

Freshwater Angling and the B.C. Economy



Report commissioned by the Freshwater Fisheries Society of British Columbia (FFSBC)



Freshwater Fisheries Society of BC

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Summary

With over 200,000 lakes, 750,000 km of streams, and 24 sport fish species, the province of B.C. is a haven for freshwater angling. Angling has been a culturally and economically important leisure activity throughout B.C.'s history, with resident and non-resident anglers taking to lakes and streams throughout the province for various reasons, including time to relax and enjoy nature, or to catch one's own food.

The purpose of this study is to analyze and report on data from the 2010 Survey of Recreational Fishing in Canada. Specific emphasis here is placed on angler profiles and demographics, angler preferences, economic expenditures, direct, indirect and induced economic impacts, angler expenditures specifically for package experiences, and the benefits of fish stocking. In 2010, the B.C. freshwater recreational angling sector reported:

- A total of 286,167 active anglers in 2010. This represents an increase of almost 6% over the number of active anglers in 2005 (or about 1% increase per year).
- Licence, conservation surcharge, stamp and classified waters fees totaling \$13.9 million.
- Over 3.8 million days fished, with anglers averaging about 13 days of angling per year.
- 7.5 million individual fish caught (58% of which were rainbow trout), resulting in an angler catch rate of 1.96 fish per day.
- Over \$27 million spent in angling packages, including full charter boat, fly-in, and lodge packages.
- \$545 million in direct angler expenditures, including licence sales, packages, accommodation, fishing, boating and camping equipment, air and ferry transportation expenditures, and fishing supplies.
- Direct, indirect and induced impacts resulted in employment of 5,000 person years.
- Total direct, indirect and induced impacts of \$957 million.
- Federal tax revenues of \$89 million and Provincial tax revenues of almost \$55 million.

- Angler expenditures attributable to the province's stocking program delivered by the Freshwater Fisheries Society of BC amounting to \$188 million to \$228 million.
- For every \$1 invested in services delivered by the Freshwater Fisheries Society of BC, an average of \$24 in angler expenditures ensued.

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Concepts, terms and definitions

Fisheries and Oceans Canada (DFO): federal body delivering programs and services that support sustainable use and development of Canada's waterways and aquatic resources including salmon and fish habitat (<http://www.dfo-mpo.gc.ca/>).

Ministry of Forests, Lands and Natural Resource Operations (FLNRO): provincial body responsible for managing freshwater fisheries in the province.

Freshwater Fisheries Society of BC (FFSBC): independent, not-for-profit agency that works closely with the province to deliver BC's fish culture (hatcheries) and related conservation programs (www.gofishbc.com).

Recreational fishing: refers to non-commercial fishing (including both recreational angling and sport fishing as well) (Fisheries and Oceans Canada, 2007).

Resident angler: an angler living and fishing within British Columbia in 2010.

Non-resident angler: an angler residing within a Canadian jurisdiction other than BC.

Alien angler: an angler residing outside of Canada.

Direct expenditures: expenditures on goods and services incurred while angling.

Indirect impacts: economic impacts resulting from the production or provision of the goods and services directly purchased by anglers.

Induced impacts: economic impacts resulting from the wages and salaries associated with the individuals providing the goods and services purchased by anglers.

Fishing equipment and fishing supplies: fishing equipment includes expenditures on rods, reels, depth finders, etc., while fishing supplies are items purchased such as bait, line, etc. (Fisheries and Oceans Canada, 2007).

Gross Domestic Product (GDP): the market value of recognized final goods and services.

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1. Introduction

The province of British Columbia offers superb marine and freshwater sport fishing opportunities. B.C.'s sport fishing industry is one of four important components of the province's fisheries sector, the other three being commercial fisheries, aquaculture and fish processing. Since 1984, sport fishing has consistently had a larger contribution to gross domestic product (GDP) than either the commercial or processing sectors, with aquaculture only recently surpassing it in 2005 (BC Stats, 2007). In 2005, an estimated \$865 million in revenues were generated by the sport fishing industry, \$395 million of which came from freshwater sport fishing (BC Stats, 2007). That same year, an estimated 7,700 people were employed in B.C.'s sport fishing sector, 3,500 of which were involved specifically in fresh water sport fishing (BC Stats, 2007).

What is the freshwater recreational angling sector?

Recreational angling, or sport fishing, is considered a service industry, as opposed to the other goods-producing fisheries components mentioned above. Tangible goods are not produced; rather, services are enlisted, for example, accommodation, fishing guides, or boat rentals. The sport fishing sector, as defined by BC Stats (2007), includes all "sport fishing related activities of all industries that sell directly to anglers". This includes the transportation, accommodation, food and beverage, boating and sporting goods, manufacturers, wholesalers, retailers, and marina industries. Almost half of B.C.'s adult residents will have bought an angling licence at some point in their lifetime (GSGislason and Associates Ltd., 2009), and freshwater angling lends itself to be easily enjoyed by the young and old alike, by men and women, and by residents and non-residents.

Since 1975, the Government of Canada has been distributing recreational angling surveys every 5 years. The 2005 survey data for B.C. were analyzed and reported on in the 2009 document "Freshwater sport fishing in British Columbia: Sending ripples through the provincial economy" (GSGislason and Associates, Ltd.). This report is similar to the 2005 report, and other commissioned reports, for example, a study on the economic impacts of rainbow trout hatcheries in the United States (Caudill, 2005), a look at the economic contributions of sport fishing to Alaska's economy (Alaska Department of Fish and Game, 2009), the American Sportfishing Association report on the economics of sportfishing in America (2008) and a report on the economic dimensions of B.C.'s Skeena salmonid fisheries (Counterpoint Consulting,

2008). The purpose of this report is to analyze the 2010 freshwater sport fishing survey, and to provide information that can be used by policy makers. Here, we specifically provide information that can help the province of B.C. in its economic planning, and create a better understanding of the B.C. angler profile, the economic contribution of sport fishing to the B.C. economy, and to offer insight into the potential for sector growth.

Report Outline

This report contains 7 Sections. In the first Section, we introduce the reader to the sport fishing sector in B.C.. Section 2 is dedicated to analyzing and describing the general trends in angler motivations, demographics, expenditures and behaviours. Section 3 discusses the economic impacts of the recreational angling sector on the B.C. economy. Section 3 also discusses regional differences. In Section 4, we discuss the specifics of angling packages, while Section 5 describes the benefits of the provincial fish stocking program. Section 6 analyzes the costs and benefits of freshwater angling, and Section 7 provides some thoughts on the potential for sector growth. The report finishes with the conclusion in Section 8. An appendix is also attached to this report, in which the reader can find the 2010 angling survey, used as the basis of this study, in its entirety.

The 2010 survey

The 2010 survey, titled “2010 Survey of Recreational Fishing in Canada”, (Appendix A) was distributed to resident and non-resident angling households¹. Survey responses were weighted and used to infer information about the freshwater angling community. The survey contained questions related to:

- Angler demographics and household profile;
- Type of licence(s) purchased;
- Fishing activities, regions fished, and fish targeted;
- Catch retention or release;
- Fishing experience;
- Angler expenditures;
- Boat ownership and activities.

¹ According to Mostegl (2012 draft), the number of surveys sent out and thus the response rate

This survey is the primary source of social and economic information pertaining to B.C.'s freshwater sport fishing sector. The answers from this survey are presented here, in both quantitative and qualitative forms.

2. Freshwater angling in British Columbia

The province of B.C. is home to over 216,000 lakes and 780,000 km of streams and rivers (GSGislason and Associates, Ltd., 2003). These conditions provide ample opportunities to fish for 24 sport fish species, including several trout species (rainbow, cutthroat, steelhead) char (brook, lake, bull and Dolly Varden), kokanee, sturgeon, walleye, pike, bass and pacific salmon when they return from the sea, among others. In addition to the natural resource base, the province and the Freshwater Fisheries Society of B.C. support enhanced fisheries through the delivery of a stocking program whereby about 6-8 million fish are stocked annually in 800 lakes and streams throughout the province. Most of these fisheries would not exist without annual stocking due to lack of spawning habitat or other factors. Under contract with the province, the FFSBC receives about 53% of angling licence revenues generated each year, and these are reinvested in the stocking program. Species involved in the stocking program include rainbow trout, cutthroat trout, brook char, steelhead, and kokanee salmon. Half of all angling effort on lakes in B.C. takes place on lakes stocked by FFSBC (FFSBC, 2011).

B.C. freshwater fishery management

The province of British Columbia and Fisheries and Oceans Canada (DFO) both participate in the management of B.C.'s freshwater fisheries. DFO is responsible for the management of First Nations fisheries, fisheries in tidal waters, and salmon fisheries in non-tidal waters. The province is responsible for the management of all non-salmon freshwater fisheries. There is further cooperation between the two governments via fish stocking programs for species such as steelhead and cutthroat trout.

The provincial government manages the freshwater fisheries resource through 9 regional offices that determine local management strategies. The regional offices are shown in Figure 1. These provincial areas are explored in more detail in the Section on Regional Profile and Impacts.



Figure 1. Provincial angling regions.

Angler Licences

Angling licences, obtained through the province, are required for anyone over the age of 16 fishing on non-tidal waters in the province of B.C., and are valid from April 1 to March 31 of the following year. The majority of angling licences are now purchased through the E-licensing system. This approach was introduced in 2007, to make the licencing process more convenient for anglers as this had been a reported as a barrier to angling (FFSBC, 2009). In addition, the E-licensing system provides provincial managers with a source of demographic information that historically was not available.

There are several types of licences, and they are grouped by residence type (i.e., B.C. resident, Canadian non-resident or other non-resident (referred to as ‘alien’ in the regulations)), and then based on the period of anticipated angling. The province sells one-day, eight-day and annual licences. Different fees exist for each type of licence according to Table 1 below.

Table 1. Licence fees (\$).

Licence Type	Resident	Non-resident (Canada)	Non-resident (other)
Annual Angling Licence	36	55	80
One Day Angling Licence	10	20	20
Eight Day Angling Licence	20	36	50
Annual Licence for Disabled	1	NA	NA
Annual Licence for Age 65 Plus	5	NA	NA

From <http://www.env.gov.bc.ca/fw/fish/licences/>.

Purchase of one of the above licences gives anglers access to basic sport fishing opportunities. There are a couple of exceptions, however, and for these, an additional stamp fee must be paid in order to validate the licence. These stamps are applicable for the following²:

1. Fishing of steelhead (whether retained or released);
2. Retention of any salmon (other than kokanee);
3. Retention of rainbow trout over 50 cm caught in Kootenay Lake or Shuswap Lake;
4. Retention of char over 60 cm caught in Shuswap Lake;
5. Specific white sturgeon conservation surcharge for fishing of white sturgeon in the Fraser.

Additionally, some steelhead, rainbow, and westslope cutthroat trout streams have been designated as classified waters at certain times of the year. An additional Classified Waters licence is required to fish these.

² http://www.env.gov.bc.ca/fw/fish/regulations/docs/1113/fishing-synopsis_2011-13_provincial.pdf.

The 2010 fiscal year goes from April 2010 to March 2011, and during this time, 338,566 angling licences were purchased. B.C. residents purchased the majority (79%) of licences sold, whereas Canadian non-residents and other non-residents purchased about 12% and 8%, respectively. Just over half of all licences were purchased in the months of May, June and July, and once April and August are included, 87% of licence sales occurred in those five months (Figure 2). In addition to the number of licenses purchased, 63,739 anglers under the age of 16, who were not required to purchase a license, fished in 2010. Of these, 56,606 were B.C. residents, 5,746 were non-resident Canadians, and 1,387 were other non-residents. Of the 338,566 licences purchased, there were 286,167 active freshwater anglers (or 85%), implying that some people who purchased licences did not fish in 2010.

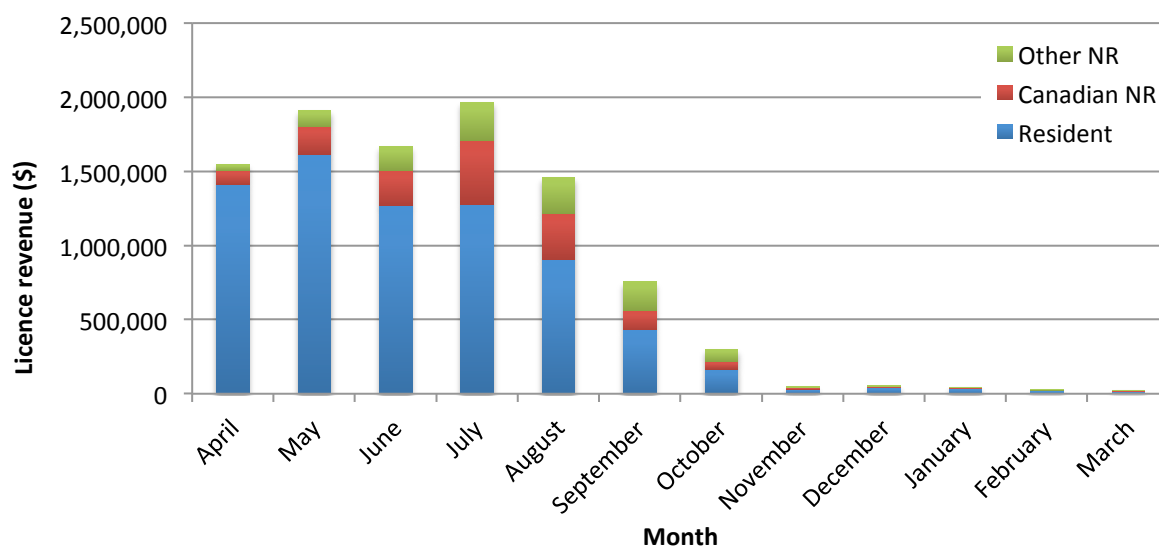


Figure 2. Licence sales by month and residency type.

The majority of the stamp fees are for salmon retention and for steelhead fishing. It is not surprising then, that for non-residents the majority of conservation surcharge sales take place during the times that salmon fishing is best, July through October. Although the majority of resident conservation surcharge fees go to salmon and steelhead as well, it appears that residents start buying their conservation surcharges as soon as they buy their annual licences. In 2010, anglers paid almost \$13.9 million in licence fees, conservation surcharges and stamps, and classified water fees.

Angler profile: Port McNeill native

Being born in Port McNeill in the 1970s, Willie Mitchell grew up on the doorstep of the Broughtons. He enjoys = steelhead fishing on the river, and taking trips for bull trout, sturgeon and rainbow trout. Although his profession has taken him away from British Columbia, Mr. Mitchell still makes it a point to return to Vancouver Island each summer to fuel his passion for fishing. To enjoy nature and relax, Mr. Mitchell takes guided trips to the interior. He is a board member of Save our Salmon (SOS), a group aimed at increasing awareness of salmon conservation in B.C.



Angler Demographics

It is hard to construct a generalization of what a freshwater angler looks like in British Columbia. The survey results suggest that a wide range of ages and both genders participated in freshwater angling in 2010 (Figure 3), although there were about five times as many male as female anglers. For both males and females, the majority of anglers were between 45 and 64 years of age.

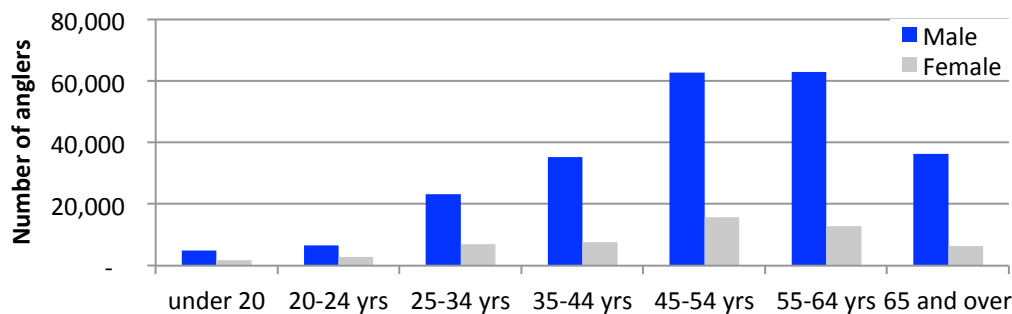


Figure 3. Number of anglers by age in 2010, disaggregated by gender.

Table 2 shows the average age for male and female anglers, disaggregated by residency type. Non-resident non-Canadian males are, on average, the oldest group, at 56 years of age. Females of the same group are also a bit older on average than the other groups, at 52 years of age. In fact, non-resident non-Canadian anglers are, on average, 5 years older than residents and non-resident Canadians alike (Table 2). Over both genders and aggregated over residency, anglers in B.C. are 51 years of age on average.

Table 2. Average angler age and total number of active anglers by residency type.

		Average age	Number of anglers
Male	Resident	50	188,169
	Canadian NR	51	23,905
	Other NR	56	19,879
	Total	51	231,953
Female	Resident	48	48,514
	Canadian NR	46	3,722
	Other NR	52	1,978
	Total	48	54,214
Total	Resident	50	236,682
	Canadian NR	50	27,627
	Other NR	55	21,857
	Total	50	286,167

In 2010, the majority of active anglers were B.C. residents (83%). About 10% of anglers came from other parts of Canada, and 7% were from outside of Canada. For the non-B.C. Canadian anglers, 80% were from Alberta. Of non-Canadian non-resident anglers, almost 30% were from Washington State, 50% from other US states, and 18% from Europe (Figure 4).

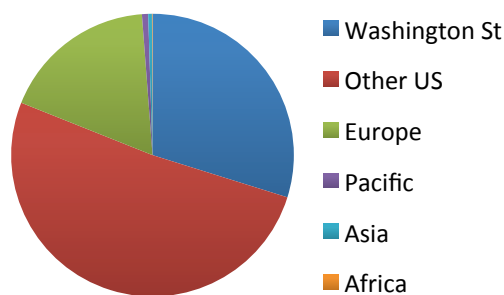


Figure 4. Origins of non-Canadian non-resident anglers.

Angler Motivations

There are several reasons that B.C. residents and non-residents engage in recreational angling. Of course catching fish is one reason, but the motivation to fish goes far beyond just catch retention. People may put their time and money into fishing because they want to spend time with loved ones, to enjoy nature, or to engage in a challenge, for example. Survey respondents were asked to rate the importance of various factors in their motivation to fish. A factor that was not at all important would receive a rating of 1, whereas a factor that was extremely important would receive a rating of 5. Figure 5 shows the average rating that anglers attributed to various motivations, grouped by residency type. In total, fishing to “relax” received the highest relative importance score of 3.91, followed closely by to “enjoy nature” (3.77) and “to get away” (3.72). Fishing to “catch many fish” was actually one of the least important factors driving angler motivation.

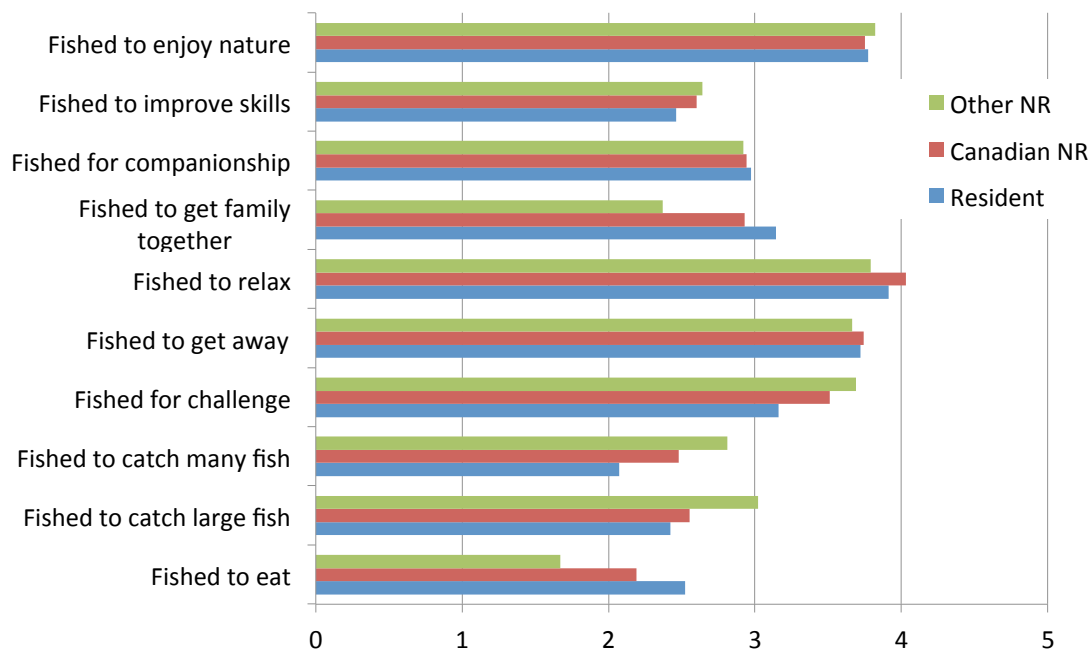


Figure 5. Relative importance of different angler motivations.

These results suggest that providing a peaceful and enjoyable angling experience is as important (if not more) to the province as providing fish for anglers to catch. Identifying the specific components of an angling trip that make it relaxing (for example, easy access, few other anglers, pristine surroundings, etc.) may help the province attract and retain anglers in the future. Freshwater Fisheries Society of B.C. recently partnered with municipalities of Whistler, Kelowna, Coquitlam, and Prince George, along with the Spruce City Wildlife Association, Ministries of Forests, Lands and Natural Resource Operations and B.C. Parks to improve fishing opportunities across the province, with particular emphasis on those venues within an hour drive of Vancouver and Victoria.

Although “fished to eat” was one of the lower fisher motivations, given the increase in the local food movement, it may in fact be the case that anglers in the future also fish to provide healthy local food for their families. It is also interesting to note that fishing to eat was substantially more important to B.C. residents than to non-resident anglers, while other non-resident anglers had a higher preference for catching many large fish.

Angler profile: Australian fly-fisherman



Paul Ratcliffe is a 33-year-old angler who was born in Australia. Now a Canadian citizen, and has spent the 7 years fly fishing in the Lower Mainland provincial region. Mr. Ratcliffe frequents several rivers including the Squamish, Pitt, Stave, Skagit, Thompson, and more recently, in the Skeena valley on the Bulkley and Kispiox. The Lower Mainland region offers accessible angling for Mr. Ratcliffe, who lives and works in Vancouver. He fishes to get outside and enjoy wildlife, discover new places, and to go camping. Although the majority of Mr. Ratcliffe’s fishing trips take place in the summer and fall, he has also enjoyed some winter fishing. One of Mr. Ratcliffe’s most memorable BC angling moments came this past fall (2012) when he captured a Steelhead on the Kispiox following “3 days of de-icing my guides and lighting fires to stay warm”.

Angler Activity

Above and beyond angler motivations to fish, the 2010 survey asked questions related to certain activities undertaken by anglers.

Angler days, hours and perceptions

In 2010, a total of 3.8 million angling days were recorded from survey data. On average, fresh water anglers spent about 13 days fishing, and averaged almost 5 hours per day of angling activity. This is different among residency type, however. Although other non-resident anglers spent fewer days angling than residents, at 7 days per year compared to 15 days per year for residents, they spent substantially more hours per day fishing than residents. In 2010, B.C. residents averaged 4.5 hours of angling per fishing day, whereas other non-residents averaged 6.8 hours of angling per fishing day. Other non-resident anglers also spent far more of their days fishing with the help of a guide. In 2010, 25% of all other non-resident anglers fished were with a guide, versus less than 1% for B.C. residents, and 5% for Canadian non-residents.

Table 3. Days fished, guided days, and average daily angling hours by residency type.

	Total days fished	Average days fished (per angler)	Days used a guide	Average hours per day fished
Resident	3,458,221	14.6	20,477	4.5
Canadian NR	205,488	7.4	9,904	5.1
Other NR	151,607	6.9	38,736	6.8

When asked how the angler would “rate” his or her angling experience in 2010, the majority responded with excellent, very good or good (Figure 6). What is interesting, though, is that substantially more other non-resident anglers (35%) than resident and Canadian non-resident anglers (about 18%) rated their experience as excellent. Whether this is because they spend more time per day fishing, or use guides more often than residents and non-residents, or some other reason is unknown.

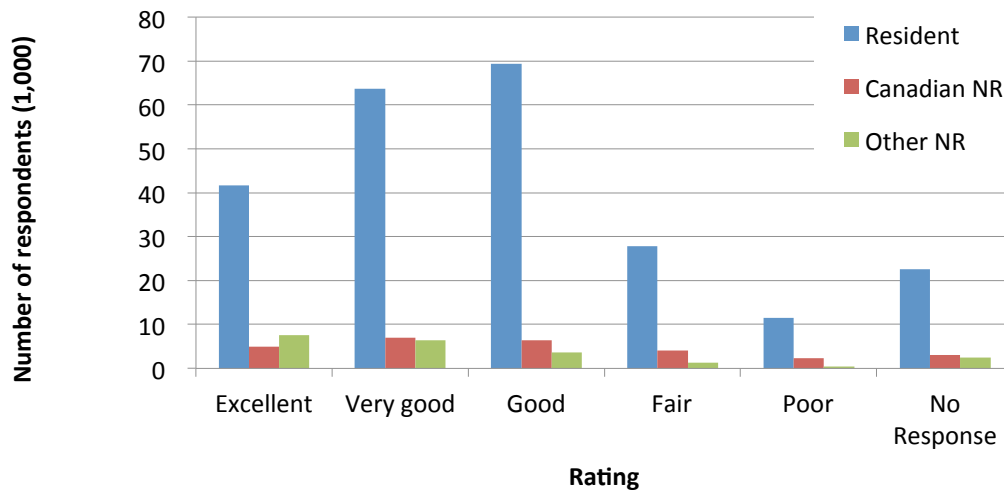


Figure 6. Angler rating of 2010 fishing experience, by residency type.

Anglers were asked if they fished as much as they wanted to in 2010. Almost 82% of those surveyed said they did not fish as much as desired, and stated various reasons for that (Figure 6). For all residency types, lack of spare time was the number one reason anglers did not spend as much time fishing as they desired (77% of respondents, on average), with costs being the number two reason (20% of respondents, on average).

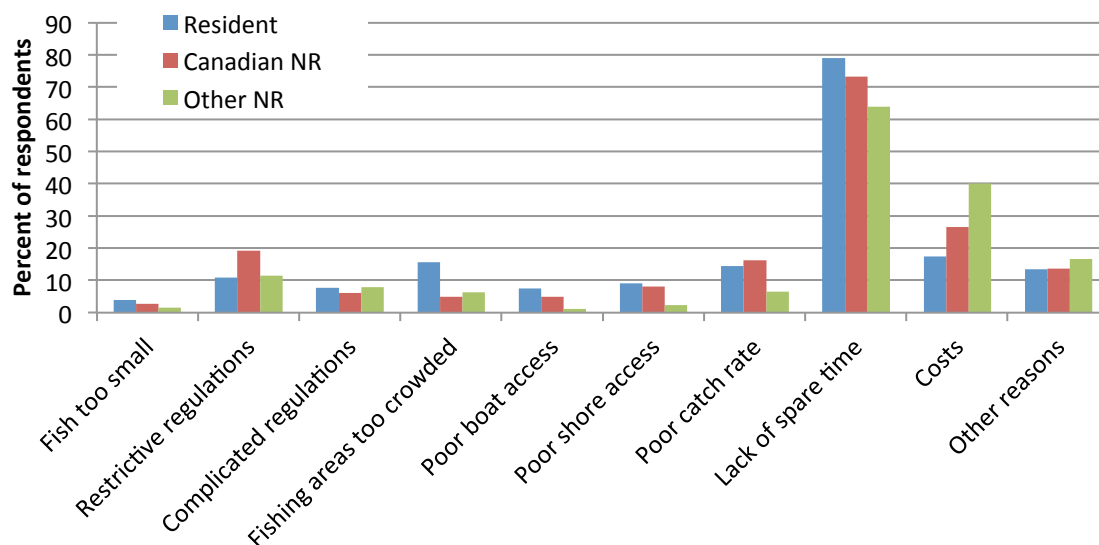


Figure 7. Angler reasons for not spending as much time fishing as desired.

When asked about their historical and future fishing activities, about 75% of anglers said they also fished in 2009, and 89% said they planned to fish in B.C. freshwater in 2011.

In 2010, about 24% of anglers who fished in B.C.'s fresh water systems also reported fishing in B.C. tidal waters. For those who did fish in tidal waters, an average of 7 days were spent doing so. Only 36% of anglers surveyed hoped to fish in B.C. tidal waters in 2011.

Access to information

In the 2010 survey, anglers were asked about different ways they would prefer to access information. Anglers overwhelmingly responded that they would use web-based fisheries-related information (93% on average). Anglers were also asked about their willingness to pay for a paper version of the angling regulation synopsis. Only 21% of anglers in total said they would be willing to pay. Of those, a fee of \$2 was the most popular choice, receiving about 32% of the vote. The next highest willingness to pay was \$5, receiving about 24% of angler responses. Willingness to pay of \$3 and \$1 was chosen by 17% and 14%, respectively, but only 5% of respondents were willing to pay \$4 (Figure 8).

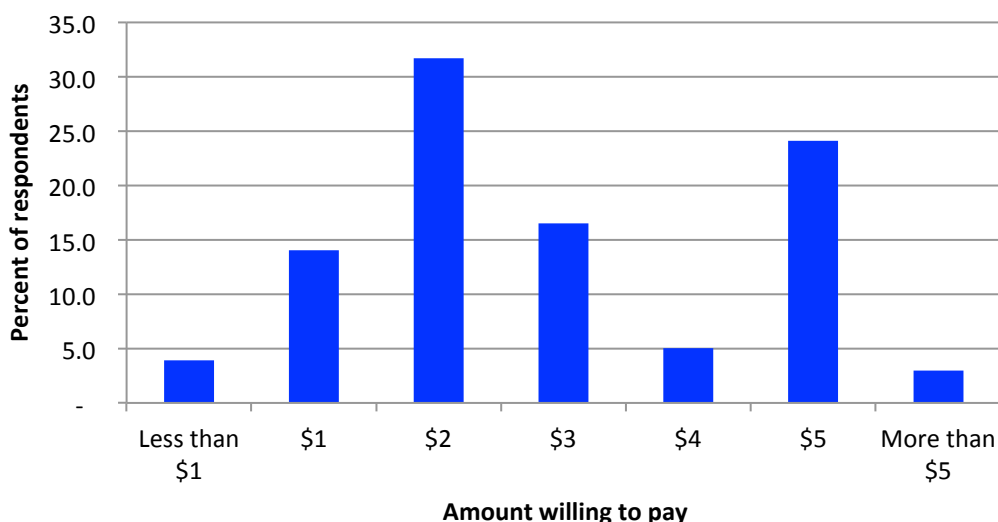


Figure 8. Angler willingness to pay for printed regulations.

Angler Catch

Of all the individual fish caught in B.C. in 2010, 58% were rainbow trout (see below for more information on this species), which was over 4 million individual fish (Figure 9). Cutthroat trout

were the second most-harvested fish, with over 1 million fish being caught, amounting to about 15% of the total 2010 catch. After these two species, sockeye and kokanee were the next most caught species, combining for about 15% of the catch (Figure 9).

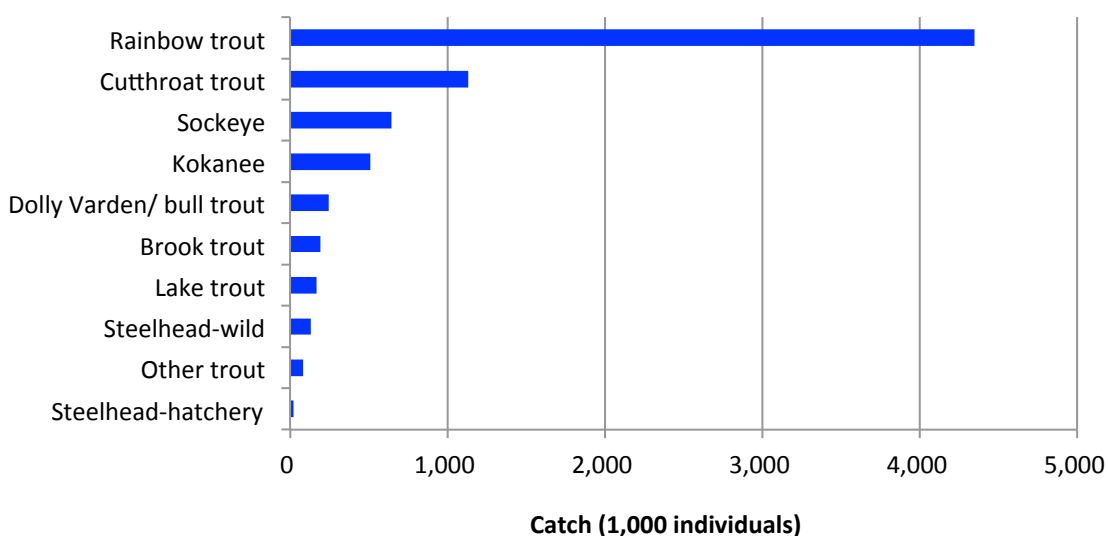


Figure 9. Catch, in 1,000 individuals, of various sport fish species.

Catches by residency type are shown in Figure 10. The major difference in catch by B.C. residents and non-residents (including Canadian and other NR), is that cutthroat and rainbow trout are about equally harvested for the latter group. Furthermore, steelhead made up only 1% of B.C. resident catch, but 4% and 7% of Canadian non-resident and other non-resident catch, respectively.

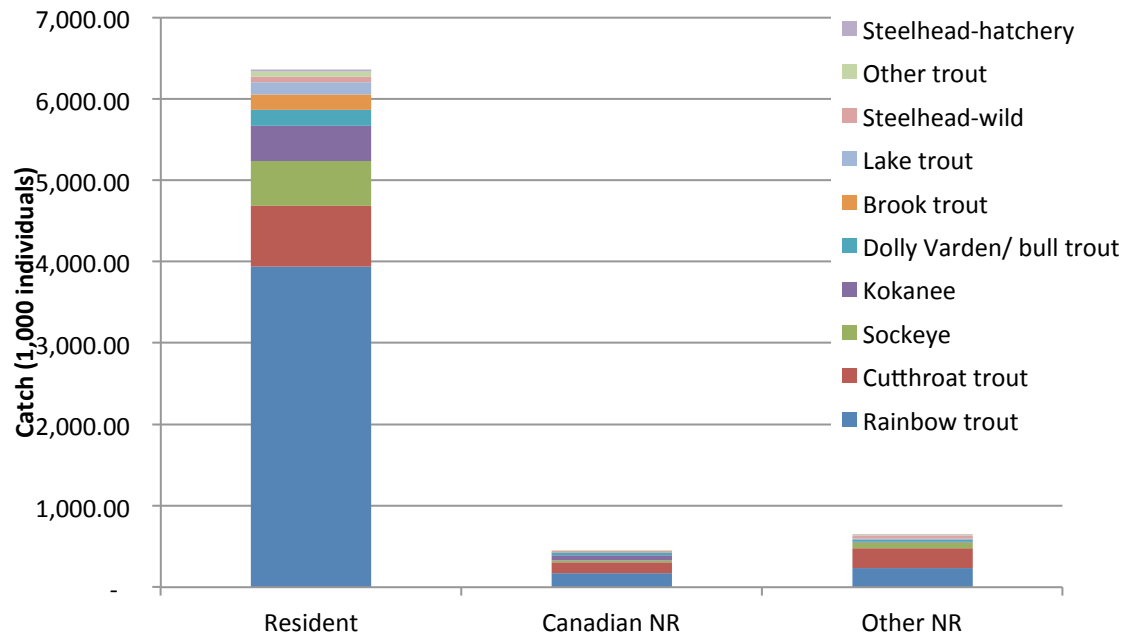


Figure 10. Catch, in 1,000 individuals, by residency type.

Anglers expressed their preference for certain species of fish. About 50% of 2010 survey respondents listed rainbow trout as their favourite fish (Figure 11). This was followed by sockeye, other salmon, cutthroat and steelhead, which were identified as favourite fish for about 29% of respondents.

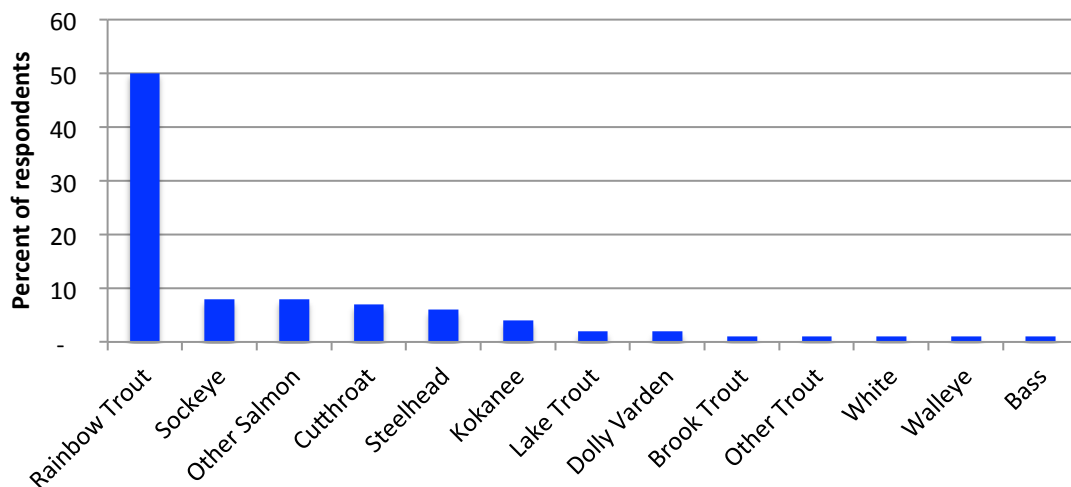


Figure 11. Percent of anglers listing various species as their most favourite fish.

Angler profile: 67-year fishing veteran



Rosa Turko fishes because she loves it, and because it's "very relaxing, out in a boat, away from phone and TV". She also fishes for consumption. Ms. Turko is over 65 years of age, and as such, she qualifies for the reduced senior's license fee. She is a Quebec native, who has been fishing for 67 years. The past 10 years she has been living and fishing in BC. In addition to some marine angling, Ms. Turko frequents Campbell, Echo (pictured at left) and Reginald Lakes on Vancouver Island.

Rainbow Trout

The 2010 survey included questions regarding angler preference for the different sport fish species. Rainbow trout has been called the "backbone" of the sport fishing industry (GSS Gislason, 2009). Table 4 shows angler preference for rainbow trout (*Oncorhynchus mykiss*), also called Kamloops trout, Gerrard trout, silver trout and redband trout. This particular species was either the most or second most preferred fish species for 67% of all anglers.

Table 4. Angler preference for rainbow trout.

Preference	Resident	Non-resident	Alien	Total	%
Not a preferred species	35,265	5,690	7,484	48,439	16.9
Most favourite fish	125,156	11,786	6,558	143,500	50.1
Second most favourite fish	40,956	5,090	3,796	49,842	17.4
Third most favourite fish	21,259	2,433	2,061	25,753	9.0
Fourth most favourite fish	8,920	1,598	1,255	11,773	4.1
Least favourite fish	5,127	1,030	703	6,860	2.4

Adult rainbow trout are usually between 30 and 70 cm in length and about 1 to 7 kg in weight. According to the Ministry of the Environment (<http://www.env.gov.bc.ca/wld/documents/fishfacts/rainbowtrout.pdf>), rainbow trout are found throughout the coastal drainage system (the coastal type), and in the Columbia basin, Fraser system (above Hell's Gate) and in the headwaters of the Liard and Peace River systems (the interior redband type). The Freshwater Fisheries Society of BC also stocks about 5 million rainbow trout each year. They are thus found throughout the province and an accessible fish in most of the provincial regions. Although they are not considered as a conservation concern generally, there have been declines or even local extinctions in some populations due to habitat damage and overfishing.

Angler Expenditures

In addition to licence fees, several economic benefits accrue to the province through angling activities. These often come in the form of angler expenditures, which help to support many of the goods and service industries existing around the sport fishing sector. Data on expenditures were collected for residents, Canadian non-residents, and other non-residents. Table 5 shows direct trip expenditures by category and residency type. Travel costs and food costs were by far where the majority of angler expenditures were made, followed by packages (Table 5). Over all types, angler expenditures reached \$173 million in 2010. Note that these expenditures do not include large-scale purchases, such as boats, boating and camping equipment.

Table 5. Angler expenditures by residence type (\$).

	Resident	Canadian NR	Other NR
Packages	7,143,620	2,150,746	18,175,726
Accommodation	8,028,759	4,121,656	5,722,282
Camp Fees	9,274,409	1,884,776	666,762
Food	39,178,521	6,785,934	4,190,742
Travel Costs	46,311,287	5,363,849	3,841,023
Ferry costs	2,957,666	190,076	200,286
Air costs	780,818	1,272,360	3,226,855
Other travel costs	872,369	411,312	164,967
	114,547,449	22,180,709	36,188,643

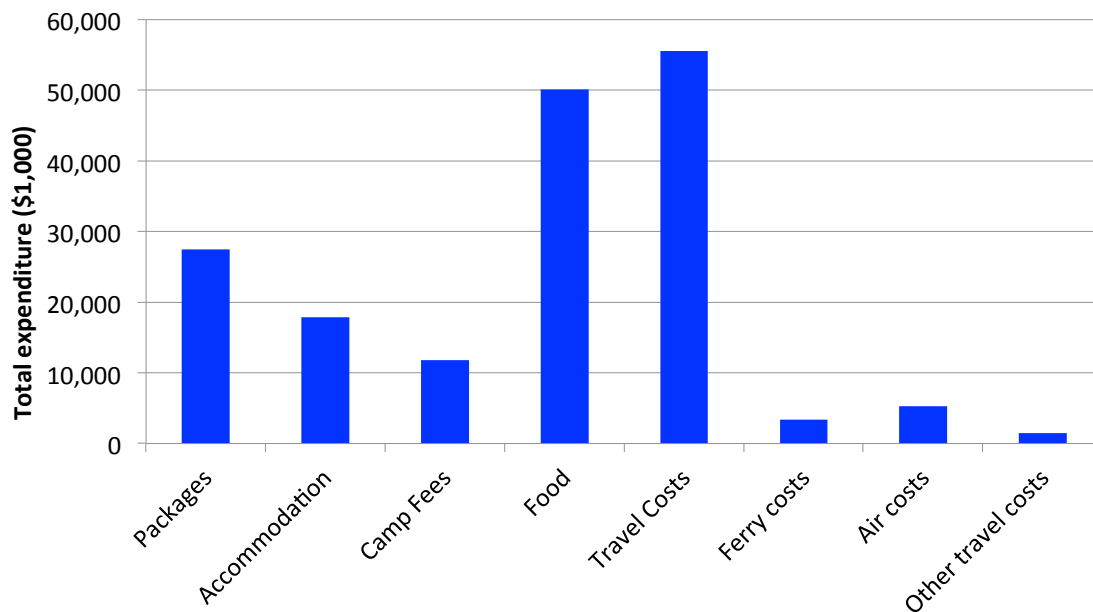


Figure 12. Total expenditures by category.

Resident expenditures amounted to about \$115 million in 2010, representing 66%, of all angler expenditures. Although resident anglers spent the most, the average expenditure per angler was much higher for other non-residents. When the total expenditures by residence type is divided by the number of anglers by residence type, we see that, on average, residents spent about \$408 per angler, Canadian non-residents about \$606 per angler, and other non-residents about \$1,613 per angler. Whereas package expenditures was one of the smallest categories for residents, 50% of all other non-resident expenditures were directed to packages.

In addition to basic expenditures on food, travel and accommodations, anglers also made major purchases in whole or in part to support angling activities. These included purchasing boating, fishing and camping equipment, as well as special vehicles (ATV, for example) and land buildings (cabin, for example). Figure 13 shows these purchases, split between purchases that were made in whole or in part for fresh water angling. When new and used boating equipment expenditures are combined, this category accounts for the largest expenditure group, with anglers spending \$144.8 million either in whole or in part on used and new boating equipment. This is followed by the “other expenditures” category, which includes special purchases such as waders or ice huts. In 2010, anglers spent just over \$325 million and \$626 million on these various large purchases either in whole, or in part, respectively.

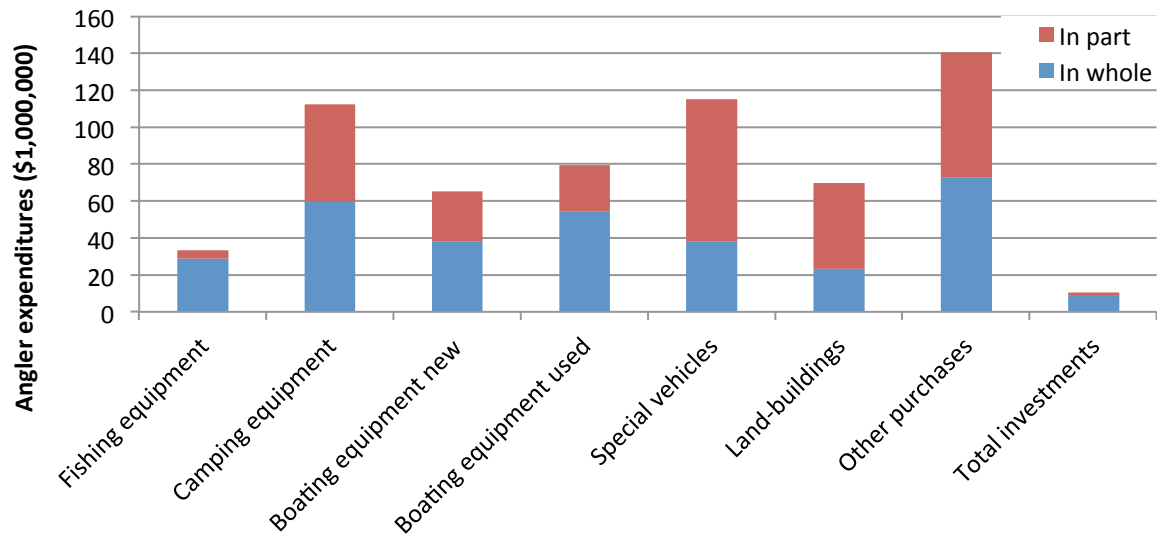


Figure 13. Angler expenditures made in part or in whole for freshwater angling.

Angler profile: Fishing to relax and to eat

Chris Govender has been fishing for about 50 years, the past 20 of which have been in B.C. freshwater and marine areas. About his motivation for fishing, Mr Govender says, “I’ve always enjoyed fishing from a young age. I fish for sport, if I catch fish I am happy, if I don’t I am still happy having gone out. I grew up as a part of a farming family and have always had strong ties to obtaining my own food. It’s great to have fresh fish to eat and to get out in nature and relax. It’s also a great way to spend time with friends”. Mr. Govender’s most memorable B.C. angling moment was catching a 32-pound spring salmon on the Fraser River.



Figure 14 shows the various angler expenditures by all categories. Boating equipment (used and new), food and accommodation, travel costs and camping equipment represent the largest expenditures (other than “other”).

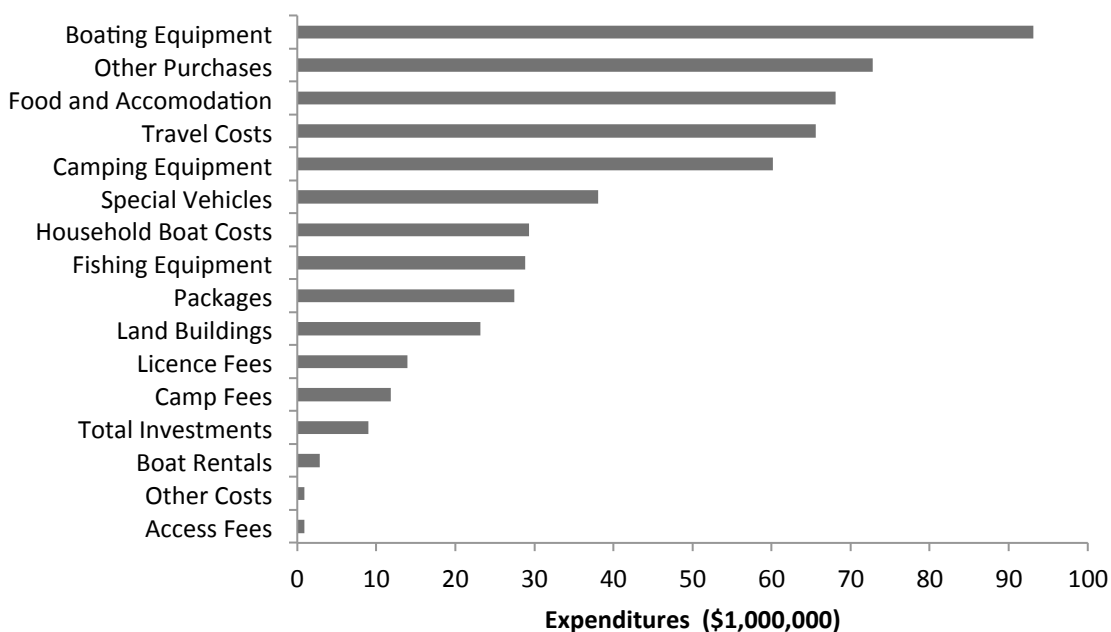


Figure 14. Angler expenditures by category (expenditures wholly for freshwater angling).

3. Economic Impacts

Direct, indirect and induced impacts

When we combine the sales from licences and conservation surcharge stamps, angler expenditures on packages, major purchases and trip expenses, the direct economic expenditure by freshwater anglers in 2010 totaled almost \$546 million. In 2010, anglers spent a total of \$532 million on various industries and sectors related to freshwater angling, with an additional \$13.9 million on licence and related fees.

There are direct, indirect and induced economic impacts that result from activity in the recreational angling sector. Direct impacts are those measuring the actual expenditures by anglers to establishments operating in the sport fishing sector, in this case \$546 million. Indirect impacts measure the economic activity of the businesses and sectors supplying goods and services to the sport fishing business establishments (these are through backward linkages). Finally, induced impacts measure expenditures resulting from the salaries and wages earned by those supplying goods and services to the angling sector (these are through forward linkages). In this study, we use the same methodology as GSGislason and Associates Ltd. (2009) to allow an easy comparison of economic values through time. The methodology is based on multiplier tables developed by BC Stats (Horne, 2008), which essentially translates one dollar of direct expenditures into its indirect and induced impacts.

Table 6. Economic impacts from B.C.'s freshwater angling sector.

	Direct	Indirect and Induced	Total
Expenditure (\$ millions)	545.7		
GDP ¹ (\$ millions)	163.8	98.3	262.0
Wages and benefits ² (\$ millions)	93.6	56.1	149.7
Employment ³ (person-years)	3,119	1,872	4,991
Taxes (\$ millions)			
Personal ⁴	15.0	9.0	24.0
Corporate ⁵	4.7	2.8	7.5
Commodity ⁶	70.2	42.1	112.3
Taxes (\$ millions)			
Federal	55.7	33.4	89.1
Provincial	34.2	20.5	54.6
Total (\$ millions) ⁷	893	208	1,101

1. Direct GDP estimated as 35% of angler expenditures, excluding used boats and land buildings.
2. Direct wages and benefits estimated as 20% of angler expenditures, excluding used boats and land buildings.
3. Direct employment derived from an estimated \$30,000 per person year (direct jobs would be about 3 times this as work is seasonal).
4. Personal income tax is estimated as 16% of direct wages and benefits with 70% being federal, and 30% being provincial.
5. Corporate income tax is estimated as 1% of angler expenditures, excluding used boats and land buildings, with 66% being federal, and 33% being provincial.
6. Commodity income tax is estimated as 15% of angler expenditures, excluding used boats and land buildings, with 60% being federal and 40% being provincial.
7. This total includes all expenditures, GDP, wages and taxes, but does not include person years.

First we consider only the direct economic impact resulting from the \$546 million in expenditures, which contributes \$164 million in value added GDP, almost \$94 million in wages and benefits (income), and employment of 3,119 person years (Table 6). Once indirect and induced impacts are included, it becomes quite clear that the freshwater angling sector has benefits far beyond the simple direct expenditures. Based on the B.C. multipliers developed in Horne (2008) and on the methodology used in GSGislason and Associates, Ltd. (2009), the total economic impact of the freshwater angling sector is estimated at \$957 million in GDP, salaries, and wages. Additionally, almost 5,000 person years of employment are supported (on a full-time basis). Because many jobs associated with the freshwater angling sector are seasonal, these full-time jobs amount to about 15,000 part-time jobs.

Part of the economic benefits of the freshwater angling sector comes in the form of tax revenues. Table 6 shows the tax benefits by tax category: personal, corporate and commodity, and by receiving entity: provincial or federal. In 2010, a total of \$89 million in federal taxes were associated with the direct and indirect/induced benefits of the sport fishing sector. In addition to this, tax revenues of almost \$55 million were generated for the province of B.C.

Angling is but one of several different components of B.C.'s tourism sector. Golf, camping, the cruise boat industry, skiing and snowboarding, and hiking all contribute in different ways to B.C. tourism. In 2009, the tourism industry generated \$12.7 billion in revenue, with almost 18,000 tourism-related business establishments operating (Tourism BC, 2011). Although B.C. reported strong growth in tourism between 1999 and 2007, the economic crisis in 2008 strongly affected tourism in the province (Tourism BC, 2011). The largest single contributor to B.C. tourism is the golf sector, contributing an estimated \$4 billion in direct, indirect and induced impacts in 2009 (Strategic Networks Group, 2009). With the freshwater angling sector contributing about \$1 billion in 2010, its contribution is thus about one quarter that of the golf sector.

Regional Profile

As stated in the introduction, there are 9 provincial fisheries management regions. Answers to the 2010 survey provided information on the regional activity of anglers, measured in fishing days (Table 7), as well as angler expenditures. While BC residents spent the highest number of days fishing in the Lower Mainland, Canadian non-residents and other non-residents spent the highest number of fishing days in Kootenay and Skeena, respectively.

Table 7. Angling days by provincial area.

	Resident	Canadian non-resident	Other non-resident
Vancouver Island	390,469	13,603	5,170
Lower Mainland	743,433	10,951	25,883
Thompson-Nicola	612,172	38,514	20,934
Kootenay	409,301	76,024	29,559
Cariboo	387,547	9,835	16,196
Skeena	302,464	28,613	47,712
Omineca	184,411	10,533	3,284
Okanagan	372,131	10,403	1,987
Peace	56,292	7,014	880
Total	3,458,221	205,488	151,607

When angler days are aggregated across residency, we see that the Lower Mainland, Thompson-Nicola, and the Kootenay regions combine for 51% of all days spent angling (Figure 15).

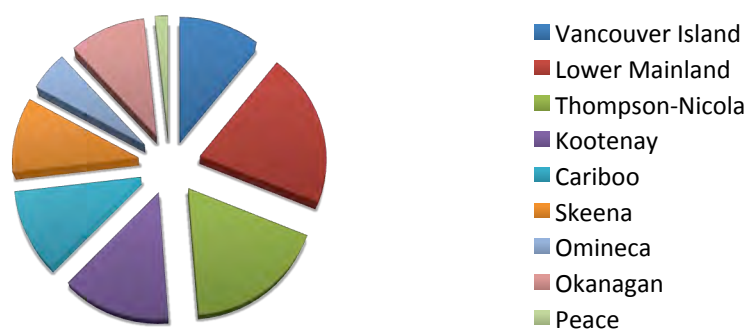


Figure 15. Proportion of days fished by provincial region, all residency categories combined.

Although the majority of days fished were in the lower mainland and in Thompson-Nicola, it was in Thompson-Nicola and Kootenay where the anglers caught the most fish (19% of the total catch from each of these two regions). When the total catch is divided by the number of angling days, Kootenay, Omineca and Vancouver Island have the highest catches per day (Figure 16).

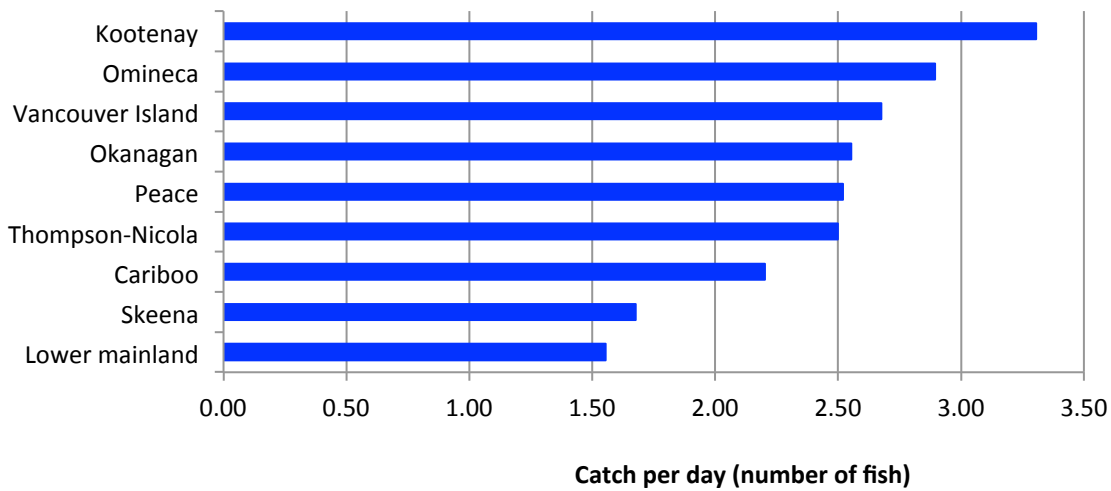


Figure 16. Average catch per day by provincial region.

Expenditures on packages varied greatly by provincial region (Figure 17), with 45% of all package expenditures taking place in Skeena, 14% in Thompson-Nicola, and 13% in the Lower Mainland. Although Kootenay and Omineca had the highest catch rates of fish, a smaller proportion of package expenditures were reported in these regions in 2010 (9% and 2% respectively).

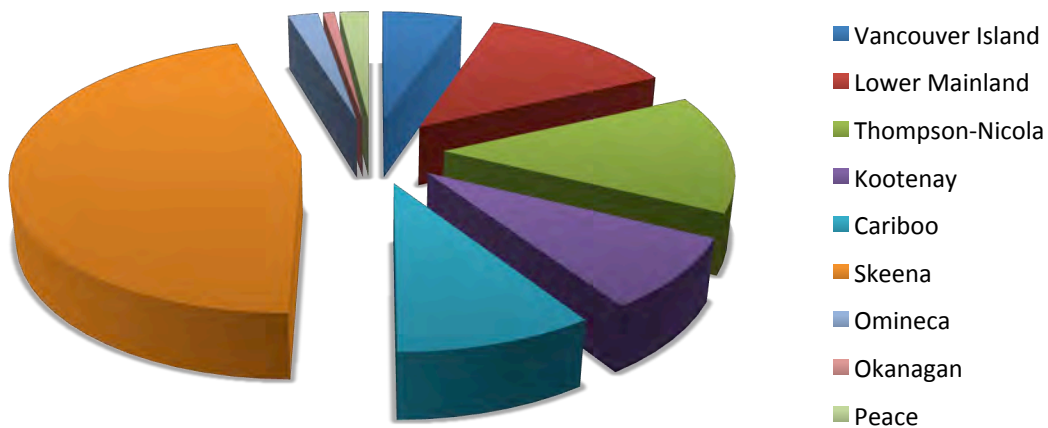


Figure 17. Package expenditures by provincial region.

The Skeena region is reportedly a prime area for catching record size Chinook and wild summer-run steelhead (GSGislason and Associates Ltd., 2003), which may be why anglers are willing to spend almost half of package purchases in that region.

4. Angling packages

While only 4% of residents and Canadian non-residents purchased angling packages, almost 33% of other non-resident anglers did. As shown in Figure 17, package expenditures differed greatly by provincial region. Several different angling packages exist, and these are generally grouped under guided charter boat packages, full charter boat packages, fly-in packages, lodge packages, and “other” packages. Lodge packages were by far the largest expenditure category, with almost \$15 million being spent on them, which represent over half of all package expenditures (Figure 18).



Figure 18. Proportion of expenditures for different package categories.

The majority of guided charter boat packages were purchased in the Skeena region, followed by the Lower Mainland, Vancouver Island, and Kootenay. This package type, compared with most of the others, shows a more even distribution across regions (with the obvious exceptions of Omineca, Okanagan, and Peace) (Figure 19).

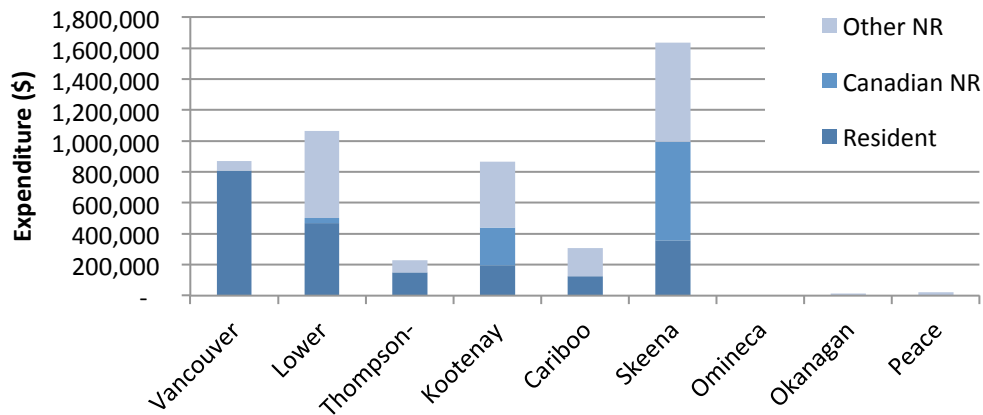


Figure 19. Guided charter boat expenditures by region.

Full charter boat packages were most popular in the Lower Mainland region and Skeena, with little or no other packages being purchased by residents for angling in other regions. Alien anglers did spend a small relative amount on full charter boat packages for Kootenay, Thompson-Nicola and Vancouver Island (Figure 20).

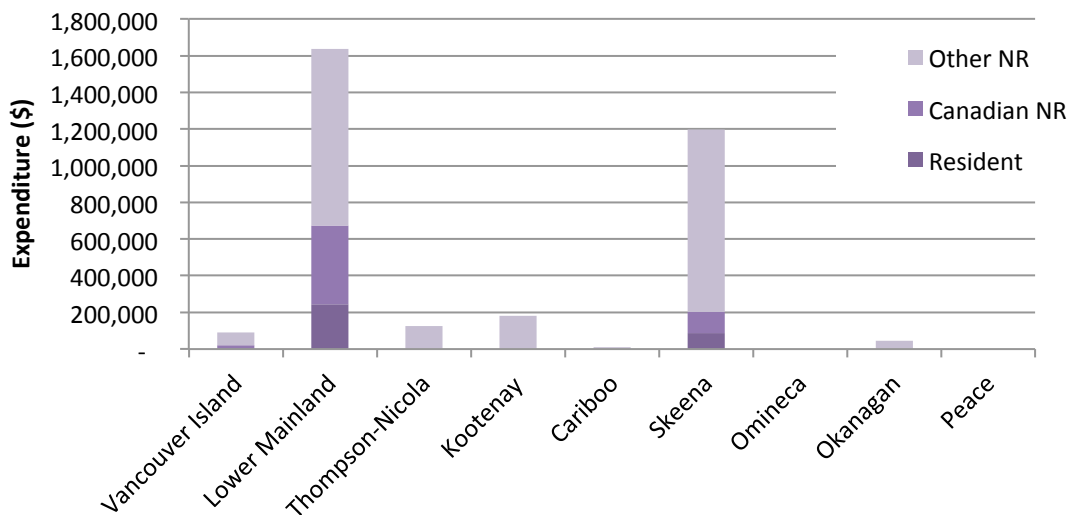


Figure 20. Full charter boat expenditures by region.

While it was predominantly residents who spent money on fly-in packages in the Omineca region, Alien anglers preferred to spend their fly-in package money in the Skeena and Cariboo regions (Figure 21).

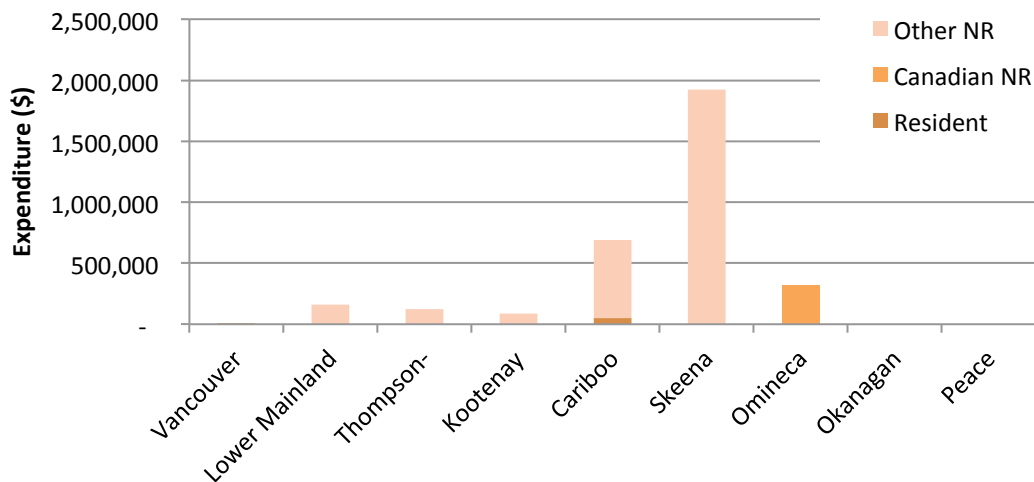


Figure 21. Fly-in package expenditures.

Lodge packages represented the largest expenditures with over 50% of all package expenditures being directed at this category. Aliens spent substantially more than residents and non-residents, with Skeena, Kootenay and Cariboo being preferred by alien anglers and the Thompson-Nicola region being preferred by residents (Figure 22).

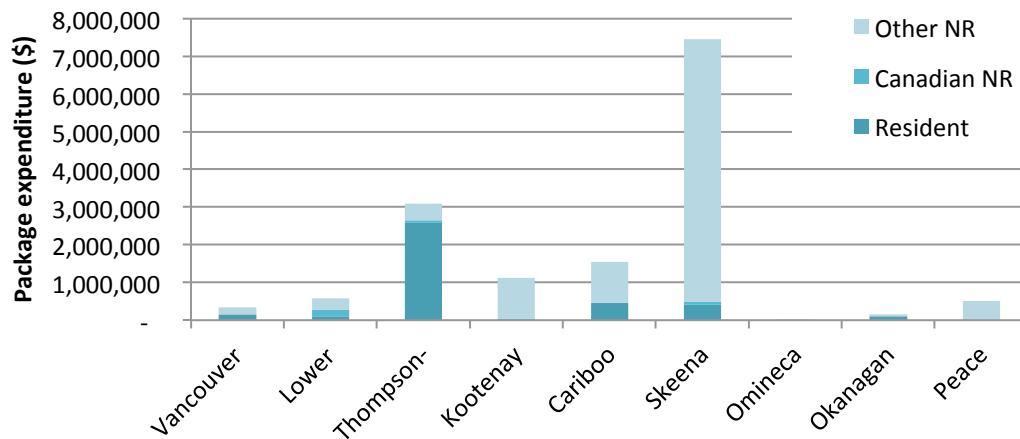


Figure 22. Lodge package expenditures.

Other package expenditures represented only 4% of all package expenditures, but were spread across the Thompson-Nicola, Skeena, Omineca, Vancouver Island, Lower Mainland and Kootenay regions (Figure 23).

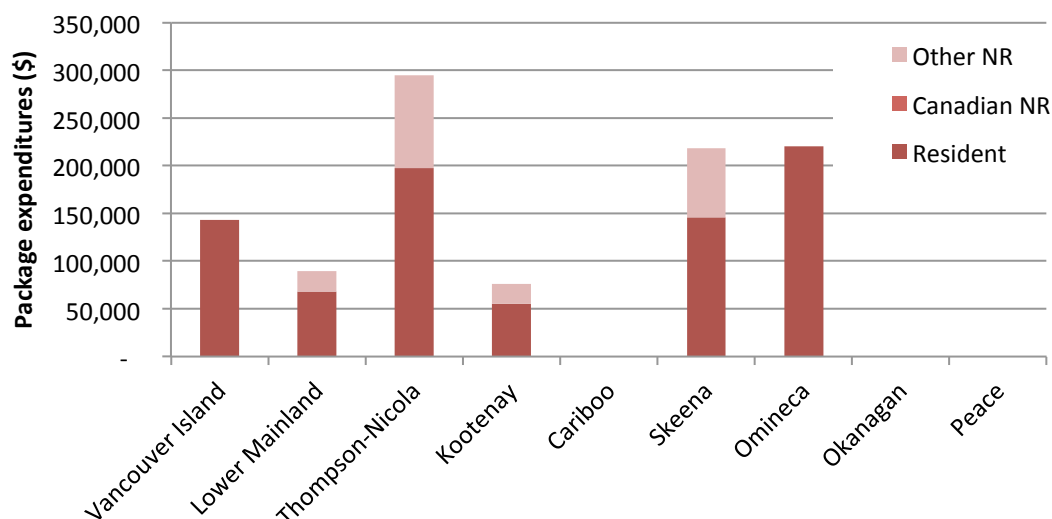


Figure 23. Other package expenditures.

5. Fish Stocking Benefits

Although freshwater angling has a long history and culture in B.C., numbers of anglers generally declined throughout the 1990s and early 2000s in B.C. and throughout most of North America (FFSBC, 2011). The Freshwater Fisheries Society of BC seeks to rebuild angler participation by improving the angling experience for both resident and non-resident anglers. Their long-term goal is to get participation rates back to about 1990 levels by 2017.

The registered purpose of the Society is “to conserve and enhance the freshwater fish resources of the province for the benefit of the public” (FFSBC Constitution 2003). Fish culture and stocking programs delivered by the Society in cooperation with the province are designed to create or sustain public fisheries primarily in lakes that would not otherwise be able to support angling opportunities. While less than 5% of provincial lakes are stocked they support about 50% of all fishing effort on lakes. In some regions stocked lakes support as much as 90% of fishing opportunities. FFSBC owns and operates five major fish hatcheries in Duncan, Abbotsford, Summerland, Clearwater and Cranbrook. Further to this, the Society operates a trout distribution centre in Prince George, three white sturgeon conservation hatcheries, nine seasonal egg collection stations and a fish health laboratory.

FFSBC stocks many varieties of rainbow and cutthroat trout as well as brook trout (char), kokanee and steelhead, all for angling purposes. Additionally, FFSBC cultures endangered white sturgeon for the Columbia and Kootenay rivers as part of the white sturgeon recovery initiative and lake char from Moberly Lake for species recovery in partnership with the province. Between 2008 and 2012, FFSBC stocked an average of 6.6 million fish per year. Although number of individual fish stocked went down, biomass has actually remained relatively constant (or even increased) in this timeframe. Over this time, rainbow trout made up 70% of all fish stocked. In 2010, specifically, rainbow trout made up about 67% of fish stocked (Table 8).

Table 8. Fish species stocked by year.

	2008	2009	2010	2011	2012	Grand Total	Average (%)
Rainbow	4,976,922	4,545,162	4,559,457	4,701,465	4,269,526	23,052,532	69.8
Cutthroat	150,964	73,801	69,914	83,528	74,213	452,420	1.4
Brook char	454,886	408,975	470,107	411,380	388,556	2,133,904	6.5
Kokanee	976,799	925,998	1,128,689	1,050,933	1,055,953	5,138,372	15.6
Steelhead	219,996	148,778	133,195	130,894	94,255	727,118	2.2
Sturgeon	638,634	344,080	455,403	56,513	13,660	1,508,290	4.6
Total	7,418,201	6,446,794	6,816,765	6,434,713	5,896,163	33,012,636	

Note that the totals for 2012 are likely underestimated due to incomplete data at the time the report was written.

The bulk of funding to cover the expenses of the stocking program comes from licence revenues from freshwater angling fees. FFSBC receives 53% of licence revenues each year under its contract with the province and these funds are reinvested into the stocking program to provide fishing opportunities. This user-pay, non-profit delivery model is unique in Canada. In 2010, FFSBC had expenses of \$8.572 million in order to carry out their stocking mandate.

To calculate the benefit of the stocking program, it is necessary to estimate what proportion of the economic benefits accruing from each of the stocked species is attributable to the stocking program. Firstly, the total angler expenditure of \$546 million was divided among the stocked species three different ways: based on angler preference for the species (column 1), the proportion of catch by species (column 2), and an average of these (column 3). For example, 50% of anglers said that rainbow trout was their most preferred species, and rainbow trout made up 58% of all angler catch (Table 9).

Table 9. Angler expenditures associated with the FFSBC stocking program.

Percent of expenditures attributable to each species			
	Preference (%)	Catch (%)	Average (%)
Rainbow Trout	50	58	54
Cutthroat Trout	7	15	11
Brook Char	1	3	2
Steelhead	6	2	4
Kokanee	4	7	5
Total expenditures attributable to each species			
	Preference	Catch	Average
Rainbow Trout	273,000,000	317,808,783	295,404,392
Cutthroat Trout	38,220,000	82,684,512	60,452,256
Brook Char	5,460,000	13,941,912	9,700,956
Steelhead	32,760,000	11,074,274	21,917,137
Kokanee	21,840,000	37,265,810	29,552,905
Total expenditures attributable to the stocking program of each species			
	Preference	Catch	Average
Rainbow Trout	166,530,000	193,863,358	180,196,679
Cutthroat Trout	5,350,800	11,575,832	8,463,316
Brook Char	5,187,000	13,244,816	9,215,908
Steelhead	6,879,600	2,325,598	4,602,599
Kokanee	4,368,000	7,453,162	5,910,581
	188,315,400	228,462,765	208,389,082
Return on investment (\$)	22	27	24

For rainbow trout, total expenditures were then multiplied by 50%, 58% and the average (54%), to give the total expenditures attributable to that species. The second step was to calculate the proportion of this expenditure that was attributable to the stocking program. For this, proportions were taken from GSGislason and Associates Ltd. 2009 report. Based on interviews with provincial staff, the authors of that study estimated that 61%, 14%, 95%, 21% and 1% of expenditures on rainbow trout, cutthroat trout, brook char, steelhead and kokanee, respectively, were attributable to the FFSBC stocking program. These proportions are then applied across the row for each species to give a final estimate of the economic benefits accruing from the stocking program.

Depending on the methodology, the total economic benefits accruing from the stocking program ranged from \$188 million to \$228 million, with an average of \$208 million (Table 9). The low end of this is similar to the 2005 estimate of \$168 million (\$183 million in 2010 dollars) (GSGislason and Associates Ltd., 2009). Given that FFSBC faced expenditures of \$8.57 million, this leads to

a return on investment ranging from \$22 to \$27: every \$1 invested in fish stocking by FFSBC leads to an average of \$24 in angler expenditures. This compares to the estimate of \$21 found in 2005 (GSGislason and Associates Ltd., 2009).

Certainly the stocking of rainbow trout is the most important, from an economic standpoint, as it is associated with an average of \$180 million in angler expenditures (Table 9). This was followed by \$9.2 million and \$8.4 million in expenditures associated with angling for brook char and cutthroat trout, respectively. Finally kokanee and steelhead has associated angler expenditures of \$5.9 million and \$4.6 million, respectively.

6. Potential for Growth

The freshwater angling sector generated direct economic impacts of \$545 million in 2010. In 2005, the estimated direct expenditure was approximately \$480 million, which amounts to about \$523 million in 2010 dollars (adjusted for inflation). In real dollars, therefore, 2010 expenditures were \$23 million more than in 2005, an increase of almost 5%. On average, then, angler expenditures increased by about 1% per year since 2005, in spite of the economic turndown in 2008 and 2009, which affected tourism in BC (Tourism BC 2011). There could be several reasons for this. Firstly, Freshwater Fisheries Society of BC began implementing its Angling Market Development Plan in 2007, which has aimed to improve the fishing experience of anglers, promote fishing as a healthy outdoor pastime, and to make the licensing process more convenient, among other activities. Secondly, anglers seem to have shifted their focus somewhat from purely leisure motivations (i.e., to enjoy nature and to relax) to more tangible motivations (i.e., to catch large fish) (Mostegl, 2012 (draft)). Perhaps B.C.'s reputation for offering superb angling opportunities has drawn interest from new clientele. Thirdly, anglers spent more per fishing day in 2010, \$142 per day, compared to \$131 per day in 2005 (converted to 2010 dollars), which could help to prop up the economic impact.

Non-resident growth

Economists discriminate between residents and non-residents when it comes to expenditures. This is because if a B.C. resident spends money on freshwater angling, that is money that otherwise would have been spent in the province in some other sector, i.e., it is a transfer of spending from one set of goods and services to another (Fish and Wildlife Service 2005). That said, most B.C. resident anglers live in urban areas but fish in rural B.C., thus transferring much-

needed economic activity to rural B.C. Spending by non-residents, however, represents a net gain in economic value to the province as a whole. This is important to consider as B.C. moves forward and analyzes the potential for growth of the freshwater angling sector. It is really an increase in non-residents that will have largest economic impact on the province. That being said, this growth should not come at the cost of the angling experience for current resident and non-resident anglers alike.

Residents and non-residents have different motivations for fishing. Non-resident non-Canadian anglers tend to use packages and guided trips more, and spend more money per angling day. They also expressed a greater desire to catch many fish and large fish than did residents. This means that growth in the sector by non-resident anglers may in fact not compete with resident anglers as they likely fish for different reasons and in different regions.

Most of the non-resident non-Canadians participating in B.C.'s freshwater angling opportunities are from Washington State, or other states within the US. Europe is the second largest contributor to non-resident activity. Sport fishing is a huge leisure activity in the U.S., with the freshwater sector contributing about \$89 billion in economic impact in 2006 (American Sportfishing Association, 2008). There is thus ample opportunity to further promote the B.C. sector at trade shows and on websites related to angling in the U.S. in an effort to pull more of this activity into B.C.

The possibility to expand further into the European, Asia-Pacific and African markets may have more to do with economics than with a desire to experience angling in B.C.. Given the current economic situation, Canadian (living outside B.C.) and American populations are probably the best place to target campaigns. As a higher proportion of non-residents participate in package angling, promoting different package options, and working with lodges and guided package operators to promote angling packages to non-residents may further spur growth in the non-resident sector.

One additional thing to consider, though, is the changing demographics of the B.C. population itself. With increasing immigration, the composition of potential residential anglers is changing. A better understanding of what first and second generation Canadians are looking for in terms of angling experiences may help to create improved opportunities and experiences for anglers from other countries, specifically from the Asia-Pacific region.

Coupled tourism growth

As reported in the 2005 survey report (GSGislason and Associates Ltd, 2009), many tourists visiting B.C. express an interest in angling even if it is not their primary reason for visiting the province. Outreach to tourism providers and links to the gofishbc.com website from tourism websites may provide tourists with the information they need to include angling in their activities. The availability of gear is one thing that visitors to the province may not know how to address, apart from buying their own gear and tackle. Improved awareness and access to fishing equipment may also help. Obviously gear and tackle is provided on guided trips and packages, but tourists wishing to supplement their camping trip with a little recreational angling, may need to be pointed in the right direction.

Freshwater angling in Ontario is quite popular, with over 1 million active anglers, and an estimated \$2.5 billion in economic contribution to the province (according to www.mnr.gov.on.ca). Yet many Ontarians travel to B.C. – it is estimated that annual tourism by Ontario natives to B.C. may reach one million by 2024 (Research Resolutions and Consulting Ltd., 2004). Thus coupling freshwater angling with Ontario-based tourists may be a potential avenue for growth.

Licence revenue growth

In 2005, 319,400 licences were purchased (GSGislason and Associates Ltd., 2009), while in 2010, licence sales reached 338,562 in number, an increase of almost 6%. As reported in the FFSBC's Annual Report, growth in 2009 and 2010 has been an exception, in part due to the efforts of the FFSBC in relation to their Angler Market Development Plan (FFSBC, 2009; FFSBC, 2011), in addition to a good sockeye salmon year. Certainly continued emphasis on programs like the Learn to Fish, Fishing in the City and Fishing Buddies, should lead to continued growth in the interest and involvement of resident anglers, especially over the long term.

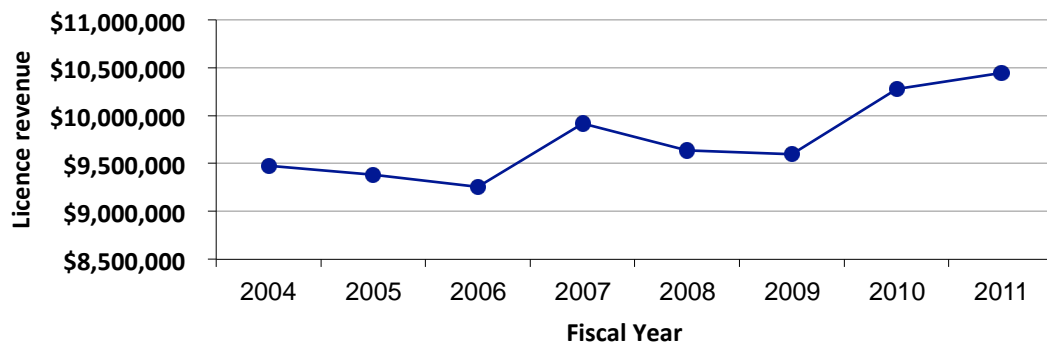


Figure 24. Angling licence revenue.

Licence sales tend to peak with good sockeye salmon fishing years, and to a lesser extent with pink and Chinook availability (Figure 24). 2010 (good sockeye) and 2011 (good pinks) were two strong years for licence revenues, but these were followed by the 2012 year, which had poor salmon fishing opportunities and resulted in a downturn in licence sales. This variability in licence sales results in FFSBC, who relies on these sales as operating revenue, having to contend with the same costs to deliver their programs, but fewer resources with which to do that in some years, requiring careful budget management and planning.

There would also be value in reviewing and modernizing the types of licences that the province currently offers the angling public to assist in licence revenue planning. For example many other jurisdictions offer automatic licence renewal, lifetime licences and family licences. Questions related to willingness to purchase multi-year licences could be included in the next survey.

Aging population

Between 2009 and 2012, licence sales in the senior category have increased by 17%. This is not the result of an increasing interest in angling by the senior population, but rather represents an aging BC population in general. From 1995-2011 licence sales for individuals aged 16-65 declined by 21%, however senior licence sales increased by 27%. Every time an angler moves into the senior's category, their annual contribution to licence revenues drops from \$36 to \$5. Given the stocking program that supports 50% of lake fisheries is funded by licence revenue this is a looming problem as the angler population continues to age. This is likely to result in decreased licence revenues over time which will lead to reduced stocking and other services. The province and FFSBC should consider changes to the licensing system that will offset this issue over time.

Increasing female participation

In 2010, about 20% of the licensed anglers were female. In 2005, similar results were observed, with 17% of anglers being female. Certainly there could be room to increase the interest and participation of female anglers. In the U.S., for example, about 25% of anglers are female. The U.S. hosts female angling tournaments, and female angler forums have popped up over the internet (where forum topics include “truck or boat?”, “ladies rod/reel setup, and “ladies angling vacations”, among others). Campaigns aimed at increasing the number of female anglers, and improving the female angling experience, are likely to help maintain or increase female participation, but so would campaigns targeting young female anglers now (i.e., before they turn 16). Perhaps coupling with programs like BC Girl Guides or local YMCAs to provide angling opportunities to young girls would show some returns in the future with adult licence sales.

There really is no reason that freshwater angling should be inaccessible to women, so directed research into the preferences of female anglers (and potential anglers) may help to guide future campaigns. Questions within the surveys asking not only if a female participated in angling but why or why not, may help.

7. Conclusions

In 2010, 286,167 people participated in freshwater angling in British Columbia, with angling days totaling more than 3.8 million. In direct expenditures, these anglers contributed \$546 million to the B.C. economy. If we compare these numbers with 2005 estimates, we see that, in real dollars, economic expenditures by freshwater anglers increased by \$23 million in five years (or about \$5 million per year on average), and the number of active anglers increased by almost 6%. This is in spite of the economic slowdown in 2008, the result of which was an overall decrease in tourism-related expenditures in B.C. (Tourism BC, 2011). Potential growth in the freshwater angling sector can be found in addressing the aging nature of the B.C. population, programs targeting female angler preferences, coupling B.C. tourism with freshwater angling, and focusing on non-resident anglers in the U.S.. Further to this, programs aimed at improving the angling experience of first and second generation Canadians could increase both B.C. resident and other non-resident angling activity.

Freshwater angling took place in all provincial regions, with the Lower Mainland region showing the most angling activity in terms of angling days (20%), the Skeena region hosting the majority of angling package expenditures (45%), and Kootenay region having the highest catch rate per

day (about 3.3 fish). Although the Lower Mainland and Skeena were obviously popular spots to visit, they actually had the lowest catch rates of the 9 Provincial regions (1.6 and 1.7 fish per day, respectively). However, when comparing regional catch rates one has to bear in mind that this is only one indicator of fishing quality.

It is obvious that the freshwater angling sector is an important component of the B.C. economy, generating almost \$1 billion in direct, indirect and induced impacts. Part of this contribution comes in the form of federal and provincial taxes, which amounted to \$89 million and \$55 million in 2010, respectively. In addition to this, 5,000 full time person year jogs (or about 15,000 part time jobs) were supported. Continued enhancement of freshwater sport fish resources and investment in improving the angling experience will continue to help this sector grow and attract both local and foreign interests. Further to this, conservation efforts by the Province, FFBC, the Habitat Conservation Trust Foundation, and other groups, will help to ensure ample opportunities for future generations to enjoy the benefits of freshwater angling in B.C..

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Figure sources:

Title page: Valley Fishing Guides, Ltd.; Box page 7: Valley Fishing Guides, Ltd.; Box page 10: Paul Ratcliffe; Box page 16: echolakeresort.com; Box page 19: Chris Govender.

Appendix

2010 SURVEY OF RECREATIONAL FISHING IN CANADA

PROVINCE OF BRITISH COLUMBIA RECREATIONAL FISHING IN FRESH WATER

Le présent questionnaire est également disponible en français

CONFIDENTIAL WHEN COMPLETED

Questions? | info2010@dfo-mpo.gc.ca

NOTE TO ANGLERS

The following instructions may be of assistance:

ê the questions are to be answered only by the person to whom the questionnaire was addressed

ê this survey covers your fishing activity between January 1 and December 31, 2010

ê the term "household members" refers only to individuals living in your residence

The Ministry of Environment appreciates your help with the information we needed to manage freshwater fishing in B.C.

The questions are to be answered only by the person to whom the questionnaire is addressed

THANK YOU IN ADVANCE FOR YOUR COOPERATION AND ASSISTANCE

LICENCE INFORMATION

1. Which of the following basic and supplementary licences did you hold to fish in British Columbia freshwater in 2010? For 8-day and 1-day licences, please indicate how many you purchased.

<u>Basic Licences</u>		<u>Number</u> <u>Held</u>	<u>Supplementary Licences</u>	
Annual (16-64 years)	1		Steelhead	1
Senior	2		Kootenay Lake Rainbow Trout	2
8-day	3	_____	Shuswap Lake Char	3

1-day	4	_____	Shuswap Lake Rainbow Trout	4
Disabled	5		Non-tidal Salmon	5
			Classified Waters	6
			White Sturgeon	7

YOUR PERSONAL RECREATIONAL FISHING ACTIVITIES

2a) Did you fish for recreation in fresh water in British Columbia in 2010?

Yes ₁ | please continue

No ₂ | go to questions **9**

b) How many days in total did you fish in fresh water in British Columbia in 2010?

_____ days

c) Of the total days you fished, how many were spent using the services of a paid guide?

None ₀ or _____ days

d) On average, how many hours per day did you fish in fresh water in British Columbia in 2010?

_____ hours per day

3. What are your five favourite species to fish for in British Columbia fresh water? Please rank from 1 to 5 (with **1** being your top favourite; **2**, your next favourite, etc.).

Rainbow trout	_____	Dolly Varden/ bull trout	_____	Arctic grayling	_____
Cutthroat trout	_____	Trout (other/ unknown)	_____	Whitefish	_____
Lake trout	_____	Kokanee	_____	Perch	_____
Steelhead	_____	Salmon (freshwater)	_____	Bass	_____
Brook trout	_____	White sturgeon	_____	Northern pike	_____
		Walleye (pickerel)	_____	Other fish	_____

4. How would you rate your recreational fishing experience in British Columbia fresh water in 2010?

Excellent ₁ Very Good ₂ Good ₃ Fair ₄ Poor ₅

FRESHWATER FISHERIES MANAGEMENT REGIONS



5. For each water body on which you fished in British Columbia fresh water in 2010, please provide the name of the water body, the nearest town or village, the region number (**from map**), and the number of days you fished, ice fished and/or were guided. For each location, please also provide the number of fish you caught and the number you kept. Even if you did not catch any fish, please give the number of days you fished on each waterbody.

Please include only your personal fishing activities from January to December 2010.

Note: Steelhead hatchery fish are those with the adipose fin removed.

Name of waterbody: <hr/> Lake ₁ River/ Stream ₂			Name of waterbody: <hr/> Lake ₁ River/ Stream ₂			Name of waterbody: <hr/> Lake ₁ River/ Stream ₂		
Nearest Town/ Village: <hr/>			Nearest Town/ Village: <hr/>			Nearest Town/ Village: <hr/>		
Region number _____ (from map)			Region number _____ (from map)			Region number _____ (from map)		
Total number of _____ days fished			Total number of _____ days fished			Total number of _____ days fished		
# days ice fished _____			# days ice fished _____			# days ice fished _____		
# days guided _____			# days guided _____			# days guided _____		
Species Number of fish <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <u>Caugh</u> t </div> <div style="text-align: center;"> <u>Kept</u> </div> </div>			Species Number of fish <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <u>Caugh</u> t </div> <div style="text-align: center;"> <u>Kept</u> </div> </div>			Species Number of fish <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <u>Caugh</u> t </div> <div style="text-align: center;"> <u>Kept</u> </div> </div>		
Rainbow trout _____			Rainbow trout _____			Rainbow trout _____		
Cutthroat trout _____			Cutthroat trout _____			Cutthroat trout _____		
Lake trout _____			Lake trout _____			Lake trout _____		
Steelhead			Steelhead			Steelhead		
wild _____			wild _____			wild _____		
hatchery _____			hatchery _____			hatchery _____		
Brook trout _____			Brook trout _____			Brook trout _____		
Dolly Varden/ bull trout _____			Dolly Varden/ bull trout _____			Dolly Varden/ bull trout _____		

Trout (other/unknown) _____	Trout (other/unknown) _____	Trout (other/unknown) _____
Kokanee _____	Kokanee _____	Kokanee _____
Salmon (freshwater) _____	Salmon (freshwater) _____	Salmon (freshwater) _____
White sturgeon _____	White sturgeon _____	White sturgeon _____
Walleye (pickerel) _____	Walleye (pickerel) _____	Walleye (pickerel) _____
Arctic grayling _____	Arctic grayling _____	Arctic grayling _____
Whitefish _____	Whitefish _____	Whitefish _____
Perch _____	Perch _____	Perch _____
Bass _____	Bass _____	Bass _____
Northern pike _____	Northern pike _____	Northern pike _____
Other fish _____	Other fish _____	Other fish _____

5 (continued)

Name of waterbody: Lake ₁ River/ Stream ₂	Name of waterbody: Lake ₁ River/ Stream ₂	Name of waterbody: Lake ₁ River/ Stream ₂
Nearest Town/ Village: 	Nearest Town/ Village: 	Nearest Town/ Village:
Region number _____	Region number _____	Region number _____

(from map)			(from map)			(from map)		
Total number of	_____		Total number of	_____		Total number of	_____	
days fished			days fished			days fished		
# days ice fished	_____		# days ice fished	_____		# days ice fished	_____	
# days guided	_____		# days guided	_____		# days guided	_____	
Species	Number of fish		Species	Number of fish		Species	Number of fish	
	<u>Caught</u>	<u>Kept</u>		<u>Caught</u>	<u>Kept</u>		<u>Caught</u>	<u>Kept</u>
	<u>t</u>			<u>t</u>			<u>t</u>	
Rainbow trout	_____	_____	Rainbow trout	_____	_____	Rainbow trout	_____	_____
Cutthroat trout	_____	_____	Cutthroat trout	_____	_____	Cutthroat trout	_____	_____
Lake trout	_____	_____	Lake trout	_____	_____	Lake trout	_____	_____
Steelhead			Steelhead			Steelhead		
wild	_____	_____	wild	_____	_____	wild	_____	_____
hatchery	_____	_____	hatchery	_____	_____	hatchery	_____	_____
Brook trout	_____	_____	Brook trout	_____	_____	Brook trout	_____	_____
Dolly Varden/ bull trout	_____	_____	Dolly Varden/ bull trout	_____	_____	Dolly Varden/ bull trout	_____	_____
Trout (other/unknown)	_____	_____	Trout (other/unknown)	_____	_____	Trout (other/unknown)	_____	_____
Kokanee	_____	_____	Kokanee	_____	_____	Kokanee	_____	_____
Salmon (freshwater)	_____	_____	Salmon (freshwater)	_____	_____	Salmon (freshwater)	_____	_____
White sturgeon	_____	_____	White sturgeon	_____	_____	White sturgeon	_____	_____
Walleye (pickerel)	_____	_____	Walleye (pickerel)	_____	_____	Walleye (pickerel)	_____	_____
Arctic grayling	_____	_____	Arctic grayling	_____	_____	Arctic grayling	_____	_____
Whitefish	_____	_____	Whitefish	_____	_____	Whitefish	_____	_____
Perch	_____	_____	Perch	_____	_____	Perch	_____	_____

Bass	_____	_____	Bass	_____	_____	Bass	_____	_____
Northern pike	_____	_____	Northern pike	_____	_____	Northern pike	_____	_____
Other fish	_____	_____	Other fish	_____	_____	Other fish	_____	_____

If you fished on more than six bodies of water, please provide additional information on a separate sheet. You may print additional copies by going to: <http://www.dfo-mpo.gc.ca/stats/rec/can/2010/effort-eng.htm>.

QUESTIONS ABOUT YOUR FISHING EXPERIENCE

6. Please rate the importance of each of the following motivations for your fishing trips (please check your rating for each):

	<i>Not at all important</i>	<i>Somewhat important</i>	<i>Important</i>	<i>Very important</i>	<i>Extremely Important</i>
To catch fish for eating	1	2	3	4	5
To catch a 'record' or 'trophy' fish	1	2	3	4	5
To catch many fish	1	2	3	4	5
For the challenge or sport of fishing	1	2	3	4	5
To get away from the regular routine	1	2	3	4	5
For relaxation	1	2	3	4	5
To bring your family closer together	1	2	3	4	5
To be with others who enjoy the same things you do	1	2	3	4	5
To improve your fishing skills	1	2	3	4	5

To be close to nature	1	2	3	4	5
-----------------------	---	---	---	---	---

7a) Did you spend as much time fishing for recreation in British Columbia fresh water in 2010 as you had wanted to?

Yes ₁ | go to question **8**

No ₂ | please continue

b) Why not? (check all that apply)

fish too small	1	poor shore access	6
restrictive regulations	2	poor catch rate	7
complicated regulations	3	not enough spare time	8
fishing spots too crowded	4	cost	9
poor boat access	5	other _____	10

8a) Did you see a Conservation Officer on patrol while you were fishing in British Columbia freshwater in 2010?

Yes ₁ No ₂ | go to question **9**

b) Was the number of times you saw a Conservation Officer the same as in previous years, or was it more or less often?

Same ₁ More often ₂ Less often ₃

9a) When using the Internet for searching and downloading, which information items related to fishing in British Columbia fresh water do you access?

I do not use the Internet for searching or downloading fishing information ₀ | go to question **9c**

Items on fishing in ₁ Maps ₂ Fishing Regulation ₃ Other ₄

b) Would you use information provided via the Internet on angling (e.g., closures, catch limits, resorts, tackle shops)?

Yes ₁ No ₂

c) Would you be willing to pay a fee for a printed version of the Freshwater Fishing Regulations Synopsis?

Yes ₁ No ₂ | go to question **10**

d) What maximum amount would you expect to pay for a printed version of the Freshwater Fishing Regulations Synopsis?

Less than \$1.00 ₁ \$1.00 ₂ \$2.00 ₃ \$3.00 ₄ \$4.00 ₅
\$5.00 ₆

More than \$5.00 ₇ | what amount? \$_____

- 10a)** Did you fish in British Columbia freshwater in 2009? Yes ₁ No ₂
- b)** Do you intend to fish in British Columbia freshwater in 2011? Yes ₁ No ₂
- 11a)** Did you fish in British Columbia tidal waters in 2010? Yes ₁ No ₂
- | go to question **11c**
- b)** If yes, how many days did you fish in British Columbia tidal waters? _____ days
- c)** Do you intend to fish in British Columbia tidal waters in 2011? Yes ₁ No ₂

INVASIVE SPECIES

- 12a)** Have you heard of the term “aquatic invasive species”? Yes ₁ No ₂ | go to question **13**
- b)** If yes, are you able to name any such species? Yes ₁
- | _____ No ₂
- 13a)** Are you aware of any fish species in BC lakes or streams, excluding hatchery fish, which have been introduced or transferred from another province or state?
- Yes ₁ No ₂ | go to question **14**
- b)** If yes, which species have been introduced?
- _____
- 14.** Do you know that it is illegal to have live sport fish or live bait fish in your possession in BC without a transfer permit?
- Yes ₁ No ₂
- 15.** Are you aware that regulations in BC prohibit the release or transfer of live fish of any species, including sport fish and bait fish, from one body of water to another without a transfer permit?
- Yes ₁ No ₂
- 16a)** Did you launch a boat you owned in any bodies of freshwater in other provinces or states in 2010?

Yes ₁ | please continue

No ₂

b) If yes, in which provinces or states did you launch your boat?

(1) _____ (2) _____ (3) _____ (4)

If you live in British Columbia, please go to Question 19.

TRIP INFORMATION FOR VISITORS TO BRITISH COLUMBIA

If you were a visitor to British Columbia, please answer the following questions.

17a) How many trips did you make to British Columbia in 2010?

(a trip should be counted each time you crossed the border into the province)

_____ trips

b) How many days in total did you spend in British Columbia in 2010 for all reasons?

_____ days

c) On how many of your trips to British Columbia in 2010 did you fish in fresh water?

_____ trips

d) How many of these freshwater fishing trips were day-trips requiring no accommodation?

_____ day trips

e) For the remaining freshwater fishing trips, how many nights were spent in B.C.?

_____ nights

f) For how many of your fishing trips to British Columbia was fishing in fresh water (number):

the main reason for visiting _____ a secondary reason _____ decided after arrival

18. If there had been no fishing opportunities in British Columbia fresh water in 2010, would you have:

(please check one only)

Stayed a shorter time or visited less frequently

₁

Substituted other activities, but stayed the same length of time ₂

Not come at all

₃

HOUSEHOLD EXPENDITURES ON RECREATIONAL FISHING

19a) Did you or any member of your household make any major purchases or investments in British Columbia in 2010 related in whole or in part to freshwater recreational fishing? (e.g., fishing rods, boats, motors, 4x4's, snowmobiles, cabins, camping gear, trailers, ice fishing gear, etc.)

Please Note: Purchases of fishing supplies (lures, line, tackle, bait, etc.) are covered in question 21.

Yes ₁ | please continue

No ₂ | go to question **20**

b) For each investment category, please indicate the amount of money spent in British Columbia in 2010 by you and members of your household and estimate the percentage of the total amount you consider was directly attributable to freshwater recreational fishing (including applicable taxes).

Investment Category	Amount Spent in British Columbia	% Attributable to Freshwater Fishing
Fishing Equipment (rods, reels, fish finders, etc.)	\$ _____	_____
Camping Equipment (tents, camper trailers, etc.)	\$ _____	_____
Boating Equipment (boats, motors, trailers, etc.)		
New	\$ _____	_____
Used	\$ _____	_____
Special Vehicles (4x4's, camper truck, ATV's, snowmobiles, etc.)		
New	\$ _____	_____
Used	\$ _____	_____
Land-Buildings (cabins, cottages, land, etc.)	\$ _____	_____
Other (special clothing, waders, ice-huts, etc.)	\$ _____	_____

c) Of the above investments, how much was spent solely for ice fishing?

(include ice-huts, ice augers, floater coats and suits, ice fishing rods, etc.)

\$ _____.00

20. FRESHWATER “PACKAGES” PURCHASED IN 2010

The following question refers only to packages for fishing in fresh water purchased in British Columbia from a fishing lodge, guide or outfitter (or their agent) which include a complete range of services such as lodging, food, transportation, etc.

For self-organized trips, please include expenditures in question 21.

a) Did you or any member of your household purchase any such packages to fish in B.C. fresh water in 2010?

Yes ☐ 1 | please continue

No ☐ 2 | go to question 21

b) If yes, please provide the total cost to you and your household for each package and the region in which the package was taken (**from map on Page 2**). If the package was purchased by a group, please include **only** your household's share. We have provided enough space for up to three packages of the same type.

<i>Package Type</i>	Package 1		Package 2		Package 3	
	Region	Cost	Region	Cost	Region	Cost
Charterboats – Guided (guided fishing in a boat only)	_____	\$ _____	_____	\$ _____	_____	\$ _____
Charterboats – Full package (guide, meals, supplies, etc.)	_____	\$ _____	_____	\$ _____	_____	\$ _____
Fly-in Packages (air, lodging, meals, etc.)	_____	\$ _____	_____	\$ _____	_____	\$ _____
Lodges/Resorts (lodging, meals, supplies, etc.)	_____	\$ _____	_____	\$ _____	_____	\$ _____
Other (please specify) _____	_____	\$ _____	_____	\$ _____	_____	\$ _____

21a) EXCLUDING expenditures on major purchases and package deals, please estimate the amount of money (including taxes) you and other members of your household spent in BC on the following to fish in fresh water in 2010.

Expenditure Category	Amount
Accommodation (hotels, motels, etc.)	\$_____ .00
Campsite fees (private, provincial, etc.)	\$_____ .00
Food (groceries, restaurant meals, alcoholic beverages)	\$_____ .00
Travel costs within British Columbia for freshwater recreational fishing:	
- vehicle (gas, repairs, etc), vehicle rentals, tolls, etc.	\$_____ .00
- ferry	\$_____ .00
- air (not included in question 20)	\$_____ .00
- other (not including personal boating costs)	\$_____ .00
Household owned boat costs (gas, repairs, launch/ramp fees, moorage, insurance, etc.)	\$_____ .00
Rentals for fishing (boats, gear, snowmobiles, ice-huts, etc.)	\$_____ .00
Fishing supplies (lures, line, tackle, bait, etc.)	\$_____ .00
Guide services (not included in question 20)	\$_____ .00
Fishing licence fees (permits, tags, etc.)	\$_____ .00
Access fees (park fees, etc.)	\$_____ .00
Other (please specify) _____	\$_____ .00

b) Of the above expenditures, approximately how much was spent for ice fishing?
\$_____ .00

INFORMATION ABOUT YOU AND YOUR HOUSEHOLD

In order for us to analyze this survey in a meaningful way, we require some personal information about you and your household. This will allow us to accurately estimate the number of anglers in the province, their use of the resource and the economic benefits generated by recreational fishing in fresh water in British Columbia.

YOUR ANSWERS WILL REMAIN STRICTLY CONFIDENTIAL

22. In what year were you born? 19____

23. Are you: Male ₁ Female ₂

24. **Excluding yourself**, how many members of your household are 16 years of age and over?

Of these household members, please indicate how many held British Columbia freshwater licences in 2010?

Members 16 years of age and over _____ Members who held BC freshwater licences _____

25. How many members of your household were under 16 years of age? Of these household members, how many fished for recreation in British Columbia fresh water in 2010 and how many days in total did they fish?

Members under 16 years of age _____ Number who fished _____ Total days fished _____

26. Please indicate which of the following categories best represents your total household income before taxes in 2010 (check only one please)

No employment income	₁	\$60,000 to \$79,999	₅
Less than \$19,999	₂	\$80,000 or over	₆
\$20,000 to \$39,999	₃	Don't know	₇
\$40,000 to \$59,999	₄	Prefer not to answer	₈

Thank you!!