Sport Fishing Mapping Project

Consultant Report

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BRITISH COLUMBIA
MARINE CONSERVATION ANALYSIS

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1.0 Introduction

1.1 The Sport Fish Mapping Project

Sport fishing in the tidal waters of British Columbia has taken place since the first Western Europeans settlers arrived and is an important social activity, especially in small coastal communities. The tidal sport fishery in BC generated $467 million in direct economic output and $135 million in GDP in 2005[1]. Marine planning has, in the past decade, become more in focus as the Canadian, British Columbian and First Nations governments move to undertake a number of marine planning initiatives[2]. Being able to identify where important sport fishing grounds are located will allow marine planners to develop marine spatial plans that impact as little as possible on sport fishing opportunities while maximizing conservation.

The British Columbia Marine Conservation Analysis (BCMCA) is developing products to inform future marine planning initiatives, including a comprehensive atlas of marine values and results of a series of spatial analyses exploring "what if" scenarios. Both products rely on the use of the best available mapped data. Existing and available spatial data to represent the sport fishing sector were found to have spatial gaps and inaccuracies according to consultation with members from the sector as part of a preliminary BCMCA data survey.

The BCMCA sport fishing mapping project engaged hundreds of knowledgeable tidal waters anglers from different areas of the BC coast through the Sport Fishing Advisory Board (SFAB) process and asked them to review and update historic sport fishing data that had been generated in the mid-1990s. At nineteen separate meetings, anglers shared their local knowledge of the spatial extent of the different fishing grounds along the BC coast. The SFAB are recognised by Fisheries Management at Fisheries and Oceans Canada as the official representative voice of the sport fishing community in tidal waters. Through the comprehensive consultation and mapping process, the sector is confident that many of the spatial gaps and data inaccuracies have been corrected.

The data collected in this project illustrate areas where sport fishing for anadromous fish, groundfish, crab and shrimp and prawn occur along the BC coast. Areas where sport fishing does not occur should not be inferred from lack of 'presence'; the absence of recorded sport fishing does not necessarily mean that sport fishing will not occur in that area in the future or that an area does not see current sporadic use. While these data identify where fishing occurs, additional information that would be useful in marine use planning, and that was part of the initial data collection plan for this project, was not obtained. Participants could not agree on appropriate methods to consistently rank or illustrate frequency of use (i.e., to show how often a particular location is visited), seasonality of use, or relative importance of sites (e.g., personal value, size or amount of catch, economic value), so efforts to obtain this information ceased after the first two meetings.

[1] BC Stats. *British Columbia Fisheries and Aquaculture*. Prepared for the BC Ministry of Environment. 2007. www.env.gov.bc.ca/omfd/reports/BC-Fisheries-Aquaculture-Sector-2007.pdf

[2] Examples include: PNCIMA (www.pncima.org), DFO MPA network planning (www.dfo-mpo.gc.ca/media/infocus-alaune/2011/mpa-zpm-eng.html) and Province of BC coastal planning (http://archive.ilmb.gov.bc.ca/cis/coastal/planning/index.html).

1.2 BCMCA Project Background

The BC Marine Conservation Analysis (BCMCA) is a collaborative, BC coast-wide project that is assembling and analysing map-based data that can be used to support marine planning initiatives in BC, without advocating any particular planning outcomes. The overall goal of the BCMCA is to identify marine areas of high conservation value and marine areas important to human use.

There are several marine planning initiatives underway or in preparatory stages in BC. The BCMCA project does not seek to replace these processes. Rather, the BCMCA is developing products that illustrate the spatial distribution of biological, ecological, oceanographic and human use values in BC's marine environment in order to inform discussions and decisions made within these planning initiatives.

The BCMCA was focused on two major products:

1) An atlas that illustrates known biophysical values and human uses in Canada's Pacific Ocean. This atlas was created from best available existing mapped data. Its purpose is to illustrate aspects of marine biology, ecology, oceanography, and human use relevant to a coast-wide scale.
2) A set of results from analyses using the Marxan[3] decision support tool. Results are documented from a range of scenarios, each with different sets of explicit objectives which inform the values put into Marxan parameters. Broadly, the analyses explore a range of "What if…?" scenarios designed to identify areas of high conservation value and areas important to each sector of human use based on data collated for the atlas.

Beginning in the fall of 2006, the BCMCA held a series of workshops in order to assemble the best available biological, ecological, and oceanographic data for the coast. Scientific experts were invited to the workshops to identify these data and make recommendations on the parameters for subsequent Marxan analyses. The BCMCA then obtained and collated 110 of the recommended datasets and prepared the features illustrated in the atlas and used in spatial analyses. Reports summarising expert workshops are available at the BCMCA website (www.bcmca.ca). All reports have undergone workshop participants' review before finalisation.

In 2008, the BCMCA identified six sectors of human use (i.e., commercial fisheries, recreational fisheries, ocean energy - wind, wave, tidal, oil, gas - , shipping and transportation, tenures, and recreation and tourism) and began assembling known human use data held by BCMCA project team organisations. Seeking advice and feedback from human use groups about the overall project, the BCMCA met with representative organisations and advisory boards and, based on feedback from these meetings initiated a Human Use Data Working Group. This group, with the cooperation and assistance of many individuals, reviewed approximately 100 human use datasets for accuracy and completeness. In a few cases data were improved by the BCMCA, and in all cases comments from reviewers are included as part of the atlas facing page information. The sport fish data are an example of where BCMCA funds were allocated to improve available data representing this sector's use of the marine environment.

[3] www.uq.edu.au/marxan/

1.3 The Sport Fishing Advisory Board

The Sport Fishing Advisory Board (SFAB)[4] is a salt-water angling consultation process organized by and overseen by Fisheries and Oceans Canada (DFO). The SFAB was originally formed in 1964 to provide the Minister of Fisheries in Ottawa with the local sport fisher's perspective on British Columbia's tidal waters fisheries management and fisheries policy development. The SFAB operate under a terms of reference with DFO[5] but has no formal or legal authority and is not registered as a company or a society; the SFAB merely offers advice on fisheries matters to DFO. The SFAB has three tiers of operation:

- Tier 1 - Local Committees: The coast is divided up into a number of local jurisdictions, referred to as a Local Sport Fishing Advisory Committee. Each committee has a chairperson and elected executive committee. Members include local sport fishermen who fish for pleasure (primary level user group members) and those whose businesses or jobs earn revenue from sport fishing (secondary level user group members. Committees and boards are structured in such a way to achieve a balance between the primary and secondary level user group members.
- Tier 2 - North and South Regional Boards: Local committees are part of regional boards, consisting of delegates (the chairs) from the local committees. The regional boards oversee matters that impact their area of jurisdiction.
- Tier 3 – Main Board. The main board, which advises on coast wide matters, consists of delegates elected from the south and north coast boards plus additional representatives from a number of angling NGOs (e.g., British Columbia Wildlife Federation (BCWF), British Columbia Federation of Fly Fishers (BCFFF), British Columbia Federation of Drift Fishers (BCFDF), Sport Fishing Institute (SFI), etc.).

The SFAB operates exclusively with volunteers and the advisory process is structured on a grass roots basis. Important sport fishing issues are discussed and voted on at the local committee level and approved motions from those meetings move up to the next tier through the advisory process. The local SFAB committees generally meet twice a year, as do the Regional and Main Boards. Meetings traditionally occur once in the fall and once in the spring. An elected executive committee handles matters of urgency that arise outside the scheduled meeting cycle.

In order to be province-wide in representation and transparent to all anglers, the SFAB Regional and Main Boards include representatives from the various angling NGOs including the BC Wildlife Federation (BCWF), the BC Federation of Fly Fishers (BCFFF), the BC Federation of Drift Fishers (BCFDF), and the Sport Fishing Institute (SFI). For that reason the SFAB is well regarded and broadly accepted as the voice of tidal waters sport fishing in BC.

[4] See http://www.pac.dfo-mpo.gc.ca/consultation/fisheries-peche/smon/sfab-ccps/index-eng.htm

[5] See http://www.pac.dfo-mpo.gc.ca/consultation/fisheries-peche/smon/sfab-ccps/loc-torman-eng.htm. There is a separate Terms of Reference for each tier.

2.0 Methods

2.1 Identification of the need

Coast-wide mapping of British Columbia's tidal-water sport fishery took place in the mid-1990s as part of an effort to collect, organize and report information pertinent to oil spill planning from fisheries staff. Information included some local knowledge (full details are found in BCMCA metadata for sport fish features which is available online at www.bcmca.ca/data). These historic sport fish maps were prepared in a Geographic Information System (GIS) and used in a number of different planning efforts. The data became part of the Coastal Resources Information Management System (CRIMS), and earlier DFO source data were retained in DFO's Mapster system.

Neil Davis, the BCMCA Human Use Project Coordinator in 2008 and 2009, gave a presentation about the BCMCA project at the April 2008 SFAB Main Board meeting and welcomed the SFAB's advice and input to the project. After some deliberations on how to participate, Christopher Bos, a SFAB Main Board member who had participated in Parks Canada's Southern Strait of Georgia proposed National Marine Conservation Area feasibility study, was approved to represent the SFAB interests on the Human Use Data Working Group (HUWG). Chris was subsequently nominated by the HUWG to sit on the BCMCA Project Team as well.

The BCMCA had identified the CRIMS data as the best available spatial data to represent the sportfish sector. Following input from the SFAB, the BCMCA recognized that the CRIMS data needed to be updated if they were to be utilized in the BCMCA products. The SFAB's main concerns were the age of the data, that the original data had not been reviewed by the angling community and that the information appeared to contain gaps and errors. The BCMCA Project Team agreed to fund a review and update of the sport fishing maps.

2.2 Consultation Approach

To ensure all sport fishing stakeholders were properly consulted on the mapping project, the BCMCA Project Team worked within the SFAB advisory process. Once the SFAB executive approval had been given, the BCMCA Project Team engaged Christopher Bos as mapping project coordinator to approach all the coastal Sport Fishing Advisory Board Committees in order to update the historic sport fishing maps. The mapping consultation was timed to link with the SFAB fall and winter local committee meetings. Local SFAB committees based in the interior of the province where no tidal water fishing occurs were not consulted. Additionally, Parks Canada had recently completed extensive mapping of sport fishing in the southern Gulf Islands (Duncan, Sidney and Victoria areas) and were willing to contribute these data sets so there were no interactive mapping meetings organized for those areas.

The mapping project coordinator gave presentations to 19 local and regional SFAB committee meetings in late 2008 and early 2009 (See Appendix 1). The local SFAB committee chairpersons were contacted in order to align the BCMCA sport fishing mapping project presentation with their fall/winter meeting schedule.

Each meeting followed a similar process: An introduction to the BCMCA project, a PowerPoint presentation and interactive mapping review session was scheduled for each SFAB committee meeting. The brief (10 – 15 minute) PowerPoint presentations were designed to explain why the sport fishing mapping exercise was important and described the BCMCA project. Presentations also included some basics on marine planning and how marine planning groups might utilize the final BCMCA products. Following each PowerPoint presentation there was time set aside for questions and answers.

After the mapping project coordinator answered questions, maps showing the historic sport fishing data against CHS nautical charts, prepared by BCMCA contractors, were laid out for the anglers to verify and mark changes where appropriate. There were four different chart sets for each local SFAB jurisdiction to enable updates to data illustrating fishing areas for 1) anadromous fish, 2) groundfish (primarily halibut, lingcod and rockfish), 3) crab, and 4) prawn or shrimp fishing by trap. The four categories both matched the existing datasets and best reflected the different tackle techniques used in the pursuit of sport fish species sought by tidal waters anglers.

A focus question was posed to the anglers to guide them while they reviewed and updated the local charts containing the historic fishing data: "please update and edit the charts provided to identify areas that you currently fish or have fished over the past ten years". This question was uniform to each of the four fishing categories. It was also explained to participants that the BCMCA was not seeking private GPS waypoints but rather the local areas of importance in that fishing category.

During the interactive mapping session, the anglers were encouraged to use their local knowledge to modify fishing polygons and/or add additional areas of importance on those paper charts using marker pens. Additionally, the anglers were asked to identify polygons or portions of the polygons shown on the charts where fishing does not occur or no longer occurs.

2.3 Response

The BCMCA sport fish mapping sessions were conducted as part of the regular SFAB local committee meetings and all meeting attendees were encouraged to participate in the mapping process. In general, meeting attendees actively and positively participated. However it should be noted that some anglers indicated they were suspicious about sharing their data. The suggestion was made more than once that "other government agencies" had "tricked" them into sharing their fishing data before, only to see that fishing opportunity taken away later. It was felt by some that this could happen again through the BCMCA mapping project. The response was made that the purpose for this exercise is to help craft tools for marine planning so as to help inform future marine planning exercises and that the BCMCA has no power to manage fisheries. Of the hundreds of anglers who attended the meetings very few refused to participate in the mapping process. Additional details of challenges encountered are included in Section 3. A list of the meetings held is contained in Appendix 1.

2.3 GIS and Quality Control

After all interactive mapping meetings were completed the paper charts were transferred to a BCMCA GIS contractor for transcription into digital format. Several meetings occurred between the GIS specialist and the mapping project coordinator to discuss how to correctly interpret the new hand drawn polygon information on the charts. Minor interpretation questions were resolved (example: how to reflect hand drawn fishing boundaries touching or overlapping land masses).

Data recorded on nautical charts were digitized using a "heads up procedure" with the digital nautical charts in the background. All newly mapped polygons were clipped to the Canadian Hydrological Service (CHS) high water coastline and then areas overlapping the previously mapped polygons for each recreational fishery were erased. Each newly mapped use area was attributed to the SFAB region where the data were collected. Overlaps between newly identified (2008) use areas from different workshops were not removed.

Following the completion of the work done by the GIS specialist to transcribe all the chart data, a final check was done to look for errors and omissions. The mapping project coordinator and the BCMCA Project Manager completed this checking process. Some minor transcription errors were identified and subsequently corrected.

3.0 Challenges and Limitations

Some challenges arose during the exercise to update data representing sport fishing on the BC Coast. As a result, some limitations related to the updated data must be noted:

1. Due to scheduling difficulties and funding limitations, the Kitimat and Bella Coola SFAB Committees did not get the opportunity to directly engage in the mapping project at their local meeting level. Kitimat and Bella Coola committee chairs attending the regional north coast meeting in December 2008 at Prince Rupert addressed this shortfall by participating in the mapping at that time. Furthermore, some of the members of the North Coast SFAB and Central Coast SFAB committees were familiar with fisheries in those two areas and provided some additions to the local maps that they deemed important.

2. The original consultation plan was to not only identify polygons on the charts where fishing occurred but also to rate those polygons for their relative importance. This was to be achieved by asking anglers at the meetings to place adhesive paper dots on the charts according to relative importance by area of one fishing ground over another. Interaction with local anglers at the first and second meeting led the mapping project coordinator to conclude that assigning a relative importance would provide biased results for a number of reasons:
    - If the fishing grounds for one coastal community group overlap with fishing grounds of another coastal community group, different levels of relative importance could be assigned by each group.
    - Boat size is a major factor to accessing fishing grounds. Bigger boats can range further from shore. Therefore the relative importance of one area over another is somewhat reflective of an angler's boat size.
    - Salmon fishing is not limited to one species but all five Pacific salmon (Chinook, Coho, Chum, Pink and Sockeye). Each species has different migration patterns and feeding habits and, as such, are often caught in different locations. Some fishing locations provide fishing opportunities for one specific species of salmon for only a few weeks per year as they migrate through the area. An anglers ranking of relative importance would be biased by their preference for certain species.
    - While there was good participation in the mapping exercise, participants may not be a representative sample of users when it comes to ranking importance.

    After discussion with Neil Davis, the BCMCA Human Use Project Coordinator at the time, efforts to collect information on relative importance were halted.

3. The data collected in this mapping project illustrate areas where sport fishing for anadromous fish, groundfish, crab and shrimp and prawn occur along the BC coast. Areas where sport fishing does not occur should not be inferred from lack of 'presence'; the absence of recorded sport fishing does not necessarily mean that sport fishing will not occur in that area in the future or that an area does not see current sporadic use. While these data identify where fishing occurs, additional information that would be useful in marine use planning, and that was part of the initial data collection plan for this project, was not obtained. Participants could not agree on appropriate methods to consistently rank or

illustrate frequency of use (i.e., to show how often a particular location is visited), seasonality of use, or relative importance of sites (e.g., personal value, size or amount of catch, economic value), so efforts to obtain this information ceased after the first two meetings. These limitations are documented on BCMCA sport fishing atlas facing pages and in the metadata files to alert future users of the data that these limitations exist.

4. Many of the local SFAB committee members pointed out that the mapping of important fishing grounds over the past ten years is limited by an important consideration, time. Good locations for sport fishing are dynamic: fish migration patterns and forage distribution change, resulting in what was once a great angling location no longer being good fishing. Some areas are cyclically excellent then poor. A recommendation suggesting that these fishing maps be updated on a regular basis (for example 3-5 years) was heard repeatedly at several meetings. These points are also documented on the BCMCA atlas facing pages and in the metadata files to inform future users of these data and maps.

5. On the north east coast of Haida Gwaii (the Queen Charlotte Islands) there was a commercial crab dataset mixed in with the sport fishing data on the charts. This caused some confusion during the mapping exercise. The commercial data were edited and removed from the GIS data after the consultation and recreational crabbing areas identified by the mapping project coordinator were reinstated where they overlapped with the commercial areas.

6. At the Nitinat, Port Renfrew, Cowichan local SFAB meeting a significant concern was expressed by the meeting Chairperson about the use of mapping data. The Chair, after organizing a vote of members present, advised that their committee was unwilling to participate in the exercise, and instructed the mapping project coordinator to mark their entire local jurisdiction as vitally important to sport fishing. Those instructions were noted but not followed. Instead, a subsequent meeting of several knowledgeable local anglers identified the areas of importance to sport fishing that now forms the data for that area of the coast.

7. The tidal portion of streams and rivers was not included in the mapping. These areas are defined as marine fisheries by DFO, and are some of the most heavily fished areas, particularly by families. Because these waters are important from a life cycle perspective and because they are so accessible to individuals and families there may be additional use areas in tidal waters. This represents a data gap that could be addressed in a future round of updates.

APPENDIX 1 - Table Details of Consultation for the Sport Fish Mapping Project:

LOCAL SFAB Committee	Date	Committee Chair	# of Angler Attendees	Comments
Nanaimo	08 Oct 08	Clyde Wicks	14	Accepted well – some concern expressed about future use of information to close fisheries – challenge with relative importance
Sechelt	16 Oct 08	Dave Sandford	18	Accepted well – challenge with relative importance process
Powell River	22 Oct 08	Hugh Kingwell	12	Accepted well
Port Hardy	23 Oct 08	Graeme Bull	6	Poor turn out – need to re-visit
Port Alberni	29 Oct 08	Bob Cole	18	Accepted well – some concern expressed about future use of information to close fisheries
Tahsis	01 Nov 08	Cathy Danes	11	Attendance limited - Not a good representation for Gold River area or the Area North of Tahsis (Kyouquot and Zeballos)
Campbell River	04 Nov 08	Rupert Gale	29	Unable to meet on 6 Oct 08 but LOCAL SFAB chair arranged special meeting that included Campbell River Guide Assn members
Victoria	25 Nov 08	Chris Bos	57	BCMCA project explained but no interactive mapping undertaken. Info gathered by Parks Canada NMCA feasibility study
Terrace	02 Nov 08	Tom Protheroe	17	Although inland location many local anglers fish in the ocean out of Kitimat and Prince Rupert. Presentation well received
Prince Rupert	03 Dec 08	Ken Franzen	24	Accepted well – some concern expressed about future use of information to close fisheries
Queen Charlotte Is	04 Dec 08	Urs Thomas	6	Poor turn out
SFAB North Coast	06 Nov 08	Urs Thomas	25	Accepted well – help with Kitimat and Bella Coola local maps
Vancouver	10 Nov 08	Laurie Milligan	18	Special meeting of local fishing guides and SFAB members
Tofino	16 Dec 08	Jay Mohl	8	Accepted well
Queen Charlotte Is	21 Jan 09	Martin Paish	1	Expert Review and map additions to compensate for low attend at meeting on 04 Dec 2008. M Paish is North Lodge Manager for Oak Bay Marine group
SFAB Main Board	01 Feb 09	Richmond	32	No mapping undertaken but a presentation given and an update on sport fish mapping project progress
Nitnat, Port Renfrew Cowichan	03 Mar 09	Bob Gallaugher	17	Group elected not to participate in mapping
Port Hardy	19 Mar 09	Graeme Bull	11	Accepted well
SFAB Central Coast	31 Mar 09	Mike Rough	28	Accepted well – received good input to Bella Coola area too
		Total attendance	**352**	