



PACIFIC FISHERIES RESOURCE CONSERVATION COUNCIL
Conseil pour la conservation des ressources halieutiques du pacifique

APPLYING THE SALMON STRONGHOLD CONCEPT
IN CANADA

JUNE 2009

PREPARED FOR
Pacific Fisheries Resource Conservation Council
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EXECUTIVE SUMMARY

The idea underlying Salmon Strongholds is to ensure thriving fish habitat conditions where it is most crucial to maintain the abundance, productivity and diversity of wild Pacific salmon species and populations. It emphasizes the prevention of problems and reduction of threats to wild salmon in geographical areas of particular importance, complementing the emphasis in recent years on crisis management of salmon stocks.

The Salmon Strongholds concept is meant to reinforce the vitality of salmon and steelhead habitat ecosystems through voluntary and locally-based initiatives, along with government agency participation. A particular focus of Salmon Strongholds is the purchase or property-rights arrangements (covenants, set-asides) of land at the landscape level with special significance or vulnerability for salmon.

This approach to salmon habitat conservation was initially conceived by Canadian researchers and fisheries specialists and explained in the 1990's in the *Living Blueprint for B.C. Salmon Habitat* report. It was not adopted then, primarily because of Canada's attention to the Wild Salmon Policy's development and the preoccupation of governments with recovery for a series of crisis conditions that included fish population crashes and immediate threats to salmon diversity in several areas.

In 2008, the Pacific Fisheries Resource Conservation Council (PFRCC) decided to explore innovative long-term salmon habitat strategies, especially in light of climate change and emerging water issues. The PFRCC identified the potential of the Salmon Strongholds approach to supplement existing programs and reinforce Canada's salmon and steelhead conservation effort.

Initially introduced in the northwest Pacific states south of British Columbia, the North American Salmon Stronghold Partnership is a voluntary network of individuals and organizations involved in salmon conservation in landscape-level habitat areas designated as Salmon Strongholds. These areas are determined and rated through a rigorous scientific evaluation of their ecological attributes and importance for salmon conservation. The partners (volunteers, government agencies, scientists, NGO's, First Nations) are involved in activities such as fish passage restoration, land exchanges, stock status assessments, regional planning, land set-asides for conservation, and non-development agreements with landowners. The partners share information and experiences through a network across the coastal and inland Salmon Strongholds throughout the Pacific Northwest, and they operate under a Charter that spells out their purpose and relationships.

The initial experience of the North American Salmon Stronghold Partnership in Washington and Oregon has proven to be valuable in improving and safeguarding salmon habitat in key basin and watershed areas. The experience of those states has involved coping with severe climate change impacts, competition for water resources, and urbanization. It is a harbinger of the problems that wild Pacific salmon and steelhead in British Columbia and Yukon will soon face with similar intensity.

Canadian support for the Salmon Stronghold concept is strong, but tempered by concern about possible consequences for non-Stronghold salmon habitat areas. However, the designation of Salmon Strongholds does not imply that other salmon watersheds or river systems should be overlooked or could be dispensable in any way. The heightened public awareness and diligence this concept creates concerning salmon habitat actually has the effect of highlighting the importance of protecting all salmon-producing ecosystems, not just in Salmon Strongholds.

Salmon Strongholds require a science-based validation and ranking of watershed and basin areas based on clear and comparable criteria. Like any measurement or comparison, this ranking is not the only basis for judgments or decisions about salmon habitat. The Salmon Strongholds approach does not signify that any salmon area

should be sacrificed. It provides a verification of the importance of investing wisely, particularly in preventive measures and specifically in areas where the deterioration of salmon habitat would have the most extensive and devastating impact.

The initial structure of the North American Salmon Strongholds Partnership has been informal and network-based, rather than a conventional committee or conservation organization. It was intended, from the start, to extend to Alaska and British Columbia and offer flexibility for participation in whatever forms would fit Canada's unique needs, institutions and existing programs.

The Salmon Strongholds approach could help to supplement the initiatives of Canadian government agencies and organizations such as the Pacific Salmon Foundation and Living Rivers Trust Fund that have broad habitat restoration mandates. In contrast to the United States, Canada has developed its own ways to derive and deliver funding and project support for salmon habitat ecosystems. These arrangements could be strengthened through the adoption of a Salmon Strongholds approach. For instance, the effort to establish a comprehensive salmon habitat program for the Heart of the Fraser region could be focused and implemented as a Salmon Stronghold since it would most likely qualify as a particularly high-value salmon habitat area.

The Salmon Stronghold approach could reinforce the implementation of Canada's Wild Salmon Policy by providing additional scientific components of habitat assessment to complement the Policy's concentration on biology, abundance and species diversity. It would fill a gap through its emphasis on prevention of habitat degradation and on maintaining strong and healthy stocks and habitats. By contrast, the Wild Salmon Policy's focus is on stocks in decline and habitat where chronic problems occur.

The implementation of the Salmon Strongholds concept in Canada is consistent with the need to restore balance between prevention and crisis management in the overall salmon conservation strategy. It would re-emphasize the role of prevention of habitat loss and bolster the case for investment in new measures to protect vulnerable, highly productive salmon basins and watersheds. Its application of science would help justify, in substantiated terms, the value of investing in the prevention of problems, to complement the on-going importance of crisis management.

This report suggests that the implementation of the Salmon Stronghold concept in Canada could have significant benefits to the long-term viability of wild salmon populations. The Pacific Fisheries Resource Conservation Council should provide leadership and resources to test the Salmon Strongholds approach in Canada in a six-month pilot project. The PFRCC should establish an agreement with the Wild Salmon Center to exchange technical information and mutual assistance to design and implement a trial Salmon Stronghold in at least one key British Columbia watershed.

The pilot project would involve: selecting a representative area; testing the concept with stakeholders, government agencies and local residents; determining the breadth of the Stronghold area; identifying potential participants, including government agencies; assessing information needs about the salmon stocks; identifying the area's needs in restoration and prevention programs; and applying the Salmon Stronghold scientific assessment criteria to generate an evaluation and ranking. It would look at the applicability in Canada of measures taken in Salmon Strongholds in the United States where innovative easements, tax measures, and land assembly arrangements have been adopted for riparian and landscape-level areas.

The PFRCC should also approach the Pacific Salmon Foundation and Pacific Salmon Commission to have them consider how their science criteria for habitat funding programs could be adapted to enable support of projects in Canadian Salmon Strongholds.

The PFRCC should proceed with other activities to lay the groundwork for implementation of Salmon Strongholds in British Columbia and Yukon, ensuring that it would obtain broad support, generate tangible results, and complement existing conservation programs. This would involve adapting the Salmon Strongholds Charter to accommodate Canadian circumstances and building effective links into the Salmon Strongholds network.

Finally, the governments of Canada and British Columbia should be asked to work with their counterparts in the Pacific coastal states to establish a joint funding mechanism, possibly through the intergovernmental climate change programs and collaborative project arrangements, to support the involvement of Canadians and Canadian organizations in the coast-wide network of Salmon Strongholds for effective long-term salmon conservation and joint initiatives for salmon and steelhead habitat.

1. INTRODUCTION

The task of developing innovative ways to safeguard crucial wild Pacific salmon habitat through positive action and preventive approaches is a challenging but essential task, especially in the face of trends in climate change, human population growth, and competition for water resources.

British Columbia's and Yukon's once-abundant salmon and steelhead stocks are adversely affected by an array of agricultural, forestry, industrial and residential developments that characterize the extraordinary human population growth of the past century. The increasing tempo of that growth has disturbed, and in many cases destroyed, the natural characteristics of salmon spawning, rearing and migration habitats. The consequence is environmental stress on wild salmon that threatens to devastate the remaining salmon stocks that have been such a crucial icon of the Pacific region's natural history.

While government programs and volunteer projects have helped alleviate some of the more visible salmon habitat threats and damage, the overall mitigation and restoration effort has constantly lagged behind the rapid pace of destabilization of essential salmon habitat. The current ways of dealing with wild salmon habitat protection and renewal are not coping with the problems nor generating adequate results. The resources and strategies to deal with salmon habitat challenges are not delivering on the conservation principles and intent stated in federal and provincial legislation and regulation.

A trend of the past three decades has been to focus financial and technical resources on crisis situations, such as rebuilding the salmon stocks in areas where they have crashed. For example, the sharp declines in Strait of Georgia coho a decade ago required an extensive rebuilding program through both habitat restoration initiatives and severe reductions in fishing opportunities. While this sort of fire-fighting and triage to manage salmon crises has been, and continues to be, necessary, it has gradually diverted attention and resources away from the important task of preventing crisis situations from occurring. Where funding for salmon conservation became severely rationed, it was considered necessary to deal with immediate emergencies rather than invest in prevention. The unintentional result has been the creation of an imbalance in the assignment of resources, and the lessening of prevention as a fundamental strategy in the overall Pacific salmon conservation effort.

More funding for existing salmon conservation initiatives is an essential ingredient. But marginal growth in spending on habitat restoration or reliance on the Wild Salmon Policy's implementation are not enough. New strategic approaches and frameworks for salmon habitat are needed in order to achieve long-term sustainability for Pacific salmon. More is needed than simply an incremental increase in what is already in place. Innovative approaches are necessary to help build a stronger infrastructure for salmon conservation. This includes new ways for governments and volunteers to work together, to share their experience and expertise, and to plan and build on the areas of strength of British Columbia's salmon and steelhead resource.

What is needed is a rebalancing of salmon conservation activities by assigning resources to more cost-effective prevention measures and investing in the protection of high-productivity habitat areas. In doing this, it will be important to satisfy the expectations of British Columbians that the investment in salmon protection and restoration gets positive results and is money put to good use. They reasonably expect scientific justification and measurement of results. British Columbians equally require assurances that the investment for wild Pacific salmon is addressing the problems on a priority basis.

2. APPROACH AND METHODOLOGY

The Pacific Fisheries Resource Conservation Council (PFRCC) has worked for more than a decade to help make British Columbia and Yukon wild Pacific salmon and steelhead stocks healthy and sustainable. The PFRCC has been involved in finding, testing and promoting innovative solutions for salmon stocks and salmon habitat in both ocean and freshwater environments.

Members of the PFRCC have emphasized the importance of habitat and its significance for the productivity and long-term prospects of Pacific salmon. They have generated a number of ground-breaking reports in recent years on habitat indicators, water issues and other aspects of freshwater environmental and ecosystem conditions. In mid-2008, the PFRCC investigated the options for fresh strategies and policy frameworks to conserve salmon habitat. The Salmon Strongholds approach was identified as one that merited serious consideration as a strategic concept.

The North American Salmon Stronghold Partnership was created and developed by the Wild Salmon Center, a salmon stewardship organization based in Portland, Oregon, that manages several salmon habitat protection initiatives around the North Pacific Rim, particularly in the United States and Russia. The Partnership has begun to achieve visible success in advancing salmon habitat protection in the states of Oregon and Washington.

The PFRCC received a briefing from Wild Salmon Center officials in the Fall of 2008 and, after conducting some additional research about the Partnership, commissioned this report to investigate the feasibility of adopting the Salmon Strongholds approach in Canada. A caveat added by the Council members was to ensure that any recommendations contained in the report for adoption of a Salmon Strongholds approach would not in any way undermine the work of existing institutions, but would help reinforce their purpose, resources and activities.

In a competitive process, the Council selected PPM Public Policy Management Limited to prepare this report that was to include options and recommendations for action. The project was headed by Ken Beeson, and supported by a steering committee comprised of Dr. Marvin Rosenau, Tim Crowhurst and Dave Peterson, all of whom have contributed their fisheries knowledge and expertise in previous PFRCC reports. Also assisting in the preparation of aspects of the report was communications specialist Carla Shore.

Research for this report included meetings with officials of the Wild Salmon Center in Portland, and the assistance of Greg Block, Mark Trenholm and Guido Rahr was particularly informative and helpful. A number of presentations and discussions took place with Wild Salmon Center staff and participants in the North American Salmon Strongholds Partnership at the February 2009 State of the Salmon conference in Vancouver, all contributing to the preparation of this report. Additional background information outlining the Council's intent in commissioning this report is contained in Appendix A. Report's Terms of Reference.

This report is intended to inform the PFRCC's decisions on whether or not to endorse, support or facilitate Canadian adoption of a Salmon Strongholds approach and/or to enable Canadian involvement in the North American Salmon Strongholds Partnership.

3. DEVISING THE SALMON STRONGHOLDS CONCEPT

The term Salmon Stronghold refers to a watershed, multiple watersheds, basin or other defined spatial units where salmon populations are strong and diverse, and the habitat has high intrinsic potential to support a particular salmon species or suite of species.

In its essence, the Salmon Strongholds concept involves establishing a balance between proactive (prevention) and reactive (crisis response) salmon habitat activity. It applies science and rational criteria to determine a ranking of habitats and areas (watersheds, basins, landscapes) in terms of their significance for salmon productivity and future sustainability.

Underlying the Salmon Strongholds concept is its emphasis on prevention and the recognition that it should be a supplement to the existing framework of Pacific salmon conservation, not a replacement nor an alternative to what is being done. It is intended to ensure that there is more effective effort put into salmon habitat areas in order to bolster the most crucial salmon habitats, rather than simply wait and ignore them until the inevitable problems occur. Given the observation of trends in salmon stock declines and the replication of this experience moving northward from California, Oregon and Washington, it is expected that British Columbia's current salmon habitat problems will continue to multiply and intensify, particularly as the province's population grows.

BLUEPRINT REPORT

The concept of Salmon Strongholds (but not the name) was given form and substance in Canada in the 1990's by fisheries scientists and managers who were disturbed by what they saw in the widespread deterioration of salmon habitat and the limitations of the conservation policies and practices that had become more reactive than proactive.

In 1999, a group of scientists and fisheries specialists produced a seminal report entitled *Living Blueprint for B.C. Salmon Habitat*, organized through the Pacific Salmon Foundation. That report set out the conceptual basis for what was adopted later in the northwest United States, and became known as Salmon Strongholds.

That report presented a compelling case for a shift in the prevailing policy direction. Unfortunately, it came at a time when a series of stock collapses and salmon species threats required immediate remedial action. The report's proposals were consequently set aside in the salmon fisheries turmoil of that era when a series of crisis situations took precedence in salmon conservation and fisheries management. At the same time, the Government of Canada's Wild Salmon Policy was being proposed, and it took center-stage in policy development considerations. Federal government officials concluded that the emphasis on scientific knowledge and identification of diversity through the Wild Salmon Policy would represent a more appropriate course of action. Consequently, essential points of the *Living Blueprint for B.C. Salmon Habitat* report were recognized as being valid, but were not adopted at that time in Canada.

The *Living Blueprint for B.C. Salmon Habitat* report painted a bleak picture for the future of Pacific salmon. It described the extent of habitat loss and degradation, and explained how the even more severe problems of salmon evident in Washington and Oregon would inevitably be repeated in British Columbia and overwhelm the salmon conservation effort in the province within twenty years. The report explained:

"It's now or never: the salmon's lifeline is becoming frayed every day and, unless immediate and meaningful action is taken, the wild salmon resource could suffer a collapse from which it may never recover".

3. DEVISING THE SALMON STRONGHOLDS CONCEPT

The *Blueprint* report went on to point out that public and news media tend to be mesmerized by high-profile practices taking place in the fisheries, dealing with issues such as catch levels and allocation to the exclusion of real habitat protection. In the public perception, the problems of Pacific salmon became all-too-readily attributed to overfishing, while the more insidious and permanent effects of habitat loss were overlooked. At the same time, the solutions suggested by some advocates, such as reducing catch levels, were simplistic and failed to recognize other basic reasons for declines in wild Pacific salmon. Too often ignored was the systemic weakening of habitat conditions that more fundamentally undermine the long-term sustainability of salmon stocks than prevailing fishing practices.

The report called for the concentration of resources within an overall salmon-productivity strategy. Specifically, it called for the assignment of “...the highest priority to the protection of the remaining critical and significant salmon habitat”. It stressed the importance of the role of proactive habitat management and support for volunteer involvement within the strategy.

The *Living Blueprint for B.C. Salmon Habitat* also explained the need for priority-setting, in contrast with the view that prevailed at the time that every salmon area and problem deserved equal treatment. The realities of budget constraints and sheer scale of the increasing problems of salmon habitat loss had made, even by then, a necessity of more priority-setting and rationing, however much that situation was disheartening to the advocates of wild salmon protection. The *Blueprint* report went on to propose an elaborate structure of an advisory board, several regional watershed management committees, federal-provincial government reviews, new legislation, regulatory amendments, new programs, and program changes. The sheer scale of the transformation of federal and provincial government salmon habitat arrangements proposed in the report was daunting and, in retrospect, unrealistic.

Portraying Salmon Strongholds

The Salmon Stronghold concept as it has been developed and managed through the Wild Salmon Center has been described in several ways, including the following:

- Protect the best, first—including all salmon habitat from headwaters to oceans.
- Core centers of wild salmon abundance and diversity that generate the highest percentage of wild salmon.
- Volunteer network of basins, rivers and regions that are primary sources of wild Pacific salmon.
- Promote and protect critical ecosystem services—including clean water, carbon sequestration and healthy fish habitat—necessary to mitigate climate-change impacts.
- Buffer against future wild salmon collapses by coordinating government and volunteer efforts.
- Use private dollars, investment and contributions to leverage government funding to support the highest priority conservation actions.
- Voluntary, incentive-based efforts, saving salmon ecosystems across entire watersheds.
- Respecting private property rights and providing critical funding to acquire easements and riparian lands, improve fish passage and reward fish-friendly land-management practices.

HABITAT CHALLENGES

Further rationale and scientific analysis to back up the views expressed in the *Blueprint* report were contained in an article published the next year by Dr. Robert Lackey entitled "*Restoring Wild Salmon to the Pacific Northwest: Chasing an Illusion?*". In it, he raised questions about the assumption that there might be any hope of regaining the pristine state of the Pacific coast's salmon habitat, or even maintaining the prevailing state in light of conditions such as growing populations and increasing competition for water. His theme was the need to adopt a strategy that would set priorities and focus on realistic objectives for salmon habitat protection where it was needed most.

A subsequent report by the David Suzuki Foundation entitled *The Will To Protect* reiterated some of the primary messages of the *Living Blueprint for B.C. Salmon Habitat* report and added further analysis that confirmed the urgent need for action. It chronicled the ways in which salmon habitat was continuing to deteriorate as a result of fundamentally changing conditions that required new approaches by governments and stakeholders. It suggested ecosystem-based solutions, volunteer involvement and integrated efforts on a large scale as crucial components.

4. APPLYING THE SALMON STRONGHOLDS CONCEPT

While Canada and British Columbia did not proceed with the adoption of a Salmon Strongholds approach, the underlying ideas inspired fisheries and conservation leaders in Oregon and Washington to consider how it could be implemented in a practical and constructive form.

The notions that were expressed in the *Living Blueprint for B.C. Salmon Habitat* found strong support among salmon conservation activists in the United States northwest states. The trends in salmon stocks due to habitat deterioration that were only starting to be felt in British Columbia and Yukon were already in the process of ravaging Oregon and Washington, and moving northward.

The work by the Wild Salmon Center in Portland five years ago revolved initially around the notion of “sanctuaries” for wild salmon. This approach had a parallel to refuges or reserves similar to the more widely encompassing marine protected areas.

The initial concept evolved into what became known as “Salmon Strongholds” that entailed a process that would identify and measure the salmon habitat’s conditions and the ecosystem’s vital signs in key basins and watersheds.

CONCEPT IMPLEMENTATION

For the Wild Salmon Center, the development of a North American Salmon Stronghold Partnership was evolutionary, and emerged gradually from the identification of the missing components in the strategies that had traditionally been applied to salmon habitat recovery. The reasoning was explained in the list of assumptions contained later in the Salmon Stronghold Partnership Charter:

Wild Pacific salmon are a central part of the culture, economy and environment of Western North America. Salmon generate billions of dollars of economic activity, provide thousands of jobs and are a keystone species, supporting food webs in freshwater and marine environments... During periods of rapid environmental change like that anticipated over the next several decades, maintaining key ecosystem processes and functions, population abundance, and genetic integrity are vital to ensuring the health of salmon populations. In light of these changes, it is vital to make strategic investments now as a cost-effective strategy to establish a range-wide network of salmon strongholds to ensure wild salmon survival for future generations.

Underlying the Salmon Strongholds approach was an awareness of the existence of serious gaps that needed to be filled, as the Partnership Charter went on to describe:

Current measures to recover threatened or endangered stocks should be complemented by identifying and sustaining core centers of abundance, productivity and diversity in the healthiest remaining wild salmon ecosystems throughout their range. A synergistic network of core wild salmon centers of abundance and diversity is intended to complement, not substitute for, work in impacted systems and will maintain and can increase long-term resilience...

A particularly important role foreseen for the Salmon Strongholds Partnership was to bring together the various government agencies, volunteer organizations, conservation groups and stakeholders (landowners, fishers, water users) to help coordinate their habitat conservation and fish management activities. The need was identified for ways to enable more effective planning and mutually-reinforcing activities by all of those involved in salmon habitat watersheds and basins.

4. APPLYING THE SALMON STRONGHOLDS CONCEPT

The concept was gradually solidified into a program proposal by the Wild Salmon Center which had obtained sponsorship from the Hewlett Foundation, Packard Foundation and Goldman Foundation, charitable organizations that support an array of pioneering environmental initiatives. The funding provided by these foundations enabled the North American Salmon Stronghold Partnership to be launched in 2006.

PARTNERSHIP DEVELOPMENT

The North American Salmon Stronghold Partnership developed organically during its first two years, rather than in line with any detailed organizational structure or firm assumptions about how it should evolve. The approach was to find out how local volunteers perceived the best contribution that could be made by applying the Salmon Strongholds approach to their work and achievement of objectives. This adaptive approach to the development of the North American Salmon Strongholds Partnership enabled it to emphasize the value of the volunteer effort and local participation. The Wild Salmon Center's administrative contribution was in a supporting role for technical assistance, coordination and network-building for the various Salmon Strongholds that were being formed, rather than creating a centralized organization. See Appendix C for an elaboration of the principles of the North American Salmon Stronghold Partnership.

At the same time, the initial Partnership organizers were firm in their resolve to ensure the application of rigorous scientific criteria to the identification and measurement of potential Salmon Strongholds. They recognized that the designation of a Salmon Stronghold needed legitimacy in terms of meeting specific agreed-upon qualifications that would validate the salmon-related significance of the watershed or basin. The result would be a capability to illustrate in tangible ways how investment in protection, restoration and other salmon conservation activities for a Salmon Stronghold could have significant benefits and cost-effectiveness. The emphasis on science and evidence is essential to help determine priorities and identify where financial and technical resources could be assigned to deliver the best value.

The scientific criteria for the assessment of Salmon Stronghold criteria consider the number of species and factors of run-timing. They are evaluated in terms of salmon abundance and weighted measures of productivity, percent natural-origin-spawners, and life-history diversity. The data related to these criteria are gathered from whatever sources are available, mainly from government agencies, and reviewed by experts on a thorough basis to establish a ranking

Key Elements of Salmon Stronghold Activity

Among the elements of what Salmon Strongholds involves in operational terms are the following:

- Ranking salmon-producing areas on the basis of clear and comparable values.
- Assessing potential Strongholds (watersheds, basins) in terms of rigorous science-based criteria to measure salmon habitat.
- Assembling, linking and protecting crucial salmon habitat.
- Priority-setting for salmon habitat investment decisions with consideration of the relative importance of areas and productivity opportunities, but with attention to unique salmon values of some areas.
- Coordination of the collaboration and involvement by government agencies, local groups and individuals.
- Network-building across Strongholds and among volunteer and community participants, sharing experience and expertise.
- Engaging in an array of salmon habitat restoration, protection and prevention initiatives.
- Supplementing and reinforcing the work of agencies and stakeholders involved in salmon habitat conservation projects.
- Accelerating the introduction of habitat conservation activities.
- Combining public and private sources of funding for investment in salmon habitat recovery and sustainability.

with comparability to others. Salmon Stronghold designations are awarded on meeting the thresholds to fulfill these criteria. See Appendix D for further information on the scientific methodology and scoring.

ECONOMIC DIMENSIONS

The Partnership members identified the significant economic benefits that could be derived from the adoption of the Salmon Stronghold approach and its emphasis on maintaining healthy stocks that, in turn, enabling greater predictability for sustainable First Nations, commercial and recreational fisheries. By bolstering high-productivity salmon habitat in the Salmon Stronghold, fishing opportunities can be maintained or possibly increased with less risk to diversity of the species.

At the same time, the investment in preventive measures in Salmon Strongholds can save governments millions of dollars that would otherwise be required for future restoration, stock rebuilding and emergency programs to deal with salmon stock crises. By targeting funds strategically in Salmon Strongholds, governments could more readily demonstrate the economic value and returns from investment in Pacific salmon protection and re-population in crucial areas. The jobs in the fishery harvest, processing and coastal communities could be strengthened by building the sustainability and predictability of the fishery in Salmon Strongholds.

The Salmon Strongholds approach emphasizes the value of investing in prevention and stock rebuilding where the significance of a thriving salmon habitat is measurable in terms of both ecological and economic values.

VOLUNTARY AND LOCAL ACTIVITY

The organizers and participants in the North American Salmon Stronghold Partnership gradually codified the ways in which they would work individually and in common. The result was the writing of the Partnership Charter that spelled out their purpose, assumptions, principles and governance framework. In essence, they agreed to describe the Stronghold partnership as:

"...a private-public effort working across political boundaries, government jurisdictions and land ownerships to identify, restore and protect North America's healthiest remaining Pacific salmon ecosystems".

Key Elements of the Partnership Charter

The terms of participation in the North American Salmon Stronghold Partnership are set out in a Charter dated December 3, 2007. That Charter includes the following points:

- The Stronghold Partnership's purpose 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, steelhead, and the many species that depend on them and inhabit these watersheds.
- The Stronghold Partnership is a voluntary, incentive-based initiative intended to supplement ongoing ecosystem protection and restoration efforts by providing leadership, enhanced coordination and public and private resources to support priority actions.
- The Stronghold Partnership activities involve: identifying a distributed network of strongholds across western North America; developing replicable conservation partnership models; enabling the acceleration of habitat restoration and protection projects; and securing salmon habitat resources via federal, state, and local legislation, public and private grants or contributions, and other means.
- The Network is meant to include the range of ecological processes, ecosystem functions, and connectivity at regional and pan-coastal scales, linking each of the self-sustaining strongholds.
- Salmon Stronghold status is conferred to a defined geographical unit which meets biological criteria for abundance, productivity, diversity (life history and run timing), habitat quality, or other biological attributes important to sustaining viable populations of wild Pacific salmon throughout their range.

In terms of their joint work and primary functions, the members of the Salmon Strongholds network began to engage in several activities:

- **Identifying biologically important Salmon Strongholds** and determining their dimensions based on scientific criteria.
- **Developing the science-based profile and ranking** of each Salmon Stronghold in order to qualify for designation, as well as identify projects and opportunities to restore or reinforce salmon habitat conditions and values.
- **Reviewing existing conservation plans** and developing consensus plans among government agencies and stakeholders for salmon habitat protection.
- **Organizing land exchanges** to set aside crucial riparian areas while permitting agriculture and other development to proceed where conditions are more suitable.
- **Assessing the ongoing status of fish** in the Salmon Stronghold area, watersheds, basins and rivers, and develop plans for joint action to act wherever appropriate.
- **Obtaining and applying expertise** on fish passage and implementing projects that establish effective remedial measures.
- **Initiating non-development agreements** with landowners to ensure that vulnerable habitat is not encroached in the future.
- **Providing specialists** to help local communities and generating funds to undertake key restoration and protection activities.

A recent example of how the North American Salmon Stronghold Partnership works was succinctly described in the January 2009 newsletter of the Wild Salmon Center:

Deer Creek has been identified as one of the most important spawning and rearing tributaries for coho salmon in the Illinois River sub-basin and Rogue watershed in Oregon. The North American Salmon Stronghold Partnership approved funds for a restoration project along a two mile stretch of Deer Creek... Funding for LiDAR remote sensing on Deer Creek will provide essential baseline data for project design. Phase one of restoration will help leverage additional public and private financial support for the project.

Through the collaborative efforts of over 10 private and public partners, including Oxbow ranch landowner Ellen Lovett, the project will eventually return 3.2 cfs to the stream, reconnect floodplains, stabilize stream banks, and restore natural hydrological processes and critical off channel rearing and spawning habitat along two continuous stream miles of Deer Creek.

While this example explains only one project within a large Salmon Stronghold, it exemplifies the sort of initiative that can be undertaken. Several of these kinds of projects, in addition to restoration projects, are typical of the work of Salmon Strongholds, involving partnerships of environmentalists, government agencies, landowners and fisheries biologists. The volunteers and other participants receive technical assistance, organizational support and some project funding from the Wild Salmon Center, but are also expected to generate funding and sustain their own activities.

ORGANIZATIONAL BASIS

The North American Salmon Stronghold Partnership has evolved its administrative framework through the Wild Salmon Center into a structure with three component operations: Stronghold identification; legislative affairs; and project management. The Stronghold identification component supports the science activities of mapping, database development, and biologist services. The legislative affairs component has had a significant role in drafting and promoting federal legislation intended to establish a program and authorize large-scale federal funding to support Salmon Strongholds initiatives. The project management component provides coordination, administrative support, outreach and communications.

The budget of the North American Salmon Stronghold Partnership covers the costs of four staff members and two contracted specialists, and includes the standard administrative office and operational support expenditures. Those costs are kept relatively low by having the Wild Salmon Center serve as the administrative platform for the Partnership, permitting the sharing of overhead costs. The overall annual budget is about \$650,000, covered primarily by foundation contributions.

An incentive for Salmon Stronghold participation is the potential to obtain new or additional technical and financial assistance for programs to restore or protect local salmon habitat. The participating Salmon Strongholds have developed procedures among themselves and with the Wild Salmon Center to determine appropriate investments and, to some extent, develop consensus on priority projects.

By April 2009, there were nine confirmed and endorsed Strongholds, and another one pending, across the inland and coastal areas of Washington and Oregon. Other areas are lining up to be evaluated for their Salmon Stronghold attributes, based on the growing awareness of the Salmon Strongholds Partnership. Alaskans have begun to participate in the North American Salmon Stronghold Partnership, and there are several obvious candidate areas across that state.

NEXT PHASE

In early April 2009, the *Pacific Salmon Stronghold Conservation Act* was proposed in the United States Congress by a bipartisan group of Senators and Representatives to establish a federal Salmon Stronghold program, building on the current Wild Salmon Center program. Supporters of this legislation described how it would supplement existing initiatives to recover salmon stocks by directly supporting public-private incentive-based efforts to maintain strong crucial stocks, sustaining the economic, ecological cultural and health benefits of wild Pacific salmon for future generations.

The Wild Salmon Center described what this legislation would do:

- **Provide statutory direction** to focus resources on protection of healthy Pacific Salmon Strongholds, complementing existing recovery efforts.
- **Leverage private funding** to support cooperative conservation in stronghold basins.
- **Streamline delivery** of incentive-based programs in Salmon Strongholds.
- **Enhance coordination** among federal, state and local governments, tribes, non-governmental organizations and other entities to implement an effective wild salmon conservation strategy.
- **Save billions of dollars** in future restoration, stock rebuilding and emergency funding, by making strategic investments in the highest value conservation actions within Salmon Strongholds.

4. APPLYING THE SALMON STRONGHOLDS CONCEPT

It appears likely that this legislation will be enacted, and that the availability of funding for Salmon Stronghold investment will increase significantly. The current proposal calls for annual grants of \$30 million for four years.

The legislation also calls for the establishment of a more formal structure and governance arrangement for Salmon Strongholds than currently exists, mainly to ensure continued prudence and accountability in determining projects and spending public funds.

From its beginning, the North American Salmon Strongholds Partnership was intended to expand to a pan-coastal network, including participating Salmon Strongholds in British Columbia and Alaska. Salmon conservation needs are similar in many respects across the northern arc of the Pacific region, from California northward and across to Russia and Korea. Where they differ in some observable ways is in the timing of the impact of trends such as climate change and competition for water access. The impacts of those trends on salmon and their habitat are rapidly moving from south to north, and the severe losses of salmon habitat in California, Oregon and Washington are now being replicated in British Columbia and Yukon, as the authors of the *Living Blueprint for B.C. Salmon Habitat* forecast a decade ago.

The lessons of the four U.S. western salmon states (including Idaho) having failed to act soon enough to protect their cores of salmon abundance could help guide British Columbia and Yukon as they face the emergence of the same conditions.

A particular strength of the North American Salmon Stronghold Partnership as it has been adopted in the United States has been its enthusiastic endorsement by high-profile regional and national leaders, and by members of the environmental advocacy community.

A further strength of the Salmon Strongholds Partnership has been the bipartisan political endorsement that provides recognition and support to initiatives under the Salmon Strongholds banner. Spokespersons for the Salmon Strongholds Partnership include former Oregon Governor John Kitzhaber and former head of the Environmental Protection Agency William Ruckelshaus. Both have brought their credibility and political credentials to raise the public profile of Salmon Strongholds.

The ultimate ambition of the North American Salmon Strongholds Partnership is to extend participation across the entire west side of the continent. The North American Salmon Stronghold Partnership currently estimates that, for the U.S. states south of British Columbia, the potentially-qualifying Salmon Strongholds cover approximately 20 percent of the existing range of Pacific salmon.

5. CANADIAN INITIATIVES AND INSTITUTIONS

Canadian governments and non-governmental organizations have developed several legal frameworks, programs, policy initiatives and activities for the restoration and protection of Pacific salmon habitat, as well as measures designed to prevent the deterioration of conditions affecting salmon productivity.

The protection and restoration of salmon habitat in Canada has jurisdictional issues, regulatory regimes, funding processes and government policy initiatives that contrast with those of the U.S. Pacific states. Factors such as unresolved Aboriginal land entitlement make Canada's situation more complicated in terms of responsibilities and ownership of important salmon-producing watersheds. Still, there are far more geopolitical commonalities than differences across North America's Pacific coastal region in what should drive Canadian public policy decisions concerning the prevention of salmon habitat deterioration, particularly in crucial high-productivity watersheds and regions.

SITUATION COMPARISONS

There are some significant points that should be noted about salmon habitat in British Columbia and Yukon. For example:

- **A large portion of the land base** of British Columbia and Yukon is held by the provincial government in public ownership. Apart from its national parks, the Government of Canada has little involvement in land ownership or control, in contrast with extensive federal lands in the western United States. This situation gives the Province of British Columbia considerable weight and significance in land-use decisions that affect salmon habitat.
- The **split of constitutional responsibilities** between the federal and provincial governments in Canada for fish and habitat has meant overlaps and gaps at times in the handling of salmon (federal) and steelhead (British Columbia) issues. The impacts of decisions by the Province of British Columbia in its responsibilities for transportation, industrial development, mining, forestry, agriculture, run-of-the-river hydro, and other activities are significant for salmon habitat protection and management.
- The **structure of major watersheds** in British Columbia (with the exception of the international Columbia River), particularly the Fraser and Skeena rivers, involves a greater scale and geographic diversity of river systems compared to the coastal U.S. mainland states. This could make it challenging to have several Salmon Strongholds working in areas along a single Canadian salmon river system.
- An extensive **body of law and regulations** is in place at the federal and provincial levels to protect salmon and steelhead stocks and habitat. The federal Species at Risk legislation in Canada, for example, provides extensive coverage, but is directed towards crisis management rather than preventive action for salmon. Both Canada and the United States have a sometimes-confusing mix of legal and policy responsibilities for fisheries management across federal/provincial and federal/state mandates.
- **In the United States, land is protected** under the country's constitution, with no taking except with compensation. Such is not the case in Canada where constraints can more easily be placed on private land where it is deemed necessary for purposes that include fish habitat protection. The consequence is that there has been a greater onus in the United States on achieving consensus and buy-in of all stakeholders, particularly landowners, for salmon habitat conservation initiatives involving possible constraints on land use.
- **Funding from non-governmental sources** for environmental and salmon-related habitat is less frequently available in Canada than in the United States. Philanthropy in Canada is not as widely practiced in this field, and the private foundation funding that spurred the North American Salmon Stronghold Partnership in its initial phase is not expected to be made available from Canadian sources.

Both the Pacific Fisheries Resource Conservation Council and the Wild Salmon Center identified the importance of accommodating Canada's unique conditions and needs in Canada's adoption of the Salmon Strongholds approach and Canadian participation in the North American Salmon Stronghold Partnership. The initial organizational model needs to be adapted for Canadian involvement.

At the same time, the work envisaged for Salmon Strongholds in Canada is not unique. Most of the activities undertaken through the Salmon Strongholds Partnership would not be new to Canada. Land acquisition for wildlife and natural habitat protection has been taking place for several years through a variety of private and government foundations and funding arrangements. Salmon habitat restoration has become a long-standing program involving streamkeepers and volunteers from across British Columbia. Ecosystem planning initiatives for watersheds and regions have been introduced on many occasions across British Columbia during the past three decades.

While these facets of Salmon Strongholds are already in place to some extent in Canada, they lack the strategic coherence of building Canada's capacity to prevent salmon stock collapses from which there could be no recovery. It is important to recognize that the Salmon Strongholds concept calls for a focus on key salmon habitat, priority-setting and preventive approaches. The notion of Salmon Strongholds is to add to the important salmon habitat conservation work already underway by reinforcing the cores of salmon abundance and diversity.

INSTITUTIONS AND PROGRAMS

Canadian involvement in the North American Salmon Stronghold Partnership should be considered through a perspective that acknowledges and supports important existing initiatives and organizations, including the following:

- The **Pacific Salmon Foundation** is a not-for-profit organization established with a federal government-funded endowment and funding from salmon fishing licenses, and given a mandate to conserve, rehabilitate, and enhance wild Pacific salmon, primarily by facilitating salmon restoration projects. It operates the more recently established Pacific Salmon Endowment Fund that provides funding for salmon habitat projects across the province through a competitive evaluation process. It serves as a fund-raising vehicle to obtain corporate and individual contributions for salmon habitat initiatives. Among its programs is the Salmon Sustainability Lens that links volunteers across the spectrum of salmon interests and encourages knowledge transfer and advocacy.
- The **Fraser Salmon & Watersheds Program** operates as a cooperative activity of the Pacific Salmon Foundation with the Fraser Basin Council, Living Rivers Trust Fund and the Fraser Basin Initiative of Fisheries and Oceans Canada. Its network of streamkeepers and array of participants with interests in salmon conservation has developed to become a leading source of information and activity related to salmon habitat.
- Government personnel from **Fisheries and Oceans Canada** (DFO) and British Columbia's **Environment Ministry** fisheries programs both conduct their extensive habitat-related work under separate legislated obligations to monitor and regulate salmon and steelhead stocks, as well as relevant habitat conditions. DFO has instituted the Fish Habitat Management Program with a mandate to conserve and protect fish habitat, applying risk management practices and assessing the actual and potential impacts of major projects on salmon habitat. Both governments can respond to salmon habitat-related problems and risks primarily through regulatory restrictions on fishing and development.

- The **Heart of the Fraser** initiative is still in its formative stages, and is meant to apply a range of conservation and salmon habitat renewal initiatives in a crucial segment of the Fraser River between the communities of Mission and Hope. It is expected to involve land acquisition and broad-scale cooperative planning for this unique and highly productive salmon area.
- The **Nature Conservancy of Canada**, **The Nature Trust**, **Land Trust Alliance of British Columbia** and **Habitat Conservation Trust Fund** are all involved in acquiring and preserving land, including areas of high-value and significance for Pacific salmon. Some of their initiatives include a combination of outright land purchases, land donations, and conservation agreements (covenants, servitudes, easements) that involve firm restrictions on activities that would threaten the environmental value or pose threats to wildlife, salmon and associated ecosystem values. The Stewardship Endowment Fund of the Nature Conservancy of Canada provides resources for activities that include inventories, restoration and threat abatement.
- Many **stewardship, conservation and watershed organizations** operate across British Columbia, making exceptionally valuable contributions to the protection and restoration of salmon habitat. The nature of these organizations and the challenges facing them were outlined in the 2005 report to the PFRCC entitled *Reality Stewardship*. DFO is intimately involved in facilitating the work of salmon stewardship groups, providing personnel and technical support resources, while the Pacific Streamkeepers Federation facilitates the highly-valued training, public awareness and information exchanges among the participants.
- Under the **Pacific Salmon Treaty**, two restoration and enhancement funds were created and jointly funded by Canada and the United States to provide support for resource management, rehabilitation and restoration of marine and freshwater habitat, and enhancement of wild salmon stocks. Annually, a call for project proposals to be funded under the Treaty leads to the implementation of an array of projects.
- Many **First Nations communities and organizations** carry out salmon conservation and habitat restoration projects, funded from various sources including the Pacific Salmon Foundation. They have developed considerable capacity at the local level throughout the province to undertake stock status assessments and initiate salmon habitat renewal projects, but are typically constrained by a lack of available funding.
- The **Wild Salmon Policy**, still in the early implementation stage, is meant to restore and maintain wild salmon populations and habitat. It defines conservation units as the habitat and ecosystem areas that would permit informed and integrated planning. It establishes habitat status reports to track highly productive and limiting habitats, as well as provide status indicators for rivers, lakes and estuaries. It ranks the status of salmon populations within each conservation unit on the basis of rigorous scientific criteria, emphasizing the stocks that appear to be primarily at risk.

MUTUAL BENEFITS

The organizations and activities listed above, along with others, could benefit from the presence of the North American Salmon Stronghold Partnership in Canada. The work of these organizations would continue to be crucial regardless of the adoption of the Salmon Strongholds approach in Canada. In many respects, the North American Salmon Stronghold Partnership would reinforce the work of these organizations and their programs, particularly by helping to reinvigorate public awareness about the plight of Pacific salmon and providing new solutions that fill gaps in the existing habitat conservation effort.

The members of the North American Salmon Stronghold Partnership in the United States could also benefit from the involvement of Canadians, particularly from what is being learned as a result of the scientific work generated through the Wild Salmon Policy, as well as from the Ecological Aquatic Units of British Columbia (EAU BC)

hierarchical classification of freshwater ecosystems. EAU BC is a spatially explicit tool to quantify the interplay between freshwater species distribution and their ecosystem physical habitat and environmental processes.

Some of the Canadian experience in salmon restoration and innovative habitat projects could be beneficial for Americans to emulate. The lessons and findings of Canadian fisheries specialists, such as the PFRCC's development of habitat indicators, could be disseminated through the North American Salmon Stronghold Partnership. The studies initiated by DFO on habitat status methodology and ecosystem values that are underpinning the Wild Salmon Policy would be significant Canadian contributions to advance understanding across the North American Salmon Stronghold Partnership.

The Wild Salmon Policy's development of integrated strategic planning could benefit from the experience of the North American Salmon Stronghold Partnership and its coordination across large landscape-level areas. The experimentation in network information exchange and knowledge transfer across the Partnership network could provide useful lessons for Canada. The capacity to develop consensus in planning among stakeholders has been a focus of much of the initial work of the Salmon Strongholds participants.

Some of the activities undertaken through the North American Salmon Stronghold Partnership are less immediately relevant to Canada than they have been in the United States. The volunteer involvement in streamkeeping, enhancement and other work has already been extensive in Canada and strongly supported by federal government agencies. In addition, British Columbians are already familiar with large-scale regional planning processes related to salmon and fish habitat. As a consequence, the focus of Canadian involvement in Salmon Strongholds would more likely be in the aspects of scientific assessment, land acquisition, salmon passage, and technical aspects of restoration projects.

PUBLIC PERCEPTION

The notion of proactive solutions and attention to prevention of habitat degradation in Salmon Strongholds has drawn widespread news media and public attention to Pacific salmon in the northwest United States. The introduction of Salmon Strongholds has been changing the public perception of the situation of Pacific salmon, and providing an increased sense of both the problems and the potential for effective solutions.

Salmon Strongholds have become a rallying point for positive action to combat salmon declines, compared to the resigned attitude of inevitable and unrelenting deterioration for salmon that has too often prevailed in Canada and across the Pacific coast for the past several decades. The adoption of the Salmon Strongholds approach in Canada offers the opportunity for a renewal of hope for effective action to restore and protect crucial Pacific salmon habitat.

PROFILING STRONGHOLDS

While the Salmon Stronghold locations, size and characteristics are determined by an elaborate scientific methodology and analysis, it is already obvious that some areas of British Columbia could be prime candidates to be designated as Salmon Strongholds. The coast-wide salmon habitat mapping, for which the Wild Salmon Center is renowned, indicates several areas of British Columbia where Salmon Stronghold characteristics and criteria would likely qualify them.

While Salmon Strongholds could be identified and designated in most regions of British Columbia, some with obvious potential include the Harrison River region, Kitlope and parts of Vancouver Island, as well as segments of the Fraser, Nass, Okanagan and Skeena river ecosystems. The criteria of stock productivity, multiple salmon species and diversity would seem likely to qualify them, although the scientific assessment is essential to measure and rank the attributes of these and other potential Salmon Strongholds.

Salmon Strongholds would typically encompass watershed and basin areas that are considerably larger than the conservation units being developed under Canada's Wild Salmon Policy. For instance, there are about 44 conservation units anticipated for the Fraser River, considerably more than the number of landscape-level Salmon Strongholds that could be anticipated.

FUNDING ISSUES

In Canada, governments have been the primary sources of funding for salmon habitat initiatives, either directly through public sector programs or indirectly through money made available from endowments set up primarily by governments. Relatively little has been provided from the private sector or individual donors, although The Nature Conservancy and The Nature Trust have both had an encouraging degree of success in getting resources for their land acquisition efforts.

It should be noted that the expected new federal funding for Salmon Strongholds in the United States would not be available for use in Canada, regardless of how Canadian participation might be structured in the North American Salmon Stronghold Partnership. Whatever funds might be required for use by Salmon Strongholds in Canada would have to come from other sources.

The participation of Canadians in the North American Salmon Stronghold Partnership will depend, in large part, on the ability to provide a compelling case for new financial resources to bolster the cause of Pacific salmon. A significant part of the work of the Wild Salmon Centre for the North American Salmon Stronghold Partnership has been its legislative program to have the *Pacific Salmon Stronghold Conservation Act* adopted and its funding be made available. Since Canadians would not qualify for project support under that legislation, alternative sources for Salmon Stronghold activities, including restoration and land acquisition, in British Columbia and Yukon would have to be found.

Funding for a Salmon Stronghold initiative by the Government of Canada should be considered in light of the impending national

Q&A on Salmon Strongholds

Q: "Doesn't the notion of Salmon Strongholds imply that there are also weak habitat areas that can be ignored?"

A: The ranking of high-priority watersheds or areas is not the only basis for salmon habitat protection or restoration. Salmon Strongholds are part of an overall strategy that calls for the continuation of comprehensive salmon habitat protection efforts wherever problems or threats arise. The Salmon Strongholds approach is meant to protect the crucial core areas of salmon abundance, not shifting resources or attention from any other watersheds or basins. The compelling case for salmon habitat protection continues to be obvious for watersheds throughout the Pacific region.

Q: "Wouldn't assigning financial resources to Salmon Strongholds mean less help for areas where there are also needs for salmon restoration?"

A: Salmon Strongholds involve building on the existing government and volunteer effort, not diverting what already exists. The experience of Salmon Strongholds in the United States is that it has attracted entirely new financial and technical resources from governments and the private sector into salmon habitat conservation. The emphasis of Salmon Strongholds on prevention complements the habitat restoration and protection work done in all watersheds.

Q: "Won't the adoption of Salmon Strongholds inevitably lead to fewer fishing opportunities for sports, commercial and First Nations fisheries as part of the program?"

A: The emphasis of Salmon Strongholds is on habitat restoration and protection to maintain and in some cases rebuild the health of salmon stocks in key areas of abundance. This approach makes fishing opportunities predictable and sustainable for the long-run. Its success should enable sports and First Nations (and possibly commercial) fishing opportunities, unlike marine protected areas where fishing is often prohibited or discouraged.

Q: "Won't the Wild Salmon Policy provide enough of the sort of science-based protection of salmon stocks that is needed?"

A: "The Wild Salmon Policy makes a valuable contribution to the understanding and management of Pacific salmon, but is focused on monitoring and dealing with the stocks most immediately at risk, rather than preventive measures for areas of core abundance. Salmon Strongholds would benefit from the information generated from the scientific effort at the level of Conservation Units within the Wild Salmon Policy, and could work in tandem with it to help implement solutions in Salmon Stronghold areas.

funding in the United States. The establishment of coordinated coast-wide Salmon Strongholds programs by both countries could provide a highly effective demonstration of environmental cooperation. The assignment of new Canadian federal government resources for targeted, priority-focused and prevention-directed Salmon Stronghold habitat activity should be encouraged. The profiling of Canadian federal government funding through Salmon Strongholds in this country would generate considerably greater public support and confidence than simply adding to the budgets of existing fisheries programs.

Among the many unexplored sources for funding of coast-wide international projects are the programs established for climate change cooperation between British Columbia and western U.S. state governments. Among these programs is one for joint and coordinated action to deal with climate change impacts. Another recent program is the Pacific Coast Collaborative established two years ago to identify and support joint projects and activities among the four west coast states and British Columbia. The activities of the North American Salmon Stronghold Partnership, if extended to British Columbia, would be particularly illustrative of coastal and bi-national activities that demonstrate a combination of economic benefit and environmental value.

FOCUS ON RESULTS

The success of any Salmon Stronghold initiative in Canada will also depend upon the willingness of government officials, NGO's, conservation advocates and stakeholders in the Pacific salmon community to embrace the concept and work cooperatively with it. They need to see Salmon Strongholds in tangible terms and ways it can reinforce their work and be beneficial to them.

Canadian involvement in the North American Salmon Stronghold Partnership would be entirely consistent with the intent expressed in the 1999 *Living Blueprint for B.C. Salmon Habitat* report, although the organizational form is less prescribed and limited to the province, rather than a pan-coastal cooperative partnership. While that 1999 report suggested a highly structured set of regional committees and detailed program mandates, the North American Salmon Stronghold Partnership has been built on network links and sharing information and expertise in considerably less formal ways. At the same time, the recent success of the Fraser Salmon and Watersheds Program in forming and leading a network of conservation volunteers, stakeholders and entities illustrates that Canadians are becoming more receptive to working through these network arrangements for innovative organizations like Salmon Strongholds, rather than government-like organizational and committee structures.

Support for the Salmon Strongholds concept is strong, but not universal in Canada. Some Canadian fisheries stakeholders have suggested that the recognition of priority status for some habitat areas could serve as an excuse for the abandonment of non-priority habitat and their salmon stocks. Even the Salmon Stronghold adoption of science-based assessments and unbiased ranking is questionable to some who believe that any differentiation of salmon habitat or stock status would give rise to governments deciding that only the strong should survive. Government officials, they suggest, would be tempted to forsake non-Stronghold areas and salmon stocks.

This skepticism by some Canadians about the potential for the Salmon Strongholds to be exploited and misrepresented to the detriment of salmon in other watersheds and rivers seems to reflect both a perceived lack of trust in the environmental commitment of governments, and an uncertainty about the depth of the Canadian public's commitment to the future of wild Pacific salmon.

The experience of Salmon Strongholds in the United States, so far, has shown that it has not represented a retreat of any sort from comprehensive salmon conservation, nor led to any decline in the overall commitment to protect salmon stocks wherever they are put at risk. Salmon Strongholds has neither diminished nor jeopardized

5. CANADIAN INITIATIVES AND INSTITUTIONS

the effort to protect and rebuild Pacific salmon stocks. In fact, it is widely acknowledged that the new U.S. federal government funding through the *Pacific Salmon Stronghold Conservation Act* would never have been given serious consideration if it were simply in the form of a request for additional resources to existing bureaucracies and programs.

The most compelling reason why the Salmon Strongholds strategy and approach has been embraced as a necessary initiative in the United States is the severity of the salmon habitat crisis that has been ravaging salmon stocks in California, Oregon and Washington. In some areas of those states and for some stocks, the fate of wild salmon has been sealed, and the notion of Salmon Strongholds is considered a last-ditch effort to retain at least the highly-productive areas and salmon stocks. The conditions of climate change, competition for water and human population growth have been eroding fish habitat and undermining salmon populations have moved rapidly northward. No one should doubt that British Columbia's salmon habitat will increasingly suffer similar severe impacts, and the Salmon Strongholds approach offers an alternative solution.

Canadian involvement now in the North American Salmon Strongholds Partnership could help this country to prepare for and cope with the onslaught of the increasingly challenging salmon habitat conditions that are inevitable in Canada's future.

6. CANADIAN ADAPTATION AND IMPLEMENTATION

This report finds that the long-term sustainability of Pacific salmon in British Columbia could be advanced significantly by the adoption of the Salmon Strongholds approach and Canadian participation in the North American Salmon Stronghold Partnership.

The initial work of the North American Salmon Stronghold Partnership has had the effect of creating a beacon of hope for wild Pacific salmon stocks that have otherwise been a persistent source of bad news and bleak prospects.

The Salmon Stronghold messages of proactive, preventive, science-based and collaborative action resonate positively in the public perception. The recognition of the volunteer basis and leveraging of resources, as well as the long-run cost savings from the prevention of salmon declines through Salmon Strongholds has intuitive appeal. It presents a compelling rationale of cost-effectiveness and money-well-spent for the assignment of additional investment in crucial salmon habitat protection and renewal.

The concept of Salmon Strongholds fits well with the primary approach of conservation programs already in place in British Columbia and Yukon. It does not call for nor require any fundamental changes in salmon habitat institutions. Instead, it complements and adds balance to reinforce the underpinnings of the prevailing Canadian Pacific salmon habitat strategies. It adds an essential dimension to the overall conservation strategy, and fills a gap through its emphasis on prevention of habitat degradation and lessening of risks to crucial wild salmon stocks.

6.1 This report recommends that Canadians should participate in the North American Salmon Stronghold Partnership.

Canadian involvement in the North American Salmon Stronghold Partnership requires an adaptation of the participation arrangements to accommodate some unique needs and different conditions than those prevailing in the United States. While the simplest method for Canadian involvement would have been to follow the same procedures as American participants, it is unlikely that this would be sustainable.

The funding processes and organizational structures for salmon habitat initiatives in Canada do not make Canadian participation feasible without adaptation. Enabling and coordinating Canadian participation through a Canadian entity, working in conjunction with the Wild Salmon Center, would be needed to provide an initial organizational platform and start-up resources.

6.2 This report recommends that the Pacific Fisheries Resource Conservation Council should promote Canadian involvement in the North American Salmon Stronghold Partnership and encourage support for it among salmon conservation leaders and stakeholder groups.

As a relatively new organization, the North American Salmon Stronghold Partnership is not widely known in Canada. While some aspects of its work have been favorably observed in the salmon conservation community, the Partnership has had a relatively low profile in Canada. The Pacific Fisheries Resource Conservation Council should convene meetings and opportunities for Canadian government officials, NGO representatives, streamkeepers and other salmon conservation stakeholders to be briefed about the North American Salmon Stronghold Partnership and discuss aspects of its applicability to Canada's salmon habitat strategies.

The PFRCC should initiate a public information program to raise public awareness of the North American Salmon Stronghold Partnership and open a public dialogue on the need for more effective salmon habitat initiatives.

6.3 This report recommends that the Pacific Fisheries Resource Conservation Council should provide leadership and resources to test the Salmon Strongholds approach in Canada, in conjunction with the Wild Salmon Center, in a six-month pilot project to determine the most practical and effective forms for Canadian involvement.

The Pacific Fisheries Resource Conservation Council is uniquely positioned among Canadian salmon conservation organizations to lead a pilot project in a region of the province where a Salmon Stronghold could be tested and evaluated for its applicability on a representative basis. The PFRCC's mandate to seek out innovative solutions as an independent advisory organization to both federal and provincial ministers and the public on salmon stocks and habitat would be well served by leading this initiative.

The PFRCC should establish a formal agreement with the Wild Salmon Center to exchange technical information and mutual assistance to help design and test the applicability of a Salmon Stronghold in at least one key British Columbia watershed during a six-month period from June to November 2009.

The pilot project would include the following activities:

- Establish the procedures to undertake the pilot project with clear measurable components of activities and outcomes.
- Review potential candidate Stronghold areas, and select one that would be considered representative and indicative of future potential for Salmon Strongholds applicability in other areas of British Columbia.
- Identify potential participants in the Salmon Strongholds region, including government agencies, First Nations, and fisheries and conservation stakeholders.
- Determine the appropriate geographical dimensions of the Salmon Stronghold for the pilot project.
- Assess the data and other information needs that need to be obtained for the application of scientific assessment criteria.
- Identify the Salmon Stronghold area's needs in terms of potential restoration and prevention projects.
- Determine how the Salmon Strongholds Partnership network activities of information sharing and best practices might need to be adapted to Canadian requirements.
- Generate the scientific evaluation and ranking of the pilot project Salmon Stronghold.
- Produce an evaluation of the pilot project in terms of lessons learned, adaptation requirements, and procedures for effective involvement of Canadian habitat regions in the North American Salmon Strongholds Partnership.

The pilot project would look at the applicability in Canada of measures taken in Salmon Strongholds in the United States where innovative easements, tax measures, and land assembly arrangements have been adopted for riparian and landscape-level areas. It would serve as a guide to what aspects of Salmon Strongholds are most needed in Canada, and how Canadian involvement and activities should be concentrated.

6.4 This report recommends that the managers of the Fraser Salmon and Watershed Program and the Restoration and Enhancement Committees under the Pacific Salmon Treaty be invited to work with the PFRCC and Wild Salmon Center to investigate ways in which they might be able to align their project assessment criteria with the scientific criteria adopted for Salmon Strongholds in Canada.

These funding mechanisms for salmon habitat and other salmon projects through these two organizations have been developed with the assignment of fair and appropriate criteria for the evaluation and selection of qualifying projects. They involve highly credible, science-based criteria to determine which projects would deliver the greatest value. This recommendation for additional consideration of the criteria developed to assign rankings of Salmon Strongholds is not meant to imply that the funds in these highly-valued salmon habitat restoration project selections should be diverted away from their traditional uses. It is simply to suggest that the project selection criteria could also take into account the rigorously-developed and applied science-based rankings of Salmon Strongholds to serve as a factor in the selection of projects to be funded.

6.5 This report recommends that the Pacific Fisheries Resource Conservation Council should also proceed during the next six months coincident with the pilot project to:

- Identify how the Charter of the North American Salmon Stronghold Partnership could be adapted to enable effective Canadian participation.
- Approach officials of federal government departments and the Province of British Columbia to determine the potential for the Salmon Strongholds Partnership to be associated with Pacific pan-coastal and bi-national environmental initiatives.
- Recruit leaders who could serve as high-profile and credible spokespersons to represent the Canadian components of the Salmon Stronghold Partnership.
- Investigate options to determine the appropriate level of financial resources for Canadian involvement and ways to establish sustainable funding from a combination of government and private sector sources.
- Establish an inclusive implementation plan for the funding and operational support to enable participation by Canadians in the North American Salmon Strongholds Partnership.

The adoption of the Salmon Strongholds approach for Canada's Pacific salmon habitat could constitute an important contribution to the country's overall wild salmon conservation strategy. It is consistent with the goals of the governments and the conservation community, and would help to offset some of the shortcomings in current salmon habitat policies through its emphasis on priority-setting and prevention. It could help restore the essential balance between prevention and responsiveness to immediate conservation crisis conditions.

The experience of Salmon Strongholds in the United States has shown that it represents an optimistic perspective of positive action for the future, replacing what has been an often-prevailing sense of pessimism about the prospects of wild Pacific salmon.

APPENDIX A. REPORT'S TERMS OF REFERENCE

In mid-2008, the members of the Pacific Fisheries Resource Conservation Council began to discuss how more innovative approaches could be applied for wild salmon conservation, particularly related to habitat. They were motivated by the increasingly obvious need to supplement the programs of habitat restoration and protection that have been successful in many respects, but have focused resources and attention on coping with crisis conditions rather than preventing detrimental impacts.

The Council members noted that Canadians had been instrumental in providing the conceptual basis for the North American Salmon Stronghold Partnership that was established by the Wild Salmon Center in Portland, with the support of the Hewlett Foundation, Packard Foundation and Goldman Foundation. A 1999 advisory report in Canada initiated by the Pacific Salmon Foundation and reinforced by others provided the rationale and a basis for the framework adopted by the North American Salmon Stronghold Partnership.

The Council members decided in November 2008 to commission a study and obtain a report to determine whether or not the approach proposed in the *Living Blueprint for B.C. Salmon Habitat* and adapted in the initial stages in the Pacific Northwest states would be workable or valuable if implemented in Canada. There are obvious differences of jurisdiction, regulatory regimes, and organizational infrastructure between Canadian and American treatment of salmon conservation and protection. There are also many crucial similarities of geography, salmon characteristics, environmental challenges and risk factors across the Pacific coast.

In December 2008, the Council commissioned a consulting firm, PPM Public Policy Management Limited, to prepare this report to provide guidance on the potential for the application of the Strongholds approach in Canada. It was given the mandate to consider “... *ways to protect and restore a network of the healthiest remaining wild Pacific salmon ecosystems in British Columbia and Yukon*”.

The approach defined by the Council was to be “...*designed to complement existing federal and provincial approaches to salmon management that now focus on either populations or conservation units under threat or else deal with protection and restoration on more of a case-by-case basis*”.

The project was led by Ken Beeson, who has served for the past ten years as a policy advisor to the Pacific Fisheries Resource Conservation Council. He was assisted by a steering committee of experts in important facets of Pacific salmon: Dr. Marvin Rosenau, Dave Peterson, Tim Crowhurst and Diane Lake. The project was also assisted by work carried out by C-Shore Communications (Carla Shore). Valuable contributions of information and advice were provided by several members of the staff of the Wild Salmon Center in Portland who were generous in sharing their experience and observations.

APPENDIX B. RELEVANT REPORTS AND DOCUMENTS

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APPENDIX C. PRINCIPLES OF THE NORTH AMERICAN SALMON STRONGHOLD PARTNERSHIP

The Stronghold Partnership Charter sets out nine guiding principles for its work:

1. **Voluntary Cooperative Approach.** The Stronghold Partnership is a voluntary public-private partnership entity promoting cooperative conservation.
2. **Ecosystem Functioning.** During periods of rapid environmental change like that anticipated over the next 50 years, maintaining key ecosystem processes and functions is vital to ensuring healthy wild salmon populations and the ecological and economic benefits they provide.
3. **Best Available Science.** The Stronghold Partnership will employ a science-based approach to salmon ecosystems, informed by and using the best available science.
4. **Long Term Reliance on Natural Processes.** Management within Strongholds will be encouraged to rely on natural processes rather than engineered approaches to increase biological diversity (e.g. hatcheries, fish farms).
5. **Building on Local Efforts.** Extensive efforts are underway to identify causes for decline and promote recovery of listed salmon and steelhead throughout much of North America; the Stronghold Partnership will support and build on these efforts.
6. **Improving Delivery Mechanisms.** Where possible, the Stronghold Partnership will seek to streamline and improve existing conservation delivery mechanisms in salmon strongholds.
7. **Ecosystem Monitoring.** Long-term monitoring and assessment is essential to understanding ecosystem trends and identifying limiting factors and threats. Stronghold Partners will work together to support monitoring and assessment through enhanced coordination, information sharing and funding, as appropriate.
8. **Policy toward Local Communities.** Stronghold Partners will work closely with local communities and their elected representatives to ensure that actions taken under this initiative are locally supported and, where appropriate, are led by local groups or individuals. The Partnership recognizes and supports the role of working lands in the culture and economy of rural areas, and is counting on the participation of landowners and managers in this effort.
9. **Governance.** Participation in the Stronghold Partnership is voluntary. Membership is established by concurrence of existing members. A Stronghold Partner may cease participation at any time. The members will adopt guidelines for decision-making, in-kind and financial contributions, staffing and related matters. Nothing in this Charter diminishes or limits the authority of any Stronghold member.

APPENDIX D. SALMON STRONGHOLD DETERMINATION AND SCORING

The scientific evaluation and ratings assigned to a Salmon Stronghold make use of a database designed by the Wild Salmon Center to be the decision support tool to enable calculations and scoring by salmon experts.

The Population Stronghold Index makes use of biological criteria representing high quality standards for abundance, productivity, diversity (life history and run timing), habitat quality and other biological attributes important to sustaining viable populations of wild Pacific salmon throughout their range. It involves the following criteria and methodology:

Percent Natural Origin Spawners (PN): Percent of adult fish on the spawning grounds in recent generations.

- 5 = 100% natural origin spawners (no past hatchery releases and few if any strays)
- 4 = 75–99% natural origin spawners
- 3 = 50–74% natural origin spawners
- 2 = 25–49% natural origin spawners
- 1 = 0–25% natural origin spawners
- 0 = no data or knowledge

Viability (V): Combinations of productivity and abundance measurement.

- 5 = high productivity and high abundance
- 4 = high productivity and moderate abundance (or vice versa)
- 3 = moderate productivity and moderate abundance
- 2 = low productivity and low abundance
- 1 = critically low productivity or abundance
- 0 = no data or knowledge

Life History Diversity (LHD): Diversity expressed within the population relative to the historical range as well as the range across all populations within the species/race.

- 5 = multiple and/or rare life history strategies
- 4 = majority of historical and species/race life history strategies are present
- 3 = few life history strategies present and some reduction from historical
- 2 = single life history strategy and reduced from historical
- 1 = no data
- 0 = unknown to expert

The **Population Stronghold Index (PSI)** is the outcome of the scoring methodology:

$$\text{PSI} = \text{PN} + 2\text{V} + \text{LHD}$$

Note that in this calculation viability (2V) was doubled to account for the relative importance of this measure. Using this system, the maximum score is 20. In applying and testing this scoring system, it was found that a score of 14 was a threshold for what would be considered a “strong salmon population”.



PACIFIC FISHERIES RESOURCE CONSERVATION COUNCIL
Conseil pour la conservation des ressources halieutiques du pacifique

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