Fisheries
(In the Kitimat Fjord System)

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Abstract

Fisheries along BC’s north coast are hugely important in both coastal societies and the coastal ecosystem. Commercial, recreational, aboriginal and aquaculture fisheries occur in and around the Kitimat Fjord System. This Backgrounder outlines the target species, harvest methods, value, and recent landings trends for these distinct but linked fisheries.

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For each fishery, a summary and (for some) recent catch data are presented.

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**Introduction**

Most of the current vessel activity in the Gitga’at Territory can be attributed to fishing-related traffic. Fisheries activities there can be categorized as commercial, recreational (which includes commercial-recreational activities like fishing lodges), aquaculture and aboriginal fishing. All these types of fishing contribute greatly to the socio-economics of both local communities like Hartley Bay and Kitimat and also the entire province of British Columbia. In addition to their cultural importance, fisheries here, like everywhere, have a substantial trophic impact that must be taken into consideration for projects like the Bangarang.

This Backgrounder reviews the four kinds of fishery in the Kitimat Fjord System; to do so it leans heavily on the literature and data review by Watson et al. (2010), the Technical Data Report for the Northern Gateway Pipeline application, and references therein. The footnotes demonstrate how heavy this lean is. This secondary source will have to suffice until the Backgrounders are revised and fleshed out after season 2.

Catch data from 2000 to 2013 are shown for some commercial fisheries. These data were made available to the author from Canada’s Department of Fisheries and Oceans (DFO) upon his request (Data Request FISHDATA-286). Many fishery data sets did not have effort associated with their landings, but even those that did are officially “unofficial and incomplete” as far as DFO is concerned. Some holes in the data arise due to a federal privacy protection act that prohibits catch data for an area from being made public if fewer than three vessels were licensed for that fishery in that place. Like the entirety of this Backgrounder, presentations of those catch data are preliminary and will be refined in the future.

**Management Areas**
The British Columbia coast is divided into Fisheries Management Areas (FMAs). The Kitimat Fjord System (the Gitga’at Territory, Bangarang study area, and the majority of Enbridge’s Confined Channel Assessment Area) corresponds to FMA 6. To the north, between Gil Basin and the Prince Rupert area, is FMA 5. Principe Channel is included in FMA 5, which is within the Confined Channel Assessment Area.

**National Context**

For the nation of Canada, total 2008 landings by commercial fisheries were valued at $1.89 billion\(^2\). This translated to a Gross Domestic Product of $1.23 billion\(^3\). British Columbia contributes 13% of this total fishing value ($247 million)\(^4\). Commercial fishing in Canada employees approximately 85,000 Canadians\(^5\). Their fleet consists of nearly 16,000 vessels, the majority of which specialized in inshore fishing\(^6\). The average landed value per vessel was $118,176 in 2008\(^7\).

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**From DFO (2011): Canadian Fisheries Statistics 2008:**

<table>
<thead>
<tr>
<th>Fishing Fleet</th>
<th>Fishing Method</th>
<th>Management Method</th>
<th>Vessel Length</th>
<th>Number of Fish Harvesters(^1)</th>
<th>Main (directed) Species</th>
<th>Landed Value in 2008 ($m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shellfish</td>
<td>Dive, Dredge, Trawl, Trap</td>
<td>IQ, Competitive, Trap Limits</td>
<td>12' - 150'</td>
<td>739</td>
<td>Prawn, Shrimp, Geoduck, Dungeness Crab, Clam, Horse Clam, Euphausiids, Sea Urchins, Sea Cucumber, Opal Squid</td>
<td>$94m</td>
</tr>
<tr>
<td>Groundfish - Multispecies</td>
<td>Trawl, Longline</td>
<td>IQ, Competitive</td>
<td>10' - 185'</td>
<td>330</td>
<td>Groundfish (Rockfish, Longspine / Shortspine Thornyheads, Greenlings, Lingcod, Perch, Cod, Sole, Flounder, Dogfish, Pollock, Hake, Tuna)</td>
<td>$56m</td>
</tr>
<tr>
<td>Pacific Halibut</td>
<td>Longline</td>
<td>IQ</td>
<td>9' - 85'</td>
<td>425</td>
<td>Pacific Halibut</td>
<td>$31m</td>
</tr>
<tr>
<td>Sabrefish</td>
<td>Longline, Trap</td>
<td>IQ</td>
<td>23' - 117'</td>
<td>48</td>
<td>Sabrefish</td>
<td>$17m</td>
</tr>
<tr>
<td>Salmon</td>
<td>Gillnet, Purse Seine, Troll</td>
<td>Competitive</td>
<td>17' - 101'</td>
<td>1,556</td>
<td>Salmon (Sockeye, Coho, Pink, Chum, Chinook)</td>
<td>$17m</td>
</tr>
<tr>
<td>Herring</td>
<td>Purse Seine, Gillnet, Seine, Dip net</td>
<td>IQ, Competitive</td>
<td>48' - 101'</td>
<td>146</td>
<td>Herring, Herring Roe, Herring spawn on kelp</td>
<td>$16m</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$12m</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$245m</td>
</tr>
</tbody>
</table>

*The number of harvesters and crew employed for Pacific region is based upon their Fisher Registration Card (FRC) data.
Source: DFO, Pacific Region, Statistics and Licensing Units.*

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National seafood exports are valued at $3.88 billion; the most valuable exports were lobster, farmed salmon, snow crab and shrimp\(^8\). In 1990, Canada was 2\(^{nd}\) behind the US in seafood export value. Burgeoning Asian markets have pushed Canada back to 7\(^{th}\)\(^9\). Canada has been ranked by the Food and Agriculture Organization as 22\(^{nd}\) in the world in volume of fishing landings\(^{10}\). Canada’s aquaculture production is 27\(^{th}\) in the world\(^{11}\). In 2008, 56% of total Canadian fishing value came from species captured with pots (crab and lobster). In terms of volume, trawl fishing contributed 35% of total commercial catch\(^{12}\).

Canada imports $2.24 billion in marine, freshwater and aquaculture products every year. The main imported species were shrimp, lobster, wild salmon, tuna and groundfish species like cod, haddock and halibut\(^{13}\).

## Definitions

**Bunt**
The section of purse seine net that is hauled last, typically where the catch is concentrated.\(^{14}\)

**Escapement**
The number of salmon that successfully enter their ancestral spawning stream during a run.

**Finfish**
Any actual fish (as opposed to shellfish) targeted in a fishery, but often refers specifically to salmon and groundfish (like halibut).

**Fixed or static gear**
Fishing gear that is set in a stationary position, such as longlines, hooklines, handlines and gillnets.\(^{15}\)

**Hook and line**
Longlines and hooklines are considered “hook and line” gear; it is a fixed gear.\(^{16}\)

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\(^{14}\) Watson et al. 2010
\(^{15}\) Watson et al. 2010
\(^{16}\) Watson et al. 2010
\(^{17}\) www.afma.gov.au
Gill net
Monofilament netting that is either weighted to the ocean floor or set adrift. Fish are caught as they try to swim through the mesh, entangling their gills. This is considered a type of fixed gear\textsuperscript{18}.

\textbf{(Purse) Seine net}
A large fishing net with weights along the bottom edge and floats on the top, so that it hangs vertically in the water column\textsuperscript{20}.

\textsuperscript{18} Watson et al. 2010
\textsuperscript{19} www.miseagrant.umich.edu
\textsuperscript{20} Watson et al. 2010
\textsuperscript{21} www.njsscuba.net
Shellfish
Any crustacean or mollusk that is target of a fishery. So this includes shrimp, crabs, clams, geoducks, octopuses, prawn, the works.

Trawl
A strong fishing net used for dragging along the sea bottom or mid-water\textsuperscript{23}.
Commercial Fisheries

The primary species harvested in FMAs 5 and 6 include Pacific salmon, groundfish (particularly halibut), herring, prawn (and other shrimp), Dungeness crab, red sea urchin, geoduck, horse clam and octopus.25

Minor harvests also occur of black cop, red snapper, sole, lingcod, sea snails, squid, scallop, king crab, pilchard, eulachon, dogfish, Pacific (Grey) cod26.

Commercial fisheries are generally active year-round, but seasonal openings are governed by species, run timings (e.g., salmon) and abundance or spawning indices (e.g. prawn).27

Salmon

In FMAs 5 and 6, all five species of Pacific salmon (chum, coho, pink, chum, sockeye, Chinook) are targeted, but pink are the most abundantly harvested species28.

In Kitimat Arm a salmon hatchery (established 1977) releases approximately 11 million fish of five salmonid species (Chinook, coho, chum, steelhead, and cutthroat)29. Chinook return to the estuary between June and August, coho between August and October, chum in July and August, steelhead between March and May, and cutthroat in all months (DFO 2006a)30.

The salmon fishery is open for specified time over a 4-6 week period from mid to later summer31. The dates of salmon openings are unpredictable and are based on predicted fish abundance and the most recent available escapement information gathered by stream walkers32. All commercial fishermen must have a valid license onboard and their Fisher Identification Number (FIN) displayed33. The vessels can only fish in daylight hours (for a maximum of 16 hours per day at the start of season, decreasing to 13 hours max by the end)34.

Gill nets are primarily used for salmon fishing, but seine nets are also used. Salmon targets allocations are divided by gear type (seing (40%), gill net (38%) and troll (22%))35. In FMA6, chum are selectively targeted by gill nets; sockeye and Chinook are considered bycatch36. Between 2000 and 2008, 1,709 vessels fished for salmon in FMA6; 65% of these vessels were gill netting, 30% were purse seining, and 5.5% were trolling37. In 2008, 23 vessels were reported to be fishing in FMA638.

FMA6 experiences strong pink returns on odd-numbered years and modest returns on even-numbered years39. In FMA6, pink were the most numerically abundant species caught during odd-numbered years between 2001 and 2007. In even-numbered years chum salmon were the most numerically abundant species with the exception of 200040. Country-wide, salmon landings have declined consistently since the 1990’s41.

25 Watson et al. 2010
26 Watson et al. 2010
27 Watson et al. 2010
28 Watson et al. 2010
29 Watson et al. 2010
30 Watson et al. 2010
31 Watson et al. 2010
32 Watson et al. 2010
33 Watson et al. 2010
34 Watson et al. 2010
35 Watson et al. 2010
36 Watson et al. 2010
37 Watson et al. 2010
38 Watson et al. 2010
39 Watson et al. 2010
40 Watson et al. 2010
Total catches per species across all gear types in FMA 5 and 6.
For CPUE, effort is counted as number of days fished by all vessels in a gear type during that year.

FMA 5 Totals (all gear types)

Year

FMA 6 Totals (all gear types)

Year

Total catches per species across all gear types in FMA 5 and 6.
For CPUE, effort is counted as number of days fished by all vessels in a gear type during that year.

FMA 5. Effort by Gear Type

Year

FMA 6. Effort by Gear Type

Year

Total effort for each gear type across species in FMA 5 and 6.
Effort is counted as number of days fished by all vessels in a gear type during that year.
Catch (landings) per unit effort (days fished by all vessels in a gear type during that year) for each species, separated by gear type, in FMA 5 (left column) and 6 (right). Notice that the y axis scale changes for each species, but is the same between FMAs for a single species.
Pacific Halibut

The halibut fishery is one of the six commercial groundfisheries on the Pacific coast. Because it constitutes such a substantial component of the coastal commercial fishery, the halibut fishery is usually reported on separately from that for other groundfish.

Licensing for halibut fishing eligibilities is stringently limited and vessel-based. No halibut smaller than 81.3cm (head-on) can be retained. There are no specific gear restrictions in the halibut fishery. Hook and line and groundfish trawl are the main commercial gear types used to harvest halibut. Nearly all harvested halibut in FMAs 5 and 6 are taken with long line.

In FMA5, between 21 and 51 long line commercial vessels fished for halibut each year from 2000 to 2007. The halibut fishery in FMAs 5 and 6 contributed less than 2% to total BC landings from 2000 to 2008. FMA6 halibut fishery generates approximately 1.5x the revenue of FMA 5. 30% of FMA6 halibut catches from 2000 to 2008 came from FMA 6-10 (Campania and Caamano Sound).

Other Groundfish

Groundfish are caught by hook and line, troll and trawl fishing. From 2000 to 2008, Pacific hake was the most abundant species caught of those groundfish species in FMA6, followed by longnose skate, Pacific cod and Dover sole. Minor landings reported for this time period were canary, silvergray, yelloweye, yellowtail rockfish, Rex, English and southern rock sole, lingcod, big skate, and pollock.

Excluding the halibut fishery, the groundfish fishery in BC contributed $134 million to the landed value for all species in BC in 2007. FMA6 groundfish landings contribute less than 0.5% of total BC catches. Three times more fishing effort occurs in FMA5 than in FMA6.

Pacific Herring

Pacific herring are harvested either as roe (ripened egg masses), spawn on kelp (marine kelp fronds covered in herring eggs), or adults (“food” or “bait” herring). The Kitimat Fjord system (FMA 6) falls within the Central Coast management area for herring fisheries. This is the only forage fish fishery active in FMAs 5 and 6. Fisheries for other forage fish species that occur in the area are summarized in the “Forage Fish” backgrounder.

Roe

Roe are harvested with seine and gill nets. The roe fishery opens between mid-March and mid-April, dates depend upon roe maturity and estimates of optimum yield quality reached. Test vessels conduct pre-fishery sampling to inform opening and closing dates. Closures are often implemented for areas within the

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42 Watson et al. 2010
43 Watson et al. 2010
44 Watson et al. 2010
45 Watson et al. 2010
46 Watson et al. 2010
47 Watson et al. 2010
48 Watson et al. 2010
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58 Watson et al. 2010
59 Watson et al. 2010
60 Watson et al. 2010
Central Coast management area. Between 1999 and 2003, FMA 6 harvest totals represented 13% of the total British Columbia total.

**Spawn-on-Kelp**
To harvest spawn-on-kelp (SOK), fronds are suspending on lines prior to periods of spawning. The same management areas as the roe fishery are used. There is a limit of 8 tons per license. Spawn-on-kelp landings in FMA 6 contributed between 0% and 7% of total catches between 1998 and 2008.

**Food and Bait**
Adult herring are caught with either purse seine or drift net. The food and bait fishery occurs during the winter months from November to February. Only a few subareas in FMA5 are open. There is no adult herring fishery in FMA 6. Country-wide herring landings have declined consistently since the 1990’s.

![Graph](image)

*Food and bait herring catches (tonnes), 2000-2013, for FMA 5 Section 52 only. Catch refers to the winter at the beginning of its respective year (e.g., the year 2000 data point refers to catches during the 1999-2000 winter fishery). Effort data was not made available to this author.*

**Dungeness Crab**
Dungeness crab (*Metacarcinus magister*) is the most important crab species commercially harvested in British Columbia. The crabs are caught using traps or ring nets. FMA6 (the Kitimat Fjord System) is within Area B of the Dungeness Crab management area (there are 7 such areas for the BC coast). Between 3 and 22 commercial vessels per year trapped for Dungeness between 1998 and 2008. FMA6 catches contribute less than 1% of BC-wide catches. There is twice as much fishing effort in FMA 5.

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61 Watson et al. 2010  
62 Watson et al. 2010  
63 Watson et al. 2010  
64 Watson et al. 2010  
65 Watson et al. 2010  
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67 Watson et al. 2010  
68 Watson et al. 2010  
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73 Watson et al. 2010  
74 Watson et al. 2010  
75 Watson et al. 2010  
76 Watson et al. 2010
Prawn

The BC commercial shrimp fishery targets seven species, of which prawn (*Pandalus platyceros*) is the largest\(^{77}\). In FMA6, prawn are caught in trawls and in traps deployed on long lines set in 100 – 150m depths\(^{78}\). Openings generally occur between mid-May and mid-July\(^{79}\). Between 6 and 47 vessels fished for prawn each year in FMA6 from 1998 - 2008\(^{80}\). The FMA6 prawn fishery contributes less than 2% to total BC prawn landings\(^{81}\). Japan is the largest consumer of BC prawns (the country purchases 95% of BC’s catch)\(^{82}\).

![Prawn Trap CPUE](image1)

**Prawn Trap CPUE**

![Prawn Trawl CPUE](image2)

**Prawn Trawl CPUE**

*Trawl data were infrequent for FMA6, and a proper line could not be drawn. Effort here is defined as the number of licenses issued.*

Shrimp (other than Prawn)

The other six species of shrimp harvested in BC (all of genus *Pandalus*) are usually targeted with trawl fishing, but trap methods are also used\(^{83}\). FMA6 is within shrimp management areas 6IN (for “inshore”) and 6OFF (for “offshore”)\(^{84}\). Shrimp openings typically occur in early summer (near June)\(^{85}\). Two to 23 vessels per year fished for shrimp in FMA6 between 1998 and 2008\(^{86}\). The FMA6 shrimp landings contributed less than 1% to total BC catches\(^{87}\).

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\(^{77}\) Watson et al. 2010  
\(^{78}\) Watson et al. 2010  
\(^{79}\) Watson et al. 2010  
\(^{80}\) Watson et al. 2010  
\(^{81}\) Watson et al. 2010  
\(^{82}\) Watson et al. 2010  
\(^{83}\) Watson et al. 2010  
\(^{84}\) Watson et al. 2010  
\(^{85}\) Watson et al. 2010  
\(^{86}\) Watson et al. 2010  
\(^{87}\) Watson et al. 2010
Geoduck

The enormous geoduck (pron. “gooey-duck”) clam (Panopea abrupta) occurs from Alaska to the Gulf of California in the northeastern Pacific Ocean and is one of the longest-lived animals in the world. (100+ years, spawning entire life)\(^8\). Geoduck are harvested by divers with high-pressure water hoses with a nozzle (“stinger”) that loosens the substrate around the clam, allowing the geoduck to be extracted alive (but alarmed). FMA6 falls within the North Coast geoduck management area (there are 3 such areas)\(^9\). The geoduck fishery is typically open year-round, but populations are monitored for biotoxin levels and shortfalls and closures are implemented accordingly\(^10\). As of 2009, there are no permanent closures of geoduck fisheries in FMAs 5 or 6. There is no minimum size for geoduck harvest\(^9\). Between 0 and 61 vessels per year harvested geoduck in FMA6 between 1998 and 2008\(^9\).

Landings are greatest in FMA-13 (west coast of Aristazabal and Rennison Islands)\(^9\). FMA6 geoduck harvests contributed between 8 and 23% of provincial landings from 1998 to 2008\(^9\). Most geoduck landings are exported to Asian markets\(^9\).

An incidental fishery for horse clam is open only when the geoduck fishery is open\(^6\).

Red Sea Urchin

The red sea urchin (Strongylocentrotus franciscanus) fishery is one of three urchin fisheries open in BC\(^7\). Red sea urchings are harvested by SCUBA divers\(^9\). FMA 5 and 6 fall within the north coast urchin management area (one of 4 such areas)\(^9\). Some subareas of FMA5 are subject to permanent closure. Openings are briefs and occur in mid-summer\(^10\). The number of vessels harvesting sea urchins in FMA6 has declined from 293 in 1998 to 78 in 2008.\(^10\). FMA 6- 13 (west coast of Aristazabal and Rennison Islands) provides the majority of catches\(^10\). Landings from FMA6 contributed between 20% to >60% of provincial landings from 1998 to 2008\(^10\).

\(^{88}\) Watson et al. 2010
\(^{89}\) Watson et al. 2010
\(^{90}\) Watson et al. 2010
\(^{91}\) Watson et al. 2010
\(^{92}\) Watson et al. 2010
\(^{93}\) Watson et al. 2010
\(^{94}\) Watson et al. 2010
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\(^{97}\) Watson et al. 2010
\(^{98}\) Watson et al. 2010
\(^{99}\) Watson et al. 2010
\(^{100}\) Watson et al. 2010
\(^{101}\) Watson et al. 2010
\(^{102}\) Watson et al. 2010
\(^{103}\) Watson et al. 2010
Giant Sea cucumber

The giant sea cucumber (*Parastichopus californicus*) is hand-picked by SCUBA divers\(^{104}\). FMAs 5 and 6 fall within the North Coast urchin management area (of which there are 4 for sea cucumber)\(^{105}\). Openings are typically from early October to late November\(^{106}\). Landings in FMA6 contributed from 18% to 42% of provincial total from 1998 to 2008 (three times that of FMA5)\(^{107}\). Harvest rates have been constant or have increased in response to higher demand\(^{108}\). Most of the harvested cucumbers are exported to Asian markets\(^{109}\).

Giant Pacific Octopus

Giant Pacific octopus (*Octopus dofleini*) are actively hand-harvested by Scuba divers. Weapons or traps can’t be used\(^{110}\). All harvesting must take place 3m below the low tide level. The minimum size is 2kg\(^{111}\). The species is also accidentally by-caught in trawls and traps. FMAs 5 and 6 fall within octopus management sub-areas 1 to 10 of Area C (North Coast)\(^{112}\). FMA6 usually contributes a small percentage to provincial landings, but in 2000 FMA6 landings accounted for 85% of the provincial total\(^{113}\).

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\(^{104}\) Watson et al. 2010  
\(^{105}\) Watson et al. 2010  
\(^{106}\) Watson et al. 2010  
\(^{107}\) Watson et al. 2010  
\(^{108}\) Watson et al. 2010  
\(^{109}\) Watson et al. 2010  
\(^{110}\) Watson et al. 2010  
\(^{111}\) Watson et al. 2010  
\(^{112}\) Watson et al. 2010  
\(^{113}\) Watson et al. 2010
Recreational Fisheries

The population of adult recreational fishers in Canada continues to age. Anglers in 2011 contributed $2.5 billion to the Canadian economy in expenditures directly related to their fishing activities (primarily transportation, food and lodging). The sport of fishing is clearly important to Canada.

All recreational marine fishers in Canada (children too) must purchase and carry with them a “Tidal Waters Sport Fishing Licence” ($22.26 for a Canadian adult resident; children under 16, no cost; $107.06 for an international resident). In addition, fishers wishing to retain caught salmon must purchase a “Salmon Conservation Stamp” ($6.36).

In addition to solo anglers, there is a commercial-recreational fishery that consists of outfitters, charters and lodges. These are an important component of local tourism industries during their months of operation, which are generally from May to September and coincide with summer fair weather and salmon runs. As of 2009 there were six fishing lodges located in FMA 6, but this author knows that at least one of those has closed (King Pacific Lodge). He knows of two lodges currently operational within the Bayangarang study area: West Coast Resorts, whose lodge is located in Barnard Harbor from May to July, and North King Lodge, whose headquarters is on the northwest tip of Aristazabal Island near Parker Passage.

Salmon is the main focus for recreational fishing in FMA 6. The three primary tidal recreational salmonid species are chinook, coho and pink salmon. Popular salmon fishing spots in Douglas Channel include Sue Channel (Grant point and areas around Loretta and Devastation Channels) and Money Point. A heavier concentration of recreational fishing occurs during salmon runs in Kitimat Arm.

In the waterways of Gil Basin, the long distance to marinas keeps recreational fishing efforts low although fish habitat in many areas is ideal. As a result up to 90% of all recreational fishing activity within FMA 6 occurs in the Douglas Channel area. Recreational fishing efforts are relatively low in FMA-5. However, remotely located lodges give anglers access to these incredible fishing grounds. Area residents and lodge managers indicate that commercial-recreational fishing boats focus their efforts in the following areas: Kitimat Arm, Douglas Channel, Caamaño Sound, Principe Channel, Estevan Sound, Squally Channel, Nepean Sound, Browning Entrance, Wright Sound, Campania Sound, Otter Channel and Lewis Passage. Popular salmon spots in close proximity to the lodges include Alexander Islands, and Fawcett and York Points.

Other than salmon, the top targeted fish species are halibut and rockfish, primarily caught by trolling and jigging. Other targeted species include sea bass, ling cod, crabs and prawn. Gardner Canal is better for prawn and crab fishing than for salmon fishing. There are permanent closures to recreational fishing in both FMA 5 and 6 for sixgill shark, sturgeon, abalone, all clam species, geoduck, blue mussels, California mussels, Olympia oyster, Pacific oyster, and scallops. There is also an ongoing temporary closure for eulachon.

Aquaculture

On the British Columbia coast, aquaculture occurs for Pacific salmon, Atlantic salmon, shellfish and marine plants like kelp. Sablefish, sturgeon and tilapia are farmed on a much smaller scale. British Columbia dominates Canadian aquaculture production, accounting for over half of the country’s total\textsuperscript{132}. BC aquaculture production produced $428.9 million from finfish and shellfish in 2008. Canada exports 85\% of its aquaculture yield\textsuperscript{133}.

Salmon aquaculture is the greatest contributor (~$300 million), the province’s largest agricultural export, and a significant employer on the BC coast (2,000 jobs)\textsuperscript{134}. The first finfish farm was established in BC in 1971; by 1989 there were 135. The most common species farmed are Atlantic salmon, chinook and coho\textsuperscript{135}. The most commonly cultured shellfish species include Pacific oysters (\textit{Crassostrea gigas}), manila clams (\textit{Venerupis philippinarum}) and gallo mussels (\textit{Mytilus galloprovincialis}).

No salmon aquaculture operations occur in FMA6 and three occur in FMA5. Six more salmon operations occur just to the south of the FMA6 boundary. No shellfish farm occurs in FMA6 either, and one operates northern FMA5. There is no kelp farm in or near FMA 6 either.\textsuperscript{136}

\textsuperscript{134} Watson et al. 2010
\textsuperscript{135} Watson et al. 2010
\textsuperscript{136} Watson et al. 2010
Aquaculture sites (“tenures”) on the coast are distributed according to habitat characteristics. Salmon fisheries occur in relatively deep waters, but shellfish farms occur in shallow and sheltered waters\textsuperscript{137}.

**Aboriginal Fisheries**

Eight First Nations and one Band use the tidal water fisheries resources occurring within FMAs 5 and 6\textsuperscript{138}. These include Aboriginal groups that use tidal water fisheries resources within the FMA5 and 6 include Gitga’at Nation, Gitxaala Nation, Haisla Nation, Kitasoo/XaiXais Nation, Kitsumkalum Band, Kitselas First Nation, Lak-Kw’alaams First Nation, Metlakatla First Nation.

Gitga’at historically used and still use a variety of marine resources found within FMA6: seaweed and other marine plants, salmon, halibut, octopus, herring, cod, abalone, crab, clams, mussels, sea cucumbers, and small marine mammals. Among these, salmon and halibut stand out as the staple fish of Gitga’at culture and way of life\textsuperscript{139}. For more information about Gitga’at marine use and culture, see the Backgrounders, “The Giga’at & Other Coastal First Nations” and “Natural History of the Gitga’at Territory.”

In 1992, Department of Fisheries and Oceans launched the Aboriginal Fisheries Strategy (AFS) to affirm that the right of Aboriginal to fish for food, social and ceremonial (FSC) purposes was secondary only to resource conservation and other “valid legislative objectives”\textsuperscript{140}

**Fisheries & Northern Gateway**

The Technical Data Report (TDR) for Enbridge’s 2010 application to the National Energy Board for the Northern Gateway Project was compiled by Triton Environmental Consultants LTD and Jacques Whitford AXYS\textsuperscript{141}. The report was a literature and data summary; no field work was conducted.

Based on this TDR, Enbridge selected eulachon, Pacific herring, rockfish and chum salmon as Key Indicators in their self-assessment. The primary potential environmental effect Enbridge identified was acoustic disturbance\textsuperscript{142}. Herring in particular may be sensitive to the noise frequencies produced by intense tanker traffic. Enbridge concludes that underwater noise from vessel-related traffic will not substantially impact fishes in the Confined Channel Assessment Area. Other possible impacts include vessel wake, but the potential impacts are considered negligible\textsuperscript{143}.

**Literature Cited**

Enbridge. 2010. Volume 8B: Environmental and Socio-Economic Assessment (ESA) – Marine Transportation. Enbridge Northern Gateway Project Sec. 52 Application

\textsuperscript{137} Watson et al. 2010
\textsuperscript{138} Watson et al. 2010
\textsuperscript{139} www.gitgaat.net
\textsuperscript{140} DFO 2008a, 2008b, 2008c in Watson et al. 2010
\textsuperscript{141} Watson et al. 2010
\textsuperscript{142} Enbridge 2010.
\textsuperscript{143} Enbridge 2010.