



INVESTING IN CONSERVATION

WITH REVENUE ASSOCIATED WITH

BRITISH COLUMBIA'S QUALITY WATERS

1997-2012

NOVEMBER 2015



*A river is water in its loveliest form, rivers have life and sound
and movement and infinity of variation, rivers are veins of the earth
through which the life blood returns to the heart.*

Roderick Haig-Brown, *A River Never Sleeps*

Cover photo: Dean River Steelhead, Ministry of Forests, Lands and
Natural Resource Operations

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Preface

The Government of British Columbia (the Province), the Freshwater Fisheries Society of BC (FFSBC) and the Habitat Conservation Trust Foundation (HCTF) share a responsibility to account for revenue derived from licences associated with the recreational and commercial use of the province's freshwater fisheries.

From a revenue perspective, there are generally three categories of angling licences:

- Licences that only have a fee component;
- Licences that have fee and surcharge components; and
- Licences that only have a surcharge component.

These licences currently generate about \$14 million annually. About \$10.5 million, or 75% of the total annual licence revenue, is from the fee component of licences.

Since 2003, 70% of the fee component of revenue collected from all freshwater angling related sources (recreational licences, commercial licences and rod days) has been invested in sport fishing using a contract with the Freshwaters Fisheries Society of British Columbia. Until March 31, 2014, the Province retained the remaining 30% of the revenue in its Consolidated Revenue Fund. As of April 1, 2015, this contract was amended and FSBC now administers 100% of the fee component of angling licence revenue.

About \$3.5 million, or 25% of total annual licence revenue, is from the surcharge component on certain angling licences. It is administered by the Habitat Conservation Trust Foundation (HCTF) and invested in conservation projects that maintain and enhance the health and biological diversity of British Columbia's fish and their habitats so that people can use, enjoy, and benefit from them.

Some of the surcharges on angling licences are associated with use of the province's premier angling streams or Quality Waters.

This report accounts for the administration and investment of this revenue by the Habitat Conservation Trust Foundation for the 1997 to 2012 period. It provides a historical perspective of government licence pricing decisions, documents the revenue received and briefly describes project investments made by HCTF on Quality Waters. It also provides a unique resource to help inform new policies and procedures about the involvement of HCTF in the evolution of the province's Quality Waters Strategy.

This report is **not** a technical evaluation of the efficacy of those project investments.

Important government policy issues associated with the management of fish stocks of the province's premier fishing streams and the recreational and commercial use of those resources are also outside the scope of this report.

Brian Springinotic, Chief Executive Officer, Habitat Conservation Trust Foundation

Executive Summary

British Columbia’s freshwater sport fishing is managed by the provincial government to maintain healthy fish populations and return social and economic benefits to the Province.

In non tidal habitats, the province boasts over 20,000 lakes, a staggering 750,000 kilometers of streams and 24 different fish species targeted by anglers- often in wilderness areas of unparalleled scenery.

Licencing of anglers using freshwater is the sole responsibility of the Province of British Columbia. Revenue derived from the **fee component** of licences is managed under contract by the Freshwater Fisheries Society of BC. The **surcharge component** of those licences is managed by the Habitat Conservation Trust Foundation (HCTF).

Some of the revenue generated from angling licences is a result of use of the province’s premier angling streams or Quality Waters. The value of surcharges on such licences has changed over time.

The goal of this report is to account for the licence surcharge component of the revenue associated with the use of Quality Waters by documenting the financial administration and project investment activities of the Habitat Conservation Trust Foundation.

Revenue

In the 1997 to 2012 period, the Foundation received \$5.5M in revenue from surcharges associated with licences to angle and/ or guide on Quality Waters.

It used two internal funds to manage revenue-the General Operating Fund and the Quality Waters Fund.

Over 73 % of the total revenue received was managed in the Quality Waters Fund while 27% was administered in the Foundation’s General Operating Fund.

Project Investments

The two funds at the Habitat Conservation Trust Foundation had different project investment goals. Revenue administered in the Quality Waters Fund was dedicated to on river activities while revenue administered in the General Operating Fund was directed to science-based conservation projects designed to maintain and enhance populations of fish and their stream habitats.

The following table summarizes the regional distribution of over \$14 million in project investments on Quality Waters from the two funds during the reporting period.

Science-based projects on Vancouver Island, the Lower Mainland and Thompson-Nicola attracted the greatest investment from the General Operating Fund.

River Guardian activities in the Cariboo Region and River Guardian and angler management planning activities Skeena Region accounted for the highest level of on river investment from the Quality Waters Fund.

Project activities in the Vancouver Island and Thompson-Nicola Regions accounted for over 40% of total investments from the combined funds. There were no investments in the Omineca-Peace and Okanagan regions.

The Value of Project Investments by HCTF on Quality Waters, 1997-2012						
REGION	PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND		PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND		TOTAL FROM BOTH FUNDS AT HCTF	
	\$K/#	%	\$K	%	\$K	%
Vancouver Island	3,307	30	137	4	3,444	24
Lower Mainland	2,414	22	25	1	2,439	17
Thompson-Nicola	2,536	23	163	5	2,699	19
Kootenay	312	3	705	20	1,017	7
Cariboo	896	8	1,337	38	2,233	15
Skeena	1,145	10	917	26	2,062	14
Victoria	379	3	220	6	599	4
Admin (HCTF)			8	0		
TOTALS	10,989	100	3,512	100	14,493	100

1. Background

1.1 British Columbia's Natural Endowment

The experts agree that Canada's westernmost province is endowed with unique natural values.

British Columbia is the most biologically diverse of Canada's provinces and territories, and includes many regionally, nationally and globally significant species and ecosystems.

British Columbia is important from a continental perspective because so many sensitive species and ecosystems that have been lost from other areas are still present here. Many of these species and ecosystems are found nowhere else in Canada. Some are found nowhere else in the world.

Genetic diversity is the foundation of biodiversity. Genes are the functional units of heredity and genetic variation, which enable species to adapt to changing environments. BC has a disproportionately high level of genetic diversity relative to its species diversity. The province's glacial history, complex topography and varied climate have contributed to the evolution of a wide variety of adaptations to different environments. As a result, many species occur in the province as geographically

distinct subspecies, which differ from each other in appearance, environmental tolerances and behaviour. These differences reflect differences in genetic make-up. (Biodiversity BC, 2007)

This biological diversity makes British Columbia simply one of the best places to fish in North America.

In tidal or ocean habitats, five species of Pacific salmon are recognized as a world class resource that supports significant commercial and sports fisheries.

In non tidal or freshwater habitats, the province boasts over 20,000 lakes, a staggering 750,000 kilometers of streams and 24 different fish species targeted by anglers often in wilderness areas of unparalleled scenery. *(Bailey and Sumalia, 2013)*



Vancouver Island anglers



Fisherman

It is a small number of those streams- the premier angling streams or so called “Quality Waters” that are the subject of this report. And, in the majority of those waters, the steelhead is the most sought after creel. Other premier non tidal fisheries on Quality Waters include salmon, rainbow trout, Westslope cutthroat trout and bull trout.

British Columbia’s freshwater sport fishing is managed by the provincial government to maintain healthy fish populations and return social and economic benefits to the Province.

The Government of BC recently released a draft framework for the management of steelhead. It provides an excellent overview of current policies:

Throughout North America, large, wild steelhead are regarded as rare and exceptional sport fish. British Columbia, with 100 or so streams draining to more than 27,000 kilometres of Pacific Ocean coastline, remains as one of the few places on Earth that provides an opportunity to encounter these

wild fish in a wilderness setting. Such conditions are conducive to high levels of angler satisfaction and participation. They call for an approach that differs significantly from harvest-based fisheries where a sustainable yield philosophy underlies the basic management approach.

The Province maintains a diversity of steelhead angling opportunities that include gear type options, exceptional experiences on Classified Waters, limited entry for non-residents (on the Dean River), guided and non-guided fishing, and harvest of hatchery-origin fish. Steelhead fishing opportunities exist in almost every month of the year, at least in some part of the province.

Resident priority (under provincial Allocation of Angling Opportunity Policy) is acknowledged through reduced license fees and unrestricted (but licensed) access to Classified and Limited Entry Waters (see Skeena Angling Management Plans, Dean River regulations). Thus, the overall intent is to provide a mix of options that maintains or slowly increases participation in a recreational fishery that focuses on 'good opportunities for many rather than exceptional opportunities for a few'. Since societal and economic benefits generally increase with the level of angler participation, measures such as catch-and-release have become key regulatory tools used to meet demand, particularly when the number of wild fish is limited. (Government of BC, 2014)



Steelhead, Ashlu Creek

Under the broad strategies to meet objectives section of the same draft plan, the heading "manage angler use to maintain exceptional fisheries on Classified Waters" is noteworthy:

Within the broad spectrum of steelhead streams in BC, a limited number have been designated as Classified Waters to recognize the exceptional experience (notably, the surroundings) and fish values that characterize fisheries on these systems and maintain their appeal as premier steelhead fishing destinations. Under such circumstances, a key strategy to preserve this

experience is to manage angler use through the implementation of special regulations, angling management plans and enforcement. (Government of BC, 2014)

The appendix describes the biology of steelhead and provides further information about current challenges involved in their management.

1.2 World Class Angling Creates Significant Economic Impacts

But the steelhead, with the brightness of the sea still on him, is the liveliest of all the river's life. When you have made your cast for him, you are no longer a careless observer. As you mend the cast and work your fly well down to him through the cold water, your whole mind is with it, picturing its drift, guiding its swing, holding it where you know he will be. And when the shock of his take jars through to your forearms and you lift the rod to its bend, you know that in a moment the strength of his leaping body will shatter the water to brilliance, however dark the day. (Haig-Brown, 1946)

British Columbia's freshwater sports fishing opportunities are managed by the provincial government to conserve fish stocks and return social and economic benefits to the provincial economy. (Government of BC, 2004)

The economic impacts of angling attributable to use of the Quality Waters component of the provincial freshwater sports fishery are difficult to quantify. However, a recent report of the estimated economic impact estimates of all freshwater angling in the province by Bailey and Sumalia, based on the 2010 Survey of Recreational Fishing in Canada, provides important contextual information:

THE LURE

BC's reputation for outstanding freshwater sports fishing is well known by resident and non- resident anglers alike. Here is just one example of promotional materials produced to entice non- resident anglers to the province to fish our rivers for steelhead:

British Columbia. Steelheading. These words alone conjure up images of wild rivers, spectacular mountain scenery, and monster steelhead turning to the fly. And for good reason. No doubt about it, a fly fisher's best shot for tying into a huge wild steelhead is to head for the rivers of western Canada. Storied rivers such as the Dean, Thompson, and Fraser are legendary, as is the mother of all BC steelhead rivers, the Skeena.

A fly-fishing trip to British Columbia is a must for any angler who wants an authentic wilderness experience. This untamed and majestic land offers the best opportunity for an angler to hook into a wild trophy steelhead. If you are lucky enough to land one these incredible fish, you will be forever changed. (Bourque, 2014).

THE CATCH

Over 58% of all the individual sports fish caught in BC during 2010 were rainbow trout. Anglers reeled in a remarkable 4 million of them. Cutthroat trout came second, with over 1 million caught.

That amounts to about 15% of the total 2010 catch. After these two, sockeye and kokanee were captured the most frequently, combining for about 15% of the catch.

As far as preference is concerned, rainbow trout was by far the favourite fish followed by sockeye, other salmon, cutthroat and steelhead. (Bailey and Sumalia, 2013)



Fraser River near Hope



Small lakes creel

THE ANGLER

Anglers who fish in British Columbia are like no others. Via surveys and a trail of detailed data, we've been able to discover what really makes them tick.

Probably most obvious to any angler is the fact that there are many motivating factors for participating in the sport. Catching a fish is only one of them. Fishing is relaxing. It's a chance to get away from it all and contemplate nature. It's a wonderful way to spend time with friends and family. It's also a challenge. A puzzle.

This is an important part of the adventure. Human versus fish is an age-old battle of wits that continues to this day. While those motivators appeal to all, four times as many men fish in BC than women. Regardless of gender, the majority of anglers are between 45 and 64 years old. (Bailey and Sumalia, 2013)

The words of Roderick Haig-Brown (1946) may help further explain the fishing adventure:

I still don't know why I fish or why other men fish, except that we like it and it makes us think and feel. But I do know that if it were not for the strong, quick life of rivers, for their sparkle in the sunshine, for the cold grayness of them under rain and the feel of them about my legs as I set my feet hard down on rocks or sand or gravel, I should fish less often. A river is never quite silent; it

can never, of its very nature, be quite still; it is never quite the same from one day to the next. It has its own life and its own beauty, and the creatures it nourishes are alive and beautiful also. Perhaps fishing is, for me, only an excuse to be near rivers. If so, I'm glad I thought of it.



Proud angler



Blackwater rainbow trout, Dot Lake

The Economics:

Freshwater fishing provides significant economic benefits to the province. As Haig-Brown (1939) wrote:

“One remembers not merely the actual fishing, but all that led up to it and followed upon it - the journey, the people, food, lodging, conversation, ideas and thoughts.

According to Bailey and Sumalia (2013);

In 2010, BC anglers spent three times more on fishing equipment than skiers did on downhill ski equipment in 2006/7. \$33 million compared to \$11.5 million respectively.

In 2009, golf contributed about \$4 billion to the province. Freshwater fishing by comparison contributed almost \$1 billion in 2010 – 1/4 of the golf sector.

The cruise industry in 2007 contributed an estimated \$1.5 billion to BC. Not much more than the approximately \$1 billion freshwater fishing contributed in 2010.

These contributions were further described by Alcock (2013):

Freshwater sport fishing attracts residents and visitors from all over the world to fish in BC's pristine waters. Through their purchases, anglers support our members' businesses including fishing lodges, resorts, angling guides, hotels, charter operators, distributors, tackle shops, dealers, boat and tackle

manufacturers, regional airlines and others. Our members feel the economic impact of freshwater sport fishing every day.

With this impressive endowment of native fish providing world class angling opportunities and significant economic benefits, BC has a tremendous responsibility to steward and sustain freshwater ecosystems. Maintaining and enforcing strong laws and regulations associated with both land and resource are important stewardship functions. Wisely investing in policies that preserve quality angling opportunities and in supporting conservation projects that sustain these wild stocks is equally important.

1.3 Legislative Responsibility for the BC Freshwater Fishery

Since over 94% of BC is Crown Land, there are no privately owned angling rights associated with much of the province's land base.

Haig-Brown, 1939 noted that "under public ownership there is always a very real danger that everybody's business and responsibility will become nobody's business and responsibility..."

The Government of Canada and the Province of British Columbia, represented by the Ministry of Forests, Lands and Natural Resource Operations (FLNRO) share the business and responsibility for fisheries management in the province as follows:

The Ministry has, through delegated authority under the federal Fisheries Act, responsibility for the Province's non-salmon freshwater fisheries which also includes sea-run steelhead, cutthroat and Dolly Varden. In this capacity, the Ministry has the lead on freshwater fish governance, conservation and recreation. The licensing of freshwater recreational fishing is enabled under the Province's Wildlife Act.

The provincial government has primary responsibility for land and water use decisions on Crown land and utilizes a variety of statutes to sustainably manage fish habitat and other environmental values.

The Fisheries and Oceans Canada is responsible for First Nation fisheries commercial and recreational fisheries in tidal waters, salmon fisheries in non-tidal waters and has the lead responsibility for fish habitat protection.

The provincial and federal governments consult and coordinate on fisheries matters in part through the Canadian Council of Fisheries and Aquaculture Ministers (CCFAM).

The federal government also cooperates with the Province through federal hatchery programs for salmon and steelhead which produce fish for both saltwater and freshwater anglers. (Freshwater Fisheries Society of BC, 2014)

1.4 Revenue Overview

Licencing of anglers using freshwater is the sole responsibility of the Province of British Columbia. The provincial government has a long established process, with internal analyses and external consultation components, to help determine the cost of fees and licences, which licences are to have surcharges and the value of any surcharges. Cabinet approval of a regulation pursuant to the *Wildlife Act* is the final stage of this process.



Placing large woody debris, Englishman River



Bonaparte fishway construction, Bonaparte River

From a recreational angler's perspective, there are four types of angling licences:

- Basic Angling Licences that, subject to regulations, allows angling in freshwater in the province;
- Conservation Surcharge Stamp Licences that validate basic angling licences to permit angling and/or retaining for/of certain fish and/or certain fish in certain locations;
- Classified Waters Licences that validate basic angling licences to permit angling on highly productive trout streams during the period when they are classified; and
- White Sturgeon Conservation Licences that validate basic angling licences to permit participation in the catch-and-release fishery on the lower and middle portions of the Fraser River watershed.

From a revenue perspective, there are three categories of angling licences:

- Licences that only have a fee component. An example is the Annual Licence for BC Residents that are permanently disabled;

- Licences that have both a fee and HCTF surcharge component. These are most licences and include the Basic Angling Licence, Conservation Surcharge Stamp Licences and Classified Waters Licences; and
- Licences that only have a HCTF surcharge component. The White Sturgeon Conservation Licence is the only licence of this type.

Revenues from angling licences are collected by government. E-licensing of non tidal anglers was launched on September 6th, 2007 and use of pre- printed paper licences was phased out.

Historically, the administration of revenue from these licence components was as follows:

- Fee Component

The province's Consolidated Revenue Fund (CRF) received 100% of the fee component of revenue. Over the years it was used to help finance the basic operations and stewardship responsibilities of government. These responsibilities were met by supporting annual expenditure plans of the ministry responsible for the management of fish and wildlife resources.

- Surcharge Component

The Habitat Conservation Trust Foundation received 100% of the surcharge component of revenue for use for the purposes of the trust. HCTF has its own Account Code in the government revenue system where its portion of revenue (as set out in regulation) was automatically directed to the trust each time money is received from the sale of a licence or payment for a rod day.

Recently, there have been changes to the way the revenue from the fee component of licences is administered.

In 2003, the Province signed a 30-year contract with the Freshwater Fisheries Society of BC (FFSBC) to be a non-profit delivery partner with a mandate to conserve and enhance freshwater fishing opportunities in BC. Under the terms of the contract, 70% of the fee component of angling licences was directed to the Society and the remaining 30% stayed in the CRF. The administration of angling revenue was as follows:

- FFSBC (sport fishing services by a contract) about 53% of total revenue or 70% of the fee component;
- The Province of BC (policy development and basic stewardship) about 23% of total revenue or 30% of the fee component; and
- HCTF (science-based fish conservation projects and on river activities) about 25% of total revenue or 100% of the surcharge component.

Effective April 1, 2015, the contract with government was amended and 100% of fees from angling licences are now transferred monthly to FFSBC for use to support recreational fisheries, education,

enforcement, and committees for rivers, large lakes and small lakes. The administration angling revenue is currently as follows:

- FFSBC- about 75% of total revenue (100% of an estimated \$10.5 million of revenue from the fee component) for sport fishing and fish stewardship services by contract; and
- HCTF- about 25% of total revenue (100% of an estimated \$3.5 million of revenue from all surcharges on licences) for investments in science-based fish conservation projects as well as on river activities that maintain and enhance the health and biological diversity of British Columbia's fish and their habitats so that people can use, enjoy, and benefit from them.

1.5 The Role of the Habitat Conservation Trust Foundation

Some of the revenue generated from angling licences is a result of angler use of the province's Quality Waters. The surcharge portions of those licences are managed by the Habitat Conservation Trust Foundation.

Like the laws regarding the management of freshwater angling, the establishment of the Habitat Conservation Trust Foundation is enabled by the province's *Wildlife Act*.

The original idea for what was to become the Habitat Conservation Trust Foundation came from the anglers, hunters, guide-outfitters and trappers of British Columbia, who are its "shareholders". In the late 1970s, those shareholders approached the provincial government with a simple business proposition.

Faced with a straightforward request from the resource users for self-imposed additional surcharges on licences, government agreed to act as collector, and **to ensure that the funds are directed towards fish and wildlife projects that were above and beyond the basic management of wildlife and fish resources**. This original trust-based agreement has persisted and is at the very core of the Habitat Conservation Trust Foundation.

Today, the Foundation is a non-profit charitable foundation acting as Trustee of the Habitat Conservation Trust. Originally established as a special purpose fund within the provincial government's Ministry of Environment, HCTF became a not for profit charitable foundation acting as Trustee of the Habitat Conservation Trust in 2007 and now operates completely outside of the provincial government.

Conservation and on river investments funded by the surcharge component of angling licences are invested by HCTF to benefit contributors by directly enhancing their opportunities to use and enjoy fish resources.

The mission of the Foundation is:

To invest in projects that maintain and enhance the health and biological diversity of British Columbia's fish, wildlife, and habitats so that people can use, enjoy, and benefit from these resources.
(Habitat Conservation Trust Foundation, 2014)

The Habitat Conservation Trust Foundation has established a number of internal funds in its financial management system to provide a transparent record of the variety of revenue it receives (e.g. licence surcharges and any other contributions received from the Province as well as contributions and donations from other non-government parties). The General Operating Fund is used to manage unrestricted revenue while any dedicated revenue is managed in separate funds and accounts.

In the case of licence surcharge revenue from angler use of Quality Waters, some revenue was managed in the General Operating Fund and some revenue was managed in a restricted (dedicated) Quality Waters Fund.

The uniqueness of the Habitat Conservation Trust Fund comes from its:

- Dedicated and consistent funding source – surcharges on certain licences and fees issued under the authority of the Wildlife Act;
- Provincial scope;
- Ability to fund acquisition of key habitats;
- Accessibility to public proponents;
- Ability to fund multi-year work and carry over unexpended monies from one year to the next;
- Low overhead and administration costs;
- Long-standing history in conservation sector;
- Ability to administer revenue and contributions to a program and/or project;
- Ability to manage revenue, for specific purposes, in dedicated accounts/funds; and
- Ability to fund up to 100% of the total cost for certain key projects.

The Foundation is also recognized as a valuable source of consistent funding for conservation work and for its flexible approach to grant management. It recognizes that field work in often remote areas of the province can be influenced by a number of factors:

- The availability of staff; contractors and equipment;
- Cash and “in kind” funding from partners;

- Weather conditions; and
- Other unforeseen issues

While project leaders indicate the projected length of work in their original conservation proposals, sometimes it is not possible to adhere to that plan. For multi- year projects, the Foundation can approve carry-over of unspent funds from one year to the next, or allow projects to be dormant for a year or more while issues are dealt with. As well, the Foundation has a policy to fund, subject to annual reporting, approved projects for a maximum of five annual funding cycles and will consider additional years of work thereafter by evaluating it as a new project.

Since its inception, the Foundation has invested over \$155 million in about 2500 conservation projects across the province. This work would never have happened without the funding commitment to conservation made by the anglers, hunters, guide-outfitters and trappers of BC.



Quality Waters, Dean River



Helicrew stock assessment, Quinsam River

1.6 The Scope of this Report

This report describes the administration of HCTF surcharge revenue that is generated by the angling use of BC's premier fishing streams or Quality Waters.

It is a direct response to a recommendation in a government-commissioned report on the Review and Evaluation of BC's Quality Waters Strategy by Dolan and Associates (2012).

The HCTF needs to develop a communications plan that includes:

- *An annual report, as done in the past;*
- *What projects were funded and where and what the value of those projects was (this information is sent out in a yearly news release but ought to be pulled together into a report and made available on HCTF's website);and*
- *Funding information that goes beyond audited financial statements and also includes total funds allocated and balance unallocated at the end of the year.*

Originally, the outline for this report focused on the operation's of the Quality Waters Fund- the dedicated revenue flowing from licence pricing decisions introduced in 1998 with a primary goal of supporting an expanded River Guardian Program. However, on review of the data, it became apparent that HCTF also received surcharge revenue from several angling licences associated with the use of Quality Waters and managed that revenue in its General Operating Fund.

To provide complete information about HCTF's contributions in support of the province's investments in Quality Waters, the scope of this report was expanded to describe the revenue and project investments (expenditures) from both the Quality Waters Fund and General Operating Fund.

This report has been designed to provide summary information about:

- Government freshwater angling policy/pricing decisions that affected the amount of surcharge revenue that flowed to HCTF from angling licences associated with the use of Quality Waters;
- Revenues received by HCTF from surcharges associated with those angling licences; and
- Conservation and on river project investments made on premier angling streams (Quality Waters) using the revenue received and managed by HCTF.

Like recent reports on dedicated funds administered by the Foundation, this report is designed to account for the receipt and management of special revenue. It will provide new content for the HCTF web site and "report out" to angler and guide contributors, project leaders and the general public.

2. Revenue Associated With The Management Of Angling Opportunities—A Historical Perspective

*The real truth is that the sport is made by and exists in just three things: tradition, ethics and restraint.
(Haig-Brown, 1939)*

From time to time, governments develop and implement policies, laws and regulations to govern the commercial and recreational use of natural resources. User fees in the form of licences are often required for the opportunity to use those public resources. The pricing of those licences often changes to reflect the economics of the day. As previously mentioned, the sole authority for setting of fees and licences lies with the provincial government - though public stakeholder consultations are often utilized to gauge public support for any proposed changes.

Most revenue from licences in British Columbia is directed to the government's Consolidated Revenue Fund. In some cases, the government adds surcharges to licences and allocates revenue to a special fund for specific work or actions.

The Habitat Conservation Trust Foundation is one such special fund that administers a portion of the revenue that is generated from licences associated with the recreational and commercial uses of fisheries and wildlife resources. It is dedicated by government to the conservation of those resources.

For the 1997-2012 period, four important freshwater (non tidal) fishery management and pricing initiatives by the Government of British Columbia shaped the amount of revenue received, and therefore the magnitude of conservation project investments made by the Habitat Conservation Trust Foundation. These initiatives were:

- **In 1990**, the Classified Waters Sports Fishery Management System for steelhead and other species was introduced to help manage and maintain unique fishing opportunities on premier fisheries streams. This was followed in 1994-1995 by new licences for steelhead and new licences for use of special waters, and in 1995-1996, by increases in certain licences and surcharges on certain licences;
- **In 1997-1998**, major changes to angling regulations and to the pricing of angling licences occurred. New surcharges were added to certain licences with the new revenue *dedicated* to on river and angler management planning work on the province's premier angling streams or Quality Waters. Coinciding with these was the establishment of the Quality Waters Fund. This new fund would be administered by the Habitat Conservation Trust Foundation;
- **In 2003-2004**, an increase in the cost of licences (both the fee and surcharge components) to reflect a new government funding model for recreation associated with fish, wildlife and parks; and

- In 2005-2006, the creation of a more broadly-based, province-wide Quality Waters Strategy led by government with a goal of maintaining the quality angling experience on selected provincial waters.

A more detailed description of each of these initiatives below provides important contextual and background information in support of revenue and project investment analyses in this report.

DEFINITIONS OF TERMS USED IN THIS REPORT

Basic Angling Licence is a document issued by the Government of British Columbia to prove that the holder has paid a fee prior to participating in recreational fishing on non tidal waters. It is valid for a year. The cost of basic licences is comprised of a fee component and a HCTF surcharge component. E-licensing of non tidal anglers was launched on September 6th, 2007 and use of pre printed paper licences was phased out.

Conservation Surcharge Stamp Licences must be purchased to validate basic angling licences and are required when angling for or retaining specific species in certain waters as outlined in the Angling Regulations. For example a steelhead conservation surcharge stamp licence is required to fish for steelhead anywhere in BC. The cost of these licences is comprised of a fee component and a HCTF surcharge component.

Quality Waters a descriptive term used by fisheries managers and anglers to describe the sum of all Classified Waters and some non classified waters that provide the province's premier stream angling opportunities. *Quality Waters are currently Classified Waters or candidates to become classified. (Government of British Columbia, 2005)*

Classified Waters are the 52 streams in wilderness or semi wilderness settings that receive special management activities as set out in law. Schedule A of the Angling and Scientific Collection Regulation of the BC Wildlife Act defines the areas of streams designated as Classified Waters, the time period for which the classified designation applies and any special licencing requirements for anglers during those time periods.

The **River Guardian Program** is a seasonal, on river regulatory compliance presence that promotes public awareness, education, and resource stewardship while collecting accurate angling data in support of fisheries conservation and management.

The **Quality Waters Strategy** is a collaborative management process led by government that was designed to preserve and/or enhance the unique angling experiences on many of the Province's highest quality and popular streams.

DEFINITION OF HCTF FUNDS USED IN THIS REPORT

General Operating Fund is the main fund in the account structure of HCTF. It administers surcharges on angling, hunting, trapping and guiding licences. It makes annual science- based conservation investments in projects focused on fisheries, wildlife, stewardship, education and habitat acquisition. Some of its revenue is derived from surcharges associated with the sale of licences used by anglers on BC's Quality Waters. This revenue supports science-based conservation project investments on Quality Waters and native fish species using those waters.

Quality Waters Fund is a restricted fund in the account structure of HCTF. At the direction of government, portions of surcharges on certain licences associated with BC's premier angling streams are administered in this account to support an on river presence on Quality Waters. The River Guardian Program and the development of Angling Management Plans are major activities supported by this fund.

2.1 The Classified Waters Management System (1990-1997)

OVERVIEW

With the province's reputation as a world class stream fishing destination and as more anglers sought out high quality fishing opportunities, many felt their quality angling experiences on many streams were being compromised by crowding. Steelhead streams were of particular concern. Angler crowding was becoming a common problem at popular sport-fishing destinations around the world.

To address this situation, in 1990 the BC Government introduced a province-wide Classified Waters Management System to help manage freshwater sport fishing and guiding activities on premier fishing rivers.

The system identified rivers that resource managers and anglers determined were among the finest fisheries the province had to offer its residents, and the world. (Government of BC, 2004)

The classification system for streams was based on the following criteria:

- significant potential for commercial guiding;
- relatively pristine and scenic watersheds; and
- existing angler crowding that impacted the angling experience or potential for future crowding by additional resident anglers and commercial guides

The use of such a system is not unique to British Columbia. Other jurisdictions, like New Brunswick for example, implemented a similar system on its rivers in 1952. (Walker per com)

The new management system for BC, created through Regulation 125/90 of the provincial *Wildlife Act*, sought to preserve unique non tidal fishing opportunities on streams by classifying waters according to the quality of angling experiences they offered, by introducing new licencing requirements and by

capping the number of “rod-days” available to angling guides. Rod day quotas give angling guides the right to guide clients for fish on a given stream for a given time period for a fee.

That is, limits were placed on the number of guides and the number of client days (rod days) on each Classified Water. During the time when a water was designated as “classified”, anglers required specific licences to fish these waters and only guides with rod day quotas could legally provide services to licenced clients.

CLASSIFIED WATERS MANAGEMENT SYSTEM

The Classified Waters Management System today includes the requirement for anglers to have special licences to help maintain unique fishing opportunities.

All anglers are required to purchase a Classified Waters Licence, in addition to the Basic B.C. Angling Licence, before fishing on a stream during the period when it is “classified”.

For Residents of British Columbia, a Classified Waters Licence allows them to fish on any classified water during the licensing year (April 1st to March 31st).

For Non-Residents, the Classified Waters Licence was sold on a per diem basis and is date and water specific. Although anglers may purchase as many Classified Waters Licences as they wish, each licence may not exceed 8 consecutive days.

Angling guides who operate on Classified Waters must be licenced and are allocated rod days which represent the maximum number of rod days that they are allowed to guide anglers on any given waters. One rod-day is defined as one rod fishing any part of one day.

There are annual fees for guide licences, assistant guide licences, and rod-day allocations for Classified Waters.

A Steelhead Conservation Surcharge Stamp Licence is required at all times when fishing for steelhead, or when fishing Classified Waters during the period when steelhead are known to be present.
(Government of BC, 2011)

Under the original system, all or portions of 42 areas of highly productive steelhead and trout streams were designated as Classified Waters. The majority were steelhead streams in the Skeena region. Additional Classified Waters were designated in the Cariboo, Vancouver Island and Thompson-Nicola regions.

In 2005-06, all or portions of 10 new streams, mainly in the Kootenay Region, were added to the system bringing the total to 52 Classified Waters.

There were two categories of Classified Waters (Table 1). These were located in 6 different regions of the province and managed a variety of different premier fisheries (Table 2).

There are no Classified Waters in the Lower Mainland and Okanagan regions of the province and only one in the Omineca-Peace region.

TABLE 1 CLASSIFIED WATERS IN BRITISH COLUMBIA (Dolan and Associates, 2012)		
Classified Water Type	Location of Stream	Description
Class I	Inland (non-anadromous)	Wilderness waters with wild fish that have a very high-quality angling experience due to their remote natural setting. These waters have no road access or very limited road access.
	Coastal (anadromous)	
Class II	Inland (non-anadromous)	Semi-wilderness waters with wild fish, but unlike Class I waters, they have limited to extensive road access.
	Coastal (anadromous)	

TABLE 2 CLASSIFIED WATERS IN BRITISH COLUMBIA				
Classified Water Type	Location By Region	Stream	Areas Of Stream Classified	Premier Fishery
Class 1 Coastal Waters Anadromous	Cariboo	Dean	3 portions	Summer run steelhead, Summer run Chinook salmon
	Skeena	Babine ¹	portion	Summer run steelhead
		Gitnadoix	all	Spring run steelhead, salmon
		Lakelse	all	Winter run steelhead, salmon
		Suskwa	all	Summer run steelhead
		Sustut	all	Summer run steelhead
		Zymoetz	portions	Summer run steelhead
Class II Coastal Waters Anadromous	Vancouver Island	Ahnuhati	all	Winter run steelhead
		Kakweiken	all	Winter run steelhead
		Kingcome	all	Winter run steelhead
		Seymore	all	Winter run steelhead
		Wakeman	all	Winter run steelhead
	Thompson-Nicola	Thompson	portion	Summer run steelhead
	Cariboo	Atnarko ¹ / Bella Coola*	portions	Summer/winter run steelhead

¹ Designated as a Heritage River

TABLE 2 CLASSIFIED WATERS IN BRITISH COLUMBIA				
Classified Water Type	Location By Region	Stream	Areas Of Stream Classified	Premier Fishery
Class II Coastal Waters Anadromous		Chilcotin	portion	Summer run steelhead
		Chuckwalla/ Kilbella	portion	Winter run steelhead
	Skeena	Bulkley	portions	Summer run steelhead
		Damdochax Creek	all	Summer run steelhead
		Ecstall	all	Summer run steelhead
		Kispiox	all	Summer run steelhead
		Kitsequecla	all	Summer run steelhead
		Kitsumkalum	all	Winter run steelhead, salmon
		Kitwanga	all	Summer run steelhead
		Kluatantan	all	Summer run steelhead
		Kwinageese	all	Summer run steelhead
		Ksi X'anmas	all	Summer run steelhead, salmon
		Morice	all	Summer run steelhead
		Skeena	3 different areas	Summer run steelhead, salmon
		Zymoetz	portion	Summer run steelhead
		Yakoun	all	Winter run steelhead, salmon
		Haida Gwaii Other streams (Copper, Datlamen, Deena Honna, Mamin, Pallant, Tlell)	all	Salmon, winter steelhead
Class II Inland Waters	Kootenay	Bull	all	Bull trout, Westslope cutthroat trout

TABLE 2 CLASSIFIED WATERS IN BRITISH COLUMBIA				
Classified Water Type	Location By Region	Stream	Areas Of Stream Classified	Premier Fishery
Non-Anadromous		Elk	all with exception of Line Creek (closed all year), a portion of Coal Creek (age restricted fishery) and the Wigwam River (separate Class II Water)	Westslope cutthroat trout, Mountain whitefish, Bull trout
		Upper Kootenay	All of the upper watershed from the White River confluence to headwaters	Westslope trout, Bull trout
		St Mary	all with the exception of Joseph Creek (age restricted fishery)	Westslope cutthroat trout, Bull trout
		White	all	Westslope cutthroat trout, Bull trout
		Wigwam	all	Bull trout , Westslope cutthroat trout
	Cariboo	Chilko	portion	Rainbow trout, Bull trout
		Dean	portion	Rainbow trout, Cutthroat trout
		Horsefly	portion	Rainbow trout
		West Road (Blackwater)	all	Rainbow trout, Cutthroat trout
	Omineca-Peace	Stellako	all	Rainbow trout

Schedule A of the current Angling and Scientific Collection Regulation pursuant to the BC Wildlife Act is found at:http://www.bclaws.ca/Recon/document/ID/freeside/10_125_90

It defines the areas of streams designated as Classified Waters, the time period for which the classified designation applies and any licencing requirements for anglers.

CHANGES TO ANGLING LICENCES

There were few immediate changes to the cost of angling licences implemented as a result of the Classified Waters Management System initiative in 1990. Any new revenue was directed to the Province's Consolidated Revenue Fund.

Surcharges on angling licences that existed in the early 1990s (Table 3) were modified effective April 1, 1994 (Table 4).

The cost of most licences was increased but the cost of a steelhead conservation surcharge stamp licence ("steelhead licence") for non resident aliens was reduced to \$20 (\$17 and \$3 surcharge) from \$42: the same price as a steelhead licence for non- resident Canadians.

For the first time, the Habitat Conservation Trust Foundation received revenue from surcharges on all steelhead licences that were required to fish on classified and non classified steelhead streams. These were purchased by both resident and non-resident anglers.



Skeena River



Dean River floodplain, Dean River

ADMINISTRATION OF REVENUE

Until April 1, 1994, all of the revenue from licences associated with the use of the province's premier angling streams was directed to the province's Consolidated Revenue Fund and used to support annual budget allocations to government ministries.

Starting in 1994-1995, the Habitat Conservation Trust Foundation (HCTF) received a modest amount of revenue from surcharges on certain angling licences. Some of this revenue was associated with angling

on Quality Waters and was managed in the Foundation's General Operating Fund. Here is a breakdown of revenue from new surcharges by licence and the estimated number of clients at the time:

- **Angling Steelhead- Resident Licences:** a \$3 surcharge as part of \$10 licences sold to an estimated 21,000 anglers using both classified and non classified steelhead rivers in the province;
- **Angling Steelhead- Non Resident Canadian and Non Resident Alien Licences:** a \$3 surcharge as part of \$20 licences sold to an estimated 3,100 anglers using both classified and non classified steelhead rivers in the province;
- **Angling Guide Licence:** a \$5 surcharge as part of \$200 licences sold to an estimated 330 guides in BC; and
- **Assistant Angling Guide Licence:** a \$5 surcharge as part of \$45 licences sold to an estimated 330 assistant guides in BC.

A year later in 1995-1996, surcharges on steelhead angling licences for non- residents and non-resident aliens were increased to \$13 from \$3.

As well, two new surcharges were added to revenue received by HCTF from conservation surcharge stamp licences:

- Non Tidal Salmon, Resident: a \$7 surcharge as part of \$10 licences;
- Non Tidal Salmon, Non Resident: a \$17 surcharge as part of \$20 licences;

The total annual revenue received by HCTF from these licence surcharges averaged about \$105K.

This new revenue was administered in the Foundation's General Operating Fund and available for any type of habitat and/or species enhancement project that was consistent with HCTF fisheries objectives. It was not administered in a dedicated account nor was it earmarked for steelhead conservation projects only.

TABLE 3 FEES AND SURCHARGES ASSOCIATED WITH LICENCES FOR ANGLING ON QUALITY WATERS, PRE 1994-1995				
TYPE OF LICENCE	TOTAL COST PER LICENCE EXCLUSIVE OF TAXES \$	PORTION TO CONSOLIDATED REVENUE FUND OF GOVERNMENT (Fee Component) \$	PORTION TO HABITAT CONSERVATION TRUST FOUNDATION (Surcharge Component) \$	
			GENERAL OPERATING FUND	QUALITY WATERS FUND (Dedicated)
Steelhead, BC Resident	7	7	0	0
Steelhead, Non Resident Canadian	17	17	0	0
Steelhead, Non Resident Alien	42	42	0	0

TABLE 3 FEES AND SURCHARGES ASSOCIATED WITH LICENCES FOR ANGLING ON QUALITY WATERS, PRE 1994-1995				
TYPE OF LICENCE	TOTAL COST PER LICENCE EXCLUSIVE OF TAXES \$	PORTION TO CONSOLIDATED REVENUE FUND OF GOVERNMENT (Fee Component) \$	PORTION TO HABITAT CONSERVATION TRUST FOUNDATION (Surcharge Component) \$	
Chinook Salmon; Resident and Non Resident	4	4	0	0
Classified Waters Licence Class I, Non Resident	20/day	20/day	0	0
Classified Waters Licence Class II, Non Resident	10/day	10/day	0	0
Angling Guide	200	195	5	0
Assistant Angling Guide	45	5	5	0

TABLE 4 FEES AND SURCHARGES ASSOCIATED WITH LICENCES FOR ANGLING ON QUALITY WATERS, 1994-1997				
TYPE OF LICENCE	TOTAL COST PER LICENCE EXCLUSIVE OF TAXES \$	PORTION TO CONSOLIDATED REVENUE FUND OF GOVERNMENT (Fee Component) \$	PORTION TO HABITAT CONSERVATION TRUST FOUNDATION (Surcharge Component) \$	
			GENERAL OPERATING FUND	QUALITY WATERS FUND (Dedicated)
Steelhead, BC Resident	10	7	3	0
Steelhead, Non Resident Canadian	30	17	3-13 ¹	0
Steelhead, Non Resident Alien	30	17	3-13 ¹	0
Non Tidal Salmon; Resident	10	3	0-7 ²	0
Non Tidal Salmon; Resident Non Resident	20	3	0-17 ²	0
Classified Waters Licence Class I, Non Resident ³	20/day	20/day	0	0
Classified Waters Licence Class II, Non Resident ³	10/day	10/day	0	0
Angling Guide	200	195	5	0
Assistant Angling Guide	45	40	5	0
<div> <div>■ Conservation Surcharge Stamp Licences</div> <div>■ Dedicated Revenue</div> </div> ¹ \$3 in 1994-1995 only, then \$13 thereafter ² \$0 in 1994-1995 only ³ Licences for Classified Waters could be purchased for any number of days to a maximum of 8 days				

2.2 The River Guardian/Quality Waters Program (1998-2004)

OVERVIEW

It was hoped that the Classified Waters sports fishery management system would help alleviate some of the crowding problems on BC's quality sport-fishing streams.

Unfortunately, this was not always the case. Angler use continued to increase. Both resident and non-resident anglers indicated that the quality of angling experiences had become increasingly jeopardized by angler crowding.

A new approach to sport-fishery management was needed to augment and support the Classified Waters Management System and to preserve the quality of angling experiences.

Following a thorough review of classified waters and angling guide policies, legislation was modified in 1997 to update and simplify the system and provide greater flexibility in the management of Classified Waters.

Two key issues were identified at the time:

- To implement many of the proposed changes, existing Angling Management Plans for streams had to be modified. These plans described the preferred level of commercial and non-commercial angling use on Classified Waters and set out the rationale for angler day quotas defined in regulation. Updating of the plans often required better information on levels of use and on the perception of what constituted "crowding". There was a major shortfall in quality data; and
- There was a growing perception that existing regulations on Classified Waters were not adequately enforced. Stakeholders indicated wide support for an expanded River Guardian program modeled after one that had been operating for a number of years on the Dean River in the Cariboo Region.

CHANGES TO ANGLING LICENCES

In a news release in February 1997, the government announced major changes to non tidal angling licences for the 1997-1998 year.

Included were changes to the costs of licences for anglers using Classified Waters.

In response to public input on the classified waters system, we're taking steps to reduce overcrowding, simplify licencing and insure that BC anglers continue to get priority access to these premier steelhead rivers....Changes will better reflect the value of BC classified waters and help ensure that the non-residents are abiding by the regulations....

The most significant changes to the regulations and fees are:

- *Class I and Class II waters are being combined so that streams and rivers will either be classified or unclassified;*
- *An annual classified waters licence for BC residents will replace the per diem licence. The classified waters licence for non-BC residents will now be available only on a per diem basis, and will specify the date and the water body; and*
- *Angling guide licence fees are being increased to better reflect the cost of administering the guiding system and to raise funds for the new (River Guardian) program being developed for Classified Waters. (Government of BC, 1997)*

The increase in licences caught many users by surprise and there were concerns that tourism and businesses would suffer. The biggest financial impact was on angling guides where fees for guiding on classified waters were to increase to \$11 per rod day from \$1 per rod day—with all of the increase in the form of a surcharge to be dedicated to the Habitat Conservation Trust Foundation for an expanded River Guardian Program on Quality Waters.

As noted above, non-resident fees for Classified Waters—B.C.'s then 42 premiere angling locations—were scheduled to change from a two-tier system of \$20/day (Class I waters) and \$10/day (Class II waters) to a single-tier of \$40/ day to fish on any classified water.

Angling guides, resort owners and tourism interests immediately expressed concerns about the potential to discourage visiting anglers, inadequate consultation, late notice about licence changes, and the inability of some Classified Waters to support the new fees.

In April 1997, some of the new fee and regulation changes for Classified Waters were fine tuned and adjusted for the 1997/98 season to allow guides to prepare for the permanent changes.

In May 1997, after intensive stakeholder consultation, government announced a one-year deferral on non-resident classified water fees. A Freshwater Fisheries Consultation Steering Committee was set up to advise on further consultation. The committee included key groups representing anglers, guides, conservation interests and resort owners.

The committee eventually recommended that the April 1, 1997 fee increase for non-residents on Classified Waters be cancelled. They suggested that fees should be considered in the context of licence simplification (such as holiday packages) as well as a review of the management of Classified Waters. They also expressed concern that a fee increase as planned would pre-empt recommendations that may result from the completion of the Sport Fish Strategy... (Government of BC, 1997)

Relevant licence fees and conservation surcharges that were finally implemented are described in Table 5.

ADMINISTRATION OF REVENUE

With the original announcement of the government's new fee structure for recreational and commercial use of fish in 1997, the Habitat Conservation Trust Foundation was expected to receive over 50% of a projected \$3M increase in revenue with the remainder earmarked for the Consolidated Revenue Fund.

The last minute delay in implementing, and subsequent cancellation of components of the proposed new fee structure, reduced the expected increase in revenue from surcharges to the Foundation.

When all the changes were finalized, surcharge revenue from angler and angling guide use of fish stocks in Quality Waters (both classified and unclassified waters) were administered by the Habitat Conservation Trust Foundation in two separate funds:

GENERAL OPERATING FUND

Revenue from **existing** surcharges on steelhead and other angling licences and angler guide fees continued to be administered in the Foundation's **General Operating Fund**. Science-based conservation project proposals for access to this revenue for work on Quality Waters were competitive with project proposals for all other types of fisheries conservation work in the province.

The annual revenue to the General Operating Fund remained relatively constant at around \$100K.

During this period, government fisheries managers made steelhead conservation work on both classified and non classified waters a priority for submissions to HCTF for project investments from its General Operating Fund.

QUALITY WATERS FUND

New revenue generated from **increases** in surcharges on steelhead angling licences, angling guide licences, surcharges on angling guide's rod days as well as any new project/program specific contributions from government were dedicated to a new **Quality Waters Fund** within HCTF to be used exclusively for an on river presence and angler management planning.

The changes to surcharges on angling licences were implemented on all waters on a province-wide basis.

The changes to surcharges associated with angling guide licences and rod day fees were limited to the commercial use of Classified Waters.

Here is the breakdown of revenue from surcharges to the new Quality Waters Fund (Table 5):

- **Angling Steelhead- Resident Licences:** \$2 of a \$5 surcharge (40%);
- **Angling Steelhead- Non Resident Canadian and Non Resident Alien Licences:** \$2 of a \$15 surcharge (13%);

- **Angling Guide Licence:** \$35 of a \$40 surcharge (88%);
- **Assistant Angling Guide Licence:** \$15 of a \$20 surcharge (75%); and
- **Angling Guide per day fee (rod day):** \$10 of a new \$10 surcharge (100%) on fees of \$1 for every “rod day” of angling on Classified Waters.

The actual revenue for the initial year of 1997/98 was \$224K—25% lower than what had been originally projected. The actual revenue averaged about \$235K over the next 5 years.

On river project investments from the new fund were directed to work on Quality Waters- both classified and non classified waters with the priority being steelhead on Classified Waters. Most of the new money was initially earmarked for investment in an expanded River Guardian Program that was designed to conserve, protect and monitor angler use of some of BC’s most popular steelhead waters.

Information collected by the guardians will be used over time to develop angling-use plans for each of the rivers involved. The plans will address issues such as overcrowding and will focus on maintaining quality angling experiences while conserving fish.

The first year of the program will cover the Dean, Chilcotin, Kispiox, Babine and Bulkley rivers. These rivers are all classified waters – a unique management designation recognizing their special fishing opportunities. The identified areas are home to some of the largest steelhead in the world. (Government of BC, 1997)



River Guardian and angler, Kispiox River

It is noteworthy that the Foundation’s Quality Waters Fund does not receive any surcharge revenue from basic angling licences associated with the use of rainbow trout, Westslope cutthroat or bull trout on Quality Waters. But, it invests in on river work on such waters by virtue of the fact that revenue is received from surcharges on guide licences and rod days associated with non-resident trout anglers using Classified Waters. The Foundation’s General Operating Fund invests in science-based conservation projects to support these important trout species to complement on river investments from the Quality Waters Fund.

The announcement of a new fund dedicated to new activities was not without controversy. At the time, the Habitat Conservation Trust Foundation was a special purpose trust of government known as the Habitat Conservation Trust Fund.

A Public Advisory Board provided advice to the trustee who was the Minister of Environment. Though the Board had recommended a small expenditure to explore the design a province-wide expanded River Guardian Program, it had yet to receive a proper full proposal for review and consideration. The Trustee had, in an unprecedented move, acted unilaterally and announced a new program without formal input from her Board.

The Trustee was formally notified of the Board's concerns as recorded in the minutes of its March 1997 meeting:

The establishment of special funds without prior Board consultation and the presupposed Board endorsement of the related expenditures is problematic, in principle, for Board members..... It is unclear as to how the enforcement elements of this proposed program correspond to the terms of reference of the fund. (Habitat Conservation Trust Fund, 1997)

In a letter to fellow board member Craig Orr in August 1997, Ian McTaggart-Cowan, Chair of the Board, outlined his support for and concern about the new program:

The River Guardian concept is not a new one. It has been used in Europe, in various guises for at least a century. In philosophy it is little different from the old time game warden in our own province. I knew many of them, and the best of them were excellent ambassadors for their regions. They knew what was there, and the problems and needs in the field of many categories of fish and wildlife. They were in the field constantly meeting the hunters, fishermen and others and keeping them informed as well as learning from them. They were present at all meetings of fish and game associations in their regions, to answer questions and guide direction, and were a source of information and advice to the administrators. They also enforced the regulations. I see no reason the River Guardians cannot do likewise if they are well chosen, adequately prepared and given the opportunity and backing. However, I have misgivings as to the legislative mandate of our trust to fund all aspects of such a program.

The members of the BC Wildlife Federation publically voiced similar concerns. They were worried about enforcement activities being foisted upon or off loaded to HCTF. Enforcement of laws and regulations regarding the use of fish and wildlife was considered a core responsibility of government funded by its Consolidated Revenue Fund and not at all considered by the conservation community to be a legitimate activity using the licence surcharge revenue of "their" Trust Fund.

The role of enforcement thereafter became an important aspect in the design and delivery of the River Guardian Program. Roles and responsibilities around enforcement were more clearly defined as a result of improved and more comprehensive project proposal submissions to HCTF.

It is noteworthy that, to this day, there is no written agreement between the Foundation and government to formally define the scope of acceptable project investments of the dedicated revenue to the Quality Waters Fund.

TABLE 5 FEES AND SURCHARGES ASSOCIATED WITH ANGLING LICENCES FOR ANGLING ON QUALITY WATERS, 1998-2004				
TYPE OF LICENCE	TOTAL COST PER LICENCE EXCLUSIVE OF TAXES \$	PORTION TO CONSOLIDATED REVENUE FUND OF GOVERNMENT (Fee Component) \$	PORTION TO HABITAT CONSERVATION TRUST FOUNDATION (Surcharge Component) \$	
			GENERAL OPERATING FUND	QUALITY WATERS FUND (Dedicated)
Steelhead, BC Resident	15	10	3	2
Steelhead, Non Resident Canadian	40	25	13	2
Steelhead, Non Resident Alien	40	25	13	2
Non Tidal Salmon; Resident	10	3	7	0
Non Tidal Salmon; Resident Non Resident	20	3	17	0
Classified Waters Licence				
Class I, Non Resident ¹	20/day	20/day	0	0
Classified Waters Licence Class II, Non Resident ¹	10/day	10/day	0	0
Angling Guide	240	200	5	35
Assistant Angling Guide	100	80	5	15
Rod Day Fees	11	1	0	10
<div> <div></div> Conservation Surcharge Stamp Licences <div></div> Dedicated Revenue </div>				
¹ Licences for Classified Waters could be purchased for any number of days to a maximum of 8 days				

2.3 The New Recreation Funding Model (2004-2012)

OVERVIEW

With the election new government in 2000, a Core Review of government services, the creation of a Recreational Stewardship Panel and a government-wide review of fees and licences eventually led to changes to non tidal angling licences.

The work of the Recreation Stewardship Panel was key to those changes. The terms of reference for the panel, established in 2002, were as follows:

The recreation services provided by the Ministry of Water, Land and Air Protection in BC Parks, hunting, fishing and wildlife viewing opportunities, and the provincial freshwater hatchery program—are deeply valued by BC residents and a drawing card for visitors from around the world.

Government is committed to improving the delivery of this world-class recreational experience in a way that is financially sustainable and creates benefits for everyone involved—local communities, tourism operators, First Nations and the public at large. Government is also committed to balance

the provincial budget by fiscal year 2004/2005. The three-year service plan for the Ministry of Water, Land and Air Protection, published in February, indicates that fewer ministry staff and funds will be directed to providing camping and recreational services such as hunting and angling opportunities (including stocking of lakes and rivers) where recreational use is low or costs cannot be recovered (cost recovery will be largely dependent on the management and funding model adopted for parks, and hunting and angling).

To that end, the Minister of Water, Land and Air Protection has appointed an expert 6 member panel to review these services and recommend improved management models and funding sources. (Government of BC, 2002)

The panel received 675 submissions, consulted widely, solicited comment on a draft report and made 25 final recommendations.

Some of recommendations and comments in the panel report are relevant here:

- *The panel's principles provide specific direction on pricing.*

The implications associated with the principles provide additional clarification of the panel's intent and understanding of the ramifications of the principles. The key principles that provide specific direction on pricing include (paraphrased):

Principle #12 – User fees will cover incremental costs;

Principle #13 – Non-residents will pay competitive market value;

Principle #14 – Commercial service providers will pay market prices;

Principle #15 – Setting fees will be delegated to the Ministry; and,

Principle #17 – Fee discounts.

The provincial government has provided direction that the beneficiaries of the use of recreation opportunities should assume primary responsibility for the cost of providing those opportunities. The panel's principles imply that, in general, there will be increases to existing fees, there will be new fees for existing services, and there will be new fees for new services. In many cases, existing fees are less than the Ministry's incremental costs to provide the opportunity. The panel believes that the pricing for the use of recreational facilities and services is a key to the Ministry's budget issues. The movement toward a user-pay pricing system will assist in maintaining the Ministry's primary responsibility for conservation, protection and restoration of the province's fish, wildlife and parks.

Concerning angler use of Classified Waters, the panel wrote:

The panel recognizes that a number of specific issues, such as the Angling Guide and Classified Waters and regulations need resolution. The panel heard about ongoing controversies surrounding management policies that affect a number of valuable and high profile salmon and trout fisheries. These waters are particularly attractive to resident and non-resident anglers and to the commercial guides who offer them services. The issues are focussed on maintaining 'quality angling experiences' by establishing some form of limits on angling effort. Earlier measures introduced by government have been only partially successful, and further work is required.

As part of Recommendation 21, the panel said:

Retain the Habitat Conservation Trust Fund (HCTF) with its current purpose to receive and allocate user contributions for habitat and species conservation and recreation;

The panel heard considerable praise for the efficiency and effectiveness of the Habitat Conservation Trust Fund. In particular, there is strong support for expenditures on enhanced levels of conservation and recreation not normally funded by the Ministry. In fiscal year 2002/03, HCTF received \$5.5 million in surcharges from angling and hunting licences which, in the funding model proposed in this report, are considered to be contributions. There is a significant level of support for the continuation of the fund. The panel heard that there is some interest in increasing the independence of the HCTF and lessening direct government control. In principle, the panel supports HCTF independence as long the assured funding through the current surcharges is maintained, and there is no erosion of the efficiency, effectiveness and public support for the fund and its operation. (Recreation Stewardship Panel, 2002)

With receipt of the report of the Recreational Stewardship Panel, in January, 2003 the BC government created a new funding model at the policy level:

BC's new model for fish, wildlife and park recreation will protect and expand BC's world-class outdoor opportunities while maintaining conservation values, Water, Land and Air Protection Minister Joyce Murray announced today.

'Our new recreation model will put park, fish and wildlife recreation services on a sound financial footing,' said Murray. 'This new model is about providing a better quality recreation experience in BC Fees and licences will be dedicated to maintaining and enhancing park, fish, and wildlife services.

All fees and licence revenue raised from fish and wildlife recreation will be dedicated to those services. All fees and licence revenue raised in provincial parks will remain in the parks system. Previously, most of these funds were returned to general revenue.

All revenue from user fees and surcharges will be dedicated to fish, wildlife and park recreation services and to conservation through the Habitat Conservation Trust Fund. The most recent increase to any angling and hunting fee was five years ago. (Government of BC, 2003)

CHANGES TO ANGLING LICENCES

With the new funding model in place for April 1, 2004 came modifications of some non tidal angling licences and associated surcharges. The revenue to HCTF's Quality Waters Fund was as follows (Table 6):

- **Angling Steelhead- Resident Licences:** \$2 of the \$5 surcharge continued;
- **Angling Steelhead- Non Resident Canadian and Non Resident Alien Licences:** \$2.40 of an \$18 surcharge;
- **Angling Guide Licence:** \$43.75 of a \$50 surcharge;
- **Assistant Angling Guide Licence:** \$15 of a \$20 surcharge; and
- **Angling Guide per day fee (rod day):** \$10 of the \$10 surcharge per day on fees of \$1 for every "rod day" of angling on Classified Waters continued. These surcharges were later increased to \$12.50/day (2006) and then again to \$15/day (2008).

In addition to the changes noted above, the following surcharges on licences, provided revenue to the Foundation's General Operating Fund:

- **Non Tidal Salmon, Resident:** a \$3 surcharge on \$15 licences;
- **Non Tidal Salmon, Non Resident:** a \$9 surcharge on \$30 licences;
- **Annual Classified Waters- Resident:** a \$3 surcharge on \$15 licences;
- **Classified Waters Non- Resident:** a \$12/day surcharge on \$40/day licences, Class I waters; and
- **Classified Waters Non- Resident:** a \$6/day surcharge on \$20/day licences, Class II waters.

TABLE 6 FEES AND SURCHARGES ASSOCIATED WITH LICENCES FOR ANGLING ON QUALITY WATERS, 2004-2012

TYPE OF LICENCE	TOTAL COST PER LICENCE EXCLUSIVE OF TAXES \$	PORTION TO CONSOLIDATED REVENUE FUND OF GOVERNMENT (Fee Component) \$	PORTION TO HABITAT CONSERVATION TRUST FOUNDATION (Surcharge Component) \$	
			GENERAL OPERATING FUND	QUALITY WATERS FUND (Dedicated)
Steelhead, BC Resident	25	20	3	2
Steelhead, Non Resident Canadian	60	42	15.60	2.40
Steelhead, Non Resident Alien	60	42	15.60	2.40
Non Tidal Salmon; Resident	15	12	3	0
Non Tidal Salmon; Resident Non Resident	30	21	9	0
Classified Waters Annual, Resident	15	12	3	0
Classified Waters Licence Class I, Non Resident ³	40/day	28/day	12/day	0
Classified Waters Licence Class II, Non Resident ³	20/day	14/day	6/day	0
Angling Guide	450	400	6.25	43.75
Assistant Angling Guide	150	130	5	15
Rod Day Fees	11-16 ²	1	0	10-15 ²

■ Conservation Surcharge Stamp Licences ■ Dedicated Revenue

¹ In 2003 a new funding model was implemented with 70% of revenue from the fee component of angling licences provided, under contract, by the Province to support the conservation work of the Freshwater Fisheries Society of BC. This was increased to 100% effective April 1, 2015.

² In 2006-2007, the \$10 surcharge component of the licence was increased to \$12.50; in 2008 it was increased to \$15.00.

³ Licences for Classified Waters could be purchased for any number of days to a maximum of 8 days.

ADMINISTRATION OF REVENUE

The new funding model for fish and wildlife recreation had little impact on the amount of revenue to the HCTF. To provide more money for the basic management of fish in its Consolidated Revenue Fund, government decreased the value of surcharges on 18 different angling licences while increasing the value of surcharges on only 10 licences. Surcharges on 19 non tidal angling licences were unchanged.

Revenue from surcharges on licences associated with angler and angling guide use of quality waters continued to be administered by the Habitat Conservation Trust Foundation in its **Quality Waters Fund** and **General Operating Fund**.

2.4 The Quality Waters Strategy (2005-2012)

Building on a review of the Classified Waters Management System that was initiated in 1999, data secured from several years of an expanded River Guardian Program and encouragement in the report of the Recreational Stewardship Panel, resource managers, anglers, guides and other members of the public came together to design a new Quality Waters Strategy (QWS) with the goal to further improve the management of Quality Waters.

This provincial level program is aimed at maintaining the best of the best of British Columbia's world class fisheries and is funded through dedicated fees paid by anglers and angling guides. One of the hallmarks of the program is the active participation and contributions of angling stakeholders. (Government of BC, 2004)

Fundamentally, the Quality Waters Strategy was seen as a collaborative management process designed to preserve and/or enhance the unique angling experiences on many of the British Columbia's highest quality and popular streams. It built on history as noted by Chambers, 1991....*most successful attempts to control overexploitation of common property resources are those which develop similar attributes within the 'community' of people dependent on the resource.*

In short, the Quality Waters Strategy was *a management model to preserve the unique qualities of the province's quality waters through the management of angler use. (Government of British Columbia, 2005)*

The following principles directed the development and implementation of the government- led strategy. They were used to ensure that the intent of the strategy was applied throughout the Province in a consistent manner and that all interests were considered. They were to:

- *Maintain an effective and mutually respectful process that supports sound management of angler use;*
- *Ensure that the priority and interests of BC resident anglers are maintained where decisions regarding angling opportunities are required as a result of angling opportunities that have become oversubscribed;*

- *Foster a healthy business environment that is supportive of angling guides, tourism businesses and local economies;*
- *Realize fair social and economic returns to the Province for the use of sport fish resources;*
- *Provide efficient, cost-effective and transparent administrative processes;*
- *Maintain an enforceable management system that ensures regulatory compliance and promotes ethical behaviour;*
- *Provide for timely acquisition and application of data for efficient and effective management; and*
- *Complement provincial fisheries management goals for resource conservation and sustainable fisheries.*
(Government of British Columbia, 2005)

There were no new surcharges or increases in licence fees associated with the introduction of the Quality Waters Strategy.

3. The Administration Of Revenue Associated With Angling On Quality Waters

The Habitat Conservation Trust Fund uses a number of internal funds in its financial system to provide transparency and accountability. Some funds are permanent while others are one time recipients of revenue and can be drawn down over time.

As previously mentioned, the Habitat Conservation Trust Foundation continues to administer revenue from licence surcharges associated with angler and guide use of Quality Waters in two distinct funds:

- 1 Revenue from original surcharges on steelhead angling licences and angling guide licences on Quality Waters that were initiated in 1994-1995 are administered in the Foundation's permanent General Operating Fund. As part of HCTF's annual allocation of funding to general fisheries projects, these monies were available for any type of science-based habitat and/or species enhancement project that was pursuant to HCTF fisheries objectives anywhere in the province. In practice however, the value of investments in steelhead and trout conservation projects on Quality Waters far exceeded the amount of revenue received;
- 2 Beginning in 1997-98, revenue from increases in surcharges on steelhead angling licences, all angling guiding licences and new surcharges on "rod days" for Classified Waters were dedicated to a new Quality Waters Fund to be used for an "on river" presence on premium angling streams (Quality Waters) anywhere in the province. In practice, most of this revenue was invested in River Guardian activities on steelhead streams.

Because the General Operating Fund and Quality Waters Funds received revenue on a province-wide basis and the Foundation was a proposal-driven organization, project investments were not linked to the sources of licence surcharge revenue by species or by region. However, even without a revenue fidelity model, projects did take place in all regions with Quality Waters.

The information on revenue and project investments that follows reflects a commitment by the Habitat Conservation Trust Foundation to the highest levels of financial and scientific accountability. As stated in its Strategic Plan, one of the goals of HCTF is to ... *maintain and enhance transparency, discipline, and accountability in its funding processes.* (*Habitat Conservation Trust Foundation, 2014*)

4. Financial Activities Associated With Revenue Received From Angling On Quality Waters (1997-2012)

4.1 Revenue to Both Funds

Table 7 documents the total revenue from surcharges on selected angling licences received by the Foundation during the 15 year reporting period.

Over 73 % of the \$5.5M in revenue received from these licences by the Habitat Conservation Trust Foundation was managed in the Quality Waters Fund while 27% was administered in its General Fund.

On average, anglers and guides on Quality Waters contributed over \$370K per year in total revenue to the combined funds.



Rod rack, Dean River

TABLE 7 REVENUE FROM SURCHARGES ON LICENCES USED BY ANGLERS ON QUALITY WATERS, 1997-2012			
YEAR ENDING MARCH 31	LICENCE SURCHARGE REVENUE MANAGEMENT MECHANISMS OF THE HABITAT CONSERVATION TRUST FOUNDATION		
	REVENUE TO THE GENERAL OPERATING FUND \$K	REVENUE TO THE QUALITY WATERS FUND \$K	TOTAL REVENUE \$K
1998 ¹	96	224	320
1999	104	249	353
2000	103	248	351
2001	109	236	345
2002	112	209	321
2003	118	245	364
2004	106	228 ²	334
2005 ³	97	185	282
2006	93	248	341
2007	101	321	422
2008	99	339	438
2009	93	305	398
2010	99	346	445
2011	92	331	423
2012	101	341	442
TOTALS	1,523	4,055	5,579
AVERAGES	102	270	372
%	27	73	100
¹ New licence surcharges and fees.			
² Does not include a one-time \$30K contribution to the Quality Waters Fund by government to develop the Kootenay Angling Management Plan for Classified Waters.			
³ New funding model implemented with changes to the cost of licences, licence surcharges and fees.			

About 77% percent of the over \$4 million of revenue to the Quality Waters Fund was generated from surcharges from rod days- fees paid by angling guides on Classified Waters (Table 8). These fees accounted for an average of about \$200K per year.

Surcharges on the province-wide sale of steelhead licences and angling guide licences provided a total of \$935K or an average of about \$62K per year.

TABLE 8 REVENUE FROM SURCHARGES, QUALITY WATERS FUND (1997-2012)			
YEAR ENDING MARCH 31	REVENUE FROM SURCHARGES ON LICENCES \$K	REVENUE FROM SURCHARGES ON ROD DAYS \$K	REVENUE ALL SURCHARGES \$K
1998 ¹	60	164	224
1999	62	187	249
2000	65	183	248
2001	65	171	236
2002	65	144	209
2003	68	177	245
2004	59	169	228 ²
2005 ³	58	127	185
2006	61	187	248
2007	70	251	321
2008	75	264	339
2009	53	252	305
2010	57	289	346
2011	60	271	331
2012	57	284	341
TOTALS	935	3,120	4,055
AVERAGES	62	208	270
%	23	77	100
¹ New licence surcharges and fees introduced. ² Does not include a one-time \$30K contribution to the Quality Waters Fund by government to develop the Kootenay Angling Management Plan for new Classified Waters. ³ New funding model implemented with changes to the total costs of licences, licence surcharges and fees.			

4.2 Operations of the Quality Waters Fund (Dedicated Revenue)

Table 9 documents the operations of the Quality Waters Fund. Over \$3.5 million of the \$4 million in revenue received was invested in work on premier angling streams. The fund balance as of March 31, 2012 was nearly \$600K.

TABLE 9 FINANCIAL OPERATIONS OF THE QUALITY WATERS FUND, 1997-2012			
YEAR ENDING MARCH 31	REVENUE FROM SURCHARGES ON LICENCES \$K	PROJECT INVESTMENTS USING REVENUE \$K	FUND BALANCE \$K
1997	15 ¹	0	15
1998	224	294 ²	(18) ³
1999	249	187	43
2000	248	189 ³	66
2001	236	138	165
2002	209	279	95
2003	245	213	129
2004	228 ⁴	199	187
2005 ⁵	185	269	103
2006	248	193	158
2007	321	181	298
2008	339	240	397
2009	305	375	323
2010	346	327	343
2011	331	240	430
2012	341	180	592
Misc EK Angling Plan Administration	30 (2004)	8	
TOTALS	4,100 (4,055 from licences)	3,512	588 ⁶
15 YEAR AVERAGES	273	234	

¹ Start up revenue from new fees in support of the River Guardian Program. The development plan for the program was funded from the General Operating Fund of HCTF at a cost of \$15K

² First year of dedicated revenue; over expenditure in 1997-1998 reflects reduced revenue due to government decision to delay, then eventually, eliminate some proposed licence and licence surcharge increases

³ Inter fund loan of \$36K was implemented to cover the shortfall between expenditures and reduced revenue. The loan was retired by March 31, 2000

⁴ This investment does not include a one-time \$30K restricted contribution by government to develop the Kootenay Angling Management Plan for new Classified Waters

⁵ New funding model; increases and adjustments in the cost of licence fees and licence surcharges.

⁶ \$4K difference in official fund balance in HCTF statements and information displayed here is due to rounding of financial data

5. Summaries Of Project Investments

5.1 Selection of Projects

The Habitat Conservation Trust Foundation administers a well established and proven process for evaluating project proposals that dates back to 1981. With minor modifications, the process described below for the 1997-2012 period reflects the current policies of the Foundation.

PROPOSAL INTAKE

By the first week of November, the Habitat Conservation Trust Foundation annually receives 200-300 project proposals for funding from its regular and special funds.

Because this angling revenue was administered in two funds, there were slight differences in the type of project proposal applicants and the proposal review processes:

- In the case of the surcharge revenue managed in the General Operating Fund, any person, group or organization was eligible were to submit any science-based fisheries proposal to the Foundation. However, in the reporting period, nearly all of the approved projects were led by government fisheries managers and most involved steelhead and their habitat. Partnerships were encouraged - both monetarily and in-kind contributions were considered invaluable; and
- In the case of the dedicated surcharge revenue administered in the Quality Waters Fund, **project proposals were limited to the staff of the provincial Ministry responsible for the administration of the *Wildlife Act***. In most years, this meant that the Foundation received a single project proposal comprised of activities on Quality Waters in several regions with work coordinated and administered by the Victoria office of the Ministry.

Analysis of the data for the 1997 to 2012 period shows that it was not unusual for fisheries managers to simultaneously use grants from both funds to address management issues on Quality Waters.

Monies managed in both the General Operating Fund and the Quality Waters Fund of the Foundation supported project investments on the basis of merit, effectiveness and ability to produce meaningful results.

All applications for project funding provided detailed information in the following general areas:

- Project Effectiveness (efficacy);
- Feasibility;
- Site Value (for Site-specific Projects); and
- Benefit/Cost.

Consistent with the Province's Classified Waters policy and the policies and strategic objectives of the Habitat Conservation Trust Foundation, the revenues from the General Operating Fund were invested in science-based projects that:

- Addressed the objectives of the Province's Quality Waters Strategy;
- Had the potential to achieve a significant conservation outcomes;
- Best represented the interests of the Foundation's contributors; and
- Maintained or enhanced opportunities for high quality angling on British Columbia's premier angling streams and associated outdoor recreational activities.

For the Quality Waters Fund, the investment strategy was similar with the exception of emphasis on significant conservation outcomes. Revenues to the fund were invested in projects that:

- Addressed the objectives of the Province's Quality Waters Strategy;
- **Had the potential to achieve a significant presence on BC's most productive fishing streams;**
- Best represented the interests of the Foundation's contributors; and
- Maintained or enhanced opportunities for high quality angling on British Columbia's premier angling streams and associated outdoor recreational activities.

TRANSPARENT REVIEW AND APPROVAL PROCESS

Each project proposal was subjected to thorough evaluation process consisting of a two level, independent technical peer review, scrutiny by Foundation staff, and a final sign off by the Chair of the Board.

Approved projects were announced in early April of each year.

Once implemented, projects (and activities) were routinely subjected to various levels of financial and technical monitoring and evaluation that is part of the Foundation's accountability policies. An open, solutions-based approach directed the overall process for evaluations of project work. Findings were shared with the proponents and help inform future decision-making relating to the project by the Foundation's Technical Review Committees and Board of Directors.

The project leaders were required to submit annual progress reports and final reports.

SUCCESSFUL PROJECTS REQUIRED LEADERS WITH KNOWLEDGE AND SKILLS

Regional and Victoria government staff, who led project proposals to the Foundation, invested a significant amount of time and expertise to identify and describe issues, problems and/ or opportunities and to develop cost effective plans to clearly meet realistic objectives.

Project leaders often cobbled together confirmed and potential funding from any number of sources to meet their project objectives. Rarely was any of the funding guaranteed and more often than not, different funding sources had different application deadlines and different information requirements on application documents. It also should be recognized that these project leaders and their fisheries management staffs had many other responsibilities so there was a finite capacity for the number of projects that could be properly delivered in any one year.

The expertise and dedication of government fisheries managers and contractors to develop science-based, technically accurate proposals, arrange and manage partnerships and deliver projects- often involving any number of funders, stakeholders, volunteers and weather conditions-was very important to the success of these project investments.

5.2 Reporting of Project Investments

PROJECT TRACKING

The Foundation allocates project proposals and any subsequently approved projects with unique tracking numbers to reflect the location of the work. The first number indicates the regional location within the province and is consistent with the numbering of government administrative regions as described in the Angling Regulation Synopsis.

SOURCES OF INFORMATION

Information provided in the following pages briefly describes financial support from the Foundation for project investments on Quality Waters.

The descriptions of project work, associated investment figures and project partners were derived from annual and final reports that were authored by project leaders and housed in unique electronic and paper project files of the Habitat Conservation Trust Foundation in Victoria. These data were augmented by information from the BC Conservation Foundation, a not-for-profit general contractor involved in the delivery of some projects.

The expenditure figures listed for each project only represent cash investments from the Foundation and do not include direct “in kind” or cash contributions to activities from local and regional partners. It is important to note that, for most projects, cash investments by the Foundation attract cash and in “kind” contributions. For some projects, these contributions can be up to 3 times the investment provided by HCTF.

An example of the value of partnership contributions to a project was documented in the 2012 report of the Quality Waters Strategy Project (6-213) in the Skeena Region. Over a 6 year period beginning in 2006-2007, the project invested at total of \$730K with \$401K provided from the Quality Waters Fund of HCTF and \$322K worth of cash and “in kind” contributions from other partners.

Expenditure figures found in project reports were checked against entries in the annual Statement of Operations of either the Foundation's General Operating Fund or the Quality Waters Fund. In some cases, there were minor discrepancies in project reporting and actual project billings. In these instances, figures from the audited financial statements of HCTF were relied upon.

5.3 Investments of Revenue-Overview

GENERAL OPERATING FUND

Table 10 documents the history of investments in science-based projects on the province's Quality Waters using revenue generated by surcharges on angling licences and managed in the General Operating Fund of HCTF.

To determine which conservation project investments from the General Operating Fund were associated with Classified Waters and other Quality Waters and their native fish species, the author used several criteria and applied them to the listing of all completed science-based fisheries conservation projects found in the Foundation's database.

Projects on large lakes, small lakes and non game fish were immediately excluded from consideration.

For streams, only those projects that met one or more of the following criteria were selected as legitimate Quality Waters expenditures from the General Operating Fund:

- Classified Waters and their tributaries;
- Non classified streams considered as Quality Waters by virtue of approved expenditures by government from HCTF's Quality Waters Fund;
- Non classified streams considered as Quality Waters by government fisheries management and the angling public; and
- Work to advance knowledge and understanding of species found in Quality Waters.

A total of 38 major projects met these criteria as legitimate expenditures on Quality Waters from the General Operating Fund of the Habitat Conservation Trust Foundation. The choice of the projects for inclusion in this report was confirmed on review by government regional fisheries managers.

Anglers and guides generated over \$1.5 million in revenue to help support over 157 project years of investment involving steelhead and other species found in Quality Waters. The total invested in these projects was nearly \$11 million.

This represents a significant investment of funding in Quality Waters by the Foundation's General Fund—well beyond the contribution of anglers and guides recreating on those premium streams. For every dollar invested in projects using monies received from licence surcharges associated with angler use of Quality Waters, an additional \$7 was invested in those same projects using revenue from surcharges on other

angling licences. Clearly, in the reporting period, conservation work on steelhead was a top priority of the regional fisheries management staff of the BC government.

The 157 project years of work, described in later in Section 6, were associated with 38 discrete conservation projects. There were 8 long term projects in 5 different regions with each lasting 5 years or more.

The 2005-2006 fiscal year saw over \$1 million invested in 16 different projects- the most projects and largest investment of money in any one year of the reporting period. This investment represented almost 20% of the total investment on all fish, wildlife, education and acquisition projects from the Foundation's General Operating Fund for that year as recorded in its audited statements.

The total value of investments in conservation projects averaged over \$700K per year. Over 30% of the total investment for the reporting period occurred on Quality Waters in the Vancouver Island Region.



Underwater steelhead, Cowichan River



Kloiya River resistivity counter

TABLE 10 MAJOR SCIENCE-BASED PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND, 1997-2012								
YEAR ENDING MARCH 31/REGION			TOTAL INVESTMENT					
	1 VI \$K	2 LM \$K	3 TN \$K	4 K \$K	5 C \$K	6 S \$K	0 VIC \$K	TOTAL FOR YEAR \$K
1998	169	45	341	35	75	146	56	867
1999	204	102	321	34	25	126	48	860
2000	140	271	269	42	0	137	42	901
2001	157	157	88	12	144	75	50	683
2002	449	140	125	30	84	57	57	912
2003	289	205	127	44	88	48	0	801
2004	313	348	57	115	3	55	0	891
2005	394	339	223	0	12	93	97	1158
2006	402	326	193	0	199	97	21	1238
2007	396	278	218	0	210	78	8	1188
2008	100	90	98	0	33	43	0	364
2009	99	64	129	0	23	63	30	408
2010	98	29	71	0	0	56	0	254
2011	97	19	75	0	0	14	0	205
2012	0	1	201	0	0	57	0	259
TOTALS	3,307	2,414	2,536	312	896	1,145	379	10,989
AVERAGES	220	161	169	21	60	76	25	732
%	30	22	23	3	8	10	3	100
Number of Projects	3	13	6	5	3	4	4	38
Project Years	28	31	40	12	17	18	11	157

QUALITY WATERS FUND

Table 11 documents over \$3.5 million of investments in on river work funded from the Quality Waters Fund. Not surprisingly, the rivers and streams of the Cariboo Region and Skeena Regions, at 38% and 26% respectfully, received the greatest benefits from the investment of dedicated angling revenue.

The investment of revenue from the Quality Waters Fund focused on three major activities:

- The River Guardian Program: maintaining a coordinated “on river” approach to monitoring angler use patterns and programs to improve compliance with regulations that govern fisheries and environmental/watershed protection;
- Angling Management Plans: plans to prescribe a suite of regulatory mechanisms designed to address the crowding issues on each priority water; and

- Data Collection and Management: conducting a coordinated approach to data collection and management as it relates to quality fisheries.

The majority of investment was directed at the River Guardian Program.

TABLE 11 THE VALUE OF PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND BY REGION, 1997-2012								
YEAR ENDING MARCH 31/ REGION	1 VI \$K	2 LM \$K	3 TN \$K	4 K \$K	5 C \$K	6 S \$K	0 VIC \$K	TOTAL FROM HCTF RECORDS \$K
1998	23				105	157	8	294
1999					111	76		187
2000					83	93	13	189
2001	5				101		32 ¹	138
2002	40		28		124	87		279
2003	5		28	56	94		28 ²	213
2004	8		20	91	73		6	199
2005		25	20	20	86	95	25	269
2006			20	70	86		17	193
2007				100	45	19	19	181
2008	24			88 (90) ³	21	99	7	240
2009	18		4	97 (99) ³	99	159		375
2010	14		20	63 (66) ³	100	112	18	327
2011				60 (62) ³	133		47 ⁴	240
2012			23	60 (63) ³	76	20		180
TOTALS	137	25	163	705 ⁵ (717) ³	1337	917	220	3,504
%	4	1	5	20	38	26	6	100
Admin (HCTF)								8
TOTAL								3,512
¹ Quality Waters-A Review and Five Year Operational Plan (2001-2006)								
² Government provided an additional \$21K for the Quality Waters Review and Analysis								
³ Records in the Kootenay Region show higher expenditures than audited records @ HCTF. This could mean that government budgets covered the difference								
⁴ Review and Evaluation of the Quality Waters Strategy (Dolan and Associates, 2012)								
⁵ Total expenditures as reported in audited statements of HCTF is \$12K less than those reported in reports for project investments in the Kootenay Region. Smaller discrepancies occur in other regions.								

6. Details Of Project Investments

Investments in projects were recorded in 6 regions and Victoria. There were no project investments in the Okanagan and Omineca-Peace regions.

6.1 Vancouver Island (Region 1)

QUALITY WATERS

Class II Classified Waters, located on the mainland portion of this region, are the Ahnuhati, Kakweiken, Seymore, Wakeman and Kingcome Rivers.

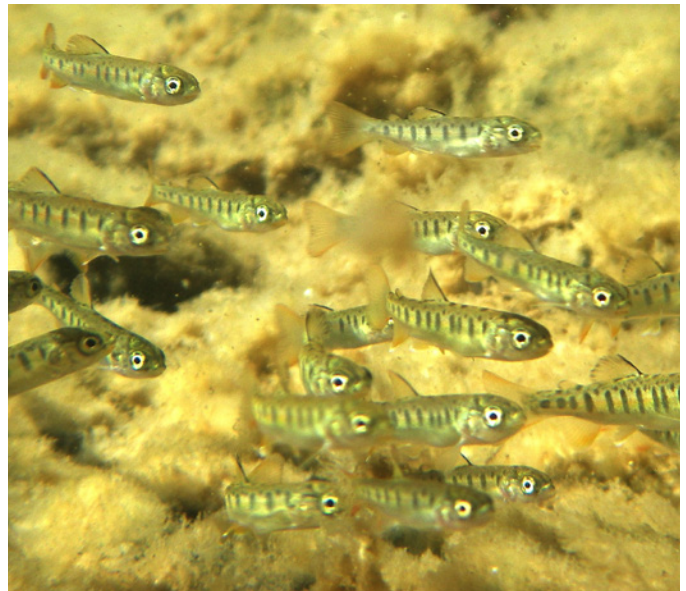
Of an additional 25 unclassified Quality Waters on the east side of the island, the Cowichan, Little Qualicum, Big Qualicum, Oyster, Campbell, Puntledge and Courtenay Rivers are perhaps the most well known and are sometimes referred to as the “rivers of Roderick Haig-Brown” (Hume, 2000).

GENERAL OPERATING FUND

Table 12 provides a summary of 3 major science-based project investments from this fund. The total 15 year investment was \$3.3 million which represents 30% of total provincial investments on Quality Waters from this fund.



Stock assessment, Ahnuati River



Cowichan River steelhead fry

TABLE 12 MAJOR PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND			
VANCOUVER ISLAND (1997-2012)			
YEAR ENDING MARCH 31	LONG TERM PROJECTS (2)		SHORT TERM PROJECTS (1)
	Vancouver Island Steelhead Recovery (1-161) \$K	Keogh River Steelhead Population Dynamics (1-319) \$K	Ecological and Genetic Impact of Escaped Atlantic Salmon on Steelhead (1-148) \$K
1998	86	30	53
1999	100	50	54
2000	31	64	45
2001	102	55	
2002	396 ¹	53	
2003	210	79	
2004	201	112	
2005	297	97	
2006	298	104	
2007	295	101	
2008	2	98	
2009		99	
2010		98	
2011		97	
2012		0	
TOTALS	2018	1137	152
TOTAL ALL PROJECTS	3,307		

¹ Includes a one-time grant of \$90K from the Government of BC

Here are short summaries of these major project investments from this fund in the reporting period:

The Vancouver Island Steelhead Recovery Project (1-161)

This long term project resulted in an investment of over \$2 million. In consultation with government agencies, First Nations, organized anglers and sport fishing businesses and with funding from over 15 different partners, east coast Vancouver Island steelhead stocks were intensely monitored. Conservation limits for stocks in up to 20 watersheds were determined and appropriate angling regulations, harvest limits, habitat restoration and fish culture programs were developed.

Following extensive stock assessments on 11 of the highest priority watersheds, the focus was shifted to restoring freshwater habitats, evaluating key indicator stocks monitoring Living Gene Bank Steelhead returns and improving communications and partnerships. The short term goal of the recovery plan was to rebuild wild Steelhead populations to abundance levels within the routine management zone as defined by the province's Steelhead conservation policy framework.

Examples of habitat restoration projects on priority watersheds included habitat complexing in key reaches of the Englishman, Little Qualicum, Big Qualicum, Oyster and Chemainus Rivers. Spawning platforms were created at 2 sites on the Campbell River and lake outlets including Elsie, Consort, Sproat and Toquart lakes. As well, 4 rivers were enriched using liquid and solid fertilizers. Dozens of snorkel surveys were completed in at least 13 watersheds enumerating winter and summer steelhead stocks. Steelhead fry electroshocking assessments on key index sites including the Englishman and Cowichan Rivers and a smolt enumeration completed on the Englishman River.

In all, there were 54 partners: 21 governments, corporations and foundations, 16 First nations and 17 non government and academic organizations. Over 19% of the cash investment was from partners and the British Columbia Conservation Foundation administered 92% of the project funding from HCTF.

This project later became an integral component of the Georgia Basin Steelhead Recovery Plan. Current information is available at <http://www.bccf.com/steelhead/>



Habitat complexing, Little Qualicum River



Gravel placement, Ash River

The Keogh River Steelhead Recovery Project (1-121 and 1-319)

Keogh River is one of dozens of similar rivers on the east coast of Vancouver Island. This funding, over \$1million over a 15 year period, provided critical support for BC's only comprehensive steelhead assessment site at the Keogh River fish fence and fish counting device installed near the river mouth. The device, which registers a subtle change in electrical current each time a fish passes over it, enables staff to enumerate each fish that migrates up or down the river. These escapement and smolt yield values allow for separation of freshwater and marine influences on life history. There were 14 other partners.



Keogh River



Keogh River fence

The Ecological and Genetic Impact of Escaped Atlantic Salmon on Steelhead (1-148)

Hatchery and wild steelhead salmon were evaluated in controlled experiments examining three levels of interaction with Atlantic salmon - behavioural, ecological and genetic.

QUALITY WATERS FUND

Table 13 highlights the on river project investment activities associated with this dedicated revenue. The major project investments on Quality Waters in the Vancouver Island Region from this fund in the reporting period were in excess of \$137K and represented 4% of the provincial total.

Starting in 2005, other sources of money like the Living Rivers Trust Fund were accessed to continue and expand work to recover steelhead stocks on Vancouver Island. This included support for the River Guardian Program. The primary objective of the **Greater Georgia Basin Steelhead Recovery Action Plan** is to stabilize and restore wild steelhead stocks and habitats to healthy self-sustaining levels.

TABLE 13 PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND			
VANCOUVER ISLAND (1997-2012)			
YEAR ENDING MARCH 31	INVESTMENT \$K	RIVER GUARDIAN PROGRAM	ACTIVITIES AND/OR FUNDING SOURCES
1998	23	yes	Monitoring of angling closures on six streams
1999		yes	\$45K funded by HCTF Steelhead Recovery Project (1-161); monitoring of angling closures on an additional seven streams
2000		yes	\$45K funded by HCTF Steelhead Recovery Project (1-161); monitoring of angling closures on an additional two streams
2001 ¹	5	yes	Cowichan River Creel Census (168 contacts); monitoring of angling closures on additional three streams; Cowichan Tribe provided "in kind" support; funded by HCTF Steelhead Recovery Project (1-161)
2002 ²	40	yes	Winter Creel Survey and Steelhead Angler Census on 19 streams (1451 anglers interviewed during 223 days); angling closure removed on Campbell River
2003	5	yes	Funded by HCTF Steelhead Recovery Project (1-161); over 1880 anglers checked during 406 river patrols on 27 priority watersheds on both coasts; angling closures removed or modified on Big Qualicum and Little Qualicum Rivers
2004 ³	8	yes	Cowichan River, Campbell River, Little Qualicum River and four other streams; funding by HCTF Steelhead Recovery Project (1-161)
2005 ⁴			Funding from the Georgia Basin Living Rivers Program; angling closure modified on Puntledge River
2006			Funding from the Georgia Basin Living Rivers Program
2007			Funding from the Georgia Basin Living Rivers Program
2008	24	yes	Cowichan River random stratified creel survey; additional funding from the Georgia Basin Living Rivers Program Cowichan River random stratified creel survey
2009	18	yes	Mainland Coast Dolly Varden Char Fishery Assessment; Cowichan River Creel Survey funded by the Georgia Basin Living Rivers Program
2010	14		Mainland Coast Dolly Varden Char Fishery Assessment; Funding from the Georgia Basin Living Rivers Program
2011			Funding from the Georgia Basin Living Rivers Program
2012			Funding from the Georgia Basin Living Rivers Program
TOTAL	137		
¹ Sections of the Little Qualicum, Big Qualicum, Oyster and Campbell Rivers were re-opened for winter Steelhead under an artificial fly only regulation. ² Region-wide bait ban ³ Steelhead Recovery Plan web site launched ⁴ Georgia Basin Living Rivers Program launched with a focus on Steelhead recovery.			

Here are samples of project reporting:

1997-1998 Synopsis: River Guardian Program

The Quality Waters Strategy has played an important role in addressing steelhead conservation issues on Vancouver Island. Declining steelhead populations has been a major concern. With dedicated HCTF funding in 1998, the River Guardian Program provided resources for two River Guardians. The guardians were primarily responsible for undertaking surveys of anglers during winter steelhead fisheries (January - March). In 1998 the guardians functioned as Deputy Conservation Officers in terms of monitoring angling compliance with regulations. The guardians also provided public information about regulations, etc. The River Guardian Program provides added value to the Steelhead Recovery Plan, another initiative funded through HCTF. (HCTF Project 1-161, General Operating Fund)

2007-2008 Synopsis: Creel Survey

The Cowichan River Creel Survey study used a randomized, unbiased sampling design to meet the following objectives:

- *quantify angling effort on the Cowichan River by gear type, stream reach, angler demographics and mode of angling for both the winter steelhead (December–April) and trout fisheries (March–July);*
- *quantify catch by species throughout the winter steelhead and trout fisheries;*
- *using the above information, determine efficiencies of each gear type and mode of use; and*
- *identify changes of the Cowichan River sport fishery over time for angling management purposes. The results of the first random stratified creel survey of the steelhead fishery on the Cowichan River will provide valuable tools for management and improved understanding of steelhead stocks.*

Both the steelhead and trout fisheries were monitored throughout the “fishable range” of environmental conditions using random stratified creel surveys. For each fishery, a combination of roving angler surveys by foot, drift boat surveys and helicopter surveys were used. During the steelhead season, roving surveys were the primary method of data collection. Drift surveys were used in addition to roving surveys to gain access to more areas, interview more boat anglers and to coordinate with Conservation Officer Patrols. Helicopter surveys were used as instantaneous counts to qualify ground-based efficiency. During the trout season, drift surveys were used more regularly to access the upper river and boat anglers more efficiently, while helicopter surveys were only used during the overlap between the steelhead and trout seasons. Drift surveys replaced helicopters as the method of obtaining ‘instantaneous’ counts, since it was possible to drift almost the entire survey area in a few hours. Data from the steelhead season also shows that angler counts from drift surveys were highly correlated ($r = 0.907$) with instantaneous counts by helicopter.

Roving surveys on foot, used throughout the entire study, were designed to randomly sample all access points. For each fishery, all likely access points were identified. From these, random start points

were chosen and numbered. A random number generator was used to determine a start point for each survey day, from which the creel observer would continue upstream towards the uppermost access point before beginning again at the lowest access point identified.

The river was divided into eight zones based on angling regulations, access points, and land districts. These zones were used to analyze the spatial distribution of catch and effort. Key results for the 2007 steelhead season were:

- a baseline data set that can be used to calibrate the Steelhead Harvest Analysis for the Cowichan River and to compare to future years;
- a clear understanding of spatial and temporal patterns of angler use;
- efficiency estimates for gear types and modes of angling; and
- knowledge of angler demographics.

For both the steelhead and trout seasons, effort in 2007 was at or near an all-time low. While it appears that adverse weather and flow conditions were partially responsible, we noted that anglers were present at much higher flow conditions than were previously considered fishable. In future years, we can investigate whether the relatively high proportion of boat-based anglers in the steelhead season was a result of high flows, or whether this is a growing trend. Boat-based anglers have a much higher catch per unit effort (CPUE) than shore anglers and could place new pressures on the resource. Furthermore, an increasing proportion of more efficient anglers could create the illusion of higher abundance than actually exists. Overall, when compared to past creel surveys of trout seasons, the CPUE for 2007 was significantly higher, which we infer is a result of having fewer, more dedicated, efficient anglers. Continued monitoring of the steelhead and trout fisheries on the Cowichan River is recommended for the following reasons:

- to build on this year's data set and account for variables such as weather and elevated stream flows;
- to continue to collect baseline data on the steelhead fishery;
- to monitor the increased use of boats; and
- to continue to improve the rate of compliance.

Summary

For the Vancouver Island Region, project investments from General Operating Fund and Quality Waters Fund of the Habitat Conservation Trust Foundation totalled almost \$3.5 million- or 24% of the total provincial expenditure on Quality Waters during the reporting period.



Cowichan River



River Guardian on the river

6.2 Lower Mainland (Region 2)

QUALITY WATERS

There are no Classified Waters in this region.

Unclassified Quality Waters in this region include the Upper Pitt, Coquihalla, Cheakamus, Squamish, Chilliwack/Vedder, Silverhope, Chehalis, and Alouette Rivers.



Anglers on the Vedder River



Boulders and large woody debris treatments, Chehalis River

GENERAL OPERATING FUND

Table 14 provides a summary of 15 science- based conservation project investments on Quality Waters. The total 15 year investment was in excess of \$2.4 million and represents over 21% of the total provincial investment from the General Operating Fund during that period.

TABLE 14 MAJOR PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND				
LOWER MAINLAND (1997-2012)				
YEAR ENDING MARCH 31	LONG TERM PROJECTS (2)		SHORT TERM PROJECTS(11)	
	Lower Mainland Steelhead Conservation (2-135) \$K	Georgia Basin Steelhead Recovery (2-250) \$K	Various \$K	
1998	45			
1999	94			Restoration of Alouette River Large Woody Debris (2-154) 8
2000	160		Vedder River Steelhead (2-193) 50 Gravel Management Plan for Lower Mainland Streams (2-136) 55	6
2001	114		Gravel Management Plan for Lower Mainland Streams (2- 136) 43	
2002	86	54		
2003	58	131	Cheakamus River Steelhead (2-276) 16	
2004	35	284 ¹	29	
2005		302	37	
2006		326		
2007		278		
¹ Includes a one-time grant of \$60K from the Government of BC				

TABLE 14 MAJOR PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND				
LOWER MAINLAND (1997-2012)				
YEAR ENDING MARCH 31	LONG TERM PROJECTS (2)		SHORT TERM PROJECTS(11)	
2008			Chehalis River Habitat Restoration (2-383) 30 Shovelnose Creek Groundwater Side-Channel Development Project (2-384) 30 Silverhope Creek Mainstem, Floodplain and Side-Channel Restoration (2-382) 30	
2009			Silverhope Creek Mainstem, Floodplain and Side-Channel Restoration (2-382/420) 27	Coquihalla River Side Channel Habitat (2-406) 22 Preliminary Engineering for Migratory Fish Passageway - Alouette Dam Fish Ladder: Feasibility Study (2- 415) 15
2010			Seymour River Steelhead Tagging (2-431) 13	16
2011			0	Coquihalla River Side Channel Habitat (2-406) 19
2012			1	
TOTALS	592	1375	361	86
TOTAL ALL PROJECTS	2,414			

Here are brief summaries of the major science-based conservation project work completed on Quality Waters supported by this fund:

The Lower Mainland Steelhead Conservation Plan Development (2-135)

This work represents an investment of almost \$600K. A conservation strategy was developed for wild steelhead in 6 rivers. For two of those high priority rivers - the Chilliwack and Squamish, detailed juvenile density survey and adult count data were collected to help establish habitat capacity estimates and cost effective stock status indices. The project determined safe population levels from habitat capability and developed techniques to economically monitor populations.

The Georgia Basin Steelhead Recovery Program (2-250)

This 6 year project, at a cost of almost \$1.4 million, was designed to help recover declining wild steelhead populations on 20 high-priority streams by stock assessment (preliminary estimates were provided from 17 winter and 5 summer snorkel surveys), recovery actions (one index stream was set up on the Salmon River), habitat restoration (opportunities on 9 streams investigated), and fishery development activities (new angling opportunity developed on the Coquihalla River). A Steelhead Recovery web site was established (www.steelheadrecoveryplan.ca), presentations made to workshops and community groups and partnerships developed. This project later became an integral component of an expanded Georgia Basin Steelhead Recovery Plan. Current information is available at <http://www.bccf.com/steelhead/>

The Cheakamus River Steelhead Escapement (2-276)

This three year project during the 2002-2005 period was designed to quantify the escapement of steelhead in the Cheakamus River and to relate these new data to escapement estimations from previous years and to help determine stock conservation status.

Vedder River Steelhead RadioTagging (2-193).

Samples of wild male and female, hatchery male and female steelhead in the Vedder and Chilliwack rivers were fitted with 68 radio tags over a five-month period. Priorities for the one year project included monitoring of the movements and behaviour of different components of the winter steelhead run, interactions of wild and hatchery steelhead at spawning time, spawning locations of steelhead by groups, and the effects of the intensive sport fishery that targeted this resource.

Restoration of Alouette River Large Woody Debris (2-154)

Volunteers constructed and placed in a forty log-jam structures in a 4km reach to replace previous structures lost due to logging practices and damming of the Alouette River. These structures were designed to provide important resting habitat for steelhead, cutthroat trout, pink, chum, Chinook and Coho salmon.

Gravel Management Plan for Lower Mainland Streams (2-136)

Intensive demands from the aggregate industry and encroaching urban development have pressured governments to allow the removal of gravel from the Fraser and the Vedder Rivers. These rivers contain important fish habitat for 24 species- including migrating stocks like the Thompson River steelhead run. This initiative identified the habitat requirements of fish and related them to the physical effects of gravel mining. These data, and that from the experimental mining of gravel, also informed the development of a scientifically - based Gravel Management Plan.



Steelhead recovery planning



Chilliwack River steelhead

Preliminary Engineering for Migratory Fish Passageway - Alouette Dam Fish Ladder: Feasibility Study (2- 415)

With a the goal to re-establish migratory fish runs to upper areas of the Alouette River watershed and following the investment of the seed funding grant, the size and type of fish ladder, pump and ladder specifications, and approximate cost of an Alouette Dam fishway were determined by a feasibility study over a two year period. The final recommended design was chosen from three options and had a length of about 220 metres.

Seymour River Steelhead Tagging (2-431)

A radio telemetry/mark recapture project tagged a subsample of each steelhead population component with radio transmitter tags and then tracked them throughout the year. A total of 90 Steelhead were tagged- 49 applied to the summer run and 41 to the winter run. This method was used to calibrate snorkel counts and provide escapement estimates and determine the behavior of fish (holding and spawning areas, residence time and run timing). These data were used to inform development of a Water Use Plan for the Seymour Dam with Metro Vancouver.

Coquihalla River (Ladner Creek) Side Channel Habitat Restoration (2-406)

This project created over 23,000 m² of off-channel trout and char habitat in the Coquihalla watershed. Following intake construction/testing and excavation of channel meanders, a second phase added habitat complexity (LWD, cutbanks, boulders, riffles) over the 700 m length of the channel.



Side channel, Ladner Creek



Large woody debris structures, Silverhope Creek

Silverhope Creek Mainstem, Floodplain and Side-Channel Restoration (2-382)

The restoration of ecological processes was accomplished by constructing and upgrading of 16 Large Woody Debris (LWD) structures, 35 rounded boulder clusters and the addition of bar stabilizers (placed mid channel on elevated aggraded bars). Upgrades to existing LWD structures occurred to address functionality issues sustained during the 75 year flood event in November 2007. As well, channel assessments and investigations of off channel projects were completed.

Silverhope Creek Mainstem Restoration Phase III (2-420)

The restoration of ecological processes was accomplished by constructing 13 Large Woody Debris (LWD) structures and associated rounded boulder clusters.

Chehalis River Habitat Restoration (2-383)

Consistent with the Steelhead Recovery Action Plan, this project built 8 functioning J-hook vein LWD structures and 60 boulder clusters over a 1.2 km section of the lower Chehalis River with the goal of producing an additional 800 Coho smolts and 300 Steelhead smolts.

Shovelnose Creek Groundwater Side-Channel Development Project (2-384)

Three new side channels, with a total length of almost 1000m, were excavated to provide additional groundwater habitat for an estimated 700 Coho smolts and 400 Steelhead smolts.

QUALITY WATERS FUND

On river investments were limited to the Upper Pitt River and only in the 2004-2005 period. After consultation with stakeholders, a comprehensive study documented river boat use during the late summer and early fall season and reviewed existing scientific literature on the potential environmental effects of boat traffic on riverine ecosystems.

The total investment was \$25K or 1% of the total provincial investment from this fund during the reporting period.

SUMMARY

For the Lower Mainland Region, project investments from General Operating Fund and Quality Waters Fund of the Habitat Conservation Trust Foundation totalled over \$2.4 million - or 17% of the total provincial expenditure on Quality Waters during the reporting period.

6.3 Thompson-Nicola (Region 3)

QUALITY WATERS

A portion of the Thompson River (the lower Thompson) is Class II, but only during the fall. The Thompson River in the summer is considered a Quality Water, but not a Classified Water. The Clearwater River is considered a Quality Water. Both offer summer fishing opportunity for resident trout in large streams; a class of fishery that is rare in this region of the province.

GENERAL OPERATING FUND

Table 15 provides a summary of 6 science-based project investments 3 of which were each funded for more than 5 years. The total 15 year investment was over \$2.5 million or 23% of the provincial total invested in conservation work on Quality Waters.

TABLE 15 MAJOR PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND					
THOMPSON-NICOLA (1997-2012)					
YEAR ENDING MARCH 31	LONG TERM PROJECTS (3)			SHORT TERM PROJECTS (3)	
	Thompson River Wild Steelhead (3-97) \$K	Bonaparte Fishway Operations (3-71) \$K	Thompson River Juvenile Steelhead (3-112) \$K	Interior Fraser River Wild Steelhead Conservation (3-251) \$K	Marine Survival Assessment of Juvenile Thompson River Steelhead (3-257) \$K
1998	311	30			
1999	290	31			
2000	225	33			Deadman River Habitat Restoration (3-139) 11
2001	55	33			
2002	49	39	37		
2003	40	47	40		
2004		18	39		
2005	72	28	50	73	
2006		20	59	64	50
2007		19	65	53	81
2008		24		74	
2009		21	60	48	
2010		21	0	50	
2011		0	0	75	
2012		47	69	85	

TABLE 15 MAJOR PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND					
THOMPSON-NICOLA (1997-2012)					
YEAR ENDING MARCH 31	LONG TERM PROJECTS (3)			SHORT TERM PROJECTS (3)	
TOTALS	1042	411	419	522	142
TOTAL ALL PROJECTS	2,536				

Here are brief summaries of major project investments:

Thompson River Steelhead Project (3-97)

Over \$1 million was invested in a 9 year project of which 8 years were in this reporting period. Population status of various Thompson River and Chilko River steelhead stocks were monitored (helicopter overflight counts, resistivity fish counter, and radio tagged fish) and assessed (arrival time model). An important objective of the project was to estimate the abundance of spawners in the Nicola, Deadman and Chilko Rivers. The information from escapement monitoring programs for 3 recognized indicator stocks was needed to ensure conservation objectives continued to be met under the Fisheries Management Protocol between the federal and provincial governments.



Bonaparte fishway



Thompson River

The Interior Fraser Wild Steelhead Conservation Project (3-251)

This Operations and Maintenance project, an expanded version of project 3-97 above, received in excess of \$500K from the General Operating Fund over an 8 year period to monitor abundance, recruitment and status of 4 stocks: Thompson River stocks (Nicola, Deadman and Bonaparte) and Chilcotin stock (Chilko). A variety of methods were used:

- Nicola River-periodic counts combined with tag-based estimates of observer efficiency, stream residency time and spatial distribution;
- Deadman River-use of a resistivity fish counter @ 96% efficiency;
- Bonaparte River-use of a resistivity fish counter @ 100% efficiency; and
- Chilko River-weekly helicopter counts of spawning steelhead during the mid May to early June period.

Bonaparte Project (3-71) and Bonaparte Fishway Structural Alterations Project (3-174)

Over \$400K was provided to critical projects on the Bonaparte River for annual operations and one time construction costs. This fishway structure provides access to an additional 150km of habitat for anadromous and resident salmonids. A concrete and metal cell was added to the existing fishway as a bi pass channel to house an electronic (resistivity) counter. This modification allowed fish to utilize the fishway without being delayed, captured and handled. Annual costs to operate the fishway were subsequently reduced. Enumeration data from the long term year project were essential to completing the Thompson River Steelhead Conservation Project.

Thompson River Juvenile Steelhead (3-112)

This 8 year project, with an investment of over \$400K, was designed to help derive biological reference points for the management and conservation of Thompson River steelhead. A diver count assessment of steelhead parr standing stock was tested as a method by which a time series of juvenile abundance data could be collected into the future to provide an estimate of steelhead carrying capacity and associated abundance reference points. In any one year, up to 160 sites were sampled with up to 33 on the Thompson River mainstem and up to 127 sites in tributaries. Sampling was stratified, and was modified to reflect the review of sampling in the previous year. A literature review and evaluation report were also produced. The rapid assessment technique as tested was considered very effective. The project was conducted in years where spawning stock abundance fall outside of the range surveyed to date. This approach avoids repeating surveys associated with spawning stock sizes already surveyed therefore reducing costs and alleviating potential redundancy. In 2010, spawning stock abundance was lower than the range surveyed to date, therefore the juvenile abundance survey was undertaken to provide a valuable data point.

Marine Survival Assessment of Juvenile Thompson River Steelhead (3-257)

This project, an important activity in a much larger multi-partnered, multi –million dollar Pacific Ocean Shelf Tracking initiative, involved the capturing of 100 steelhead smolts using RST traps and fitting them with hydroacoustic tags to monitor marine survival rates and migration pathways in the Fraser River and Georgia Strait.

Deadman River Habitat Restoration (3-139)

Water withdrawal, removal of riparian vegetation and development encroachment (ranching) have resulted in the overall degradation of the Deadman River to the detriment of Thompson River steelhead and Coho salmon stocks. To stabilize the stream bank, a combination of bioengineering structures was

installed. To re-establish healthy riparian zones along the shoreline, banks were groomed and planted with willow and cottonwood and the entire area was enclosed with fencing. The project partner was the Skeetchestn Indian Band.

QUALITY WATERS FUND

Table 16 highlights the on river project investment activities associated with this dedicated revenue. River Guardians funded by HCTF were active beginning in the 2001-2002 fiscal with a steelhead angler survey. They were active in a total of 8 of 15 years of the reporting period.

The total 15 year investment of \$163K and represented 5% of total provincial expenditures from this fund for the reporting period.



River Guardians



Thompson River steelhead

TABLE 16 PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND			
THOMPSON-NICOLA (1997-2012)			
YEAR ENDING MARCH 31	INVESTMENT \$K	RIVER GUARDIAN PROGRAM	ACTIVITIES AND/OR FUNDING SOURCES
1998			
1999			
2000		yes	\$17K; Random stratified angler survey jointly funded by the Kingfisher Club and BC Ministry of Environment
2001			
2002	28	yes	Random stratified angler surveys, work on the spatially-explicit simulation model for the steelhead fishery and dissemination of information on steelhead stock status and management objectives
2003	28	yes	Random stratified angler surveys, work on the spatially-explicit simulation model for the steelhead fishery and dissemination of information on steelhead stock status and management objectives
2004	20	yes	894 angler interviews in random stratified angler surveys
2005	20	yes	888 angler interviews in random stratified angler surveys
2006	20	yes	578 angler interviews during 18 days of roving angler surveys over a 6 week period
2007			
2008			
2009	4	yes	\$17K from other funders for random stratified angler surveys
BCCF			
2010	20	yes	373 anglers interviewed during 24 days of sampling
2011		yes	47 complete and partial patrol days over 212 days focused on non-compliant recreational angling effort and First Nations fishing effort on the Thompson River; funded by other partners (\$25K).BCCF was contractor
2012	23	yes	18 patrol days; additional \$12K from other funders. BCCF was contractor
TOTALS	163		

The Quadra Report (2003) described the methodology for River Guardian activities in this region:

The River Guardian Program on the Thompson River began in 1999-2000. It occurs from October – November during the winter steelhead fishery. Guardians were contracted...with the sole focus on a creel survey.

The creel survey methodology is peer reviewed; it is customized to the situation using a standard roving and access point stratified survey. Changes have been made to enhance empirical support (i.e.,

had a person focus on overall count of anglers as well as the creel survey interviewing). Up to three persons were involved in the program at different times/schedules (e.g., weekends/weekdays); in some cases there were two people working at the same time.

The survey has a dual purpose:

- a) in-season tracking of steelhead angling activity, complements federal monitoring of fishing; needed to manage the fishery; and*
- b) post-season assessment of fish populations based on information about harvest; need to have time series data on populations.*

Here are samples of project reporting:

2002-2003 Synopsis: River Guardian Program

From October 12th to November 29th, 2002, 894 angler surveys were conducted on 572 different anglers in the Thompson steelhead sport fishery. The combined CPUE during this period was 0.04282 steelhead/rodhour (n=828, SE=0.003877), ranking it the 4th highest CPUE recorded since the early 1980's. There was no significant correlation between the average yearly CPUE of Thompson steelhead anglers and the cumulative CPUE for steelhead from the Albion Chum Test Fishery: for the years 1980 to 2002 ($r^2=0.142$, $F=1.15$, $P=0.318$) and 1998 to 2002 ($r^2=0.499$, $F=1.99$, $P=0.294$). Total effort for the 7 week period was estimated to be 24, 999 rodhours producing an estimated total catch of 1, 146 steelhead. Applying a 1.6% to 5% catch and release mortality rate, an estimated range of 18 to 57 steelhead were killed out of a predicted escapement of 1, 000 steelhead.

BC Resident anglers were the most common residency type on the Thompson in 2002 comprising 75% of the anglers (n=424). This was followed by Non Resident US, Non Resident Canadian, Non Resident Foreign and BC Local with 18% (n=105), 3% (n=16), 2.4% (n=13) and 1.8% (n=10), respectively.

The most popular gear type used in the Thompson steelhead sport fishery was bait at 44.3% (n=244). This was only slightly more popular than fly fishing at 37.4% (n=206) and twice as common as lure fishing at 18.3% (n=101). Bottom bouncing with bait proved to be the most effective angling method with a CPUE of 0.0823 steelhead/rodhour (n=114, SE=0.0126) followed by float fishing with bait lure fishing and fly angling, which had CPUE's of 0.0726 (n=146, SE=0.0135), 0.0397 (n=103, SE=0.0108), 0.0112 steelhead/rodhour (n=264, SE=0.0028), respectively. Bait fishermen had the highest proportion of effort with 44.3% of the total effort. This was followed by fly fishermen with 38.6% and lure fishermen with 14.9% of the total effort. Of the various gear and residency types, Non Resident Canadian bottom bouncing bait fishermen appeared to be the most effective with a CPUE of 0.1707 steelhead/rodhour (n=4, SE=0.0735), although sample size was very small. This was followed by BC Resident bottom bouncers (with bait) and BC Resident float (with bait) fishermen which had CPUE's of 0.0907 steelhead/rodhour (n=75, SE=0.0163) and 0.0745 steelhead/rodhour

(n=133, SE=0.0144), respectively. BC Resident and US fly anglers had fairly consistent CPUE's of approximately 0.01 steelhead/rodhour whereas BC Local and Non Resident Canadian fly anglers had slightly higher CPUE's of approximately 0.03 steelhead/rodhour. BC Resident bait fisherman got the most use out of the resource by catching 690 steelhead. This was followed by BC Resident lure fisherman who captured an estimated 134 steelhead and US bait fisherman which captured 68 steelhead. BC Resident and US fly fisherman captured an estimated 57 and 35 steelhead, respectively.

2011-2012 Synopsis: River Guardian Program

Since 2004, the opening of the Thompson River steelhead fishery has been conditional on an in season forecast of abundance exceeding 850 spawners. In season forecasts are based on a model that relates daily gillnet catches of steelhead in the Albion Test Fishery in the lower Fraser River during the fall to escapement estimates made for individual spawning tributaries the following spring.

In 2011, results from the Albion Test Fishery indicated a 60% probability of exceeding the abundance threshold of 850 fish. As a result, the Thompson River was opened to catch and release angling on October 29, 2011 for the remaining balance of the fall steelhead migration period and the fall/early winter angling season (to December 31).

Creel surveys of the Thompson steelhead fishery date back to 1976 and were continuous from 1976-1984, with 1979 being an exception. Creel surveys were also conducted during most years from 1998 to 2009 as part of a provincial fishery monitoring program that later developed into the BC Quality Waters Strategy.

Seven guardian patrols were completed during the October closure period. A total of 9 anglers were observed and/or encountered. Those encountered were informed as to the closure as part of procedure.

SUMMARY

For the Thompson-Nicola Region, project investments from General Operating Fund and Quality Waters Fund of the Habitat Conservation Trust Foundation totalled almost \$2.7 million- or 19% of the total provincial expenditure on Quality Waters during the reporting period.

6.4 Kootenay (Region 4)

QUALITY WATERS

The Kootenay Region has 13 % of Classified Waters in the province, with an approximate combined Class II watershed area of 17,000 sq km.

The entire watersheds of the Bull River, Skookumchuck Creek, White River and Wigwam River are designated as Class II Waters. The entire Elk and St. Mary watersheds are also designated as Class II Waters with the exception of two small tributaries with age restricted fisheries (Coal Creek and Joseph Creek, respectively). The upper Kootenay River is also designated as a Class II Water from the White River to its headwaters.

As for Quality Waters that are unclassified,—the upper Kootenay River below its classified portion is considered a Quality Water and is the primary wintering habitat for a majority of bull trout and Westslope cutthroat trout populations which utilize the classified watersheds. Anglers consider the Columbia River reach between Hugh Keenleyside Dam and the U.S. border a blue ribbon rainbow trout fishery.

GENERAL OPERATING FUND

The 5 major science-based project investments on Quality Waters in the Kootenay Region from this fund in the reporting period were in excess of \$300K and represented 3% of the provincial total. (Table16).

TABLE 16 MAJOR PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND					
KOOTENAY (1997-2012)					
YEAR ENDING MARCH 31	SHORT TERM PROJECTS (5)				
	Status of Westslope Cutthroat Trout in the Kootenay Region (4-235) \$K	Kootenay River Bull Trout (4-218) \$K	Wigwam River Bull Trout (4-147) \$K	Wigwam River Cutthroat Trout (4-306) \$K	Joseph Creek Cutthroat Trout (4-188) \$K
1998			35		
1999			34		
2000			28		14
2001		12			
2002	27	3			
2003	11	8		25	
2004	3	112			
2005-2012	0	0	0	0	0
TOTALS	41	135	97	25	14
TOTAL ALL PROJECTS	312				

Here are short summaries of these major project investments from this fund in the reporting period:

The Status of Westslope Cutthroat Trout in the Kootenay Region (4-235)

The status of this blue-listed species was assessed by the study of population genetics, a review of data, and an assessment of stocks of the Wigwam River. These data, combined with that of researchers in other watersheds in the East Kootenay, supported the maintenance of separate demographic management strategies for trout inhabiting different river systems and illustrated how differing habitat structure (i.e. presence of migration barriers) may influence patterns of biodiversity and gene-flow equilibrium.

The Kootenay River Bull Trout Project (4-218)

This project was funded over a 4 year period for work in the upper Kootenay River watershed. A total of 71 trout were implanted with radio tags and 133 hours invested in aerial tracking produced 1127 locations. The project confirmed major known spawning areas on the Wigwam River and Skookumchuck Creek, and new unknown spawning concentrations in the White River, Blackfoot Creek and Verdant Creek.

Wigwam River Bull Trout (4-147)

The status of Wigwam River bull trout was determined by trapping, tagging, creel surveys, redd count, genetic analysis and juvenile surveys over a 4 year period (1997-2000). Reliable data were used to develop a conservation plan for this important population of bull trout and address habitat protection concerns.

Wigwam River Cutthroat Project (4- 306)

Radio telemetry of 29 tagged fish, ranging from 4-6 years of age, and diver surveys of 36.1km of water were used to examine the life history and abundance of Westslope Cutthroat Trout in the Wigwam River watershed over a 2 year period. Spawning, beginning in the first or second week of May, occurred in the mainstem Wigwam and the Elk River. Extensive overwintering migrations were documented, populations estimated and management recommendations made.

Joseph Creek Cutthroat Trout (4-188).

Joseph Creek is one of only four spawning streams on the lower 40 kilometres of a Quality Water, the St. Mary River, near Cranbrook. To determine the present use of Joseph Creek by spawning Westslope cutthroat trout, to identify critical spawning areas, and to assess whether 23 culverts are barriers to spawning cutthroat trout, samples at 17 sites were taken using fish fences, traps and electro-shocking techniques. These data from the one year project were used to identify critical spawning habitat and culverts that impeded spawning fish as well as the development of a priority list to replace poorly placed culverts.

QUALITY WATERS FUND

Table 17 highlights the on river project investment activities associated with this dedicated revenue. The total 10 year investment was in excess of \$600K and represented 18% of total provincial expenditures.

The River Guardian Program was not fully active until 2004-2005 when several streams in the region were designated as Classified Waters.

TABLE 17 MAJOR PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND			
KOOTENAY (2002-2012)			
YEAR ENDING MARCH 31	INVESTMENT \$K	RIVER GUARDIAN PROGRAM	ACTIVITIES AND/OR FUNDING SOURCES
2003	56	yes	Creel survey on the Elk River was conducted in the summer and fall of 2002 (818 anglers interviewed) 492 contacts on St Mary River; and 36 aerial surveys of entire East Kootenay Area
2004	91	yes	18 aerial surveys were completed and 80 days of angler surveys occurred on the Elk River; government contribution of \$30K to help develop the East Kootenay Angling Management Plan
2005	20	yes	375 anglers interviewed; Preliminary River Guardian Program angler surveys and compliance monitoring were completed on all seven watersheds. River Guardians were also involved in bull trout (BT) spawner abundance counts (Redd counts) in the Wigwam, White and Skookumchuck watersheds in the fall of 2004
2006	70	yes	River Guardian Program included angler surveys and compliance monitoring on all seven watersheds and a winter project on the Elk River winter fishery. RGs were also involved in BT spawner abundance counts (Redd counts) in the Wigwam, White and Skookumchuck watersheds in the fall of 2005. 464 anglers interviewed over a 101 day period-59% were Canadian; East Kootenay Angling Management Plan was finalized
2007	100	yes	River Guardian Program included angler surveys and compliance monitoring on all seven watersheds by three River Guardians in the summer and fall of 2006 (1023 anglers were interviewed over a 106 day period to monitor the effectiveness of angler use regulatory measures). RGs were also involved in BT spawner abundance counts (Redd counts) in the Wigwam, White and Skookumchuck watersheds in the fall of 2006. A compliance monitoring project and angler survey were conducted during the 2007 winter fishery on the Kootenay and Elk Rivers

TABLE 17 MAJOR PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND			
KOOTENAY (2002-2012)			
YEAR ENDING MARCH 31	INVESTMENT \$K	RIVER GUARDIAN PROGRAM	ACTIVITIES AND/OR FUNDING SOURCES
2008	88 (90) ¹	yes	River Guardian Program included angler surveys and compliance monitoring on all seven watersheds by three River Guardians in the summer and fall of 2007. 670 anglers were interviewed (14% non compliant) on all Classified Waters in the East Kootenay during the summer/fall period. RGs were also involved in BT spawner abundance counts (Redd counts) in the Wigwam, White and Skookumchuck watersheds in the fall of 2007. A compliance monitoring project and angler survey were conducted during the 2008 winter fishery on the Kootenay River
2009	97 (99) ¹	yes	River Guardian Program included angler surveys and compliance monitoring on all seven watersheds by two River Guardians in the summer and fall of 2008.(608 anglers interviewed) RGs were also involved in BT spawner abundance counts (Redd counts) in the Wigwam, White and Skookumchuck watersheds in the fall of 2008. A compliance monitoring project and angler survey was conducted during the 2009 winter fishery on the Kootenay and Elk Rivers with 99 anglers interviewed. The East Kootenay Angling Management Plan was finalized
2010	63 (66) ¹	yes	River Guardian Program included angler surveys and compliance monitoring on all seven watersheds by two River Guardians in the summer and fall of 2009. (664 anglers checked) RGs were also involved in BT spawner abundance counts (Redd counts) in the Wigwam, White and Skookumchuck watersheds in the fall of 2009. A compliance monitoring project and angler survey was conducted during the 2010 winter fishery on the Kootenay and Elk Rivers
2011	60 (62) ¹	yes	River Guardian Program included angler surveys and compliance monitoring on all seven watersheds by two River Guardians in the summer and fall of 2010 (541 anglers checked). RGs were also involved in Westslope cutthroat trout (WCT) assessments in the upper St. Mary River and in the White River Middle Fork in the late summer and fall of 2010 to estimate adult WCT abundance. Additionally, RGs were involved in BT spawner abundance counts (Redd counts) in the Wigwam, White and Skookumchuck watersheds in the fall of 2010. A compliance monitoring project and angler survey was conducted during the 2011 winter fishery on the Kootenay River. This included instantaneous counts and a study design specific to estimating extrapolated angler use, impacts to WCT and BT, and catch composition/targeted species

TABLE 17 MAJOR PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND			
KOOTENAY (2002-2012)			
YEAR ENDING MARCH 31	INVESTMENT \$K	RIVER GUARDIAN PROGRAM	ACTIVITIES AND/OR FUNDING SOURCES
¹ Records in the Kootenay Region show expenditures that, in total, are \$12K greater than audited records @ HCTF. This could mean that government budgets funded the difference.			
2012	60 (63) ¹	yes	River Guardian Program included angler surveys and compliance monitoring on all seven watersheds by two River Guardians in the summer and fall of 2011 (over 500 anglers checked). Intensive surveys were also conducted by RGs on the lower Elk River (June 15-July 31) to estimate impacts to migrating adfluvial BT by estimating extrapolated angler use, catch and harvest. RGs were also involved in WCT assessments in the White River North Fork in the fall of 2011 to estimate adult WCT abundance. Additionally, RGs were involved in BT spawner abundance counts (Redd counts) in the Wigwam, White and Skookumchuck watersheds in the fall of 2011. A compliance monitoring project and angler survey was conducted during the 2012 winter fishery on the Kootenay River. This included instantaneous counts and a study design specific to estimating extrapolated angler use, impacts to WCT and BT, and catch composition/targeted species
TOTALS	705 (717)¹		
¹ Records in the Kootenay Region show expenditures that, in total, are \$12K greater than audited records @ HCTF. This could mean that government budgets funded the difference.			

Here are samples of project reporting:

2006-07 Synopsis: River Guardian Program

The 2006 East Kootenay Quality Waters Program focused on 7 classified watersheds in the Kootenay Region (Elk, Wigwam, Bull, St. Mary, Skookumchuck, White and Upper Kootenay). It consisted of two sub-programs. The River Guardian Program monitored angler use by collecting creel data and providing limited enforcement activities on the 7 classified watersheds through the use of three River Guardians (1 full time and 2 seasonal). The second sub-program was a Fish Monitoring Program, which assessed Westslope cutthroat and bull trout numbers/density and size class distribution in index sections of the St Mary River and/or Michel Creek (tributary of the Elk River) through the use of diver counts. The feasibility of conducting diver counts on some of the other classified watershed (i.e. Elk and White Rivers) was also investigated.

2007-08 Synopsis: River Guardian Program

A compliance monitoring project and angler survey were conducted over a 102 day period by two River Guardians on classified streams in the East Kootenay region from July 3 to October 12, 2007.

They were mandated to provide a fisheries presence for compliance monitoring, public relations and educational purposes. River Guardians worked in a limited enforcement capacity, issuing violation tickets and warnings for licence infractions and working with the Conservation Officer Service to deal with serious regulation infractions encountered while in the field. The angler survey collected detailed information from guided and non-guided anglers including: hours fished, fish caught and released by species, trip length, angling methods, place of residence, licence details, river access and quality of angling experience.



River Guardian



Bull River

2009-2013: Five Year Summary of the Kootenay Region River Guardian Program

Over a five year period from 2009-2013, two River Guardians conducted angler surveys, biological monitoring, education initiatives, species inventory and compliance and enforcement projects on Kootenay Region classified waters. These projects took place on seven systems within the upper Kootenay watershed and included seasonal fisheries over spring, summer, fall and winter months. Angler surveys collected detailed information from all anglers including: effort, catch, harvest, guided or non-guided, trip length, angling methods, demographics, licence details, access and quality of experience. Surveys were carried out on the Bull River, Elk River (includes Michel Creek), Skookumchuck Creek, St. Mary River, Wigwam River, White River and upper Kootenay River. Winter-spring projects were specific to the upper Kootenay and Elk River systems. Species inventory projects were carried out in the Wigwam, White, Skookumchuck and St. Mary watersheds.

Combining all systems and specific seasonal fisheries over the five year survey period, Kootenay River Guardians interviewed 3,481 anglers. These anglers fished for 7,903 hours, and caught 7,604 fish for a combined catch per unit effort of 0.96 fish per angler rod hour. Species catch composition included 6,172 Westslope cutthroat trout, 879 bull trout, 510 mountain whitefish and 43 rainbow trout (81%, 12%, 7% and <1% of catch, respectively). Anglers harvested 389 fish; 323 mountain whitefish, 43

bull trout and 23 westslope cutthroat trout. The majority of harvested fish were mountain whitefish, caught during the Elk River winter fishery (99% of whitefish harvest and 82% of overall harvest).

River Guardians also conducted extrapolated angler effort and catch projects on the upper Kootenay winter and lower Elk River summer bull trout fisheries over two years (2011-2012). These surveys estimated total period effort, catch and harvest. Combined total estimates for the two systems were: 2,469 angler days, 3,226 bull trout caught, 393 bull trout harvested and 230 post-catch mortalities (combined CI = approximate $\pm 40\%$).

Over a two year period from 2011-2012, Kootenay River Guardians (with assistance from FLNRO and partner agency staff) conducted westslope cutthroat trout inventory projects in 9 indexes of the White River and 3 indexes in the upper St. Mary River. Results indicated very low abundance and densities in the North and East Forks of the White River, and led directly to changes in angling regulations for these systems in 2013. Additionally, over the five year study period from 2009-2012, bull trout inventory projects (redd index counts) were conducted through the River Guardian Program (with assistance from FLNRO and partner agency staff) on the Wigwam, White and Skookumchuck systems. These projects were vital in maintaining long term population trend data in primary spawning systems. In combination with data from River Guardian angler surveys on key bull trout fisheries, redd index data over this period indicated a decline in populations within the upper Kootenay watershed. As a result, regulation changes were implemented in 2013 to better protect these populations.

SUMMARY

For the Kootenay Region, project investments from General Operating Fund and Quality Waters Fund of the Habitat Conservation Trust Foundation totalled over \$1 million- or 7% of the total provincial expenditure on Quality Waters during the reporting period.



Elk River



Elk River angler

6.5 Cariboo (Region 5)

QUALITY WATERS

The Cariboo Region has the most diverse array of Classified Waters in the province that represents 15% of the provincial total.

Three areas of the Dean River are designated as Class I Coastal Waters for anadromous stocks.

Additionally, areas of the Atnarko, Chilcotin, Chuckwalla, Kibella and Nekite are Class II Coastal Waters (anadromous) while portions of the Chilko, Dean, Horsefly and West Road Rivers have a Class II Inland Waters (non-anadromous) designation.

The Cariboo River, Quesnel River and Mitchell River are seen by stakeholders as being Quality Waters but are not as yet classified.

GENERAL OPERATING FUND

The major science- based project investments on Quality Waters in the Cariboo Region from this fund in the reporting period were almost \$900K represented 8% of the provincial total.

Table 18 lists the projects and investments by year.



Bella Coola angler

TABLE 18 MAJOR PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND			
CARIBOO (1997-2012)			
YEAR ENDING MARCH 31	LONG TERM PROJECTS (2)		SHORT TERM PROJECT (1)
	Conservation of Bella Coola Steelhead and Sea Run Cutthroat Trout (5-119) \$K	Quesnel Lake Restoration ¹ (5-130) \$K	Bella Coola Steelhead Conservation and Management ² (5-98) \$K
1998			75
1999			25
2000			
2001	40	104	
2002	6	78	
2003	3	85	
2004	3		
2005	3	9	
2006	5	194	
2007	3	2071	
2008		33	
2009		23	
2010		\$58K from other partners	
2011			
2012			
TOTALS	63	733	100
TOTAL ALL PROJECTS	896		
¹ Work on the Mitchell and Horsefly Rivers were considered part of the Quesnel Lake project.			
² Partnership with Forest Renewal BC			

Here are short summaries of these major project investments from this fund in the reporting period:

The Conservation of Bella Coola Sea Run Cutthroat (5-119)

Population status of depleted numbers of anadromous trout relative to the habitat base was monitored by using fry assessment, electrofishing at several sites, snorkel surveys and helicopter overflights. Data were collected for 7 years and used in the development of a recovery plan with the goal to re-establish the sport and native food fisheries.

Bella Coola Steelhead Conservation and Management (5-97 and 5-98)

An evaluation of the abundance of anadromous juvenile trout and other species compared to established habitat standards was conducted in 80 discrete stream habitats. Dean River data aided analysis of Chinook salmon interactions with steelhead trout. Juvenile densities were used to track adult spawning escapements and population recovery. The four year evaluation included monitoring distribution, abundance and habitat use by anadromous trout and other species for all life history stages throughout

the Bella Coola watershed. Life history traits and environmental constraints were assessed with the aid of companion watershed / ecological studies.

Quesnel Lake Restoration (5-130).

Available data on Kokanee and Rainbow Trout populations were assessed and new data collected (abundance, spawner surveys, stock separation, stock identification, limnology, lake circulation, and lake fishery) as a foundation for the preparation of species conservation and management plans. The concerns expressed by fisheries managers and the public regarding declining status of the populations were supported by the biological data collected by the project. Total investment was \$713K over 8 years with several cash and in kind funding from 5 partners.

QUALITY WATERS FUND

Table 19 highlights the on river project investment activities associated with this dedicated revenue. The total 15 year investment was in excess of \$1.3 million and represented 38% of total provincial expenditures. The River Guardian Program was active in each of the 15 years of the reporting period and was the only regional program of its kind in this regard.

Since 1999, the British Columbia Conservation Foundation (BCCF) has been contracted by the government to collect, analyze, and report on data collected by River Guardians associated with the Dean River salmon and steelhead sport fishery.

TABLE 19 PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND			
CARIBOO (1997-2012)			
YEAR ENDING MARCH 31	INVESTMENT \$K	RIVER GUARDIAN PROGRAM	ACTIVITIES AND/OR FUNDING SOURCES
1998	105	yes	Dean River-angler data collected using completed Dean River Angler report cards; a public advisory board was established for the Dean River
1999	111	yes	Dean River-every angler who fished from Crag Creek to the tidal boundary was contacted; Chilcotin River-2 contractors from the Ts'ilqotin Band monitored the rod and reel aboriginal fishery
2000	83	yes	Dean River anglers contacted; Chilcotin River-active guardian patrols significantly reduced angling pressure and improved steelhead survival to spawning
2001	101	yes	Dean River-3564 angler days recorded
2002	124	yes	Dean River-3450 angler days recorded; Chilcotin River-232 anglers checked and all were residents of BC; Horsefly River-foot, vehicle, boat and aerial methods used
2003	94	yes	Dean River-3600 angler days with 74% non resident aliens; Chilcotin River-105 anglers contacted; River Guardians were given specific authorities as "Special Conservation Officers"
2004	73	yes	Dean River-2849 angler days recorded; Chilcotin River- 40 days of patrol; Horsefly River-111 anglers interviewed during creel survey
2005	86	yes	Dean River-2849 angler days recorded; Horsefly River Creel Survey-110 anglers interviewed
2006	86	yes	Dean River-3017 angler days recorded with 69% non-Canadian residents
2007	45	yes	Dean River-3000 angler days recorded
2008	21	yes	Quesnel River Creel Survey-216 anglers interviewed; Mitchell River Project-randomly stratified roving ground and aerial surveys; boat launch survey recorded 33 jet boats and 67 anglers
2009	99	yes	Dean River-2635 angler days recorded with 69% non-resident aliens; continued implementation of the Dean River Angling Management Plan and produced the annual steelhead abundance index; 51 days of surveys by Interior River Guardians on the Horsefly, Mitchell, Quesnel, and Chilko Rivers.
2010	100	yes	Dean River-2659 angler days recorded-the lowest angling effort since 1988;74% were non-resident aliens; Horsefly River- 46 anglers interviewed; Angling Management Plans initiated for the Mitchell and Quesnel Rivers

TABLE 19 PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND			
CARIBOO (1997-2012)			
YEAR ENDING MARCH 31	INVESTMENT \$K	RIVER GUARDIAN PROGRAM	ACTIVITIES AND/OR FUNDING SOURCES
2011	133	yes	Dean River-2474 angler days recorded; initial stakeholder meetings held re the Angling Management Plan for the Mitchell River; Blackwater River creel survey; data compiled and initial stakeholder meetings held re the Angling Management Plan for the Quesnel River
2012	76	yes	Dean River-2673 angler days recorded or 56% of the 10 year average; 71% were non- resident aliens; Mitchell River-99 anglers contacted during 25 days of survey
TOTAL	1,337		



Dean River



River Guardian, Dean River

Here are samples of project reporting:

2002-2003 Synopsis: River Guardian Program

Information collected by guardians is the primary index used to estimate the Dean River steelhead escapement on an annual basis. Guardians also collect information that is required by region to administer the Limited Entry Angler Draw. Management of the draw would not be possible without a seasonal Guardian presence.

Creel cards submitted in 2002 indicate that overall effort was approximately 3,600 angler days. The 3,600 angler days recorded in 2002 is consistent with the 1991-2001 average of 4,062. Proportionally, non-resident alien anglers were the principal user group on the Dean in 2002. They represented 2,673 angler days or 74% of the overall effort in 2002. The total catch for steelhead and chinook was 4,450

and 403 fish respectively. The steelhead Catch Per Unit Effort (CPUE) for 2002 was 1.24 which is higher than the 1991-2001 average of 0.84. Flyfishing accounted for 99% of all steelhead caught in the Dean, as 4,391 of 4,450 steelhead were caught on the fly. The 2002 Dean River steelhead-spawning escapement is estimated to be 4,625.

2008-2009 Synopsis: River Guardian Program

In the summer of 2008 two river guardians monitored angling activity on the Horsefly, Quesnel, Mitchell, and Chilko Rivers. Random roving patrols were conducted to determine the presence of angling activity. Anglers were contacted on the rivers either on foot or by boat. Interviews were conducted and information regarding location, time spent fishing, angler success, and permanent residence was recorded. Monitoring and compliance of current sport fishing regulations were also undertaken by the guardians.

Due to logistical constraints, the majority of creel survey effort was prioritized towards the Horsefly and Quesnel Rivers, Which were visited 22 and 20 days respectively. The Mitchell and Chilko rivers were visited 5 days and 6 days respectively. The Horsefly River is estimated to have received 339 unguided angler days from July to September. There were 32 resident and 21 non resident anglers surveyed. Unguided angler success recorded a catch per unit hour of 0.48. The most intense angling pressure occurred in the upper portion of the river. There were 5 anglers found to be fishing without a classified angling license. A total of 7 regulatory infractions occurred among 6 anglers. The Quesnel River is estimated to have received 169 unguided angler days from July to August. There were 45 resident and 9 non resident anglers surveyed. Unguided angler success recorded a catch per unit hour of 0.89. A total of 29 regulatory infractions occurred among 19 anglers. (Moreau, 2008).

2011-2012 Synopsis: River Guardian Program

The Dean River is located on British Columbia's central coast approximately 470 km northwest of Vancouver. The river supports populations of rainbow trout, salmon, and sea-run cutthroat trout and is regarded by anglers as one of the finest summer-run steelhead rivers in the world.

In 2011, a total of 2673 angler days were recorded. Non-resident aliens comprised 71% of river use, B.C residents comprised 5% and Canadian residents comprised 24% of total river use. The total Chinook and steelhead catches were 258 and 3164 fish respectively. The average steelhead CPUE in 2011 was 1.18/day. Run timing for both Chinook salmon and steelhead in 2011 was consistent with historical data. The 2011 steelhead escapement estimate was 3288 fish. No strong correlations between steelhead CPUE and environmental parameters were observed in 2011. (Karpinski, 2011)

The Mitchell and Quesnel rivers have been recognized for supporting highly valued angling opportunities for wild strains of rainbow trout. Maintenance of the fisheries qualities has been a priority for provincial government biologists and consequently, the river has been a candidate for inclusion into the provinces quality waters strategy.

Although the Mitchell and Quesnel rivers are high valued fisheries, there has been limited effort by the provincial government to monitor use and monitor trends in stock abundance and catch success. In 2007, a random, stratified creel census was undertaken on the Quesnel River between June 26th and October 12th. The results had indicated that approximately 726 angler days were expended on the river, with the majority of effort (55%) concentrated in the upper portion of the river near the town of Likely. It was determined that 61% of the anglers interviewed were non-guided. A second random survey carried out for a total of 19 days in July and August 2008, reported an estimated 169 days of angling effort for the two month period (Moreau, 2008). In 2011, the Quesnel River's discharge remained exceptionally high throughout the 17 day survey period between June 22nd and August 14th. On a number of occasions anglers would arrive at the river, and depart shortly thereafter as they realized the dangers associated with "walk and wade" fishing. As such, only 17 non-guided anglers were interviewed while fishing the Quesnel River in 2011. According to local angling guides, they had not previously witnessed such low effort by non-guided fisherman. Daily catch rates for rainbow trout ranged from 0 to 14 fish per day with a number of fish over 50 cm reported to have been landed. (Dolighan, 2011)

SUMMARY

For the Cariboo Region, project investments from General Operating Fund and Quality Waters Fund of the Habitat Conservation Trust Foundation totalled over \$2.2 million- or 15% of the total provincial expenditure on Quality Waters during the reporting period.

6.6 Skeena (Region 6)

QUALITY WATERS

The Skeena Region has 48% of Classified Waters in the province and the highest number of any region at 21. The vast majority are located in the Skeena River watershed with some in the Nass watershed and others that drain directly in the ocean.

All or portions of 5 watersheds are designated as Class I Coastal Waters for anadromous stocks. These are the Gitnadoix, Lakelse, Suskwa, Sustut and Zymoetz Rivers.

Additionally, all or portions of 16 watersheds have a Class II Coastal Waters (anadromous) designation.

Two of the classified waters (Yakoun River and Haida Gwaii Other Rivers) that are listed in Schedule A of BC Regulation 125/90 are described as being in Skeena Region are now managed by the Vancouver Island Region (1).

Hooton (2011) provides an overview of the Skeena watershed and its fishery values:

There are two distinct groups of steelhead within the Skeena system-summer and winter fish...The summer steelhead are, by far, the most renowned group...

The Skeena tributaries most commonly associated with the summer fish are the Copper or Zymoetz, near Terrace, the Bulkley/Morice system which enters at Hazelton, the Kispiox..., Babine and Sustat. There are more than a dozen other summer steelhead tributaries of the Skeena that are less well known due to their remoteness and/ or their small stock they now support...

Most of the Skeena watershed lies north of the 54th parallel of latitude. Winters are long and the growing season is short especially in many of the higher elevation summer steelhead- producing tributaries in the interior of the drainage. The Skeena is not a productive fish territory by any classic biological metric...

Home to world-record-size steelhead, what sustains Skeena's place in the angling mythology of the planet is not some unique capacity of its steelhead to withstand the same levels of human incursion found virtually everywhere to the south, but simply the fact that the northern creep of that influence has not yet arrived in similar magnitude, at least not yet.

GENERAL OPERATING FUND

The major science-based project investments on Quality Waters in the Skeena Region from this fund in the reporting period were over \$1.1 million and represented 10% of the provincial total.

Table 20 lists the major project investments by year.

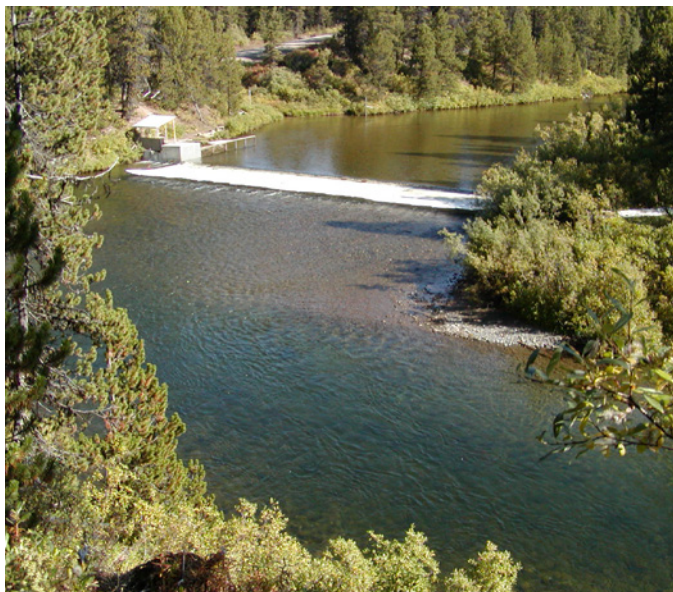
TABLE 20 MAJOR PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND				
SKEENA (1997-2012)				
YEAR ENDING MARCH 31	LONG TERM PROJECT (1)	SHORT TERM PROJECTS (3)		
	Skeena Weirs and Steelhead Stock Assessment (6-97) \$K	Skeena Steelhead Conservation and Rainbow Trout Genetics (6-79) \$K	Various \$K	
1998	88	58		
1999	45	81		
2000	59		Skeena River Summer Steelhead Juvenile Assessment (6-96) 78	
2001	75	Other partners		
2002	57	Other partners		
2003	48	Other partners		
2004	55			
2005	76	28 100% from of a donation	17	
2006	70	11 and other partners ¹	3	Nass River Steelhead Stock Assessment (6- 180) 13
2007	66	12		
2008	43			
2009	63			
2010	56			
2011	14			
2012	57			
TOTALS	872	162 Excludes a donation of \$28K	98	13
TOTAL OF ALL PROJECTS	1,145			

¹ Partnership funding from Canada's Green Plan

Here are short summaries of these major science-based project investments from this fund in the reporting period:

Skeena Weir and Steelhead Stock Assessment (6-97)

A 15 year investment of \$872K was made to operate a weir on the Sustut River to enumerate and assess the escapement of summer-run Steelhead returning to the Skeena River. Accumulated logs, weeds and other debris were annually removed from the weir fence structure. Over this period the project has also supported enumeration/weir projects on Babine, Kitwanga and Toboggan Creek (Bulkley River). Pens were reconfigured to accommodate fish passage and reduce stress.



Skeena weir and steelhead stock assessment project



Kitwanga River weir



Skeena summer steelhead



Skeena summer steelhead

Skeena Steelhead Conservation & Rainbow Trout Genetics (6-79)

Molecular genetic analyses of summer run Steelhead returning to the Skeena River were conducted to improve knowledge of stock structure, stock-specific run timing and stock status as part of the Skeena Steelhead Stock Assessment Framework. Additionally it clarified the genetic relationship between sympatric steelhead and rainbow trout.



Skeena River

Skeena River Summer Steelhead Juvenile Assessment (6-96)

To estimate the abundance of steelhead fry at a variety of representative sites on major Skeena River tributaries after a record year of adult escapement caused by a closure in commercial fishing, 101 juvenile steelhead index sites were sampled throughout the Bulkley, Sustut, Kispiox and Skeena Rivers. The data collected were used to provide information to managers to refine habitat capability estimates and more accurately define the optimal number of spawners to sustain steelhead populations and world-class steelhead fishing opportunities.

Nass River Tributary Steelhead Stock Assessment Project (6-180)

This project in 2005-06 applied radio tags to Nass Steelhead for enhanced protection, conservation and management of Cranberry River and other Nass Steelhead populations and habitats.

QUALITY WATERS FUND

Table 21 highlights the on river and angling management planning investments associated with this dedicated revenue. The total 15 year investment was in excess of \$900K and represented 26% of total provincial expenditures.

The River Guardian Program was active in 5 of 15 years of the reporting period while the development of Angling Management Plans was a major initiative- especially during the last 6 years.

TABLE 21 PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND			
SKEENA (1997-2012)			
YEAR ENDING MARCH 31	INVESTMENT \$K	RIVER GUARDIAN PROGRAM	ACTIVITIES AND/OR FUNDING SOURCES
1998	157	yes	1,192 anglers contacted and 758 surveys completed by 4 River Guardians on the Babine, Bulkley and Kispiox Rivers Delivery by the BC Conservation Officer Service
1999	76	yes	2464 anglers were counted on 36 aerial flights on the Bulkley River; 1198 anglers were interviewed
2000	93	yes	500 angler interviews conducted on Class I and Class II sections of the Zymoetz (Copper) River; aerial flight data, and roving and exit point access stations were used
2001			Work deferred due to staff shortages and contractor availability
2002	87	yes	Kispiox River- anglers in the Class II section of the river were interviewed using roving and exit point stations augmented by aerial surveys
2003			No project submission
2004			No project submission
2005	95	yes	Morice River angler survey-455 interviews by using roving and exit point access stations augmented by 19 aerial flights
2006			No project submission
2007	19		First Stages of the Development of Skeena River Watershed Angling Management Plans; historical angler use summary prepared; preparation of technical documents completed
2008	99		Phase 1 of public consultation- 18 stakeholder and public meetings and drafts of Skeena River Watershed Angling Management Plans
2009	159		Phase II of public consultation- 28 stakeholder meetings (228 attendees) and six open houses (145 attendees) were held in addition to an online response form (428 respondents) to gather public feedback on Skeena River Watershed Angling Management Plans for 13 individual sections of 11 streams
2010	112		18 facilitated meetings in the further development of Skeena River Watershed Angling Management Plans
2010	112		18 facilitated meetings in the further development of Skeena River Watershed Angler Management Plans
2011			Further development of Skeena River Watershed Angling Management Plans ("in kind")
2012	20		Completion of a tourism and economic assessment of proposed regulation changes as a result of proposed Skeena River Watershed Angling Management Plans
TOTALS	917		

Here are samples of project reporting:

1997-98 Synopsis: River Guardian Program

The River Guardian Program focused on three rivers - Babine, Bulkley and Kispiox between July-November 1997. Four River Guardians and a contract coordinator were involved. Guardians were recruited from Malaspina College and also received training through the Conservation Officer Service and in the field. The main focus of the Program was on-site angler surveys, public information and education and regulation compliance. A total of 1,192 anglers were contacted and 758 surveys completed. The survey information collected included steelhead angler demographics, perceptions of crowding and preferred fisheries management strategies. Angler catch data were recorded and catch rates estimated. Water levels, temperature and turbidity levels were also recorded. River Guardians were given Deputy Conservation Officer Status and worked closely with Conservation Officers in the Region. Seventy-six regulation compliance actions were initiated. The guardians were actively involved in providing information to the angling public including fish handling and release techniques, litter and garbage control, and bear awareness. The local print and radio media were used to promote the River Guardians...

1999-2000 Synopsis: River Guardian Program

The River Guardian Program was focused on the Zymoetz (Copper) River. Four River Guardians were employed from late August to early December 1999. A contract supervisor who coordinated the surveys and did the analysis and reporting was also funded through the Program. The guardians' main functions were angler data collection using aerial angler counts, exit surveys and roving surveys. River levels, water clarity and temperature were also collected. Public education and information was disseminated regarding regulations, catch and release methods, fish runs, etc. The guardians did not possess Deputy Conservation Officer status but used the provincial observe, record and report forms to identify any compliance infractions with regulations.

2009-2010 Synopsis: Angler Management Plans

Since 1990, angling effort has increased on many Skeena steelhead streams. In some cases this has led to crowding, creating conflicts for both resource managers and stakeholders. The Ministry of Environment has received requests to implement some form of effective demand management for high use rivers. This project proposes to develop Angling Management Plans for 11 streams (13 individual sections) which have, or may have the highest level of conflict (i.e. crowding) in the Skeena region. These plans will be developed concurrently and in full consultation with stakeholders and the public. A primary goal of these plans is to maintain and enhance the world-class quality of experience offered on Skeena steelhead rivers. The success of this process will hinge on recognizing both direct and indirect stakeholder interests, while reflecting the principles and objectives of the Quality Waters Strategy policy.

From April 2009 to March 2010 draft recommendations for thirteen Angling Management Plans were revised. These revisions were conducted by three Working Groups and were based on feedback received during the Phase II Consultation Process. Working Groups themselves were also modified to include business and tourism interests. Revised i.e. final recommendations were developed from May to June 2009, consisting of eighteen facilitated meetings. Final recommendations of the Working Groups were publicly released in October 2009.



Skeena steelhead



River guardian, Kispiox River

SUMMARY

For the Skeena Region, project investments from General Operating Fund and Quality Waters Fund of the Habitat Conservation Trust Foundation totalled nearly \$2.1 million- or 14% of the total provincial expenditure on Quality Waters during the reporting period.

6.7 Victoria (Province-wide, Region 0)

GENERAL OPERATING FUND

The major science-based project investments on Quality Waters led by Victoria staff from this fund in the reporting period were in excess of \$370K and represented 3% of the provincial total.

Table 22 lists the project investments by year.

TABLE 22 PROJECT INVESTMENTS FROM THE GENERAL OPERATING FUND: PROVINCE-WIDE OR MULTIPLE REGIONS (1997-2012)				
YEAR ENDING MARCH 31	LONG TERM PROJECT (1)	SHORT TERM PROJECTS (3)		
	Towards Native Cutthroat Trout Conservation 0-180 \$K	Steelhead Acoustic Tracking in BC 0-291 \$K	Zoography of Bull trout in BC 0-125 \$K	Conservation Management Plan for Westslope Cutthroat Trout 0-323 \$K
1998			56	
1999			48	
2000	27		15	
2001	50			
2002	27			
2003	0			
2004	0			
2005	7	90		
2006	21			
2007	8			
2008				
2009				30
2010				
2011				
2012				
TOTALS	140	90	119	30
TOTAL ALL PROJECTS	379			

Here are short summaries of these major project investments on Quality Waters from this fund in the reporting period:

A Coordinated Approach Towards Native Cutthroat Trout Conservation (0-180)

Following the recommendations of the Provincial Cutthroat Trout Workshop, the evaluation of genetic structure associated with landform complexity and a detailed population dynamics study were completed.

Representative populations throughout native range of Cutthroat Trout in the province were selected to define population structure and units for conservation, basic biology and habitat requirements under different hydrological regimes. Quantitative benchmarks under various environmental regimes for juvenile abundance were determined.

Steelhead Acoustic Tracking Array for British Columbia (0-291)

This project, part of the larger Pacific Ocean Shelf Tracking initiative, provided baseline data by tracking early ocean habitat use, migration pathways and early ocean survival of Keogh River stocks by using listening lines to monitor acoustic tags on 170 steelhead, 38 Dolly Varden and 107 Coho salmon.

Zoogeography of Bull trout in BC (0-125)

There were 3 components to this project: a phylogenetic analysis of bull trout to determine the zoogeography of major groups; a phylogenetic analysis of Dolly Varden to determine the zoogeography of major groups and its relationship to bull trout; and a metapopulation study of bull trout to better understand population structure and dynamics within watershed, the significance of barriers and the life history variation.

Conservation Management Plan for Westslope Cutthroat Trout (0-323)

An evaluation of land and waters use activities and recreational fishing pressure informed a 2 day provincial workshop convened by the Ministry of Environment to help define measureable objectives for a conservation management plan for Westslope cutthroat trout.

QUALITY WATERS FUND

Table 23 highlights the project investment activities to compliment government investments in support of on river activities in regions. The total 15 year investment was in excess of \$200K and represented 6% of total provincial expenditures.



River Guardian at work on the Kispiox River



Vancouver Island steelhead

TABLE 23 PROJECT INVESTMENTS FROM THE QUALITY WATERS FUND FOR PROVINCE-WIDE PROGRAM MANAGEMENT (1997-2012)		
YEAR ENDING MARCH 31	INVESTMENT \$K	DETAILS
1998	8	Coordination and reporting; Classified Waters licence data review; implemented an annual coordinated approach to monitoring angler use patterns on Quality Waters via a single province-wide program proposal for investment from HCTF
1999		Coordination, monitoring and reporting via in kind contribution; Classified Waters licence data review. All investment directed to activities in regions
2000	13	Coordination, monitoring and reporting; Classified Waters licence data review; Angling Guide Management System and Classified Waters reviews
2001	32	Development of Five Year Operational Plan for Quality Waters Strategy (Quadra Planning Consultants and Regional Planning Consulting); Classified Waters licence data review; Coordination, monitoring and reporting
2002		Coordination, monitoring and reporting-in kind
2003	28	Coordination and reporting, program review and analysis- with stakeholder input, drafting of a management plan for the QWS/River Guardian program (Quadra Planning Consultants and Regional Planning Consulting); Government provided an additional \$21K;
2004 ¹	6	Coordination and reporting; Managing Angling Use on Waters Under Provincial Management-Draft Strategy and Action Plan released
2005	25	Coordination and reporting; consultations on final Quality Waters Strategy with joint government /sector working group
2006	17	Assessment and refinement of the Provincial Rod Day Allocation and Diligent Use Policy, coordination of Quality Waters Strategy Advisory Committee formation; coordination and administration of Provincial Committee QWS workshops and program reporting; the Quality Waters Resource Strategy Resource Document was released
2007	19	Coordination of Quality Waters Strategy Advisory Committee consultation process, overseeing communications strategy and coordination of program reporting
2008	7	Coordination and reporting
2009		Coordination and reporting provided by an in kind contribution
2010	18	Coordination of Quality Waters Strategy Advisory Committee consultation process; A single province-wide program proposal for annual investments is replaced by one or more project proposals from each region. Regional QWS projects are assigned unique project numbers in HCTF project filing system;
2011	47	Review and evaluation of Quality Waters Strategy (Dolan and Associates,2012) with \$21K of in kind contributions
2012		No project submission
TOTALS	220	
¹ Government released draft of Managing Angling Use on Waters Under Provincial Management-Strategy and Action Plan		

Until 2009-2010, there was a single, multi- region proposal for program investments from the Quality Waters Fund that was coordinated by government staff in Victoria. A Provincial Quality Waters Coordinator was responsible for the overall management and delivery of the Quality Waters Strategy (QWS) which included:

- Coordination and evaluation of funding applications;
- Coordination and delivery of annual reports to funders;
- Coordination of the annual work of the QWS Provincial Committee re the funding allocation process within the program; and
- Contracting analysis of classified waters licence data.

These activities supported the strategic objective of the QWS to implement a coordinated approach to the monitoring of angler use patterns on Quality Waters. Government also worked to maintain and improve the provincial Angling Guide Management System.

Here are samples of project reporting:

2004-2005 Synopsis: Management Strategy

A comprehensive consultation process was utilized to engage representatives of the resident angling community and the commercial angling guide sector to draft a management strategy that would address issues of angler use on quality fisheries in the province, and to address the concerns of the HCTF Public Advisory Board with regard to the continued administration of the Quality Waters Fund....

A Quality Waters Resource Document was developed by a government and stakeholder working group consisting of regional and headquarters Ministry of Water, Land and Air Protection staff, and representatives of the resident angler community and commercial angling guide sector. Drafts of the strategy were posted on the government website and public input was solicited. The strategy has also been presented in a number of public meetings across the province (Cranbrook, Fernie, Kamloops and Terrace).

The new Quality Waters Strategy Resource Document will provide a template for the coordinated administration and implementation of the Quality Waters Strategy across the province, and will enable the development and monitoring of management planning for provincial quality fisheries.

2011-2012 Synopsis: Review of the Quality Waters Strategy (Dolan and Associates, 2012)

River Guardian Programs

There is a need for a manual to describe in detail how a River Guardian program should be conducted. This will provide ministry staff with direction and make survey results more comparable

between years and between regions. The manual should use the old manual as a reference point and should include things such as:

- *Design of social science surveys for interviewing anglers on quality of their experience with a sample template survey*
- *Discussion of how to interact with anglers on educational issues—regulations, etiquette, fish handling, etc.*
- *Clear guidelines on River Guardian role in enforcement*

A training program should be developed to accompany the manual. Consideration could be given to seek joint funding with other agencies to develop a training program for local First Nations as well as other members of the community to become River Guardians.

...The purpose of the HCTF is to only fund projects that are over and above the fundamental management and conservation responsibilities” of the ministry. There is a serious need for a conversation between the ministry, HCTF and stakeholders on what constitutes the ‘fundamental management and conservation responsibilities’ of the ministry and who should fund what. The lack of resources is impacting the people of BC, the natural resources of BC, the financial viability of communities, and the morale and well-being of ministry staff.

SUMMARY

Program and project investments administered by government staff in Victoria from General Operating Fund and Quality Waters Fund administered by government staff in Victoria accounted for nearly \$600K or 4% of the total provincial expenditures on Quality Waters during the reporting period.

7 Perspectives From the Author

The management of angler use of British Columbia's premier fishing streams is extremely complex. As the effectiveness of policies regulating angling on these waters has declined and angler numbers increased, it is important to note that government and stakeholders continue to have a common goal of preserving the province's high quality fisheries.

Where necessary to provide context for this report, some pertinent government policy and pricing decisions have been briefly described because they directly affected the value of surcharge revenue generated by anglers using Quality Waters and administered by the Habitat Conservation Trust Foundation. These are but a few of the many policy decisions that are associated with the management and use of the province's premier angling streams.

It is apparent that regional fisheries managers were very creative in securing funds to complete conservation project work. Science-based investments supported by the Foundation's General Operating Fund often complemented on river activities supported by the Quality Waters Fund. Project leaders also utilized funding from regular government budgets and community partners who often provided significant cash or "in kind" contributions. The credibility and stability of funding from HCTF was often a catalyst to attract other funding partners.

The type of investment from the Quality Waters Fund reflected the needs and priorities of each individual region. River Guardian programs in regions were customized to reflect needs, opportunities and available budgets. For example, the Cariboo Region was the only region to invest in a River Guardian program in each of the 15 years covered in the report. In the Skeena, the development of angling management plans was the priority in later years.

There are minor issues with the accuracy of the data in Table 11-investments from the Quality Waters Fund- because several years of River Guardian Program reports did not clearly indicate expenditures by region. Data in regional reports for some years differ from expenditures reported in audited HCTF financial statements.

The merging of data from government and Foundation files has provided some unique summary information. Tables 3-6 are particularly useful to help track historic pricing of angling licences and help understand the sources of surcharge revenue to the Foundation.

Unlike other "special" monies managed in dedicated funds by HCTF, there is no written agreement between the Foundation and Government to formally define the scope of acceptable project investments of revenue to the Quality Waters Fund. Such an agreement would help manage the expectations of both parties. In the absence of an agreement, hopefully this report will provide interested parties with sufficient history to understand past decisions and to help focus future program activities.

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10 Appendix

THE BIOLOGY AND MANAGEMENT OF STEELHEAD IN BC

Biology

Winter (2006) described the general biology of steelhead:

The steelhead life cycle includes both freshwater and marine phases. Steelhead hatch in freshwater rivers or streams, remaining there for one to four years. They migrate to the ocean in spring and grow rapidly as they enter estuarine waters, doubling or tripling in size in approximately two weeks. Steelhead spend two to three years in the ocean, yet little is known about this phase of their life cycle; they are regularly reported in Alaskan and Aleutian waters and may travel as far as Japan. For example, a steelhead caught in the Skagit River in northern Washington State had been tagged six months earlier in the Sea of Japan.

Two different types of steelhead are distinguished by the time at which they return to freshwater: winter run fish enter rivers and streams from November to May while summer run steelhead return between April and October. Both populations spawn in early spring (April to May), with eggs hatching four to seven weeks later. Unlike Pacific salmon, adult steelhead may return to the ocean after spawning and spawn multiple times; up to 20% of steelhead are repeat spawners. Steelhead survival, which is currently low, is affected by factors acting at the freshwater and marine stages of the life cycle. The greatest mortality occurs at the freshwater stage, with a 0.77% average survival from egg to smolt; this is influenced by land use decisions and weather patterns that alter channel morphology, water temperature, food availability, and other stream features.

Marine survival varies from 13-15% when ocean conditions are favourable to 2-4% when they are unfavourable. Changes in marine productivity caused by climatic events such as El Niño or decadal oscillations influence ocean survival; declining ocean productivity is associated with the current

low marine survival of steelhead and several Pacific salmon species. Other factors that may impact ocean survival include predation by species such as salmon sharks (*Lamna ditropis*) and daggertooth (*Anotopterus nikparini*), which have increased in abundance in recent years, viral diseases, and environmental conditions such as sea surface temperature.

Steelhead Management Issues—The Skeena Example

Skeena steelhead have long been famous for their world record size and legendary rivers such as the Kispiox, Babine and Sustut where they can be angled for in magnificent natural surroundings. Unfortunately their time of return from ocean pastures in the central North Pacific Ocean overlaps strongly with a single stock of enhanced sockeye salmon that is the focus of a historic gill net fishery and, more recently, a seine net fishery. Steelhead are far less abundant than the target salmon but are equally vulnerable to capture. In the fisheries lexicon the Skeena steelhead situation represents a classic mixed stock fishery dilemma. The fact that the Federal Government is the statutory authority for salmon and commercial fisheries while the Provincial Government is responsible for steelhead and freshwater fisheries is the root of a historic management conflict. A multitude of policies, plans, strategies, vision documents, resolutions, commitments and promises arising from an overwhelming array of consultative forums has done little to resolve even the most basic issues around the unnecessary wastage of an incredibly valuable recreational fishery resource. First Nations fisheries continue to expand throughout the Skeena watershed and will become a far more influential feature of the management scenario in years ahead. The challenges facing both provincial and federal governments to accommodate commercial, recreational and constitutionally protected First Nations fisheries while maintaining explicitly stated fishery management principles and objectives are unprecedented. (Hooton, 2012)

DRAFT PROVINCIAL FRAMEWORK FOR THE MANAGEMENT OF STEELHEAD IN BC

Released in 2014, the draft framework lists the following management objectives:

- 1. Maintain a diversity of sustainable recreational angling opportunities for steelhead in British Columbia.*
- 2. Maintain, protect and restore the productive capacity of the freshwater environment to produce steelhead.*

It also describes the management tools available to governments for steelhead management:

Management tool	Provincial fisheries management level of influence on tool	Legal authority to use tool
Recreational Fishing Regulations	Direct control	Delegated Authority via the BC Sport fishing Regulation under federal Fisheries Act
Hatchery Enhancement	Direct control	Federal Fisheries Act – bilateral Introduction and Transfers Committee, provincial policy (e.g. Steelhead Stream Classification Policy)
Habitat Protection/ Enhancement	Variable levels of influence, no direct control	Numerous Acts involved (e.g. Water Sustainability Act, federal Fisheries Act, Fish Protection Act, Forest and Range Practices Act, [RSBC 1996] CHAPTER 159; Environmental Management Act [SBC 2003] CHAPTER 53), Canada - British Columbia Fish Habitat Management Agreement, provincial Riparian Areas Regulation (under provincial Fisheries Act)
By-catch Management	Minimal; must be demonstrable conservation concern under current federal policy framework; direct control is by federal DFO	Federal Integrated Fisheries Management Plan process associated with Fisheries Act, supported by federal policies (By-catch)



Steelhead stock assessment, Kakweiken River



River Guardian, Kispiox River

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Page	Caption	Photographer
4	Vancouver Island anglers	D. Krenz
4	Fisherman	iStock
5	Steelhead, Ashlu Creek	Ministry of Forests, Lands and Natural Resource Operations
7	Fraser River near Hope	Troy Smith
7	Small lakes creel	Mo Bradley
8	Proud angler	Freshwater Fisheries Society of BC
8	Blackwater rainbow trout, Dot Lake	Freshwater Fisheries Society of BC
10	Placing large woody debris, Englishman River	BC Conservation Foundation
10	Bonaparte fishway construction, Bonaparte River	Ministry of Forests, Lands and Natural Resource Operations
14	Quality Waters	Ministry of Forests, Lands and Natural Resource Operations
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