Marine Fish and Fish Habitat Technical Data Report

Proposed Aurora LNG Project

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EXECUTIVE SUMMARY

Aurora LNG is proposing to construct and operate the Aurora LNG Project (the Project), a liquefied natural gas (LNG) processing and storage facility and marine terminal, on Digby Island near Prince Rupert, British Columbia (BC). Construction, operations, and decommissioning of the proposed Project have the potential to affect marine fish and fish habitats, which have cultural, ecological, and economic importance in BC. This Technical Data Report (TDR) provides a summary of information on the presence, abundance, and distribution of marine fish and fish habitats in the local assessment area (LAA) and regional assessment area (RAA) for the Project.

Information characterizing existing conditions for marine fish and fish habitats in the LAA and RAA was collected through desktop and field-based studies. The desktop study collected information from publicly available scientific literature, government reports, and spatial data, as well as Traditional Ecological Knowledge from publicly available sources for Lax Kw'alaams Band, Metlakatla First Nation, Gitxaala Nation, Kitsumkalum First Nation, Kitselas First Nation, Gitga'at First Nation, and the Métis Nation BC. The field-based studies were designed to supplement information compiled during the desktop study, and to collect site-specific information on marine fish and fish habitats in areas potentially affected by the Project. Four types of field-based studies were completed by Stantec Consulting Ltd. (Stantec) between 2014 and 2016 within the LAA: intertidal surveys; subtidal remotely operated vehicle (ROV) surveys; an eelgrass survey; and marine fish surveys. Data collected during the marine fish surveys complemented information on marine fish collected by Triton Environmental Consultants Ltd. (Triton) in 2014 and 2015. Data collected during each survey were grouped into four study areas specific to where the marine environment could potentially be affected by Project infrastructure and activities: Casey Cove, East Digby Island, South Digby Island, and Delusion Bay. While Stantec field crews were conducting the eelgrass and May marine fish field surveys, information on crabs was also collected, primarily to support the human health risk assessment. Crab trapping efforts and catch are summarized in this TDR; results of the human health risk assessment can be found in the Human Health TDR, Appendix R of the Application.

Marine vegetation, algae, and invertebrates inhabiting the intertidal zone of the LAA were assessed during a series of intertidal surveys conducted in July 2014, September 2014, and August 2015. Survey areas were sampled using transects and quadrats during the best available low tide series; transects were positioned haphazardly to capture the diversity of habitat types with each study area (i.e., to avoid missing rare or patchy habitats within each study area, as can occur by random sampling). Algae, vegetation, invertebrates, and fish inhabiting the subtidal zone of the LAA were surveyed in July 2014, September 2014, and October 2015 using a ROV flown along pre-determined transects oriented perpendicular to shore. A survey was conducted in August 2015 to assess the presence and extent of eelgrass (*Zostera marina*) coverage within the intertidal and subtidal zones using a combination of hydroacoustics and on-foot delineation. The distribution and abundance of marine fish in nearshore waters of the LAA was assessed in October 2015, February 2016, and May 2016 using beach seining and tangle netting.

The proposed Project is located in lower Chatham Sound, a highly productive area that supports a variety of marine fish (including numerous species of commercial, recreational, and Aboriginal [CRA] importance) and fish habitats. Chatham Sound has been designated an Ecologically and Biologically Significant Area (EBSA) in part because it is an area of particularly high primary productivity due to tidal mixing. The Chatham Sound EBSA is biologically important because it encompasses a major spawning area for

Pacific herring (*Clupea pallasii*), supports dense aggregations of green sea urchins (*Strongylocentrotus droebachiensis*) and Dungeness crabs (*Metacarcinus magister*), has a high diversity of shrimp species (Family Hippolytidae), and supports concentrations of humpback whales (*Megaptera novaeangliae*), northern resident killer whales (*Orcinus orca*), and northern fur seals (*Callorhinus ursinus*).

The RAA overlaps with Fisheries and Oceans Canada (DFO) "Important Areas" (IAs) for Pacific herring, pollock (*Pollachius* spp.), eulachon (*Thaleichthys Pacificus*), Dungeness crab, tanner crab (*Chionoecetes bairdi*), shrimp and prawn (*Pandalus* spp.), and green urchin. The RAA also encompasses two Rockfish Conservation Areas (RCAs), namely Hodgson Reefs and Gull Rocks (north and south), as well as Pacific herring spawning habitat. Within the LAA, surf smelt (*Hypomesus pretiosus*) spawning habitat has been documented in the Prince Rupert harbour from the inner coast of Digby Island to the mainland.

Four fish species listed on Schedule 1 of the *Species at Risk Act* (SARA) have the potential to occur within the RAA: bluntnose sixgill shark (*Hexanchus griseus*), green sturgeon (*Acipenser medirostris*), tope (*Galeorhinus galeus*), and rougheye rockfish (*Sebastes aleuntianus*). Northern abalone (*Haliotis kamtschatkana*) is the only SARA listed marine invertebrate species with potential to occur in the RAA. A variety of fish and invertebrate species targeted by CRA fisheries occur within the LAA and RAA, including Pacific salmon (*Oncorhynchus* spp.), eulachon, Pacific herring, flatfish, molluscs (e.g., clams and scallops), crustaceans (e.g., shrimp, prawns, and crabs), and echinoderms (e.g., sea cucumbers and sea urchins).

The intertidal and subtidal zones of Casey Cove are primarily comprised of soft bottom substrate with some areas of hard substrate (e.g., gravel and cobble and shell). Vacant buildings are present in the backshore and other anthropogenic debris such as cables is present in the intertidal and subtidal zone. Two small freshwater streams drain into the cove. Riparian vegetation bordering the shoreline consists of a primarily coniferous overstory, with an understory of shrubs, sedges, terrestrial grasses, and mosses. The intertidal and subtidal zones support various species of marine vegetation and algae including native eelgrass and understory and canopy-forming kelps. A relatively dense, continuous eelgrass bed was recorded on the western side of the bay and a narrow patch was recorded along the south shore. Marine organisms such as snails, shore crabs (*Hemigrapsus* spp.), barnacles (Class Maxillopoda), and clams (Class Bivalvia) were observed in the intertidal zone while species such as giant California sea cucumber (*Parastichopus californicus*), scallop (Family Pectinidae), red urchin (*Strongylocentrotus franciscanus*), Dungeness crabs, rockfish (*Sebastes* spp.), flatfish, and lingcod (*Ophiodon elongates)* were observed by ROV in the subtidal zone. Beach seine catches in Casey Cove included juveniles belonging to all five species of Pacific salmon, surf smelt, Pacific herring, starry flounder (*Platichthys stellatus*), and unidentified larval fish (a grouping that could possibly include eulachon, as well as other Osmerids), among others. Individuals captured by tangle net included shiner perch and Pacific staghorn sculpin.

Intertidal substrates along East Digby Island are primarily a mixture of soft bottom (e.g., sand and mud), gravel and cobble, with some areas of large woody debris. The subtidal zone is primarily composed of cobble and gravel substrate with varying amounts of shell material. The riparian vegetation consists of similar species to those recorded in Casey Cove; however, a stream located at Philips Point and another stream located north of Philips Point are bordered by skunk cabbage and sedges. Various species of marine vegetation and algae were observed in the intertidal and subtidal zones, including native eelgrass and understory and canopy-forming kelps. Eelgrass beds were recorded in areas north of Philips Point and between Philips Point and Frederick Point. Limpets (*Lottia* spp., *Onchidella borealis)*, snails, and barnacles (*Balanus glandula*, *Chthamalus dalli, Semibalanus cariosus)* were observed in the intertidal zone and siphon holes were visible in many areas surveyed. Pandalus shrimp, tanner crab, Dungeness crab, red urchin, scallop, and flatfish were observed by ROV in the subtidal zone. Marine fish species observed in beach seine catches included juveniles belonging to all five species of Pacific salmon, starry flounder, and unidentified larval fish (a grouping that could possibly include eulachon, as well as other Osmerids), among others. Species captured by tangle net included rock sole.

Substrate composition in the intertidal zone of South Digby Island varies according to the geographic location. In most areas surveyed, the mid and high intertidal zones are composed primarily of bedrock whereas the low intertidal zone is composed of a mixture of sand, gravel, and/or boulder. The small islets located south of Digby Island are predominantly bedrock, with minimal amounts of sand, mud, and shell in the low intertidal zone. The subtidal zone is primarily composed of soft bottom substrate; however, rocky substrate (e.g., boulder, bedrock, cobble and gravel) is present in some areas, such as the nearshore waters around the small islets (i.e., Spire, Tuck, and Metford Islands). The backshore riparian vegetation is consistent with that observed in Casey Cove; however, black lichen was present in the high intertidal zone on all transects surveyed. Numerous species of marine vegetation and algae were observed in the intertidal and subtidal zones of South Digby Island, including native eelgrass, surfgrass (*Phyllospadix* spp.), and understory and canopy-forming kelps. A mosaic of small and larger eelgrass beds, as well as eelgrass patches of varying density, are located at South Digby Island. Kelp was present throughout South Digby Island and relatively large bull kelp beds were identified in the waters between the southern shoreline of Digby Island and the small islets (i.e., Tuck and Spire Islands). Limpets, snails, barnacles, clams, and cockles (mostly *Clinocardium sp.*) were observed in the intertidal zone and siphon holes were visible in many areas surveyed. Dungeness crab, tanner crab, spot prawn (*Pandalus platyceros*), *Pandalus* shrimp, scallop, urchin, sea cucumber, as well as rockfish, big skate (*Raja binoculata*), Pacific cod (*Gadus macrocephalus*), and flatfish, were observed by ROV in the subtidal zone. Marine fish species observed in beach seine catches included juveniles belonging to all five species of Pacific salmon, surf smelt, Pacific herring, starry flounder, Dolly Varden (*Salvelinus malma*), and unidentified larval fish (a grouping that could possibly include eulachon, as well as other Osmerids), among others. Three species were captured by tangle net: shiner perch, rock sole, and English sole.

Delusion Bay has primarily mudflat habitat with gravel, cobble and boulder present in some areas. A stream bisects the bay and eventually drains into waters off the southern shore of Digby Island. Riparian vegetation in the supralittoral zone consists primarily of a coniferous overstory, with an understory of shrubs, sedges, terrestrial grasses, and mosses. From the mouth of Delusion Bay, and extending northward for 3.5 km along both sides of the bay, lies estuarine meadow habitat. Marine vegetation, including native eelgrass and beaked widgeongrass (*Ruppia maritima*) was observed in Delusion Bay. A continuous, dense eelgrass bed was recorded at the mouth of the bay and individual beds with sparse patches were observed throughout the bay. Snails and barnacles were observed on the transects surveyed and worms, clams, and unidentified bivalves were excavated from soft sediment habitats. Shiner perch (*Cymatogaster aggregata*), flatfish, and sculpin (Family Cottidae) were captured by beach seine, and pink salmon (*O. gorbuscha*) carcasses as well as a live cutthroat trout (*O. clarkii*) were incidentally observed at the head of Delusion Bay. Marine fish species observed in beach seine catches included juveniles belonging to all five species of Pacific salmon, as well as surf smelt, starry flounder, Dolly Varden, and unidentified larval fish (a grouping that could possibly include eulachon, as well as other Osmerids), among others. Species captured by tangle net included starry flounder.

The results of the field-based studies, combined with the information obtained through the desktop review, provide a characterization of marine fish and fish habitats within the LAA, and a general characterization of marine fish and fish habitats within the RAA. The information presented in this TDR will be used to support the assessment of potential Project effects on marine fish and fish habitat, as well as an application for a section 35(2)(b) *Fisheries Act* Authorization for residual serious harm to fish, if needed.

ACRONYMS AND ABBREVIATIONS

BC EAO	British Columbia Environmental Assessment Office
BC MCA	British Columbia Marine Conservation Analysis
BC MFLNRO	British Columbia Ministry of Forests, Lands and Natural Resource Operations
BC MOE	British Columbia Ministry of Environment
BC	British Columbia
CDC	Conservation Data Centre
CEA Agency	Canadian Environmental Assessment Agency
cm	centimetres
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPUE	catch per unit effort
CRA	commercial, recreational and Aboriginal
CRIMS	Coastal Resource Information Management System
DFO	Fisheries and Oceans Canada
DGPS	differential global positioning system
EAC	Environmental Assessment Certificate
EBSA	Ecologically and Biologically Significant Area
EBSCO	Elton B. Stephans Company Information Services
FAA	*Fisheries Act* Authorization
Gitxaala	Gitxaala Nation
GPS	global positioning system
HHWMT	higher high water, mean tide mark
IA	Important Area
IDW	inverse distance-weighted
IQR	interquartile range
Khtada	Environmental Services LP
Kitselas	Kitselas First Nation
Kitsumkalum	Kitsumkalum First Nation
km	kilometres
LAA	Local Assessment Area
Lax Kw'alaams	Lax Kw'alaams Band
LNG Canada	LNG Canada Development Ltd.
LNG	liquefied natural gas
m	metre
Métis	Métis Nation BC

Metlakatla	Metlakatla First Nation
MLLW	mean lowest low water level
mm	millimetres
MOF	material offloading facility
NOAA	US National Oceanic and Atmospheric Administration
PDA	Project Development Area
PNCIMA	Pacific North Coast Integrated Management Area
PNW LNG	Pacific Northwest LNG
RAA	regional assessment area
RCA	Rockfish Conservation Area
ROV	remotely operated vehicle
SARA	*Species at Risk Act*
SCC	Skagit Systems Cooperative
SD	standard deviation
Stantec	Stantec Consulting Ltd.
TDR	Technical Data Report
the Project	Aurora LNG Project
the Project	the Aurora LNG Project
TK	Traditional Ecological Knowledge
Triton	Triton Environmental Consultants Ltd.
TU	Traditional Land Use
WQG	Water Quality Guideline

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1 INTRODUCTION

Aurora LNG is proposing to construct and operate the Aurora LNG Project (the Project), a liquefied natural gas (LNG) processing and storage facility and marine terminal, on Digby Island near Prince Rupert, British Columbia (BC). Activities associated with construction, operations, and decommissioning of the proposed Project have the potential to adversely affect marine fish through changes in fish mortality, changes in fish behavior, changes in fish health, or changes to marine fish habitat used for spawning, rearing, feeding, or migration.

This Technical Data Report (TDR) presents information on existing conditions for marine fish and fish habitats within the marine fish and fish habitat local assessment area (LAA) and regional assessment area (RAA). The purpose of the TDR is to support the Project's Application for an Environmental Assessment Certificate (EAC) (the Application) and the Project's application for a section 35(2)(b) *Fisheries Act* Authorization (FAA) (including the associated habitat offsetting plan). Information on existing conditions focuses on marine fish that are part of, or support, commercial, recreational, and Aboriginal (CRA) fisheries[1], marine fish species at risk, traditional use marine fish species, marine vegetation (which includes marine riparian vegetation and seagrass), and algae. Marine fish are defined in the *Fisheries Act* as including: (a) parts of fish, (b) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and (c) the eggs, sperm, spawn, larvae, spat, and juvenile stages of fish, shellfish, crustaceans, and marine animals. Although the definition of fish includes marine mammals, these are not discussed in this TDR. Information on existing conditions for marine mammals in the Project's Marine Mammal LAA and RAA is provided in the Marine Mammals TDR (Stantec 2016).

Information on existing conditions was collected through a combination of desktop and field-based studies. Desktop studies compiled information from publicly-available literature and spatial datasets to describe marine fish and fish habitats within the RAA and, if information was available, within the LAA. Information provided by Aboriginal Groups and through available public sources was reviewed to identify marine fish species and areas considered important to the continued practice of Aboriginal rights by the Aboriginal Groups identified for consultation in relation to the Project.

Four types of field-based studies were conducted within the LAA to address knowledge gaps and collect site-specific information in areas potentially affected by the Project: intertidal surveys; subtidal remotely operated vehicle (ROV) surveys; eelgrass surveys; and marine fish surveys. Crab trapping was also conducted between 2014 and 2016. The results of these surveys will support the assessment of potential Project effects on marine fish and fish habitat, as well as an application for a section 35(2)(b) *Fisheries Act* Authorization for residual serious harm to fish, if needed.

[1] Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries are interpreted to be those fish that fall within the scope of applicable federal or provincial fisheries regulations as well as those that can be fished by Aboriginal organizations or their members for food, social or ceremonial purposes or for purposes set out in a land claims agreement.

2 ASSESSMENT AREAS

Information on existing conditions for marine fish and fish habitat is presented in the context of the marine fish and fish habitat LAA and RAA.

The LAA represents the area within which Project specific effects are expected to occur. The LAA includes four parts (see Figure 1):

- Area within a 500 m buffer around the project development area (PDA[2])
- Area within 500 m on either side of the centreline of the shipping route from the marine terminal to the Triple Island pilot boarding station
- One nautical mile diameter boundary of the previously-used disposal at sea site at Brown Passage
- Areas where total suspended solids levels during dredging and disposal at sea are expected to exceed water quality guidelines (WQGs) for the protection of aquatic life (Canadian Council of Ministers of the Environment 1999)

The RAA represents the area that establishes the context for determination of significance of Project specific effects and is the area within which potential cumulative effects are assessed. The RAA is largely bounded by the area defined as the Skeena River Estuary but also includes marine waters out to the Triple Island pilot boarding station (see Figure 1). The boundaries of the Skeena River Estuary were developed by the Pacific Salmon Foundation under the Skeena Salmon Program (Pacific Salmon Foundation 2013).

[2] The PDA is the Project's footprint and includes terrestrial and marine areas that will be developed to accommodate the LNG facility and marine terminal.

3 TRADITIONAL KNOWLEDGE

Traditional Knowledge (TK) is recognized as being complementary to western knowledge, especially when establishing existing environmental conditions, evaluating potential environmental effects, and designing mitigation strategies or offsetting plans (Canadian Environmental Assessment Agency [CEA Agency] 2013). Consequently, available TK information held by Aboriginal Groups identified under the Section 11 Order issued for this Project has been integrated into this TDR.

For the purpose of this TDR, TK includes both spatial and non-spatial information and is defined as a cumulative and dynamic body of knowledge and beliefs, transmitted through generations of cultural transmission, about the interrelationship between living organisms, people, and their environment that is held by, and unique to, Aboriginal peoples (Berkes 1993; Lewis 2012; CEA Agency 2013). Spatial elements of TK include (but are not restricted to) species distribution, migration routes, locations of culturally and ecologically significant species, wildlife features, and habitats (Lewis 2012). Non-spatial TK include (but is not restricted to) taxonomic identification, information pertaining to community ecology, animal behavior, and natural phenomena (Lewis 2012).

3.1 Sources

Information on TK related to marine fish and fish habitat was acquired from publicly available sources (e.g., academic papers and sources related to other environmental assessments for similar projects in the region such as Pacific NorthWest LNG Project [PNW LNG] and LNG Canada Project) and Project specific TK/traditional use (TU) studies available at the time of writing, including: DM Cultural Services Ltd. and Metlakatla Stewardship Society (DMCS and MSS) (2016), Calliou Group (2016), Gitga'at First Nation (Inglis Consulting Services 2016), Kitsumkalum First Nation (2016), Pulla (2015), and Métis Nation BC (2015). Aurora LNG anticipates receiving Project specific TU information from Lax Kw'alaams Band during the application review period for the environmental assessment; however, this information was not available at the time of writing.

3.2 Findings

Marine fish, invertebrates, and algae identified as traditionally harvested and/or of cultural importance within the LAA and RAA are summarized in Table 1 and Table 2. Additional species may be traditionally harvested and may be of cultural importance (i.e., the list is not exhaustive).

Table 1 Marine Fish Identified by Aboriginal Groups as Traditionally Harvested and/or of Cultural Importance within the LAA and RAA

Fish	Lax Kw'alaams Band	Metlakatla First Nation	Gitxaala Nation	Kitsumkalum First Nation	Kitselas First Nation	Gitga'at First Nation	Métis Nation BC
Pelagic fish							
dogfish				✓			
eulachon	✓	✓		✓	✓	✓	
Pacific herring	✓	✓	✓	✓	✓	✓	✓
Pacific salmon	✓	✓	✓	✓	✓	✓	✓
Pacific sardine				✓			
smelt	✓						
steelhead trout		✓	✓	✓			
sturgeon				✓			
Benthic fish							
bottom fish	✓	✓					
cod	✓	✓	✓	✓		✓	✓
black cod	✓	✓	✓	✓	✓	✓	
grey cod		✓			✓		
rock cod		✓	✓		✓	✓	
devilfish				✓			
eel				✓			
flatfish							✓
flounder		✓		✓	✓	✓	
greenling	✓					✓	
halibut	✓	✓	✓	✓	✓	✓	
hake						✓	
lingcod	✓	✓	✓	✓		✓	
rockfish	✓	✓	✓	✓	✓	✓	
red snapper	✓	✓	✓	✓	✓		
snapper		✓	✓			✓	
sculpin				✓			
sablefish	✓	✓				✓	
sole				✓	✓	✓	

SOURCES:

Lax Kw'alaams Band (2004); BC Environmental Assessment Office (BC EAO) (2008); Kitsumkalum Indian Band (2012); Satterfield et al. (2012); Kitsumkalum Indian Band (2013); Crossroads (2014); LNG Canada (2014); PNW LNG (2014a); PNW LNG (2014b); Métis Nation BC (2015); Pulla (2015); Calliou Group (2016); DMCS and MSS (2016); Inglis Consulting Services (2014); Kitsumkalum First Nation (2016).

Table 2 Marine Invertebrates, Marine Plants, and Algae Identified by Aboriginal Groups as Traditionally Harvested and/or of Cultural Importance within the LAA and RAA

Invertebrate	Lax Kw'alaams Band	Metlakatla First Nation	Gitxaala Nation	Kitsumkalum First Nation	Kitselas First Nation	Gitga'at First Nation	Métis Nation BC
Molluscs							
abalone	✓	✓	✓	✓	✓	✓	
china hats		✓					
china slippers		✓	✓	✓			
chiton		✓	✓	✓	✓	✓	
clams	✓	✓	✓	✓	✓	✓	✓
cockles	✓	✓	✓	✓	✓	✓	
cuttlefish				✓			
geoduck	✓	✓	✓				
mussels	✓	✓	✓	✓	✓	✓	✓
octopus	✓	✓	✓	✓	✓	✓	
oyster							✓
periwinkle		✓					
rock scallops		✓				✓	
rock oysters					✓		
sea prunes		✓	✓	✓	✓		
scallops			✓	✓		✓	
shellfish				✓	✓	✓	
squid	✓		✓				
Crustaceans							
barnacle				✓	✓		
crabs	✓	✓	✓	✓	✓	✓	✓
crustaceans		✓			✓		
prawns	✓	✓	✓	✓		✓	✓
shrimp	✓	✓	✓	✓		✓	✓
Echinoderm							
sea cucumbers	✓	✓	✓	✓	✓	✓	
sea urchins	✓	✓	✓	✓	✓	✓	
shellfish	✓				✓		
Algae and Marine Plants							
kelp		✓	✓	✓	✓	✓	
seaweed	✓	✓	✓	✓	✓	✓	
seagrass	✓	✓					

SOURCES:

Lax Kw'alaams First Nation (2004); BC EAO (2008); Kitsumkalum Indian Band (2012); Satterfield et al. (2012); Kitsumkalum Indian Band (2013); Crossroads (2014); LNG Canada (2014); PNW LNG (2014a); PNW LNG (2014b); Métis Nation BC (2015); Pulla (2015); Calliou Group (2016); DMCS and MSS (2016); Inglis Consulting Services (2014); Kitsumkalum First Nation (2016).

A variety of benthic and pelagic fish known to occur within the LAA and RAA are traditionally harvested and/or considered culturally important by Metlakatla First Nation, including Pacific salmon (*Oncorhynchus* spp.), eulachon (*Thaleichthys pacificus*), Pacific herring (*Clupea pallasii*), rockfish (*Sebastes* spp.), cod, and sole (Family Pleuronectidae) (see Table 1; DMCS and MSS 2016). A variety of invertebrates, including nearshore, shallow species (e.g., limpets), and more offshore, deeper species (e.g., octopus), are also traditionally harvested for food, social and ceremonial purposes, or are culturally important. Algae and marine plants (i.e., seaweeds, kelp, and eelgrass [*Zostera* spp.]), are gathered for food, social, or ceremonial purposes, especially to collect roe during the herring spawning season (see Table 2; DMCS and MSS 2016). The area encompassed by the LAA and RAA is generally considered a culturally and spiritually sensitive area for the Metlakatla First Nation people. For example, marine waters between Digby Island and Kaien Island (located immediately east of Digby Island) are considered among the main Sockeye salmon drifts and salmon fishing areas, whereas waters near Triple Island pilot boarding station are identified as significant seafood harvesting and fishing areas (DMCS and MSS 2016).

Lax Kw'alaams Band traditionally harvests both pelagic and benthic marine fish (e.g., salmon, eulachon, cod), invertebrates (crabs, shrimp, cockles), and seaweed from areas located within the LAA and RAA (Lax Kw'alaams Band 2004; BC EAO 2008; LNG Canada 2014; PNW LNG 2014b; Table 1 and Table 2). General areas identified as good fishing areas include the waters around Lelu Island, Pearse Island, Bernie Island, Melville Island, Work Channel, Steamboat Pass, and the Skeena River (PNW LNG 2014b; Lax Kw'alaams Band 2004).

Gitxaala Nation traditionally harvests benthic and pelagic fish within the LAA and RAA, such as halibut, Pacific salmon, cod, snapper and rockfish, and invertebrates such as mussels, crabs, prawns, octopus, and squid. Herring-roe-on-kelp is harvested by Gitxaala Nation, along with various types of seaweed (see Table 1 and Table 2). Harvesting for marine fish and invertebrates occurs throughout the LAA and RAA, such as in Casey Cove and south of Digby Island (e.g., for halibut [*Hippoglossus stenolepis*] and crab), off the west coast of Digby Island and south of Lima Point (e.g., for Pacific salmon), and from Parizeau Point to the entrance of Dodge Cove (e.g., for rock cod and sea prunes). Harvesting for seaweeds (e.g., kelp) occurs in areas such as west of the Kinahan Islands (located south of Digby Island). Based on Calliou Group (2016), eelgrass is not harvested by Gitxaala Nation; however, many individuals cite eelgrass as being an important plant for fish species, especially juvenile salmon (Calliou Group 2016).

Kitsumkalum First Nation traditionally harvests marine fish (e.g., salmon, halibut, and eulachon), invertebrates (crabs, china hats) and algae (referred to as seaweed) in areas encompassed by the LAA and RAA (Kitsumkalum First Nation 2016; Kitsumkalum Indian Band 2012; Kitsumkalum Indian Band 2013; Crossroads 2014; PNW LNG 2014b; Table 1 and Table 2;). Geographic areas emphasized as being important to Kitsumkalum First Nation include Hecate Strait, Chatham Sound, and the Skeena River. In particular, herring eggs are harvested around Stephens Island (Kitsumkalum Indian Band 2012).

Kitselas First Nation traditionally harvests, and/or considers a variety of benthic and pelagic fish as culturally important, including cod, eulachon, flounder, halibut, Pacific herring and Pacific salmon (see Table 1; Pulla 2015). A variety of invertebrates, including molluscs (e.g., clams) and crustaceans (e.g., barnacles), are also traditionally harvested for food, social, and ceremonial purposes, or are culturally important. Algae, such as seaweeds and kelp, and marine plants are gathered for food, social, or ceremonial purposes, especially to collect roe during the herring spawning season (see Table 2; Pulla 2015). Harvesting areas within the LAA and RAA, include the waters between Digby Island and Kaien

Island (for harvesting halibut), areas north of Digby Island (for harvesting Pacific herring and cod), and waters around Digby Island (for commercial salmon fishing), among others (Pulla 2015).

Gitga'at First Nation traditionally harvests, and/or considers a variety of benthic and pelagic fish as culturally important, including eulachon, Pacific herring, Pacific salmon, cod, flounder, and snapper (see Table 1). A variety of invertebrates, including abalone, clams, rock scallops, octopus, sea urchins, and sea cucumbers are also traditionally harvested for food, social and ceremonial purposes, or are culturally important (see Table 2). Algae, such as seaweeds and kelp, and marine plants are gathered for food, social, or ceremonial purposes, especially to collect roe during the herring spawning season. Areas used for harvesting marine fish, invertebrates, and algae within the LAA and RAA include around the southeast end of Digby Island (e.g., for harvesting clams, mussels, and cockles), western side of Digby Island (e.g., for harvesting herring eggs), and at the mouth of the Skeena River (e.g., for harvesting halibut and Pacific salmon) (Satterfield et al. 2012; Inglis Consulting Services 2016).

Species traditionally harvested by the Métis Nation BC include pelagic (e.g., Pacific herring and Pacific salmon) and benthic (e.g., cod and flatfish) fish and marine invertebrates (e.g., crab, clams, and mussels). Algae or marine plants were not referenced as being harvested in Métis Nation BC (2015); however, this does not indicate that Métis Nation does not harvest them. Marine harvesting locations within the LAA and RAA include Dodge Cove (clam harvesting), Casey Cove, and Delusion Bay (crab harvesting), and waters around Digby Island, Prince Rupert Harbour, and south of Kaien Island between the Kinahan Islands (Pacific salmon harvesting), among others (Métis Nation BC 2015).

More detailed information pertaining to marine resource harvesting by Aboriginal Groups and potential Project-related effects are available in the Aboriginal Consultation Section of the Application (see Section 12.0 in the Application).

4 LITERATURE REVIEW AND PREVIOUS INVESTIGATIONS

4.1 Sources

Publicly available scientific literature, government reports, and spatial data were reviewed to characterize marine fish and marine fish habitats in the LAA and RAA. A section describing geographic and oceanographic conditions is included to provide a regional context for the marine environment within and around the RAA.

The following key sources of information on existing conditions were reviewed:

- Fisheries and Oceans Canada (DFO) WAVES online catalogue: http://waves-vagues.dfo-mpo.gc.ca/waves-vagues/
- DFO Canadian Science Advisory Secretariat publications: http://www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm
- DFO Mapster v3: http://www.pac.dfo-mpo.gc.ca/gis-sig/maps-cartes-eng.htm
- Environment Canada publications
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessments and status reports: http://www.cosewic.gc.ca
- Species at Risk Public Registry: http://www.sararegistry.gc.ca
- Government of British Columbia publications
- BC Coastal Resource Information Management System (CRIMS): http://geobc.gov.bc.ca/coastal/index.htm
- BC Species and Ecosystems Explorer: http://www.env.gov.bc.ca/atrisk/toolintro.html
- BC Conservation Data Centre (BC CDC): http://a100.gov.bc.ca/pub/eswp/
- BC Marine Conservation Analysis (BC MCA): http://bcmca.ca/
- US National Oceanic and Atmospheric Administration (NOAA) publications
- Science Direct and Elton B. Stephans Company Information Services (EBSCO) host research databases
- Peer-reviewed literature

4.2 Findings

4.2.1 Physical Geography and Oceanography

The proposed Project is located in lower Chatham Sound; an area characterized by numerous rocky inlets, straits, passes, sounds, and narrows that have been sculpted by several glacial and weathering events over the last million years (Thomson 1981). Two glacially formed rivers, the Skeena and the Nass, annually discharge large amounts of freshwater and sediment into Chatham Sound, contributing to the well-defined estuarine environment in the area.

The Skeena River is located approximately 30 km southeast of the Project and drains a basin area of 54,400 km^2 (Benke and Cushing 2009). The river discharges large amounts of freshwater that mixes with the salt water of Chatham Sound and flows out as a layer of brackish water (up to 10–20 m thick in some areas during spring freshet). The influence of freshwater is most prevalent in the late spring and summer during the spring freshet, and again in the fall as precipitation increases (Thomson 1981; Akenhead 1992). Due to the large amount of sediment discharged into the marine environment, the Skeena River forms the second largest delta in BC, which extends 30 km west into Chatham Sound (Thomson 1981). Extensive mudflats and shallow intertidal passages exist in the lower reaches of the Skeena River, formed as a result of the suspended sediments and prevailing currents (Ocean Ecology 2014). The Nass River, which reaches Chatham Sound through Portland Inlet, drains approximately 18,500 km^2 of land (BC Ministry of Environment [BC MOE] 1986). The mouth of Portland Inlet is located approximately 42 km northeast of the Project.

Tides in southern Chatham Sound are semidiurnal, with mean tidal amplitude of 4.9 m (Akenhead 1992; Stucchi and Orr 1993; Cretney et al. 2002). As the tide passes through the shallow (45 m depth) and narrow (600 m wide) channel between Digby Island and Kaien Island, tidal currents can reach up to 3 knots (Akenhead 1992; Stucchi and Orr 1993). Swift tidal streams (horizontal currents associated with the tides) can also develop and, together with wind and changes in salinity linked to freshwater runoff, create non-tidal currents (e.g., jets and eddies) that can cause variations in circulation that are independent of the tidal cycle (Thomson 1981). In the summer, currents are influenced by northwest winds, resulting in weak ocean upwelling (Akenhead 1992; Cummins and Haigh 2010). In the winter, currents are driven by southeast winds, resulting in strong downwelling (Akenhead 1992; Cummins and Haigh 2010).

Water temperature and salinity in Chatham Sound vary both regionally and seasonally and are primarily driven by changes in the amount of sunlight, precipitation, and freshwater runoff (Thomson 1981). Salinity ranges annually within Chatham Sound and has been recorded between 20% and 25% (in the Prince Rupert harbor) and between 14% and 20% (during freshet along the eastern shore of Chatham Sound) (Stucchi and Orr 1993).

4.2.2 Marine Fish Habitat

The combination of tidal mixing, non-tidal currents, and winds brings nutrient-rich deep ocean water to the surface and makes Chatham Sound a highly productive area that supports a variety of marine fish habitats (Whitney et al. 2005; Pacific North Coast Integrated Management Area [PNCIMA] 2011). Within the RAA, marine fish habitat[3] can be grouped into the following categories: marine riparian habitat, intertidal habitat, subtidal habitat, estuaries and salt marshes, and kelp and eelgrass beds (Jamieson and Davies 2004; Lucas et al. 2007). Motile and sessile species, from fish to crabs to clams, rely on these habitats for food, shelter, protection from predators, and for nursing/rearing purposes (Jamieson and Davies 2004). Marine habitats also provide important ecological services such as carbon sequestration and nutrient recycling (Plummer et al. 2013).

4.2.2.1 Marine Riparian Habitat

Marine riparian habitat is located at the intersection between the marine and terrestrial environments and is an area that is exposed to tidal action that may experience temporary, frequent, or seasonal inundation. This habitat supports salt-tolerant plant species (mostly found at the upper limit of the intertidal zone) and/or plant species that can handle saturated soil conditions, including grasses, sedges, shrubs, and trees. Riparian areas associated with brackish water often contain Lyngbye's sedge (*Carex lyngbyei*) and cottonwood (*Populus balsamifera*), whereas sandy beaches with sand dunes lining the backshore are primarily dominated by dune grass (*Elymus mollis*) and shore pine (*Pinus contorta*) (Levings and Jamieson 2001). The marine riparian falls between these two boundaries:

- Seaward of the higher high water, mean tide mark (HHWMT) to the limit of salt marsh or brackish marsh vegetation or to the tidal elevation that is submerged less than 10% of the time annually
- Landward of the HHWMT to the limit of the salt spray, dune vegetation, and/or one half potential tree height or 30 m linear distance, whichever is greater (Levings and Jamieson 2001).

Adult and juvenile fish use marine riparian habitat to fulfill lifecycle requirements, from foraging to rearing and spawning (Brennan and Culverwell 2005; Brennan et al. 2009). For example, insects captured by the wind as "wind fall" from riparian vegetation are an important food source for juvenile salmon and trout (Brennan and Culverwell 2005). Leaf litter stimulates marine plankton growth and large woody debris provides shelter for small fish and invertebrates (Levings and Jamieson 2001). Non-vegetated beach substrates are also considered marine riparian habitat and can support surf smelt (*Hypomesus pretiosus*) and sand lance (*Ammodytes hexapterus*) populations during spawning and incubation (Levings and Jamieson 2001). Marine riparian habitat stabilizes the bank and reduces soil erosion that could lead to poor water quality conditions (Levings and Jamieson 2001; Brennan and Culverwell 2005).

[3] Fish habitat is defined under the *Fisheries Act* as "spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly to carry out their life processes."

4.2.2.2 Marine Intertidal Habitat

Marine intertidal habitat exists in the zone between high tide and low tide and experiences daily submersion and exposure (Kozloff 1973; Carefoot 1977; Dethier 1990; Schoch and Dethier 1996). This zone supports algae, invertebrates, and fish that have adapted to survive periods of desiccation, submersion, and high levels of predation (Kozloff 1973). Within the intertidal zone, the spatial distribution of a species is primarily influenced by physical factors (e.g., substrate type, slope, elevation, wave exposure) and biological factors (e.g., predation, competition, recruitment), resulting in some species being concentrated in distinct areas (Kozloff 1973; Carefoot 1977; Seliskar and Gallagher 1983; Schoch and Dethier 1996). For example, species in the upper limits of the intertidal zone must be able to withstand extreme changes in temperature, wave action, and sunlight, while species inhabiting the lower limits must be able to handle frequent submersion (Connel 1972; Carefoot 1977).

Based on data from the BC Shorezone Mapping System (BC Ministry of Forests, Lands and Natural Resource Operations [BC MFLNRO] 2005), rock, sand, and gravel beach is the most common shoreline type in the RAA, while sand flat is the most common shoreline type in the LAA (see Table 3; Figure 2).

Table 3 Length and Relative Abundance of Shoreline Types in the LAA and RAA

Shore Type	RAA		LAA	
	Length (km)	Relative Abundance (%)	Length (km)	Relative Abundance (%)
No Data[a]	134	8	0	0
Channel	0	0	0	0
Estuary, Marsh or Lagoon	52	3	0	0
Gravel Beach	15	1	0	0
Gravel Flat	4	0	0	0
Man-made	5	0	0	0
Mud Flat	42	2	0	0
Rock Cliff	113	6	0	0
Rock Platform	3	0	0	0
Rock with Gravel Beach	311	17	<1	2
Rock with Sand Beach	49	3	0	0
Rock, Sand and Gravel Beach	525	29	2	14
Sand and Gravel Beach	61	3	1	7
Sand and Gravel Flat	78	4	0	0
Sand Beach	10	1	0	0
Sand Flat	384	22	11	77
Total	**1,786**	**100**	**14**	**100**

NOTES:
Data obtained from BC MFLNRO (2005)
[a] Lengths of shoreline for which there are no data on the types of shoreline present

In the RAA, slightly more than half (55%) of the total shoreline length is composed of rock-dominated substrate (see Table 3; BC MFLNRO 2005). In the LAA, rocky substrates are more limited, accounting for only 16% of the total shoreline length (see Table 3; BC MFLNRO 2005). Rocky shoreline habitats support a diverse assemblage of epifaunal organisms (i.e., organisms living on the seafloor). This includes a variety of tough, sessile, or slow moving species such as barnacles (*Chthamalus dalli*, *Balanus glandula*, and *Semibalanus cariosus*), mussels (*Mytilus* spp.), periwinkles (*Littorina* spp., *Nucella* spp.), limpets (*Lottia* spp.), isopods (*Idotea wosnesenskii*), and chitons (*Mopalia* spp., *Tonicella* spp.) (Kozloff 1973; Dethier 1990). Rocky shores often support rich algal communities that may include numerous species of green, brown, and red algae, as well as habitat forming kelps such as bull kelp (*Nereocystis luetkeana*) and giant kelp (*Macrocystis integrifolia*) (Kozloff 1973).

Sandy habitats are present within the LAA and RAA (see Table 3). In the LAA, over three-quarters (84%) of the shoreline consists of sandy substrate (see Table 3; BC MFLNRO 2005). In the RAA, sandy substrates account for slightly less than one-third (30%) of the total shoreline length (see Table 3; BC MFLNRO 2005). Sandy habitats are composed of fine particulates and support infaunal communities (i.e., organisms living interstitially within the seafloor sediments) (Kozloff 1973). These communities are often dominated by suspension feeders (bivalve molluscs such as cockles, clams, mysids, and polychaetes) and deposit feeders (*Macoma* spp.) (Kozloff 1973). Eelgrass is a common seagrass associated with soft substrates and is found in numerous beds distributed throughout the LAA and RAA (BC MCA 2010a) (see Section 4.2.2.4; Figure 3). Red, green, and brown algae are generally sparse in soft sediment habitats due to a lack of anchorage sites, but can sometimes be found in small patches or mats.

4.2.2.3 Marine Subtidal Habitat

Marine subtidal habitat extends from the mean lowest low water (MLLW) level for spring tides to the abyssal plain (greater than 1,000 m) (Williams 1993; Jamieson and Davies 2004). Factors such as seabed topography, roughness, sediment type and distribution, grain size and shape, patchiness, rock composition, and sediment thickness influence the composition of subtidal habitat (Levings et al. 1983; Fader et al. 1998; Todd and Kostyley 2010). Additional oceanographic factors such as oxygen saturation, temperature variability, water stratification, and chlorophyll-*a* concentrations may also influence subtidal habitat characteristics (Todd and Kostyley 2010).

Subtidal habitat along the coast of BC has been described by the BC Marine Conservation Analysis using benthic descriptors (e.g., muddy depression) (BC MCA 2010b). The descriptors take into account three factors: landscape features to describe the terrain of the seafloor (depressions, slopes, flats and ridges); depth (0–20 m; 20–50 m; 50–200 m and greater than 200 m); and substrate (e.g., hard, mud, sand, undefined).

Based on the benthic class descriptors, subtidal benthic habitat in the RAA is relatively homogenous and consists primarily of soft substrates (i.e., sand, silt and mud; Figure 4) ranging from 50 to 200 m depth (BC MCA 2010b; DFO 2013a). There is a limited amount of hard substrate in the RAA (21%) and in the LAA (36%) (see Table 4). Areas of hard or rocky substrate (i.e., boulder, bedrock, or cobble) provide complex habitat that supports diverse assemblages of marine organisms. The interstitial spaces in rocky habitat offer refuge and foraging habitat for myriad marine fish and invertebrates including species of CRA importance (e.g., rockfish, lingcod [*Ophiodon elongates*], and Pacific salmon) (Buckley and Hueckel 1985, Hueckel et al. 1989). Furthermore, the hard substrate provides an attachment surface for marine invertebrates and algae and can therefore support diverse assemblages of kelp. Areas of soft sediment habitat, although limited in structural complexity, provides refuge for organisms that live on (e.g., crabs and flat fish) or in (e.g., infaunal organisms such as clams or polychaetes) the substrate. This type of habitat also provides a medium in which marine vegetation, such as eelgrass, can grow. Eelgrass beds provide habitat for a variety of fish and invertebrates including Pacific salmon, Pacific herring, and Dungeness crab (*Metacarcinus magister*) (Simenstad and Fresh 1995; Holsman et al. 2006; Penttila 2007; Plummer et al. 2013).

Table 4 Area and Relative Abundance of Subtidal Benthic Classes in the LAA and RAA

Benthic Class	RAA		LAA	
	Area (ha)	Relative Abundance (%)	Area (ha)	Relative Abundance (%)
No data*	16,444	9	16	<1
Hard Flat	27,110	14	911	15
Hard Depression	6,798	4	936	16
Hard Slope	1,095	1	85	1
Hard Ridge	4,217	2	222	4
Muddy Flat	79,575	42	3,016	50
Muddy Depression	23,331	12	662	11
Muddy Slope	3,890	2	68	1
Muddy Ridge	8,317	4	82	1
Sandy Flat	11,772	6	0	0
Sandy Depression	3,579	2	0	0
Sandy Slope	359	0	0	0
Sandy Ridge	1,512	1	0	0
Total	**187,998**	**100**	**5,998**	**100**

NOTES:

Data obtained from BC MCA (2010b).

[a] Areas where there are no data available on the type of benthic substrate present

4.2.2.4 Estuarine Marsh and Meadow

Habitat located in the mid and high intertidal zones that contains vascular plants can be separated into two categories: estuarine marsh (or salt marsh) and estuarine meadow. An estuarine marsh is defined as an area that occurs in the middle to upper intertidal zones that floods diurnally with tidal waters and has communities dominated by salt-tolerant emergent graminoids and succulents (MacKenzie and Moran 2004). An estuarine meadow is defined as an area that occurs in the high intertidal and supralittoral zones, where tidal flooding may not occur with daily tidal cycles, and has a more diverse vegetation community dominated by graminoids such as grasses, sedges, and forbs (MacKenzie and Moran 2004). Estuarine marshes and meadows play an important role in primary productivity, provide habitat for various infaunal and intertidal species, and provide nursery habitat for various fish species. These habitats contribute to sediment stabilization and are able to store and filter nutrients from the environment.

Estuarine wetlands such as salt marshes and meadows are present within the LAA and RAA. Data from the BC Shorezone Mapping System (BC MFLNRO 2005) identifies salt marsh habitat along 52 km of shoreline within the RAA (see Table 3). Although regional data do not identify salt marsh habitat within the LAA, Project specific field surveys conducted in April and August 2014 identified fringing salt marsh at Miller Point and extensive estuarine meadows at Delusion Bay on Digby Island (Triton 2014). The high salt marsh at Miller Point covers the supralittoral zone and extends from the upper limit of the intertidal zone back to the tree line in an area approximately 30 m long by 20 to 40 m wide. The substrate in this area is bedrock, boulder, and cobble with an organic soil veneer as growing medium (Triton 2014). This salt marsh transitions into an estuarine meadow as it bends around the mouth of Delusion Bay and the gradient decreases. The meadow runs north along both sides of Delusion Bay for approximately 3.5 km and ranges in width from 10 to 30 m (Triton 2014). The following species were identified during a survey of the salt marsh and estuarine meadow habitat: sedges (*Carex* spp.), tussock grass (*Deschampsia* spp.), rushes (*Juncus* spp.), dune grass (*Leymus mollis*), sea plantain (*Plantago maritima*), seabench sandwort (*Triglochin maritima*), sea milk-wort (*Glaux maritima*), seabeach sandwort (*Honkenya peploides*), silverweed (*Potentilla anserina*) and Douglas' aster (*Aster subspicatus*) (Triton 2014).

A narrow strip of salt marsh habitat has also been identified in a small bay located north of Philips Point on Digby Island. A second salt marsh, covering an area of approximately 500 m^2 is located in a bay west of Frederick Point (Triton 2014).

4.2.2.5 Eelgrass and Kelp

EELGRASS

Eelgrass (*Zostera* spp.) is a submerged marine vascular plant that is widely distributed in temperate coastal environments throughout the northern hemisphere (Granger et al. 2002). Eelgrass grows via underground rhizomes primarily in silty sand or sandy silt areas with less than 5% organic matter (Simenstad and Fresh 1995; Koch 2001; Granger et al. 2002). Eelgrass typically grows in sheltered bays, estuaries, and lagoons, and can extend from the intertidal zone into the subtidal zone up to 10 m depth (Precision Identification Biological Consultants 2002). Native eelgrass (*Z. marina*) and the introduced dwarf eelgrass (*Z. japonica*) are the two species that occur along the north Pacific coast (Moore and Short 2006). Dwarf eelgrass is typically found higher in the intertidal zone (Moore and Short 2006).

The majority of shoreline within the LAA (76%) has been identified as an eelgrass bioband based on the BC Shorezone Mapping System (BC MCA 2010a; Figure 3). Eelgrass biobands are areas where eelgrass has been previously observed, and are rated as either patchy (less than 50% of a shore unit) or continuous (greater than 50% of a shore unit) (BC MCA 2010a). Eelgrass beds represent valuable habitat for a variety of fish and invertebrate species (Plummer et al. 2013). For example, juvenile Pacific salmon are known to rear and forage in eelgrass beds, which support important prey species such as harpacticoid copepods, gammarid amphipods, and cumaceans (Blackmon et al. 2006; Semmens 2008; Weitkamp et al. 2014). Pacific herring use eelgrass as spawning substrate (Penttila 2007) and young-of-year Dungeness crabs can use eelgrass beds for rearing (Simenstad and Fresh 1995; Holsman et al. 2006). Eelgrass also provides food for a variety of birds, including herbivorous birds that feed directly on the blades, seeds, and associated epibenthos, and bald eagles that feed on the salmon that rear in the eelgrass beds (Nelson and Waaland 1997; Plummer et al. 2013). In addition to providing rearing, foraging, and refuge habitat for a variety of marine species, eelgrass beds also provide a number of ecosystem functions, including primary and secondary production, nutrient and carbon sequestration, and erosion control through sediment stabilization (Phillips 1984; Orth et al. 2006; Plummer et al. 2013).

KELP

Kelps dominate the shallow subtidal rocky habitat of most temperate coastal waters and often grow in multilayered assemblages referred to as kelp forests (Duggins et al. 1990). Similar to forests on land, kelp forests are tiered and consist of understory and canopy forming species. Along the eastern Pacific coast, kelp canopies are dominated by bull kelp and giant kelp, while stipitate and prostrate kelps (e.g., Laminariales) form the understory layer (Lucas et al. 2007). Kelps grow on hard substrate (e.g., shell, cobble, boulder, bedrock) in nearshore waters from 40 m depth to the low intertidal zone and prefer nutrient-rich waters that are cool and clear to allow light penetration (Duggins et al. 1990). Bull kelp is known to inhabit areas up to 20 m depth and giant kelp up to 30 m depth in the Pacific Northwest (Lamb and Hanby 2005).

Kelp forests are highly productive and dynamic ecosystems that offer structurally complex habitat for a variety of marine organisms including CRA fish species such as Pacific salmon, Pacific herring, rockfish and lingcod (Cass et al. 1990; Jamieson and Davies 2004; Lucas et al. 2007; Yamanaka and Logan 2010; DFO 2011a; DFO 2014a). Forage fish (e.g., surf smelt and Pacific sand lance [*Ammodytes hexapterus*]), sea urchins (*Strongylocentrotus* spp.) and sea otters (*Enhydra lutris*) also utilize kelp beds as foraging, spawning, and refuge habitat. Kelp forests serve as nursey habitats for juvenile fish by offering food and protection from predators (Lucas et al. 2007).

Within the RAA, kelp is known to inhabit rocky shallow subtidal areas (0 m to 18 m depth; Dayton 1985; PNCIMA 2011). Available data do not identify the species of kelp found within the LAA; however, the RAA includes bull kelp, giant kelp, and areas of mixed and undefined kelp (see Figure 3).

4.2.3 Marine Fish

A total of 409 species of marine fish have been documented in the coastal and offshore waters of BC, many of which occur within the LAA and RAA (Hart 1973; Klinkenberg 2014). A number of these species are targeted by CRA fisheries including, but not limited to, Pacific salmon, eulachon, rockfish, Pacific herring, and Pacific halibut.

The LAA lies within the Chatham Sound Ecologically and Biologically Significant Area (EBSA) (Clarke and Jamieson 2006a). An EBSA is considered an area worthy of enhanced management or risk aversion based on the presence of unique physiographic and oceanographic features and ecologically important communities (Clarke and Jamieson 2006a). Chatham Sound was identified as an EBSA in part because it is an area of particularly high primary productivity due to tidal mixing (Clarke and Jamieson 2006a). The Chatham Sound EBSA is biologically important because it encompasses a major spawning area for Pacific herring, supports dense aggregations of green sea urchins (*Strongylocentrotus droebachiensis)* and Dungeness crabs, has a high diversity of shrimp species, and supports concentrations of humpback whales *(Megaptera novaeangliae)*, northern resident killer whales (*Orcinus orca*), and fur seals (*Callorhinus ursinus)* (Clarke and Jamieson 2006a).

The RAA overlaps with DFO “Important Areas” (IA) for Pacific herring, Pollock (*Pollachius* spp.), and eulachon (Clarke and Jamieson 2006b, DFO 2013a; Figure 5). The IA for Pacific herring also overlaps with the LAA. These species-specific areas were ranked by scientific experts as having high importance in the context of three primary dimensions: uniqueness, aggregation, and fitness consequence (Clarke and Jamieson 2006b). At this time, identification of an area as an IA does not confer any legislative or regulatory protection.

Two Rockfish Conservation Areas (RCAs) are located within the RAA: Hodgson Reefs and Gull Rocks (north and south) (DFO 2006; Figure 6). These RCAs are part of a larger network of 164 RCAs established by DFO in 2002 to alleviate rockfish population declines (DFO 2006; Yamanaka and Logan 2010). RCAs prohibit mortality of rockfish associated with recreational and commercial fisheries (DFO 2006; Yamanaka and Logan 2010). Along with catch restrictions, fishery monitoring, and stock assessment programs, RCAs are intended to promote the recovery of depleted rockfish populations along the BC coast (Yamanaka and Logan 2010).

Within the RAA, Pacific herring spawning has been documented in intertidal and shallow subtidal habitats in the surrounding waters of Port Simpson, Dundas Island, Prince Rupert, North Porcher Island, and Banks Island (Hay and McCarter 2012; Figure 6). While inter-annual variation in spawning locations may occur, the general spawning areas remain relatively consistent from year to year (Hay 1985). Spawning areas shown on Figure 6 are based on cumulative data for spawning events from 1933 to 1997 (not including 1951-1952 and 1955-1964 as data are not available for those years).

Within the LAA, surf smelt spawning habitat has been documented in the Prince Rupert harbour from inside Digby Island to the mainland (Therriault et al. 2002). Adult surf smelt spawn in the upper intertidal zone on beaches with a mixture of fine to coarse gravel (1-7 mm in diameter). Spawning can occur in the summer, winter, or year round, and the timing depends on the population. The Prince Rupert population spawns during the spring between mid-February and April (Therriault et al. 2002). Information on the individual beaches used by surf smelt for spawning in the Prince Rupert area is unavailable at the current time.

Twelve marine fish species of conservation concern have the potential to occur within the RAA (see Table 5). Of these, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has classified one as endangered (bocaccio rockfish [*Sebastes paucispinis*]), three as threatened (canary rockfish [*Sebastes pinniger*], quillback rockfish [*Sebastes maliger*] and yellowmouth rockfish [*Sebastes reedi*]) and eight as special concern (bluntnose sixgill shark [*Hexanchus griseus*], darkblotched rockfish [*Sebastes crameri*], eulachon, green sturgeon [*Acipenser medirostris*], tope [*Galeorhinus galeus*], North Pacific spiny dogfish [*Squalus suckleyi*], rougheye rockfish [*Sebastes aleuntianus*] and yelloweye rockfish [*Sebastes ruberrimus*]) (BC CDC 2014). Four species are listed under Schedule 1 of the federal *Species at Risk Act* (SARA) as special concern (bluntnose sixgill shark, green sturgeon, tope, and rougheye rockfish) (BC CDC 2014). In BC, eulachon is Blue listed and green sturgeon is Red listed (BC CDC 2014).

Table 5 Marine Fish Species of Conservation Concern Potentially Occurring within the RAA

Common Name	Scientific Name	Provincial Status[1]	SARA Status[1]	COSEWIC Status[1]
Bluntnose sixgill shark	*Hexanchus griseus*	no status	Schedule 1 *special concern*	*special concern*
Bocaccio	*Sebastes paucispinis*	no status	no status	*endangered*
Canary rockfish	*Sebastes pinniger*	no status	no status	*threatened*
Darkblotched rockfish	*Sebastes crameri*	no status	no status	*special concern*
Eulachon (Nass/Skeena River population)	*Thaleichthys pacificus*	Blue	no status	*special concern*

Table 5 Marine Fish Species of Conservation Concern Potentially Occurring within the RAA

Common Name	Scientific Name	Provincial Status[1]	SARA Status[1]	COSEWIC Status[1]
Green sturgeon	*Acipenser medirostris*	Red	Schedule 1 *special concern*	*special concern*
Tope	*Galeorhinus galeus*	no status	Schedule 1 *special concern*	*special concern*
North Pacific spiny dogfish	*Squalus suckleyi*	no status	no status	*special concern*
Quillback rockfish	*Sebastes maliger*	no status	no status	*threatened*
Rougheye rockfish	*Sebastes aleuntianus*	no status	Schedule 1 *special concern*	*special concern*
Yelloweye rockfish (Pacific Ocean outside waters population)	*Sebastes ruberrimus*	no status	no status	*special concern*
Yellowmouth rockfish	*Sebastes reedi*	no status	no status	*threatened*

NOTES:
[1] Information obtained from the BC Species and Ecosystems Explorer (BC CDC 2014)

A number of marine fish species occurring within the RAA have high ecological and socio-economic importance, including Pacific salmon, eulachon, Pacific herring, and Pacific halibut. Specific life history stages that are considered to be sensitive for these species include spawner migration, spawning, and outbound juvenile migration. The timing of these periods is presented in Table 6.

Table 6 Sensitive Life History Stages of Marine Fish in the RAA

Species	Inbound Spawner Migration	Spawning Period	Peak Spawning Period	Outbound Juvenile Migration
Chinook salmon [1,2,3] (*Oncorhynchus tshawytscha*)	June-July	July-October	August-September	May-July
Pink salmon [2,4,5] (*Oncorhynchus gorbuscha*)	July-August	July-October	August	March-July
Sockeye salmon [2,5] (*Oncorhynchus nerka*)	July-October	July-October	August	March-July
Chum salmon[2,3,4] (*Oncorhynchus keta*)	July-September	September-November		March-July
Coho salmon [2,6] (*Oncorhynchus kisutch*)	July-November	August-December	November	May-July
Steelhead trout[7] (*Oncorhynchus mykiss*) summer run	May-October	April-June		June-October
Steelhead trout[7,8] (*Oncorhynchus mykiss*) winter run	October-June	April-June		October-May
Eulachon[9,10,11] (*Thaleichthys Pacificus*)	February-March	March-May	February-March	March-April

Table 6 Sensitive Life History Stages of Marine Fish in the RAA

Species	Inbound Spawner Migration	Spawning Period	Peak Spawning Period	Outbound Juvenile Migration
Pacific herring[12,13,14] (*Clupea pallasii*)	March-June	February-June	March-April	Fall-Winter
Pacific halibut[15,16] (*Hippoglossus stenolepis*)	N/A	November-March	January	N/A

SOURCES:
[1] Naughton et al. 2008
[2] Carr-Harris and Moore 2013
[3] Groot and Margolis1991
[4] Hyatt et al. 2007
[5] DFO 2005
[6] DFO 1999a
[7] Beacham et al. 2012
[8] McPhail 2007
[9] McCarter and Hay 1999
[10] Moody and Pitcher 2010
[11] Rolston 2011
[12] Hay and McCarter 2012
[13] DFO 2013b
[14] Hourston and Haegele 1980
[15] Seitz et al. 2005
[16] St-Pierre 1984

4.2.3.1 Previous Studies on Pacific Salmon in the Skeena River Estuary and Chatham Sound

Previous studies have documented use of Chatham Sound and the Skeena River estuary by juvenile Pacific salmon (see Table 7). Studies were published between 1955 and 2015 and include both field-based surveys (Neave 1956; Higgins and Schouwenburg 1973; Anderson et al. 1987; Gottesfeld et al. 2008; Carr-Harris and Moore 2013; and Carr-Harris et al. 2015) and desk-top based literature reviews (Hoos 1975). Field-based studies typically occurred between May and August, with some studies starting mid-April (Higgins and Schouwenburg 1973) or extending into the first few weeks of September (Neave 1956).

Table 7 List of Studies on Juvenile Pacific Salmon Use of the Skeena River Estuary

Year	Months	Sampling Gear	Region	Reference
1955	early-June to early-September	day and night sampling using purse seines, beach seines, small-mesh gill nets, tow nets, and night lighting	Chatham Sound and adjacent waters	Neave 1956
1972	mid-April to August	purse seining and surface trawling (during August only)	Kennedy Island north to the southern end of Digby Island	Higgins and Schouwenburg 1973
1986	early-May to late-August	beach seines	Skeena River estuary	Anderson et al. 1987
2007	late-May to early July	surface trawling	Hogan Island (near the entrance of Portland Inlet) southward towards the mouth of the Skeena River and on to Ogden Channel	Gottesfeld et al. 2008[1]
2007	late-May to early July	surface trawling	Hogan Island (near the entrance of Portland Inlet) southward towards the mouth of the Skeena River and on to Ogden Channel	Carr-Harris et al. 2015[1]
2013	end of April to mid-June (beach seining) or early-July (surface trawling)	beach seining and mid-water trawling	Skeena River estuary	Carr-Harris and Moore 2013
2013	early-May to early-July	surface trawling	Skeena River estuary	Carr-Harris et al. 2015

NOTE:
[1] Carr-Harris et al. (2015) and Gottesfeld et al. (2008) rely on the same trawl data collected in 2007.

Based on the results of these studies, juveniles belonging to all five species of Pacific salmon use the Skeena River estuary for various periods of time during outmigration. Juvenile pink salmon (*Oncorhynchus gorbuscha)* are generally thought to use the mouth of the Skeena River estuary for a relatively short period of time (between early-May and mid-June) before moving along shorelines and beaches and gradually into to relatively deeper, offshore waters (Neave 1956; Higgins and Schouwenburg 1973; Hoos 1975; Carr-Harris and Moore 2013). Unlike pink, sockeye salmon (*Oncorhynchus nerka)* have been observed spending relatively longer periods of time near the mouth of the Skeena River (between a few weeks to a month) before moving offshore (Higgins and Schouwenburg 1973). Gottesfeld et al. (2008) found sockeye to be generally absent from trawls conducted in the northern and western portions of Chatham Sound; sockeye were generally caught in trawls in southern Chatham Sound at sites relatively closer to the mouth of the Skeena River. Regarding coho salmon (*Oncorhynchus kisutch*), juveniles use the Skeena estuary over a relatively long period of time, from several weeks to two months, and remain in the shallow water of sand bars, particularly in Inverness Passage (Higgins and Schouwenburg 1973; Hoos 1975). Use of the estuary by Chinook salmon (*Oncorhynchus tshawytscha)* juveniles occurs from late May to at least mid-August, with peak abundance generally occurring around mid-June (Higgins and Schouwenburg 1973), although a recent report by Carr-Harris and Moore (2013) reported peak abundance in early June. Chum salmon (*Oncorhynchus* *keta*) are generally present in the estuary between May and mid-August, though most abundant in late May (Anderson et al. 1987; Carr-Harris and Moore 2013) or mid-July (Higgins and Schouwenburg 1973).

4.2.4 Marine Invertebrates

A myriad of marine invertebrate species occur along the coast of BC, where they occupy virtually all marine habitats from the intertidal zone to the deep subtidal. Many of these species are targeted by CRA fisheries, including molluscs (e.g., clams, scallops, abalone, squid, and octopus), crustaceans (e.g., euphausiids, shrimp and prawns, and crabs), and echinoderms (e.g., sea cucumbers and sea urchins) (Lucas et al. 2007).

The RAA overlaps with DFO IAs for Dungeness crab, tanner crab (*Chionoecetes tanneri*), shrimp (Family Pandalidae) and prawn (*Pandalus platyceros*), and green urchin (Clarke and Jamieson 2006b, DFO 2013a; Figure 7). All IAs (with the exception of shrimp and prawn) overlap with the LAA as well. As with IAs for marine fish, IAs for marine invertebrates were ranked by scientific experts as having high importance in the context of three primary dimensions: uniqueness, aggregation, and fitness consequence (Clarke and Jamieson 2006b). At this time, identification of an area as an IA does not confer any legislative or regulatory protection.

Only one marine invertebrate species of conservation concern has the potential to occur within the RAA: northern abalone (*Haliotis kamtschatkana*). Northern abalone is considered *threatened* by COSEWIC and is listed as *threatened* on Schedule 1 of SARA (BC CDC 2014). In BC, Northern abalone is *Red* listed (BC CDC 2014).

A number of marine invertebrate species occurring within the RAA have high ecological and socio-economic importance, including abalone, Dungeness crab, tanner crab, prawns and shrimp, geoduck (*Panopea generosa)*, giant California sea cucumber (*Parastichopus californicus)*, sea urchins, and giant Pacific octopus (*Enteroctopus dofleini)*. The sensitive life history periods for these species are presented in Table 8.

Table 8 Sensitive Life History Stages of Marine Invertebrates in the RAA

Species	Scientific Name	Peak Spawning (S)/ Larval Release (L)	Planktonic Larvae
Northern abalone[1]	*Haliotis kamtschatkana*	April – August (S)	2-11 days
Dungeness crab[2]	*Metacarcinus magister*	End of Winter – Early Spring (L)	4 months
Grooved Tanner Crab[3,4]	*Chionoecetes tanneri*	March – April (L)	2-4 months (assumed)
Tanner Crab[5]	*Chionoecetes bairdi*	April – May (L)	30 days, 10 months (all phases)
Prawn/Shrimp[6]	*Pandalus* spp.	Jan – Mar (S)	3-4 month
Geoduck clam[7]	*Panopea generosa*	June – July (S)	1-2 months
Giant red (California) sea cucumber[8]	*Parastichopus californicus*	Spring – Summer (S)	2-4 months
Green sea urchin[9,10]	*Strongylocentrotus droebachiensis*	Feb – March (S)	2 months

Table 8 Sensitive Life History Stages of Marine Invertebrates in the RAA

Species	Scientific Name	Peak Spawning (S)/ Larval Release (L)	Planktonic Larvae
Red sea urchin[9,11]	*Strongylocentrotus franciscanus*	Mar – Sep (S)	6-9 weeks
Purple sea urchin[9,12]	*Strongylocentrotus purpuratus*	Oct – Dec (S)	2-3 months
Giant Pacific Octopus[13]	*Enteroctopus dofleini*	Jan – Feb (S)	n/a

SOURCES:
[1] DFO 2013c
[2] DFO 2013d
[3] Keller et al. 2012
[4] Phillips and Lauzier 1997
[5] Stevens 2003
[6] DFO 2014b
[7] DFO 2012a
[8] DFO 1999b
[9] Pellegrin et al. 2007
[10] DFO 2003
[11] DFO 2012b
[12] DFO 1999c
[13] Conrath and Conners 2014

5 FIELD STUDIES

Four types of field-based studies were conducted within the LAA to (1) supplement information compiled during a literature review, and (2) collect site-specific information on marine fish and fish habitats in areas potentially affected by the Project. Field studies were conducted between 2014 and 2016 to characterize habitats and species within the intertidal and subtidal zones, and specifically to gather information on the spatial distribution and abundance of marine fish and marine fish habitat. Crab trapping was also conducted during four discrete sampling events between 2014 and 2016.

Data collected during each field study were grouped into study areas to describe site conditions specific to areas potentially affected by Project infrastructure and activities. For the majority of studies, data were gathered from four study areas: Casey Cove, East Digby Island, South Digby Island, and Delusion Bay (see Figure 8). The boundaries of each study area differed slightly between surveys and are described within each section below. During crab trapping (see Section 5.3) and the marine fish survey (see Section 5.5), additional study areas located outside the LAA (but within the RAA) were sampled.

5.1 Intertidal Surveys

5.1.1 Scope

The objective of the intertidal surveys was to collect information on existing conditions for marine fish and fish habitat in the intertidal zone of the Marine Fish and Fish Habitat LAA. Data were collected to characterize the existing environment to support the assessment of potential Project effects on marine fish and fish habitat, and an application for a section 35(2)(b) *Fisheries Act* Authorization for residual serious harm to fish, if needed. The intertidal zone of the LAA was surveyed over three periods:

- July 11-15, 2014 (South Digby Island)
- September 9-10, 2014 (Casey Cove)
- July 31-August 3, 2015 (East Digby Island, Delusion Bay, and portions of South Digby Island and Casey Cove)

The survey dates were scheduled during the best available low-tide series (DFO 2014c) to increase the area of intertidal habitat exposed for sampling, and during the summer period to sample marine vegetation and algae during the period of expected peak growth. Sampling was designed to:

- Describe the characteristics of the backshore habitat (Objective 1)
- Describe the characteristics, and relative abundance, of physical habitat types within the low, mid, and high interidal zone of the LAA (Objective 2)
- Describe the relative abundance and community composition of marine vegetation, algae, fish, and invertebrates within the low, mid, and high interidal zone (Objective 3)

5.1.2 Methods

Stantec biologists, with the assistance of First Nations technicians, surveyed the intertidal zone using transect and quadrat sampling methods based on marine habitat information requirements and recommended survey protocols (Williams 1993; DFO 2004; DFO 2011b). The following sections detail the methods employed.

5.1.2.1 General Site Overview

Over three sampling periods, field crews characterized the intertidal zone at 39 sites distributed throughout the LAA (see Figure 9 to Figure 12). Sites were located in areas potentially affected by the Project and spaced to capture the variety of habitat types present within each study area. At each site, field crews recorded any anthropogenic influences (e.g., chains, rope, old docks) observed within the area, possible sources of freshwater input, and locations of eelgrass. If time permitted, eelgrass beds observed within the intertidal zone were delineated using a hand-held global positioning system (GPS). Eelgrass data collected during the intertidal survey were used to help define the scope of the more detailed, dedicated eelgrass survey conducted in August 2015 (see Section 5.4).

At each site, the field crew laid one transect extending from the highest high water mark to lowest low water mark exposed at the time of sampling using a tape measure. The GPS coordinates of the landward and seaward ends of each transect were marked. At the landward end of each transect, the field crew identified the dominant and secondary species of vegetation growing in the backshore. Extending seaward from the highest high water mark, field crews visually estimated the length of the low, mid, and high intertidal zones, and the angle of relief (measured with a clinometer). The same transects were then used to provide more specific quantitative measures of intertidal habitat composition and community (as described below).

Field crews visually estimated the boundaries of the low, mid, and high intertidal zones based on the vertical distribution of plants, algae and barnacles along each transect, from the high tide line towards the water. Along rocky shorelines of the Pacific Northwest, vertical distribution of species creates recognizable bands within the intertidal zone, with salt-tolerant plants and barnacles typically concentrated in the high intertidal zone, *Fucus* spp. (rockweed; brown algae) and green algae such as sea lettuce (*Ulva* spp.) concentrated in the mid-intertidal zone, and red algae concentrated in the low intertidal zone (Lindeberg and Lindstrom 2010). In soft-sediment habitats, such as in Delusion Bay, vertical zonation tends to be less pronounced, and patterns of zonation are typically more gradual than those in rocky intertidal habitats (Peterson 1991). As a result, field crews did not visually estimate the high, mid, and low intertidal zones in Delusion Bay.

5.1.2.2 Physical Characteristics and Intertidal Community Composition

At each site, a transect- and quadrat-based sampling technique was used to describe the intertidal habitat and biological community. Along each transect, 15 quadrats (0.5 m by 0.5 m) were sampled. Quadrat spacing was determined by dividing the total transect length by 14. Within each quadrat, the type of substrate and the percent composition of each substrate type was recorded (as described in Table 9), and species of algae, epifaunal invertebrates (i.e., organisms living on the seafloor), and fish were identified and counted. The abundance of vegetation, algae and sessile invertebrates (e.g., barnacles) was recorded using percent cover, whereas motile invertebrates (e.g., crabs) and fish were individually counted. Organisms that could not be identified to the species level in the field were identified to the lowest taxonomic level possible. A photograph of each quadrat was taken.

Benthic infauna (i.e., organisms living within the bottom sediment) were sampled in quadrats located on soft substrates (e.g., mud and sand). The sediments within quadrats were excavated using a trowel and hand-digging to a depth of approximately 20 cm and excavated materials were visually inspected for bivalves, molluscs, and other infauna. Individuals were identified to the lowest taxonomic group possible, counted, and returned to the excavated pit along with the excavated material.

Table 9 Intertidal Substrate Classification

Substrate Type	Definition
Bedrock	Continuous solid rock exposed by the scouring forces of water
Boulder	Rocks greater than 256 mm in diameter
Cobble	Moderate to small-sized rocks 64 mm to 256 mm in diameter
Gravel	Small stones between 2 mm to 64 mm in diameter
Sand	Fine deposits frequently found on margins of streams or between rocks and stones, ranging from 0.06 mm to 2 mm in diameter
Mud	A material of organic origin with a greasy feel between the fingers and no apparent structure, less than 0.06 mm in diameter
Organics	A soft material composed of silt and clay and containing 85% or more organic materials such marsh plant root matrix and remnants of decayed aquatic plants; or large immovable logs
Shell	Calcareous remains of shellfish or invertebrates containing shells

SOURCES:
Williams (1993)

5.1.2.3 Data Analysis

To achieve Objective 1 of the intertidal survey (describe the characteristics of the backshore habitat), backshore habitat was described qualitatively for each study area. Observations were grouped into one of four study areas (Casey Cove, East Digby Island, South Digby Island, or Delusion Bay).

To achieve Objective 2 of the intertidal survey (describe the characteristics and relative abundance of physical habitat types within the low, mid, and high interidal zone of the LAA), an estimate of relative abundance of substrate types was calculated for each zone of the intertidal by first pooling data from within each transect, and then calculating a median (and interquartile range [IQR]) and mean (and standard deviation [SD]) of pooled values from across all transects (i.e., multiple quadrats from a single transect were treated as sub-samples). Relative abundance was calculated for the high, mid, and low intertidal zones separately within a given study area. In Delusion Bay, however, relative abundance was not calculated for each zone because of the difficulty of visually estimating the boundaries of the three zones. Instead, quadrats surveyed along each transect within Delusion Bay were treated as sub-samples, and relative abundance was then calculated across all transects surveyed within the bay.

To achieve Objective 3 of the intertidal survey (describe the relative abundance and community composition of marine vegetation, algae, fish, and invertebrates within the low, mid, and high interidal zone), an estimate of relative abundance of species observed within a quadrat was calculated using percent cover/quadrat (for vegetation, algae and sessile invertebrates) or count/quadrat (for motile invertebrates and fish). Relative abundance was estimated for each zone of the intertidal by first pooling data from within each transect, and then calculating a median (and IQR) and mean (and SD) of pooled values from across all transects (i.e., multiple quadrats from a single transect were treated as sub-samples). Relative abundance was calculated for the high, mid, and low intertidal zones separately within a given study area. In Delusion Bay, however, relative abundance was not calculated for each zone because of the difficulty of visually estimating the boundaries of the three zones. Instead, quadrats surveyed along each transect within Delusion Bay were treated as sub-samples, and relative abundance was then calculated based on all transects surveyed within the bay.

5.1.3 Results

5.1.3.1 Casey Cove

The intertidal zone of Casey Cove was mostly surveyed in September 2014, although additional effort was made in August 2015 to survey habitat near Charles Point. Eight transects were surveyed in Casey Cove (see Figure 10). A list of the GPS coordinates, length, and slope of each transect is provided in Appendix 1, Table 1-1.

BACKSHORE HABITAT

The dominant tree species were western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*) and western redcedar (*Thuja plicata*), interspersed with red alder (*Alnus rubra*) and Pacific crab apple (*Malus fusca*), which was typically covered in old man's beard (*Usnea* spp.) (see Photo 1a). The understory vegetation was composed of salal (*Gaultheria shallon*), false lily-of-the-valley (*Maianthemum dilatatum*), and a variety of ferns. Other common species included false azalea (*Menziesia ferruginea*), salmonberry (*Rubus spectabilis*), silverweed (*Potentilla anserina*), twinberry (*Lonicera* spp.), yellow monkey-flower (*Mimulus guttatus*), sea-watch (*Angelica lucida*), coastal strawberry (*Fragaria chiloensis*), and cinquefoil (*Potentilla villosa*). Black lichen (*Verrucaria maura*) was abundant in the supralittoral zone. Sedge (*Carex* spp.), terrestrial grasses, and mosses were seen regularly.

Along the south side of Casey Cove, vacant buildings, docks, log pilings, cables, and rope were scattered through backshore and intertidal zones (see Photo 1b). The backshore was bordered by large woody debris, some of which was roped together. Several abandoned crab traps were observed in the intertidal zone.

SLOPE AND SUBSTRATE TYPE

The relative abundance of substrate types (percent cover) observed in the low, mid, and high intertidal zones of Casey Cove is provided in Appendix 1: Intertidal Surveys, Table 1-2. The high and mid intertidal zones in Casey Cove were composed primarily of gravel, cobble (see Photo 2a and Photo 2b), and sand. Mud dominated the low intertidal zones on all transects surveyed (median 84.5% cover/quadrat, IQR 8.5-100% cover/quadrat) (see Photo 3a and Photo 3b). Shell and organic substrates were rarely observed. The high intertidal zone on transect CC1 was composed entirely of bedrock. The total slope recorded along each transect ranged from a shallow grade of approximately 3° on CC3 and CC8 to a steeper grade of approximately 9° on CC1 (see Appendix 1, Table 1-1).

a. Facing west from Transect CC6

b. Facing east from Transect CC6

Photo 1 Backshore Habitat in Casey Cove

a. Facing southwest from Transect CC2

b. Facing east from Transect CC3

Photo 2 Gravel and Cobble Substrate in Casey Cove

a. Facing east from Transect CC6

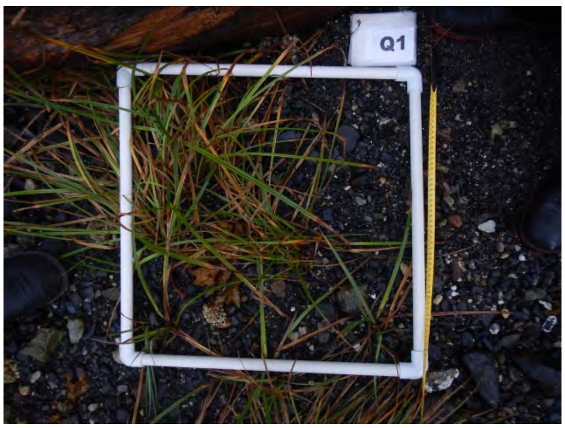
b. Facing west from Transect CC7

Photo 3 Mud-dominated Substrates in Casey Cove

MARINE VEGETATION AND ALGAE

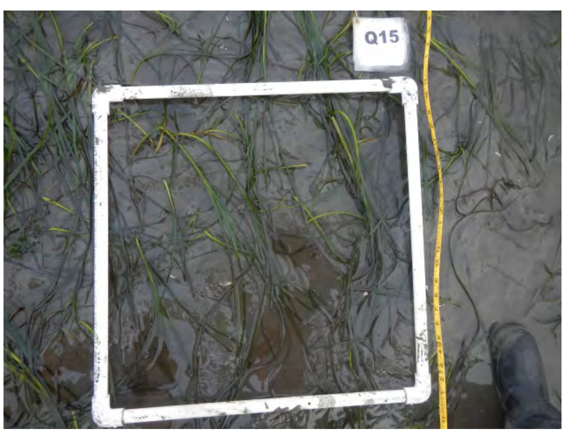
In Casey Cove, 25 taxa of marine vegetation and algae were observed (see Appendix 1, Table 1-3). Salt-tolerant vegetation, which consisted primarily of sedge species and some terrestrial grasses, lichen, and moss, dominated the high intertidal zone (see Photo 4a). *Fucus* spp., *Ulva* spp. (see Photo 4b), and turkish washcloth (*Mastocarpus* blade), were typically observed throughout the mid intertidal zone in relatively low abundance (see Appendix 1, Table 1-3). In the low intertidal zone, *Ulva* spp., *Mastocarpus* blade, and eelgrass (*Z. marina*, Photo 4c) were observed in relatively low abundance.

Kelps (*Laminaria* spp., *Saccharina* spp., *Alaria* spp.) were observed in the low intertidal zone on five of the eight transects surveyed (CC4 and CC2–CC8) (see Photo 4d). However, the median percent cover of all kelp species across low intertidal quadrats was 0% cover (IQR 0-0% cover).



a. Sedges on Transect CC3

b. *Ulva* and *Fucus* spp. on Transect CC5



c. Eelgrass (*Z. marina*) on Transect CC3

d. Kelp, green algae, and red algae growing in the low intertidal zone

Photo 4 Vegetation and Algae Observed in Casey Cove

INVERTEBRATES AND FISH

In Casey Cove, 19 taxa of motile epifaunal invertebrates were observed (see Appendix 1, Table 1-4). Molluscs (primarily limpets [*Lottia* spp.] and snails [*Littorina* spp.]) had the highest relative median abundance across all intertidal zones. *Littorina* spp. and *Lottia* spp. reached maximum median abundances of 2.0 individuals/quadrat (IQR 0-16.0 individuals/quadrat) and 4.0 individuals/quadrat (IQR 0-12.0 individuals/quadrat), respectively, in the mid intertidal zone. Purple shore crab (*Hemigrapsus nudus*) and amphipods (*Gammaridae* spp.) were also frequently observed, particularly in the mid intertidal zone. Although median abundances of these two taxa were 0 individuals/quadrat in all zones, maximum abundances were 25 purple shore crabs per quadrat and 100 amphipods per quadrat, which is reflective of a patchy distribution. Echinoderms (one *Leptasterias* sp. seastar and several brittle stars [*Ophiurpoidea* spp.*]*) were observed in the mid and low intertidal zones, and one tunicate (*Styelidae* sp. sea squirt) was observed in the low intertidal zone. Lewis's moonsnail (*Neverita lewisii*) and giant California sea cucumber were incidentally observed as the tide was retreating.

Six taxa of sessile invertebrates were observed in Casey Cove (see Appendix 1, Table 1-4). Barnacles (primarily *Balanus glandula*, followed by *Semibalanus cariosus* and *Chthamalus dalli*) covered hard substrates in all three intertidal zones. *Balanus glandula* was most abundant in the mid intertidal zone (median 5.0% cover, IQR 1.0-15.0% cover). An unknown species of sponge was recorded in the mid intertidal zone on Transect CC7 and a bryozoan was recorded in the low intertidal zone on Transect CC8.

In the mid and low intertidal zones, 32 quadrats were excavated to sample benthic infauna. Polychaete worms (primarily *Nereis* spp. and *Glycera* spp.), ribbon worms (*Nemertean* spp., Photo 5a), ghost shrimp (*Neotrypaea californiensis*, Photo 5b), and four genera of bivalve molluscs (soft-shell clam [*Mya arenaria*], macoma clams [*Macoma* sp.], salt water clams [S*axidomus* sp.], and cockles [*Clinocardium* sp.]) were identified. All bivalve species were present at low relative abundance (median 0 individuals/quadrat, IQR range: 0-0 individuals/quadrat; maximum: 6 individuals/quadrat). Siphon holes were observed throughout the low intertidal zone.

a. Ribbon worm (*Nemertean* spp.) excavated from Transect CC3

b. Ghost shrimp (*Neotrypaea californiensis*) excavated from Transect CC3

Photo 5 Benthic infauna Excavated from Quadrats in Casey Cove

One crescent gunnel (*Pholis laeta*) and one black prickleback (*Xiphister atropurpureus*) were observed in the low intertidal zone on Transect CC7. As the tide retreated, juvenile flounders (Family Pleuronectidae) were incidentally recorded on Transect CC6.

5.1.3.2 East Digby Island

The intertidal zone of East Digby Island was surveyed in August 2015. Five transects were surveyed along the eastern coast (see Figure 10). A list of the GPS coordinates, length, and slope of each transect is provided in Appendix 1, Table 1-1.

BACKSHORE HABITAT

Vegetation in the supralittoral zone consisted of shrubs such as salal, sea plantain, silverweed, false azalea, devil's club (*Oplopanax horridus*), and other species such as ferns, mosses, and lichens. The dominant trees in the backshore habitat were Sitka spruce, western redcedar, western hemlock, and red alder. Transects ED1 and ED3 were located adjacent to small streams bordered by skunk cabbage (*Lysichiton americanus*) and sedges (e.g., *Carex* spp.) (see Photo 6a). Large woody debris was prevalent along several transects surveyed at East Digby Island (see Photo 6b).

a. Facing northeast from Transect ED3

b. Facing north from Transect ED3

Photo 6 Backshore Habitat at East Digby Island

SLOPE AND SUBSTRATE TYPE

The high intertidal zone at East Digby was composed primarily of cobble (median 15.0% cover/quadrat, IQR 0-75.0% cover/quadrat), whereas the mid intertidal zone was primarily gravel (median 85.0% cover/quadrat, IQR 7.5-98.3% cover/quadrat) (see Appendix 1, Table 1-5; Photo 7). The low intertidal zone was composed primarily of sand (median 75.0% cover/quadrat, IQR 10.0-95.0% cover/quadrat) and some gravel (median 10.0% cover/quadrat, IQR 0-25.0% cover/quadrat) (Photo 8). Most transects surveyed also contained cobble. The total slope recorded along each transect ranged from 1° (ED3 and ED5) to 5° (ED2) (see Appendix 1, Table 1-1).

a. Facing Transect ED3 from Transect ED2

b. Facing backshore of Transect ED1

Photo 7 Gravel and Cobble Substrates at East Digby Island

a. Facing backshore of Transect ED3

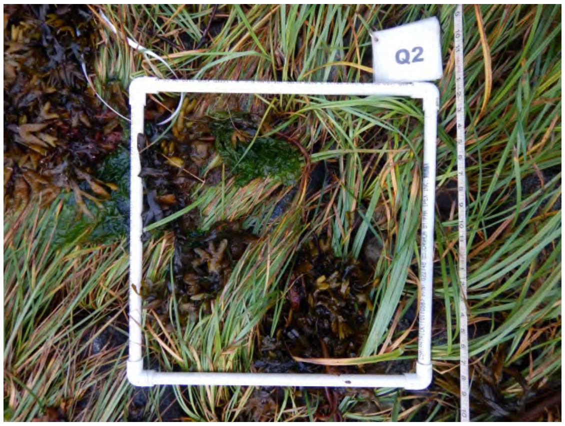
b. Low intertidal, facing north from Transect ED5

Photo 8 Sand Substrates at East Digby Island

MARINE VEGETATION AND ALGAE

At East Digby Island, 24 taxa of marine vegetation and algae were observed (see Appendix 1, Table 1-6). *Mastocarpus* blade was frequently observed in the high intertidal zone at low relative abundance (median 0% cover/quadrat, IQR 0-2.5% cover/quadrat), with *Ulva* spp. and *Hildenbrandia* spp. also present. Riparian sedges were also observed in the high intertidal zone on some transects (see Photo 9a). *Ulva* spp. and *Mastocarpus* blade were present in the mid intertidal zone but *Fucus* spp. had the highest relative percent cover (median 0.5% cover/quadrat, IQR 0-1.3% cover/quadrat). The low intertidal zone contained the highest relative abundance of *Ulva* spp. (median 3.0% cover/quadrat, IQR 0-20.0% cover/quadrat) and red algae, specifically *Botryocladia* spp. (median 2.0% cover/quadrat, IQR 1.5-2.0% cover/quadrat (see Photo 9b). Eelgrass (*Z. marina*) was also observed in the low intertidal zone in some areas.

Kelps (*Agarum* spp., *Saccharina groenlandica*, *Alaria* spp.) were observed in relatively low abundance in the mid and low intertidal zones.



a. Sedges and grasses growing on Transect ED5

b. Green and red algae growing on Transect ED2

Photo 9 Vegetation and Algae Observed at East Digby Island

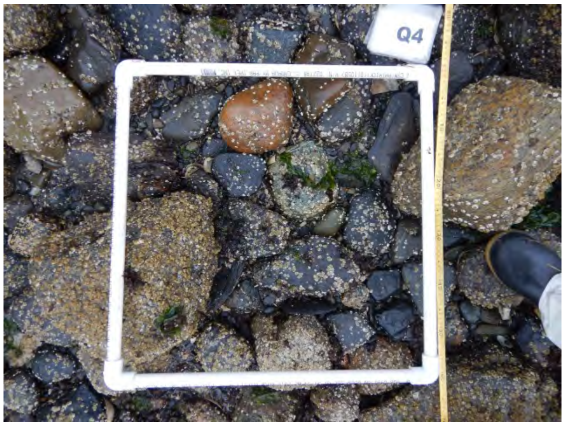
INVERTEBRATES AND FISH

At East Digby Island, 16 taxa of motile epifaunal invertebrates were observed at East Digby Island (see Appendix 1, Table 1-7). Molluscs (mainly limpets [*Lottia* spp.] and snails [*Littorina* spp.]) were the most abundant taxa in the high and mid intertidal zones. *Littorina* spp. reached a maximum median abundance of 10.0 individuals/quadrat (IQR 0-31.3 individuals/quadrat) in the mid intertidal zone, with up to 160 individuals counted in a single quadrat. *Nucella* spp. were also observed in the high intertidal (median 0 individuals/quadrat, IQR 0-1.3 individuals/quadrat). Several species of crabs were observed at relatively low abundance, including purple shore crab, green shore crab (*Hemigrapsus oregonensis*), hermit crab (*Pagarus* spp.), and pygmy rock crab (*Cancer oregonensis*). Painted anemone (*Urticina crassicornis*) and leather stars (*Dermasterias imbricata*) were incidentally observed in the low intertidal zone of Transect ED1.

Four taxa of sessile epifaunal invertebrates were observed (see Appendix 1, Table 1-7). Barnacles, including *B. glandula, S. cariosus*, and *C. dalli*, covered hard substrates across all three intertidal zones (Photo 10a). *B. glandula* had the highest relative abundance in the mid intertidal zone, reaching a median percent cover of 6.0% per quadrat (IQR 0-21.3% cover/quadrat). An unidentified species of bryozoan was recorded in the low intertidal zone on Transect ED1.

Benthic infauna were sampled in 18 quadrats excavated in soft sediment areas across all three intertidal zones. Species observed included ghost shrimp, four genera of bivalve molluscs (*Mya arenaria*, *Macoma* sp., *Saxidomus* sp., *Clinocardium* sp., Photo 10b), polychaete worms (e.g., *Nereis* spp., *Glycera* spp.), and ribbon worms (*Nemertea* spp.). All bivalve species were present at low relative abundance (median 0 individuals/quadrat, IQR range: 0-0 individuals/quadrat; maximum: 6.0 individuals/quadrat). Siphon holes were observed in all three intertidal zones.

No finfish species (e.g., gunnels) were observed during the intertidal survey.



a. Barnacles (*Balanus* spp.) colonizing rocky substrate on Transect ED5

b. Cockle (*Clinocardium* sp.) excavated from Transect ED4

Photo 10 Invertebrates Observed in East Digby Island

5.1.3.3 South Digby Island

The intertidal zone of South Digby Island was surveyed in July 2014 and August 2015, with 22 transects surveyed throughout the study area (see Figure 11). A list of the GPS coordinates, length, and slope of each transect is provided in Appendix 1, Table 1-1.

BACKSHORE HABITAT

Vegetation in the supralittoral zone was similar to that observed in Casey Cove (see Section 5.1.3.1). Black lichen was an abundant species in the backshore of all transects. Sea asparagus (*Salicornia virginica*) was present on Transect SD12. Large woody debris was commonly observed along the backshore (see Photo 11).

a. Facing east from Transect SD4

b. Facing backshore of Transect SD2

Photo 11 Backshore Habitat in South Digby Island

SLOPE AND SUBSTRATE TYPE

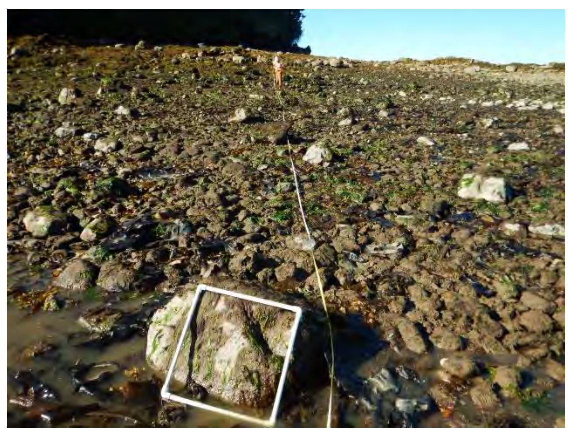
The high and mid intertidal zones along the south coast of Digby Island were composed primarily of bedrock with lesser amounts of gravel, cobble and boulder (see Appendix 1, Table 1-8; Photo 11 and Photo 12). Substrates in the low intertidal zone were more varied, often comprised of a mixture of sand, gravel, cobble, and boulder (see Photo 13). The intertidal zones of the small islands south of Digby Island (i.e., Spire, Tuck, and Metford Islands) were composed almost entirely of bedrock, with minimal amounts of fine substrates (i.e., sand, mud, shell) in the low intertidal zone. The total slope recorded along each transect ranged from less than 1°(SD5) to 15°(SD2) (see Appendix 1, Table 1-1).

a. Facing backshore of Transect SD4

b. Facing northeast from Transect SD2

Photo 12 Bedrock Substrate at South Digby Island

a. Facing south along Transect SD7



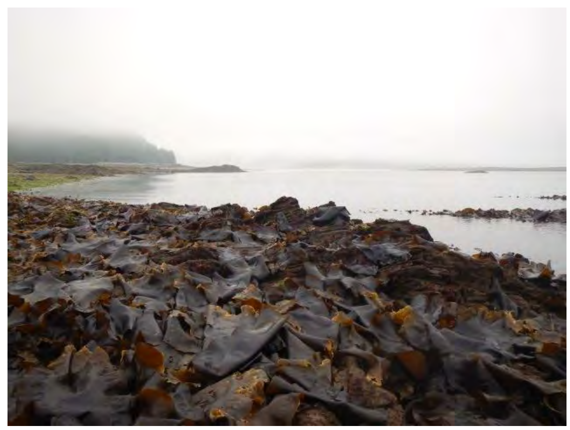
b. Facing south along Transect SD19

Photo 13 Sand, Gravel and/or Boulder Substrates at South Digby Island

MARINE VEGETATION AND ALGAE

At south Digby Island, 46 taxa of marine vegetation and algae were observed at South Digby Island (see Appendix 1, Table 1-9). Riparian vegetation, which was comprised of black lichen, sedges, mosses, terrestrial grasses, and unidentified vascular plants, was typically observed at the upper extent of the high intertidal zone. *Fucus* spp. was observed in all three zones, with the highest median abundance in the mid zone (median 10.0% cover/quadrat, IQR 1-25.0% cover/quadrat). *Ulva* spp. was also observed in all three zones, with the highest median abundance in the low zone (median 5.0% cover/quadrat, IQR 0-20.0% cover/quadrat) (see Photo 14a). There were 18 taxa of red algae identified, primarily in the mid and low intertidal zones, including *Cryptosiphonia woodii*, *Endocladia* spp., *Gloiopeltis* spp., *Halosaccion* spp., *Hildenbrandia* spp., *Mastocarpus* blade and crust, *Mazzaella* spp., *Microcladia* spp., *Neorhodomela* spp., *Odonthalia* spp., *Palmaria* spp., *Porphyra* spp., and an unidentified coralline crust. Of these, *Mastocarpus* blade and crust had the highest relative median abundance (mid intertidal zone, median 2.0% cover/quadrat, IQR [blade] 0-5.0% cover/quadrat, IQR [crust] 0-10.0% cover/quadrat). Eelgrass (*Z. marina*) was present in all three intertidal zones at varying abundance in areas of soft sediment, but was mostly found in the low zone.

a. Green, red and brown algae on Transect SD4



b. Kelp (*Saccharin*a spp.) growing on Transect SD7

Photo 14 Algae Observed at South Digby Island

Throughout the South Digby Island study area, kelps were observed at relatively high abundance in rocky habitats (i.e., bedrock, boulder, and cobble) in the mid and low intertidal zones. Six species of kelp were identified: *Alaria* sp., *Costaria costata*, *Nereocystis luetkeana*, *Saccharina groenlandica*, and *S. latisima*. Although median abundance of all species across all transects was 0% cover/quadrat, maximum abundances per quadrat were often 50-100% in areas of suitable habitat (e.g., low intertidal rocky substrate; Photo 14b). In these areas, the distribution of kelps was often observed to extend into the subtidal zone.

INVERTEBRATES AND FISH

At South Digby Island, 38 taxa of motile epifaunal invertebrates were observed (see Appendix 1, Table 1-10). Molluscs, primarily *Littorina* spp., as well as *Lottia* spp., were the most abundant taxa in high and mid intertidal zones. *Littorina* spp. had a maximum median abundance of 2.0 individuals/quadrat (IQR 0-50.5 individuals/quadrat) in the mid intertidal zone, and *Lottia* spp. had a maximum median abundance of 7.0 individuals/quadrat (IQR 1.5-19.0 individuals/quadrat), also in the mid zone. Mussels were observed in the high and mid intertidal zones at relatively low abundance (maximum of 5 individuals/quadrat in the high zone and 10 individuals/quadrat in the mid zone). Seven species of crabs were identified: purple and green shore crabs (see Photo 15a), hermit crabs, kelp crabs (*Pugettia* spp.), porcelain crabs (*Petrolisthes* spp.), pygmy rock crabs, and sharp-nosed crabs (*Scyra auctifrons*). All were observed at relatively low median abundance, although some mid and low intertidal transects contained relatively large numbers of hermit crabs (up to 40 individuals/quadrat). Seastars observed in the South Digby Island study area included six ray stars (*Lepastarias* spp.), mottled stars (*Evasteria troschelii*), sunflower stars (*Pycnopodia helianthoides*), and brittle stars *(Ophiurpoidea* spp.). Three species of sea anemone (*Metridium* sp., *Urticina lofotensis*, *U. crassicornis*) were also observed.

Five taxa of sessile epifaunal invertebrates were observed at South Digby Island (see Appendix 1, Table 1-10). Three species of barnacle (primarily *B. glandula*, followed by lower densities of *S. cariosus* and *C. dalli*) were found in high and mid intertidal zones. Bryozoans were observed in a few mid and low intertidal quadrats and an unidentified sponge species was recorded in two mid intertidal quadrats.

a. Shore crab (*Hemigrapsus* spp.) observed on Transect SD16

b. Macoma clams (*Macoma* sp.) and a ghost shrimp (*Neotrypaea californiensis)* excavated from Transect SD10

Photo 15 Invertebrates Observed in South Digby Island

Benthic infauna were sampled in 22 quadrats excavated at South Digby Island in areas of soft sediment. Macoma clams (see Photo 15b) were observed in all three zones (up to 6 individuals/quadrat), cockles were observed in the high and low zones (up to 3 individuals/quadrat), and soft shell clams were observed in the mid zone (up to 1 individual/quadrat). Polychaete worms (unidentified polychaetes and *Glycera* spp.) and ribbon worms (*Nemertea* spp.) were also identified. Siphon holes were observed in all three intertidal zones in areas of soft sediment, but were most prevalent in the low zone.

During the survey, 44 individuals belonging to five taxa of fish were observed: 18 prickleback (Family Stichaeidae), 11 unidentified gunnels (*Pholis* spp.), and 10 sculpins (Family Cottidae), all recorded in the mid and low intertidal zones. Three saddleback gunnels (*Pholis ornate*, Photo 16a) and two black pricklebacks (*Xiphister atropurpureus*) were also observed in the low intertidal zone.

a. Gunnel (*Pholis* spp.) observed on Transect SD4

b. Ochre star (*Pisaster ochraceus*) observed near Transect SD20

Photo 16 Fish and Invertebrates Observed at South Digby Island

Two species of CRA importance were incidentally observed during the intertidal survey: sole and mating Dungeness crabs. Both species were incidentally observed in the shallow subtidal zone near the mouth of Delusion Bay (Transects SD10 and SD9). Other incidental observations included ochre star (*Pisaster ochraceus*, Photo 16b) (Transect SD10), painted anemone (Transect SD14), helmet crab (*Telmussus cheiragonus*) (Transect SD18), lion's mane jellyfish (*Cyanea capillata*) (Transect SD19), leather stars and leafy hornmouth (*Ceratostoma foliatum*) (Transect SD22).

5.1.3.4 Delusion Bay

The intertidal zone of Delusion Bay was surveyed in August 2015. Four transects were surveyed at the upper, mid, and lower reaches of the bay (see Figure 12). As mentioned above, transects were not separated into low, mid, and high zones because of the difficulty in visually recognizing the boundaries of the zones in soft-sediment habitat. A list of the GPS coordinates, length, and slope of each transect is provided in Appendix 1, Table 1-1.

BACKSHORE HABITAT

Vegetation in the supralittoral zone was similar to that observed at the other three study areas, with the addition of yarrow (*Achillea millefolium*) and giant vetch (*Vicia nigricans gigantea*) (see Photo 17a). In the littoral zone, estuarine meadow habitat was present on both sides in the southern portion of Delusion Bay and extended from the entrance of the bay northward for approximately 3.5 km (see Photo 17b). The meadow was composed of sedges, rushes, sea plantain, and various species of grasses. Small streams and pools of freshwater bordered by skunk cabbage and sedges ran alongside or through several of the transects surveyed.

SLOPE AND SUBSTRATE TYPE

Delusion Bay is primarily mudflat habitat (see Appendix 1, Table 1-11; Photo 18). On transects DB1 and DB3, substrates were composed primarily of mud, with lesser amounts of cobble and gravel (see Photo 18a and Photo 19a). Transect DB2 was primarily sand with some mud and gravel (see Photo 18b). Transect DB4 was primarily sand toward the centre of the bay (i.e., lower elevation), with a more diverse mix of boulder, cobble, gravel and organics in the upper section (i.e., higher elevation) (see Photo 19b). The total slope recorded along each transect ranged from less than 1°(DB1) to 2°(DB4) (see Appendix 1, Table 1-1).

a. Facing backshore of Transect DB2

b. Facing northeast from Transect DB1

Photo 17 Backshore Habitat in Delusion Bay

a. Facing nearshore on Transect DB1

b. Facing west from Transect DB2

Photo 18 Mudflat Substrate in Delusion Bay

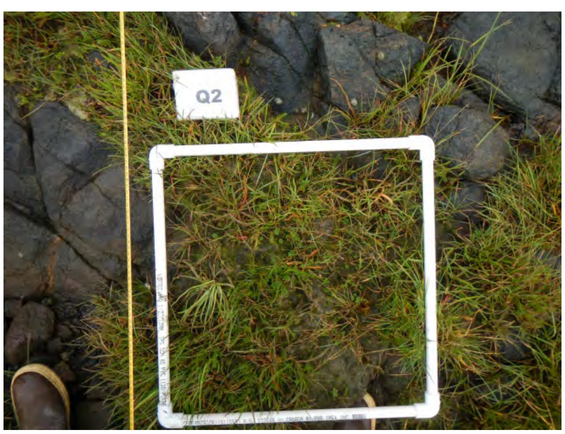
a. Facing south from nearshore Transect DB3

b. Facing nearshore on Transect DB4

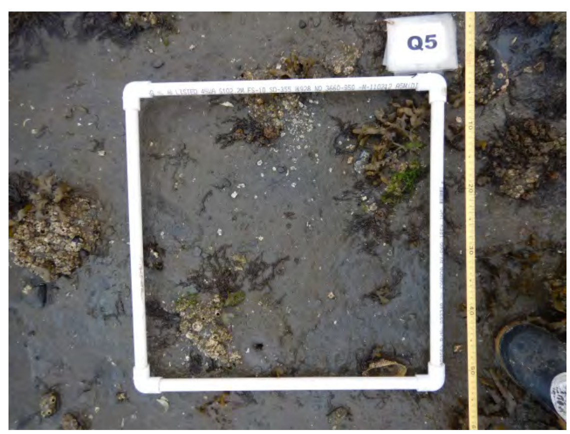
Photo 19 Cobble and Gravel Substrates in Delusion Bay

MARINE VEGETATION AND ALGAE

In Delusion Bay, 16 taxa of marine vegetation and algae were observed (see Appendix 1, Table 1-12). Towards the outer margins of the bay, in higher elevation areas, terrestrial grasses, sedges, and unidentified vascular plants were observed at relatively low abundance (see Photo 20a). Algal abundance was generally low, and was limited to areas with hard substrates suitable for attachment (e.g., boulder, cobble, gravel). On Transect DB1, filamentous green algae had a median abundance of 15.0% cover/quadrat (IQR 1.0-60.0% cover/transect), and beaked widgeongrass (*Ruppia maritima*) was occasionally observed (median 0% cover/quadrat; IQR 0-25.0% cover/quadrat; maximum: 100% cover/quadrat). On Transect DB2, *Fucus* spp. had a median abundance of 3.0% cover/quadrat (IQR 0-9.0% cover/quadrat), and some patches of beaked widgeongrass and eelgrass (*Z. marina*) were identified. On Transects DB3 and DB4, *Fucus* spp., filamentous green algae, and *Odonthalia* spp. were occasionally observed Photo 20b). *Halosaccion* spp. and *Mastocarpus* (blade and crust) were also identified on Transect DB4 in relatively low abundance.



a. Grasses and plants on Transect DB4



b. Green, brown and red algae on Transect DB3

Photo 20 Vegetation and Algae Observed in Delusion Bay

INVERTEBRATES AND FISH

Eight taxa of motile epifaunal invertebrates were observed in Delusion Bay (see Appendix 1, Table 1-13). Amphipods, red mites, isopods, limpets, periwinkles (*Littorina* spp.), shore crabs, and hermit crabs were found in varying abundance in areas where hard substrates were present. Oregon pill bugs were found on Transects DB1 and DB4 at low relative abundance (median 0 individuals/quadrat, IQR 0-0 individuals/quadrat, maximum: 16 individuals/quadrat). Three species of sessile invertebrates were identified: *B. glandula, S. cariosus* and *C. dalli*. All were found exclusively on hard substrates, generally at low relative abundance. *Balanus glandula* was found on all four transects and had the highest relative abundance of the three barnacle species (maximum of 70 individuals/quadrat).

Benthic infauna were sampled in 22 quadrats excavated in soft sediment areas of Delusion Bay. Errant polychaete worms (Class Errantia) were the most abundant taxa recorded (maximum median abundance of 2.0 individuals/quadrat [IQR 0-6.0 individuals/quadrat] on transect DB4; Photo 21a). Macoma clams, blood worms (*Glycera* spp.), and sand worms (*Nereis* spp.) were observed on Transects DB3 and DB4 at low relative abundance. A single butter clam (*Saxidomus* spp.) was identified in one quadrat on Transect DB3.

No finfish species were observed in the intertidal zone of Delusion Bay. Stantec biologists did incidentally observe several live pink salmon (*Oncorhynchus gorbuscha*) and a cutthroat trout (*O. clarkii*) at the head of Delusion Bay. A few pink salmon carcasses, with evidence of grey wolf (*Canis lupus*) and bear predation (grizzly bear [*Ursus artos horribilis*] and/or black bear [*U.americanus*]), were also observed (Photo 21b).

a. Polychaete worm (Class Errantia) observed on Transect DB3

b. Pink salmon (*Oncorhynchus gorbuscha*) carcass incidentally observed at head of Delusion Bay

Photo 21 Invertebrates and Fish Observed in Delusion Bay

5.2 Subtidal ROV Surveys

5.2.1 Scope

The objective of the subtidal surveys was to collect information on existing conditions for marine fish and fish habitat in the subtidal zone of the LAA. Data were collected to characterize the existing environment, to support the assessment of potential Project effects on marine fish and fish habitat and an application for a section 35(2)(b) *Fisheries Act* Authorization for residual serious harm to fish, if needed.

Stantec biologists, with the assistance of Sea Roamer Marine Services, surveyed the subtidal zone using an ROV at depths ranging from 1 m CD to 56 m (depth recorded as chart datum and depth surveyed varied by study area) of the LAA over three periods:

- July 6–11, 2014 (South Digby Island)
- September 20–21, 2014 (Casey Cove)
- October 17–19 and November 12, 2015 (East Digby Island)

Sampling was designed to collect the following information for each study area:

- Describe the composition of physical habitat types within the subtidal zone of the LAA (Objective 1)
- Describe the presence (for sessile or colonial species) and relative abundance (for motile species) of marine vegetation, algae, fish, and invertebrates within the subtidal zone (Objective 2)

5.2.2 Methods

Surveys of the subtidal zone of the LAA were completed by a field crew of three to five individuals (one or two Stantec biologists and three or four vessel crew, depending on the survey) using a *Deep Ocean Phantom DHD2+2* ROV. The ROV was operated from a 40 ft vessel and driven along pre-determined transects oriented perpendicular to shore. Transects were generally spaced between 150 and 250 m apart, and typically extended from the boundary of the LAA towards the shoreline (to the shallowest depth accessible) (see Figure 13). On some transects, stormy weather pushed the ROV off course; in these cases, partial or whole transects were re-surveyed. The depths surveyed, transect length, and GPS coordinates of each transect are provided in Appendix 2, Table 2-1. No subtidal transects were surveyed in Delusion Bay because the bay does not extend into the subtidal zone.

The ROV was equipped with a video camera (with zoom capabilities) to provide composite video signal to an overlay unit stamped with GPS coordinates (latitude/longitude) as well as the date, time, depth, and bearing for each frame. Video signal was displayed in real-time, allowing the ROV pilot to adjust the speed and flight path of the ROV if features of interest or obstacles were observed while underway. Lights provided illumination in poor light conditions and parallel scaling lasers (15 cm apart) allowed size estimation of organisms and other objects. The typical flight speed of the ROV was 0.3 m/s and the ROV typically hovered less than 0.5 m above the sea bed.

Substrate observations were recorded at the start and end of each transect, with every change in substrate composition, and for each species observation along the transect line. The type of substrate observed was grouped into the categories outlined in Table 10. Fish, invertebrates, algae, and vegetation observed along each transect were identified to the lowest taxonomic level possible and depths of observations were recorded. Observations of algae, marine vegetation, and aggregating/colonial organisms were recorded as present, whereas observations of finfish and motile invertebrates were counted.

Although video surveys by ROV provide a cost-effective method for monitoring large areas of seafloor, these types of surveys have inherent limitations that are important to recognize while interpreting results. Specifically, the ROV video analysis is more likely to detect larger, non-motile organisms due to restrictions in camera articulation and resolution, and smaller or cryptic organisms may not be visible during video review. Pelagic fish species may be missed as the camera is focused on the seafloor and primarily captures benthic and demersal fish species. Highly motile benthic and demersal fish species may not be captured on video as they avoid the field of view of the ROV camera. Finally, small, interstitial fauna (i.e., living within the seafloor sediments) are likely overlooked by ROV video survey.

Table 10 Subtidal Substrate Types

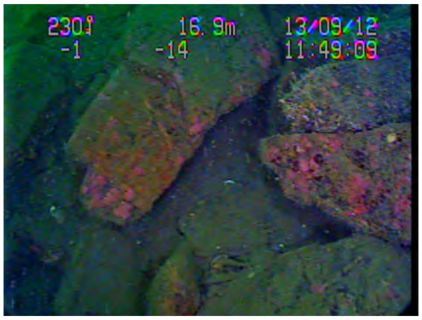
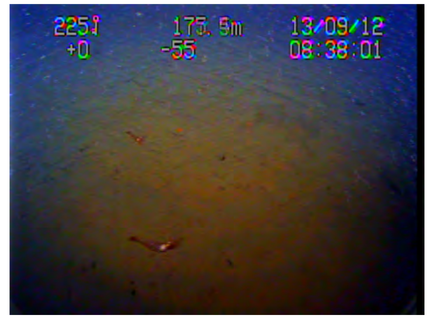
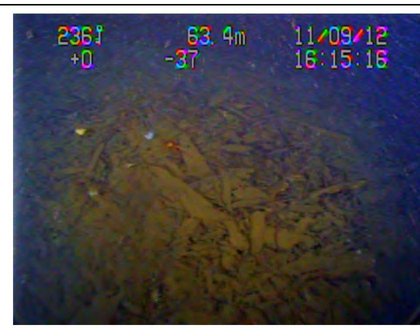
Substrate	Description	Example Photograph
Bedrock	Continuous solid bedrock	
Boulder	Rocks greater than 256 mm diameter	
Cobble/Gravel	Hard substrate, including small to medium sized rocks; gravel to cobble (2 mm – 256 mm diameter)	

Table 10 Subtidal Substrate Types

Substrate	Description	Example Photograph
Soft bottom	Fine grained sediments (<2 mm diameter)	
Shell	Calcareous remains of shellfish or invertebrates with shells	
Organic/Detritus	Soft material with 85% or more organic material	

5.2.2.1 Data Analysis

Stantec biologists reviewed all video footage following completion of each field survey to identify species and substrate composition recorded in the field. Each transect surveyed was grouped into one of three study areas (Casey Cove, East Digby Island, or South Digby Island) based on geographic location, and data collected were presented for each study area.

To achieve Objective 1 of the subtidal survey (describe the composition of physical habitat types within the subtidal zone of the LAA), substrates were grouped into “primary”, “secondary” and “tertiary” observations based on relative abundance. For example, if the start of a transect line was soft bottom habitat with shell littered on top, the primary substrate recording would be “soft bottom” and the secondary substrate recording would be “shell”. Final substrate classification was determined by grouping primary and secondary types (e.g., soft bottom with shell). In cases where three substrate types were identified, the substrate was classified as “mixed substrate”. Substrate observations were plotted along each transect and presented visually for each study area.

To achieve Objective 2 of the subtidal survey (describe the presence [for sessile or colonial species] and relative abundance [for motile species] of marine vegetation, algae, fish, and invertebrates within the subtidal zone), species observed along each transect were summarized in tabular form, either as present (for algae, vegetation, or sessile invertebrates) or as an estimate of relative abundance standardized to number/100 m of transect (fish and motile invertebrates). Median relative abundance (and IQR) and mean relatively abundance (and SD) of fish and motile invertebrates was calculated across transects, for each study area. The locations of CRA fish species were plotted along each transect to visualize the distribution of CRA fish observed during the survey.

5.2.3 Results

In the LAA, 41 transects were surveyed (see Figure 13): 8 in Casey Cove (Transects CC01–CC08), 9 at East Digby Island (Transects ED01–ED09) and 24 at South Digby Island (Transects SD01–SD24). The number of transects within each study area was influenced by the area of subtidal habitat potentially affected by the Project, and therefore larger study areas (i.e., South Digby Island) had relatively more transects compared to smaller areas (i.e., Casey Cove and East Digby Island). The total combined transect length surveyed was 4.0 km in Casey Cove, 4.9 km at East Digby Island, and 24.0 km at South Digby Island (see Appendix 2, Table 2-1). The following sections present general results for substrate types, marine vegetation and algae, invertebrates, and fish for each of the study areas. Detailed results are presented in Appendix 2, Table 2-2 through Table 2-8.

5.2.3.1 Casey Cove

Eight transects were surveyed in a grid pattern within Casey Cove, including two transects located at the southeastern corner of Casey Cove off Charles Point (CC07 and CC08) (see Figure 13). Transects completed within the cove ranged from 1 m to 23 m depth, while the two transects completed off Charles Point reached maximum depths of 36 m (see Appendix 2, Table 2-1).

SUBSTRATE

Six substrate classes were identified in the Casey Cove study area (see Figure 14). Within Casey Cove itself (Transects CC01-CC06), soft bottom was the most common substrate observed and shell was often the secondary substrate. Mixed substrates (various combinations of soft bottom, shell, and cobble/gravel) were observed on six of eight transects surveyed. Two transects completed off of Charles Point at the southeastern corner of Casey Cove (CC07 and CC08) were primarily bedrock/boulder with cobble/gravel, and mixed substrate. Several glass bottles, cables, and pieces of scrap metal were observed throughout the area.

MARINE VEGETATION AND ALGAE

Ten taxa of marine vegetation and algae were observed in Casey Cove (see Appendix 2, Table 2-2). Kelps of the genus *Laminaria* were the most commonly observed algal species and were identified on all transects at depths ranging from 1 to 17 m. Bull kelp was observed on five of eight transects. Kelps were often observed on soft bottom habitat, with shells acting as anchor points. A number of kelp observations were also made in areas where cobble/gravel or bedrock/boulder was the primary substrate. Other algal species observed include sea lettuce, rockweed, ribbon kelp (*Alaria marginata*), and pink rock crust (*Lithomanion* spp.) (see Appendix 2, Table 2-2).

Eelgrass (*Z. marina*) was observed on four of eight transects surveyed in Casey Cove (see Appendix 2, Table 2-2). Observations were made between 2 and 7 m depth in areas where the dominant substrate type was soft bottom with shell. Eelgrass beds within the LAA were surveyed in greater detail during a dedicated eelgrass survey in 2015 (see Section 5.4).

MARINE FISH

During the ROV survey, 222 fish representing 22 taxa (10 families) were observed in Casey Cove (see Appendix 2, Table 2-3). Rock sole (*Lepidopsetta bilineata*) and northern ronquil (*Ronquilus jordani*) were the most commonly observed species (observed on six of eight transects). Rock sole was the most abundant species observed in Casey Cove (median 0.9 fish/100 m of transect, IQR 0.1-1.7; Appendix 2, Table 2-3). Other species observed included snake prickleback (*Lumpenus sagitta*; Photo 22).

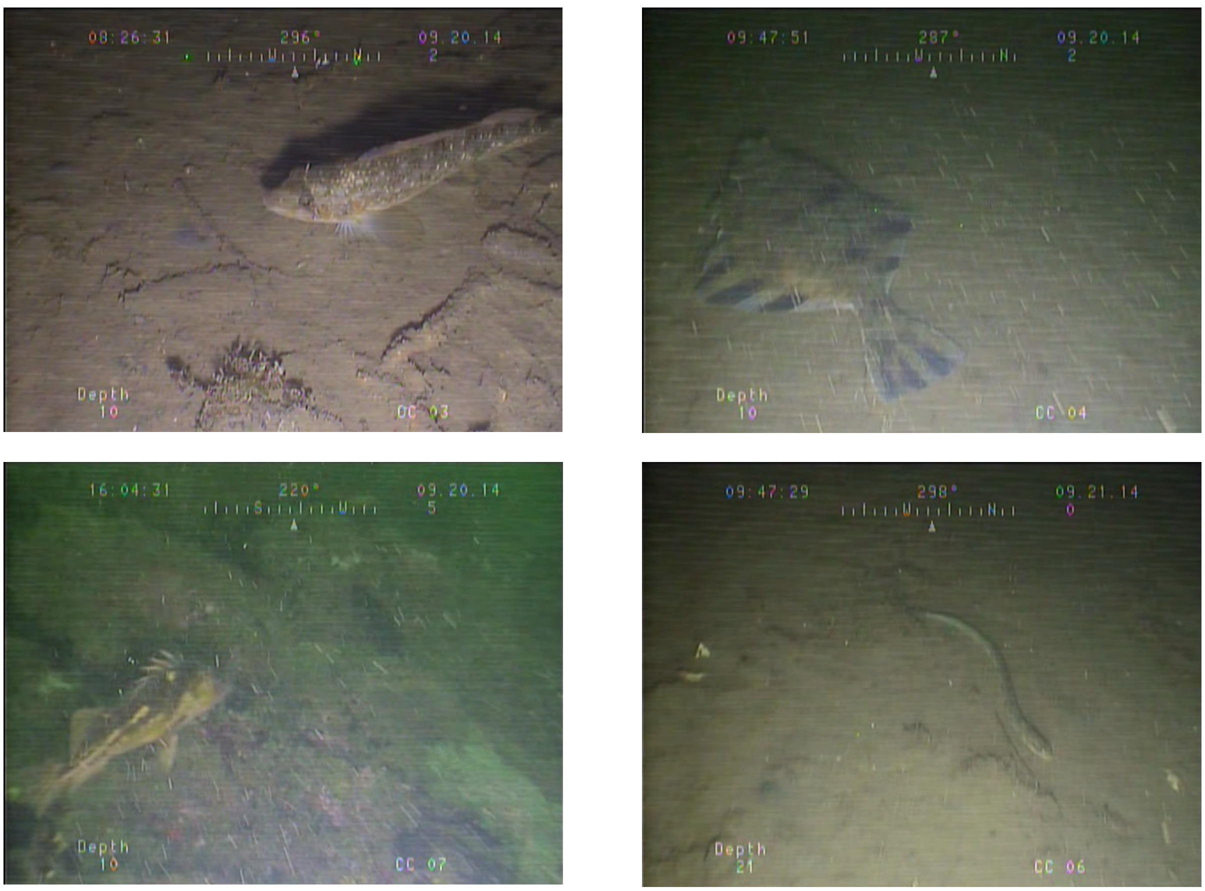


Photo 22 Marine fish observed in Casey Cove. Clockwise from top left: whitespotted greenling (*Hexagrammos stelleri*), starry flounder (*Platichthys stellatus*), snake prickleback (*Lumpenus sagitta*), and copper rockfish (*Sebastes caurinus*).

A number of species of CRA importance were observed on soft bottom substrate, including buffalo sculpin (*Enophrys bison*), red Irish lord (*Hemilepidotus hemilepidotus*), rock sole, English sole (*Parophrys vetulus*), starry flounder (*Platichthys stellatus*; Photo 22) and Pacific tomcod (*Microgadus proximus*). CRA fish species observed in areas with bedrock/boulder as the dominant substrate type included copper rockfish (*Sebastes caurinus*; Photo 22), whitespotted greenling (*Hexagrammos stelleri*; Photo 22), kelp greenling (*Hexagrammos decagrammus*), and lingcod (see Figure 15).

CRAB AND SHRIMP

During the ROV survey, 182 individuals representing 7 taxa (5 families) of crab were observed in Casey Cove (see Appendix 2, Table 2-3). Crabs were typically observed on soft bottom substrate, although a few were observed on mixed substrate (see Figure 16). The most commonly observed and abundant taxon was the hermit crab (median 0.9 individuals/100 m of transect, IQR 0.6-1.4). Dungeness crab was also relatively abundant in Casey Cove (median 0.5 individuals/100 m of transect, IQR 0.2-0.8) (see Photo 23). Eight red rock crab (*Cancer productus*) was observed in the survey area, primarily on soft bottom with shell (Photo 23). No prawn or shrimp were recorded along transects surveyed in Casey Cove.

Photo 23 CRA crab species observed in Casey Cove. Left: Dungeness crab (*Metacarcinus magister)* on soft bottom substrate. Right: red rock crab (*Cancer productus*) on mixed substrate.

OTHER MARINE INVERTEBRATES

There were 35 taxa (28 families) of marine invertebrates other than crab observed in Casey Cove (see Appendix 2, Tables 2-2 and 2-3). The giant California sea cucumber (see Photo 24) was the most abundant species observed (median 4.2 individuals/100 m of transect, IQR 2.1-6.6) (see Figure 17). Other species observed included sunflower star, swimming anemone (*Stomphia didemon*), vermillion star (*Mediaster aequalis*), and orange sea pen (*Ptilosarcus gurneyi*). A single sighting of a cloud sponge (*Aphrocallistes vastus*) was made on Transect CC07 at the southeastern edge of Casey Cove (see Appendix 2, Table 2-3; Photo 24).

Spiny scallop (*Chlamys hastata*; Photo 24), red urchin (see Photo 24), and giant California sea cucumber were the only CRA marine invertebrate species observed in Casey Cove (aside from crab, Figure 17).

The scallops were observed on soft bottom and soft bottom with shell substrates and the red urchins were found on bedrock/boulder with cobble/gravel and soft bottom. Giant California sea cucumber was observed on all substrates surveyed in Casey Cove.

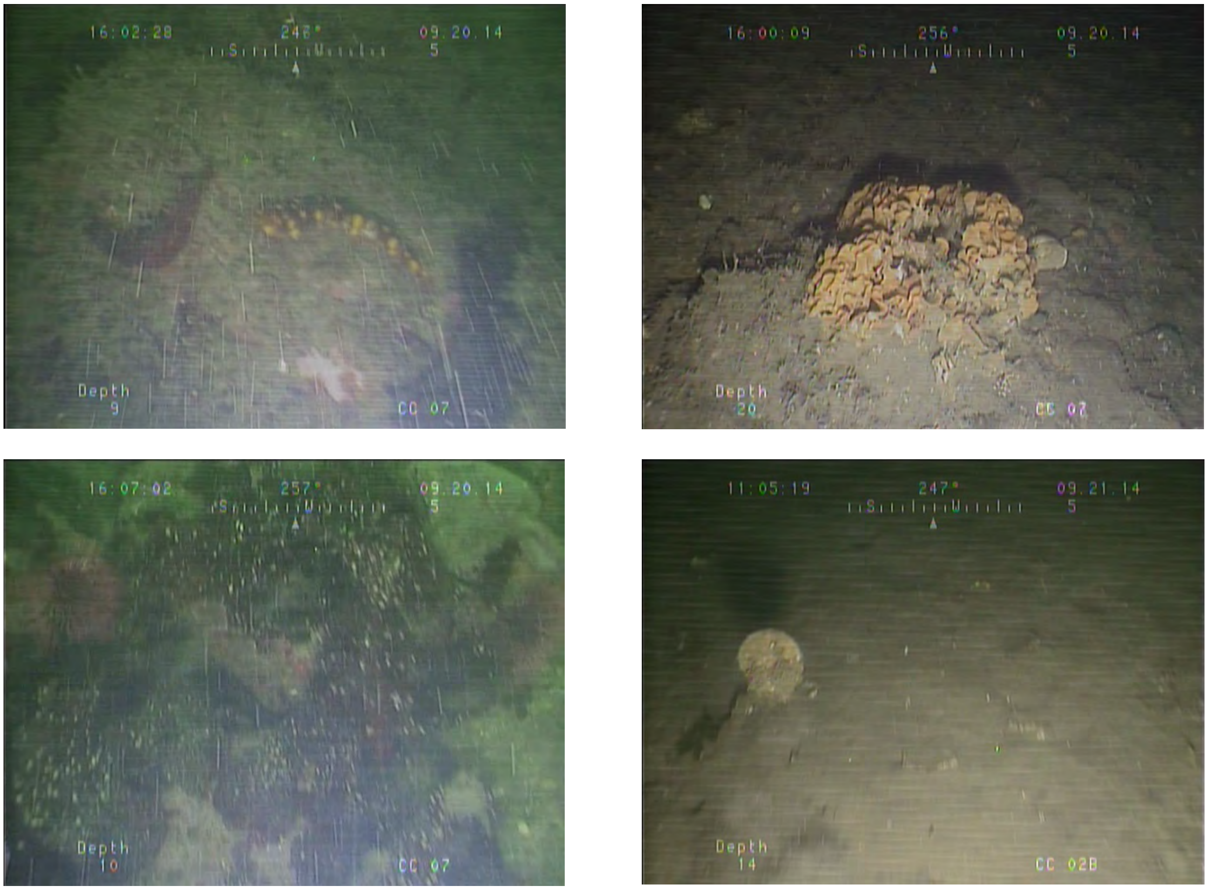


Photo 24 Marine invertebrates observed in Casey Cove. Clockwise from top left: two giant California sea cucumbers (*Parastichopus californicus*), cloud sponge (*Aphrocallistes vastus*), escaping spiny scallop (*Chlamys hastata*), and two red urchins (*Strongylocentrotus franciscanus*).

5.2.3.2 East Digby Island

Nine transects were surveyed off the east shore of Digby Island, between Charles Point and Fredrick Point (see Figure 13). Depths ranged from 1 to 49 m (see Appendix 2, Table 2-1).

SUBSTRATE

Five substrate classes were identified at East Digby Island (see Figure 18). Cobble/gravel was the dominant substrate type over all depths, and it was often associated with varying amounts of shell material. Unlike Casey Cove, soft bottom substrate was relatively less abundant, and was not observed as the primary substrate type along surveyed transects.

MARINE VEGETATION AND ALGAE

At East Digby Island, 15 taxa of marine vegetation and algae were observed (see Appendix 2, Table 2-4). Overall, observations of algae were low compared to Casey Cove. Pink rock crust was the most commonly observed species (observed on eight of nine transects), and was typically found on cobble substrates between 1 and 8 m depth. Several species of kelp were observed, including ribbed kelp (*Costaria costata*), split kelp, sea cabbage (*Saccharina sessilis*, Photo 25), broad-ribbed kelp (*Pleurophycus gardneri*), ribbon kelp, sieve kelp (*Agarum clathratum*), and bull kelp. All kelps were observed growing on cobble substrates at depths shallower than 8 m. Sea lettuce (see Photo 25) and an unidentified green alga (*Phylum Chlorophyta*) were the only green algae recorded during the survey.

Eelgrass (*Z*. *marina*) was observed on four of nine transects surveyed at East Digby Island (see Appendix 2, Table 2-4). Observations were made in areas of cobble/gravel and cobble/gravel with shell at depths ranging from 1 to 6 m. For more detailed information on the distribution of eelgrass at East Digby Island, please refer to the results of the dedicated eelgrass survey in Section 5.4.

Photo 25 Algae observed at East Digby Island. Left: sea cabbage (*Saccharina sessilis*). Right: sea lettuce (*Ulva* spp.).

MARINE FISH

During the ROV survey, 136 fish representing 22 taxa (11 families) were observed at East Digby Island (see Appendix 2, Table 2-5). Fish were observed at all depths surveyed on all five substrate classes. The highest taxon richness was observed between 13 and 36 m depth, with observations of fish belonging to eight families. Northern ronquil was the most commonly observed species, recorded on 7 of 9 transects. The most abundant species observed was an unidentified sculpin (median 0.5 individuals/100 m of transect, IQR 0.2-0.7)

As shown on Figure 19, fish species of CRA importance observed during the survey include rock sole, English sole, unidentified right eye flounders (Family Pleuronectidae), big skate (*Raja binoculata*), kelp greenling, unidentified cod (Family Gadidae), unidentified greenling (Family Hexagrammidae), and unidentified Irish lord (*Hemilepidotus* spp.) (see Photo 26).

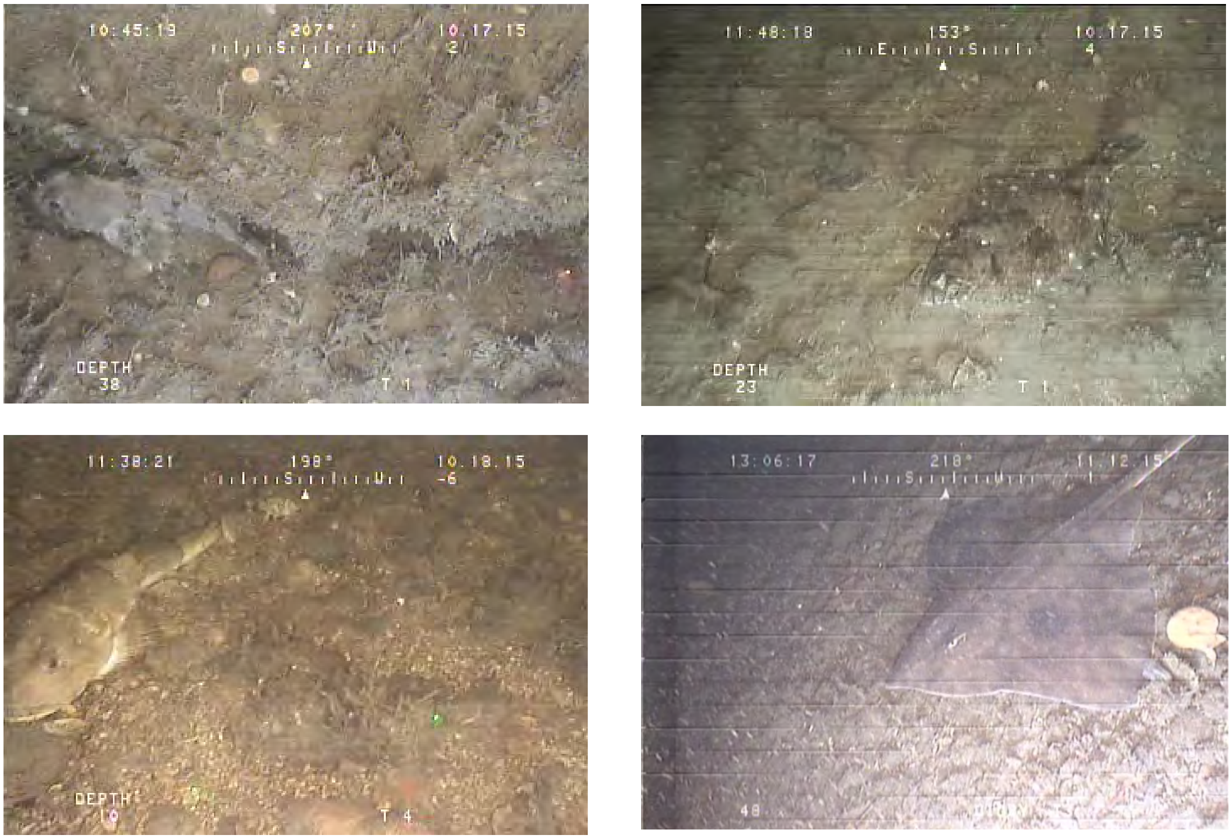


Photo 26 Marine fish observed at East Digby Island. Clockwise from top left: Irish lord (*Hemilepidotus* spp), rock sole (*Lepidopsetta bilineata*), big skate (*Raja binoculata*), and great sculpin (*Myoxocephalus polyacanthocephalus*).

CRAB AND SHRIMP

During the ROV survey, 6,590 crab and shrimp representing 18 taxa (9 families) were observed along transects surveyed at East Digby Island (see Appendix 2, Table 2-5). Shrimps of the genus *Pandalus* were commonly observed (observed along eight of nine transects) and were present at all depths (see Figure 20). The following *Pandalus* species were observed: coonstripe shrimp (*P. danae*; Photo 27), humpback shrimp (*P. hypsinotus*), spiny pink shrimp (*P. eous*), spot prawn (*P. platyceros*) and unidentified *Pandalus* species. The highest relative abundance of *Pandalus* shrimp occurred at depths between 25 and 49 m. Other species observed during the survey include hermit crab (*Pagarus* spp.; Photo 27) and squat lobster (*Munida quadrispina*; Photo 27).

Three crab species of CRA importance were observed at East Digby Island: Dungeness crab (Photo 27), red rock crab, and tanner crab. All were observed over predominantly cobble substrates.

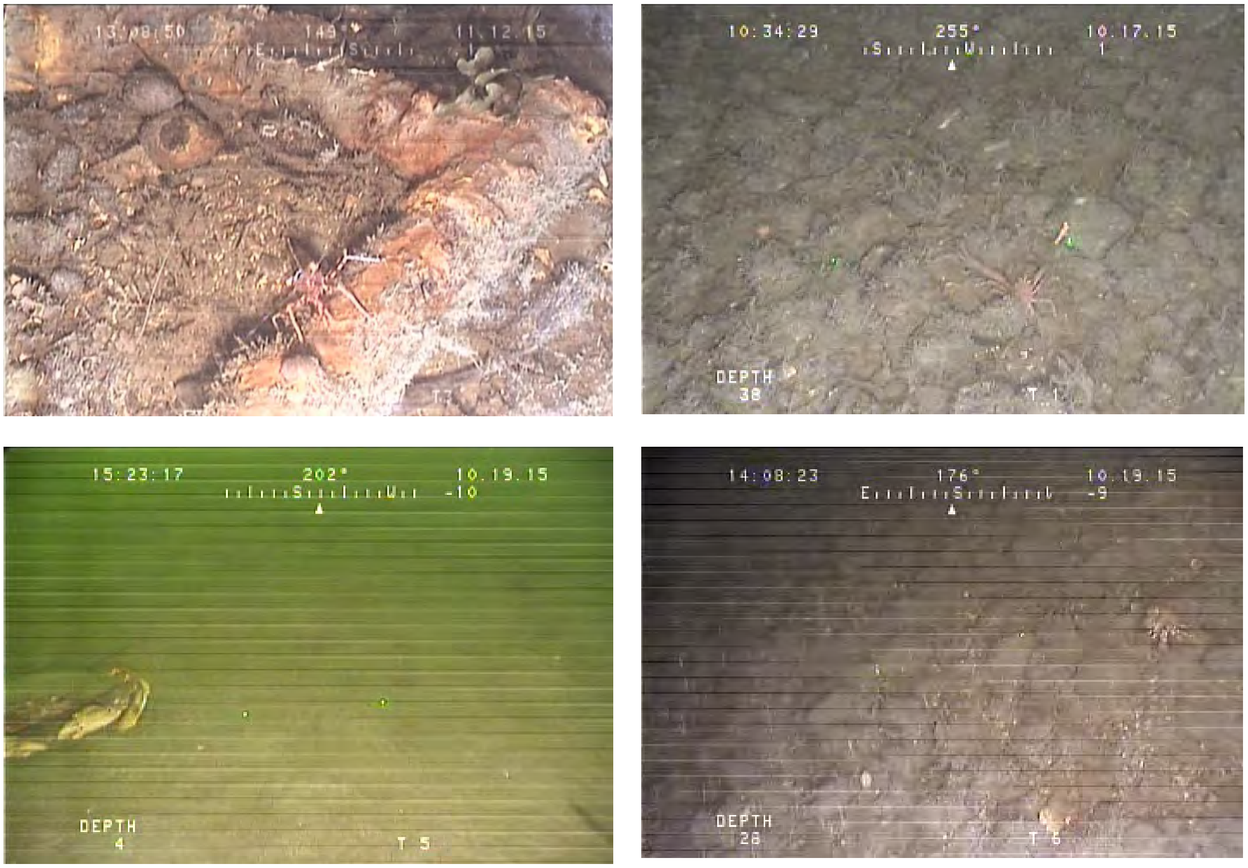


Photo 27 Crab and shrimp observed at East Digby Island. Clockwise from top left: coonstripe shrimp (*Pandalus danae*), squat lobster (*Munida quadrispina*), hermit crab (*Pagurus* spp), and Dungeness crab (*Metacarcinus magister*)

OTHER MARINE INVERTEBRATES

During the ROV survey of East Digby Island, 80 taxa (47 families) of marine invertebrates other than crab, shrimp, and prawns were observed (see Appendix 2, Tables 2-4 and 2-5; Photo 28). Invertebrates were present at all depths surveyed and on all substrate classes observed. The giant California sea cucumber was the most abundant (median 13.2 individuals/100 m of transect, IQR 12.4-17.9) and most commonly observed species (observed on all transects), and was typically found on cobble/gravel substrates with varying amounts of shell and soft bottom (see Figure 21).

Other CRA species observed included red urchin, white urchin (*S. pallidus*), purple urchin (*S. purpuratus*), and green urchin (*S. droebachiensis*). Spiny scallop and smooth pink scallop (*Chlamys rubida*) was recorded as well. Other non-CRA fish species observed species were the crimson anemone (*Cribrinopsis fernaldi*), vermilion star, and leather star. Several species of encrusting byozoans, hydroids, sponges, and hydrocorals were also observed growing on the predominantly cobble substrate (see Appendix 2, Table 2-4). A single giant Pacific octopus (*Enteroctopus dofleini*) was also recorded.

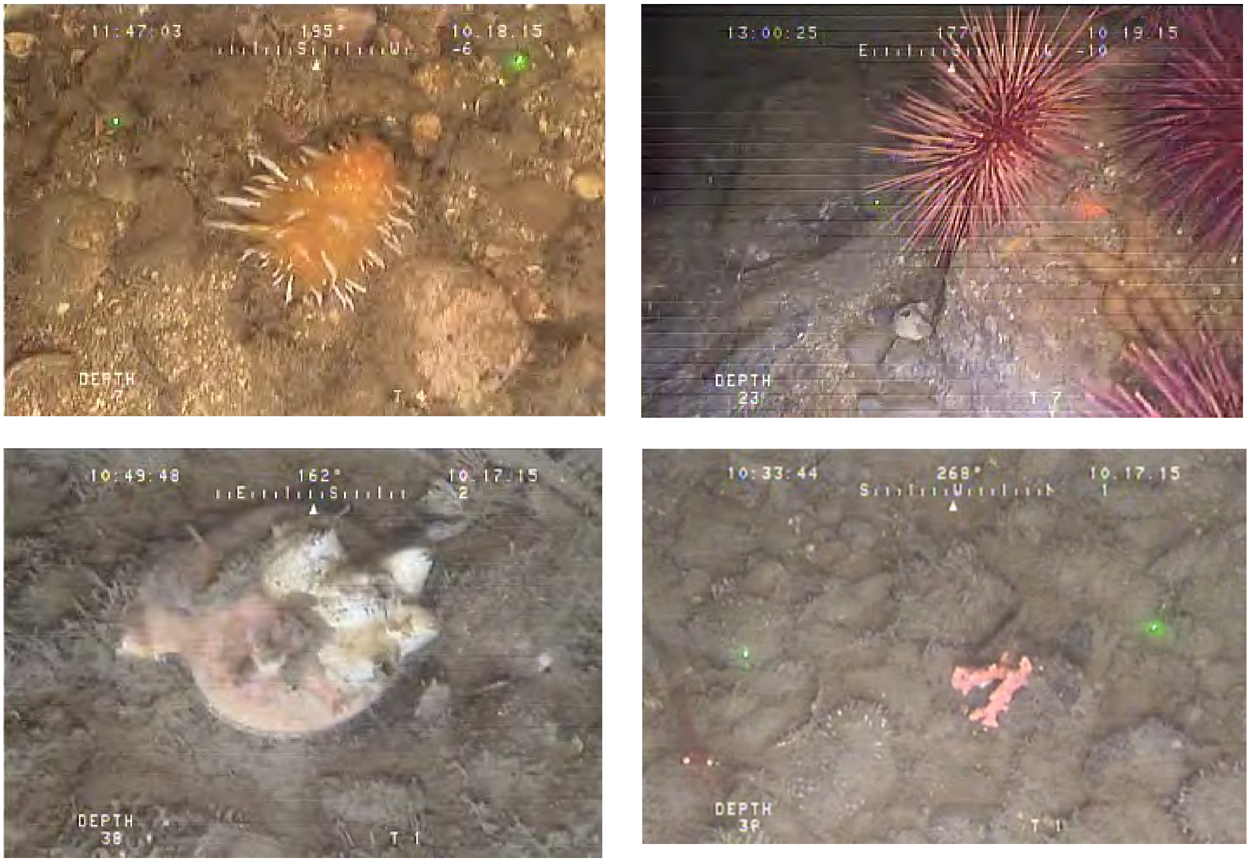


Photo 28 Marine invertebrates observed at East Digby Island. Clockwise from top left: Golden dirona (*Dirona pellucida*), red urchins (*Stronglycentrotus franciscanus*), pink branching hydrocoral (*Stylaster norvigicus*), and smooth pink scallop (*Chlamys rubida*).

5.2.3.3 South Digby Island

There were 24 subtidal transects surveyed off the south end of Digby Island (see Figure 13). The survey area included shallow subtidal habitats off of Frederick, Miller, and Lima Points, the mouth of Delusion Bay, and habitats surrounding Tuck, Spire, and Metford Islands. Survey depths varied according to location and ranged from 0 to 56 m CD (see Appendix 2, Table 2-1).

SUBSTRATE

At South Digby Island, 15 substrate classes were identified in the subtidal zone (see Figure 22). Soft bottom habitat was the most common substrate type (observed on all transects), and was generally observed in deeper waters away from the shoreline. Nearshore subtidal habitats in the vicinity of Lima Point, Fredrick Point, and Spire, Tuck and Metford Islands had higher proportions of rocky substrates (i.e., boulder/bedrock and cobble/gravel) compared to other areas off of the south end of Digby Island, with varying amounts of soft bottom and shell.

MARINE VEGETATION AND ALGAE

There were 29 taxa of marine vegetation and algae observed at South Digby Island, over a depth range of 0 to 27 m on a variety of substrate types (see Appendix 2, Table 2-6). An unidentified species of *Ulva* was the most commonly observed species and was recorded on 14 of 24 transects, primarily in shallow nearshore habitats between 0 and 5 m depth. Eight taxa of kelp were identified in the study area: bull kelp, ribbon kelp, split kelp, sugar kelp, *Agarum* spp., *Alaria* spp., *Laminaria* spp., and *Saccharina* spp (Photo 29). Bull kelp was the most commonly observed kelp species (present on 11 of 24 of transects). Kelps of the genera *Laminaria* and *Saccharina* were observed in areas of boulder, bedrock, and soft bottom with shell or cobble near Spire and Tuck Islands.

Red algal species observed during the survey included pink rock crust, splendid iridescent seaweed (*Mazzaella splendens*), Turkish washcloth (*Mastocarpus papillatus*), sea brush (*Odonthalia* spp.), red opuntia (*Opuntiella californica*), black pine (*Neorhodomela larix*), and cup and saucer (*Constantinea rosa-marina*). These species were typically found in areas where boulder, bedrock, or cobble was the dominant substrate type, especially in shallow subtidal habitats near Lima Point, Fredrick Point, and Spire and Tuck Islands.

Eelgrass (*Z. marina*; Photo 29) was observed on 13 of 24 transects surveyed at South Digby Island, primarily in shallow soft bottom habitats from 1 to 6 m depth (see Appendix 2, Table 2-6). For more detailed information on the distribution of eelgrass at South Digby Island, please refer to the results of the dedicated eelgrass survey in Section 5.4.

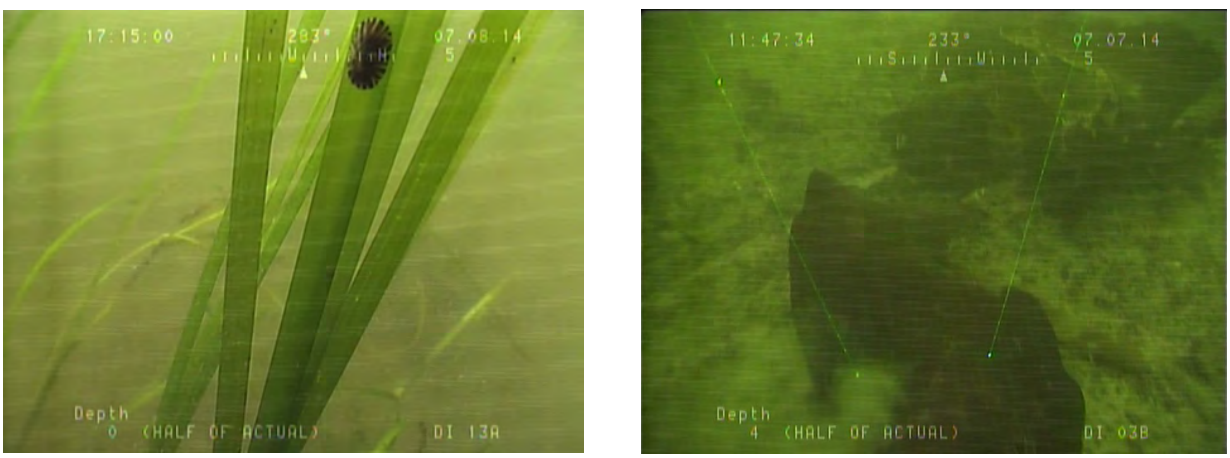


Photo 29 Marine vegetation observed at South Digby Island. Left: eelgrass (*Zostera marina*) and a limpet (*Tectura* spp.) on soft bottom substrate. Right: kelp of the genus *Saccharina*.

MARINE FISH

During the ROV survey, 1,538 fish representing 40 taxa (13 families) were observed at South Digby Island (see Appendix 2, Table 2-7 and 2-8). Right eye flounders (Family Pleuronectidae) were the most abundant taxa (median 0.3 individuals/100 m of transect, IQR 0.2-0.8), and were observed throughout the study area in soft bottom habitats. Other species observed included: pricklebacks (Family Stichaeidae), eelpouts (*Zoarcidae* spp.), unidentified sculpins (Family Cottidae), rock sole (Photo 30), unidentified cod (Family Gadidae), English sole, unidentified poacher (see Photo 30), brown Irish Lord (Photo 30), and northern ronquil.

Four species of rockfish (genus *Sebastes*) were observed within the study area: quillback rockfish, copper rockfish (see Photo 30), black rockfish (*S. melanops*), and yellowtail rockfish (*S. flavidus*). Most of these rockfish were recorded around Lima Point over predominantly rocky substrates (see Figure 23). Four unidentified rockfish were also observed, one of which occurred near the mouth of Delusion Bay.

Other CRA fish species observed at South Digby Island included Pacific cod (*Gadus macrocephalus*), slender sole (*Lyposetta exilis*), Dover sole (*Microstomus Pacificus*), yellowfin sole (*Limanda aspera*), starry flounder, big skate, cabezon (*Scorpaenichthys marmoratus*), kelp greenling, and whitespotted greenling (see Figure 23). All of these species were observed over varied soft bottom substrate.

Photo 30 Marine fish observed at South Digby Island. Clockwise from top left: rock sole (*Lepidopsetta bilineata*), unidentified poacher (Family Agonidae), brown Irish lord (*Hemilepidotus spinosus*), and copper rockfish (*Sebastes caurinus*).

CRAB AND SHRIMP

During the ROV survey, 18,632 crab and shrimp representing 19 taxa (11 families) were observed at South Digby Island (see Appendix 2, Tables 2-7 and 2-8). Hermit crab (*Pagarus* spp.) was the most commonly observed taxon (observed on all transects) and the most abundant (median 1.8 individuals/100 m of transect, IQR 0.8-4.0). Unidentified shrimp were also observed but typically in relatively lower numbers across transects, except for along the south end of transect SD08, where close to 12,000 individuals were observed over soft bottom habitat at depths of 24 to 49 m (see Figure 24). Other taxa observed included unidentified *Pandalus* shrimp (observed in relatively larger numbers off the west side of Fredrick Point).

Additional species of CRA importance were observed within the study area, including Dungeness crab, tanner crab, red rock crab, brown box crab (*Lopholithodes foraminatus*), spot prawn, humpback shrimp, and coonstripe shrimp. The Dungeness crab observations were spread throughout the study area, typically on soft bottom substrates between 2 and 30 m depth (see Figure 24). Observations of tanner crabs were typically in deeper waters in the southern portion of the study area, with most observations between 20 and 40 m depth over soft bottom. The red rock crabs and the single brown box crab were recorded in nearshore habitats over various substrate types (soft bottom, boulder, cobble, shell) in the vicinity of Metford Island and Fredrick Point).

OTHER MARINE INVERTEBRATES

During the ROV survey, 79 taxa (45 families) of marine invertebrates other than crabs and shrimp were identified in the South Digby Island study area (see Appendix 2, Tables 2-6, 2-7, and 2-8, Photo 31). Giant California sea cucumber was the most abundant species (median 1.3 individuals/100 m of transect, IQR 0-3.3), while swimming anemone and sunflower star were the most frequently observed (each recorded on 18 of 24 transects). Other species observed included giant plumose anemone (*Metridium farcimen*), brittle star (*Ophiura sarsii*), and limpet (*Tectura* spp.).

Species of CRA importance observed during the survey included purple urchin, red urchin, green urchin, white urchin, spiny scallop, smooth pink scallop, gumboot chiton (*Cryptochiton stelleri*), and giant Pacific octopus (see Figure 25). Most of the urchins were observed in the vicinity of Lima Point and to the east of Spire and Tuck Islands, in areas with mixed rocky substrates. The scallops were generally distributed in deeper waters in the southern portion of the study area, although a cluster was also observed to the east of Fredrick Point. The single giant Pacific octopus was recorded at 28 m depth over soft bottom substrate east of Lima Point.

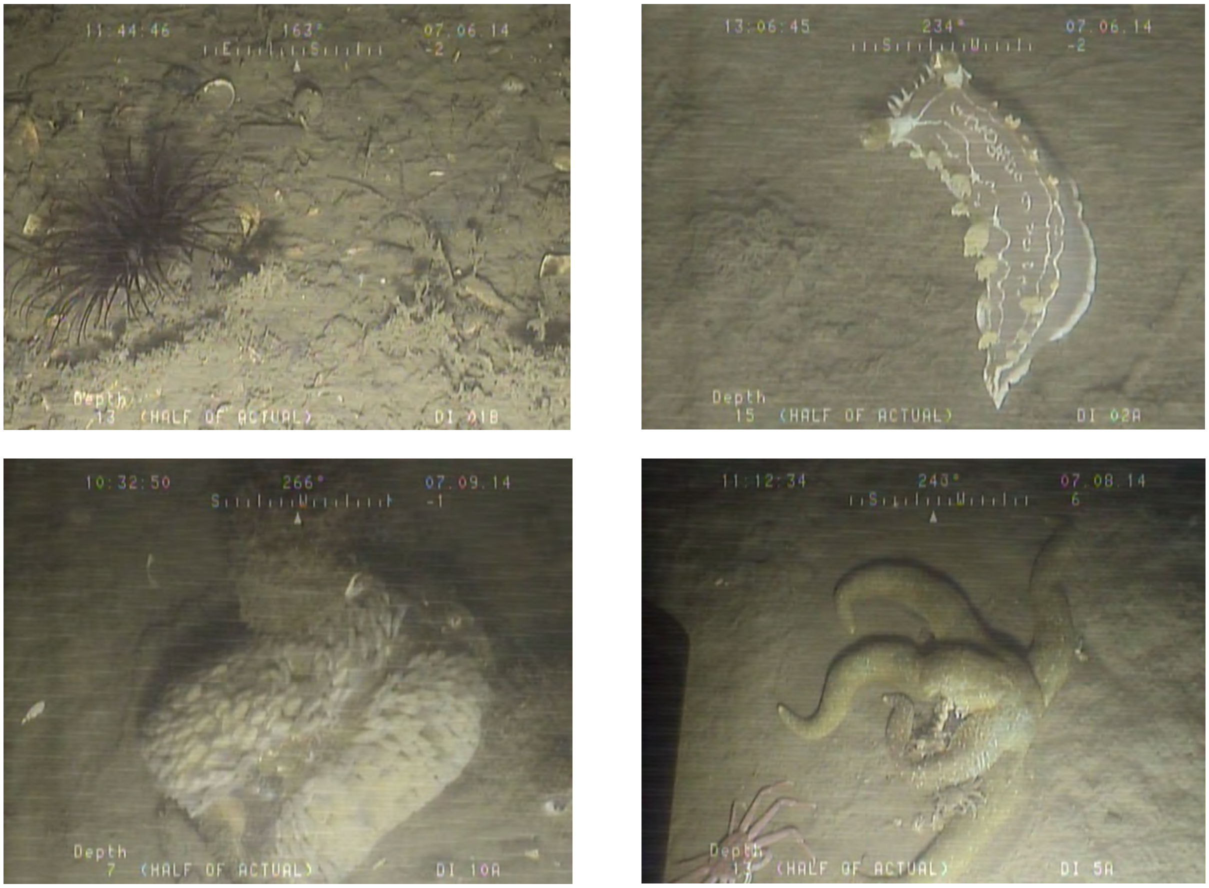


Photo 31 Marine invertebrates observed at South Digby Island. Clockwise from top left: tube dwelling anemone (*Pachycerianthus fimbriatus*), diamondback nudibranch (*Tritonia festiva*), mottled star (*Evasterias troscheli*) with tanner crabs (*Chionoecetes tanneri*), and cephalopod eggs (Cephalopoda).

5.3 Crab Trapping

5.3.1 Scope

Triton/Khtada Environment Services LP (Khtada) field crews and Stantec field crews trapped crabs on four separate occasions (herein referred to as ‘crab trapping events’), each with a specific objective (see Table 11). Details on the methods and results of the Triton/Khtada sampling events are based on information presented in Triton (2014) and Khtada (2015). Crab traps were set within Casey Cove, East Digby Island, and South Digby Island. Traps were also set in Tremayne Bay, located on the west side of Digby Island. The objective of Section 5.3 is to summarize the methods and results of each crab trapping event.

Table 11 Summary of Crab Trapping Efforts Completed for the Aurora LNG Project

Date	Company	Objective of Trapping Efforts	Site(s) Sampled
August 6–9, 2014	Triton/Khtada	Reconnaissance study to document the presence of crabs within and outside areas potentially affected by the Project	South Digby Island Tremyane Bay
March 21–22, 2015	Triton/Khtada	To collect large male Dungeness crabs (greater than minimum size limit for harvesting; DFO 2015) from within the dredge pocket associated with the material offloading facility (MOF), for tissue for analysis in support of the Project's human health risk assessment	Casey Cove
		Reconnaissance study to document the presence of crabs within and outside areas potentially affected by the Project	Casey Cove Tremayne Bay
August 1–3, 2015	Stantec	To collect large male Dungeness crabs (greater than minimum size limit for harvesting) from within the dredge pocket associated with the marine terminal, for tissue for analysis in support of the Project's human health risk assessment	South Digby Island
May 7–10, 2016	Stantec	To document the presence of crabs within areas potentially affected by the Project to support the assessment of potential Project effects on marine fish and fish habitat	Casey Cove South Digby Island East Digby Island

NOTE:

At the time of the August 2014 sampling, Tremayne Bay was located within the LAA; however, upon revision of the Project design in late 2014, the LAA was contracted and Tremayne Bay no longer fell within its boundaries. In March 2015, Tremayne Bay was treated as a reference site.

5.3.2 Methods

Table 12 summarizes the type of gear, bait, soak time, depth sampled (recorded in chart datum), and crab data recorded during each trapping event. A full schedule of crab trapping efforts, including GPS coordinates, depth, and soak time associated with each trap is included in Appendix 3, Table 3-1.

Recreational or commercial crab trapping gear was used to catch crabs, and gear type differed between Triton/Khtada and Stantec trapping events. Because both gear types are designed to capture and retain relatively large crabs, the data potentially underestimates the presence and abundance of smaller crabs in the area (e.g., smaller Dungeness crabs, or smaller species [e.g., red rock crab]). Moreover, because recreational and commercial traps are likely to have different catch efficiencies, and because of potential differences in bait used in the two gear types, catch data may not be directly comparable between Triton/Khtada and Stantec trapping efforts. Therefore, data from each gear type was reported separately.

Crab trapping occurred at Casey Cove, East Digby Island, South Digby Island, and Tremayne Bay. The location of each crab trap deployed is shown in Figure 26, organized by trapping event. All species were captured under DFO scientific collection permits and live-released at (or nearby) the location of capture, with the exception of large (>165 mm carapace width), male, Dungeness crabs that were retained for tissue analysis: seven in March 2015 and twelve in August 2015.

Table 12 Crab Trapping Field Methods Specific to Each Crab Trapping Event

Date	Gear Type	Bait	Soak Time (Range)	Depth (m) (Range)	Crab Data Recorded
August 6–9, 2014	recreational grade 24 inch square, vinyl-coated SteelFold crab traps	-	22 – 48 hr	5 - 21	▪ crab species captured ▪ number of individuals ▪ sex (Dungeness crabs only) ▪ carapace width
March 21–22, 2015		-	24 hr	-	▪ crab species captured ▪ number of individuals ▪ sex (Dungeness crabs only) ▪ carapace width ▪ weight (recorded only for male Dungeness crabs > 165 mm)
August 1–3, 2015	commercial grade traps (0.91 m bottom ring, 0.86 m top ring, two 105 mm escape hatches, 25 mm weight bar, wrapped in standard mesh [0.05 m diamond weave])	1 Pacific herring (cut in half)/ trap	24 – 26 hr	11 - 25	▪ crab species captured ▪ number of individuals ▪ sex (Dungeness crabs only) ▪ carapace width (recorded only for males > 165 mm) ▪ weight (recorded only for male Dungeness crabs > 165 mm)
May 7–10, 2016		1 Pacific herring (cut in half)/ trap	5 – 24 hr	4 - 19	▪ crab species captured ▪ number of individuals ▪ sex (Dungeness crabs only) ▪ carapace width ▪ gravid (females only)

NOTE:
- : data not reported in final report

5.3.2.1 Data Analysis

Data collected during each of the four crab trapping events were treated separately because of differences in objectives and sampling methodologies (e.g., gear type [recreational versus commercial traps], timing, and sites sampled within a study area). For each study area, a list of crab species captured and an estimate of relative abundance is provided by trapping event. Relative abundance is estimated using catch per unit effort (CPUE), which was calculated as the number caught per trap per 24 hour soak period. Median CPUE was calculated from multiple crab traps deployed within the same study area, during each trapping event. If recorded, the minimum and maximum values of the weight (g) and carapace width (mm) of male and female Dungeness crab is summarized in tabular format for each trapping event, by study area.

5.3.3 Results

5.3.3.1 Casey Cove

Crab trapping was completed in Casey Cove in March 2015 (using recreational grade traps) and May 2016 (using commercial grade traps) (see Figure 26). Dungeness crab was the only crab species captured during both trapping events (see Photo 32). CPUE estimates are provided in Table 13. Weight and carapace length of Dungeness crab captured during March 2015 and May 2016 is summarized in Table 14. Two of the five females captured in May 2016 were gravid females (see Photo 33). Appendix 3, Table 3-2 presents the length, weight, and sex of each individual captured in Casey Cove.

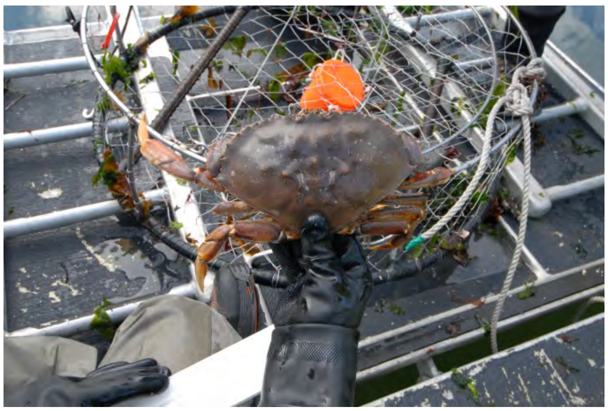


Photo 32 Male Dungeness Crab (*Metacarcinus magister*) Captured in Casey Cove in May 2016

Photo 33 Gravid Female Dungeness Crab (*Metacarcinus magister*) Captured in Casey Cove in May 2016

Table 13 CPUE (number/24 hour soak period) of Crabs Captured in Casey Cove during March 2015 and May 2015

Date	Gear Type	No. of Traps	Species	Catch	Median CPUE	Min CPUE	Max CPUE
March 21–22, 2015	recreational grade trap	3	Dungeness crab	8	3.1	0	5.2
May 7–10, 2016	commercial grade trap	5	Dungeness crab	26	4.1	1.0	11.3

Table 14 Minimum (Min) and Maximum (Max) Carapace Width (mm) and Weight (g) of Dungeness Crab Captured in Casey Cove

	Male							Female						
	Catch	Length (mm)			Weight (g)			Catch	Length (mm)			Weight (g)		
Date		n	Min	Max	n	Min	Max		n	Min	Max	n	Min	Max
March 21–22, 2015	8	8	151	205	7	693	>1000	0	0	-	-	-	-	-
May 7–10, 2016	21	21	153	190	-	-	-	5	5*	135	149	-	-	-

NOTE:
- data not recorded

5.3.3.2 East Digby Island

Crab trapping was completed in the small bay north of Philips Point, along the eastern shoreline of Digby Island in May 2016 using commercial grade traps (see Figure 26). Dungeness crab was the only crab species captured (see Table 15). The 13 Dungeness crab captured were male. Weight and carapace length of individuals captured is summarized in Table 16. Photos of individuals captured are provided in Photo 34 and Photo 35. Appendix 3, Table 3-2 presents the length, weight, and sex of each individual captured in East Digby Island.

Table 15 CPUE (number/24 hour soak period) of Crabs Captured in East Digby Island During May 2016

Date	Gear Type	No. of Traps	Species	Catch	Median CPUE	Min CPUE	Max CPUE
May 7–10, 2016	commercial grade trap	2	Dungeness crab	13	6.8	6.3	7.3

Table 16 Minimum (Min) and Maximum (Max) Carapace Width (mm) and Weight (g) of Dungeness Crab Captured in East Digby Island

	Male							Female						
	Catch	Length (mm)			Weight (g)			Catch	Length (mm)			Weight (g)		
Date		n	Min	Max	n	Min	Max		n	Min	Max	n	Min	Max
May 7–10, 2016	13	13	158	188	-	-	-	0	0	-	-	-	-	-

NOTE:
- data not recorded

Photo 34 Dungeness Crab (*Metacarcinus magister*) Captured in East Digby Island

Photo 35 Male Dungeness Crab (*Metacarcinus magister*) Captured in East Digby Island

5.3.3.3 South Digby Island

Crab trapping was completed in South Digby Island in August 2014, August 2015, and May 2016 (see Figure 26). Crab traps were distributed around Metford and Spire Island (August 2014), south of Tuck Island (August 2015), and along the length of the proposed marine trestle (May 2016). Dungeness crab were captured during each trapping event, along with red rock crab (May 2016; Photo 36) and tanner crab (August 2015; Photo 37). Catch results are shown in Table 17. Weight and carapace length of male and female Dungeness crab captured during August 2014, August 2015, and May 2016 in South Digby Island is summarized in Table 18. Appendix 3, Table 3-2 presents the length, weight, and sex of each individual captured in South Digby Island.

Photo 36 Red Rock Crab (*Cancer productus*) Captured in South Digby Island

Photo 37 Tanner Crabs (*Chionoecetes bairdi*) Captured in South Digby Island

Table 17 CPUE (number/24 hour soak period) of Crabs Captured in South Digby Island during August 2014, August 2015, and May 2016

Date	Gear Type	No. of Traps	Species	Catch	Median CPUE	Min CPUE	Max CPUE
August 6–9, 2014	recreational grade trap	6	Dungeness crab	3	0	0.5	2.2
August 1–3, 2015	commercial grade trap	15	Dungeness crab	17	0	0	10.2
August 1–3, 2015	commercial grade trap	15	tanner crab	2	0	0	1.8
May 7–10, 2016	commercial grade trap	10	Dungeness crab	32	3.1	0	6.3
May 7–10, 2016	commercial grade trap	10	red rock crab	2	0	0	4.8

Table 18 Minimum (min) and Maximum (max) Carapace Width (mm) and Weight (g) of Dungeness Crab Captured in South Digby Island

	Male							Female						
	Catch	Length (mm)			Weight (g)			Catch	Length (mm)			Weight (g)		
Date		n	Min	Max	n	Min	Max		n	Min	Max	n	Min	Max
August 6–9, 2014*	2	2	143	250	-	-	-	0	-	-	-	-	-	-
August 1–3, 2015	9	7	170	208	6	550	1106	8	-	-	-	-	-	-
May 7–10, 2016	19	19	148	210	-	-	-	13	13	128	167	-	-	-

NOTE:
*Sex of one individual captured in August 2014 was not recorded
- data not recorded

5.3.3.4 Tremayne Bay

Crab trapping was completed in Tremayne Bay in August 2014 and March 2015 (see Figure 26). Dungeness crab was the only crab species captured during both trapping events. CPUE estimates are provided in Table 19. Weight and carapace length of male and female Dungeness crab captured is summarized in Table 20. Appendix 3, Table 3-2 presents the length, weight, and sex of each individual captured in Tremayne Bay.

Table 19 CPUE (number/24 hour soak period) of Crabs Captured in Tremayne Bay During August 2014 and March 2015

Date	Gear Type	No. of Traps	Species	Catch	Median CPUE	Min CPUE	Max CPUE
August 6–9, 2014	recreational grade trap	2	Dungeness crab	1	0.5	0	1
March 21–22, 2015	recreational grade trap	6	Dungeness crab	7	0	0	4.2

Table 20 Minimum (min) and Maximum (max) Carapace Width (mm) and Weight (g) of Dungeness Crab Captured in Tremayne Bay

	Male							Female						
	Catch	Length (mm)			Weight (g)			Catch	Length (mm)			Weight (g)		
Date		n	Min	Max	n	Min	Max		n	Min	Max	n	Min	Max
August 6–9, 2014	0	-	-	-	-	-	-	1	1	139	139	-	-	-
March 21–22, 2015	7	7	172	190	7	597	777	0	-	-	-	-	-	-

NOTE:
- data not recorded

5.4 Eelgrass Survey

5.4.1 Scope

The objective of the eelgrass survey was to collect information on existing conditions of eelgrass located in the intertidal and subtidal zones of the Marine Fish and Fish Habitat LAA. Data were collected to characterize the existing environment to support the assessment of potential Project effects on marine fish and fish habitat, and an application for a section 35(2)(b) *Fisheries Act* Authorization for residual serious harm to fish, if needed.

Incidental observations of eelgrass (*Z. marina*) were obtained during intertidal (see Section 5.1.3.1 to Section 5.1.3.4) and subtidal surveys (see Section 5.2.3.1 to Section 5.2.3.3). To complement those observations and more fully describe the extent and characteristics of eelgrass available as fish habitat in the LAA (Objective 1), a comprehensive survey of eelgrass was conducted in Casey Cove, East Digby Island, South Digby Island, and Delusion Bay. Field sampling occurred from July 31 to August 6, 2015 and coincided with the summer eelgrass growing season (Philips 1984; Lee et al. 2006) to document the beds at the approximate annual peak of their spatial extent. The field program was also timed to coincide with the best available low tide series (Prince Rupert tide station, #9354) to facilitate on-foot delineation of intertidal eelgrass. Surveys took place in areas within the LAA where Project infrastructure has the potential to interact with intertidal and subtidal eelgrass beds (see Figure 8):

- Casey Cove
- East Digby Island
- South Digby Island
- Delusion Bay

In each of these study areas, several sampling methods were used and types of data collected to allow for the integration of site-wide patterns of eelgrass distribution (area, percent cover) with more localized patterns of eelgrass growth within each study area (shoot density, canopy height, and species-specific distribution).

5.4.2 Methods

5.4.2.1 Acoustic Data

To achieve Objective 1 of the survey (describe the extent and characteristics of eelgrass available as fish habitat in the LAA), acoustic data were gathered from a grid of transects spaced 25 m apart in each study area, designed to extend to 20 m depth chart datum. Grid patterns surveyed are shown in Figure 27 to Figure 31. By exceeding the known depth limits of these plants (Baldwin and Lovvorn 1994; Greve and Krause-Jensen 2005; Lee et al. 2006), this transect layout allowed for the maximum potential extent of subtidal eelgrass to be documented.

The survey vessel navigated each transect at a speed-over-ground of approximately 4.6 km/hr (2.5 knots) while a vessel-mounted BioSonics single beam sonar echosounder (Habitat MX Echosounder, BioSonics, Seattle, WA, USA) directed at the bottom returned acoustic signals or 'pings'. A portable BioSonics deck unit with integrated differential GPS (DGPS; positional accuracy < 3 m, 95% typical) processed these acoustic signals from the transducer (204.8 kHz, 8.6° conical beam angle, range accuracy 1.7 cm ± 0.2% of depth, 5 Hz ping rate). The characteristics of each acoustic return, combined with DGPS-reported positional information, were used to delineate and characterize eelgrass beds in each area (see Section 5.4.2.4 for description of analysis).

5.4.2.2 Video Ground-Truthing

A pole-mounted underwater camera (Deep Blue Pro Splash Cam, Ocean Systems Inc., Everett, WA, USA) was used to ground-truth the extent of select subtidal beds. The camera was raised and lowered as needed to visually confirm the presence/absence of eelgrass in certain areas. The DGPS signal from the acoustic device was overlaid on the video display to assist in ground-truthing and data processing.

5.4.2.3 Physical Delineation and Ground-Truthing

In addition to the acoustic survey and video ground-truthing, the extent of eelgrass was also delineated on foot using a handheld GPS unit (Trimble GeoExplorer 7x with sub-metre accuracy, Trimble Navigation Limited, Westminster, CO, USA) at low tide. Wearing drysuits, biologists waded along the deepest seaward edge of each bed at the transition between low intertidal and subtidal eelgrass. The landward edge was delineated up to a point where density was less than 1 shoot/m^2. Smaller patches and isolated tufts were marked with a single point on the GPS.

Within each bed, percent cover (visually estimated), shoot density (number of vegetative shoots), number of reproductive shoots, and canopy height were recorded using 0.25 m x 0.25 m quadrats. The canopy height measurement method was adapted from Short et al. (2006). Where blades were dense, a clump of shoots was selected, extended, and a measurement taken of the first 80% of clump height. Where blades were sparse, an average for each quadrat was calculated from the height of three shoots representative of the range of shoot heights in that quadrat. When not constrained by water depth or advancing tides, quadrats were distributed haphazardly throughout each bed to obtain a representative sample of bed and patch characteristics as biologists moved along the shoreline. Quadrats were photographed and the general condition of each bed or patch was noted (e.g., broken leaves, epiphytic fouling, and evidence of wasting disease). The presence and relative distribution of other seagrass species (Scouler's surfgrass

[*Phyllospadix scouleri*], toothed surfgrass [*P. serrulatus*], and beaked widgeongrass [*Ruppia maritima*]) were also noted.

In certain circumstances, changing tidal conditions meant that shoot density could not be measured accurately in a partially submerged bed, yet canopy cover and canopy height could be estimated (e.g., portions of East Digby and South Digby areas). In other instances, large bed and patch size meant that effort was focused on accurate delineation of bed extent, rather than description of bed characteristics (e.g., Delusion Bay and portions of South Digby). For these reasons, the quadrat sample size used for parameter estimation was not always the same for each parameter in a given bed.

5.4.2.4 Data Analysis

Acoustic data were analyzed using Visual Habitat software (BioSonics, Seattle, WA, USA). The algorithms within this program enable the quantitative interpretation of changes in acoustic signal returns to describe the presence, percent cover, and canopy height of marine vegetation across the area surveyed. Using a pre-determined number of ten acoustic pings (returns on the echogram), Visual Habitat calculates the number of pings that are characteristic of vegetation versus those that are characteristic of un-vegetated bottom. For example, if the ping cycle number for analysis was set at ten, and five pings returned a vegetation signal, then the percent cover would be calculated as 50%. Video and on-foot ground-truthing data were used to confirm the presence/absence of eelgrass in locations where the acoustic signal was unclear.

Using the acoustic data, eelgrass coverage was interpolated using the inverse distance-weighted method (IDW) at fixed intervals. At each location, this fixed interval size was set based on site-specific point density. This resulted in a 5 m by 5 m raster grid of estimated eelgrass percent cover, statistically derived based on the density of point data used for interpolation. All interpolation and data processing was done using ArcMap 10.2 software (ESRI, Redlands, CA, USA). Areas with interpolated cover < 10% were removed from consideration, unless ground-truthed by video or on foot. Where plant density was low (< 10%), there was strong potential for signal confusion, meaning that acoustic signatures of eelgrass were difficult to distinguish from other forms of marine vegetation. For an analysis of interpolation accuracy, please refer to Appendix 4.

Areas of eelgrass presence were estimated at each site by calculating the extent of the interpolated area of coverage and adding the area of foot-delineated beds that were not captured using acoustic methods. For the purposes of calculation, any small patches and tufts that appear on resulting figures as points were assumed to have an area of 0.0625 m^2.

5.4.3 Results

Hydroacoustic data and foot delineations complemented one another to provide comprehensive spatial and quantitative eelgrass data in the areas of proposed Project works. Where coverage was sparse, hydroacoustic signals were difficult to interpret, meaning on-foot delineations were needed to confirm coverage. Similarly, in areas of shallow water or flat relief not accessible by vessel, such as Delusion Bay, on-foot ground-truthing served as a practicable means to extend sampling coverage. Within the areas surveyed, small beds were observed in Casey Cove (see Figure 32) and East Digby Island (see Figure 33 and Figure 34), while the extent of eelgrass cover was greatest at South Digby Island (see Figure 35) and Delusion Bay (see Figure 36 and Figure 37; Table 21).

Table 21 Estimated Eelgrass Cover in Each Study Area

Study Area	Interpolated area (m^2) [Hydroacoustic method]	Additional ground delineation (m^2) [Foot delineation method]	Total (m^2)
Casey Cove	38,874	9,336	48,210
East Digby Island	36,750	4,152	40,902
South Digby Island	67,150	8,815	75,965
Delusion Bay	70,150	118,264	188,414

5.4.3.1 Casey Cove

A relatively dense, continuous eelgrass bed occupied the shallow subtidal of western Casey Cove, with a fringe of sparse coverage extending to the head of the cove (see Figure 32, Photo 38). A narrow patch was also found along the south shore of the cove, near the abandoned dock and buildings. The main bed was relatively dense (see Photo 39), with some parts exhibiting 100% cover, while more sparse coverage was found on the western fringe of the bed (see Photo 40). Foot exploration and delineations confirmed the westward extent of this sparse coverage (see Figure 32). Mean canopy height based on foot delineation data was 51 cm (SD = 23, range 21 to 128 cm, n = 61) while median shoot density was 6 shoots/m^2 (IQR 3-19, range 1 to 160 shoots/m^2, n = 48). The total estimated area of coverage in Casey Cove was 48,210 m^2, with mean percent cover of 42%, based on foot delineation data (SD = 26, range 10 to 100%, n = 13).

Photo 38 Casey Cove looking eastward from sparse eelgrass (*Zostera marina*) towards dense bed

Photo 39 Dense eelgrass (*Zostera marina*) in Casey Cove

Photo 40 Sparse eelgrass (*Zostera marina*) patch in Casey Cove

5.4.3.2 East Digby Island

Along the eastern shore of Digby Island, eelgrass beds were located to the north of Philips Point (see Figure 33) and between Philips and Frederick points (see Figure 34). Eelgrass coverage in the Philips Point area was estimated at 23,789 m^2 and confirmed using video ground-truthing (Appendix 4). A further 17,113 m^2 of beds and patches north of Frederick Point were interpolated and delineated on foot at low tide. Sparse nearshore patches near Frederick Point (see Photo 41) were separated from a relatively dense seaward main bed (see Photo 42) by a flat expanse of cobble and algae (see Figure 34). Mean canopy height near Frederick Point, based on foot delineation data, was 25 cm (SD = 20, range 12 to 97 cm, n = 20) while mean percent cover was 46% (SD = 25, range 5 to 95%, n = 19). Shoot density data were not collected during foot delineations along the eastern shore of Digby Island due to rising tide conditions that made it impractical to estimate number of shoots in partially submerged beds.

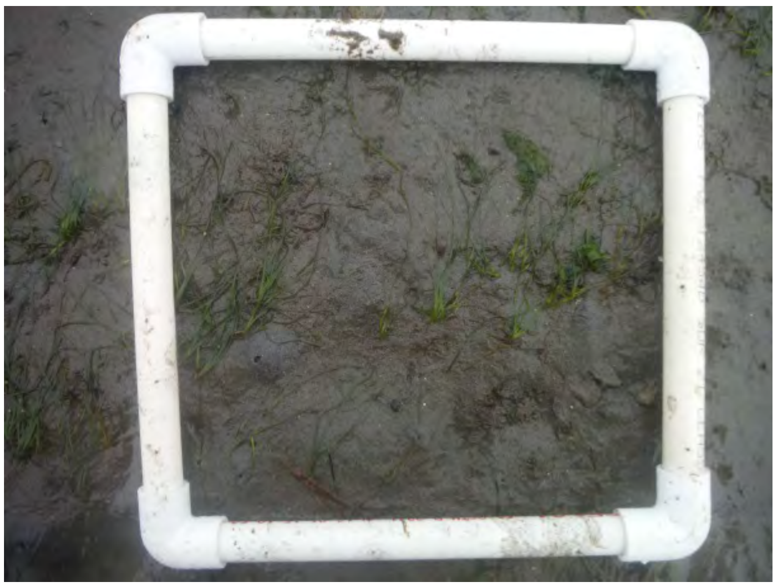


Photo 41 Sparse eelgrass (*Zostera marina*) patch near Frederick Point

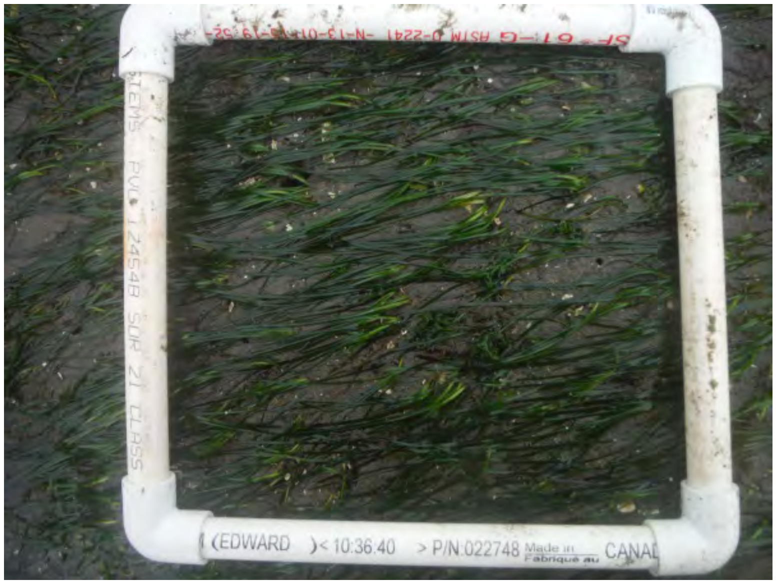


Photo 42 Dense eelgrass (*Zostera marina*) patch near Frederick Point

5.4.3.3 South Digby Island

The sand flats, and intertidal shoals of South Digby Island played host to a patchwork of eelgrass of varying density (see Figure 35). Video ground-truthing and on-foot delineations revealed patches where eelgrass occurred with toothed surfgrass in mixed-species beds (see Photo 43). The percent cover of toothed surfgrass in the three quadrats where it was measured ranged from 62 to 85%, while canopy height ranged from 120 to 131 cm. Toothed surfgrass appeared to be restricted to higher intertidal areas with varying proportions of *Z. marina,* while below the low water mark, *Z. marina* dominated amongst consolidated sand substrates mixed with silt (see Figure 35).

Away from the main beds, small patches of eelgrass were noted on soft substrates in the mid intertidal (see Photo 44), between cobbles and boulders, and within small channels (less than 5 cm deep) draining the tidal flats (Figure 35). Mean canopy height based on foot delineation data was 46 cm (SD = 41, range 9-156 cm, n = 23) while mean percent cover was 45% (SD = 24, range 20 to 100%, n = 15). Median shoot density was 3 shoots/m^2 (IQR 3-6, range = 1 to 10 shoots/m^2, n = 9). Reproductive shoots were noted with heights in excess of 2 m (see Photo 45). Small reproductive shoots (~ 10 cm shoot height) were also noted amongst these small patches (see Photo 46). Canada geese (*Branta canadensis*) were observed grazing on intertidal eelgrass during low tide.

Photo 43 Toothed surfgrass (*Phyllospadix serrulatus*) root structure

Photo 44 Sparse eelgrass (*Zostera marina*) patch off South Digby Island

Photo 45 Reproductive eelgrass (*Zostera marina*) shoot in excess of 2 m tall off of South Digby Island

Photo 46 Reproductive eelgrass (*Zostera marina*) shoot with stigma off of South Digby Island

5.4.3.4 Delusion Bay

Delusion Bay harboured a continuous, dense eelgrass bed along the southwestern edge at its mouth but, moving northward was filled with extensive, and short-canopied (~15 to 20 cm canopy height) eelgrass patches. Both sparse (Photo 47) and dense (up to 100% cover) patches (Photo 48) extended nearly a kilometre northward, within brackish zones along the edges of the main freshwater outflow, to the head of Delusion Bay (see Figure 36 and Figure 37). Beaked widgeongrass was observed (but not delineated) in the stream centre, as well as along high intertidal fringes along the length of Delusion Bay. A very small patch of Scouler's surfgrass was located on a rocky outcrop in the middle of the bay (see Figure 36, Photo 49 and Photo 50). Because of the extensive coverage of eelgrass in Delusion Bay (see Figure 36 and Figure 37), and limited low tide timing available for sampling, the decision was made to focus on comprehensive delineation of beds and patches; no quadrat-based estimates of percent cover, shoot density, or canopy height were taken in this area.

Photo 47 Small, sparse eelgrass (*Zostera marina*) patch in Delusion Bay

Photo 48 Dense eelgrass (*Zostera marina*) bed in Delusion Bay

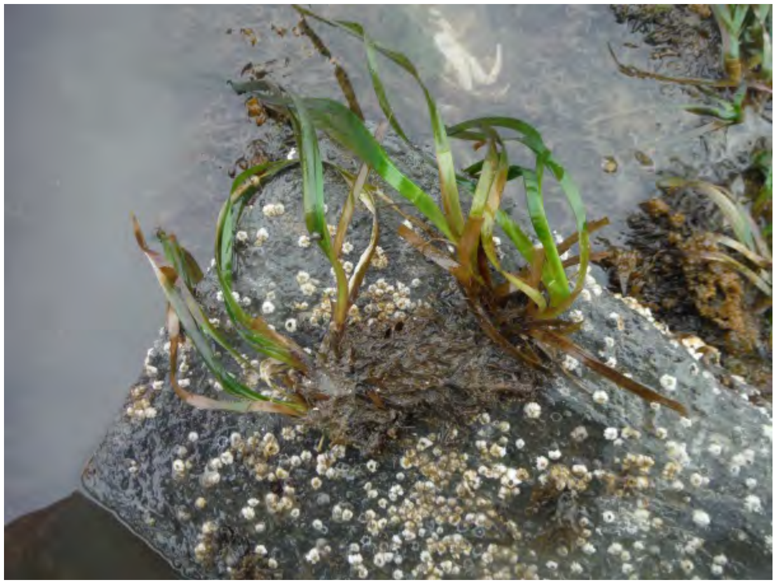


Photo 49 Scouler's surfgrass (*Phyllospadix scouleri*) patch in Delusion Bay

Photo 50 Scouler's surfgrass (*Phyllospadix scouleri*) root structure in Delusion Bay

5.5 Marine Fish Surveys

5.5.1 Scope

The objective of the marine fish surveys was to collect additional information on existing conditions on marine fish (i.e., finfish) in the Marine Fish and Fish Habitat LAA. Data were collected to characterize the existing environment to support the assessment of potential Project effects on marine fish and fish habitat, and an application for a section 35(2)(b) *Fisheries Act* Authorization for residual serious harm to fish, if needed.

Stantec field crews collected fish assemblage data using beach seines and tangle nets over three survey periods, and data complemented information on marine fish collected by Triton/Khtada in 2014 and 2015 (herein referred to as Triton). The timing of the surveys was chosen to overlap with the fall (Survey 1) and winter (Survey 2) seasons, as well as with juvenile salmon outmigration from the Skeena River (Higgins and Schouwenburg 1973) (Survey 3). Survey dates were chosen to occur with the best available low-tide series (DFO 2014c) to increase the area of intertidal habitat exposed for beach seining:

- Survey 1: October 24–29, 2015
- Survey 2: February 8–15, 2016
- Survey 3: May 5–10, 2016

Surveys took place in the nearshore waters of areas that have the potential to be affected by the Project and in two areas outside the LAA that are unlikely to be affected by the Project (see Figure 38 and). Sampling was designed to:

- identify, count, measure, and list species captured by beach seine and tangle net during Stantec-led field surveys in October 2015, February 2016, and May 2016 (Objective 1)
- describe general patterns in the relative abundance of ten focal fish species within each study area, over six survey periods, using beach seine data collected during both Triton and Stantec-led marine fish surveys (Objective 2)

5.5.2 Previous Marine Fish Surveys Completed for the Aurora LNG Project

Triton conducted marine fish surveys in April 2014, August 2014, and March 2015 (see Appendix 5 for final report). In April 2014, sampling was restricted to sites within the southeast portion of Digby Island, between Lima Point and Philips Point. In August 2014, fish sampling extended into Tremayne Bay, located on the southwest side of Digby Island. In March 2015, sampling was further expanded to include Casey Cove.

Each survey was completed by a five person team using a variety of fish sampling techniques (see Table 22). Beach seines and tangle nets were used across all three surveys to capture marine fish in the nearshore environment. In August 2014, bottom trawls were added to target demersal fish, and in March 2015, day and night mid-water trawls were used to target offshore pelagic fish (see Table 22).

Table 22 Summary of Fish Sampling Techniques Used during the Triton Marine Fish Program at Sites Within and Outside the Project Area

Survey Period	Beach Seine	Tangle Net	Otter Bottom Trawl	Mid-water Trawl (day and night combined)
Sites within the Project Area[1]				
April 2014	10	7	0	0
August 2014	9	26	6	0
March 2015	8	15	0	5
Sites outside the Project Area (i.e., Tremayne Bay)				
April 2014	0	0	0	0
August 2014	6	4	1	0
March 2015	4	5	0	6
Total	**37**	**57**	**7**	**11**

NOTES:
Table adapted from Khtada (2015)
N/A – Not Applicable.
[1] In April and August 2014, the Project Area included the south end of Digby Island, between Lima Point and Philips Point. In March 2015 the Project Area was expanded to include Casey Cove.

Surveys conducted by Triton in April 2014, August 2014, and March 2015 captured 6,619 organisms representing over 40 fish and invertebrate species. A variety of CRA fish species was captured during the three surveys: three species of Pacific salmon (pink [juvenile and adult], coho [adult], and chum [juvenile]), seven species of flatfish (C-O sole [*Pleuronichthys coenosus*], English sole, flathead sole [*Hippoglossoides elassodon*], rock sole, sand sole [*Psettichthys melanostictus*], Pacific sanddab [*Citharichthys sordidus*], speckled sanddab [*Citharichthys stigmaeus*]), Dolly varden/bull trout (*Salvelinus* sp., adult), surf smelt (larvae and juvenile), Pacific herring (juvenile and adult), and eulachon (adult) (see Table 23). The majority of species were captured both within, and outside, the Project Area; however, coho salmon and Dolly varden/bull trout were only captured within the Project Area and C-O sole were only captured at Tremayne Bay. Eulachon were captured by mid-water trawling (night only) in March 2015 in deeper waters off the west and east sides of southern Digby Island, but not during any other sampling period. While the March 2015 survey overlapped with the Pacific herring spawn, no herring spawn was observed within the areas sampled. Marine invertebrates captured incidentally during the marine fish program were Dungeness crab, red rock crab, and *Pandalus* shrimp.

Table 23 CRA Marine Finfish Captured During Triton/Khtada Marine Fish Program for the Aurora LNG Project

CRA Fish Species	March 2015		April 2014		August 2014	
	Within Project Area[1]	Outside Project Area [2]	Within Project Area[1]	Outside Project Area [2]	Within Project Area[1]	Outside Project Area [2]
Pink salmon (*Oncorhynchus gorbuscha*)	✓	✓	✓	NA		
Coho salmon (*Oncorhynchus kisutch)*				NA	✓	
Chum salmon (*Oncorhynchus keta)*		✓	✓	NA		
Pacific herring (*Clupea pallasii*)			✓	NA	✓	✓
Surf smelt (*Hypomesus pretiosus)*	✓		✓	NA	✓	✓
Eulachon (*Thaleichthys Pacificus)*	✓	✓		NA		
Dolly varden/Bull trout (*Salvelinus* sp.)	✓			NA		
Flatfish[4]		✓	✓	NA	✓	✓

NOTES:

[1] In April and August 2014 the Project Area included the south end of Digby Island, between Lima Point and Philips Point. In March 2015 the Project Area was expanded to include Casey Cove.

[2] Reference site located in Tremayne Bay

[3] Reference site not sampled in April 2014

[4] Species of flatfish captured include C-O sole (*Pleuronichthys coenosus*), English sole (*Parophrys vetulus*), flathead sole (*Hippoglossoides elassodon*), rock sole (*Lepidopsetta* sp.), sand sole (*Psettichthys melanostictus*), Pacific sanddab (*Citharichthys sordidus*) and speckled sanddab (*Citharichthys stigmaeus*)

5.5.3 Selection of Sites for Regional Context

Prior to field mobilization, Stantec conducted a desktop review of potential sites located outside the LAA (i.e., outside the area potentially affected by the Project), which could provide a regional context for patterns in marine fish abundance and distribution over time. The process consisted of reviewing maps and nautical charts of lower Chatham Sound and evaluating potential sites based on the following set of criteria:

- relative proximity to the Project
- safe and reliable access by field crew
- low likelihood of being affected by other projects proposed in the Prince Rupert area
- presence of intertidal habitat suitable for beach seining (i.e., fairly constant bottom topography and without substantial accumulations of debris or large rocks)
- site influenced by relatively similar weather and oceanographic conditions (e.g., prevailing wind direction, waves, currents, discharge from the Skeena River) to sites within the LAA.
- site previously sampled for the Project

The results of the desktop review identified Dodge Cove and Tremayne Bay as being most aligned with the criteria outlined above. As a result, Stantec field crews collected marine fish data at these two sites during each of the three surveys.

5.5.4 Field Sampling Methods

Stantec conducted marine fish surveys in October 2015, February 2016, and May 2016 using beach seines and tangle nets in areas located within the LAA and potentially affected by the Project, and in two areas located outside the LAA that are not anticipated to be affected (Dodge Cove and Tremayne Bay).

To the extent possible, field sampling techniques similar to those used by Triton were followed during the Stantec-led surveys to allow for comparison between the two data sets. However, certain field sampling techniques were not carried forward. Otter bottom trawling was not carried over into Stantec-led programs as the detailed subtidal ROV surveys conducted in 2014/2015 adequately assessed benthic fish (results presented in Section 5.2.3). Similarly, mid-water trawling was not carried over to the current field program primarily due to the limited ability to deploy the net in nearshore habitats most likely to be affected by the Project, and the relatively low return for the amount of time and effort required.

5.5.4.1 Beach Seining

Beach seines targeted fish inhabiting the intertidal zone, although some beach seines extended into the subtidal zone. Beach seining was conducted using a 3 m deep net that was 22 m long with wings of 13 mm mesh and a center of 6 mm mesh. The net had mesh small enough to target juvenile Pacific salmon. The majority of beach seine sites were paired with tangle net sites to catch fish inhabiting both the intertidal and subtidal zones within the same site. Beach seine sets were restricted to habitats with fairly constant bottom topography and without substantial accumulations of debris or large rocks, to reduce the chances of tearing the net and to limit the amount it needed to be lifted off the bottom (thereby increasing the chances of fish retention within a haul). Therefore, beach seines did not target fish closely associated with complex boulder or angular habitats. Steep and rocky shorelines were avoided due to safety concerns.

At each beach seine site, field crews attempted to complete up to four beach seine sets (also referred to as hauls) along the same stretch of beach to increase the precision of the estimate of fish abundance in a given site, as suggested by Skagit Systems Cooperative (SSC) (2003). In some areas, however, there was only enough beach to complete one or two sets. Each set was ranked on a scale of 1 (poor) to 5 (excellent) to characterize its success, based on the number of snags and quality of deployment and retrieval. Hauls completed at the same site were treated as sub-samples and grouped together during the data analysis stage (see Section 5.5.5). The maximum depth (recorded in chart datum) reached when setting the beach seine was recorded.

The majority of seines were set from a small skiff, whereby the net is set in a semicircle starting and ending at the beach (Photo 51); however, some sites required setting the net by hand (also referred to as "set by wading") because low water levels or protruding rocks prevented safe access by boat. Nets set by hand were set parallel to shore and then pulled into the beach, resulting in a similar semi-circular set upon retrieval. Seines set by hand generally sampled less area than those set by boat. The area sampled by each seine was therefore recorded and accounted for in the calculation of fish abundance (see Section 5.5.5).

Photo 51 Retrieving a beach seine by boat in Casey Cove

Upon retrieval of the beach seine, all captured fish were transferred to buckets filled with seawater. Macroinvertebrates incidentally captured (e.g., shrimp) were identified, a visual estimate of the number of individuals was taken, and then individuals were released. Fish were identified to species where possible, and ten individuals of each taxon were measured to the nearest mm (fork length, except for sculpins, flatfish, tubesnout [*Aulorhynchus flavidus*], gunnels, bay pipefish [*Syngnathus leptorhynchus*] and pricklebacks, where total length was measured). Larval fish that could not be identified reliably in the field were classified as “unidentified larval fish”. If more than ten individuals of the same species or taxon (if fish could not be identified down to the species level) were captured, the remaining individuals were identified and counted, but not measured for length. In locations where beach seine sets were completed adjacent to each other, captured fish were held between hauls to avoid capturing the same individuals. For each beach seine completed, up to two dominant substrates within the area sampled were identified and an estimate of their abundance was recorded as percent cover. Substrates were classified according to the substrate types listed in Appendix 6, Table 6-1.

5.5.4.2 Tangle Net

Tangle nets targeted pelagic and benthic fish inhabiting shallow, subtidal waters. Tangle netting was conducted using a sinking net consisting of six 15 m panels, with 40 mm to 100 mm stretched meshes, strung together in a gang forming a total net length of 96 m (Photo 52). Compared to a beach seine, tangle nets were set to target larger fish in deeper waters. Tangle net sites were typically paired with beach seine sites (see Figure 38 and). Tangle nets were set off the bow of a boat, oriented perpendicular to shore, and set on the seafloor between 1.2 m and 30 m depth. During the October survey, each tangle net was set for 20 minutes; however, due to extremely low catch, time was increased to 240 minutes during the February 2016 survey. In May, tangle nets were not set because of the potential to accidentally capture diving marine birds foraging on outmigrating salmon and other marine fish. The maximum depth (recorded in chart datum) reached when setting the tangle net was recorded.

Photo 52 Setting a tangle net in Dodge Cove

Upon retrieval of the net, all fish captured were untangled from the net as quickly as possible and transferred to buckets filled with seawater. Captured macroinvertebrates or other species (e.g., ctenophores) were identified to the lowest taxonomic level possible, a visual estimate of the number of individuals was taken, and then individuals were released. Captured fish were identified to the lowest taxonomic level possible, measured to the nearest mm (fork length, except for sculpins, flatfish, tubesnout, gunnels, bay pipefish and pricklebacks, where total length was measured), and subsequently released unharmed. Fork lengths were measured for up to ten individuals per species; the remaining individuals were identified to species and counted, but not measured for length. During the October and February surveys, water temperature (°C), pH, and dissolved oxygen (mg/L) were recorded at each tangle net site at approximately 1 m below the water's surface using an YSI water quality meter. A secchi disk was used to measure water clarity. Water quality data are summarised in Appendix 6, Table 6-2.

5.5.5 Data Analysis

To achieve Objective 1 of the marine fish survey (identify, count, measure, and list species captured by beach seine and tangle net during Stantec-led field surveys in October 2015, February 2016, and May 2016), beach seine and tangle net sites were grouped into one of six study areas (Casey Cove, East Digby Island, South Digby Island, Delusion Bay, Dodge Cove, and Tremayne Bay) based on geographic location. Within each study area, and for each of the three survey periods, a measure of fish relative abundance was estimated using CPUE. CPUE was calculated for each species, either as the number of individuals captured per 100 m^2 of seined area (for beach seines), or, as the number of individuals captured per 20 minute set (for tangle nets).

CPUE for fish captured by beach seine was calculated by pooling catch data from individual hauls completed at each beach seine site (i.e., multiple hauls from a single site were treated as sub-samples). The number of hauls completed at each site depended on the length of suitable beach exposed at the time of sampling (which depended on tidal height during daylight hours and beach topography). Catch was standardized to a count per 100 m^2 using the total area seined from all hauls at a beach seine site. Median CPUE (and IQR) was then calculated from all beach seine sites in a given study area, in a given survey period.

CPUE for fish captured by tangle net was calculated by treating each tangle net site as an independent sample within each study area. Median CPUE (and IQR) was calculated for each species within a given study area for each survey period.

To achieve Objective 2 of the marine fish survey (describe general patterns in the relative abundance of ten focal fish species within each study area, over six survey periods, using beach seine and tangle net data collected during both Triton and Stantec-led marine fish surveys), beach seine and tangle net catch data collected by Triton in April 2014, August 2014, and March 2015, were analyzed using the same methods described above. Fish abundance was estimated using CPUE for individuals captured by beach seine (fish/100 m^2), and for individuals captured by tangle net (fish/20 minute set). Median CPUE estimates were calculated for ten focal species (see Section 5.5.6.2 for a list of the focal species) for each survey period, by study area.

Using beach seine CPUE estimates from Stantec and Triton data, trends in the relative abundance and distribution of the ten focal species over time were presented graphically. Data were log-transformed prior to graphing to emphasize relative trends and reduce the influence of extreme catch values (e.g., as a result of the capture of a schooling species). Tangle net data were not presented graphically because of difficulty in visually discerning trends across a series of very low catches (further discussion provided in Section 5.5.6.2). As a result, the discussion of spatial and temporal trends in relative fish abundance and distribution focuses on the data from the beach seines.

5.5.6 Results

5.5.6.1 Marine Fish Species Observed in October 2015, February 2016, and May 2016

The three Stantec-led surveys were designed to identify, count, measure, and list species captured by beach seine and tangle net during October 2015, February 2016, and May 2016 (Objective 1). Appendix 6, Table 6-3 contains the full schedule of sampling effort by study area, including GPS coordinates of each beach seine haul (i.e., sub-sample), beach seine site, tangle net site, and the type of substrate sampled by each beach seine haul.

Over the three survey periods, 19,187 fish belonging to 39 fish species and 7 unidentified groupings of fish were captured using beach seines and tangle nets.

For each survey period, a summary of beach seining and tangle netting effort, species captured, and relative abundance (using median CPUE (and IQR) and mean CPUE (and SD) is presented below by study area. Mean fork length for each species captured is provided in Appendix 6, Table 6-4.

CASEY COVE

OCTOBER 2015

During the October 2015 marine fish survey, two beach seine sites (see Photo 53 and Photo 54) and two tangle net sites were sampled in Casey Cove (see Figure 38). Three sets (referred to as hauls, sets, or sub-samples) were completed at each beach seine site (e.g., BS02H1 [haul 1], BS02H2 [haul 2], BS02H3 [haul 3]) (see Appendix 6, Table 6-3) Beach seines were set by boat between 1.8 m and 2.7 m deep in areas dominated by gravel substrate. Tangle nets were set in water between 8.2 m and 18.6 m depth. Depths represent the maximum depth that each tangle net or beach seine was set).

Photo 53 BS02H1 beach seine site in Casey Cove

Photo 54 BS03H1 beach seine site in Casey Cove

In Casey Cove, 163 individuals representing 8 fish species were captured by beach seine and tangle net during October 2015 (see Table 24). One red rock crab was incidentally caught. Shiner perch (*Cymatogaster aggregata*) was the most commonly captured species (captured in four of six seines and one of two tangle nets); it was the most abundant species captured by beach seine and the only species captured by tangle net.

Several CRA species were captured in Casey Cove during October 2015 including 3 juvenile coho salmon (see Photo 55), 1 surf smelt (see Photo 56), 4 rock sole (see Photo 57), and 17 unidentified larval fish (see Photo 58).

Table 24 Fish Captured by Beach Seine (*n*=2 sites) and Tangle Net (*n*=2 sites) in Casey Cove in October 2015

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100 m^2)									
coho salmon	*Oncorhynchus kisutch*	3	0	0	0	0.4	0.7	0.2	0
Pacific staghorn sculpin	*Leptocottus armatus*	2	0	0	0	0	0.6	0.1	0.2
rock sole	*Lepidopsetta* spp.	4	0	0	0.2	1	1.2	0.4	0.6

Table 24 Fish Captured by Beach Seine (*n*=2 sites) and Tangle Net (*n*=2 sites) in Casey Cove in October 2015

Common Name	Scientific Name	Catch	CPUE						
			Min	**Q1**	**Median**	**Q3**	**Max**	**Mean**	**SD**
shiner perch	*Cymatogaster aggregata*	117	0	0.6	2.9	9.7	38.2	9.6	4.5
starry flounder	*Platichthys stellatus*	8	0	0	0.4	1.1	4.8	0.8	1.1
surf smelt	*Hypomesus pretiosus*	1	0	0	0	0	0.4	0.1	0.1
tubesnout	*Aulorhynchus flavidus*	10	0	0	0.2	0.7	2.2	0.6	0.9
unidentified larval fish	NA	17	0	0	0	0	20.2	1.7	2.4
Tangle Net (Fish/20 minute set)									
shiner perch	*Cymatogaster aggregata*	1	0	0.2	0.5	0.8	1	-	-
Total		**163**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one sampling effort
Table does not include the red rock crab (*n*=1) caught incidentally
Seine Area= 1,312 m^2
Total Set Time for Tangle net = 60 minutes

Photo 55 Coho salmon (*Oncorhynchus kisutch*) captured by beach seine in Casey Cove

Photo 56 Surf smelt (*Hypomesus pretiosus*) captured by beach seine in Casey Cove

Photo 57 Rock sole (*Lepidopsetta bilineata*) captured by beach seine in Casey Cove

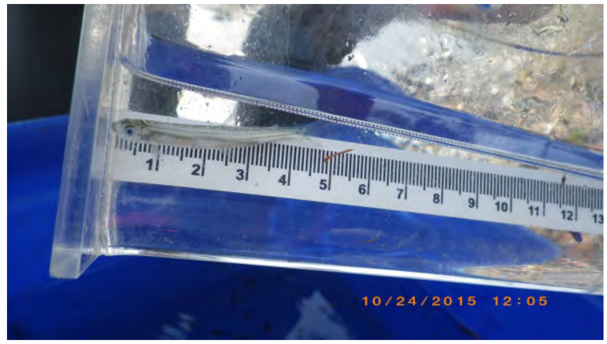


Photo 58 Unidentified larval fish (Family Osmeridae) captured by beach seine in Casey Cove

FEBRUARY 2016

During the February 2016 marine fish survey, two beach seine sites (see Photo 59 and Photo 60) and two tangle net sites were sampled in Casey Cove (see Figure 38). Three sets were completed at each beach seine site. Beach seines were either set by hand at water depths of 0.5 m across areas dominated by mud, or, by boat in water depths between 0.6 m and 4 m deep across cobble dominated substrates. Tangle nets were set in water between 3.5 m and 10.5 m depth.

Photo 59 BS02H1 beach seine site in Casey Cove

Photo 60 BS03H2 beach seine site in Casey Cove

The February survey in Casey Cove captured 226 individuals representing 9 fish species and 3 unidentified taxa (see Table 25). Pacific staghorn sculpin (*Leptocottus armatus*) was the most commonly captured species (captured in five of six beach seines and one of two tangle nets); it was the most abundant species captured by beach seine and the only species captured by tangle net.

Table 25 Fish Captured by Beach Seine (*n*=2 sites) and Tangle Net (*n*=2 sites) in Casey Cove in February 2016

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m^2)									
chum salmon	*Oncorhyncus keta*	1	0	0	0	0	0.2	0	0
English sole	*Parophrys vetulus*	11	0	0	0	0.1	0.8	0.2	0.3
Pacific herring	*Clupea pallasii*	11	0	0	0.2	0.4	0.5	0.3	0.1
Pacific staghorn sculpin	*Leptocottus armatus*	81	0	0.3	0.8	3.8	6.8	1.7	2.2
pink salmon	*Oncorhyncus gorbuscha*	17	0	0	0	0.4	1.6	0.4	0.5
shiner perch	*Cymatogaster aggregata*	2	0	0	0	0.1	0.2	0	0.1
starry flounder	*Platichthys stellatus*	76	0	0	0.4	2	6.4	1.6	2.2
surf smelt	*Hypomesus pretiosus*	3	0	0	0	0	0.7	0.2	0.2
tubesnout	*Aulorhynchus flavidus*	1	0	0	0	0	0.4	0.1	0.1
unidentified flatfish	NA	5	0	0	0.2	0.4	0.7	0.3	0.4
unidentified larval fish	NA	16	0	0	0.2	0.4	1.7	0.4	0.4
unidentified sculpin	NA	1	0	0	0	0	0.3	0.1	0.1
Tangle Net (Fish/20 minute set)									
Pacific staghorn sculpin	*Leptocottus armatus*	1	0	0	0.1	0.1	0.2	-	-
Total		**226**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
Table does not include cragnon shrip (*n*=35), hermit crab (*n*=1), California sea cucumber (*n*=2), mottled sea star (*n*=1), or pygmy rock crab (*n*=2) caught incidentally
Total Seine Area= 3,412 m^2
Total Set Time for Tangle net = 462 minutes

Several CRA species were captured in Casey Cove, including 17 juvenile pink salmon (Photo 61), 1 juvenile chum salmon (Photo 62), 11 Pacific herring (Photo 63), 3 surf smelt, 11 English sole, and 16 unidentified larval fish (Photo 64).

Photo 61 Pink salmon (*Oncorhynchus gorbuscha*) captured by beach seine in Casey Cove

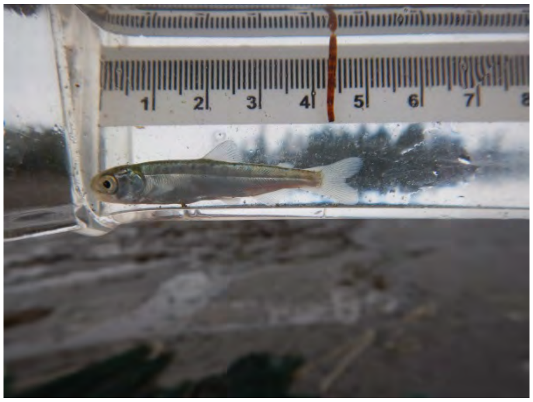


Photo 62 Chum salmon (*Oncorhynchus keta*) captured by beach seine in Casey Cove

Photo 63 Pacific herring (*Clupea pallasii*) captured by beach seine in Casey Cove

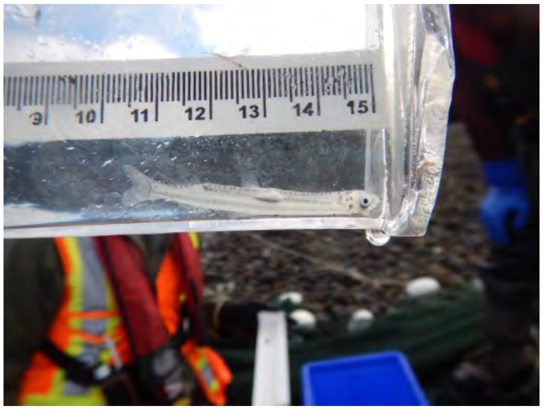


Photo 64 Unidentified larval fish captured by beach seine in Casey Cove

MAY 2016

During the May 2016 marine fish survey, two beach seine sites (see Photo 65 and Photo 66) were sampled in Casey Cove and three beach seine hauls were completed at each site (see Figure 38). Beach seines were set by hand or by boat in water depths of 0.5 m and 3 m across areas dominated by sand, or, by boat in water depths between 1.8 m to 2.4 m deep across cobble dominated substrates. No tangle nets were set during the May 2016 field survey.

Photo 65 BS02H1 beach seine site in Casey Cove

Photo 66 BS03H3 beach seine site in Casey Cove

Table 26 Fish Captured by Beach Seine (*n*=2 sites) in Casey Cove in May 2016

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
butter sole	*Isopsetta isolepis*	2	0	0	0	0	0.2	0.1	0.1
Chinook salmon	*Oncorhynchus tshawytscha*	1	0	0	0	0	0.2	0	0
chum salmon	*Oncorhyncus keta*	129	0	1.7	5.3	9.8	11.4	6	2.9
coho salmon	*Oncorhynchus kisutch*	12	0	0	0.3	1	1.1	0.4	0.3
Pacific herring	*Clupea pallasii*	2	0	0	0	0.1	0.2	0.1	0.1
Pacific staghorn sculpin	*Leptocottus armatus*	25	0	0	0.5	1.3	1.7	0.7	0.9
pink salmon	*Oncorhyncus gorbuscha*	104	0	0.1	1.7	10.8	16.8	7	8.9
shiner perch	*Cymatogaster aggregata*	13	0	0	0	0.1	1.2	0.3	0.5
sockeye salmon	*Oncorhynchus nerka*	3	0	0	0.1	0.2	1	0.2	0.2
starry flounder	*Platichthys stellatus*	96	0	0	1.4	2.8	10.7	2.5	3.6
surf smelt	*Hypomesus pretiosus*	10	0	0	0	0	5.6	0.7	1
unidentified sculpin	Family Cottidae	3	0	0	0	0.4	1.9	0.2	0.3
Total		**400**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated in instances where only one individual was captured or there was only one set
Table does not include purple shore crab (*n*=1) caught incidentally
Seine Area= 2,585 m^2

The May survey in Casey Cove captured 400 fish by beach seine representing 11 fish species and 1 unidentified grouping of sculpin (see Table 26). Chum salmon was the most commonly captured species (captured in five of six beach seines) and the most abundant. Several CRA species were captured in Casey Cove including 104 pink salmon (see Photo 67), 12 coho salmon (see Photo 68), 3 sockeye salmon (see Photo 69), 129 chum salmon (see Photo 70), 1 Chinook salmon, 2 Pacific herring, 10 surf smelt, 96 starry flounder, and 2 butter sole (*Isopsetta isolepis*).

Photo 67 Pink salmon (*Oncorhynchus gorbuscha*) captured by beach seine in Casey Cove

Photo 68 Coho salmon (*Oncorhynchus kisutch*) captured by beach seine in Casey Cove

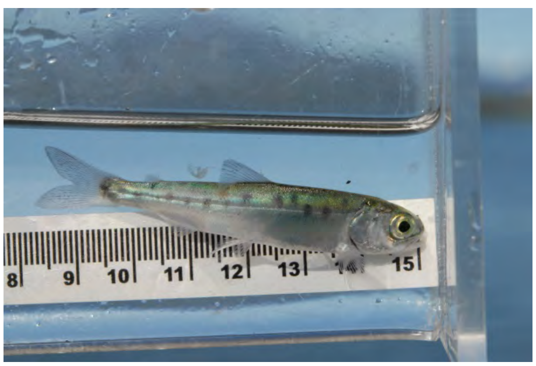


Photo 69 Sockeye salmon (*Oncorhynchus nerka*) captured by beach seine in Casey Cove

Photo 70 Chum salmon (*Oncorhynchus keta*) captured by beach seine in Casey Cove

EAST DIGBY ISLAND

OCTOBER 2015

During the October 2015 marine fish survey, three beach seine sets were completed at one beach seine site (see Photo 71 and Photo 72) in the bay north of Philips Point (). Beach seines were set by boat between 2.1 m and 6 m depth in areas dominated by mud or sand. Although one tangle net was also set, it became severely stuck around a sunken log during retrieval and no fish were caught.

Photo 71 BS04H1 beach seine site at East Digby Island

Photo 72 BS04H3 beach seine site at East Digby Island

Table 27 Fish Captured by Beach Seine (*n*=1 site) at East Digby Island in October 2015

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
Pacific staghorn sculpin	*Leptocottus armatus*	16	0.9	1	1	1.8	2.7	1.6	-
rock sole	*Lepidopsetta* spp.	9	0	0.2	0.3	1.2	2.1	0.9	-
shiner perch	*Cymatogaster aggregata*	29	0	1.1	2.1	4.7	7.3	2.9	-
starry flounder	*Platichthys stellatus*	17	1	1.1	1.2	1.9	2.7	1.7	-
Tubesnout	*Aulorhynchus flavidus*	107	1	2	3	14	25.1	10.6	-
unidentified larval fish	NA	11	0	0.1	0.3	1.6	3	1.1	-
Total		**189**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
-: SD (standard deviation) could not be calculated because there was only one beach seine
Table does not include the graceful crab (*n*=1) or crangon shrimp (*n*=10) caught incidentally
CPUE calculated as fish/100 m^2
Seine Area= 1,005 m^2

The October survey in East Digby Island captured 189 fish representing 5 fish species and 1 unidentified grouping of larval fish by beach seine (see Table 27). Tubesnout was the most abundant fish captured. Tubesnout (Photo 73), Pacific staghorn sculpin (Photo 74), and starry flounder (Photo 75) were the most commonly captured species (captured in three of three beach seines).

Photo 73 Tubesnout (*Aulorhynchus flavidus*) captured by beach seine at East Digby Island

Photo 74 Pacific staghorn sculpin (*Leptocottus armatus*) captured by beach seine at East Digby Island

Photo 75 Starry flounder (*Platichthys stellatus*) captured by beach seine at East Digby Island

FEBRUARY 2016

During the February 2016 marine fish survey, three beach seine hauls were completed in the bay north of Philips Point (see Photo 76 and Photo 77) (see). Beach seines were set by hand between 1.0 m and 1.2 m depth in areas dominated by sand. One tangle net was set in water 24 m deep (maximum depth).

Photo 76 BS04H1 beach seine site at East Digby Island

Photo 77 BS04H2 beach seine site at East Digby Island

Beach seining and tangle netting captured 36 fish representing 6 fish species and 2 unidentified taxa (see Table 28). Pacific staghorn sculpin was the most abundant fish captured and was caught in two of three seines. CRA fish species captured by beach seine included four juvenile pink salmon (see Photo 78) and one juvenile chum salmon (see Photo 79).

Table 28 Fish Captured by Beach Seine (*n*=1 site) and Tangle Net (*n*=1 site) at East Digby Island in February 2016

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m^2)									
chum salmon	*Oncorhynchus keta*	1	0	0	0	0.1	0.1	0.1	-
Pacific staghorn sculpin	*Leptocottus armatus*	18	0	0.2	0.4	1.2	2.1	1.1	-
pink salmon	*Oncorhynchus gorbuscha*	4	0	0	0	0.4	0.8	0.2	-
shiner perch	*Cymatogaster aggregata*	1	0	0	0	0.1	0.1	0.1	-
starry flounder	*Platichthys stellatus*	7	0	0.1	0.1	0.6	1.2	0.4	-
unidentified flatfish	NA	1	0	0	0	0.1	0.1	0.1	-
unidentified sculpin	NA	3	0	0.1	0.1	0.3	0.4	0.2	-
Tangle Net (Fish/20 minute set)									
rock sole	*Lepidopsetta* spp.	1	0.2	0.2	0.2	0.2	0.2	-	-
Total		**36**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
Table does not include crangon shrimp (*n*=25) caught incidentally
Seine Area= 1,690 m^2
Total Set Time for Tangle net = 122 minutes

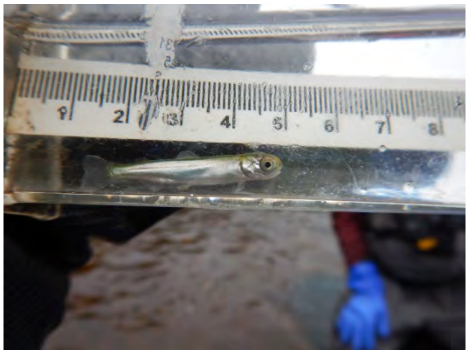


Photo 78 Pink salmon (*Oncorhynchus gorbuscha*) captured by beach seine at East Digby Island

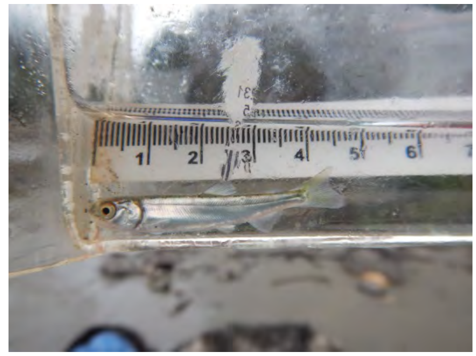


Photo 79 Chum salmon (*Oncorhynchus keta*) captured by beach seine at East Digby Island

MAY 2016

During the May 2016 marine fish survey, four beach seines hauls were completed at one site located in the bay north of Philips Point (see Photo 80 and Photo 81) (see). Beach seines were set by boat in water depths of 0.9 m and 1.8 m across areas dominated by sand with some areas of cobble/gravel. No tangle nets were set during the May 2016 field survey.

Photo 80 BS04H3 beach seine site in East Digby Island

Photo 81 BS04H4 beach seine site in East Digby Island

Beach seines captured 503 fish, representing 11 fish species and 1 unidentified taxon (see Table 29). Shiner perch was the most commonly captured species (captured in the four beach seines) and the most abundant. Several CRA species were captured by beach seine during May 2016 including 7 pink salmon, 5 coho salmon (see Photo 82), 1 sockeye salmon, 2 chum salmon, 3 Chinook salmon, 25 starry flounder, and 1 butter sole. Another species captured by beach seine was one fluffy sculpin (*Oligocottus snyderi*; Photo 83).

Table 29 Fish Captured by Beach Seine (*n*=1 site) in East Digby Island in May 2016

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
butter sole	*Isopsetta isolepis*	1	0	0	0	0	0.1	0.1	-
Chinook salmon	*Oncorhynchus tshawytscha*	3	0	0	0	0.2	0.8	0.2	-
chum salmon	*Oncorhyncus keta*	2	0	0	0.1	0.2	0.3	0.1	-
coho salmon	*Oncorhynchus kisutch*	5	0	0	0	0.3	1.4	0.3	-
cresent gunnel	*Pholis laeta*	1	0	0	0	0	0.2	0.1	-
fluffy sculpin	*Oligocottus snyderi*	1	0	0	0	0	0.2	0.1	-
Pacific staghorn sculpin	*Leptocottus armatus*	18	0	0	0.6	1.3	1.7	0.9	-
pink salmon	*Oncorhyncus gorbuscha*	7	0	0.1	0.3	0.6	0.7	0.4	-
shiner perch	*Cymatogaster aggregata*	435	2.8	14	20.8	29.1	45.1	21.8	-
sockeye salmon	*Oncorhynchus nerka*	1	0	0	0	0.1	0.3	0.1	-
starry flounder	*Platichthys stellatus*	25	0	0	1	1.9	2	1.3	-
unidentified sculpin	Family Cottidae	4	0	0	0.1	0.3	0.8	0.2	-
Total		**503**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
Table does not include Dungeness crab (*n*=3) caught incidentally
Seine Area= 1,993 m^2

Photo 82 Coho salmon (*Oncorhynchus kisutch)* captured by beach seine in Casey Cove

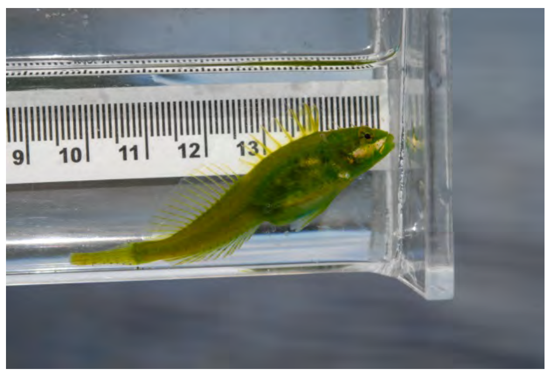


Photo 83 Fluffy sculpin (*Oligocottus snyderi*) captured by beach seine in Casey Cove

SOUTH DIGBY ISLAND

OCTOBER 2015

During the October 2015 marine fish survey, four beach seine sites (see Photo 84 through Photo 87) and seven tangle nets were sampled at South Digby Island (see). Depending on the amount of suitable habitat exposed at the time of sampling, between one and three beach seines sets were completed at each beach seine site (see Appendix 6, Table 6-3 for details). Beach seines were mostly set by boat between 0.2 m and 2.1 m depth over a variety of substrates (e.g., gravel mixed with shell, an even mixture of cobble and gravel, gravel, and mud). Tangle nets were set between 9.1 m and 30 m depth.

Photo 84 BS05H2 beach seine site at South Digby Island

Photo 85 BS07H2 beach seine site at South Digby Island

Photo 86 BS08H1 beach seine site at South Digby Island

Photo 87 BS11H1 beach seine site at South Digby Island

At South Digby Island, 869 fish representing 13 taxonomic groupings were captured using beach seines and tangle nets (see Table 30). Prickly sculpin was the most abundant species captured by beach seine and shiner perch was the only species captured by tangle net. Several CRA fish species were captured by beach seine including Pacific herring (Photo 88), starry flounder, and incidental capture of coonstripe shrimp (see Photo 89). Other species captured include great sculpin (*Myoxocephalus polyacanthocephalus*) (see Photo 90) and buffalo sculpin (see Photo 91).

Table 30 Fish Captured by Beach Seine (*n*=4 sites) and Tangle Net (*n*=7 sites) at South Digby Island in October 2015

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m²)									
buffalo sculpin	*Enophrys bison*	6	0	0	0	0.8	5	0.5	0.8
great sculpin	*Myoxocephalus polyacanthocephalus*	5	0	0	0	0	4.2	1.1	2.1
Pacific herring	*Clupea pallasii*	31	0	0	0	1.2	1.6	2.7	5.4
Pacific staghorn sculpin	*Leptocottus armatus*	19	0	0	0	0	1.2	1.1	2.3
prickly sculpin	*Cottus asper*	4	0	0	15.9	75.3	382.8	0.3	0.7
rock sole	*Lepidopsetta* spp.	1	0	0	0	0	8	0.1	0.2
shiner perch	*Cymatogaster aggregata*	715	0	0	0.5	1.9	7.8	57.4	90.4
starry flounder	*Platichthys stellatus*	25	0	0	0	0	0.5	1.5	3
tubesnout	*Aulorhynchus flavidus*	13	0	0.7	2.5	5	12.5	1.1	1
unidentified larval fish	NA	38	0	0	0.7	1	1.5	4.3	3.8
unidentified gunnel	Family Pholidae	1	0	0	0	0	38.8	0	0.1
unidentified sculpin	Family Cottidae	9	0.2	0.3	0.7	1.1	1.1	0.7	0.5
Tangle Net (Fish/20 minute set)									
shiner perch	*Cymatogaster aggregata*	2	0	0	0	0.5	1	-	-
Total		**869**							

NOTE:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
Table does not include crangon shrimp (*n*=22), hooded nudibranch (*n*=1), unidentified shrimp (*n*=86), coonstripe shrimp (*n*=50) or decorator crabs (*n*=4) caught incidentally.
Seine Area= 1,340 m²
Total Set Time for Tangle net = 140 minutes

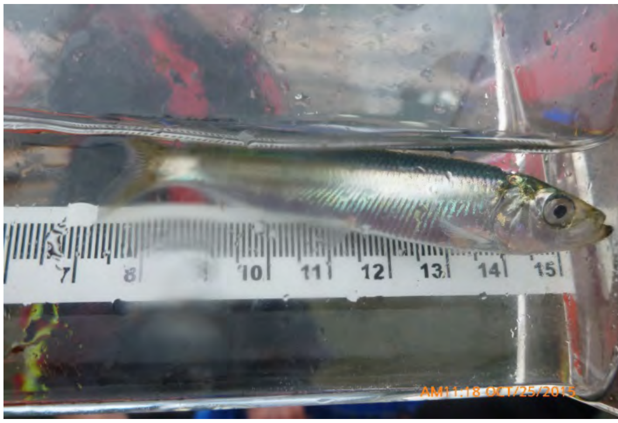


Photo 88 **Pacific herring (*Clupea pallasii*) captured by beach seine at South Digby Island**

Photo 89 **Coonstripe shrimp (*Pandalus danae*) incidentally captured in each seine at South Digby Island**

Photo 90 **Great sculpin (*Myoxocephalus polyacanthocephalus*) captured by beach seine at South Digby Island**

Photo 91 **Buffalo sculpin (*Enophrys bison*) captured by beach seine at South Digby Island**

February 2016

During the February 2016 marine fish survey, four beach seine sites (see Photo 92 through Photo 95) and six tangle net sites were sampled at South Digby Island (see). Depending on the amount of suitable habitat exposed at the time of sampling, between one and four beach seines were completed at each beach seine site. Beach seines were primarily set by boat, between 0.6 m and 3.1 m depth over a variety of substrates (sand with boulders, shells, gravel and cobble). Tangle nets were set between 3.0 m and 19.2 m depth.

Photo 92 BS05H1 beach seine site at South Digby Island

Photo 93 BS07H3 beach seine site at South Digby Island

Photo 94 BS08H1 beach seine site at South Digby Island

Photo 95 BS11H2 beach seine site at South Digby Island

At South Digby Island, 127 individuals representing 8 fish species and 3 unidentified taxa were captured using beach seines and tangle nets (see Table 31). Unidentified larval fish were the most abundant fish captured by beach seine, while Pacific staghorn sculpin was the most commonly captured species (captured in three of ten beach seine sets). Two species of sole were captured by tangle net.

Several CRA species were captured including 4 pink salmon (see Photo 96), 1 chum salmon (see Photo 97), 1 rock sole (see Photo 98), and 30 unidentified larval fish likely consisting of individuals belonging to the smelt family (Family Osmeridae). Other species captured were bay pipefish, shiner perch, and starry flounder (see Photo 99).

Table 31 Fish Captured by Beach Seine (*n*=4 sites) and Tangle Net (*n*=6 sites) at South Digby Island in February 2016

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m^2)									
bay pipefish	*Syngnathus leptorhynchus*	1	0	0	0	0	0.4	0	0
chum salmon	*Oncorhynchus keta*	1	0	0	0	0	0.4	0	0
Pacific staghorn sculpin	*Leptocottus armatus*	35	0	0	0	0.4	4.5	0.7	0.9
pink salmon	*Oncorhynchus gorbuscha*	4	0	0	0	0	0.8	0.2	0.4
shiner perch	*Cymatogaster aggregata*	6	0	0	0	0	0.5	0.1	0.2
starry flounder	*Platichthys stellatus*	31	0	0	0	0	2	0.4	0.9
unidentified flatfish	NA	30	0	0	0	0	2.4	0.4	0.8
unidentified larval fish	NA	12	0	0	0.1	0.4	1.7	0.6	0.8
unidentified sculpin	NA	5	0	0	0	0.2	0.8	0.1	0.2
Tangle Net (Fish/20 minute set)									
English sole	*Parophrys vetulus*	1	0	0	0	0	0.2	-	-
rock sole	*Lepidopsetta* spp.	1	0	0	0	0	0.2	-	-
Total		**127**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
Table does not include Alaskan hermit crab (*n*=1), unidentified shrimp (*n*=18), crangon shrimp (*n*=75), bubble shell (*n* =1), *or* decorator crabs (*n*=2) caught incidentally.
Seine Area= 4,065 m^2
Total Set Time for Tangle net = 754 minutes

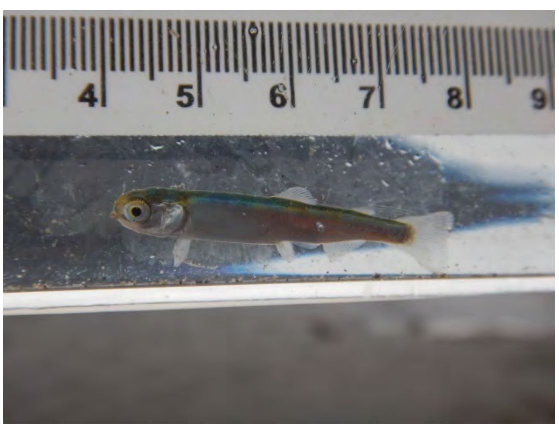


Photo 96 Pink salmon (*Oncorhynchus gorbuscha*) captured by beach seine at South Digby Island

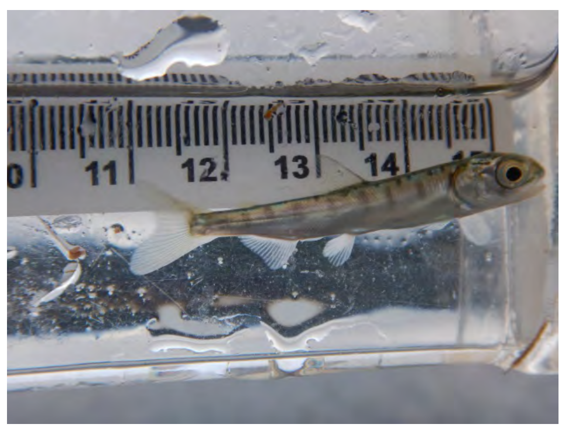


Photo 97 Chum salmon (*Oncorhynchus keta*) captured by beach seine at the head of Delusion Bay

Photo 98 Rock sole (*Lepidopsetta* spp.) captured by tangle net at the head of Delusion Bay

Photo 99 Starry flounder (*Platichthys stellatus*) captured by tangle net at South Digby Island

MAY 2016

During the May 2016 marine fish survey, four beach seine sites (see Photo 100 to Photo 103) were sampled in South Digby Island (see). Depending on the amount of suitable habitat exposed at the time of sampling, two or three beach seines were completed at each beach seine site. Beach seines were set by boat in water depths between 1.5 m and 2.4 m. Beach seines were set over a variety of substrates dominated by sand, gravel, or cobble. No tangle nets were set during the May 2016 field survey.

Photo 100 BS05H1 beach seine site in South Digby Island

Photo 101 BS07H1 beach seine site in South Digby Island

Photo 102 BS08H1 beach seine site in South Digby Island

Photo 103 BS11H3 beach seine site in South Digby Island

During May 2016, 3,697 individuals representing 31 fish species and 5 unidentified taxa were observed in beach seine catches (see Table 32). Surf smelt was the most commonly captured species (7 of 11 beach seines) and the most abundant. Several CRA species were captured at South Digby Island including 46 pink salmon, 53 coho salmon, 101 sockeye salmon, 95 chum salmon, 19 Chinook salmon, 499 Pacific herring (see Photo 104), 2,213 surf smelt (see Photo 105), 22 starry flounder, 49 butter sole, 1 C-O sole (see Photo 106), 4 English sole, 30 rock sole, 34 speckled sanddab (see Photo 107), and 2 unidentified flatfish.

Table 32 Fish Captured by Beach Seine (*n* = 4 sites) in South Digby Island in May 2016

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
bay pipefish	*Syngnathus leptorhyncus*	5	0	0	0	0	0.8	0.1	0.2
buffalo sculpin	*Enophrys bison*	14	0	0	0	0.4	3.3	0.4	0.5
butter sole	*Isopsetta isolepis*	49	0	0	0	1.2	8.4	1	1.8
Chinook salmon	*Oncorhynchus tshawytscha*	19	0	0	0	0.5	2.6	0	0
chum salmon	*Oncorhynchus keta*	95	0	0.5	1.7	2.9	7.2	0.5	0.5
C-O sole	*Pleuronichthys coenosus*	1	0	0	0	0	0.4	2.2	2.6
coho salmon	*Oncorhynchus kisutch*	53	0	0	0.7	1.9	4.9	1.4	1.3
crescent gunnel	*Pholis laeta*	89	0	0.3	0.7	2.8	8.8	2.2	1.6
Dolly Varden	*Salvelinus malma*	1	0	0	0	0	0.4	0	0
English sole	*Parophrys vetulus*	4	0	0	0	0	0.5	0.1	0.2
great sculpin	*Myoxocephalus polyacanthocephalus*	1	0	0	0	0	0.4	0	0
high cockscomb	*Anoplarchus purpurescens*	1	0	0	0	0	0.4	0	0.1
kelp perch	*Brachyistius frenatus*	4	0	0	0	0	1.3	0.1	0.3
Needlefish	*Belonidae* spp.	1	0	0	0	0	0.3	0	0.1

Table 32 Fish Captured by Beach Seine (*n* = 4 sites) in South Digby Island in May 2016

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
Pacific herring	*Clupea pallasii*	499	0	0	0.5	12.3	48.3	11.6	13.7
Pacific snake prickleback	*Lumpenus sagitta*	4	0	0	0	0.2	0.4	0.1	0.1
Pacific staghorn sculpin	*Leptocottus armatus*	19	0	0	0	0.7	2.3	0.4	0.7
penpoint gunnel	*Apodichthys flavidus*	1	0	0	0	0	0.3	0	0.1
pink salmon	*Oncorhynchus gorbuscha*	46	0	0	0.5	1.9	4.1	1.2	0.7
rock sole	*Lepidopsetta bilineata*	30	0	0	0	1.4	2.5	0.6	1.1
sand lance	*Ammodytidae* spp.	3	0	0	0	0.1	0.4	0.1	0.1
Sandfish	Family *Trichodontidae*	1	0	0	0	0	0.7	0	0.1
shiner perch	*Cymatogaster aggregata*	340	0	0	0	2.7	85.8	7.2	12.8
Snailfish	*Liparidae* spp.	1	0	0	0	0	0.3	0	0.1
sockeye salmon	*Oncorhynchus nerka*	101	0	0	0	0.9	14.7	2.1	3.9
speckled sanddab	*Citharichthys stigmaeus*	34	0	0	0	0.5	6.2	0.7	1.2
starry flounder	*Platichthys stellatus*	22	0	0	0	0.7	2.5	0.5	0.9
sturgeon poacher	*Podothecus accipenserinus*	1	0	0	0	0	0.2	0	0
surf smelt	*Hypomesus pretiosus*	2,213	0	0	21.7	79.5	226.8	48.9	68.6
tadpole sculpin	*Psychrolutes paradoxus*	1	0	0	0	0	0.4	0	0.1
tubesnout	*Aulorhynchus flavidus*	1	0	0	0	0	0.4	0	0
unidentified flat fish	*Pleuronectiformes* spp.	2	0	0	0	0	0.6	0	0.1
unidentified gadid	*Gadidae sp.*	3	0	0	0	0	0.7	0.1	0.1
unidentified larval fish	NA	26	0	0	0	0.8	3	0.8	1.5
unidentified sculpin	Family *Cottidae*	8	0	0	0	0	9.4	0.8	1.5
whitespotted greenling	*Hexagrammos stelleri*	4	0	0	0	0.2	0.7	0.1	0.1
Total		**3,697**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
Table does not include broken back shrimp (*n*=1), unidentified shrimp (*n*=1), California sea cucumber (*n*=1), crangon shrimp (*n*=15), blade shrimp (*n*=11), decorator crab (*n*=3), Dungeness crab (*n*=3), helmet crab (*n*=7), red rock crab (*n*=2), tadpole sculpin (*n*=1), or sunflower star (*n*=1) caught incidentally
Seine Area= 3,556 m^2

Photo 104 Pacific herring (*Clupea pallasii)* captured by beach seine in South Digby Island

Photo 105 Surf smelt (*Hypomesus pretiosus*) captured by beach seine in South Digby Island

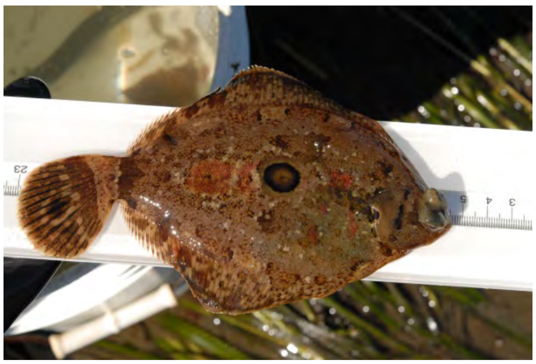


Photo 106 C-O sole (*Pleuronichthys coenosus*) captured by beach seine in South Digby Island

Photo 107 Speckled sanddab (*Citharichthys stigmaeus*) captured by beach seine in South Digby Island

DELUSION BAY

OCTOBER 2015

During the October 2015 marine fish survey, two beach seine sites (see Photo 108 and Photo 109) and two tangle net sites were sampled in Delusion Bay (see). Two beach seine sets were completed at one site and four sets were completed at the other site (see Appendix 6, Table 6-3). Beach seines were set by boat between 0.5 m and 1.8 m depth in areas dominated either by a mixture of gravel and sand, cobble, or mud. Tangle nets were set between 3.5 m and 5.8 m deep in an area that is typically exposed at low tide; hence, the net did not extend into the subtidal zone and catch did not necessarily capture fish inhabiting the subtidal zone.

Photo 108 BS12H2 beach seine site in Delusion Bay

Photo 109 BS13H2 beach seine site in Delusion Bay

At Delusion Bay, 42 fish representing 3 species were captured by beach seine; no fish were captured by tangle net, except for an incidental capture of a Dungeness crab (carapace length = 83 mm) (see Table 33). Starry flounder and Pacific staghorn sculpin were the most abundant species captured by beach seine, with starry flounder the most commonly captured species (captured in the six beach seine sets).

Table 33 Fish Captured by Beach Seine (*n*=2 sites) and Tangle Net (*n*=1 site) in Delusion Bay in October 2015

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m^2)									
Pacific staghorn sculpin	*Leptocottus armatus*	17	0	0.9	1.3	2.2	5.4	1.4	1.4
shiner perch	*Cymatogaster aggregata*	4	0	0	0	0.9	2	0.9	1.2
starry flounder	*Platichthys stellatus*	21	0.7	0.9	1.3	2.6	8.3	2	1
Tangle Net (Fish/20 minute set)									
NA		0							
Total		**42**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
NA: no fish captured by tangle net
Table does not include Dungeness crab (*n*=1) or crangon shrimp (*n*=50) caught incidentally
Seine Area= 908 m^2
Total Set Time for Tangle net = 40 minutes

FEBRUARY 2016

During the February 2016 marine fish survey, beach seining was completed at three sites (see Photo 110 through Photo 113). Three beach seine sets were completed at each site. In addition, one tangle net was deployed in 2.1 m water depth (see). Beach seines were hauled by boat or by hand in water depths between 0.6 m and 1.8 m in areas dominated by either a mixture of gravel and cobble, cobble, or mud and grass.

Photo 110 BS12H2 beach seine site in Delusion Bay

Photo 111 BS13H1 beach seine site in Delusion Bay

Photo 112 BS17H2 beach seine site at the head of Delusion Bay

Photo 113 BS17H3 beach seine site at the head of Delusion Bay

Beach seines and tangle nets captured 101 fish representing 3 species and 2 unidentified groupings (see Table 34). Pacific staghorn sculpin was the most abundant species captured by beach seine; however, unidentified larval fish was the most commonly captured species (captured in four of nine beach seine sets). Chum salmon (see Photo 115) was the only CRA fish species captured by beach seine during the February survey, and was captured in seines completed at the head of Delusion Bay. Other species captured include unidentified sculpin (Family Cottoidae; Photo 114).

Table 34 Fish Captured by Beach Seine (*n*=3 sites) and Tangle Net (*n*=1 sites) in Delusion Bay in February 2016

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m^2)									
chum salmon	*Oncorhynchus keta*	2	0	0	0	0	2	0.1	0.3
Pacific staghorn sculpin	*Leptocottus armatus*	5	0	0	0.1	0.8	1	0.3	0.2
unidentified larval fish	NA	85	0	0	0	0	70.8	5.1	8.8
unidentified sculpin	NA	8	0	0	0	0.6	1	0.3	0.1
Tangle Net (Fish/20 minute set)									
starry flounder	*Platichthys stellatus*	1	0.2	0.2	0.2	0.2	0.2	-	-
Total		**101**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
CPUE calculated as fish/100m^2 (beach seine) or fish/20 minute set (tangle net)
Seine Area= 2,151 m^2
Total Set Time for Tangle net = 90 minutes

Photo 114 Unidentified sculpin (Family Cottoidae) captured by beach seine at the head of Delusion Bay

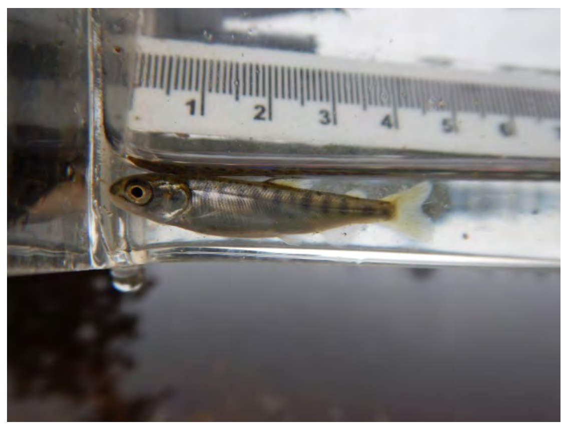


Photo 115 Chum salmon (*Oncorhynchus keta*) captured by beach seine at the head of Delusion Bay

MAY 2016

During the May 2016 marine fish survey, three beach seine sites (see Photo 116 and Photo 117) were sampled by boat in Delusion Bay (see). At each site, two to four hauls were completed, set in water depths between 0.9 m and 2.7 m in areas dominated by salt marsh, mud, or cobble. No tangle nets were set during the May 2016 field survey.

Photo 116 BS13H1 beach seine site in Delusion Bay

Photo 117 BS17H1 beach seine site in Delusion Bay

Beach seines in Delusion Bay captured 304 individuals representing 12 fish species and 1 unidentified sculpin (see Table 35). Pacific staghorn sculpin was the most abundant species captured while chum salmon was the most commonly captured species (captured in eight of nine hauls).Several CRA species were captured in Delusion Bay including 4 pink salmon, 7 coho salmon, 3 sockeye salmon (Photo 118), 35 chum salmon, 2 Chinook salmon, 154 surf smelt, and 4 starry flounder. One Dolly Varden was caught at the head of Delusion Bay (see Photo 119).

Table 35 Fish Captured by Beach Seine (*n*=3 sites) in Delusion Bay in May 2016

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
Chinook salmon	*Oncorhynchus tshawytscha*	2	0	0	0	0	1.2	0.1	0.2
chum salmon	*Oncorhynchus keta*	35	0	0.2	0.6	1.1	10.7	1.5	2
coho salmon	*Oncorhynchus kisutch*	7	0	0	0	0	4	0.2	0.2
Dolly Varden	*Salvelinus malma*	1	0	0	0	0	0.2	0	0.1
Pacific staghorn sculpin	*Leptocottus armatus*	35	0	0	1	1.7	2.5	1.1	0.3
pink salmon	*Oncorhynchus gorbuscha*	4	0	0	0	0	0.8	0.2	0.3
Sandfish	Family Trichodontidae	1	0	0	0	0	0.2	0	0.1
shiner perch	*Cymatogaster aggregata*	51	0	0	0.3	2	16.2	2.1	3.4
sockeye salmon	*Oncorhynchus nerka*	3	0	0	0	0	1.2	0.1	0.1
starry flounder	*Platichthys stellatus*	4	0	0	0	0	0.8	0.1	0.1
surf smelt	*Hypomesus pretiosus*	154	0	0	0	3.2	30.7	4.8	3.7

Table 35 Fish Captured by Beach Seine (*n*=3 sites) in Delusion Bay in May 2016

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
threespine stickleback	*Gasterosteus aculeatus*	4	0	0	0	0.5	0.6	0.2	0.3
unidentified sculpin	Family Cottidae	3	0	0	0	0	1.9	0.1	0.2
Total		**304**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
Seine Area= 2,950 m^2

Photo 118 Sockeye salmon (*Oncorhynchus nerka)* captured by beach seine in Delusion Bay

Photo 119 Dolly Varden (*Salvelinus malma*) captured by beach seine in Delusion Bay

DODGE COVE

OCTOBER 2015

During the October 2015 marine fish survey, two beach seine sites (see Photo 120 and Photo 121) and two tangle net sites were sampled in Dodge Cove (see Figure 38). Three beach seine sets were completed at each beach seine site. Beach seines were set by boat between 1.1 m and 2.3 m depth in areas dominated by a mixture of mud and sand. Tangle nets were set between 3.4 m and 6.1 m depth.

Photo 120 BS01H1 beach seine site in Dodge Cove

Photo 121 BS16H3 beach seine site in Dodge Cove

Beach seining captured 259 fish representing 13 species and 3 unidentified groupings of fish (see Table 36). Shiner perch was the most abundant species captured by beach seine and the most commonly captured species (captured in the six beach seines and one of two tangle nets). Several CRA fish species were observed in beach seine catches including juvenile coho salmon (see Photo 122), starry flounder, and unidentified larval fish (likely consisting of individuals belonging to the smelt family [Family Osmeridae]). A single Dungeness crab (see Photo 123) was incidentally captured by tangle net. Sturgeon poacher (*Podothecus accipenserinus*) (see Photo 124) and bay pipefish (see Photo 125) were also captured in Dodge Cove.

Table 36 Fish Captured by Beach Seine (*n*=2 sites) and Tangle Net (*n*=2 sites) in Dodge Cove in October 2015

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m^2)									
bay pipefish	*Syngnathus leptorhynchus*	25	0	0	0.3	2.2	10	1.7	2.4
buffalo sculpin	*Enophrys bison*	1	0	0	0	0	0.2	0.1	0.1
coho salmon	*Oncorhynchus kisutch*	5	0	0	0	0.3	1.2	0.3	0.4
crescent gunnel	*Pholis laeta*	1	0	0	0	0	0.8	0.1	0.1
Pacific staghorn sculpin	*Leptocottus armatus*	2	0	0	0	0	0.4	0.1	0.2
prickly sculpin	*Cottus asper*	15	0	0	0	1.2	3.4	0.9	1.3
shiner perch	*Cymatogaster aggregata*	111	0.3	2.6	5.6	16.3	22.5	7.1	1.7
starry flounder	*Platichthys stellatus*	2	0	0	0	0.2	0.4	0.1	0
sturgeon poacher	*Podothecus accipenserinus*	2	0	0	0	0	1.7	0.1	0.2
Tubesnout	*Aulorhynchus flavidus*	85	0.3	0.5	0.8	4	57.5	5.8	7.5
unidentified flounder	NA	1	0	0	0	0	0.2	0.1	0.1

Table 36 Fish Captured by Beach Seine (*n*=2 sites) and Tangle Net (*n*=2 sites) in Dodge Cove in October 2015

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
unidentified larval fish	NA	1	0	0	0	0	0.3	0.1	0.1
unidentified sculpin	Family Cottidae	3	0	0	0	0.2	1.7	0.2	0.3
whitespotted greenling	*Hexagrammos stelleri*	1	0	0	0	0	0.2	0.1	0.1
Tangle Net (Fish/20 minute set)									
Pacific staghorn sculpin	*Leptocottus armatus*	3	0	0.8	1.5	2.2	3	-	-
shiner perch	*Cymatogaster aggregata*	1	0	0.2	0.5	0.8	1	-	-
Total		**259**							

NOTES:

Q1 and Q3 refers to the 25th and 75th percentile, respectively

Table does not include unidentified shrimp (*n*=10), crangon shrimp (*n*=65), hooded nudibranch (*n*=13), red rock crab (*n*=2), decorator crab (*n*=1), Dungeness crab (*n*=4), or graceful crab (*n*=3) caught incidentally.

SD: standard deviation

-: standard deviation could not be calculated when only one individual was captured or there was only one set

Seine Area= 1,545 m^2

Total Set Time for Tangle net = 120 minutes

Photo 122 Coho salmon (*Oncorhynchus kisutch*) captured by beach seine in Dodge Cove

Photo 123 Dungeness crab (*Metacarcinus magister*) captured by tangle net in Dodge Cove

Photo 124 Sturgeon poacher (*Podothecus accipenserinus*) captured by beach seine in Dodge Cove

Photo 125 Bay pipefish (*Syngnathus leptorhyncus*) captured by beach seine in Dodge Cove

February 2016

During the February 2016 marine fish survey, two beach seine sites (see Photo 126 and Photo 127) and two tangle net sites were sampled in Dodge Cove (see Figure 38). Depending on the amount of suitable substrate exposed at the time of sampling, three or four beach seines were completed at each beach seine site. Beach seines were set by wading in water depths between 0.8 m and 1.2 m depth in areas dominated by a mixture of mud and sand. Tangle nets were set in water depths of 1.2 m and 4.3 m deep.

Photo 126 BS01H2 beach seine site in Dodge Cove

Photo 127 BS16H2 beach seine site in Dodge Cove

Beach seines and tangle nets caught 281 fish representing 11 species and 2 unidentified groupings in Dodge Cove (see Table 37). Pacific staghorn sculpin was the most abundant species observed in beach seine catches and the most commonly captured species (captured in five of eight beach seines and one of two tangle nets). Tubesnout (see Photo 128) was also captured. CRA fish species captured in Dodge Cove included 1 Chinook salmon (see Photo 129), 1 juvenile chum (see Photo 130) and 4 juvenile pink salmon (see Photo 131).

Table 37 Fish Captured by Beach Seine (*n*=2 sites) and Tangle Net (*n*=2 sites) in Dodge Cove in February 2016

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m^2)									
bay pipefish	*Syngnathus leptorhynchus*	2	0	0	0	0.1	0.3	0.1	0.1
buffalo sculpin	*Enophrys bison*	4	0	0	0	0.1	1	0.1	0.2
chum salmon	*Oncorhynchus keta*	1	0	0	0	0	0.2	0	0
English sole	*Parophrys vetulus*	1	0	0	0	0	0.2	0	0
great sculpin	*Myoxocephalus polyacanthocephalus*	1	0	0	0	0	0.3	0	0
Pacific staghorn sculpin	*Leptocottus armatus*	46	0	0.2	1.4	1.8	6.3	1.5	0.6
pink salmon	*Oncorhynchus gorbuscha*	4	0	0	0	0.1	0.7	0.1	0.1
starry flounder	*Platichthys stellatus*	7	0	0	0	0.4	1.3	0.2	0.2
tubesnout	*Aulorhynchus flavidus*	210	0	0	0.2	3.6	58	7.3	10
unidentified flatfish	NA	1	0	0	0	0	0.3	0	0
unidentified sculpin	NA	1	0	0	0	0	0.3	0	0
Tangle Net (Fish/20 minute set)									
Chinook salmon	*Oncorhynchus tshawytscha*	1	0	0	0.1	0.1	0.2	-	-
Pacific staghorn sculpin	*Leptocottus armatus*	1	0	0	0.1	0.1	0.2	-	-
starry flounder	*Platichthys stellatus*	1	0	0	0.1	0.1	0.2	-	-
Total		**281**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
Table does not include northern kelp crab (*n*=1) or crangon shrip (*n*=25) caught incidentally
Seine Area= 3,130 m^2
Total Set Time for Tangle net = 444 minutes

Photo 128 **Tubesnout (*Aulorhynchus flavidus*) captured by beach seine in Dodge Cove**

Photo 129 **Chinook salmon (*Oncorhynchus tshawytscha*) captured by tangle net in Dodge Cove**

Photo 130 **Chum salmon (*Onchorrhynchus keta*) captured by beach seine in Dodge Cove**

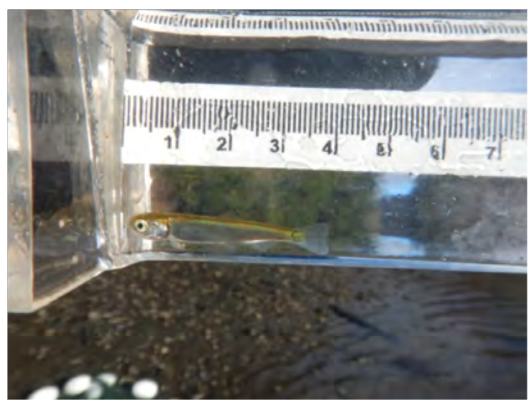


Photo 131 **Pink salmon (*Oncorhynchus gorbuscha*) captured by beach seine in Dodge Cove**

MAY 2016

During the May 2016 marine fish survey, two beach seine sites (see Photo 132 and Photo 133) were sampled in Dodge Cove and three hauls were completed at each site (see Figure 38). Beach seines were set by boat in water depths between 1.2 m and 3 m in areas dominated by mud.

Photo 132 BS01H1 beach seine site in Dodge Cove

Photo 133 BS16H3 beach seine site in Dodge Cove

Beach seines captured 5,773 fish representing 18 species and 1 unidentified grouping of fish (see Table 38). Pacific staghorn sculpin was the most commonly captured species (captured the six seines) while shiner perch was the most abundant. CRA species were captured in Dodge Cove including 10 pink salmon, 24 coho salmon, 2 sockeye salmon, 87 chum salmon, 2 Chinook salmon (see Photo 134), 12 Pacific herring, 211 surf smelt, 26 starry flounder, 14 rock sole (see Photo 135), and 7 butter sole.

Table 38 Fish Captured by Beach Seine (*n*=2 sites) in Dodge Cove in May 2016

Common Name	Scientific Name	Catch	CPUE (Fish/100 m²)						
			Min	Q1	Median	Q3	Max	Mean	SD
bay pipefish	*Syngnathus leptorhynchus*	37	0	0	0.1	1.8	3.9	1.3	1.8
buffalo sculpin	*Enophrys bison*	3	0	0	0	0	0.4	0.1	0.1
butter sole	*Isopsetta isolepis*	7	0	0	0	0.3	1.3	0.2	0.3
Chinook salmon	*Oncorhynchus tshawytscha*	2	0	0	0	0	0.3	0.1	0.1
chum salmon	*Oncorhynchus keta*	87	0	1.8	4	4.9	22.9	4.7	4
coho salmon	*Oncorhynchus kisutch*	24	0	0.1	0.5	1.6	2.1	1	0.2
crescent gunnel	*Pholis laeta*	49	0	0	0.4	2.1	9	1.7	2.4
great sculpin	*Myoxocephalus polyacanthocephalus*	3	0	0	0	0.2	0.3	0.1	0.1
Pacific herring	*Clupea pallasii*	12	0	0	0	1	1.4	0.5	0.3
Pacific staghorn sculpin	*Leptocottus armatus*	118	0.3	0.6	2.2	9.6	19.7	7.1	9.2
pink salmon	*Oncorhynchus gorbuscha*	10	0	0	0.2	0.7	3.5	0.6	0.6
rock sole	*Lepidopsetta bilineata*	14	0	0	0.3	0.8	2	0.5	0.7
shiner perch	*Cymatogaster aggregata*	5,143	0	1.2	5.9	21.9	1452.2	316.9	444.5
sockeye salmon	*Oncorhynchus nerka*	2	0	0	0	0	0.3	0.1	0.1
speckled sanddab	*Citharichthys stigmaeus*	11	0	0	0	0.5	2	0.4	0.5
starry flounder	*Platichthys stellatus*	26	0	0.1	0.3	2.2	4.3	1.6	2
surf smelt	*Hypomesus pretiosus*	211	0	0	0	0	28.1	7.4	10.5
tubesnout	*Aulorhynchus flavidus*	13	0	0	0	0	1.7	0.5	0.6
unidentified sculpin	Family Cottidae	1	0	0	0	0	0.3	0	0
Total		**5,773**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
Table does not include bubble shell (*n*=1), crangon shrimp (*n*=35), Dungeness shrimp (*n*=6), graceful crab (*n*=1), or helmet crab (*n*=2) caught incidentally
Seine Area= 2,234 m^2

Photo 134 Chinook salmon (*Oncorhynchus tshawytscha)* captured by beach seine in Dodge Cove

Photo 135 Rock sole (*Lepidopsetta bilineata*) captured by beach seine in Dodge Cove

TREMAYNE BAY

OCTOBER 2015

During the October 2015 marine fish survey, three beach seine sites (see Photo 136 and Photo 137) and two tangle net sites were sampled in Tremayne Bay (see). Depending on the amount of exposed beach at the time of sampling, between one and three hauls were completed at each beach seine site. Beach seines were set by boat between 0.8 m and 2.6 m depth in areas dominated by sand, gravel, or a mixture of mud and rocky substrate (gravel or cobble). Tangle nets were set between 7.3 m and 11.3 m depth.

Photo 136 BS14H1 beach seine site in Tremayne Bay

Photo 137 BS15H1 beach seine site in Tremayne Bay

Beach seines and tangle nets captured 1,724 fish representing 13 species and 2 unidentified groupings of fish in Tremayne Bay (see Table 39). Starry flounder was the most common species captured by beach seine (captured in four of six hauls) and the most abundant. Tangle nets captured two species of greenlings. Two schools of Pacific herring were also captured by beach seine (n_1=859 and n_2=509). CRA fish species such as juvenile coho (see Photo 138) and Chinook salmon (see Photo 139), as well as painted greenling (see Photo 140), whitespotted greenling (Photo 141), and high cockscomb (*Anoplarchus purpurescens*) (see Photo 142), were also captured. In addition, 2 adult and 40 juvenile Dungeness crab (see Photo 143) were captured in Tremayne Bay.

Table 39 Fish Captured by Beach Seine (*n*=3 sites) and Tangle Net (*n*=2 sites) in Tremayne Bay in October 2015

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m²)									
black prickleback	*Xiphister atropurpureus*	1	0	0	0	0	0.4	0.1	0.1
Chinook salmon	*Oncorhynchus tshawytscha*	4	0	0	0.2	0.4	0.9	0.3	0.3
coho salmon	*Oncorhynchus kisutch*	1	0	0	0	0	0.4	0.1	0.1
English sole	*Parophrys vetulus*	2	0	0	0	0	0.9	0.1	0.3
high cockscomb	*Anoplarchus purpurescens*	1	0	0	0	0	0.4	0.1	0.1
Pacific herring	*Clupea pallasii*	1,368	0	0	0	152.7	376.8	154.3	197.4
Pacific staghorn sculpin	*Leptocottus armatus*	11	0	0	0.2	0.8	3.5	0.8	1.2
prickly sculpin	*Cottus asper*	5	0	0	0.2	0.8	0.9	0.5	0.4
shiner perch	*Cymatogaster aggregata*	284	0	0	0	15.1	104.4	20.8	36
starry flounder	*Platichthys stellatus*	10	0	0.1	0.4	1.4	1.8	0.6	0.6
tubesnout	*Aulorhynchus flavidus*	2	0	0	0	0.3	0.4	0.2	0.2
unidentified larval fish	NA	16	0	0	0.2	1	5.3	1.1	1.4
unidentified sculpin	Family Cottidae	17	0	0	0.2	0.7	6.1	1.2	1.6
Tangle Net (Fish/20 minute set)									
painted greenling	*Oxylebius pictus*	1	0	0.2	0.5	0.8	1	-	-
whitespotted greenling	*Hexagrammos stelleri*	1	0	0.2	0.5	0.8	1	-	-
Total		**1,724**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
Table does not include Dungeness crab (*n*=42) or crangon shrimp (*n*=100) caught incidentally.
Seine Area= 1,274 m²
Total Set Time for Tangle net = 40 minutes

Photo 138 **Coho salmon (*Oncorhynchus kisutch*) captured by beach seine in Tremayne Bay**

Photo 139 **Chinook salmon (*Oncorhynchus kisutch*) captured by beach seine in Tremayne Bay**

Photo 140 **Painted greenling (*Oxylebius pictus*) captured by tangle net in Tremayne Bay**

Photo 141 **Whitespotted greenling (*Hexagrammos stelleri*) captured by tangle net in Tremayne Bay**

Photo 142 High cockscomb (*Anoplarchus purpurescens*) captured by beach seine in Tremayne Bay

Photo 143 Juvenile Dungeness crab (*Metacarcinus magister*) captured by beach seine in Tremayne Bay

February 2016

During the February 2016 marine fish survey, three beach seine sites (see Photo 144 and Photo 145) and two tangle net sites were sampled in Tremayne Bay. Depending on the amount of exposed beach at the time of sampling, one to three hauls were completed at each beach seine site. Beach seines were set by boat or by wading in water depths between 0.9 m and 1.3 m, in areas dominated by sand, mud, and cobble. Tangle nets were set on a flood tide in water depths between 3.8 m and 6.7 m depth.

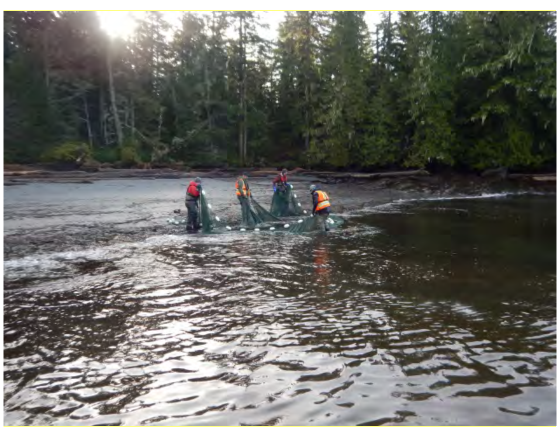


Photo 144 BS14H1 beach seine site in Tremayne Bay

Photo 145 BS15H2 beach seine site in Tremayne Bay

Beach seines and tangle nets captured 815 individuals representing 10 species and 2 unidentified groupings of fish in Tremayne Bay (see Table 40). Starry flounder and unidentified larval fish were the most commonly captured fish (captured in four of six hauls). Unidentified larval fish was the most abundant taxon captured by beach seine (see Photo 146), which included two relatively large catches (n_1=460 and n_2=186). CRA fish species captured include starry flounder, surf smelt (see Photo 147), rock sole, and kelp greenling (see Photo 148). Other species, including buffalo sculpin, Pacific staghorn sculpin, shiner and kelp perch (*Brachyistius frenatus*) (see Photo 149), were caught in Tremayne Bay.

Table 40 Fish Captured by Beach Seine (*n*=3 sites) and Tangle Net (*n*=2 sites) in Tremayne Bay in February 2016

Common Name	Scientific Name	Catch	CPUE						
			Min	Q1	Median	Q3	Max	Mean	SD
Beach Seine (Fish/100m^2)									
buffalo sculpin	*Enophrys bison*	1	0	0	0	0	0.3	0.1	0.2
great sculpin	*Myoxocephalus polyacanthocephalus*	1	0	0	0	0	0.3	0.1	0.2
Pacific staghorn sculpin	*Leptocottus armatus*	3	0	0	0	0.3	0.9	0.2	0.2
rock sole	*Lepidopsetta* spp.	2	0	0	0	0.3	0.4	0.2	0.2
shiner perch	*Cymatogaster aggregata*	2	0	0	0	0.3	0.3	0.2	0.2
starry flounder	*Platichthys stellatus*	7	0	0.4	0.5	0.7	1	0.4	0.4
surf smelt	*Hypomesus pretiosus*	10	0	0	0	0	4.4	0.8	1.4
tubesnout	*Aulorhynchus flavidus*	7	0	0	0.3	0.3	1.7	0.4	0.5
unidentified flatfish	NA	5	0	0	0	0.3	1.8	0.4	0.5
unidentified larval fish	NA	775	0	0.3	36	98	208.9	58.3	85.6
Tangle Net (Fish/20 minute set)									
kelp greenling	*Hexagrammos decagrammus*	1	0	0	0.1	0.1	0.2	-	-
kelp perch	*Brachyistius frenatus*	1	0	0	0.1	0.1	0.2	-	-
Total		**815**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
-: standard deviation could not be calculated when only one individual was captured or there was only one set
Table does not include decorator crab (*n*=1) or crangon shrimp (*n*=29) caught incidentally
Seine Area= 1,345 m^2
Total Set Time for Tangle net = 443 minutes

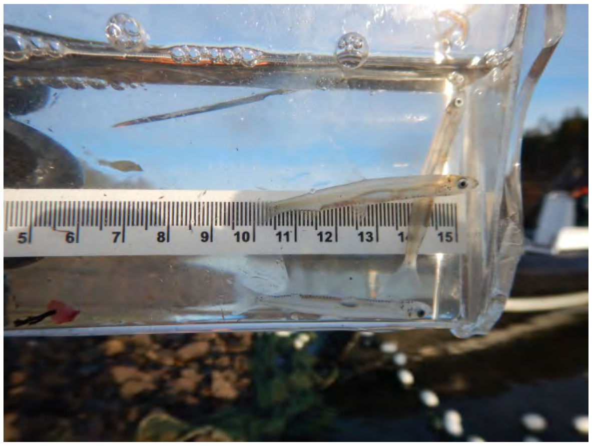


Photo 146 **Unidentified larval fish captured by beach seine in Tremayne Bay**

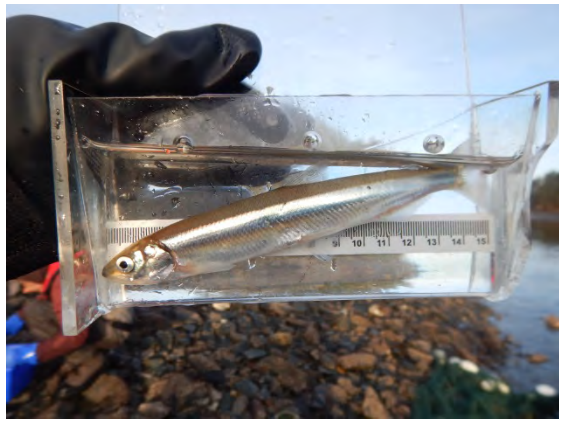


Photo 147 **Surf smelt (*Hypomesus pretiosus*) captured by beach seine in Tremayne Bay**

Photo 148 **Kelp greenling (*Hexagrammos decagrammus*) captured by tangle net in Tremayne Bay**

Photo 149 **Kelp perch (*Brachyistius frenatus*) captured by tangle net in Tremayne Bay**

May 2016

During the May 2016 marine fish survey, three beach seine sites (see Photo 150 and Photo 151) were sampled in Tremayne Bay and one to three hauls were completed at each site (depending on the amount of suitable beach exposed at the time of sampling). Beach seines were set by hand or by boat in water depths between 0.6 m and 2.4 m across areas dominated by sand or gravel.

Photo 150 BS14H2 beach seine site in Tremayne Bay

Photo 151 BS15H1 beach seine site in Tremayne Bay

Beach seines captured 3,679 fish representing 19 species and 2 unidentified fish groupings in Tremayne Bay (see Table 41). Chum salmon was the most commonly captured species (captured in the six beach seine sets) while Pacific staghorn sculpin was the most abundant species captured. Several CRA species were captured including nine pink salmon, 34 coho salmon, 1 sockeye salmon, 11 chum salmon, 15 Chinook salmon, 1 Pacific herring (see Photo 152), 12 surf smelt (see Photo 153), 1 unidentified larval fish, 1 rock sole, 23 starry flounder, and 37 butter sole.

Table 41 Fish Captured by Beach Seine (*n*=3 sites) in Tremayne Bay in May 2016

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
bay pipefish	*Syngnathus leptorhynchus*	1	0	0	0	0	0.3	0	0
brown Irish lord	*Hemilepidotus spinosus*	1	0	0	0	0	0.3	0	0
buffalo sculpin	*Enophrys bison*	15	0	0	0	0.2	4.7	0.4	0.7
butter sole	*Isopsetta isolepis*	37	0	0	0	0.6	7.3	1	1.7
Chinook salmon	*Oncorhynchus tshawytscha*	15	0	0.1	0.6	0.8	2.9	1.2	1.5
chum salmon	*Oncorhynchus kisutch*	11	0.2	0.2	0.3	0.7	1.3	0.5	0.3
coho salmon	*Oncorhynchus kisutch*	34	0	0.1	0.4	2.3	7	2	1.6
crescent gunnel	*Pholis laeta*	32	0	0	0.6	1.3	6.7	0.9	1.5
dolly varden	*Salvelinus malma*	2	0	0	0	0	0.8	0.3	0.5
Pacific herring	*Clupea pallasii*	1	0	0	0	0	0.2	0	0
Pacific staghorn sculpin	*Leptocottus armatus*	303	0	1.2	1.5	4	88.3	8.6	13
penpoint gunnel	*Apodichthys flavidus*	19	0	0	0	0	6.3	0.5	0.9
pink salmon	*Oncorhynchus gorbuscha*	9	0	0	0.2	1	1.3	0.6	0.6
rock sole	*Lepidopsetta* spp.	1	0	0	0	0	0.3	0	0
shiner perch	*Cymatogaster aggregata*	3144	0	0	0	2.2	627	83.8	145.2
sockeye salmon	*Oncorhynchus nerka*	1	0	0	0	0	0.2	0	0.1

Table 41 Fish Captured by Beach Seine (*n*=3 sites) in Tremayne Bay in May 2016

Common Name	Scientific Name	Catch	CPUE (Fish/100 m^2)						
			Min	Q1	Median	Q3	Max	Mean	SD
starry flounder	*Platichthys stellatus*	23	0	0	0	1.5	2.9	0.6	1.1
surf smelt	*Hypomesus pretiosus*	12	0	0	0.2	0.6	2.3	0.4	0.3
tubesnout	*Aulorhynchus flavidus*	1	0	0	0	0	0.3	0	0
unidentified larval fish	Family Osmeridae	1	0	0	0	0	0.2	0	0.1
unidentified sculpin	Family Cottidae	16	0	0	0.1	0.7	3.7	0.4	0.7
Total		**3,679**							

NOTES:
Q1 and Q3 refers to the 25th and 75th percentile, respectively
SD: standard deviation
Table does not include crangon shrimp (*n*=9), decorator crab (*n*=12), Dungeness crab (*n*=32), helmet crab (*n*=5), northern kelp crab (*n*=149) caught incidentally
Seine Area= 2,295 m^2

Photo 152 Pacific herring (*Clupea pallasiil* captured by beach seine in Tremayne Bay

Photo 153 Surf smelt (*Hypomesus pretiosus*) captured by beach seine in Tremayne Bay

5.5.6.2 Temporal Patterns in the Relative Abundance of Focal Fish Species in Each Study Area

To meet Objective 2 of the marine fish survey (describe general patterns in the relative abundance of ten focal fish species within each study area, over six survey periods, using beach seine data collected during both Triton and Stantec-led marine fish surveys), ten fish species were identified as focal species. These were juveniles belonging to the five Pacific salmon species (pink, chum, sockeye, coho, and Chinook), four pelagic marine fish species (surf smelt, Pacific herring, unidentified larval fish and unidentified smelt [groupings that could possibly include eulachon, as well as other Osmerids]), and one demersal marine fish species (starry flounder). Focal fish species were selected for a more in-depth examination of temporal patterns in distribution and relative abundance. Focal species were selected based on the following criteria:

- Importance as a CRA fish species or non-commercial supporting fish species, as defined by DFO fishery management objectives, and First Nation and local interests and concerns
- Designation as a species at risk by COSEWIC and SARA status
- Available catch and biological data from marine fish surveys completed between 2014 and 2016 for the Aurora LNG Project (it is for this reason that eulachon were not selected as a focal species. Sampling did not overlap with the timing of the adult eulachon run, and while larval eulachon may have been captured in beach seines, seining is not the appropriate method to target larval eulachon)

Because tangle nets were either unsuccessfully deployed, excluded from the study design (i.e., during May), or, at times, unsuccessful at catching fish, the discussion below focuses on trends in relative abundance of focal fish species using beach seine data. Beach seine sampling effort during each survey period is provided in Appendix 6, Table 6-5 and a summary of CPUE for each focal species captured by beach seine is presented by study area in Appendix 6, Table 6-6. Temporal patterns in the relative abundance of focal species observed in beach seine catches over six survey periods are presented in Figure 40 through Figure 51.

A summary of tangle net sampling effort during each survey period is provided in Appendix 6, Table 6-7 and a summary of CPUE for each focal species captured by tangle net is presented by study area in Appendix 6, Table 6-8.

CASEY COVE

Casey Cove was sampled by beach seine during most survey periods, except for April 2014 and August 2014 (see Appendix 6, Table 6-5). Beach seines were completed in areas dominated by gravel, cobble, and sand[4]. Nine of ten focal fish species were observed in beach seine catches in Casey Cove. Most species were typically observed in low abundance during all survey periods (median CPUE < 0.3 fish/100 m^2), except in May 2016, when most species numbers peaked (except for unidentified larval fish, which were observed in greatest numbers in October 2015). A discussion of species-specific trends in abundance is provided below.

Juvenile Chinook and sockeye salmon were largely absent from beach seine catches during most survey periods (except during May 2016, when one Chinook and three sockeye were caught) (see Figure 40). Juvenile Chum and pink salmon were caught in very low numbers in February 2016 (median 0 fish/100 m^2), and in higher numbers in May 2016 (5.3 fish/100m^2, IQR 1.7-9.8 [chum salmon] and 1.7 fish/100 m^2 IQR 0.1-10.8 [pink salmon]). CPUE for juvenile coho was zero for most periods sampled, although coho were observed in very low numbers during October 2015 (median 0 fish/100m^2, IQR 0-0.4), and in higher numbers in May 2016 (median 0.3 fish/100 m^2, IQR 0-1).

Pacific herring were typically not observed in beach seine catches in Casey Cove, and when observed (February and May 2016), numbers were low (median < 0.2 fish/100 m^2) (see Figure 41). Surf smelt were largely absent from most beach seine catches. One surf smelt was observed during October 2015 and

[4] Substrate type was not recorded in March 2015.

three were caught during February 2016. In May 2016, a greater number of surf smelt was observed (maximum catch 5.6 fish/100m^2).

Unidentified larval fish were typically not observed in Casey Cove, except for in October, when a small number (*n*=17) were observed in catch from one beach seine, and in February 2016, when a similar number (*n*=16) were observed in one set. Starry flounder were captured by beach seine during all survey periods (except during March 2015), and observed in low numbers in October 2015 (median 0.4 fish/100 m^2, IQR 0-1.1), and higher abundance in February and May 2016. No unidentified surf smelt were observed in Casey Cove.

East Digby Island

East Digby Island was sampled by beach seine during most survey periods, except August 2014 and March 2015 (see Appendix 6, Table 6-5). Beach seines were completed in a small bay located immediately north of Philips Point in areas dominated by sand or mud with small pockets of gravel/cobble[5]. All ten focal fish species were observed in beach seine catches in East Digby Island; however, most species were typically absent from catches during most survey periods, and when species were caught (usually in April 2014 or May 2016), numbers were often very low. A discussion of species-specific trends in abundance is provided below.

Juvenile Chinook, sockeye and coho salmon were typically not observed in beach seine catches in East Digby Island (except in May 2016, when < 5 individuals of each species were observed) (see Figure 42). Juvenile Pink and chum salmon were typically caught in very low numbers during most survey periods sampled (maximum < 0.8 fish/100 m^2), although one relatively large catch of pink salmon was observed in April 2014 (maximum 29.9 fish/100 m^2), and no pink or chum salmon were caught in beach seine catches during October 2015.

Pacific herring were absent from all beach seine catches, except for one individual captured in April 2014 (Figure 43). CPUE was zero for surf smelt during most surveys periods sampled, except in April 2014, when low numbers of surf smelt were observed (except for one large catch of 142 individuals in a single beach seine). Unidentified larval fish were only observed in October 2015 in very low numbers (median 0.3 fish/100m^2, IQR 0.1-1.6). In contrast, starry flounder were consistently observed during all survey periods sampled. Starry flounder were most abundant in October and least abundant in April 2014. Four unidentified smelts were captured by beach seine in April 2014.

South Digby Island

South Digby Island was sampled by beach seine during all survey periods (see Appendix 6, Table 6-5). Beach seines were completed in areas dominated by substrates ranging from shell dominated, to gravel/cobble mix, to sandy substrate with eelgrass[6]. All ten focal fish species were observed in beach seine catches in South Digby Island. Most species were typically absent or observed in very low numbers during most survey periods, except for in April 2014 and May 2016, when numbers were often higher

[5] Substrate type was not recorded in April 2014.
[6] Substrate type was not recorded in April 2014, August 2014, and March 2015.

(except for unidentified larval fish, which was observed in peak numbers in October 2015). A discussion of species-specific trends in abundance is provided below.

Juvenile Chinook, sockeye and coho were absent from beach seine catches during the majority of survey periods, except during May 2016, when all three species were typically caught in very low numbers (median < 0.7 fish/100 m^2), with the exception of one beach seine set, which caught relatively high numbers of sockeye (*n*=88) (see Figure 44). Juvenile chum salmon were captured in very low numbers during February 2016 and April 2014 (median < 0.2 fish/100m^2), and in relatively higher numbers in May 2016 (median 1.7 fish/100m^2, IQR 0.5-2.9). Juvenile pink salmon were caught in very low numbers in February 2016 and March 2015, and in much higher numbers in April 2014 (median 3.6 fish/100m^2, IQR 1.1-26.2), during which two beach seines captured 769 individuals combined. In May 2016, the number of pink salmon captured by beach seine was lower (median 0.5 fish/100 m^2, IQR 0-1.9) than in April 2014.

Pacific herring were typically not observed in beach seine catches (see Figure 45). A small number of individuals (*n* = 31) were observed in a single beach seine in October 2015, but in May 2015, Pacific herring were frequently caught and in relatively high numbers (0.5 fish/100 m^2, IQR 0-12.3), including two large catches of 134 and 279 individuals/seine.

A small number of surf smelt (*n*=19) were captured via two beach seines in March 2015, whereas in May 2015, relatively larger numbers of surf smelt were consistently captured in beach seines throughout South Digby Island (median 21.7 fish/100 m^2, IQR 0-79.5). Relatively low numbers of unidentified smelt (*n*=11) were observed in beach seine catches in August 2014.

Unidentified larval fish were observed during all but one, survey period (April 2014). Relatively low numbers of unidentified larval fish were consistently observed in beach seine catches in August 2014, October 2015, and February 2016. In March 2015 and May 2016, unidentified larval fish were typically not observed in catches, but when observed, numbers were generally low (except in March 2015, when two large catches of >93 individuals in a single set occurred). Starry flounder was observed infrequently during all survey periods, except in March 2015, when starry flounder was absent from beach seine catches. The numbers of starry flounder observed were generally low, and observations were limited to a handful of seines.

Delusion Bay

Delusion Bay was sampled by beach seine during all survey periods (except April 2014) (see Appendix 6, Table 6-5). Beach seines were completed in areas dominated by a mixture of gravel and sand, cobble, or mud with salt marsh vegetation[7]. Eight of ten focal fish species were observed in beach seine catches in Delusion Bay. Most species were typically absent from beach seine catches except for in February 2016, March 2015, or May 2016. A discussion of species-specific trends in abundance is provided below.

Juvenile Chinook, coho, sockeye, and pink salmon were only observed in beach seine catches during May 2016, and numbers were generally low (median 0 fish/100 m^2) (see Figure 46). Two juvenile chum salmon were observed during February 2016. In May 2016, the number of chum salmon observed was relatively higher (median 0.6 fish/100 m^2, IQR 0.2-1.1).

[7] Substrate type was not recorded in August 2014 and March 2015.

Pacific herring were not caught by beach seine in Delusion Bay, and surf smelt were absent from most beach seine catches (see Figure 47). A single surf smelt was caught in March 2015, and in May 2016, surf smelt were caught in less than half of the beach seines completed, but in relatively higher numbers (maximum 30.7 fish/100 m^2). No unidentified surf smelt were caught by beach seine. Unidentified larval fish were only caught in Delusion Bay in February 2016, and observations were limited to a single beach seine catch (maximum 70.8 fish/100 m^2). Starry flounder were observed during all survey periods sampled, except February 2016 and March 2015. Individuals were typically observed in most beach seine catches.

Dodge Cove

Dodge Cove was sampled by beach seine in October 2015, February 2016, and May 2016 (see Appendix 6, Table 6-5). Seines were completed in areas dominated by mud and sand, with some seines overlapping areas with salt marsh vegetation. Nine of ten focal fish species were caught by beach seine in Dodge Cove; however, most species were largely absent from most beach seine catches, and when observed, numbers were very low. A discussion of species-specific trends in abundance is provided below.

Juvenile Chinook and sockeye salmon were largely absent from beach seine sets, and only a few individuals of each species were caught by beach seine in May 2016 (maximum 0.3 fish/100 m^2 (see Figure 48). In contrast, juvenile coho was caught in relatively higher abundance in May 2016 (median 0.5 fish/100 m^2, IQR 0.1-1.6), and was also caught in October 2015, but in lower numbers (median 0 fish/100 m^2, IQR 0-0.3). Juvenile chum and pink salmon were caught in very low numbers in February 2016 (maximum <0.7 fish/100 m^2). In May 2016, chum salmon was caught in most beach seines completed in Dodge Cove and in relatively higher abundance (median 4 fish/100 m^2, IQR 1.8-4.9), whereas pink salmon were still caught in low numbers in May 2016 (maximum 3.5 fish/100 m^2) and observations were limited to a few beach seine catches.

Pacific herring and surf smelt were largely absent from most beach seine catches (see Figure 49). During May 2016, a small number of Pacific herring (*n*=12) were captured in two beach seines, and a relatively larger number of surf smelt (*n*=211) were caught in a single beach seine. No unidentified surf smelt were observed in beach seine catches in Dodge Cove. A single, unidentified larval fish was observed in Dodge Cove in October 2015. Starry flounder was observed in beach seine catches during all three survey periods, and catch was highest in May 2016 (median 0.3 fish/100m^2, IQR 0.1-2.2).

Tremayne Bay

Tremayne Bay was sampled by beach seine during all survey periods except April 2014 (see Appendix 6, Table 6-5). Beach seines were completed over areas dominated by sand, mud, gravel, or cobble[8]. Nine of ten focal fish species were captured by beach seine in Tremayne Bay. For most Pacific salmon species, catch was generally low and numbers typically peaked in May 2016, whereas the number of Pacific herring and unidentified larval fish captured by beach seine was largely influenced by catching schools of individuals. A discussion of species-specific trends in abundance is provided below.

[8] Substrate not recorded during March 2015 and August 2014 surveys.

Juvenile sockeye salmon were typically absent from beach seine catches, except for a single individual observed during May 2016 (see Figure 50). Juvenile Chinook salmon were observed in relatively higher numbers during May 2016 (median 0.6 fish/100 m^2, IQR 0.1-0.8) and caught in almost half of all beach seines completed at that time. Chinook salmon was also caught in October 2015, but in lower numbers, and observations were limited to a few beach seines (maximum 0.9 fish/100 m^2). A single juvenile coho salmon was observed during October 2015, whereas in May 2016, coho was caught more frequently by beach seine and in higher numbers (median 0.4 fish/100 m^2, IQR 0.1-2.3). Juvenile chum was typically absent from most beach seine catches. A few chum salmon (*n*=3) were caught in a single beach seine in March 2015. In May 2016, chum salmon CPUE was higher, and individuals were often observed in beach seine catches (median 0.3 fish/100 m^2, IQR 0.2-0.7).

Pacific herring was typically absent from most beach seines completed in Tremayne Bay (see Figure 51), but when observed, catch was generally high. Schools of Pacific herring were caught in August 2014 (up to 1,090 individuals in a single seine) and October 2015 (up to 859 individuals in a single set). A single Pacific herring was also observed in May 2016. Surf smelt were typically observed in low numbers in February 2016, March 2015, and May 2016 (maximum < 5 individuals/100 m^2). No unidentified surf smelt were observed in beach seine catches in Tremayne Bay. Unidentified larval fish were observed during all five survey periods sampled, and catch was highest during March 2015 (median 116.9 fish/100m^2, IQR 81.3-159), and lower in February 2016 (median 36 fish/100m^2, IQR 0.3-98). Unidentified larval fish were caught infrequently and in low numbers in August 2014 and October 2015 (median < 0.2 fish/100m^2). Starry flounder were consistently captured by beach seine in relatively low numbers (median <0.5 fish/100 m^2), except in August 2014, when no starry flounder were observed in beach seine catches.

6 CLOSURE

This TDR provides a summary of information on existing conditions for marine fish and fish habitats found within the Marine Fish and Fish Habitat LAA and RAA. Information was collected through a combination of desktop and field-based studies. Four types of field-based studies were conducted between 2014 and 2016: intertidal surveys; subtidal ROV surveys; an eelgrass survey; and marine fish surveys. Crab trapping was also completed during three discrete sampling events between 2014 and 2015. The information presented in this TDR will be used to inform the assessment of potential Project effects on marine fish and fish habitat, and will support an application for a section 35(2)(b) *Fisheries Act* Authorization for residual serious harm to fish, if needed.

Respectfully submitted,

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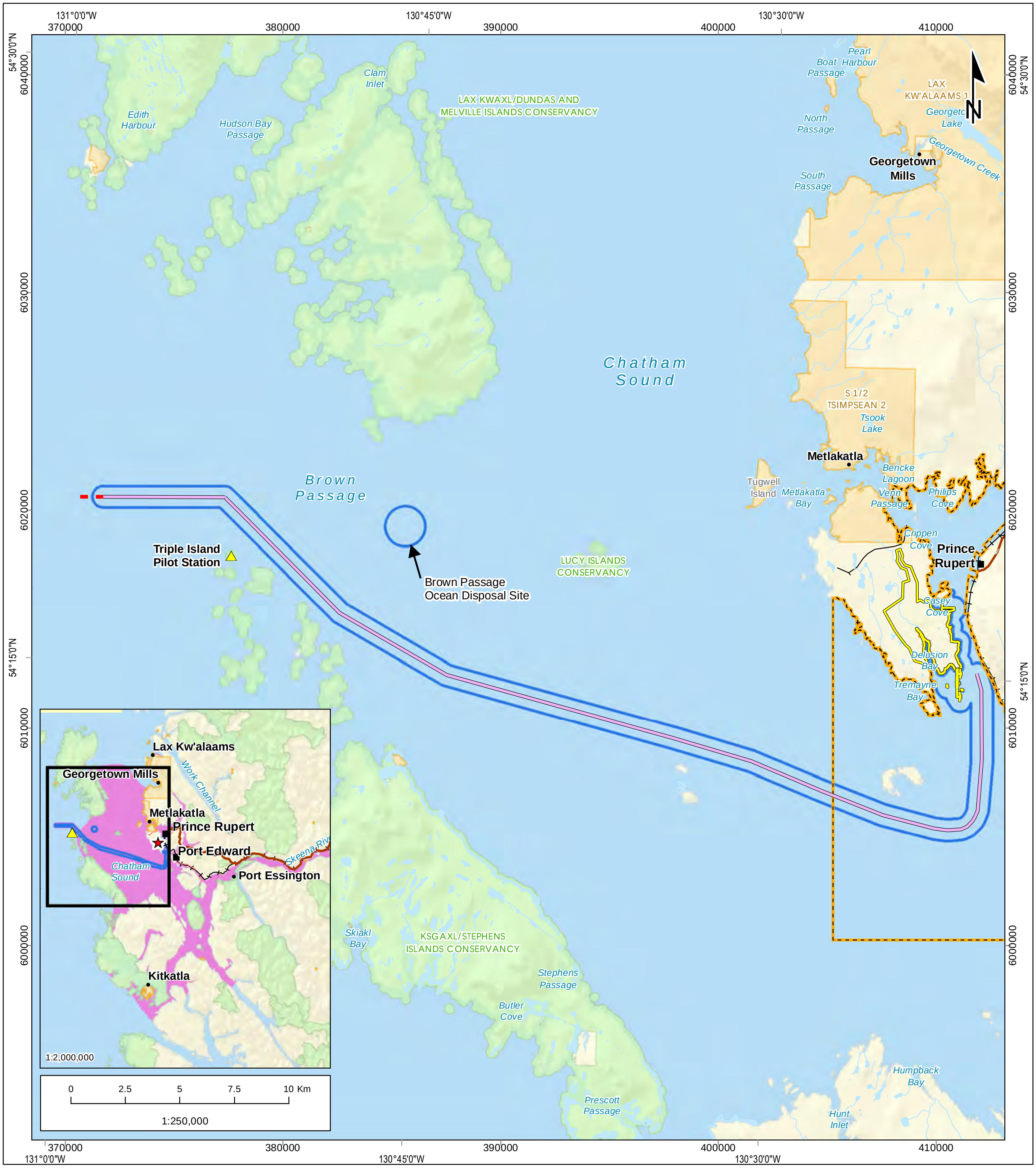
8 FIGURES

Please see the following pages.



- City, Municipality, or Town
- Community, Locality, or Village
- Triple Island Pilot Station
- Highway
- Road
- Railway
- Watercourse
- Park, Protected Area, Ecological Reserve, or Conservancy
- First Nation Reserve
- Waterbody
- Prince Rupert Port Authority Boundary
- Shipping Route
- Pilot Boarding Zone
- Project Development Area
- Local Assessment Area
- Regional Assessment Area

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.Service Layer Credits: Copyright:© 2014 Esri

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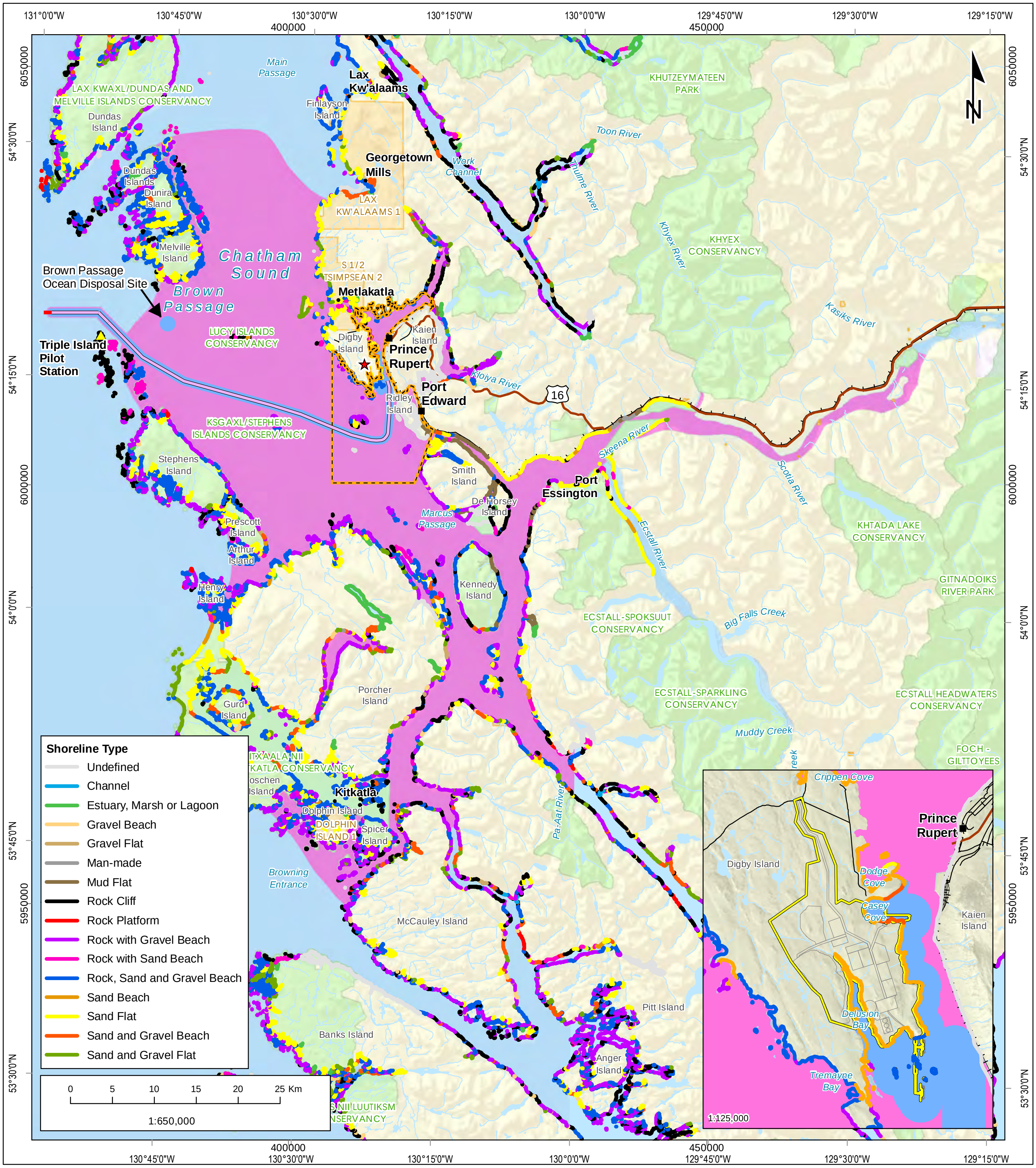
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

LOCAL AND REGIONAL ASSESSMENT BOUNDARIES FOR MARINE FISH AND FISH HABITAT

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Nov 07, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 1



City, Municipality, or Town
Community, Locality, or Village
Triple Island Pilot Station
Highway
Road
Railway
Watercourse
Park, Protected Area, Ecological Reserve, or Conservancy
First Nation Reserve
Waterbody
Prince Rupert Port Authority Boundary
Project Location
Shipping Route
Pilot Boarding Zone
Project Component
Project Development Area
Local Assessment Area
Regional Assessment Area

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.Service Layer Credits: Copyright:© 2014 Esri

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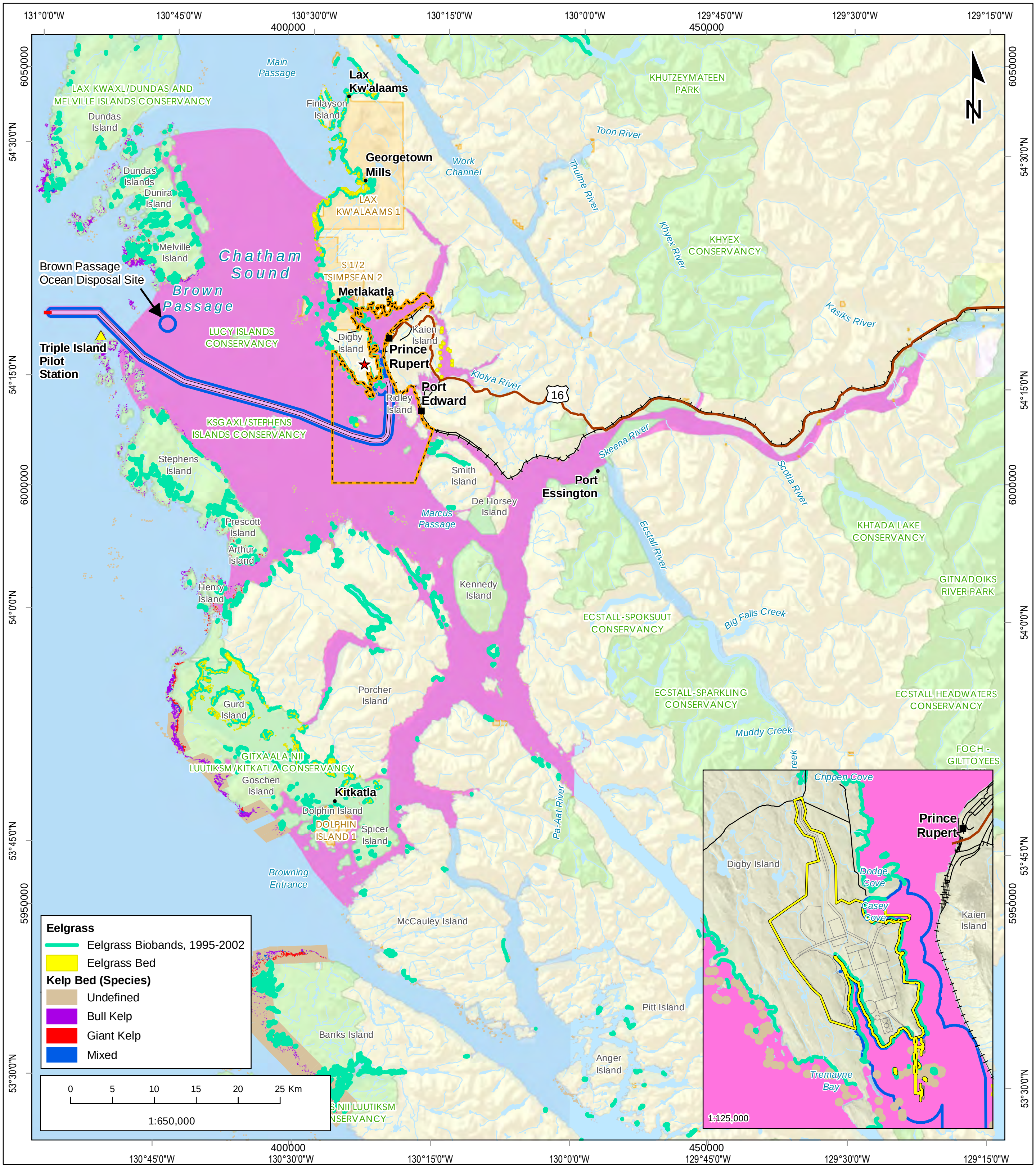
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

BC SHOREZONE MAPPING SYSTEM - SHORELINE TYPES

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Nov 07, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 2



- City, Municipality, or Town
- Community, Locality, or Village
- Triple Island Pilot Station
- Highway
- Road
- Railway
- Watercourse
- Park, Protected Area, Ecological Reserve, or Conservancy
- First Nation Reserve
- Waterbody
- Prince Rupert Port Authority Boundary
- Project Location
- Shipping Route
- Pilot Boarding Zone
- Project Component
- Project Development Area
- Local Assessment Area
- Regional Assessment Area

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.Service Layer Credits: Copyright:© 2014 Esri

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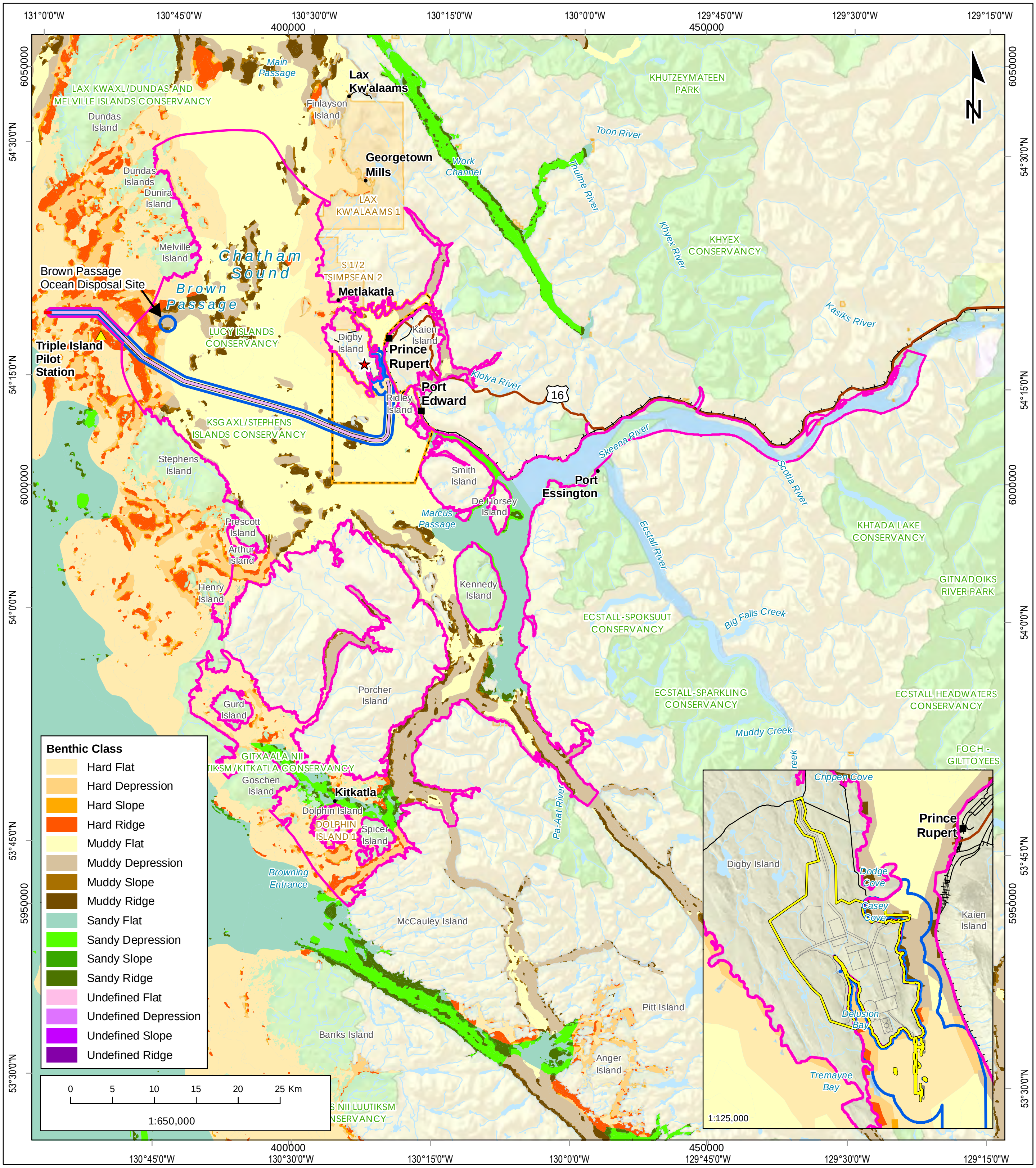
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

BC SHOREZONE MAPPING SYSTEM - KELP AND EELGRASS

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Nov 07, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 3



- City, Municipality, or Town
- Community, Locality, or Village
- Triple Island Pilot Station
- Highway
- Road
- Railway
- Watercourse
- Park, Protected Area, Ecological Reserve, or Conservancy
- First Nation Reserve
- Waterbody
- Prince Rupert Port Authority Boundary
- Project Location
- Shipping Route
- Pilot Boarding Zone
- Project Component
- Project Development Area
- Local Assessment Area
- Regional Assessment Area

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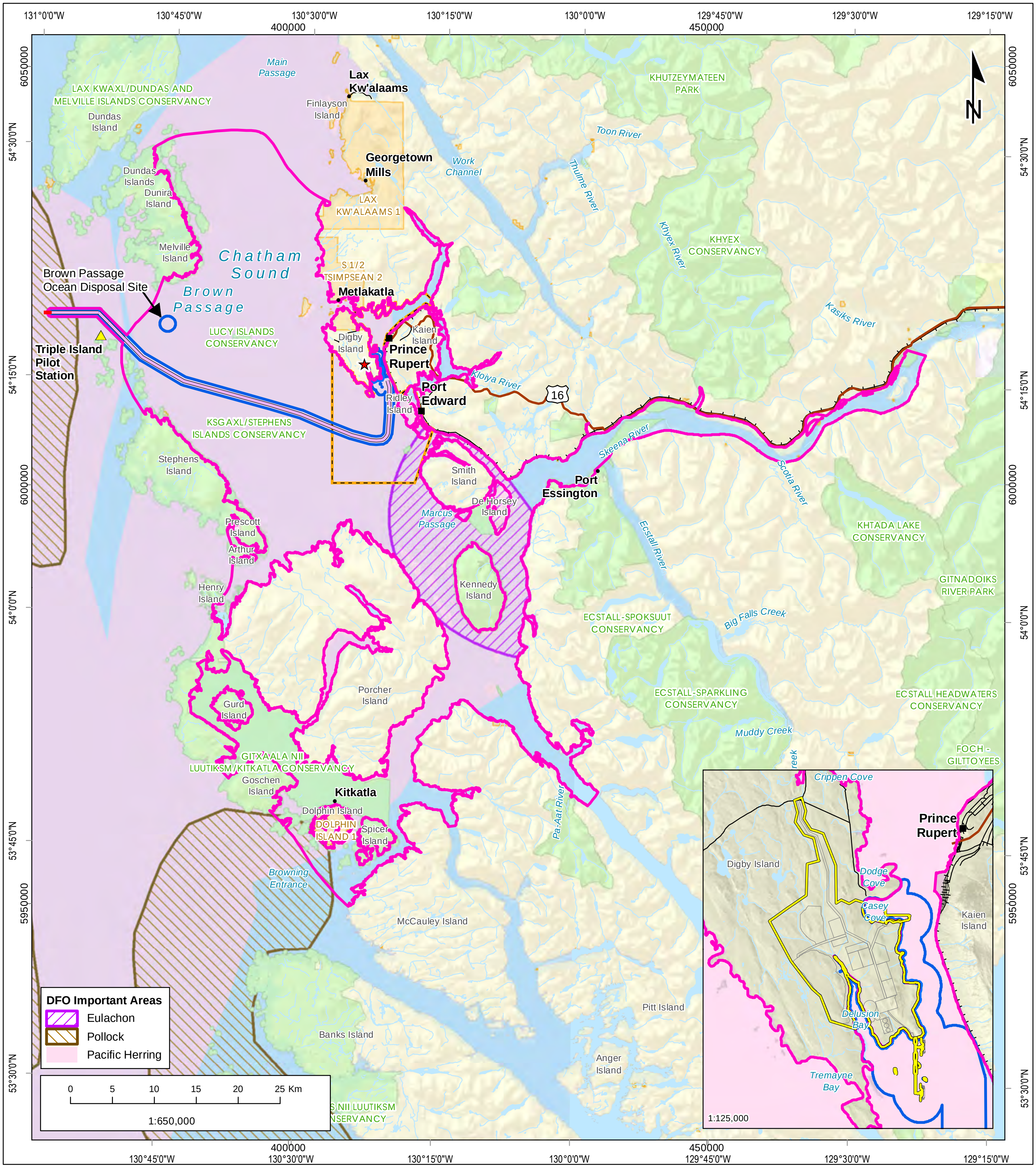
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

BC MARINE CONSERVATION ANALYSIS -BENTHIC CLASSES

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.Service Layer Credits: Copyright:© 2014 Esri

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Nov 07, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 4



- City, Municipality, or Town
- Community, Locality, or Village
- Triple Island Pilot Station
- Highway
- Road
- Railway
- Watercourse
- Park, Protected Area, Ecological Reserve, or Conservancy
- First Nation Reserve
- Waterbody
- Prince Rupert Port Authority Boundary
- Project Location
- Shipping Route
- Pilot Boarding Zone
- Project Component
- Project Development Area
- Local Assessment Area
- Regional Assessment Area

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.Service Layer Credits: Copyright:© 2014 Esri

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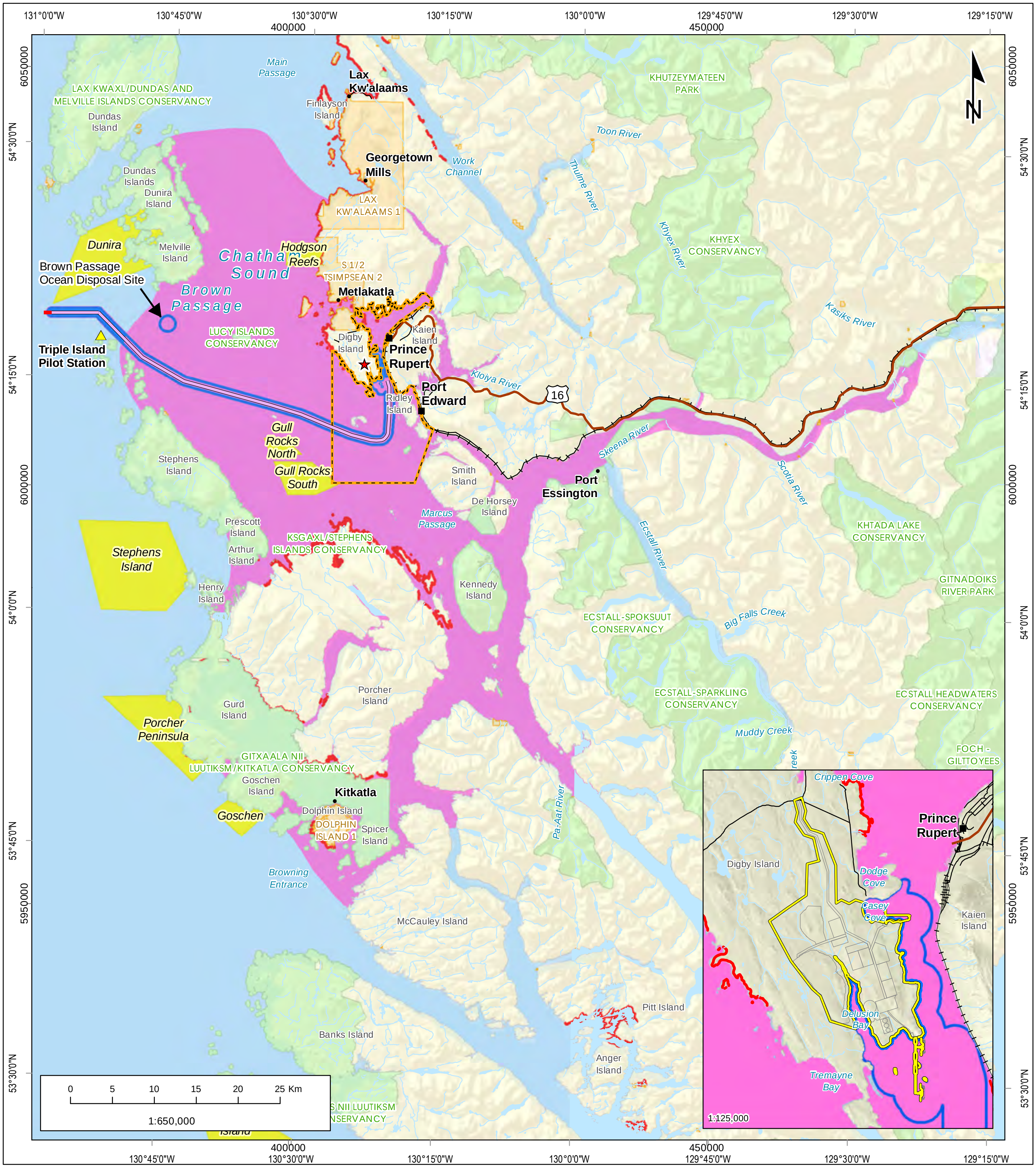
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

FISHERIES AND OCEANS CANADA IMPORTANT AREAS FOR MARINE FISH

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Nov 07, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 5



- City, Municipality, or Town
- Community, Locality, or Village
- Triple Island Pilot Station
- Highway
- Road
- Railway
- Watercourse
- Park, Protected Area, Ecological Reserve, or Conservancy
- First Nation Reserve
- Waterbody
- Prince Rupert Port Authority Boundary
- Project Location
- Shipping Route
- Pilot Boarding Zone
- Project Component
- Project Development Area
- Local Assessment Area
- Regional Assessment Area
- Herring Spawning Area
- Rockfish Conservation Area

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.Service Layer Credits: Copyright:© 2014 Esri

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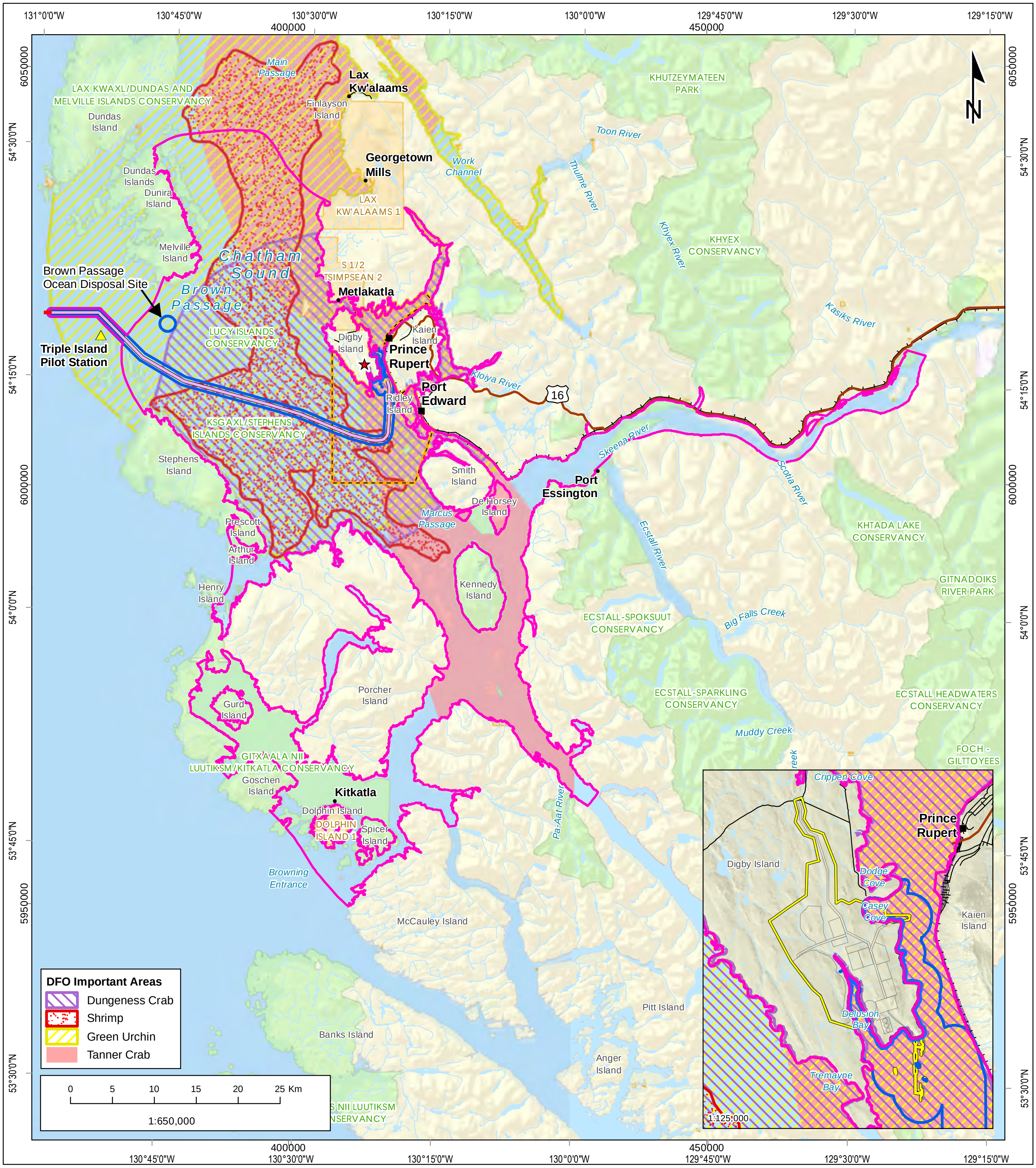
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

PACIFIC HERRING SPAWNING AND ROCKFISH CONSERVATION AREAS

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Nov 07, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 6



City, Municipality, or Town
Community, Locality, or Village
Triple Island Pilot Station
Highway
Road
Railway
Watercourse
Park, Protected Area, Ecological Reserve, or Conservancy
First Nation Reserve
Waterbody
Prince Rupert Port Authority Boundary
Project Location
Shipping Route
Pilot Boarding Zone
Project Component
Project Development Area
Local Assessment Area
Regional Assessment Area

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.Service Layer Credits: Copyright:© 2014 Esri

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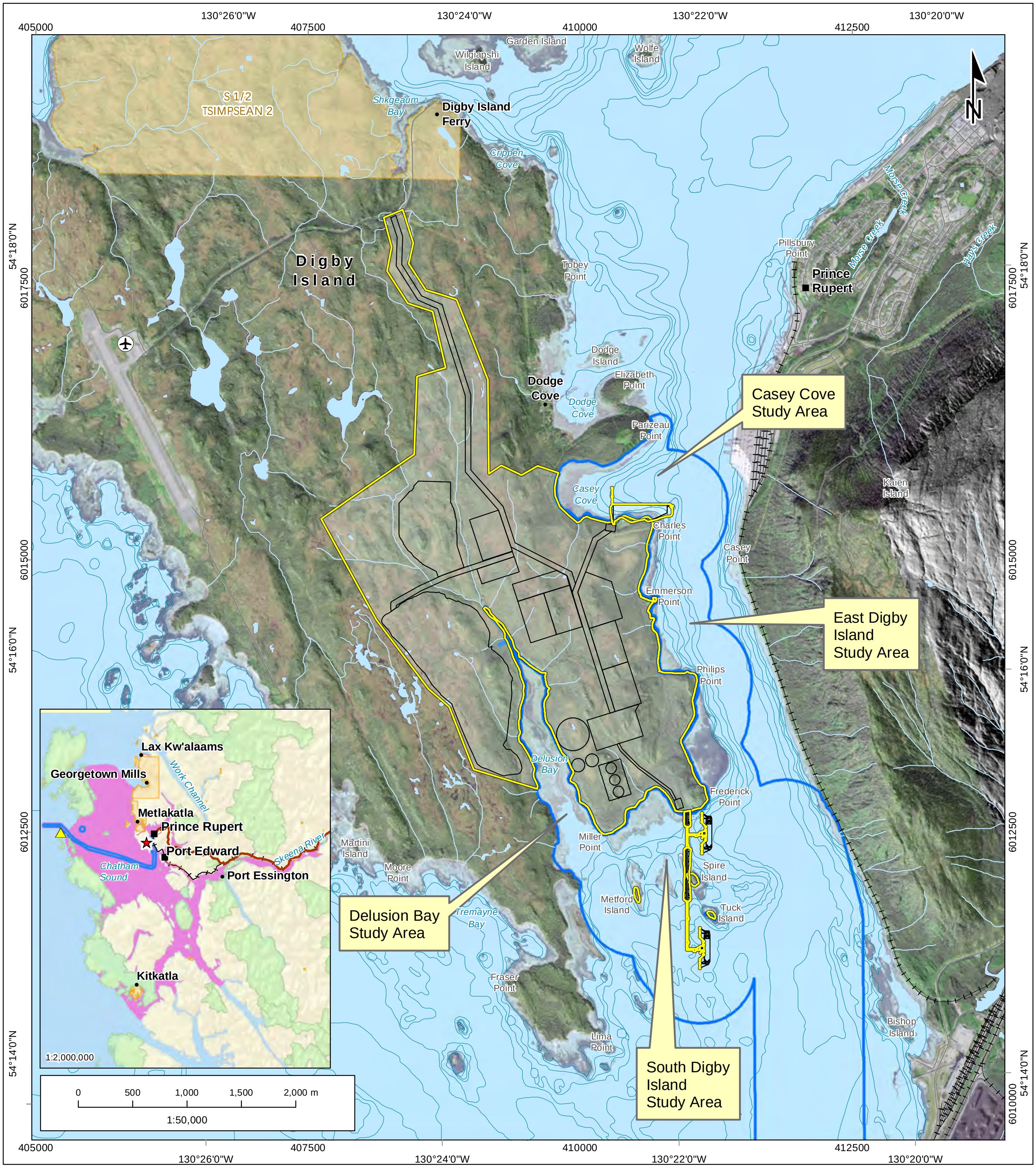
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

FISHERIES AND OCEANS CANADA IMPORTANT AREAS FOR MARINE INVERTEBRATES

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Nov 07, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 7



City, Municipality, or Town
Community, Locality, or Village
Airport
Triple Island Pilot Station
Road
Railway
Watercourse
Bathymetric Contour
Park, Protected Area, Ecological Reserve, or Conservancy
First Nation Reserve
Waterbody
Project Location
Project Component
Project Development Area
Local Assessment Area
Regional Assessment Area

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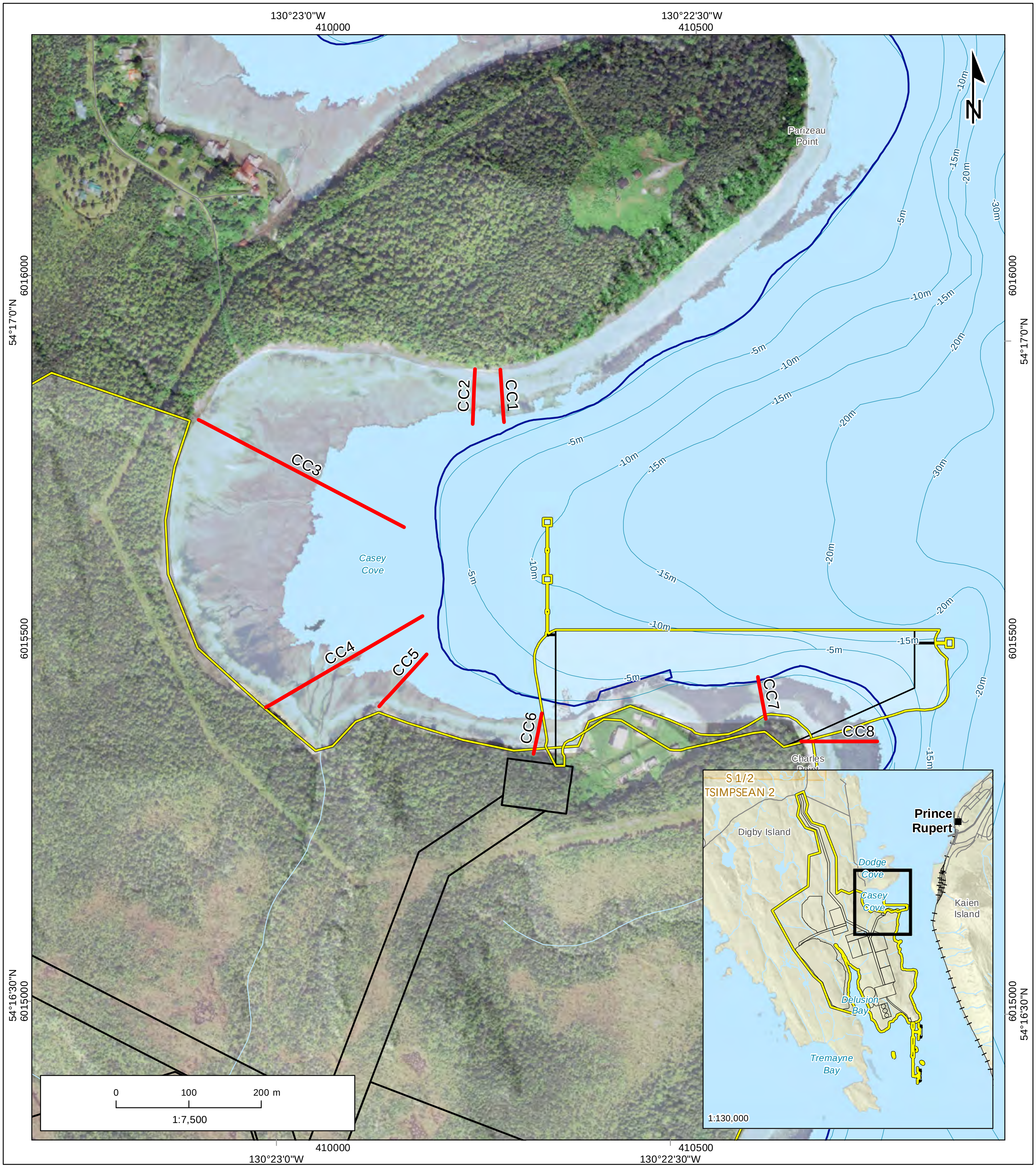
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

MARINE FISH AND FISH HABITAT STUDY AREAS

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.Service Layer Credits: Copyright:© 2014 Esri

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 8



Road
Watercourse
Low Intertidal Extent
Bathymetric Contour
First Nation Reserve
Waterbody
Project Component
Project Development Area
Intertidal Survey Transect

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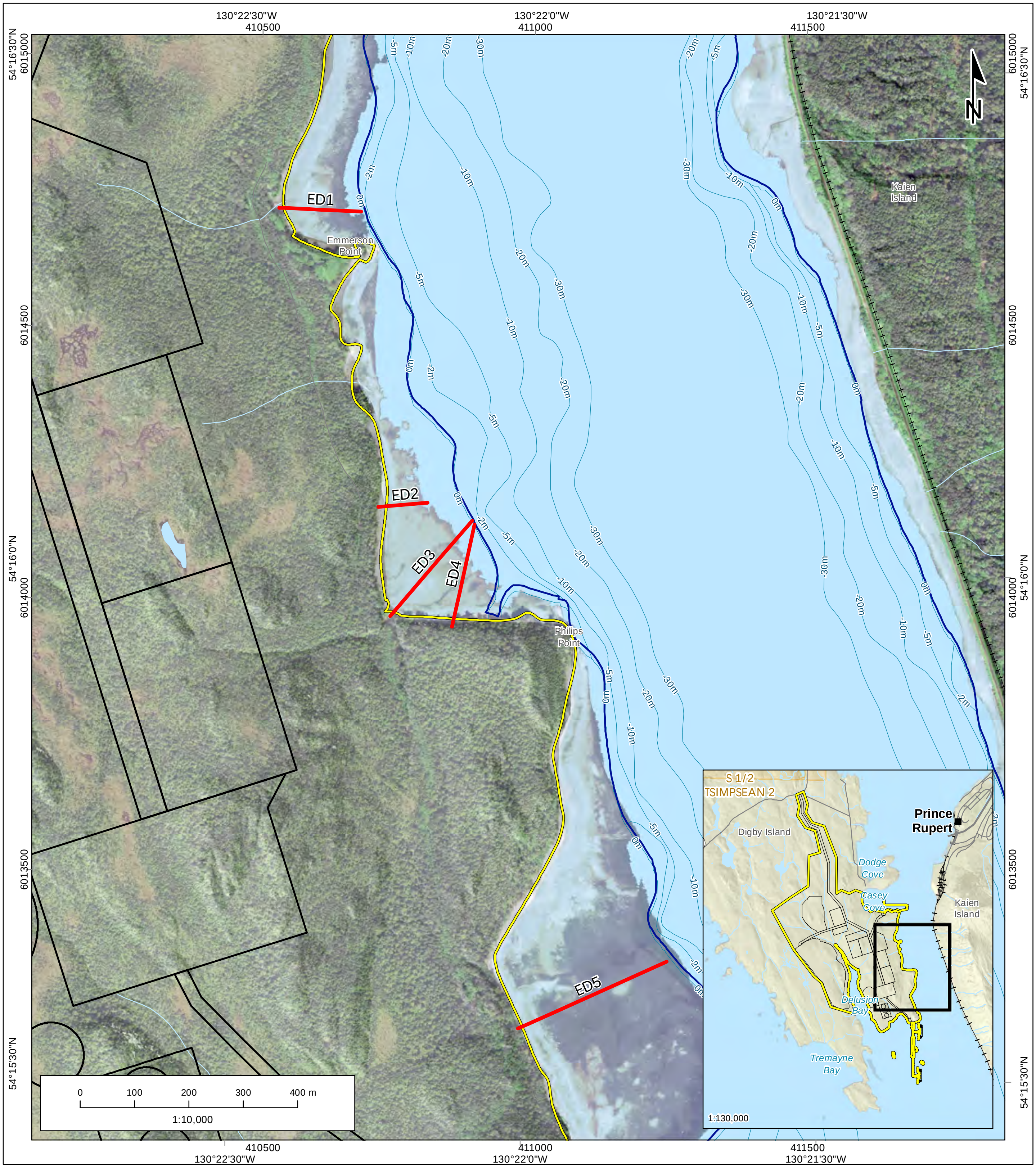
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

INTERTIDAL TRANSECTS - CASEY COVE

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 9



Road	Project Component
Railway	Project Development Area
Watercourse	Intertidal Survey Transect
Low Intertidal Extent	
Bathymetric Contour	
First Nation Reserve	
Waterbody	

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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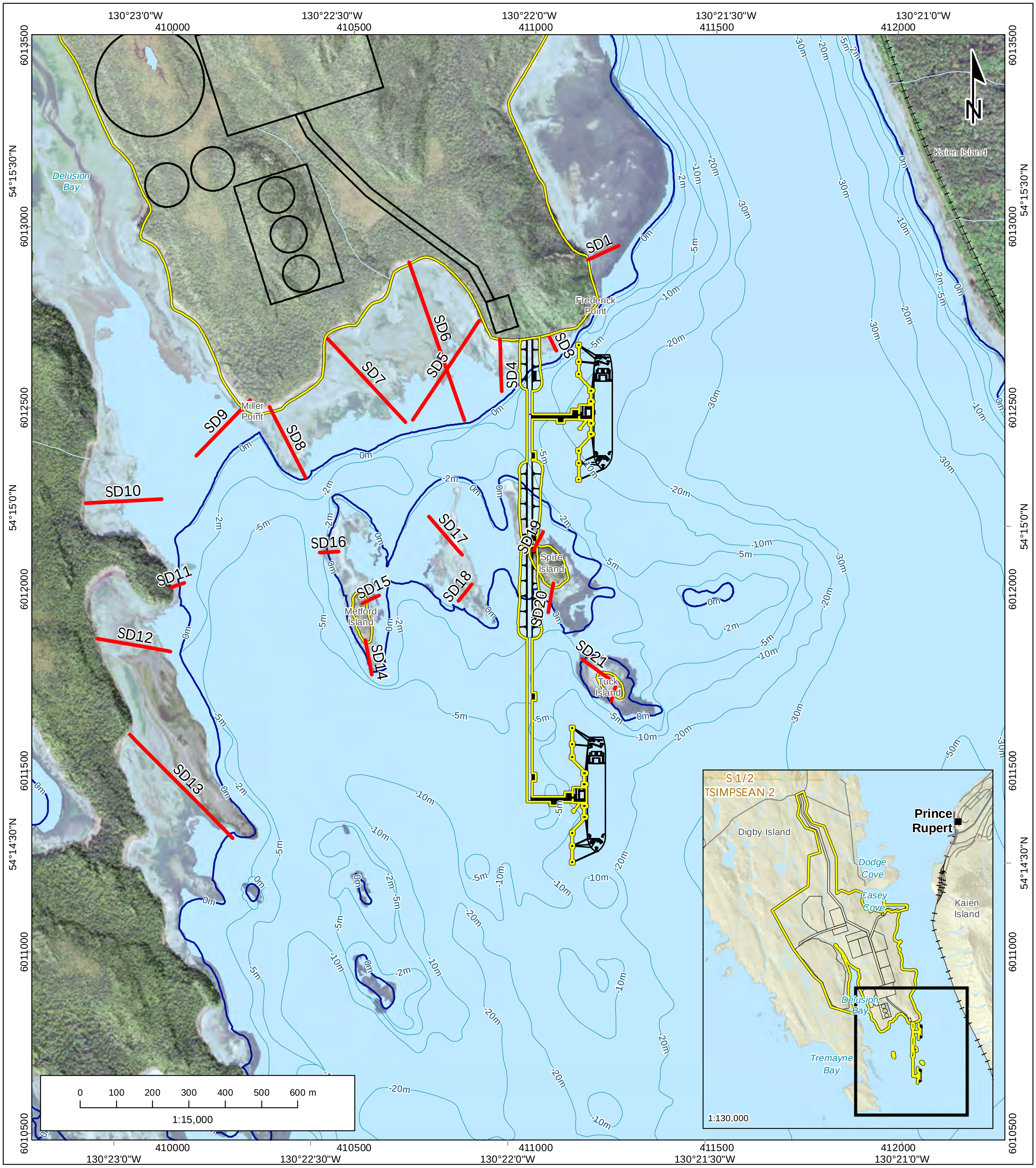
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

INTERTIDAL TRANSECTS - EAST DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 10



Railway
Watercourse
Low Intertidal Extent
Bathymetric Contour
First Nation Reserve
Waterbody
Project Component
Project Development Area
Intertidal Survey Transect

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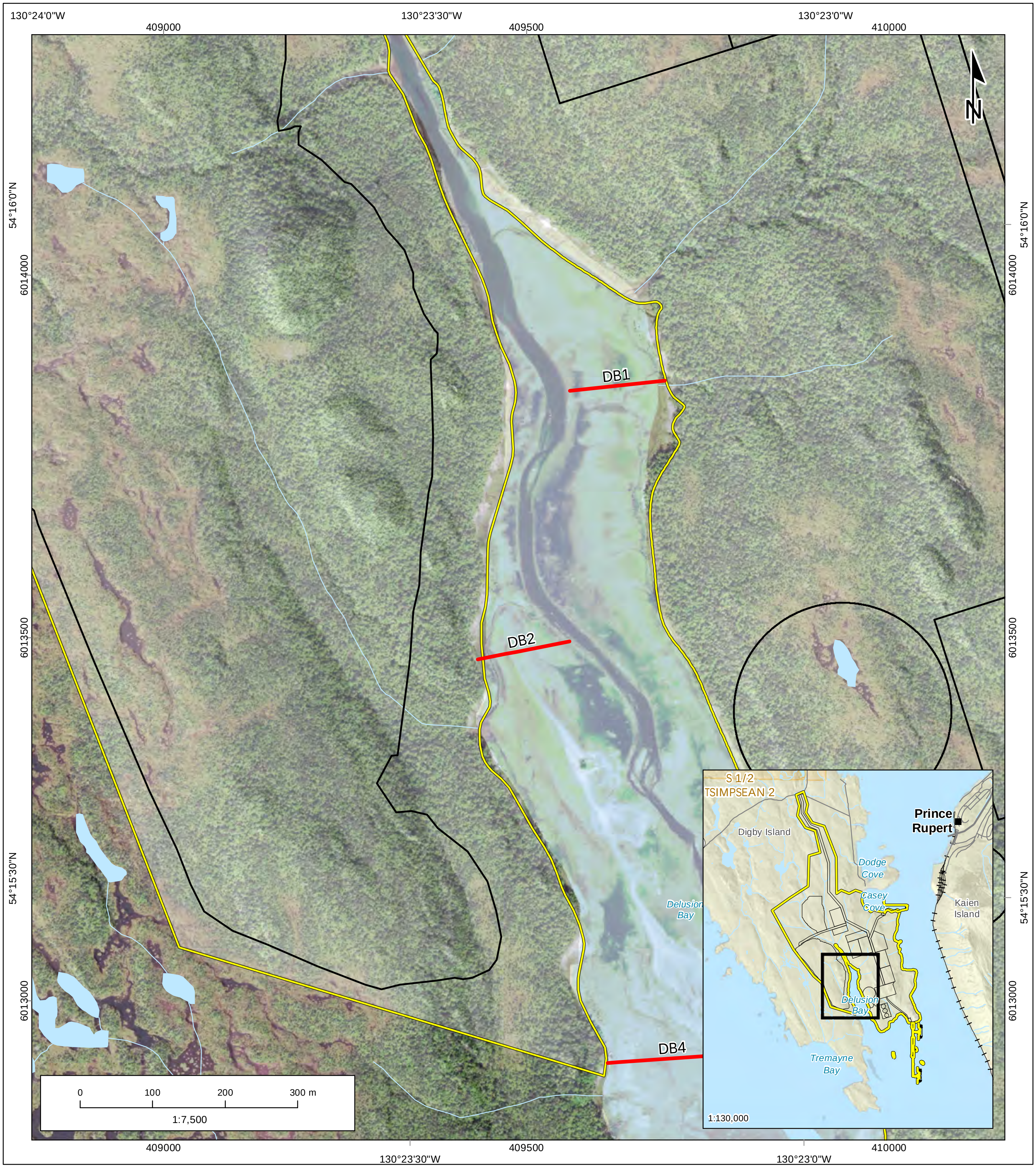
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

INTERTIDAL TRANSECTS - SOUTH DIGBY ISLAND

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 11



Watercourse
First Nation Reserve
Waterbody
Project Component
Project Development Area
Intertidal Survey Transect

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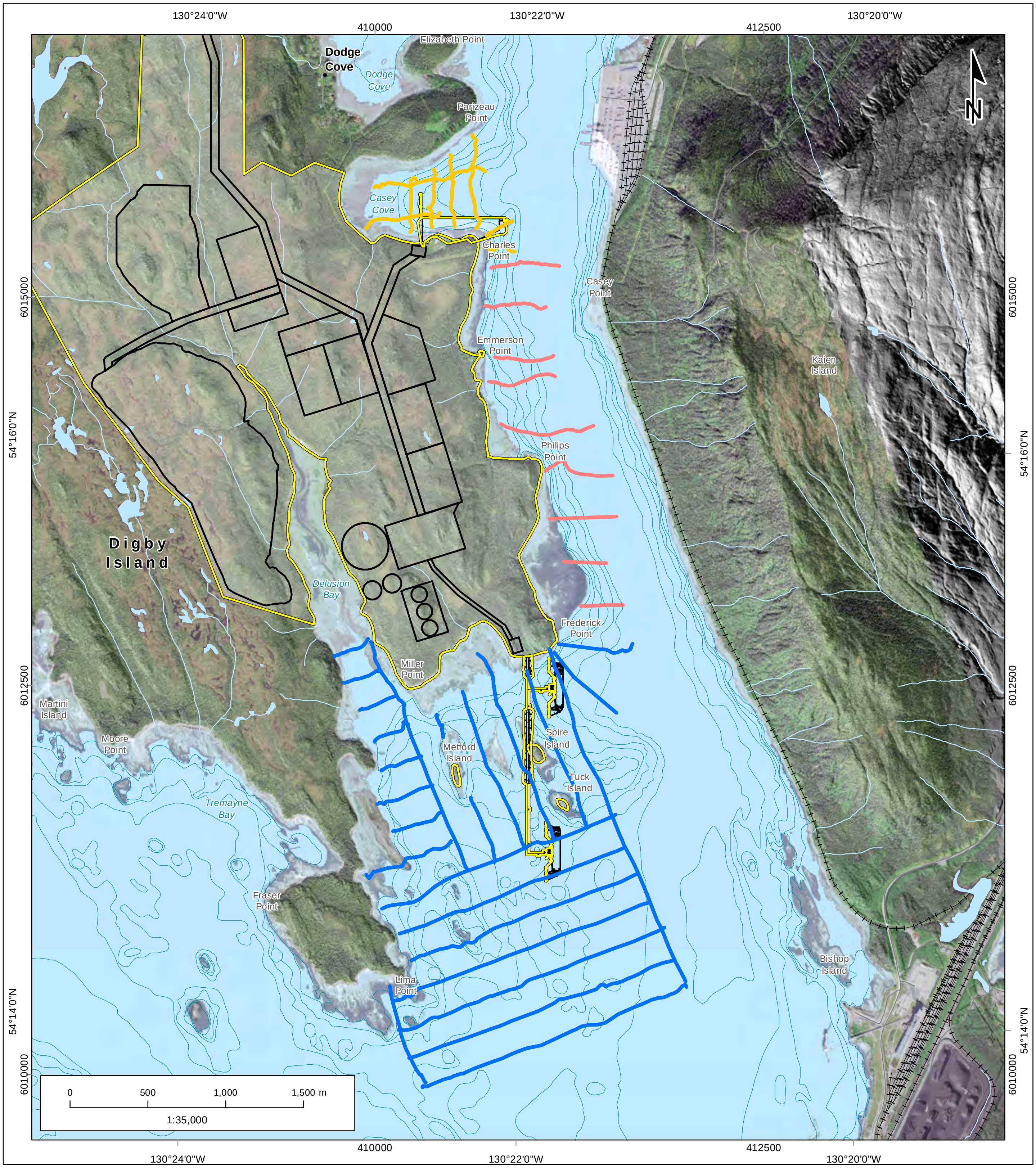
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

INTERTIDAL TRANSECTS - DELUSION BAY

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 12



- • Community, Locality, or
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development
- Casey Cove Transects
- East Digby Island Transects
- South Digby Island Transects

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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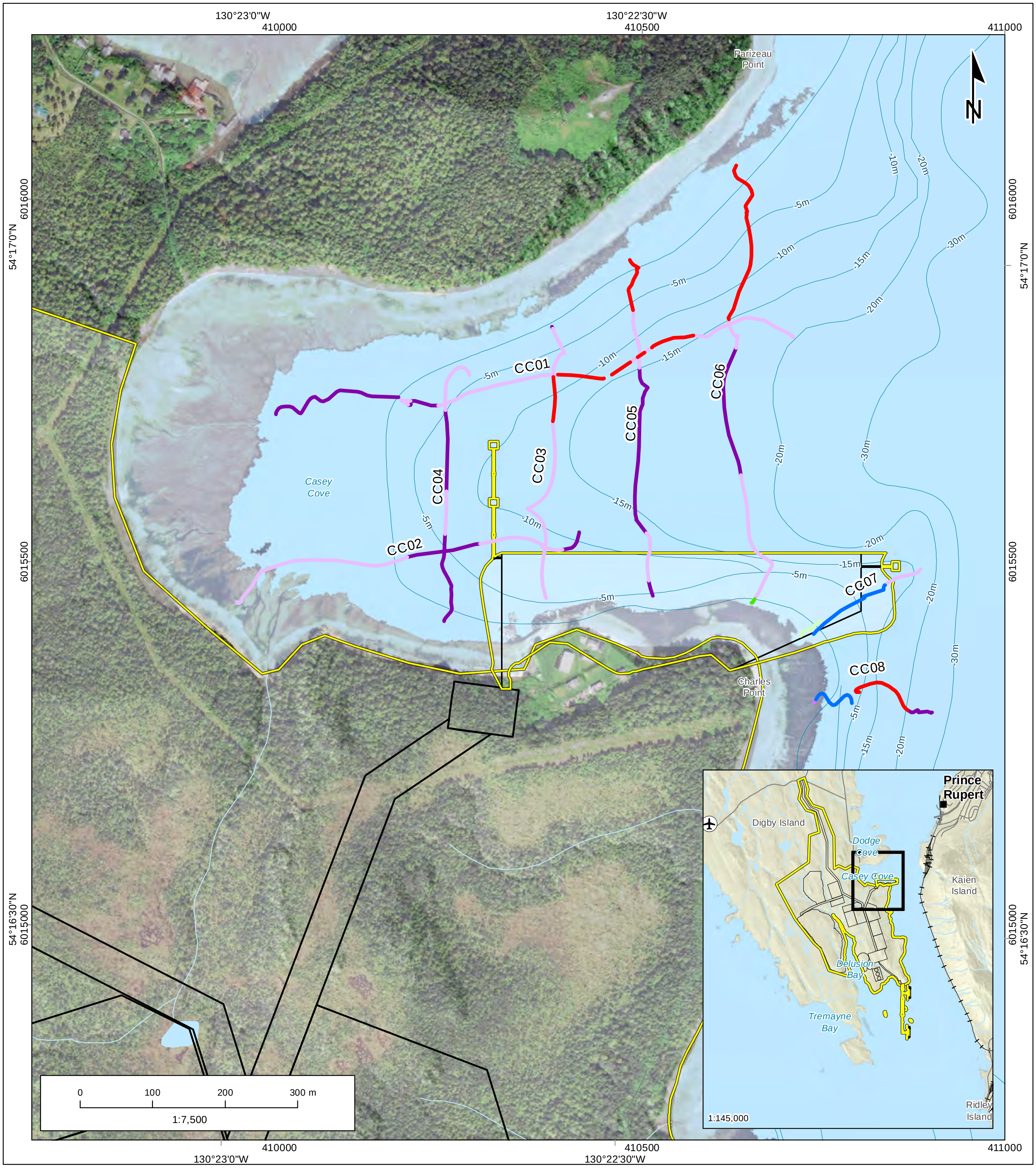
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

SUBTIDAL ROV SURVEY TRANSECTS

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 27, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 13



Legend		
City, Municipality, or Town	Project Development Area	Soft Bottom with Shell
Airport	**Substrate Type**	Mixed Substrate
Road	Bedrock/Boulder with Cobble/Gravel	
Railway	Cobble/Gravel with Bedrock/Boulder	
Watercourse	Cobble/Gravel with Soft Bottom	
Bathymetric Contour	Soft Bottom	
Waterbody	Soft Bottom with Cobble/Gravel	
Project Component		

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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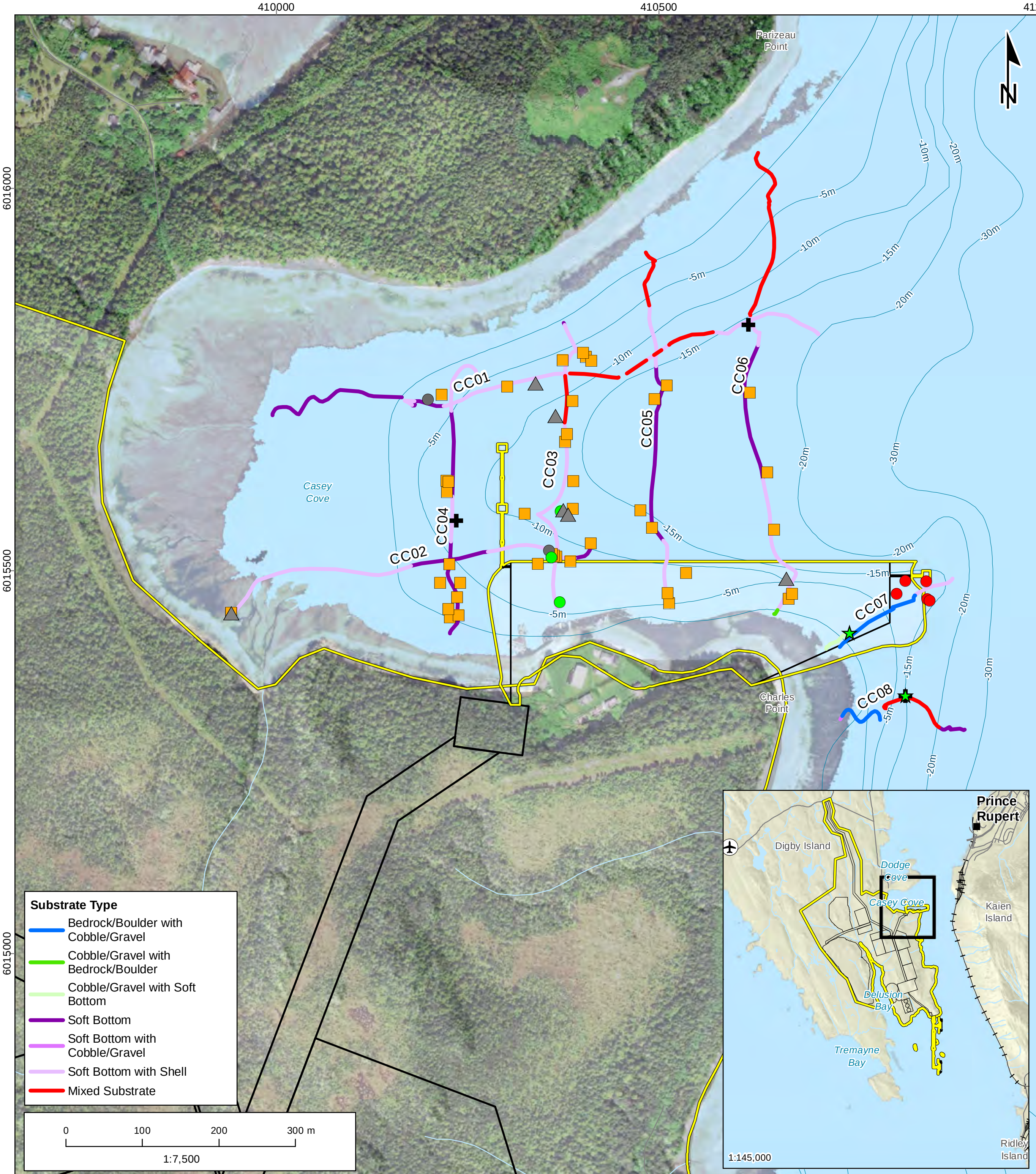
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

SUBTIDAL SUBSTRATE TYPE - CASEY COVE

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 14



- City, Municipality, or Town
- Airport
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development Area
- Copper Rockfish
- English Sole
- Kelp Greenling
- Right Eye Flounder
- Rock Sole
- Starry Flounder
- Whitespotted Greenling

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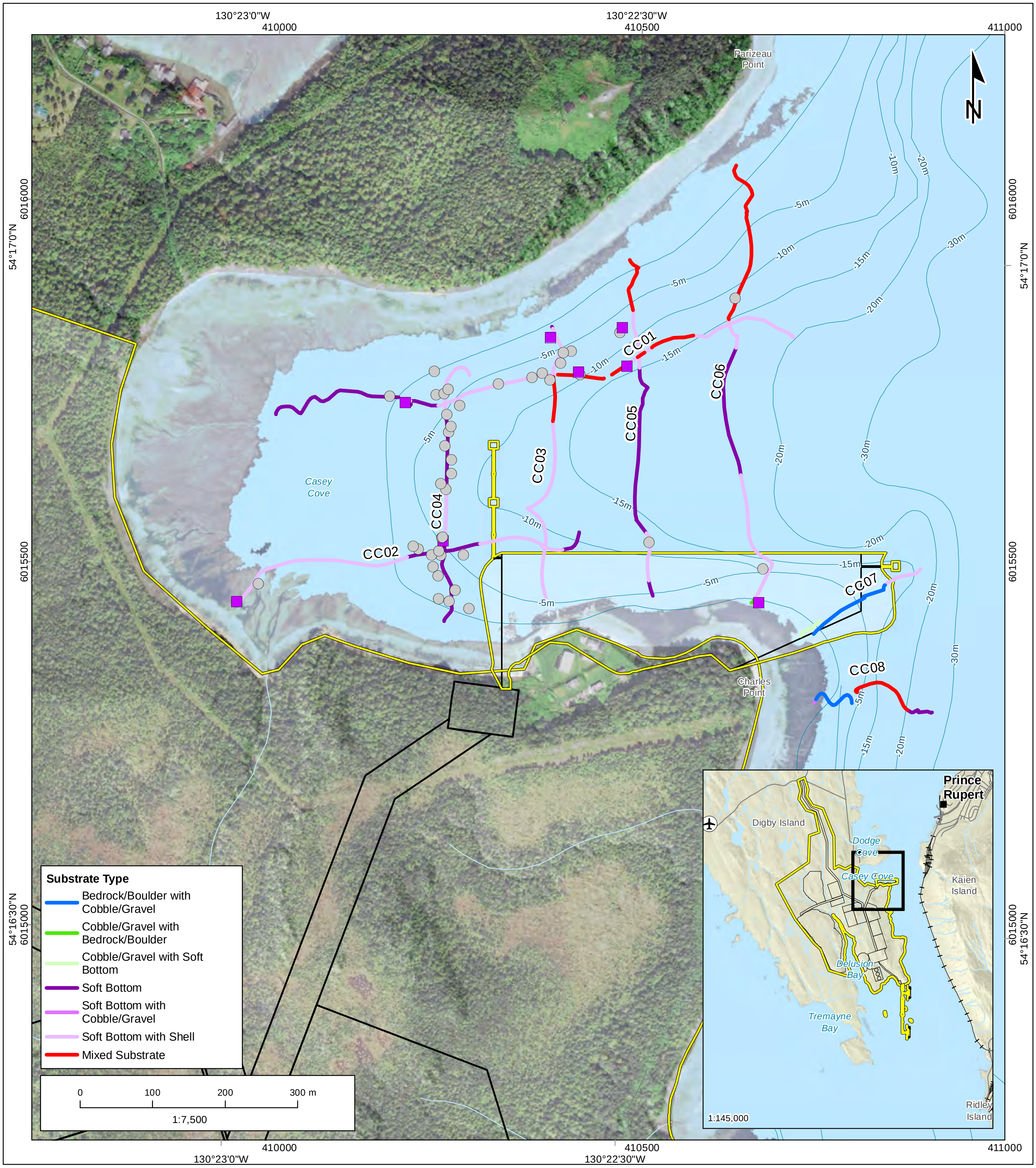
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRA MARINE FISH - CASEY COVE

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 15



City, Municipality, or
Airport
Road
Railway
Watercourse
Bathymetric Contour
Waterbody
Project Component
Project Development
Dungeness Crab
Red Rock Crab

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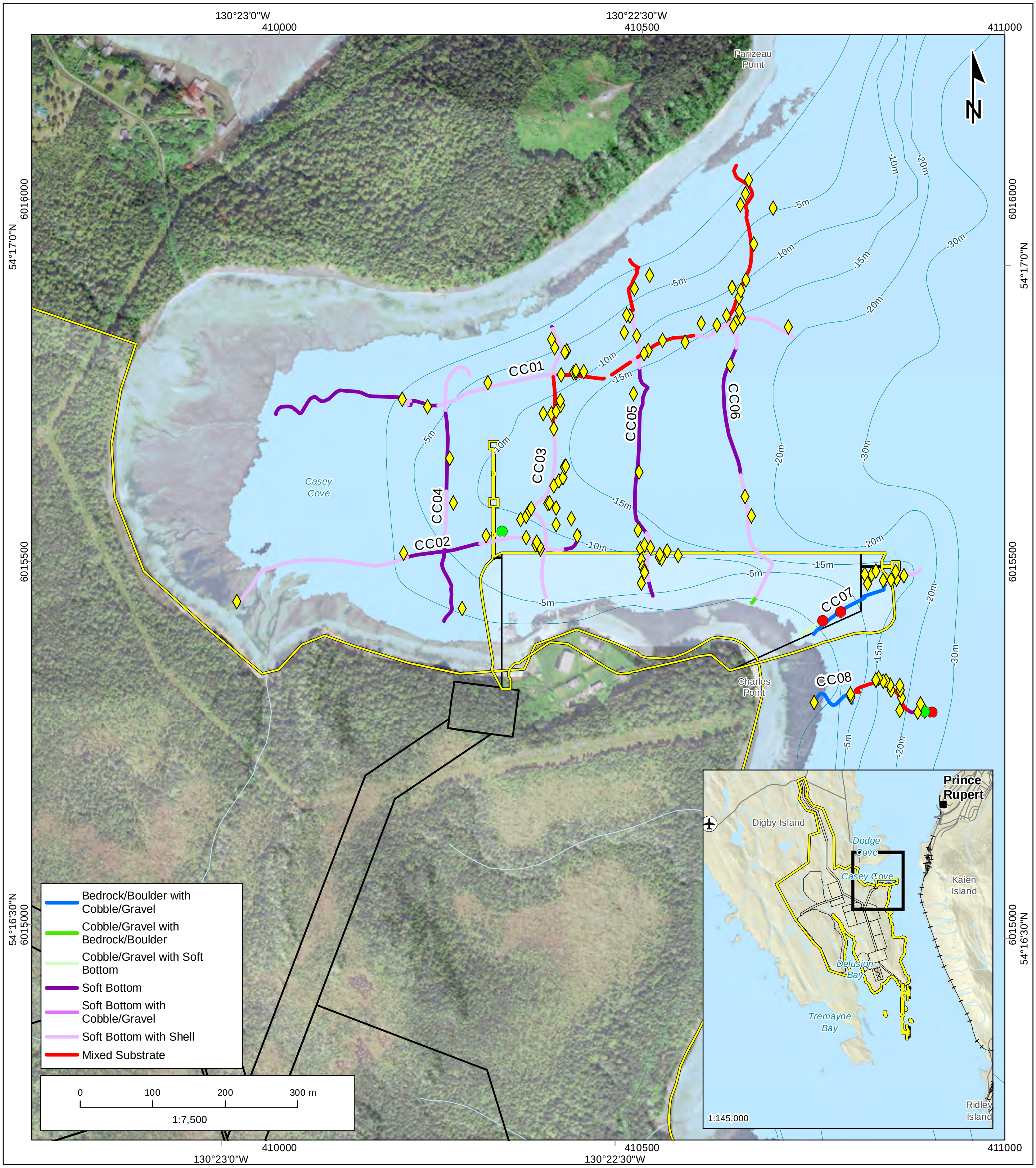
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRAB AND SHRIMP - CASEY COVE

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 16



City, Municipality, or
Airport
Road
Railway
Watercourse
Bathymetric Contour
Waterbody
Project Component
Project Development
Giant California Sea Cucumber
Scallop spp.
Urchin spp.

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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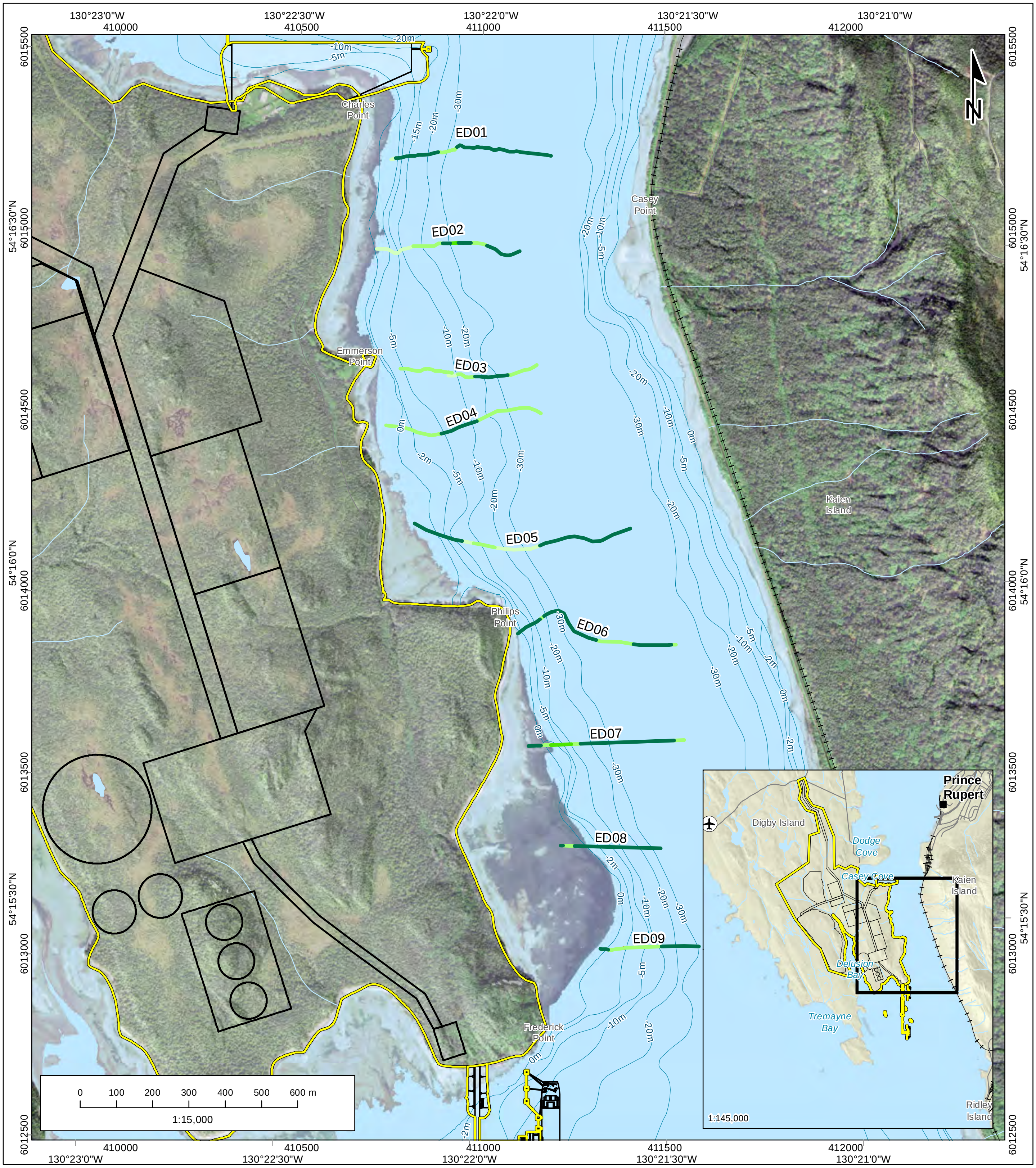
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRA MARINE INVERTEBRATES - CASEY COVE

Projection: UTM Zone 9	Fig. ID:123220054	Drawn By: RC	FIGURE NO: 17
Datum: NAD 83	Date: Oct 26, 2016	Checked By: SW	



- City, Municipality, or Town
- Airport
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development Area

Substrate Type

- Cobble/Gravel
- Cobble/Gravel with Bedrock/Boulder
- Cobble/Gravel with Shell
- Cobble/Gravel with Soft Bottom
- Mixed Substrate

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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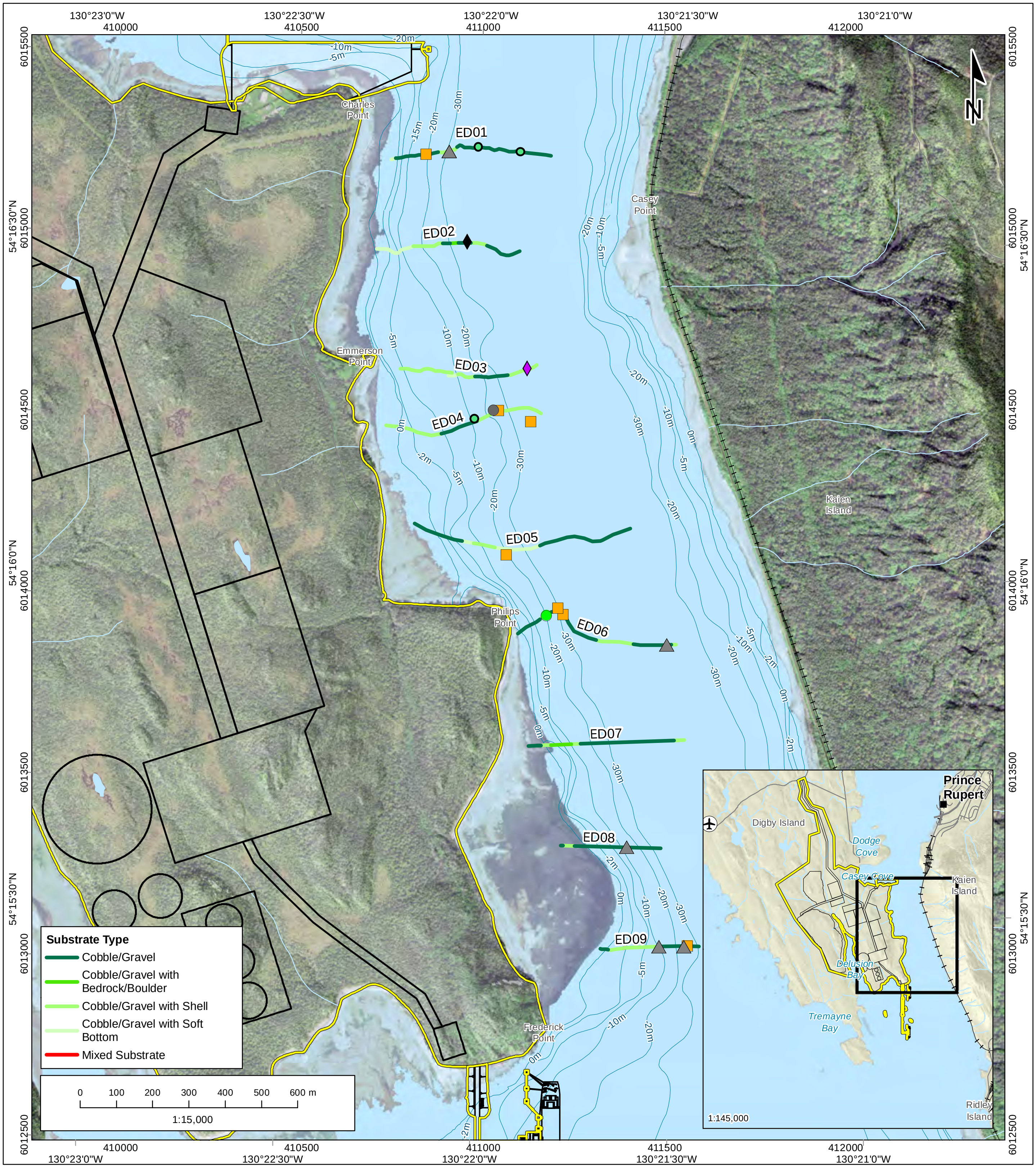
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

SUBTIDAL SUBSTRATE TYPE - EAST DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 18



- City, Municipality, or Town
- Airport
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development Area
- Big Skate
- Cod
- English Sole
- Irish Lord
- Kelp Greenling
- Right Eye Flounder
- Rock Sole

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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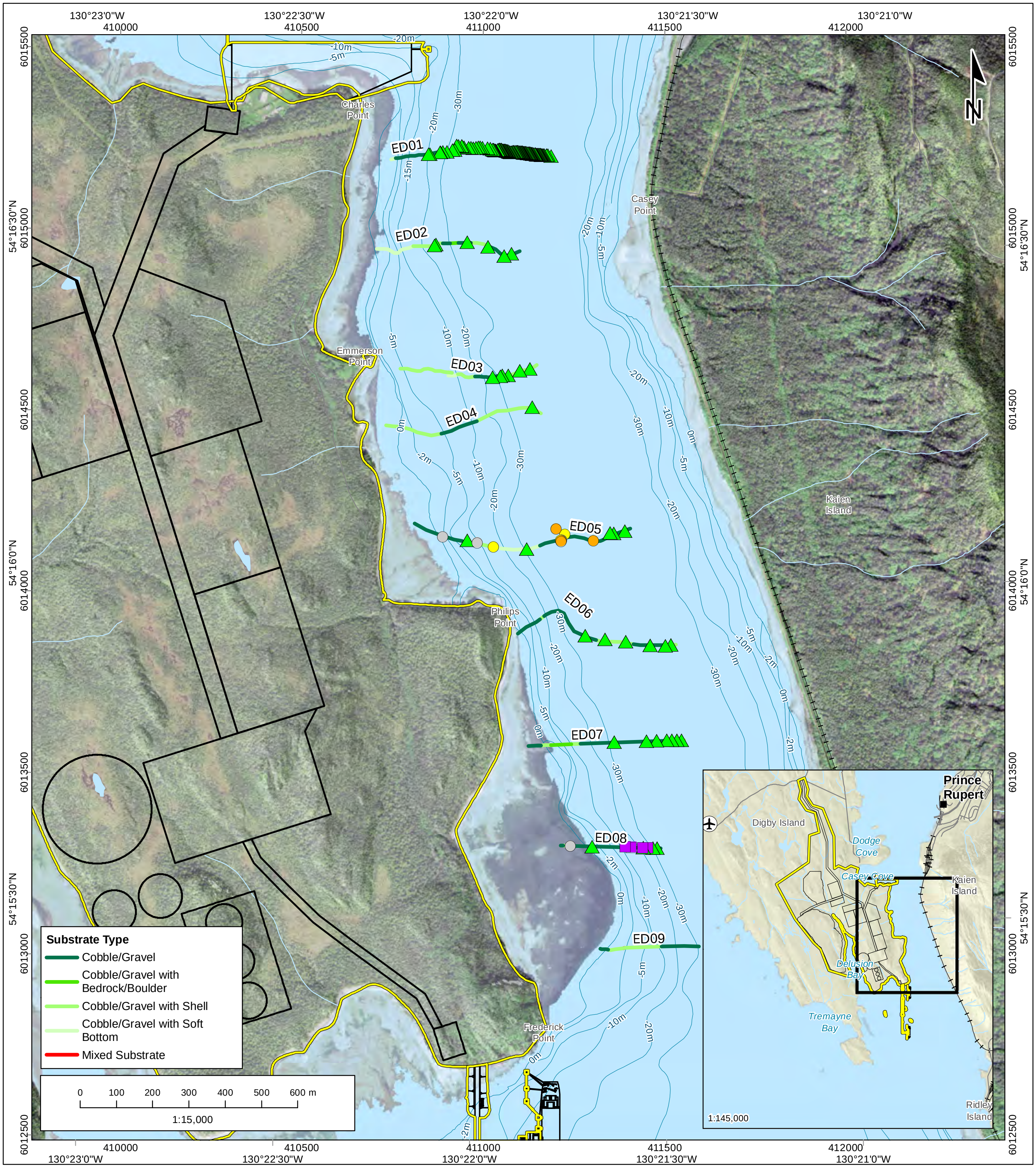
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRA MARINE FISH - EAST DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 19



- City, Municipality, or
- Airport
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development
- Dungeness Crab
- Pandalus Shrimp
- Red Rock Crab
- Spot Prawn
- Tanner Crab

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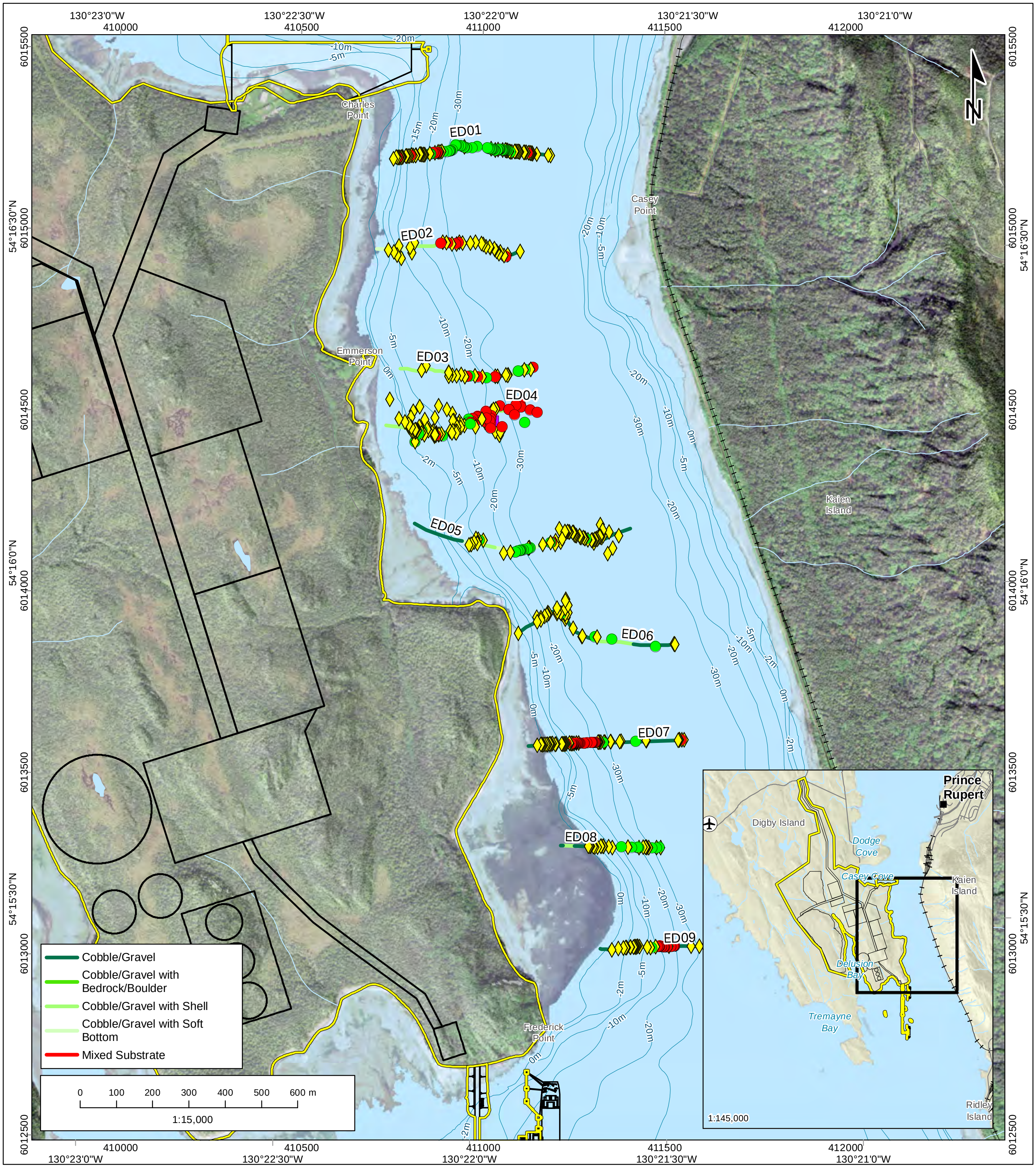
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRAB AND SHRIMP - EAST DIGBY ISLAND

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 20



- City, Municipality, or
- Airport
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development
- Giant California Sea Cucumber
- Giant Pacific Octopus
- Scallop spp.
- Urchin spp.

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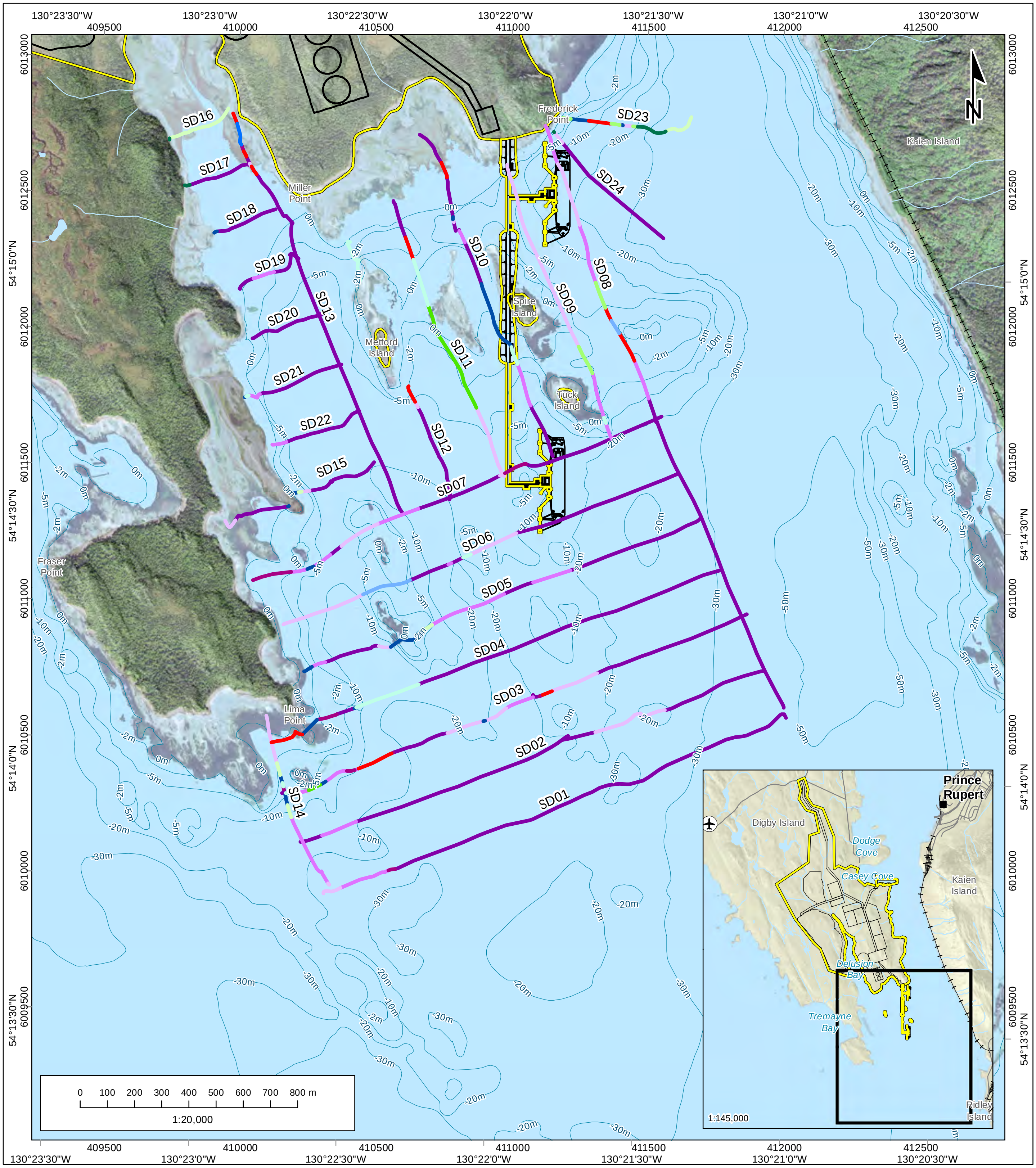
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRA MARINE INVERTEBRATES - EAST DIGBY ISLAND

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 21



■ City, Municipality, or Town
Airport
Road
Railway
Watercourse
Bathymetric Contour
Waterbody
Project Component
Project Development Area

Substrate Type
- Bedrock/Boulder
- Bedrock/Boulder with Cobble/Gravel
- Bedrock/Boulder with Shell
- Bedrock/Boulder with Soft Bottom
- Cobble/Gravel
- Cobble/Gravel with Bedrock/Boulder
- Cobble/Gravel with Shell
- Cobble/Gravel with Soft Bottom
- Soft Bottom
- Soft Bottom with Bedrock/Boulder
- Soft Bottom with Cobble/Gravel
- Soft Bottom with Shell
- Mixed Substrate

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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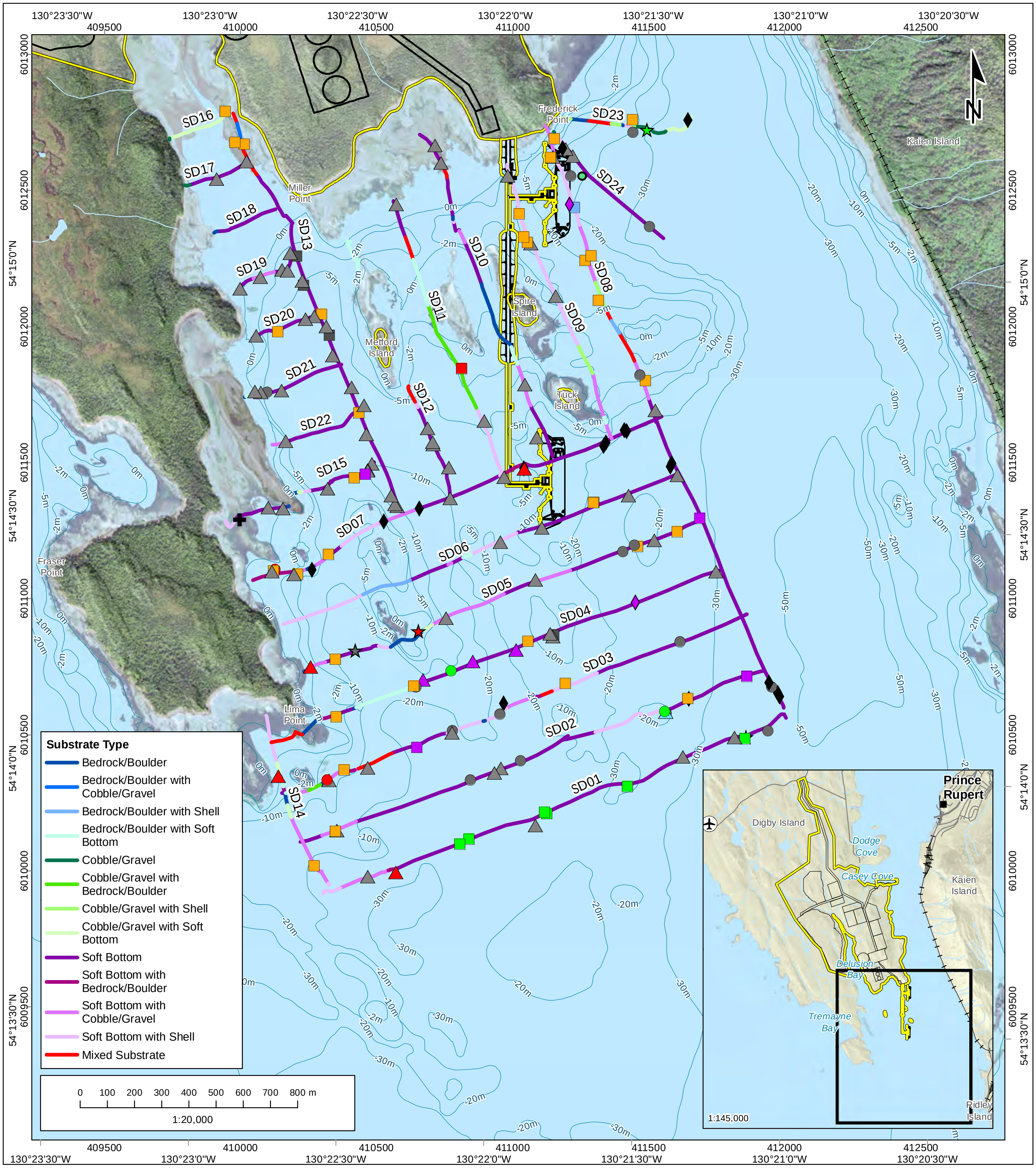
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

SUBTIDAL SUBSTRATE TYPE - SOUTH DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 22



City, Municipality, or Town	Project Development Area	Dover Sole	Sand Sole
Airport	Big Skate	English Sole	Skate
Road	Black Rockfish	Irish Lord	Slender Sole
Railway	Brown Irish Lord	Kelp Greenling	Starry Flounder
Watercourse	Cabezon	Pacific Cod	Whitespotted Greenling
Bathymetric Contour	Cod	Quillback Rockfish	Yellowfin Sole
Waterbody	Copper Rockfish	Right Eye Flounder	Yellowtail Rockfish
Project Component		Rock Sole	

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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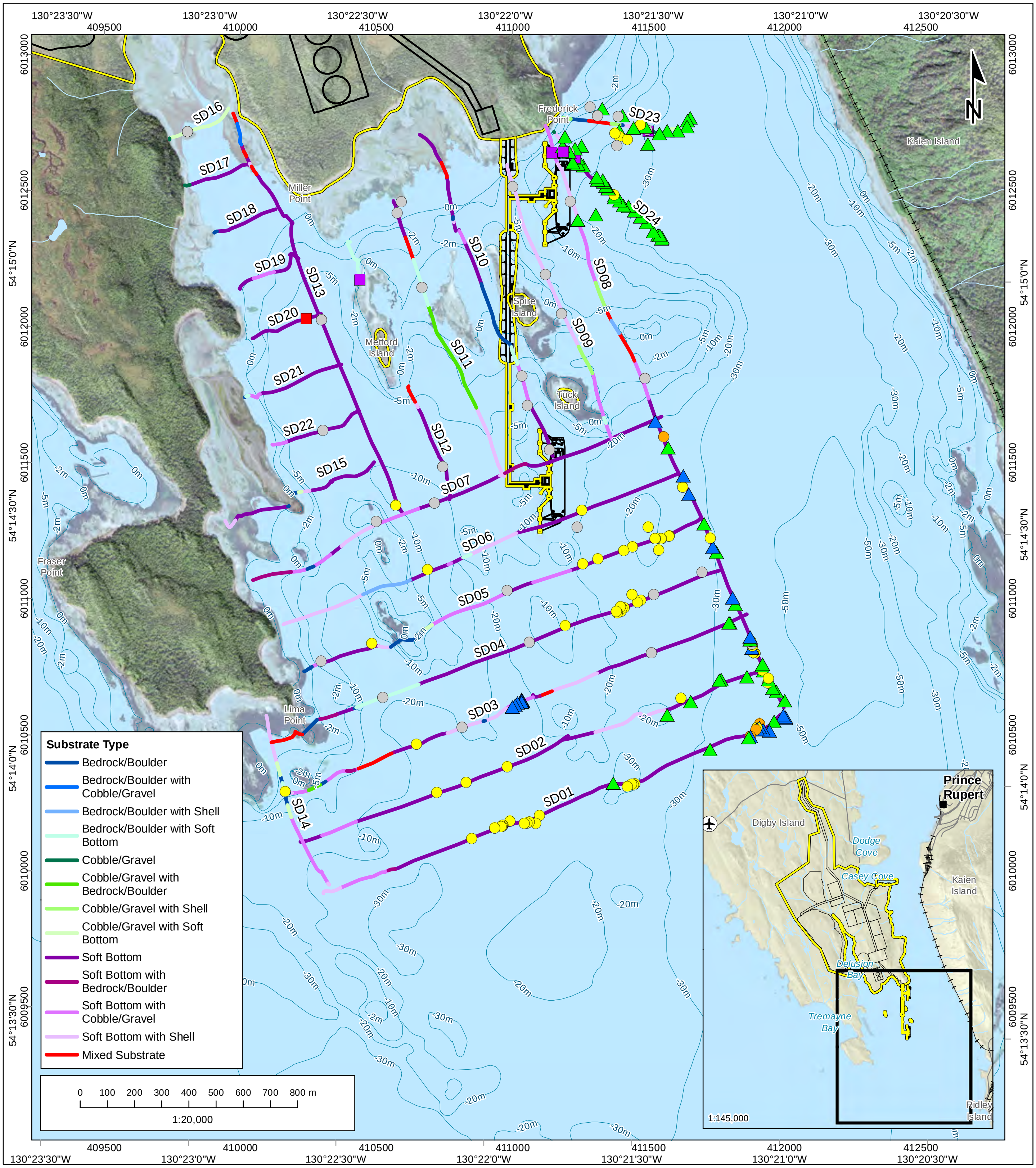
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRA MARINE FISH - SOUTH DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 23



City, Municipality, or
Airport
Road
Railway
Watercourse
Bathymetric Contour
Waterbody
Project Component
Project Development
Brown Box Crab
Dungeness Crab
Pandalus Shrimp
Red Rock Crab
Shrimp
Spot Prawn
Tanner Crab

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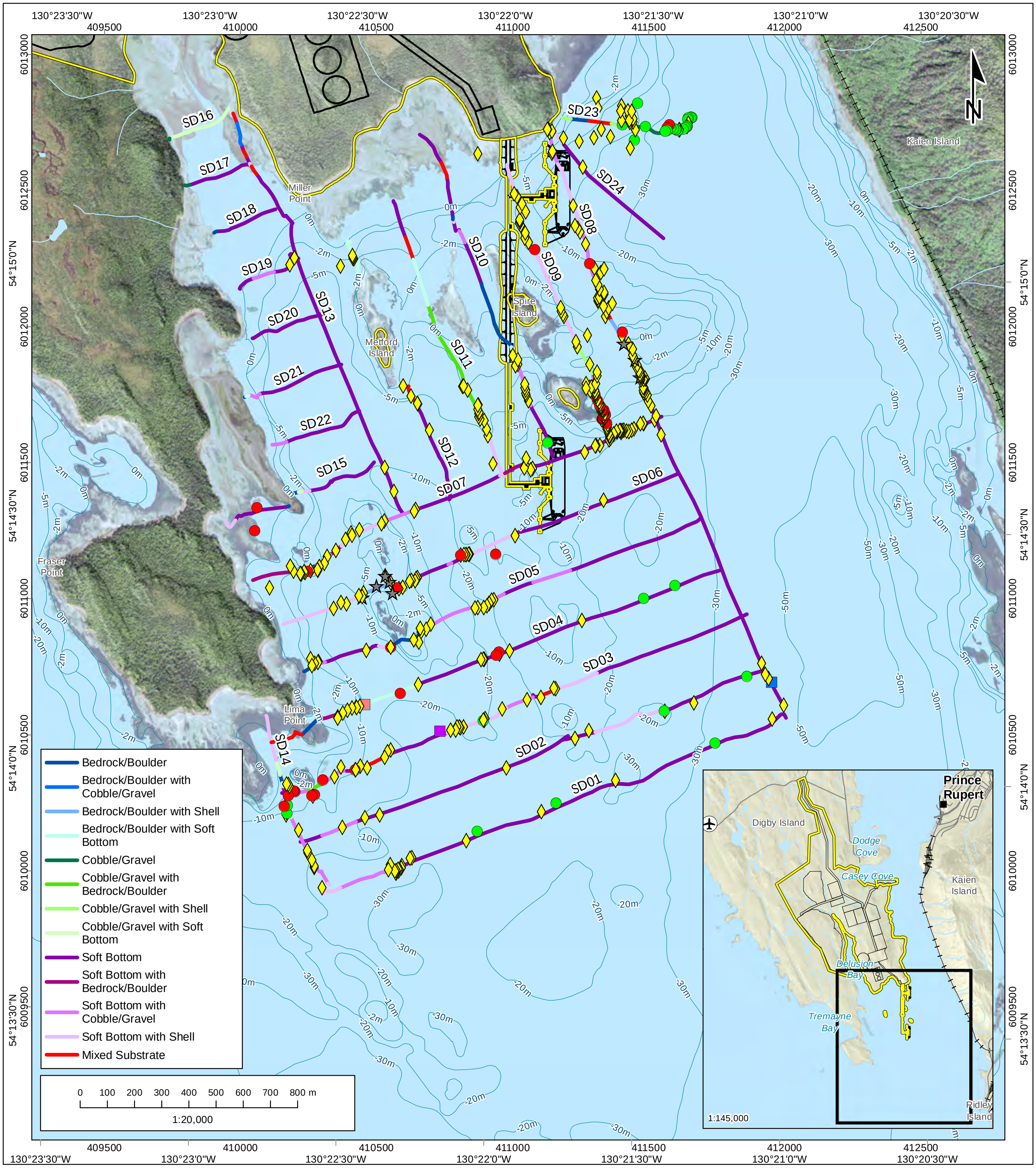
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRAB AND SHRIMP - SOUTH DIGBY ISLAND

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 24



■ City, Municipality, or
Airport
Road
Railway
Watercourse
Bathymetric Contour
Waterbody
Project Component
Project Development
Giant California Sea Cucumber
Giant Pacific Octopus
Gumboot Chiton
Octopus
Pacific Red Octopus
Scallop spp.
Urchin spp.

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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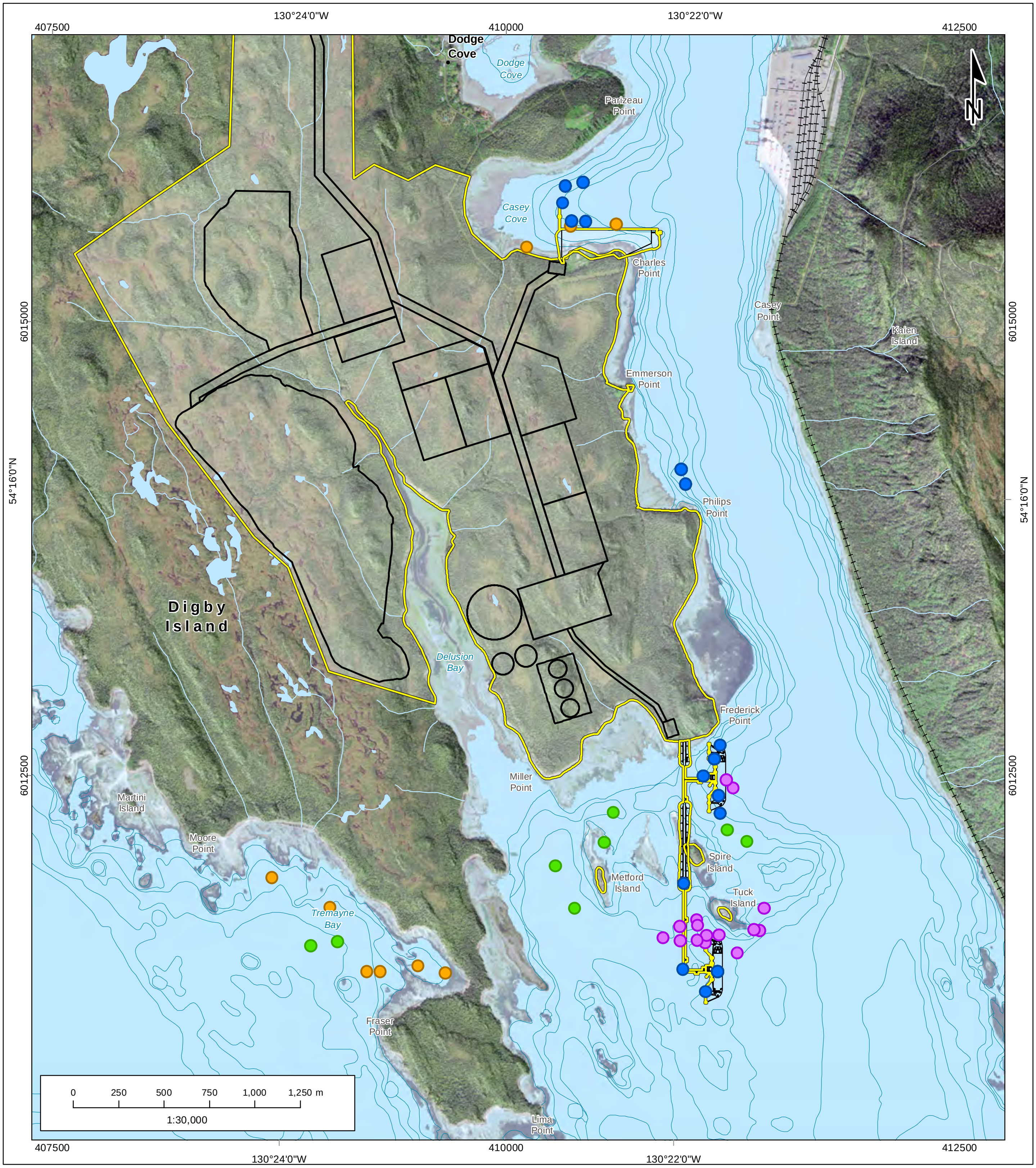
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRA MARINE INVERTEBRATES - SOUTH DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 25



- Community, Locality, or Village
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development Area

Crab Trapping Events

- August 2014 (Triton)
- March 2015 (Triton)
- August 2015 (Stantec)
- May 2016 (Stantec)

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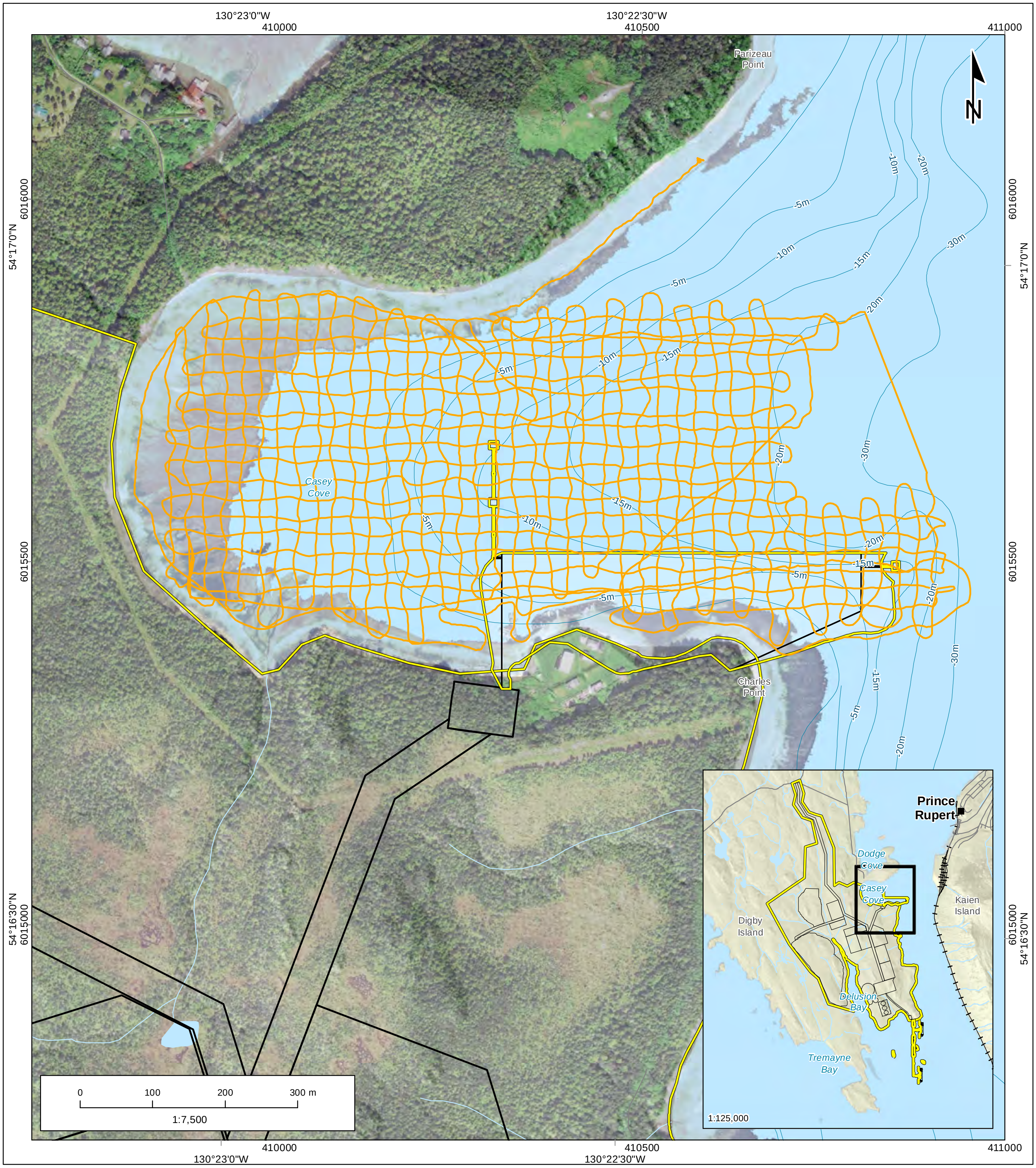
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

CRAB TRAP LOCATIONS

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 27, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 26



- City, Municipality, or Town
- Airport
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development Area
- Hydroacoustic Transect

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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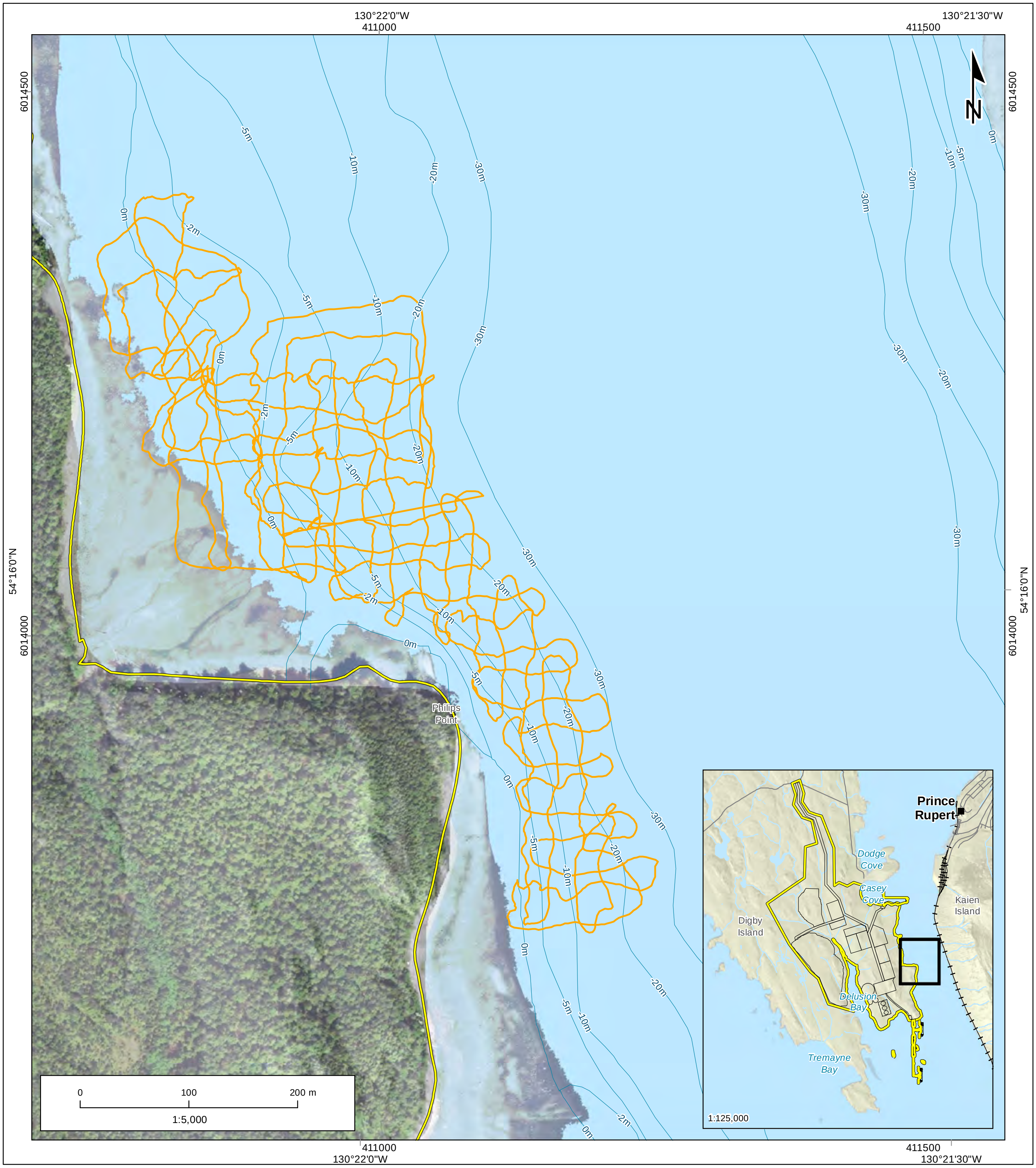
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

HYDROACOUSTIC TRANSECTS - CASEY COVE

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 27



City, Municipality, or Town
Airport
Road
Railway
Watercourse
Bathymetric Contour
Project Development Area
Hydroacoustic Transect

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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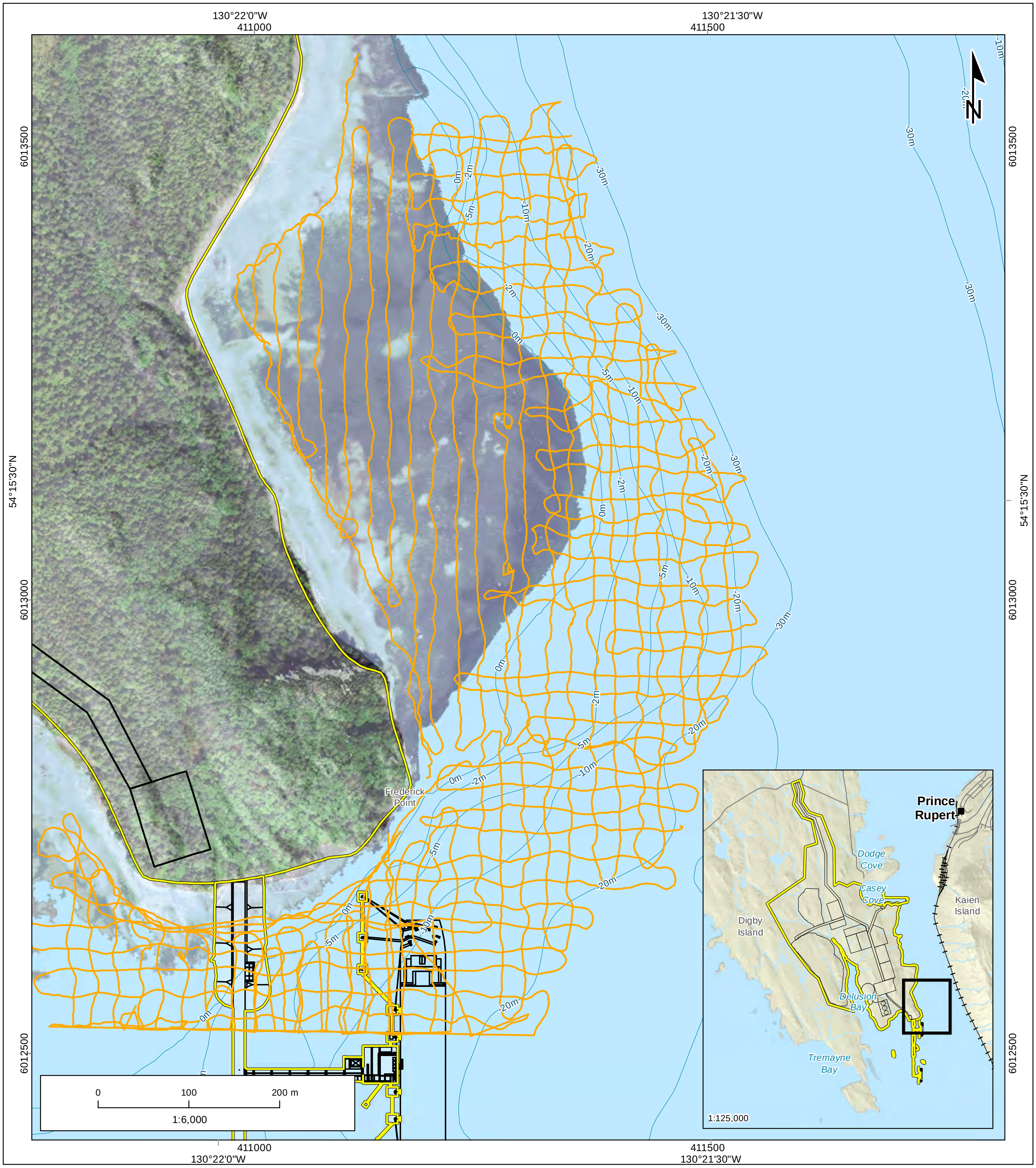
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

HYDROACOUSTIC TRANSECTS - EAST DIGBY ISLAND - PHILIPS POINT

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 28



- City, Municipality, or Town
- Airport
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Project Component
- Project Development Area
- Hydroacoustic Transect

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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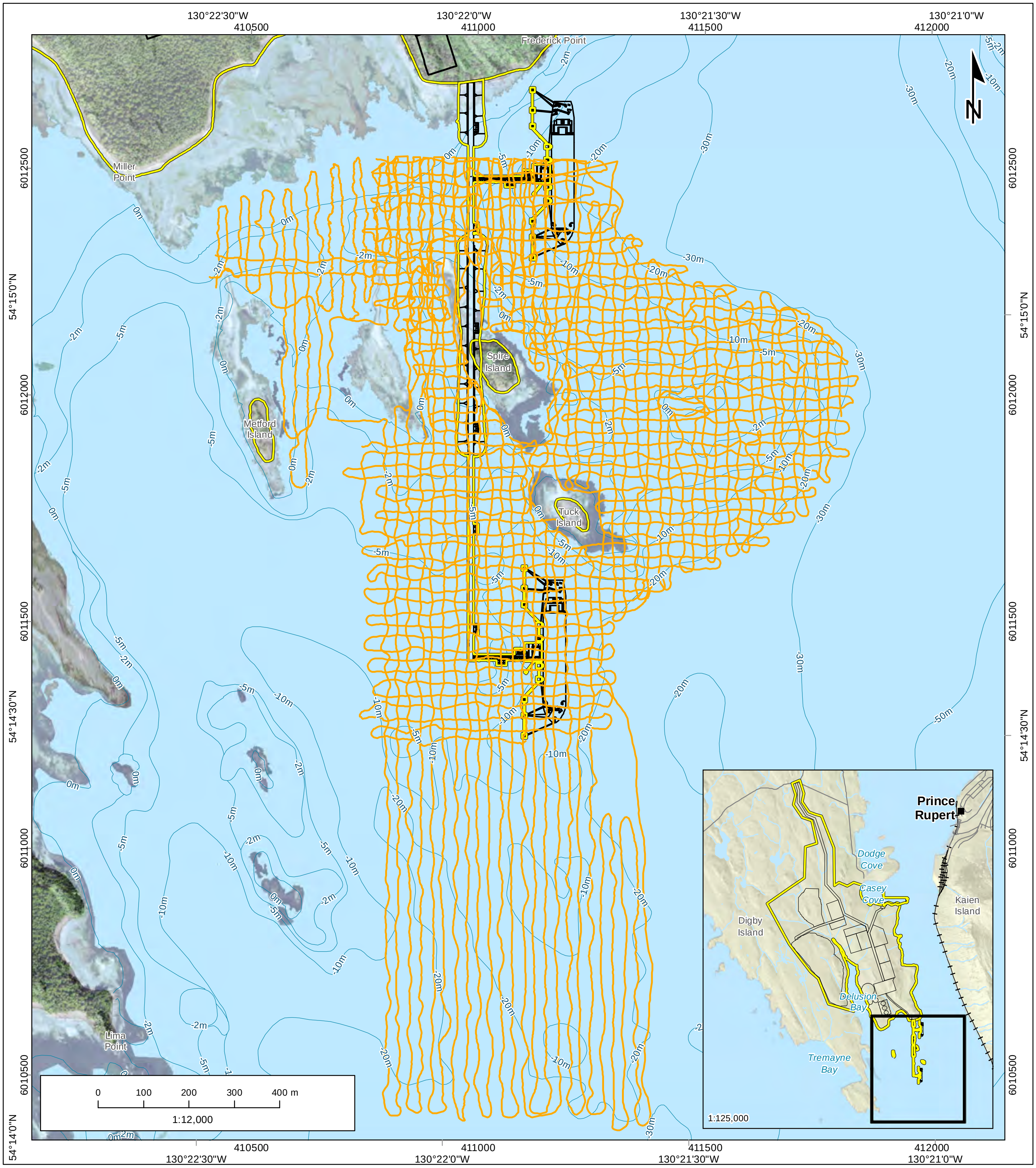
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

HYDROACOUSTIC TRANSECTS - EAST DIGBY AND SOUTH DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 29



■ City, Municipality, or Town
Airport
Road
Railway
Watercourse
Bathymetric Contour
Project Component
Project Development Area
Hydroacoustic Transect

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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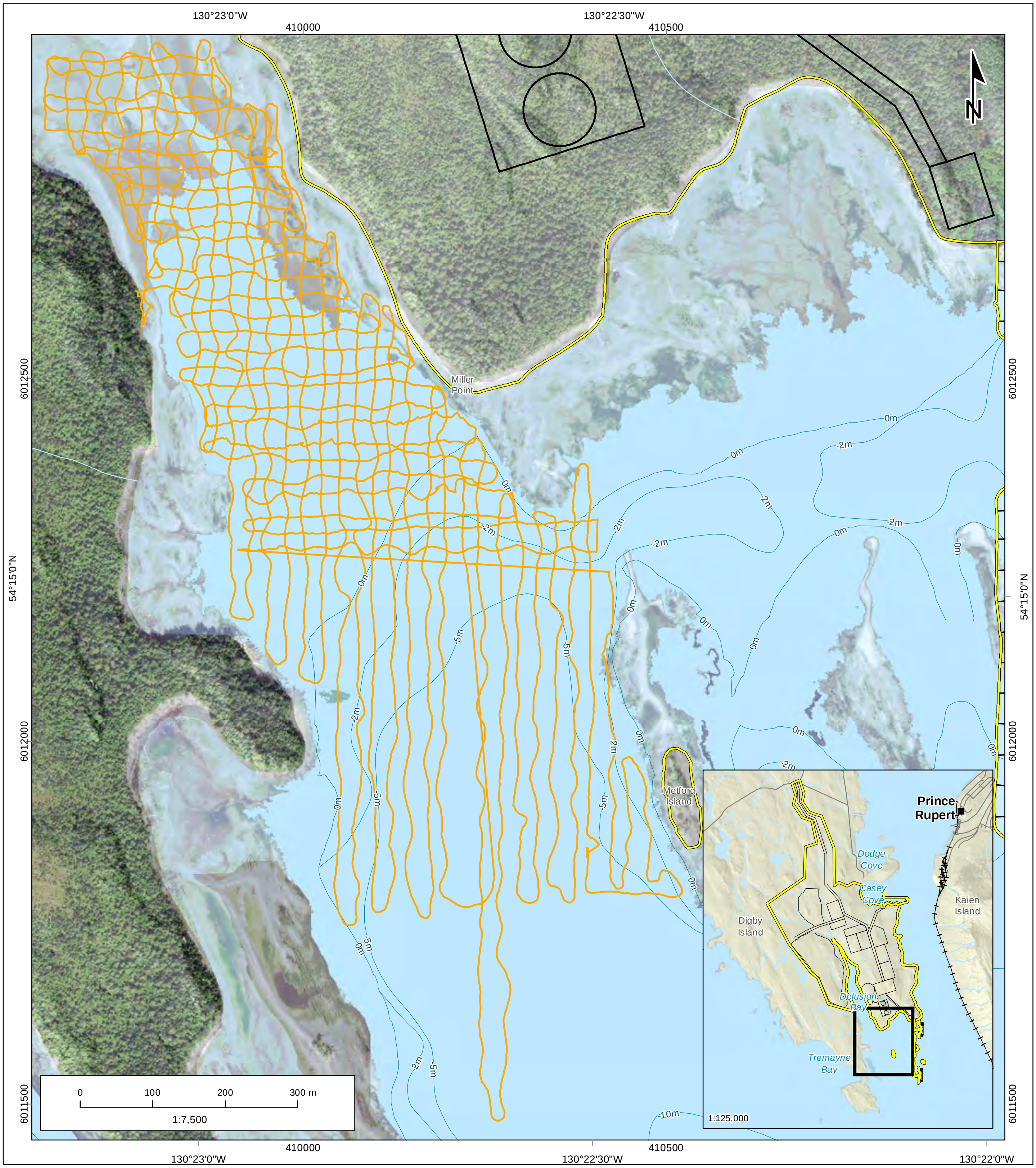
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

HYDROACOUSTIC TRANSECTS - SOUTH DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 30



■ City, Municipality, or Town
Airport
Road
Railway
Watercourse
Bathymetric Contour
Project Component
Project Development Area
Hydroacoustic Transect

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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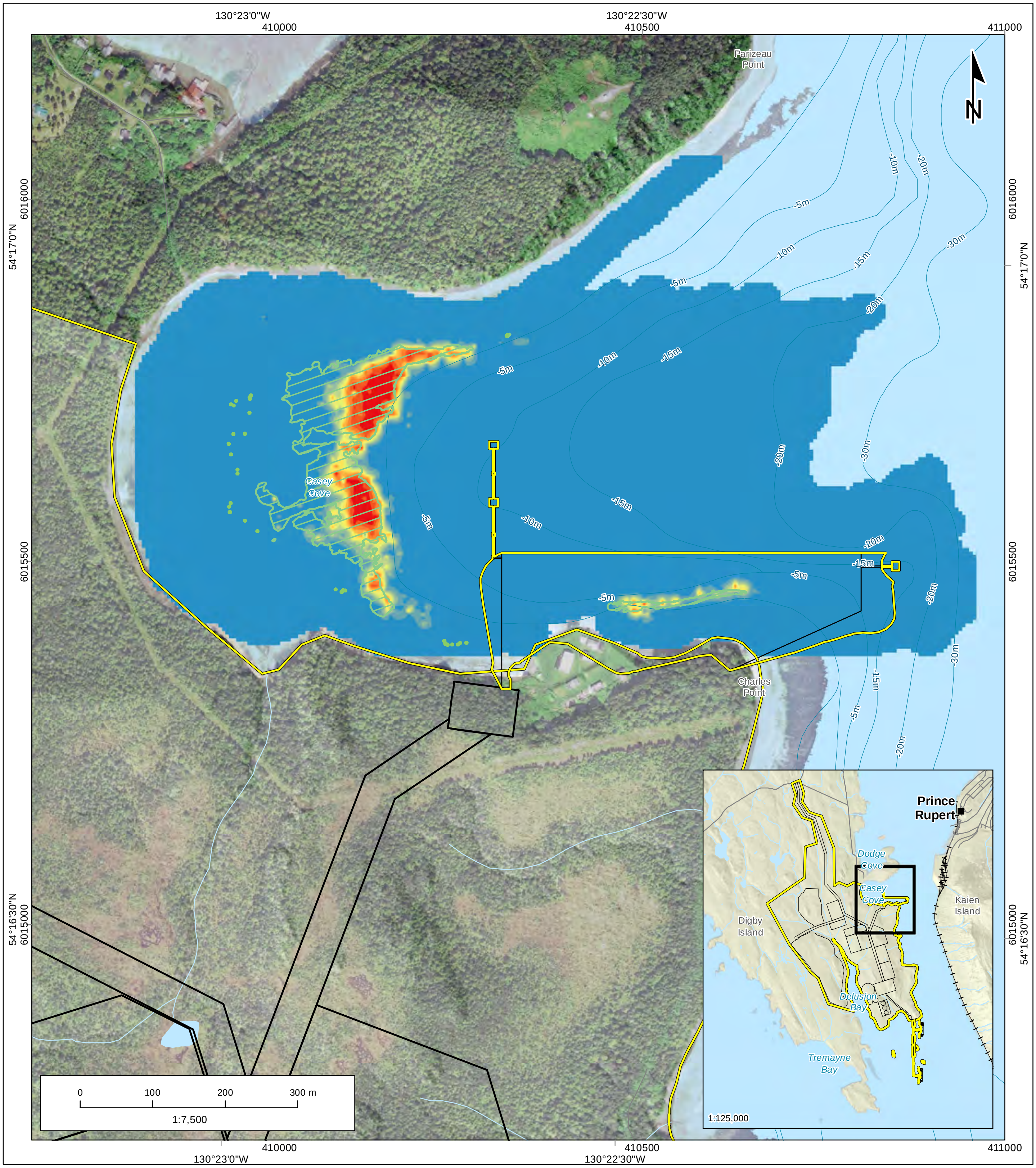
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

HYDROACOUSTIC TRANSECTS - SOUTH DIGBY ISLAND AND DELUSION BAY

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 31



- City, Municipality, or Town
- Airport
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development
- Eelgrass (*Z. marina*) Patch
- Eelgrass (*Z. marina*) Bed

Eelgrass Cover (%)

- 0 - <10
- 10 - < 20
- 20 - < 30
- 30 - < 40
- 40 - < 50
- 50 - < 60
- 60 - < 70
- 70 - < 80
- 80 - < 90
- 90 - 100

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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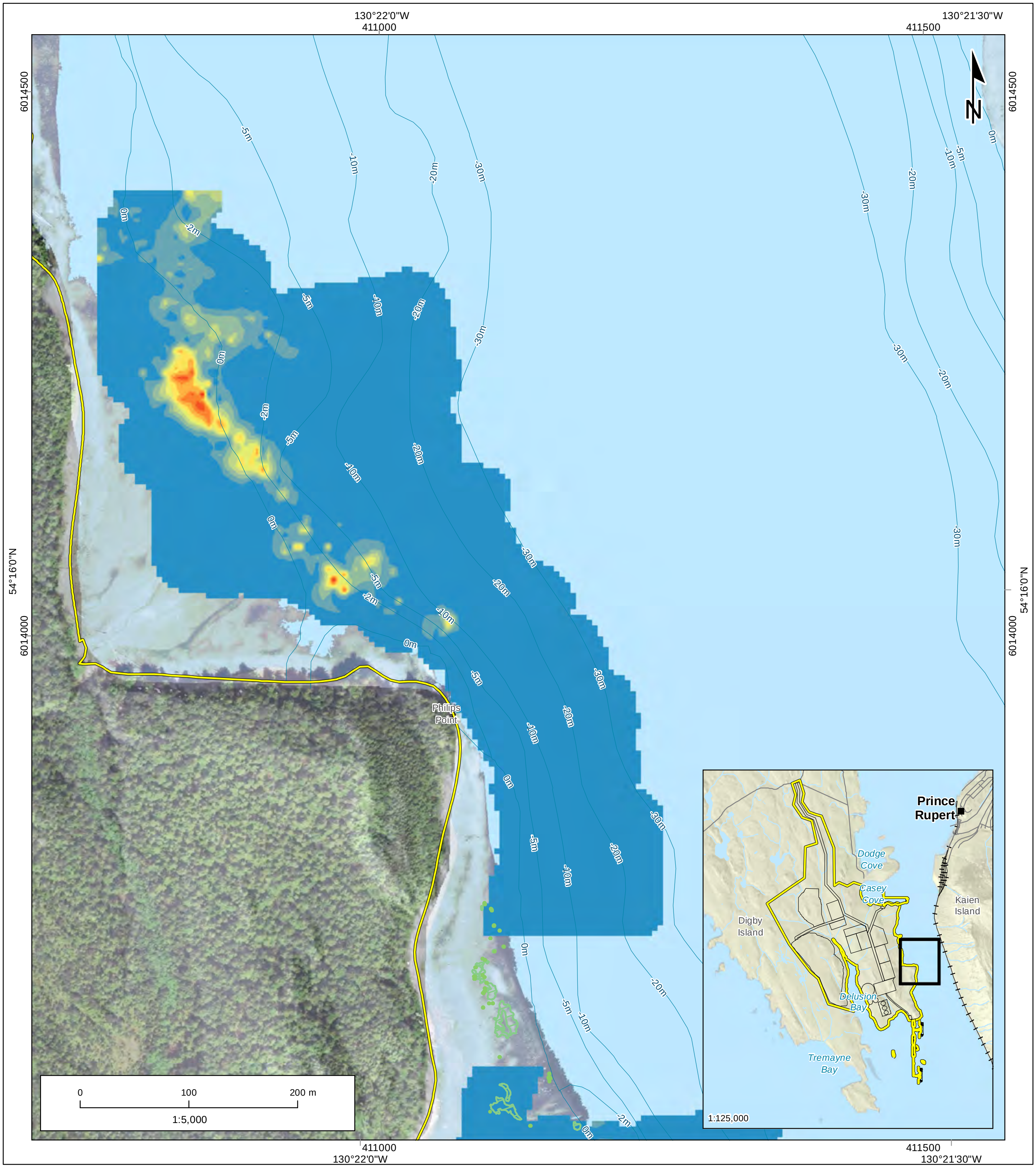
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

EELGRASS - CASEY COVE

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 32



■ City, Municipality, or Town
Airport
Road
Railway
Watercourse
Bathymetric Contour
Waterbody
Project Component
Project Development
Eelgrass (*Z. marina*) Patch
Eelgrass (*Z. marina*) Bed

Eelgrass Cover (%)
0 - <10
10 - < 20
20 - < 30
30 - < 40
40 - < 50
50 - < 60
60 - < 70
70 - < 80
80 - < 90
90 - 100

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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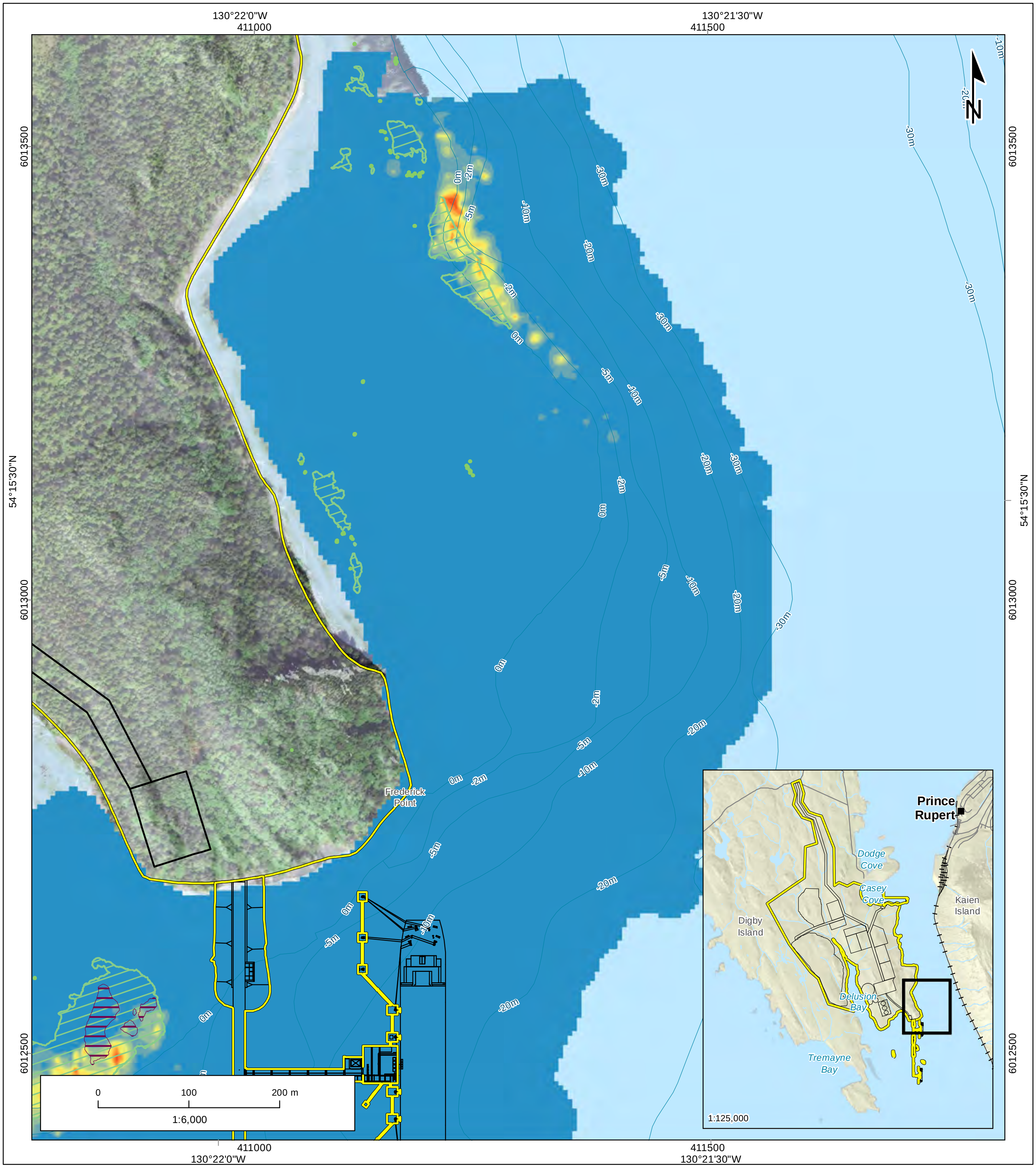
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

EELGRASS - EAST DIGBY ISLAND - PHILIPS POINT

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 33



- City, Municipality, or Town
- Airport
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development
- Eelgrass (*Z. marina*) Patch
- Eelgrass (*Z. marina*) Bed
- Mixed *Z. marina/P. serrulatu* Bed

Eelgrass Cover (%)

- 0 - <10
- 10 - < 20
- 20 - < 30
- 30 - < 40
- 40 - < 50
- 50 - < 60
- 60 - < 70
- 70 - < 80
- 80 - < 90

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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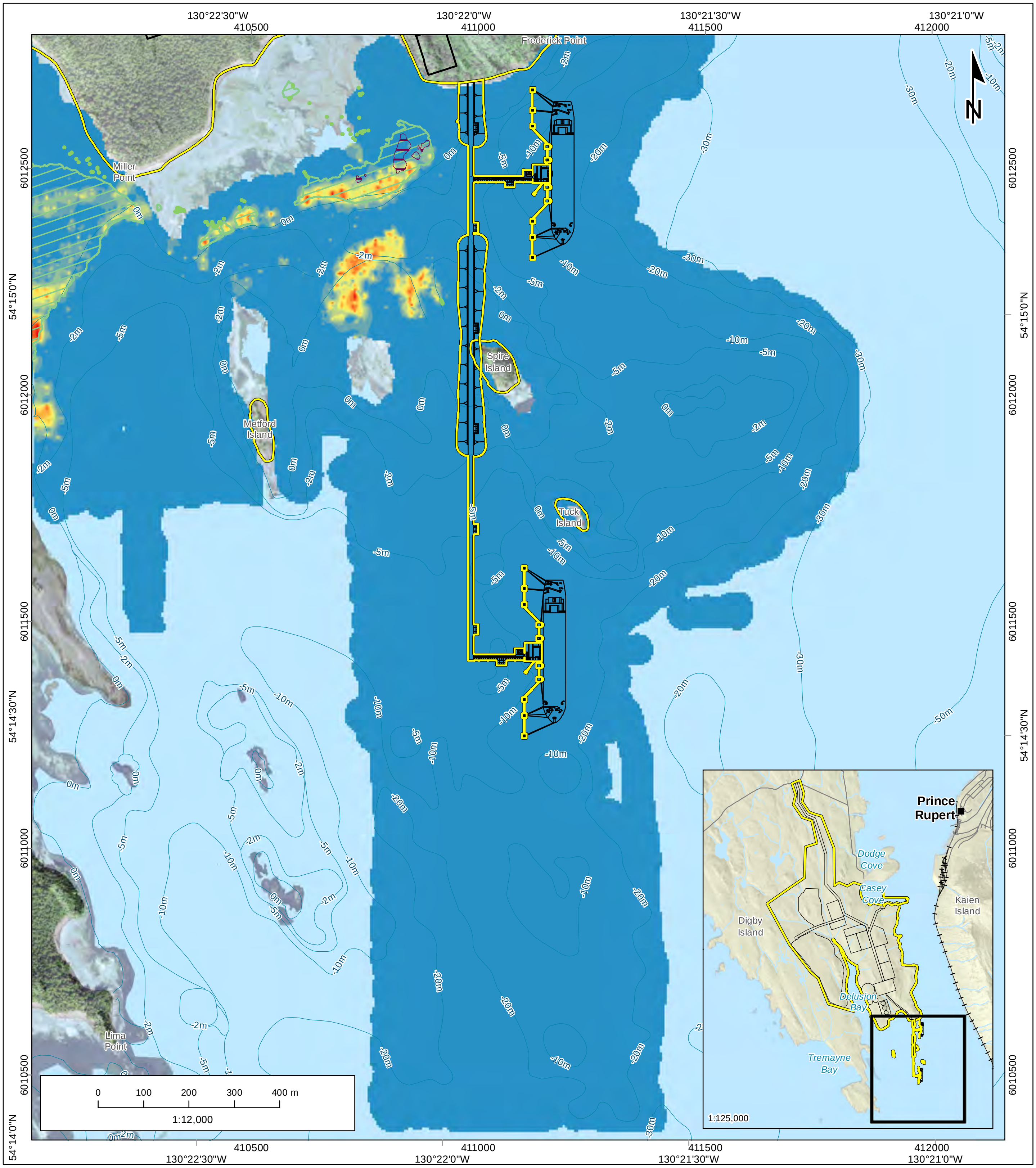
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

EELGRASS - EAST DIGBY ISLAND - FREDERICK POINT

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 34



City, Municipality, or Town	Project Development	**Eelgrass Cover (%)**
Airport	Eelgrass (*Z. marina*) Patch	0 - <10
Road	Eelgrass (*Z. marina*) Bed	10 - < 20
Railway	Mixed *Z. marina/P. serrulatu* Bed	20 - < 30
Watercourse		30 - < 40
Bathymetric Contour		40 - < 50
Waterbody		50 - < 60
Project Component		60 - < 70
		70 - < 80
		80 - < 90
		90 - 100

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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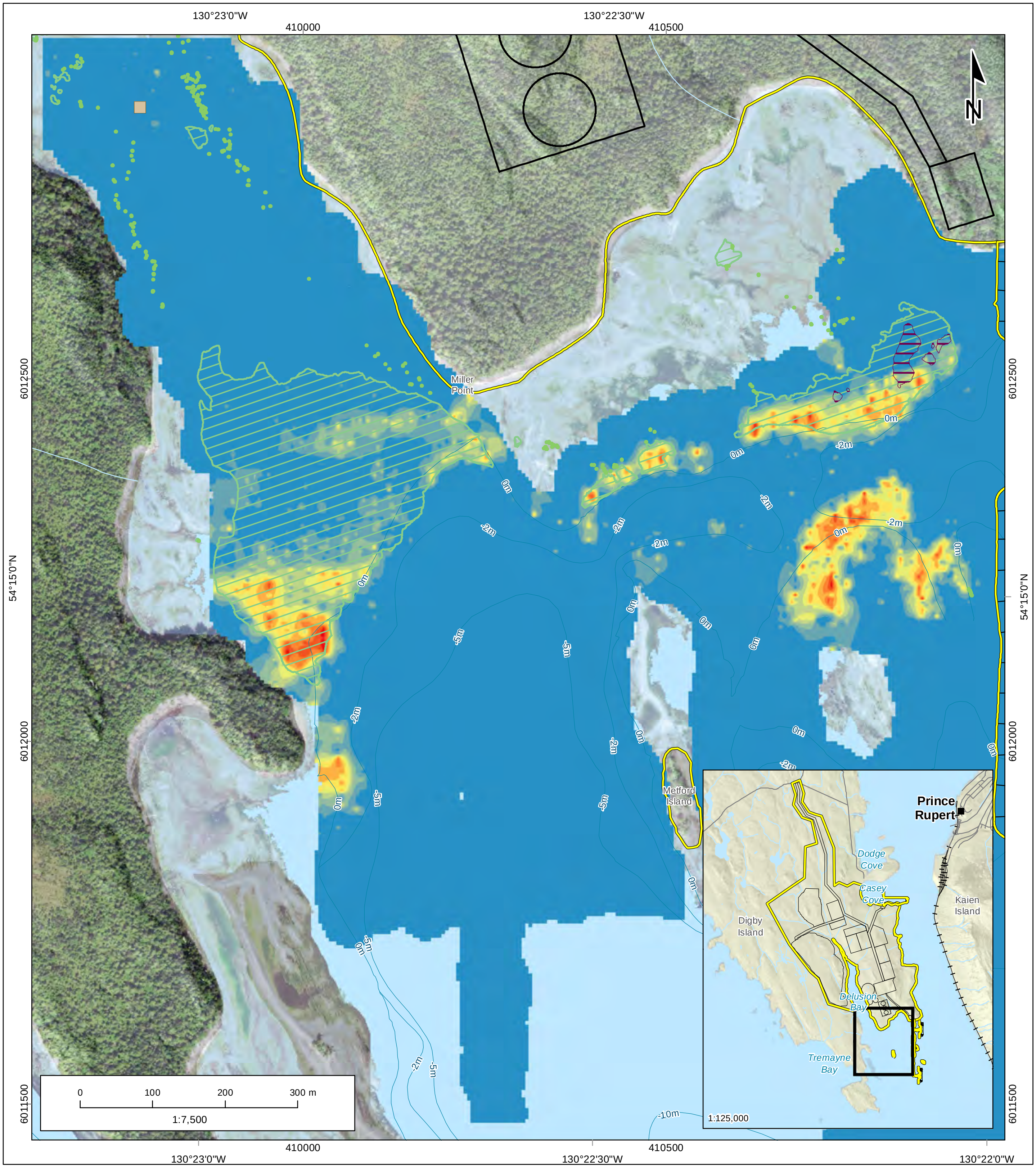
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

EELGRASS - SOUTH DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 35



City, Municipality, or Town	Project Development	**Eelgrass Cover (%)**	70 - < 80
Airport	Eelgrass (*Z. marina*) Patch	0 - <10	80 - < 90
Road	*Phyllospadix scouleri* Bed	10 - < 20	90 - 100
Railway	Eelgrass (*Z. marina*) Bed	20 - < 30	
Watercourse	Mixed *Z. marina/P. serrulatu* Bed	30 - < 40	
Bathymetric Contour		40 - < 50	
Waterbody		50 - < 60	
Project Component		60 - < 70	

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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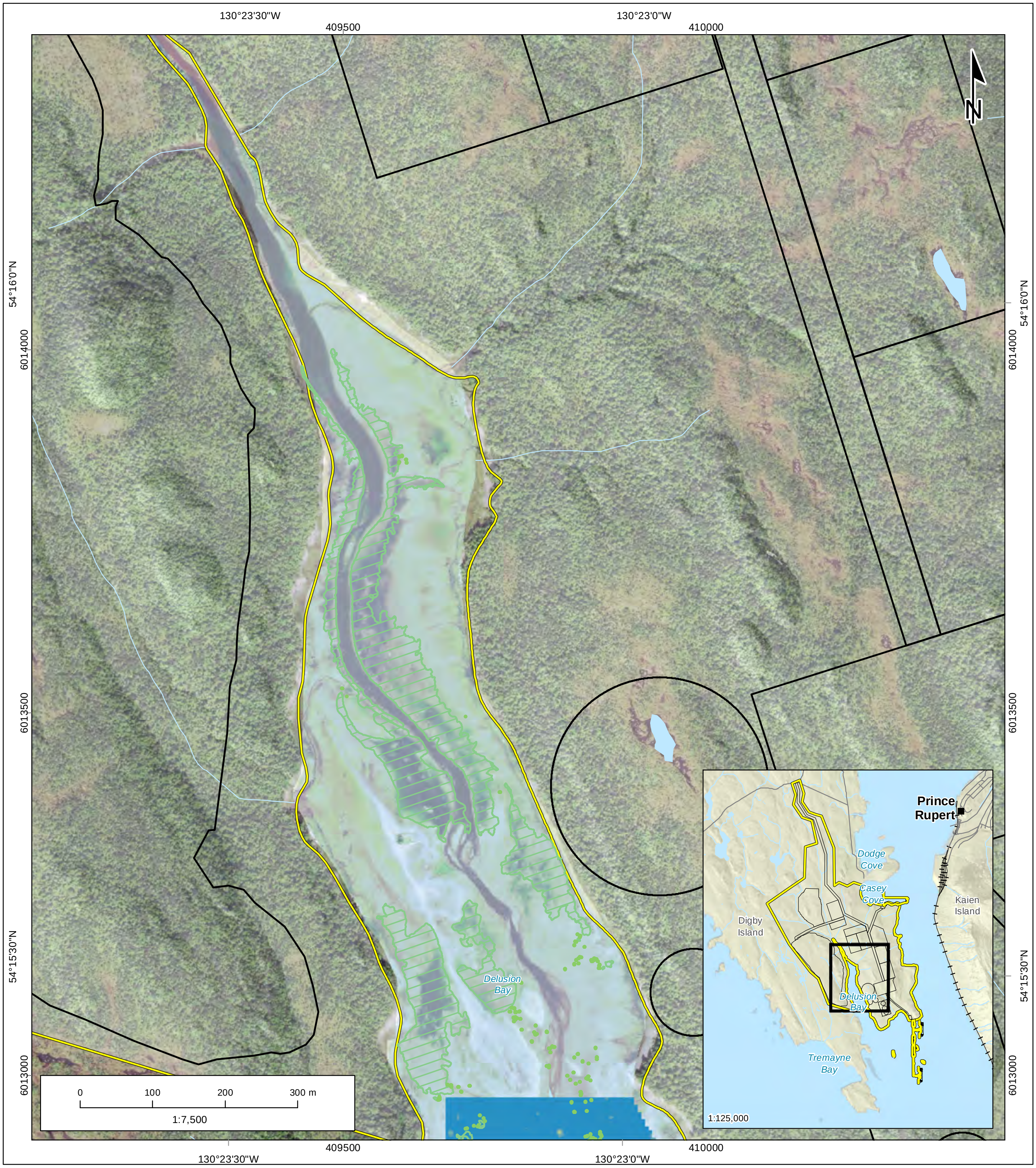
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

EELGRASS - SOUTH DIGBY ISLAND AND SOUTHERN DELUSION BAY

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 36



City, Municipality, or Town
Airport
Road
Railway
Watercourse
Waterbody
Project Component
Project Development
Eelgrass (*Z. marina*) Patch
Eelgrass (*Z. marina*) Bed

Eelgrass Cover (%)

0 - <10
10 - < 20
20 - < 30
30 - < 40

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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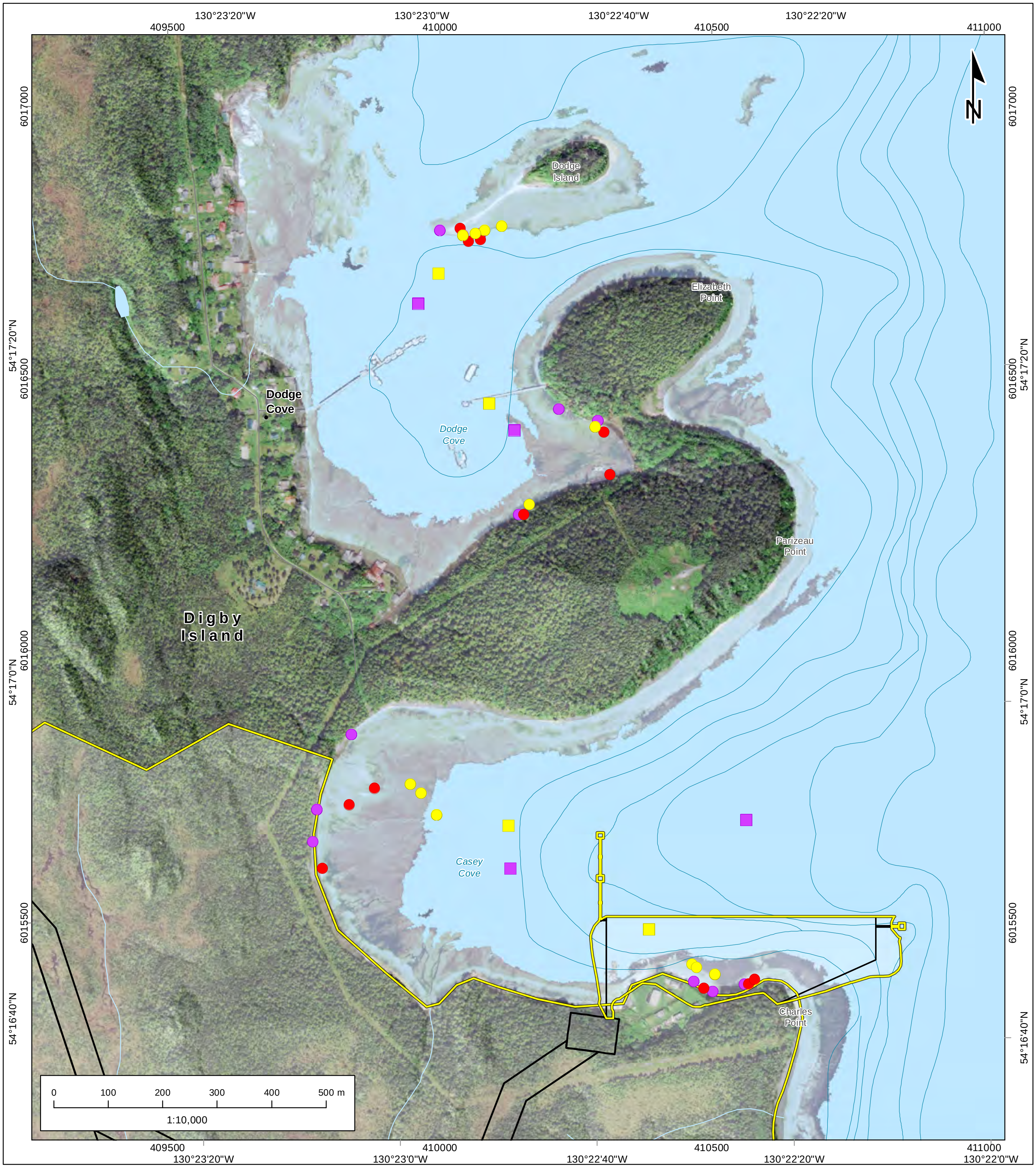
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

EELGRASS - NORTHERN DELUSION BAY

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 37



- Community, Locality, or Village
- Road
- Watercourse
- Bathymetric Contour
- Waterbody
- Project Component
- Project Development Area

Tangle Net
- October, 2015
- February, 2016

Beach Seine
- October, 2016
- February, 2016
- May, 2016

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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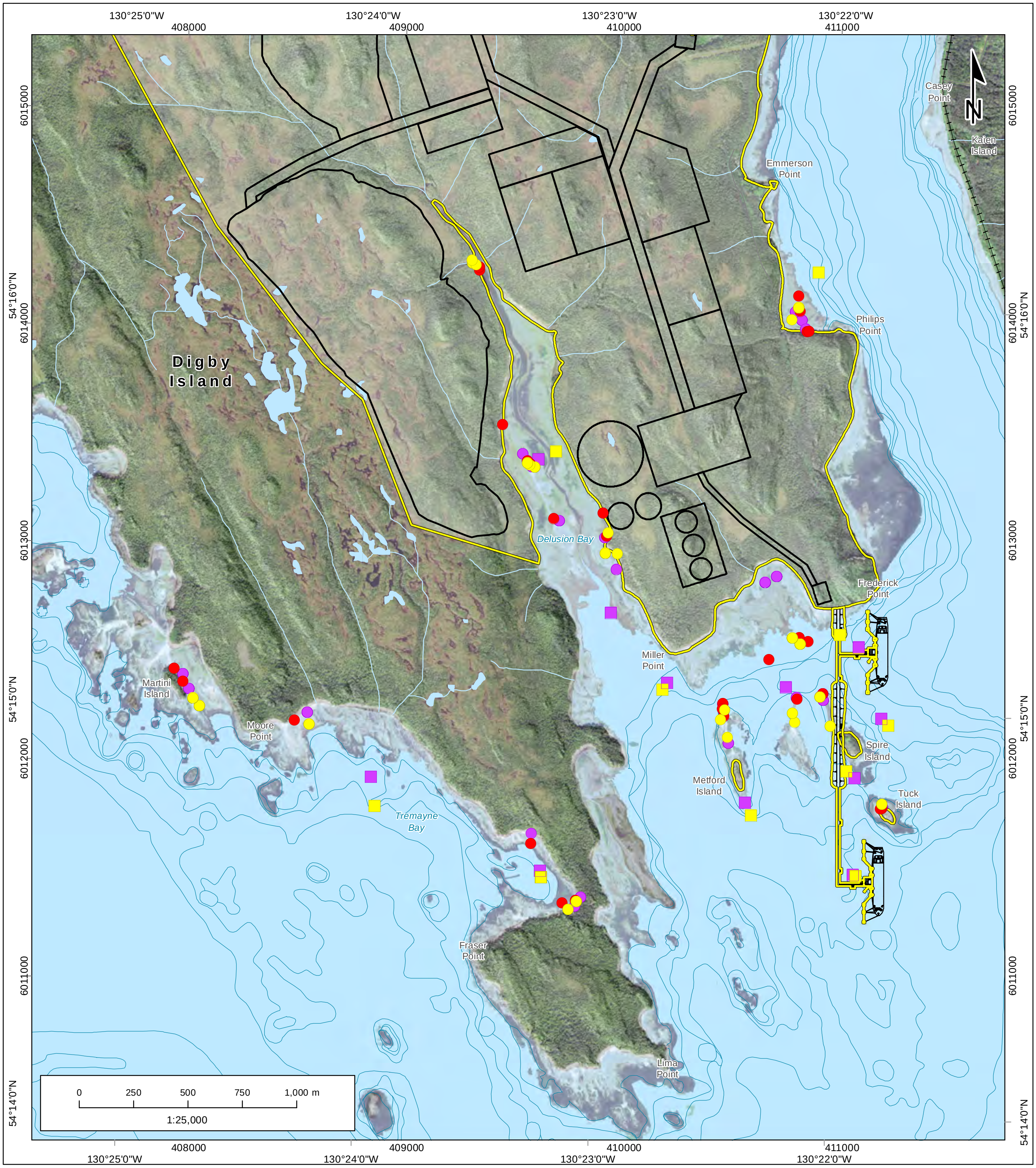
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

BEACH SEINE AND TANGLE NET SITES - NORTHERN STUDY AREAS

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 27, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 38



Road
Railway
Watercourse
Bathymetric Contour
Waterbody
Project Component
Project Development Area

Tangle Net
October, 2015
February, 2016

Beach Seine
October, 2016
February, 2016
May, 2016

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MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

BEACH SEINE AND TANGLE NET SITES - SOUTH DIGBY ISLAND STUDY AREAS

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 27, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 39

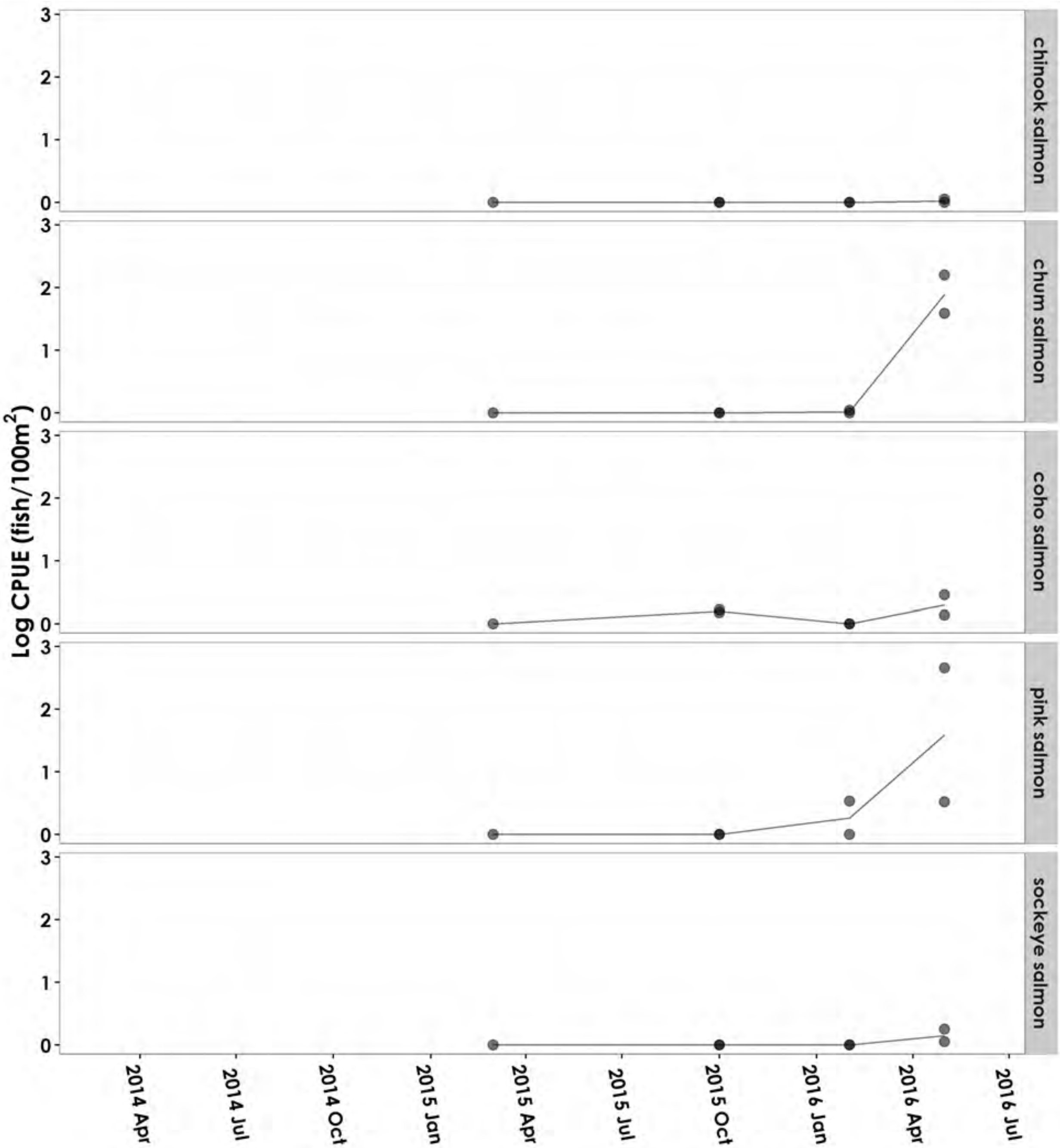


Figure 40 Catch (Fish/100 m^2) of Juvenile Pacific Salmon Caught by Beach Seine in Casey Cove

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

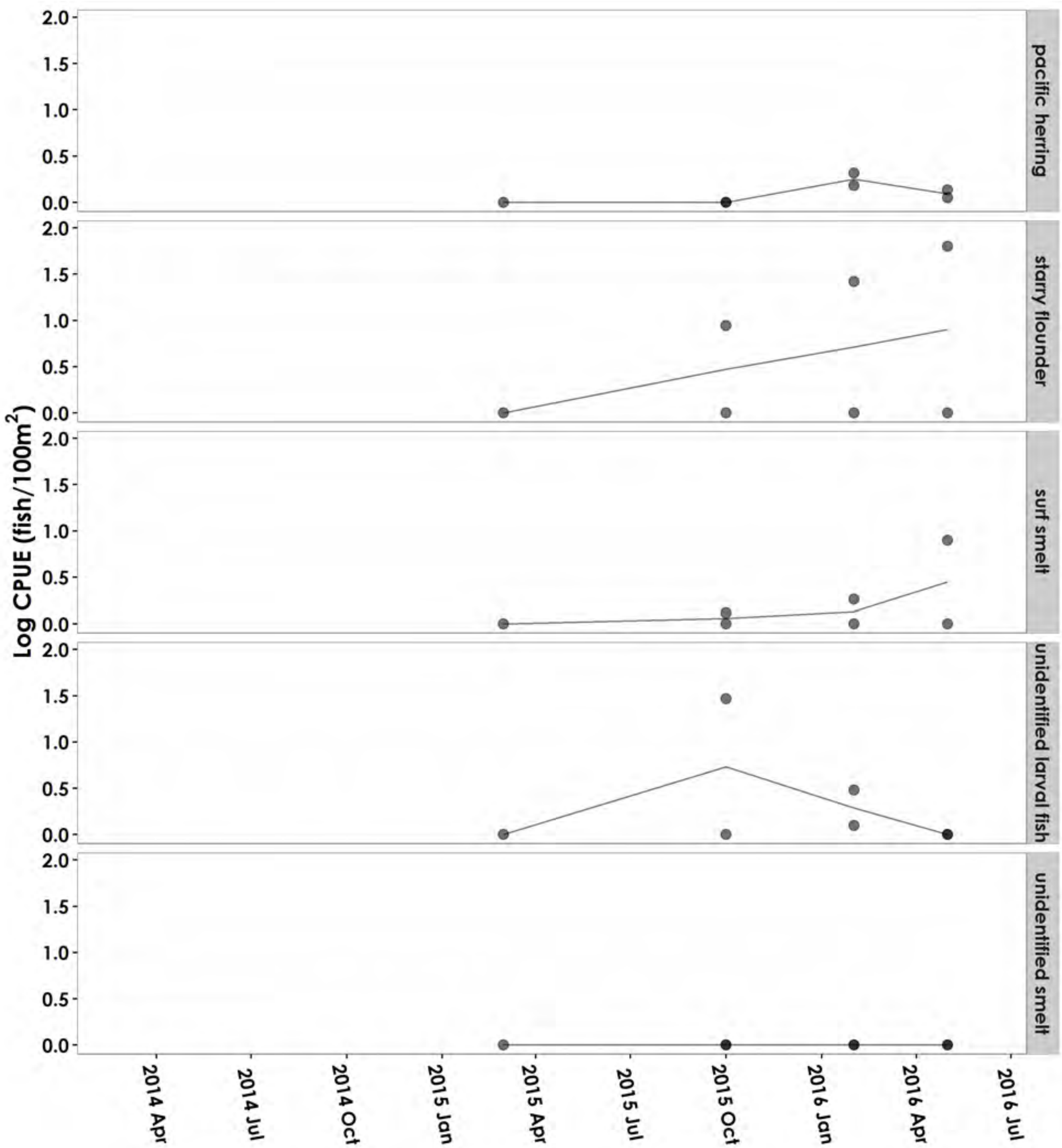


Figure 41 Catch (Fish/100 m^2) of Non-Salmonid Species Caught by Beach Seine in Casey Cove

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

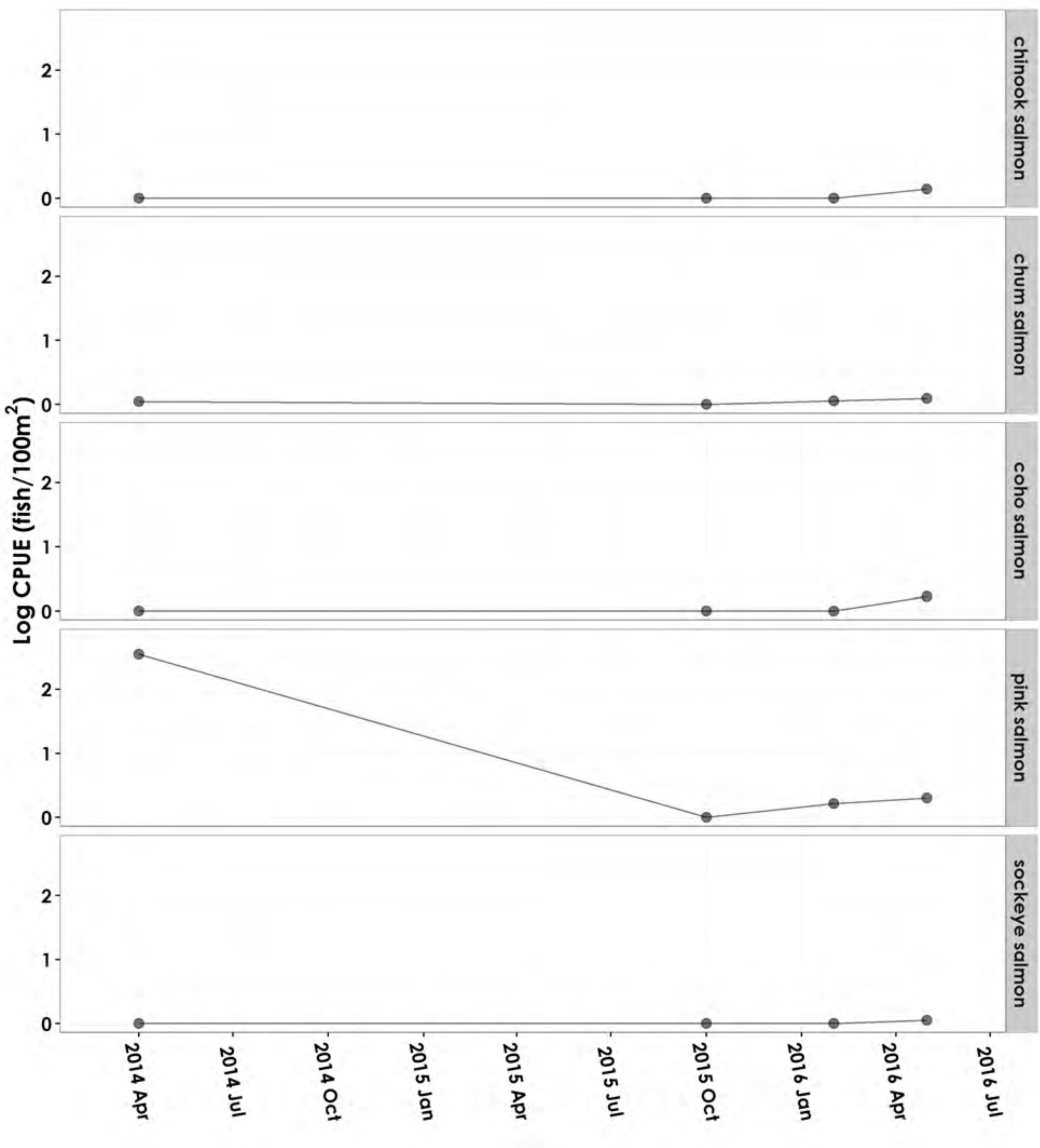


Figure 42 Catch (Fish/100 m²) of Juvenile Pacific Salmon Caught by Beach Seine in East Digby Island

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

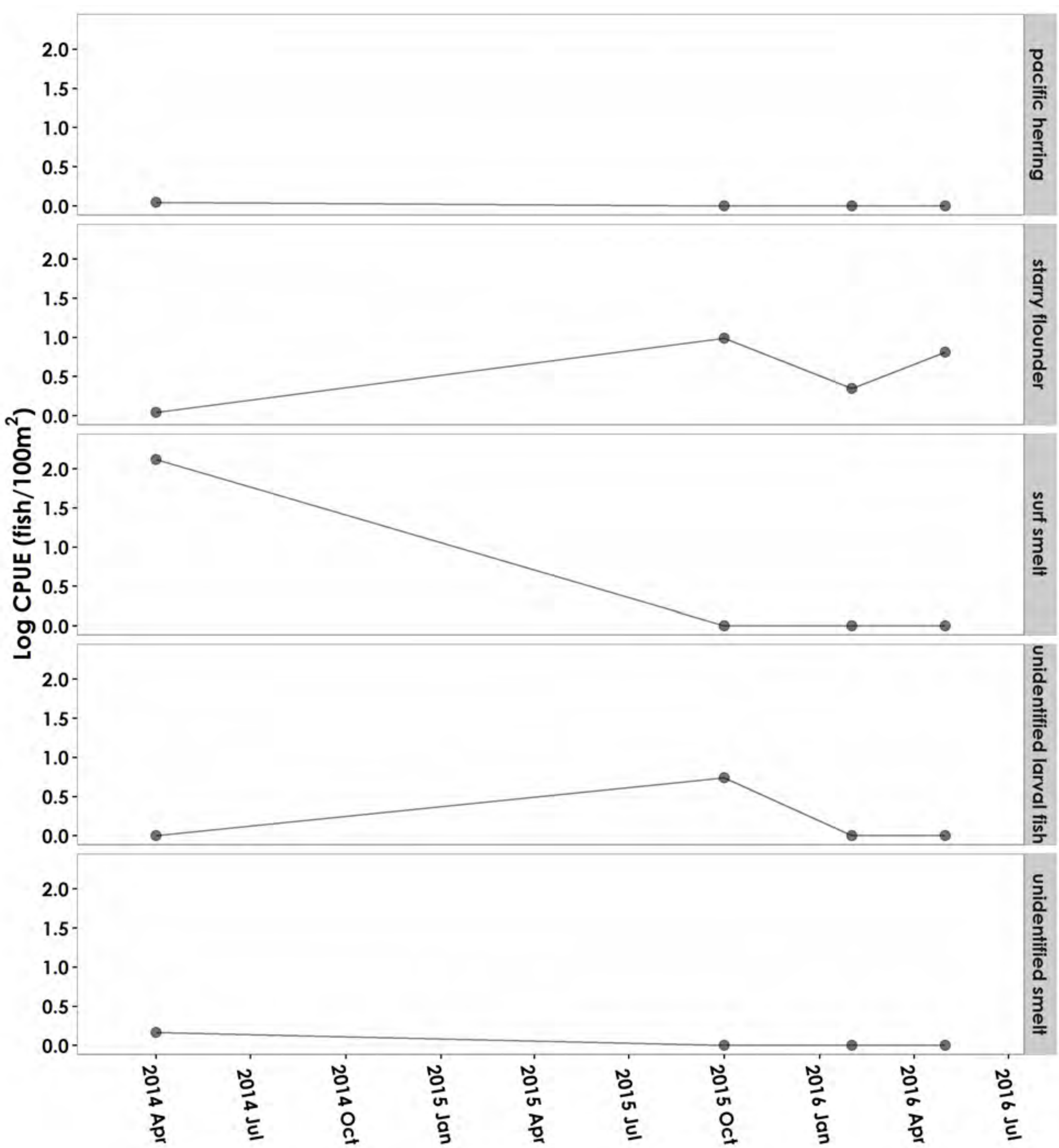


Figure 43 **Catch (Fish/100 m^2) of Non-Salmonid Species Caught by Beach Seine in East Digby Island**

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

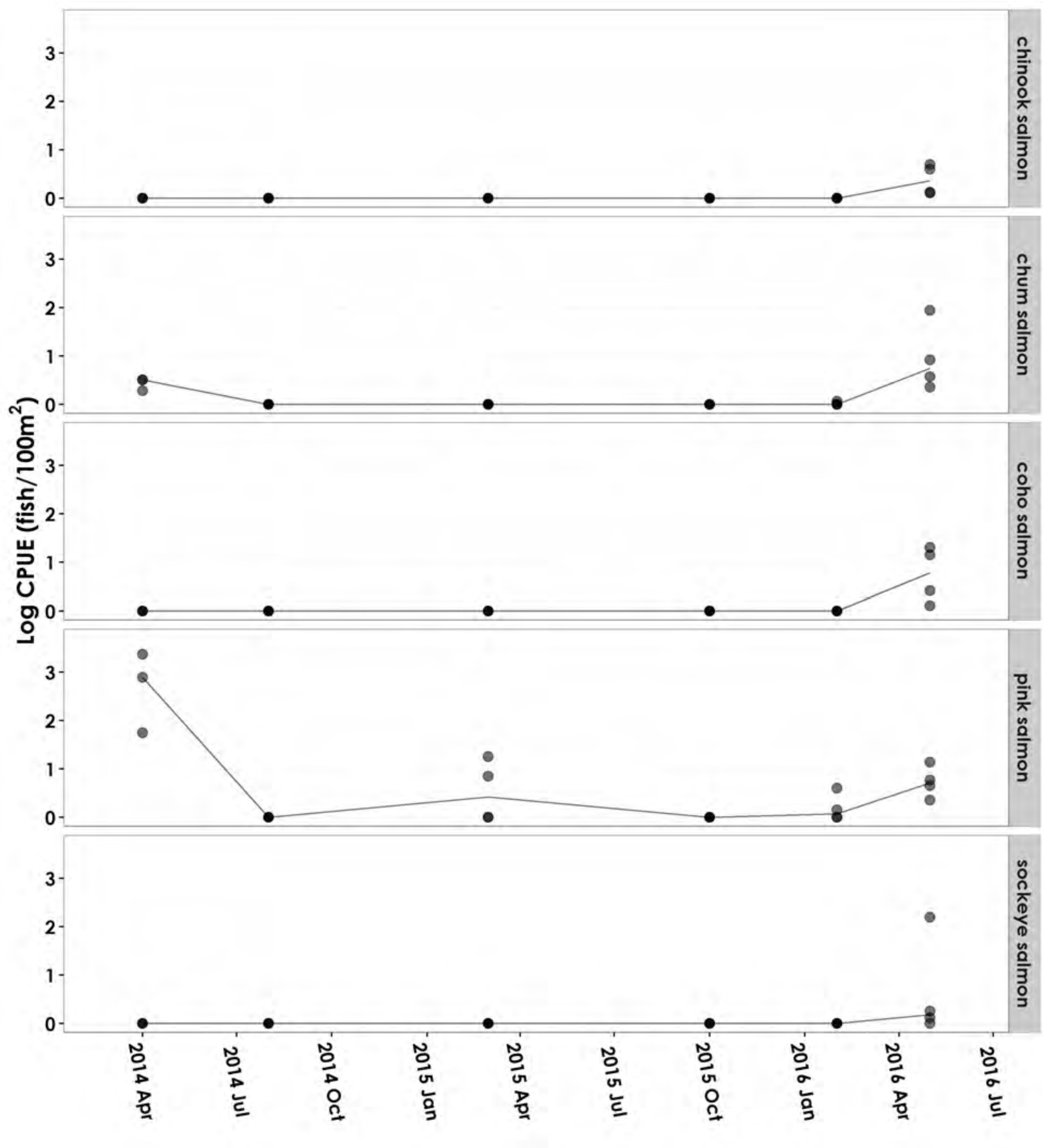


Figure 44 Catch (Fish/100 m^2) of Juvenile Pacific Salmon Caught by Beach Seine in South Digby Island

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

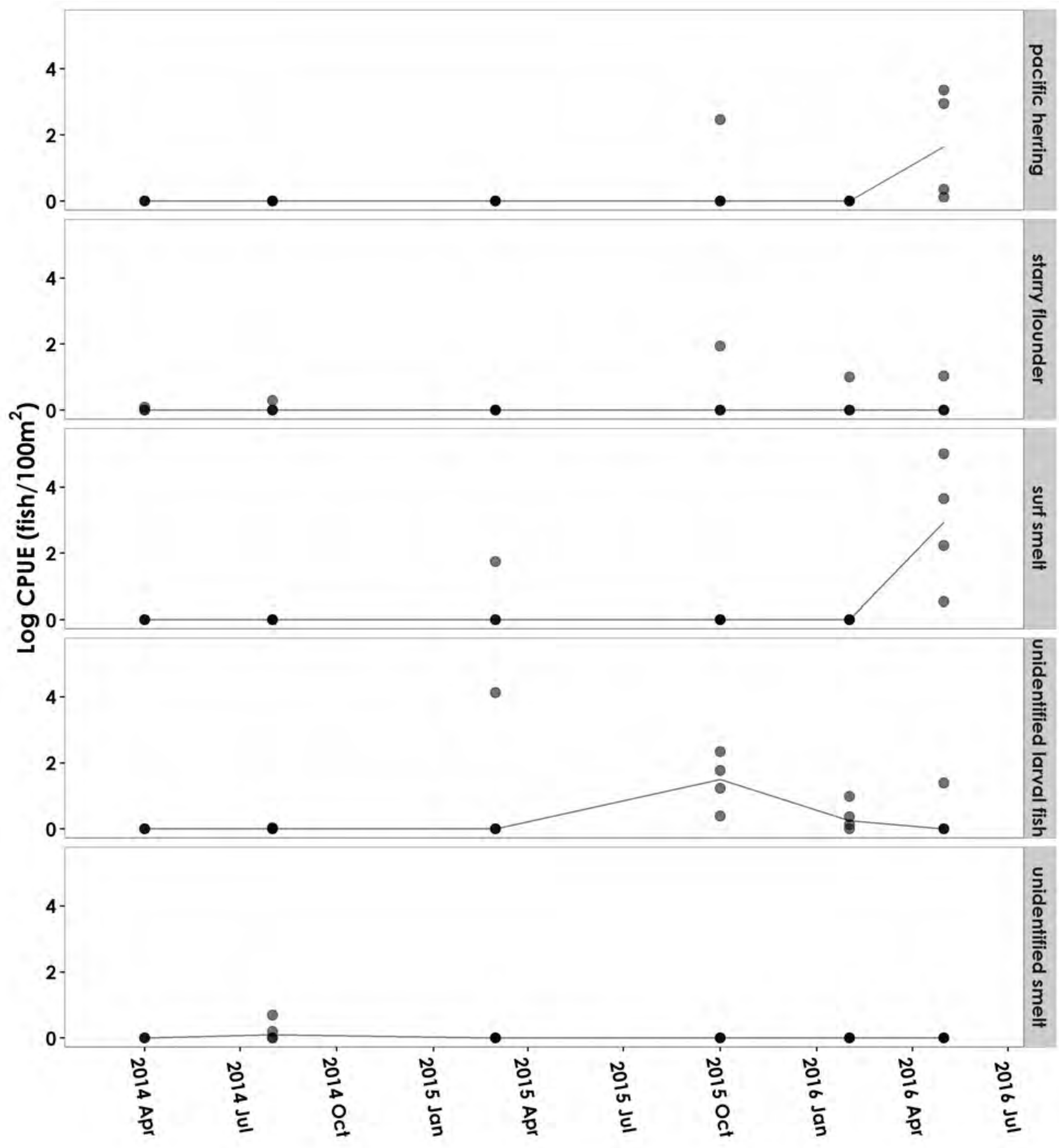


Figure 45 Catch (Fish/100 m^2) of Non-Salmonid Species Caught by Beach Seine in South Digby Island

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

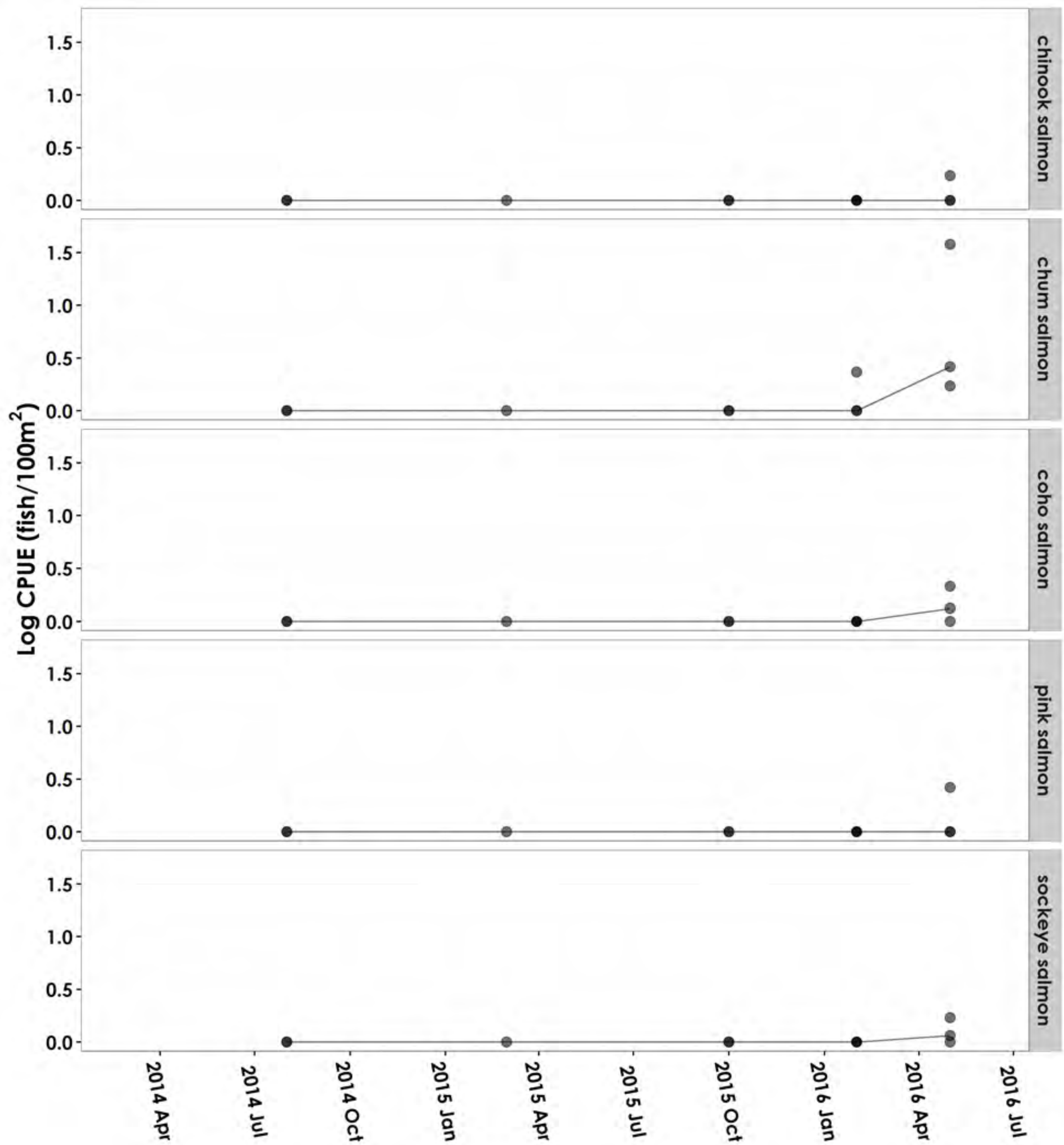


Figure 46 Catch (Fish/100 m^2) of Juvenile Pacific Salmon Caught by Beach Seine in Delusion Bay

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

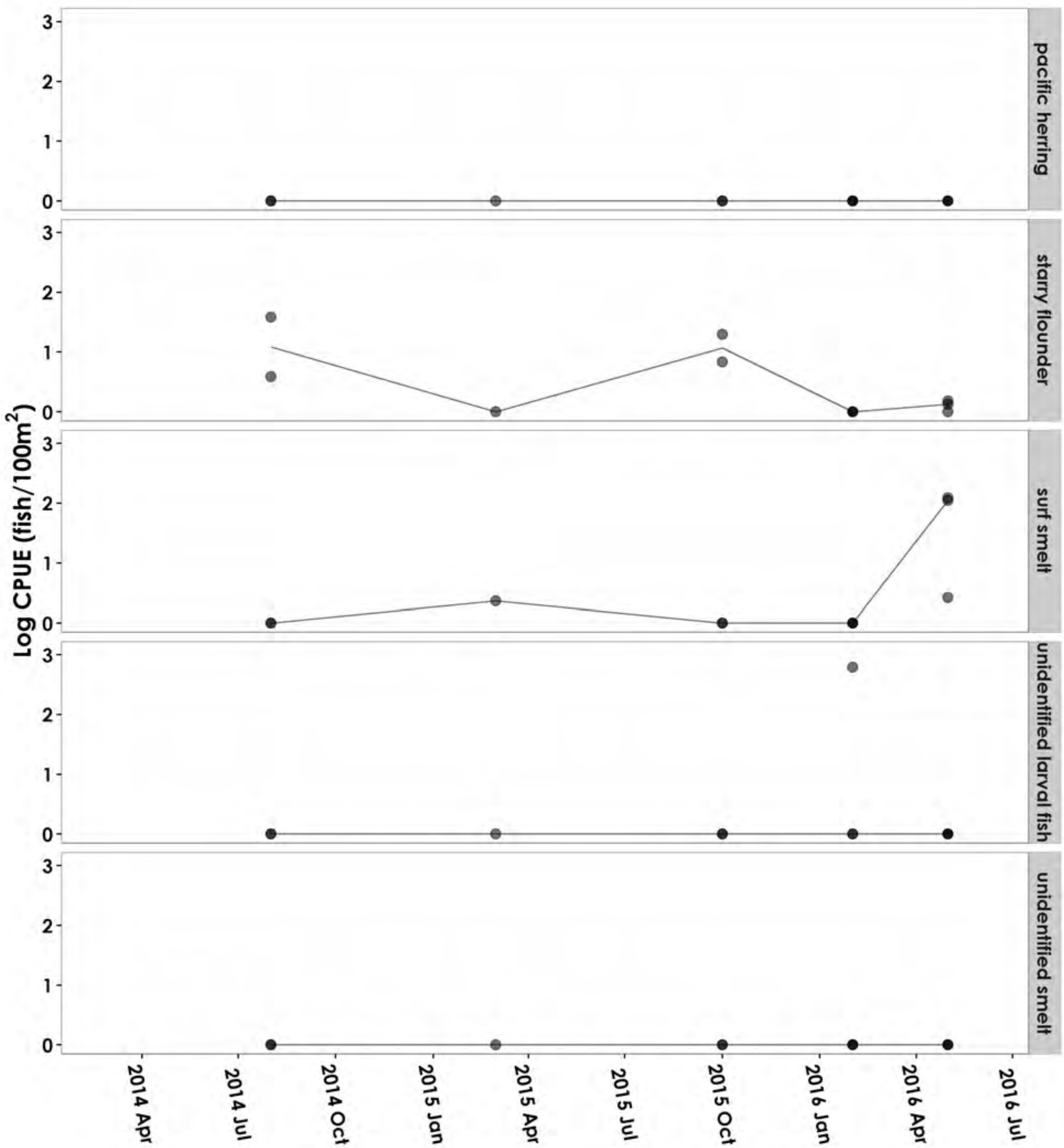


Figure 47 **Catch (Fish/100 m^2) of Non-Salmonid Species Caught by Beach Seine in Delusion Bay**

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

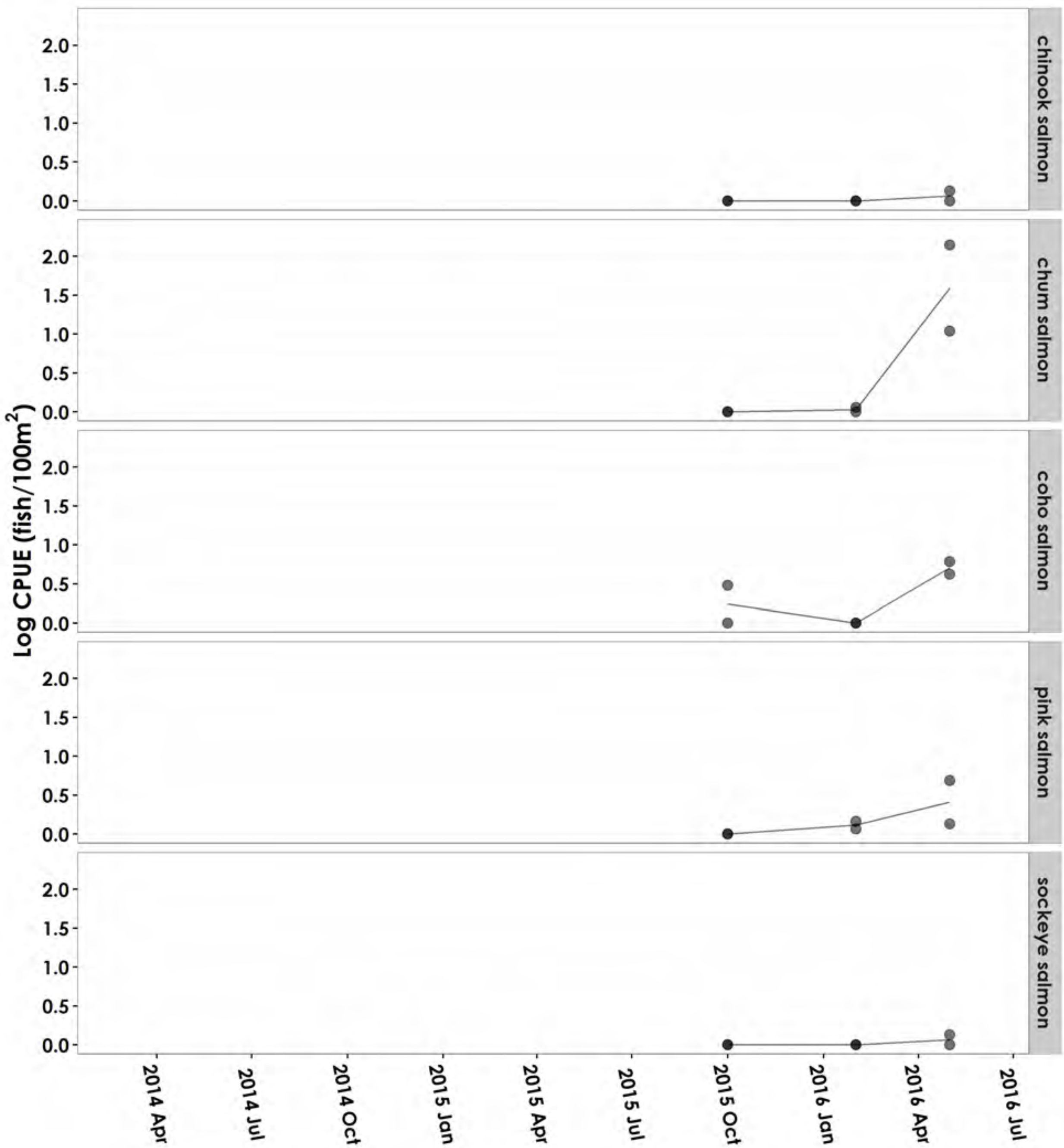


Figure 48 Catch (Fish/100 m^2) of Juvenile Pacific Salmon Caught by Beach Seine in Dodge Cove

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

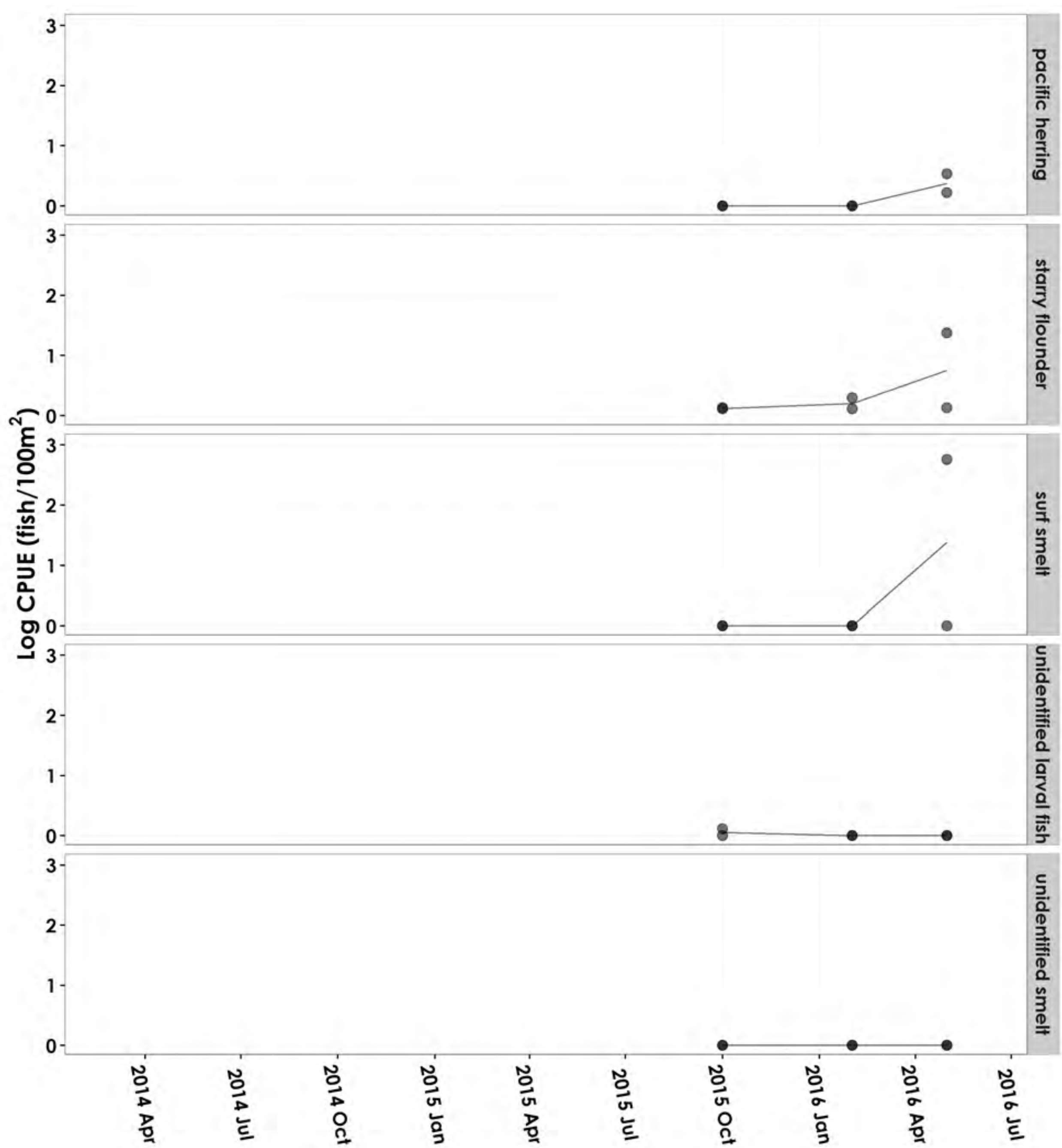


Figure 49 Catch (Fish/100 m^2) of Non-Salmonid Species Caught by Beach Seine in Dodge Cove

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

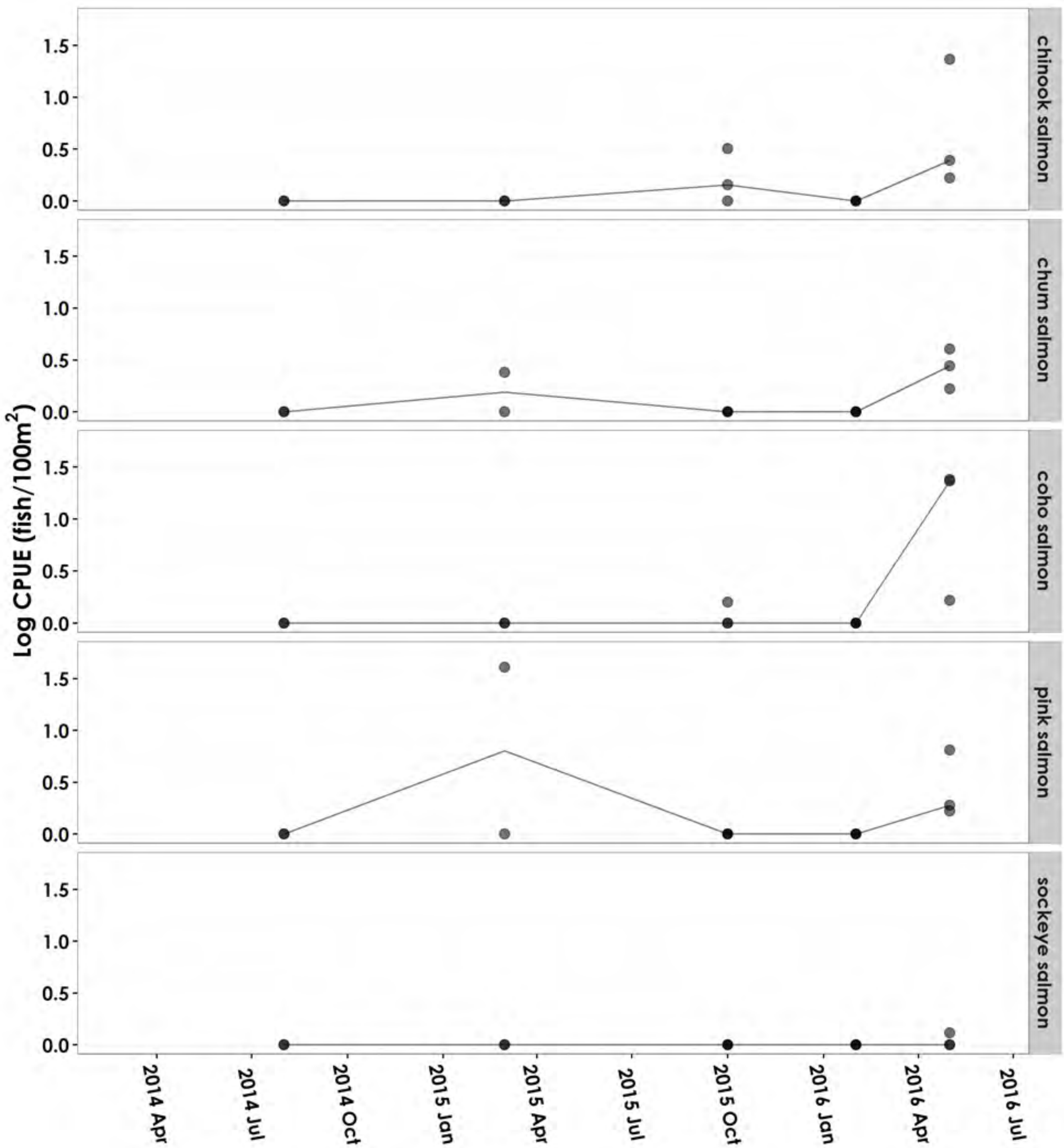


Figure 50 Catch (Fish/100 m^2) of Juvenile Pacific Salmon Caught by Beach Seine in Tremayne Bay

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

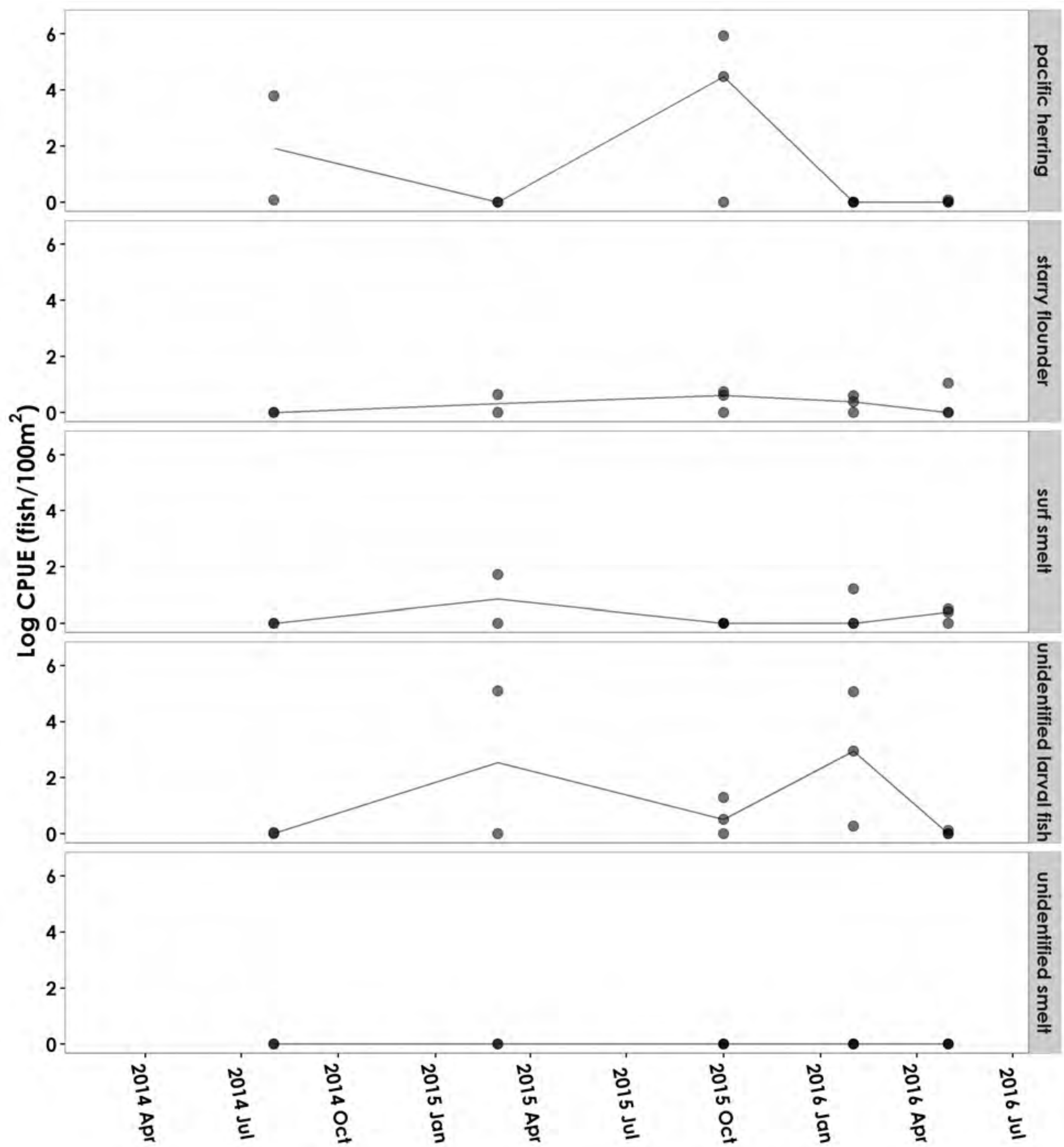


Figure 51 Catch (Fish/100 m^2) of Non-Salmonid Species Caught by Beach Seine in Tremayne Bay

NOTES: Catch represented as catch per unit effort (CPUE) and shown on a natural log scale. Dots depict catches at each beach seine site and line connects median values between each survey period.

APPENDIX 1

Intertidal Surveys

Table 1-1 Timing, Coordinates, Length and Slope of Intertidal Transects in Each Study Area

Transect	Date (dd/mm/yy)	Start Coordinates		End Coordinates		Total Length (m)	High Zone Length (m)	Mid Zone Length (m)	Low Zone Length (m)	Total Slope (°)	High Slope (°)	Mid Slope (°)	Low Slope (°)
		Latitude	Longitude	Latitude	Longitude								
Casey Cove													
CC1	10/9/2014	54.28221	-130.37880	54.28286	-130.37890	80.00	19.70	57.30	3.00	9	8	5	5
CC2	10/9/2014	54.28277	-130.37944	54.28218	-130.37946	80.00	24.00	18.00	38.00	6	6	5	2
CC3	9/9/2014	54.28217	-130.38527	54.28089	-130.38087	322.00	8.50	70.80	242.70	3	3	2	1
CC4	9/9/2014	54.27862	-130.38372	54.27979	-130.38044	246.00	8.00	48.00	190.00	4	10	4	1
CC5	9/9/2014	54.27932	-130.38034	54.27866	-130.38132	97.00	11.00	9.00	77.00	4	16	1	1
CC6	3/8/2015	54.27811	-130.37803	54.27862	-130.37788	61.00	12.00	30.00	61.00	5	8	7	4
CC7	10/9/2014	54.27860	-130.37313	54.27911	-130.37332	66.00	27.40	32.20	6.40	6	7	2	12
CC8	10/9/2014	54.28216	-130.37946	54.27832	-130.37234	105.00	41.00	4.00	60.00	3	6	7	2
East Digby Island													
ED1	3/8/2015	54.27251	-130.37165	54.27254	-130.37396	155.00	81.00	63.00	11.00	3	6	2	2
ED2	31/07/15	54.26763	-130.37100	54.26772	-130.36961	91.50	79.00	12.50	–	5	3	2	–
ED3	31/07/15	54.26744	-130.36835	54.26584	-130.37060	230.00	15.20	122.80	92.00	1	4	1	1
ED4	31/07/15	54.26568	-130.36885	54.26737	-130.36828	180.00	15.00	50.00	115.00	2	9	3	1
ED5	3/8/2015	54.26021	-130.36261	54.25906	-130.36678	305.00	21.00	52.00	232.00	1	3	3	1
South Digby Island													
SD1	2/8/2015	54.25641	-130.36398	54.25677	-130.36269	90.00	4.00	9.50	76.50	3	6	13	1
SD2	3/8/2015	54.25512	-130.36365	54.25518	-130.36397	24.00	7.20	12.10	4.70	15	18	15	2
SD3	2/8/2015	54.25413	-130.36524	54.25447	-130.36555	45.50	17.50	23.50	4.50	7	5	5	8
SD4	2/8/2015	54.25311	-130.36753	54.25440	-130.36764	145.00	23.00	67.00	55.00	2	4	3	1
SD5	2/8/2015	54.25484	-130.36853	54.25235	-130.37127	330.00	11.30	55.70	263.00	0.5	8	3	0
SD6	14/07/14	54.25237	-130.36908	54.25626	-130.37155	461.00	21.00	80.00	360.00	1	4	2	0
SD7	14/07/14	54.25432	-130.37493	54.25230	-130.37158	306.00	40.00	198.00	68.00	1	2	1	1
SD8	14/07/14	54.25260	-130.37734	54.25088	-130.37576	213.00	23.00	184.00	6.00	–	4	2	6
SD9	14/07/14	54.25136	-130.38040	54.25277	-130.37816	213.00	7.40	27.60	178.00	4	4	10	1
SD10	15/07/14	54.25027	-130.38182	54.25014	-130.38503	198.00	66.00	29.00	103.00	–	5	–	1
SD11	15/07/14	54.24903	-130.37478	54.24822	-130.38082	39.00	10.30	20.20	8.50	10	9	11	10
SD12	15/07/14	54.24650	-130.38131	54.24679	-130.38444	213.00	121.00	86.00	6.00	–	1	–	6
SD13A*	15/07/14	54.24442	-130.38298	54.24191	-130.37854	274.00	27.00	26.00	221.00	1	1.5	3.5	1
SD13B*	15/07/14	–	–	–	–	133.00	–	36.00	97.00	–	–	3	3
SD14	13/07/14	54.24603	-130.37279	54.24688	-130.37310	96.50	75.00	8.00	13.50	–	4	13.5	8
SD15	13/07/14	54.24780	-130.37325	54.24903	-130.37478	52.50	25.60	12.10	14.80	–	9	14	6
SD16	12/7/2014	54.24896	-130.37506	54.24907	-130.37433	54.00	22.20	28.40	3.40	7	7	4.5	16
SD17	12/7/2014	54.24904	-130.36907	54.24996	-130.37049	140.00	17.00	34.50	88.50	3	3	4	2
SD18	12/7/2014	54.24831	-130.36863	54.24789	-130.36919	63.00	2.00	13.30	47.70	5	50	4	2
SD19	12/7/2014	54.24918	-130.36606	54.24965	-130.36566	63.50	24.20	14.20	25.10	6	6	8	4

Table 1-1 Timing, Coordinates, Length and Slope of Intertidal Transects in Each Study Area

Transect	Date (dd/mm/yy)	Start Coordinates		End Coordinates		Total Length (m)	High Zone Length (m)	Mid Zone Length (m)	Low Zone Length (m)	Total Slope (°)	High Slope (°)	Mid Slope (°)	Low Slope (°)
		Latitude	Longitude	Latitude	Longitude								
SD20	11/7/2014	54.24830	-130.36522	54.24835	-130.36519	81.00	27.30	31.70	22.00	6	6	5	3
SD21	13/07/14	54.24651	-130.36389	54.24603	-130.36275	93.00	52.00	24.00	17.00	-	1	7	6
SD22	13/07/14	54.24584	-130.36247	54.24549	-130.36264	45.00	15.00	20.00	10.00	–	2	9	6
Delusion Bay													
DB1	1/8/2015	54.26450	-130.38858	54.26465	-130.38657	133.00	–	–	133.00	0.5	–	–	<1
DB2	1/8/2015	54.26115	-130.39042	54.26140	-130.38849	130.0	25.0	105.0	–	1	5	1	–
DB3	1/8/2015	54.25859	-130.38344	54.25813	-130.38463	95.0	–	95.0	–	1	–	1	–
DB4	1/8/2015	54.25619	-130.38750	54.25633	-130.38475	202.0	16.0	27.0	159.0	2	5	6	1

NOTES:

– not applicable

*Transect SD13 included two mid and low intertidal zones because an outcrop located 274 m from the backshore created sufficient vertical elevation to alter biophysical characteristics and create suitable environmental conditions for species typically found in the mid intertidal zone to thrive closer to the nearshore (from transect SD13A to transect SD13B). A total transect slope could not be determined for several transects in the South Digby Island study area because surveyors could not see the reference point from the backshore at low tide. **GPS coordinates for the start and end of this segment of Transect 13 were not taken.

Table 1-2 Median, Quartiles and Range of Relative Abundance of Substrate Categories (% Cover) Observed in the Low, Mid, and High Intertidal Zone of Casey Cove (*n*=8 transects)

Substrate	High (n = 8)							Mid (n = 13)							Low (n = 15)						
	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Bedrock	0.0	0.0	0.0	0.0	100.0	7.4	26.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.9	6.7
Boulder	0.0	0.0	0.0	0.0	75.0	9.3	20.6	0.0	0.0	0.0	0.0	25.0	2.4	6.3	0.0	0.0	0.0	0.0	85.0	4.2	14.2
Cobble	0.0	0.0	1.0	22.5	50.0	10.8	14.3	0.0	2.0	10.0	20.0	89.0	16.5	23.2	0.0	0.0	0.0	4.0	80.0	6.0	14.2
Detritus	0.0	0.0	0.0	0.0	99.0	5.9	20.3	0.0	0.0	0.0	0.0	15.0	0.6	2.6	0.0	0.0	0.0	0.0	75.0	1.6	10.1
Gravel	0.0	24.5	65.0	90.0	100.0	56.5	36.2	0.0	5.0	25.0	75.0	89.0	38.4	33.6	0.0	0.0	0.0	10.0	95.0	8.0	16.6
Mud	0.0	0.0	0.0	0.0	50.0	2.0	9.6	0.0	0.0	0.0	4.0	95.0	10.6	25.6	0.0	8.5	84.5	100.0	100.0	62.9	42.0
Organic	0.0	0.0	0.0	0.0	100.0	3.7	19.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sand	0.0	0.0	0.0	4.5	65.0	5.0	13.3	0.0	0.0	19.0	63.0	90.0	29.9	32.5	0.0	0.0	0.0	6.3	99.0	15.5	29.1
Shell	0.0	0.0	0.0	1.0	5.0	1.3	1.9	0.0	1.0	1.0	2.0	20.0	1.9	3.4	0.0	0.0	1.0	1.3	30.0	2.4	5.7

Table 1-3 Median, Quartiles and Range of Relative Abundance (% cover) of Algae and Marine Vegetation Observed in the Low, Mid, and High Intertidal Zone of Casey Cove (*n*=8 transects)

Description	Common Name	Scientific Name	High (n = 8)							Mid (n = 13)							Low (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Brown algae	filamentous brown algae	*Filamentous brown algae*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.04	0.27
Brown algae	rockweed	*Fucus* spp.	0.00	0.00	0.00	0.00	5.00	0.19	0.96	0.00	0.00	2.00	10.00	50.00	7.95	12.71	0.00	0.00	0.00	0.00	15.00	0.45	2.26
Green algae	green rope	*Acrosiphonia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.27	2.00
Green algae	filamentous green algae	*Filamentous green algae*	0.00	0.00	0.00	0.00	10.00	0.37	1.92	0.00	0.00	0.00	0.00	5.00	0.43	1.04	0.00	0.00	0.00	0.00	8.00	0.36	1.30
Green algae	sea lettuce	*Ulva* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	5.00	70.00	5.27	13.08	0.00	0.00	0.00	3.25	55.00	4.98	11.46
Kelp (brown algae)	winged kelp	*Alaria* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.16	0.00	0.00	0.00	0.00	35.00	2.07	6.62
Kelp (brown algae)	tangle kelp	*Laminaria setchellii*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Kelp (brown algae)	sugar kelp	*Saccharina groenlandica*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.50	0.43	1.70
Kelp (brown algae)	sugar kelp	*Saccharina latisima*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.48	1.66
Marine vegetation	eelgrass	*Zostera marina*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	1.39	4.38
Red algae	corraline crust	*Corraline crust*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.18	0.81
Red algae	filamentous red algae	*Filamentous red algae*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.11	0.39	0.00	0.00	0.00	0.00	8.00	0.23	1.25
Red algae	dead man's fingers	*Halosaccion* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	5.00	0.49	0.93	0.00	0.00	0.00	0.00	5.00	0.36	1.15
Red algae	turkish washcloth	*Mastocarpus blade*	0.00	0.00	0.00	0.00	7.00	0.44	1.40	0.00	0.00	1.00	3.00	10.00	2.43	3.25	0.00	0.00	0.00	0.25	20.00	1.75	4.01
Red algae	turkish washcloth	*Mastocarpus crust*	0.00	0.00	0.00	0.00	5.00	0.19	0.96	0.00	0.00	0.00	0.00	2.00	0.08	0.36	0.00	0.00	0.00	0.00	10.00	0.45	1.97
Red algae	rainbow-leaf	*Mazzaella* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.05	0.23	0.00	0.00	0.00	0.00	5.00	0.16	0.76
Red algae	black larch	*Neorhodomela* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	1.30	4.79
Red algae	sea brush	*Odonthalia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.19	0.70	0.00	0.00	0.00	0.00	2.00	0.04	0.27
Red algae	red ribbon	*Palmaria* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.16	0.83	0.00	0.00	0.00	0.00	8.00	0.21	1.11
Riparian vegetation	black lichen	NA	0.00	0.00	0.00	0.00	45.00	1.74	8.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Riparian vegetation	UnID grass	NA	0.00	0.00	0.00	0.00	25.00	1.00	4.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Riparian vegetation	UnID lichen	NA	0.00	0.00	0.00	0.00	14.00	0.89	3.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Riparian vegetation	UnID moss	NA	0.00	0.00	0.00	0.00	3.00	0.11	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Riparian vegetation	UnID sedge	NA	0.00	0.00	0.00	1.00	60.00	9.22	20.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 1-4 Median, Quartiles and Range of Relative Abundance of Marine Fish (count/quadrat) and Invertebrates (Sessile [% cover/quadrat] and Motile [count/quadrat]) Observed in the High, Mid, and Low Intertidal Zone in Casey Cove (*n*=8 transects)

Description	Common Name	Scientific Name	High (n = 8)							Mid (n = 13)							Low (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Amphipod	gammarid amphipod	*Gammaridea* spp.	0.00	0.00	0.00	2.00	60.00	4.26	12.14	0.00	0.00	0.00	0.00	100.00	5.92	18.63	0.00	0.00	0.00	0.00	15.00	0.61	2.50
Barnacle	common acorn barnacle	*Balanus glandula*	0.00	0.00	1.00	8.00	60.00	6.96	13.74	0.00	1.00	5.00	15.00	40.00	9.46	10.59	0.00	0.00	0.00	1.00	20.00	1.18	3.43
Barnacle	small acorn barnacle	*Chthamalus dalli*	0.00	0.00	0.00	0.00	5.00	0.37	1.15	0.00	0.00	0.00	0.00	2.00	0.11	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barnacle	thatched barnacle	*Semibalanus cariosus*	0.00	0.00	0.00	0.00	15.00	0.56	2.89	0.00	0.00	0.00	0.00	2.00	0.14	0.42	0.00	0.00	0.00	0.00	7.00	0.25	1.31
Bivalve	butter clam	*Saxidomus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.04	0.27
Bivalve	cockle	*Clinocardium* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.16	0.00	0.00	0.00	0.00	2.00	0.11	0.41
Bivalve	macoma clam	*Macoma* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.16	0.00	0.00	0.00	0.00	3.00	0.14	0.52
Bivalve	mussel	*Mytilus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.11	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bivalve	soft-shell clam	*Mya arenaria*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.16	0.00	0.00	0.00	0.00	6.00	0.18	0.86
Chiton	black katy chiton	*Katharina tunicata*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.08	0.49	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Chiton	lined chiton	*Tonicella* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.13	0.69
Crab	green shore crab	*Hemigrapsus oregonensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.16	0.69	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Crab	hermit crab	*Pagarus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	16.00	1.08	2.84	0.00	0.00	0.00	0.00	2.00	0.09	0.35
Crab	purple shore crab	*Hemigrapsus nudus*	0.00	0.00	0.00	0.00	11.00	1.00	2.45	0.00	0.00	0.00	5.00	25.00	3.57	6.25	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Crab	red rock crab	*Cancer productus*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crab	sharp-nosed crab	*Scyra auctifrons*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.17	0.41
Crab	shore crab	*Hemigrapsus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.16	0.99	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Encrusting Animal	bryozoan	*Bryozoa* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Fish	black prickleback	*Xiphister atropurpureus*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Fish	cresent gunnel	*Pholis laeta*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Isopod	isopod	*Idotea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.11	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Limpet	limpet	*Lottia* spp.	0.00	0.00	0.00	10.50	38.00	6.26	10.06	0.00	0.00	4.00	12.00	72.00	10.62	18.45	0.00	0.00	0.00	0.00	12.00	0.57	2.11
Sea star	brittle star	*Ophiurpoidea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	0.43	1.70
Sea star	six ray star	*Leptisterias* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shrimp	brown shrimp	*Crangon* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.16	0.83	0.00	0.00	0.00	0.00	5.00	0.20	0.86
Shrimp	ghost shrimp	*Neotrypaea californiensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.36	1.05
Snail	bittium	*Bittium* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Snail	dire whelk	*Lirabuccinum dirum*	0.00	0.00	0.00	0.00	3.00	0.30	0.78	0.00	0.00	0.00	0.00	55.00	1.54	9.04	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Snail	dogwinkle	*Nucella* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	10.00	1.62	2.74	0.00	0.00	0.00	0.00	50.00	1.27	6.78
Snail	periwinkle	*Littorina* spp.	0.00	0.00	0.00	4.00	42.00	5.56	11.11	0.00	0.00	2.00	16.00	150.00	16.92	33.37	0.00	0.00	0.00	0.00	10.00	0.18	1.34
Sponge	sponge	*Porifera* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tunicate	sea squirt	*Styelidae* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Worm	blood worm	*Glycera* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	12.00	1.09	2.51
Worm	flat worm	*Platyhelminthes* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.04	0.27
Worm	polychaete worm	*Polychaeta* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.16	0.83	0.00	0.00	0.00	0.00	13.00	0.84	2.59

Table 1-4 Median, Quartiles and Range of Relative Abundance of Marine Fish (count/quadrat) and Invertebrates (Sessile [% cover/quadrat] and Motile [count/quadrat]) Observed in the High, Mid, and Low Intertidal Zone in Casey Cove (*n*=8 transects)

Description	Common Name	Scientific Name	High (n = 8)							Mid (n = 13)							Low (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Worm	ribbon worm	*Nemertea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	0.32	1.45	0.00	0.00	0.00	0.00	12.00	0.63	2.07
Worm	sand worm	*Nereis* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.16	0.00	0.00	0.00	0.00	15.00	1.23	3.28
Worm	spirorbid worm	*Spirorbis* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.14	0.70

Table 1-5 Median, Quartiles and Range Relative Abundance of Substrate Categories (% Cover) Observed in the Low, Mid, and High Intertidal Zone of East Digby Island (*n*=5 transects)

Substrate	High (n = 14)							Mid (n = 10)							Low (n = 11)						
	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Bedrock	0.0	0.0	0.0	0.0	80.0	4.0	17.9	0.0	0.0	0.0	0.0	5.0	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Boulder	0.0	0.0	0.0	11.3	40.0	6.8	11.8	0.0	0.0	0.0	0.0	5.0	0.3	1.1	0.0	0.0	0.0	0.0	25.0	1.5	6.1
Cobble	0.0	0.0	15.0	75.0	100.0	35.6	39.1	0.0	0.0	0.0	5.0	100.0	13.4	30.4	0.0	0.0	0.0	5.0	85.0	12.8	26.9
Detritus	0.0	0.0	0.0	2.8	95.0	8.9	23.3	0.0	0.0	0.0	0.0	40.0	1.8	8.2	0.0	0.0	0.0	0.0	30.0	1.6	5.5
Gravel	0.0	0.0	0.0	6.3	100.0	17.5	35.3	0.0	7.5	85.0	98.3	100.0	59.5	44.5	0.0	0.0	10.0	25.0	90.0	21.6	29.3
Mud	0.0	0.0	0.0	0.0	91.0	8.3	25.7	0.0	0.0	0.0	0.0	100.0	15.6	35.2	0.0	0.0	0.0	0.0	100.0	9.7	28.6
Organic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sand	0.0	0.0	0.0	46.3	95.0	24.7	37.4	0.0	0.0	0.0	1.3	100.0	10.0	26.8	0.0	10.0	75.0	95.0	100.0	52.5	42.2
Shell	0.0	0.0	5.0	5.0	10.0	3.3	3.4	0.0	0.0	0.0	0.0	10.0	1.0	2.5	0.0	0.0	0.0	0.0	20.0	1.8	4.3

Table 1-6 Median, Quartiles and Range of Relative Abundance (% cover) of Algae and Marine Vegetation Observed in the Low, Mid, and High Intertidal Zone of East Digby Island (*n*=5 transects)

Description	Common Name	Scientific Name	High (n = 14)							Mid (n = 10)							Low (n = 11)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Brown algae	rockweed	*Fucus* spp.	0.00	0.00	0.00	0.00	10.00	0.75	2.29	0.00	0.00	0.50	1.25	5.00	0.96	1.30	0.00	0.00	0.00	0.00	25.00	1.61	4.76
Brown algae	sea cauliflower	*Leathesia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.18	1.04
Brown algae	sea fungus	*Ralfsia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.17
Green algae	filamentous green algae	Filamentous green algae	0.00	0.00	0.00	0.00	3.00	0.25	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.00	5.45	18.04
Green algae	sea lettuce	*Ulva* spp.	0.00	0.00	0.00	1.50	50.00	6.20	13.46	0.00	0.00	0.00	6.25	60.00	8.17	16.91	0.00	0.00	3.00	20.00	80.00	12.85	17.90
Kelp (brown algae)	sieve kelp	*Agarum* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	1.04	5.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kelp (brown algae)	winged kelp	*Alaria* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.27	0.98
Kelp (brown algae)	sugar kelp	*Saccharina groenlandica*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.21	1.02	0.00	0.00	0.00	0.00	10.00	0.45	1.82
Marine vegetation	eelgrass	*Zostera marina*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.21	1.02	0.00	0.00	0.00	0.00	60.00	1.82	10.44
Red algae	red grape kelp	*Botryocladia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.50	2.00	2.00	2.00	1.67	0.58
Red algae	turkish towel	*Chondrocanthus* spp.	0.00	0.00	0.00	0.00	2.00	0.20	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red algae	corraline crust	*Corraline crust*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	1.04	5.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red algae	filamentous red algae	Filamentous red algae	0.00	0.00	0.00	0.00	3.00	0.25	0.79	0.00	0.00	0.00	0.00	1.00	0.04	0.20	0.00	0.00	0.00	1.00	10.00	1.03	2.21
Red algae	dead man's fingers	*Halosaccion* spp.	0.00	0.00	0.00	0.00	5.00	0.70	1.59	0.00	0.00	0.00	0.00	5.00	0.46	1.28	0.00	0.00	0.00	0.00	5.00	0.33	0.92
Red algae	rusty rock	*Hildenbrandia* spp.	0.00	0.00	0.00	0.25	5.00	0.55	1.23	0.00	0.00	0.00	0.00	3.00	0.17	0.64	0.00	0.00	0.00	0.00	1.00	0.06	0.24
Red algae	turkish washcloth	*Mastocarpus blade*	0.00	0.00	0.00	2.50	30.00	3.40	7.32	0.00	0.00	0.00	2.75	8.00	1.46	2.48	0.00	0.00	0.00	2.00	25.00	3.15	6.43
Red algae	turkish washcloth	*Mastocarpus crust*	0.00	0.00	0.00	0.00	25.00	1.75	5.91	0.00	0.00	0.00	0.00	10.00	0.54	2.06	0.00	0.00	0.00	0.00	15.00	0.55	2.61
Red algae	rainbow-leaf	*Mazzaella* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.15	0.62
Red algae	black larch	*Neorhodomela* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.15	0.87
Red algae	sea brush	*Odonthalia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.67	3.49
Red algae	red ribbon	*Palmaria* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.17	0.48	0.00	0.00	0.00	0.00	1.00	0.03	0.17
Red algae	purple leaver	*Porphyra* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.13	0.61	0.00	0.00	0.00	0.00	5.00	0.27	0.94
Riparian vegetation	UnID sedge	NA	0.00	0.00	0.00	0.00	50.00	5.75	13.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 1-7 Median, Quartiles and Range of Relative Abundance of Marine Fish (count/quadrat) and Invertebrates (Sessile [% cover/quadrat] and Motile [count/quadrat]) Observed in the High, Mid, and Low Intertidal Zone in East Digby Island (*n*=5 transects)

Description	Common Name	Scientific Name	High (n = 14)							Mid (n = 10)							Low (n = 11)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Amphipod	gammarid amphipod	*Gammaridea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	4.79	14.26	0.00	0.00	0.00	0.00	100.00	5.48	19.33
Barnacle	common acorn barnacle	*Balanus glandula*	0.00	0.00	0.00	2.00	70.00	9.75	21.28	0.00	0.00	6.00	21.25	70.00	12.25	16.59	0.00	0.00	0.00	1.00	25.00	1.48	4.65
Barnacle	small acorn barnacle	*Chthamalus dalli*	0.00	0.00	0.00	0.00	15.00	0.75	3.35	0.00	0.00	0.00	0.00	30.00	1.25	6.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barnacle	thatched barnacle	*Semibalanus cariosus*	0.00	0.00	0.00	5.50	30.00	6.05	10.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.09	0.52
Bivalve	butter clam	*Saxidomus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.18	0.77
Bivalve	cockle	*Clinocardium* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.15	0.51
Bivalve	macoma clam	*Macoma* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.08	0.41	0.00	0.00	0.00	0.00	4.00	0.24	0.83
Bivalve	mussel	*Mytilus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.13	0.34	0.00	0.00	0.00	0.00	1.00	0.03	0.17
Bivalve	soft-shell clam	*Mya arenaria*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.25	1.22	0.00	0.00	0.00	0.00	2.00	0.06	0.35
Chiton	lined chiton	*Tonicella* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.06	0.24
Crab	green shore crab	*Hemigrapsus oregonensis*	0.00	0.00	0.00	0.00	5.00	0.25	1.12	0.00	0.00	0.00	0.00	2.00	0.08	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crab	hermit crab	*Pagarus* spp.	0.00	0.00	0.00	0.00	16.00	1.05	3.58	0.00	0.00	0.00	1.00	3.00	0.58	1.02	0.00	0.00	0.00	0.00	3.00	0.18	0.64
Crab	purple shore crab	*Hemigrapsus nudus*	0.00	0.00	0.00	0.00	1.00	0.15	0.37	0.00	0.00	0.00	0.00	10.00	0.96	2.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crab	pygmy rock crab	*Cancer oregonensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.00	3.33	16.33	0.00	0.00	0.00	0.00	3.00	0.09	0.52
Crab	sharp-nosed crab	*Scyra auctifrons*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.06	0.24
Encrusting Animal	bryozoan	*Bryozoa* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.17
Isopod	isopod	*Idotea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.03	0.17
Isopod	oregon pill bug	*Gnorimosphaeroma oregonensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	1.42	4.51	0.00	0.00	0.00	0.00	18.00	0.55	3.13
Limpet	limpet	*Lottia* spp.	0.00	0.00	0.00	5.00	23.00	4.35	6.90	0.00	0.00	0.00	4.00	80.00	6.08	17.73	0.00	0.00	0.00	0.00	30.00	1.27	5.28
Shrimp	ghost shrimp	*Neotrypaea californiensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00	1.00	3.39	0.00	0.00	0.00	0.00	14.00	0.85	2.92
Snail	dire whelk	*Lirabuccinum dirum*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.04	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Snail	dogwinkle	*Nucella* spp.	0.00	0.00	0.00	1.25	10.00	1.50	3.15	0.00	0.00	0.00	0.00	15.00	0.75	3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Snail	margarites snail	*Margarites* spp.	0.00	0.00	0.00	0.00	1.00	0.10	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Snail	periwinkle	*Littorina* spp.	0.00	0.00	0.00	1.00	50.00	5.60	13.99	0.00	0.00	10.00	31.25	160.00	30.54	45.14	0.00	0.00	0.00	0.00	100.00	3.79	17.41
Worm	blood worm	*Glycera* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	0.55	1.52
Worm	flat worm	*Platyhelminthes* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.04	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worm	polychaete worm	*Polychaeta* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.33	1.27	0.00	0.00	0.00	0.00	20.00	1.30	3.96
Worm	ribbon worm	*Nemertea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.38	0.92	0.00	0.00	0.00	0.00	8.00	0.67	1.63
Worm	sand worm	*Nereis* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.04	0.20	0.00	0.00	0.00	0.00	4.00	0.61	1.30
Worm	spirorbid worm	*Spirorbis* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.18	0.64

Table 1-8 Median, Quartiles and Range of Relative Abundance of Substrate Categories (% Cover) Observed in the Low, Mid, and High Intertidal Zone of South Digby Island (*n*=22 transects)

Substrate	High (n = 15)							Mid (n = 14)							Low (n = 15)						
	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Bedrock	0.0	0.0	60.0	98.0	100.0	50.1	44.8	0.0	0.0	65.0	99.0	100.0	51.7	44.8	0.0	0.0	0.0	60.0	100.0	24.9	40.3
Boulder	0.0	0.0	0.0	6.5	100.0	11.2	24.4	0.0	0.0	0.0	10.0	100.0	12.8	25.3	0.0	0.0	0.0	5.0	100.0	12.8	26.5
Cobble	0.0	0.0	0.0	15.0	85.0	11.9	19.1	0.0	0.0	0.0	20.0	55.0	10.6	14.7	0.0	0.0	0.0	15.0	95.0	11.0	19.4
Detritus	0.0	0.0	0.0	0.0	85.0	3.0	12.2	0.0	0.0	0.0	0.0	7.0	0.1	0.6	0.0	0.0	0.0	0.0	30.0	0.5	2.9
Gravel	0.0	0.0	2.0	20.0	100.0	14.7	23.8	0.0	0.0	4.0	20.0	95.0	14.2	21.8	0.0	0.0	1.0	20.0	100.0	14.8	24.2
Mud	0.0	0.0	0.0	0.0	29.0	1.2	4.8	0.0	0.0	0.0	0.0	10.0	0.3	1.4	0.0	0.0	0.0	5.0	60.0	3.9	9.1
Organic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sand	0.0	0.0	0.0	0.0	100.0	8.9	24.3	0.0	0.0	0.0	0.0	100.0	9.0	23.5	0.0	0.0	0.0	75.0	100.0	30.7	40.9
Shell	0.0	0.0	0.0	1.0	10.0	0.7	1.8	0.0	0.0	0.0	1.0	40.0	1.4	4.8	0.0	0.0	0.0	1.0	60.0	1.8	6.2

Table 1-9 Median, Quartiles and Range of Relative Abundance (% cover) of Algae and Marine Vegetation Observed in the Low, Mid, and High Intertidal Zone of South Digby Island (*n*=22 transects)

Description	Common Name	Scientific Name	High (n = 15)							Mid (n = 14)							Low (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Brown algae	stringy acid weed	*Desmarestia aculeata*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.54	3.34
Brown algae	filamentous brown algae	Filamentous brown algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	0.06	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brown algae	rockweed	*Fucus* spp.	0.00	0.00	0.00	3.00	100.00	5.07	13.86	0.00	1.00	10.00	25.00	95.00	19.08	23.42	0.00	0.00	0.00	1.00	96.00	4.99	14.08
Brown algae	sea cauliflower	*Leathesia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.38	1.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brown algae	tar spot, sea fungus	*Ralfsia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.22	2.23	0.00	0.00	0.00	0.00	20.00	0.17	1.82
Brown algae	studded sea balloon	*Soranthera* spp.	0.00	0.00	0.00	0.00	2.00	0.05	0.31	0.00	0.00	0.00	0.00	30.00	0.40	2.88	0.00	0.00	0.00	0.00	7.00	0.10	0.71
Green algae	green rope	*Acrosiphonia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.00	0.63	6.38
Green algae	dwarf sea hair	*Blidingia* spp.	0.00	0.00	0.00	0.00	30.00	0.43	3.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Green algae	filamentous green algae	Filamentous green algae	0.00	0.00	0.00	0.00	25.00	0.42	2.80	0.00	0.00	0.00	0.00	15.00	0.49	2.16	0.00	0.00	0.00	0.00	80.00	0.95	7.44
Green algae	short sea lettuce	*Prasiola* spp.	0.00	0.00	0.00	0.00	4.00	0.08	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Green algae	sea lettuce	*Ulva* spp.	0.00	0.00	0.00	0.00	5.00	0.10	0.64	0.00	0.00	1.00	11.00	95.00	10.06	17.50	0.00	0.00	5.00	20.00	90.00	14.23	20.04
Kelp (brown algae)	winged kelp	*Alaria* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.27	1.89	0.00	0.00	0.00	2.00	80.00	4.20	11.08
Kelp (brown algae)	five-rib kelp	*Costaria costata*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.87	3.75
Kelp (brown algae)	bull kelp	*Nereocystis luetkeana*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	3.18	15.60
Kelp (brown algae)	sugar kelp	*Saccharina groenlandica*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.20	2.22	0.00	0.00	0.00	0.00	100.00	8.25	22.04
Kelp (brown algae)	sugar kelp	*Saccharina latisima*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.02	0.20	0.00	0.00	0.00	0.00	50.00	2.13	8.13
Marine vegetation	eelgrass	*Zostera marina*	0.00	0.00	0.00	0.00	35.00	0.45	3.84	0.00	0.00	0.00	0.00	65.00	0.52	5.77	0.00	0.00	0.00	0.00	80.00	4.17	13.54
Red algae	cup and saucer	*Constantinea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.31	1.97
Red algae	corraline crust	*Corraline crust*	0.00	0.00	0.00	0.00	2.00	0.02	0.22	0.00	0.00	0.00	0.00	25.00	0.54	2.63	0.00	0.00	0.00	0.00	60.00	2.53	8.34
Red algae	bleached brunette	*Cryptosiphonia woodii*	0.00	0.00	0.00	0.00	15.00	0.18	1.65	0.00	0.00	0.00	0.00	55.00	1.48	6.92	0.00	0.00	0.00	0.00	30.00	0.42	2.91
Red algae	sea moss	*Endocladia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.20	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red algae	filamentous red algae	Filamentous red algae	0.00	0.00	0.00	0.00	10.00	0.19	1.22	0.00	0.00	0.00	0.00	50.00	1.13	5.54	0.00	0.00	0.00	5.00	85.00	6.43	15.51
Red algae	jelly moss	*Gloiopeltis* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.13	0.82	0.00	0.00	0.00	0.00	2.00	0.02	0.18
Red algae	dead man's fingers	*Halosaccion* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	15.00	0.97	2.36	0.00	0.00	0.00	0.00	20.00	0.65	2.52
Red algae	rusty rock	*Hildenbrandia* spp.	0.00	0.00	0.00	0.00	10.00	0.33	1.39	0.00	0.00	0.00	0.00	30.00	0.59	3.07	0.00	0.00	0.00	0.00	14.00	0.13	1.28
Red algae	turkish washcloth	*Mastocarpus blade*	0.00	0.00	0.00	0.00	45.00	1.42	5.82	0.00	0.00	2.00	5.00	35.00	5.11	7.34	0.00	0.00	0.00	5.00	70.00	5.87	11.63
Red algae	turkish washcloth	*Mastocarpus crust*	0.00	0.00	0.00	0.00	40.00	2.48	7.64	0.00	0.00	2.00	10.00	75.00	6.35	11.49	0.00	0.00	0.00	1.00	40.00	2.07	5.41
Red algae	rainbow-leaf	*Mazzaella* spp.	0.00	0.00	0.00	0.00	2.00	0.02	0.22	0.00	0.00	0.00	0.00	15.00	0.57	1.96	0.00	0.00	0.00	0.00	10.00	0.30	1.14
Red algae	sea lace	*Microcladia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	0.17	1.31	0.00	0.00	0.00	0.00	30.00	0.50	3.38
Red algae	sea fern	*Neoptilota asplenioides*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.73	3.38
Red algae	black larch	*Neorhodomela* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	0.32	2.70	0.00	0.00	0.00	0.00	10.00	0.16	1.07
Red algae	sea brush	*Odonthalia* spp.	0.00	0.00	0.00	0.00	1.00	0.01	0.11	0.00	0.00	0.00	0.00	60.00	1.46	6.80	0.00	0.00	0.00	0.00	95.00	2.77	12.43
Red algae	red ribbon	*Palmaria* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.11	0.92	0.00	0.00	0.00	0.00	25.00	0.83	3.25
Red algae	common sea oak	*Phycodrus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.24	1.88
Red algae	purple leaver	*Porphyra* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09	0.00	0.00	0.00	0.00	5.00	0.11	0.69
Red algae	northern sea fern	*Ptilota serrata*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	0.24	2.66	0.00	0.00	0.00	0.00	20.00	0.17	1.82

Table 1-9 Median, Quartiles and Range of Relative Abundance (% cover) of Algae and Marine Vegetation Observed in the Low, Mid, and High Intertidal Zone of South Digby Island (*n*=22 transects)

Description	Common Name	Scientific Name	High (n = 15)							Mid (n = 14)							Low (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Riparian vegetation	black lichen	NA	0.00	0.00	0.00	17.50	90.00	12.11	21.73	0.00	0.00	0.00	0.00	35.00	0.65	4.05	0.00	0.00	0.00	0.00	40.00	0.33	3.64
Riparian vegetation	UnID grass	NA	0.00	0.00	0.00	0.00	25.00	0.65	3.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Riparian vegetation	UnID lichen	NA	0.00	0.00	0.00	0.00	50.00	1.34	6.30	0.00	0.00	0.00	0.00	10.00	0.12	0.99	0.00	0.00	0.00	0.00	25.00	0.21	2.27
Riparian vegetation	UnID moss	NA	0.00	0.00	0.00	0.00	30.00	0.83	3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.17	1.82
Riparian vegetation	UnID sedge	NA	0.00	0.00	0.00	0.00	90.00	1.77	10.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Riparian vegetation	UnID vascular plant	NA	0.00	0.00	0.00	0.00	13.00	0.22	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 1-10 Median, Quartiles and Range of Relative Abundance of Marine Fish (count/quadrat) and Invertebrates (Sessile [% cover/quadrat] and Motile [count/quadrat]) Observed in the High, Mid, and Low Intertidal Zone in South Digby Island (*n*=22 transects)

Description	Common Name	Scientific Name	High (n = 15)							Mid (n = 14)							Low (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Amphipod	gammarid amphipod	*Gammaridea* spp.	0.00	0.00	0.00	0.00	200.00	5.76	27.01	0.00	0.00	0.00	1.00	150.00	2.94	14.09	0.00	0.00	0.00	0.00	250.00	3.42	23.41
Anemone	plumose anemone	*Metridium* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Anemone	strawberry anemone	*Urticina lofotensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09
Barnacle	common acorn barnacle	*Balanus glandula*	0.00	0.00	0.00	2.00	15.00	2.06	4.04	0.00	0.00	1.00	7.50	90.00	8.98	17.46	0.00	0.00	0.00	0.00	70.00	3.69	11.75
Barnacle	small acorn barnacle	*Chthamalus dalli*	0.00	0.00	0.00	0.00	3.00	0.06	0.36	0.00	0.00	0.00	1.00	80.00	3.20	12.39	0.00	0.00	0.00	0.00	15.00	0.60	2.35
Barnacle	thatched barnacle	*Semibalanus cariosus*	0.00	0.00	0.00	0.00	40.00	0.82	4.88	0.00	0.00	0.00	1.00	40.00	3.17	7.91	0.00	0.00	0.00	0.00	25.00	0.49	2.65
Bivalve	butter clam	*Saxidomus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09
Bivalve	cockle	*Clinocardium* spp.	0.00	0.00	0.00	0.00	1.00	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.03	0.29
Bivalve	jingle shell	*Pododesmus macroschisma*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.14	1.06
Bivalve	macoma clam	*Macoma* spp.	0.00	0.00	0.00	0.00	5.00	0.07	0.56	0.00	0.00	0.00	0.00	4.00	0.06	0.40	0.00	0.00	0.00	0.00	6.00	0.07	0.58
Bivalve	mussel	*Mytilus* spp.	0.00	0.00	0.00	0.00	5.00	0.19	0.74	0.00	0.00	0.00	0.00	10.00	0.28	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bivalve	soft-shell clam	*Mya arenaria*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chiton	black katy chiton	*Katharina tunicata*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.14	0.53	0.00	0.00	0.00	0.00	6.00	0.07	0.57
Chiton	gumboot chiton	*Cryptochiton stelleri*	0.00	0.00	0.00	0.00	13.00	0.16	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09
Chiton	lined chiton	*Tonicella* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.09	0.41	0.00	0.00	0.00	0.00	30.00	0.81	3.41
Chiton	mossy, hairy, and woody chitons	*Mopalia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09	0.00	0.00	0.00	0.00	2.00	0.07	0.31
Crab	green shore crab	*Hemigrapsus oregonensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.08	0.35	0.00	0.00	0.00	0.00	1.00	0.01	0.09
Crab	hermit crab	*Pagarus* spp.	0.00	0.00	0.00	0.00	13.00	0.41	1.78	0.00	0.00	0.00	2.50	40.00	2.53	5.70	0.00	0.00	0.00	1.00	35.00	1.84	5.39
Crab	kelp crab	*Pugettia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.12	0.47
Crab	porcelain crab	*Petrolisthes* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Crab	purple shore crab	*Hemigrapsus nudus*	0.00	0.00	0.00	1.00	11.00	1.19	2.25	0.00	0.00	0.00	1.00	18.00	0.94	2.24	0.00	0.00	0.00	0.00	3.00	0.08	0.38
Crab	pygmy rock crab	*Cancer oregonensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.09	0.53	0.00	0.00	0.00	0.00	4.00	0.28	0.82
Crab	red rock crab	*Cancer productus*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crab	shap-nosed crab	*Scyra auctifrons*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.08	0.28
Crab	shore crab	*Hemigrapsus* spp.	0.00	0.00	0.00	0.00	1.00	0.01	0.11	0.00	0.00	0.00	0.00	3.00	0.09	0.44	0.00	0.00	0.00	0.00	1.00	0.03	0.18
Encrusting Animal	bryozoan	*Bryozoa* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09	0.00	0.00	0.00	0.00	25.00	0.50	2.64
Fish	black prickleback	*Xiphister atropurpureus*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.02	0.18
Fish	gunnel	*Pholis* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.12	0.00	0.00	0.00	0.00	2.00	0.08	0.33
Fish	prickleback	*Stichaeidae* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.06	0.39	0.00	0.00	0.00	0.00	6.00	0.09	0.59
Fish	saddleback gunnel	*Pholis ornata*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.02	0.27
Fish	sculpin	Family Cottidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.06	0.47	0.00	0.00	0.00	0.00	2.00	0.02	0.18
Isopod	isopod	*Idotea* spp.	0.00	0.00	0.00	0.00	15.00	0.20	1.66	0.00	0.00	0.00	0.00	200.00	2.20	18.06	0.00	0.00	0.00	0.00	5.00	0.12	0.59
Isopod	oregon pill bug	*Gnorimosphaeroma oregonensis*	0.00	0.00	0.00	0.00	6.00	0.12	0.79	0.00	0.00	0.00	0.00	25.00	0.65	3.41	0.00	0.00	0.00	0.00	10.00	0.20	1.28
Limpet	leather limpet	*Onchidella borealis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.06	0.54	0.00	0.00	0.00	0.00	2.00	0.03	0.22
Limpet	limpet	*Lottia* spp.	0.00	0.00	1.00	9.00	75.00	7.76	13.88	0.00	1.50	7.00	19.00	400.00	17.94	40.06	0.00	0.00	0.00	1.00	280.00	6.50	29.09

Table 1-10 Median, Quartiles and Range of Relative Abundance of Marine Fish (count/quadrat) and Invertebrates (Sessile [% cover/quadrat] and Motile [count/quadrat]) Observed in the High, Mid, and Low Intertidal Zone in South Digby Island (*n*=22 transects)

Description	Common Name	Scientific Name	High (n = 15)							Mid (n = 14)							Low (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Mite	red mite	*Neomolgus littoralis*	0.00	0.00	0.00	0.00	40.00	1.22	5.16	0.00	0.00	0.00	0.00	5.00	0.12	0.57	0.00	0.00	0.00	0.00	20.00	0.21	1.87
Sea cucumber	orange sea cucumber	*Cucumaria miniata*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.02	0.20
Sea star	brittle star	*Ophiurpoidea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09
Sea star	mottled star	*Evasteria troschelii*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09
Sea star	six ray star	*Leptisterias* spp.	0.00	0.00	0.00	0.00	4.00	0.07	0.49	0.00	0.00	0.00	0.00	4.00	0.15	0.55	0.00	0.00	0.00	0.00	2.00	0.02	0.18
Sea star	sunflower star	*Pycnopodia helianthoides*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.13
Sea urchin	green sea urchin	*Strongylocentrotus droebachiensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.05	0.55
Shrimp	brown shrimp	*Crangon* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.07	0.53
Snail	bittium	*Bittium* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Snail	dire whelk	*Lirabuccinum dirum*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	0.36	1.30	0.00	0.00	0.00	0.00	12.00	0.35	1.34
Snail	dogwinkle	*Nucella* spp.	0.00	0.00	0.00	0.00	14.00	0.23	1.56	0.00	0.00	0.00	0.00	22.00	0.57	2.80	0.00	0.00	0.00	0.00	3.00	0.10	0.47
Snail	lacuna snail	*Lacuna* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Snail	periwinkle	*Littorina* spp.	0.00	0.00	0.00	22.50	280.00	26.69	52.66	0.00	0.00	2.00	50.50	800.00	46.91	100.79	0.00	0.00	0.00	0.00	25.00	0.60	2.82
Snail	white bubble shell	*Haminoea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sponge	sponge	*Porifera* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Squid	bobtail squid	*Rossia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worm	blood worm	*Glycera* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.09	0.58	0.00	0.00	0.00	0.00	16.00	0.32	1.75
Worm	calcareous tubeworm	*Serpula* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.04	0.30
Worm	polychaete worm	*Polychaeta* spp.	0.00	0.00	0.00	0.00	13.00	0.25	1.67	0.00	0.00	0.00	0.00	13.00	0.25	1.44	0.00	0.00	0.00	0.00	28.00	2.05	5.15
Worm	ribbon worm	*Nemertea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09	0.00	0.00	0.00	0.00	30.00	0.36	2.87
Worm	sand worm	*Nereis* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.02	0.12	0.00	0.00	0.00	0.00	3.00	0.06	0.32
Worm	scale worm	*Polynoidae* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.09
Worm	spirorbid worm	*Spirorbis* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.84	8.88	0.00	0.00	0.00	0.00	80.00	1.45	8.85

Table 1-11 Median, Quartiles and Range of Relative Abundance of Substrate Categories (% Cover) Observed in Delusion Bay (*n*=4 transects)

Substrate	DB1 (n = 15)							DB2 (n = 15)							DB3 (n = 15)							DB4 (n = 15)						
	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Bedrock	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.0	6.3	23.2
Boulder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.0	5.3	20.7
Cobble	0.0	0.0	0.0	0.0	10.0	0.7	2.6	0.0	0.0	0.0	0.0	20.0	1.3	5.2	0.0	0.0	1.0	17.5	40.0	10.1	13.2	0.0	0.0	0.0	10.0	70.0	10.7	21.2
Detritus	0.0	0.0	0.0	0.0	5.0	0.5	1.4	0.0	0.0	0.0	0.0	5.0	0.3	1.3	0.0	0.0	0.0	0.0	2.0	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gravel	0.0	0.0	0.0	0.0	1.0	0.1	0.4	0.0	2.5	5.0	10.0	85.0	13.3	22.3	0.0	0.0	0.0	0.0	100.0	16.3	35.0	0.0	0.0	0.0	4.0	40.0	6.6	12.8
Mud	90.0	99.5	100	100	100	99.1	2.6	0.0	7.5	10.0	40.0	90.0	27.5	31.8	0.0	71.5	85.0	100	100	72.7	38.3	0.0	0.0	0.0	0.0	15.0	1.7	4.5
Organic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	6.7	25.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	95.0	6.3	24.5
Sand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	70.0	82.0	92.0	50.5	36.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	87.0	100	100	62.7	44.4
Shell	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.0	0.7	1.2	0.0	0.0	0.0	1.0	5.0	0.9	1.8	0.0	0.0	0.0	0.0	5.0	0.4	1.3

Table 1-12 Median, Quartiles and Range of Relative Abundance (% cover) of Algae and Marine Vegetation Observed in Delusion Bay (*n*=4 transects)

Description	Common Name	Scientific Name	DB1 (n= 15)							DB2 (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Brown algae	rockweed	*Fucus* spp.	0.00	0.00	0.00	0.00	2.00	0.33	0.72	0.00	0.00	3.00	9.00	90.00	14.60	27.99
Brown algae	studded sea balloon	*Soranthera* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.07	0.26
Green algae	filamentous green algae	Filamentous green algae	0.00	1.00	15.00	60.00	95.00	32.13	36.66	0.00	0.00	0.00	0.00	30.00	3.73	9.70
Green algae	sea lettuce	*Ulva* spp.	0.00	0.00	0.00	0.00	5.00	1.00	2.07	0.00	0.00	0.00	0.00	10.00	0.80	2.57
Marine vegetation	beaked widgeongrass	*Ruppia maritima*	0.00	0.00	0.00	25.00	100.00	16.27	29.08	0.00	0.00	0.00	0.00	95.00	6.33	24.53
Marine vegetation	eelgrass	*Zostera marina*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.00	6.67	19.97
Red algae	black larch	*Neorhodomela* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.20	0.77
Red algae	sea brush	*Odonthalia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	30.00	4.40	10.47
Riparian vegetation	UnID grass	NA	0.00	0.00	0.00	0.00	78.00	5.20	20.14	0.00	0.00	0.00	0.00	90.00	6.00	23.24
Riparian vegetation	UnID sedge	NA	0.00	0.00	0.00	0.00	20.00	2.33	5.63	0.00	0.00	0.00	0.00	20.00	1.67	5.23
Riparian vegetation	UnID vascular plant	NA	0.00	0.00	0.00	0.00	2.00	0.33	0.72	0.00	0.00	0.00	0.00	35.00	2.73	9.02

Table 1-12 Median, Quartiles and Range of Relative Abundance (% cover) of Algae and Marine Vegetation Observed in Delusion Bay (*n*=4 transects) (cont'd)

Description	Common Name	Scientific Name	DB3 (n = 15)							DB4 (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Brown algae	fir branch	*Analipus japonicus*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.20	0.77
Brown algae	rockweed	*Fucus* spp.	0.00	0.00	0.00	3.50	30.00	4.07	8.33	0.00	0.00	0.00	4.00	30.00	3.73	7.91
Brown algae	sea cauliflower	*Leathesia* spp.	0.00	0.00	0.00	0.00	5.00	0.67	1.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brown algae	studded sea balloon	*Soranthera* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.27	0.80
Green algae	dwarf sea hair	*Blidingia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.67	2.58
Green algae	filamentous green algae	Filamentous green algae	0.00	0.00	0.00	0.00	70.00	4.67	18.07	0.00	0.00	0.00	0.00	3.00	0.27	0.80
Green algae	sea lettuce	*Ulva* spp.	0.00	0.00	0.00	0.50	5.00	0.53	1.30	0.00	0.00	0.00	0.00	10.00	0.87	2.64
Marine vegetation	eelgrass	*Zostera marina*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.07	0.26
Red algae	dead man's fingers	*Halosaccion* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.33	1.29
Red algae	rusty rock	*Hildenbrandia* spp.	0.00	0.00	0.00	0.00	1.00	0.07	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red algae	turkish washcloth	*Mastocarpus blade*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	5.00	1.07	1.91
Red algae	turkish washcloth	*Mastocarpus crust*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.40	1.06
Red algae	sea fern	*Neoptilota asplenioides*	0.00	0.00	0.00	0.00	2.00	0.13	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red algae	black larch	*Neorhodomela* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.07	0.26
Red algae	sea brush	*Odonthalia* spp.	0.00	0.00	0.00	0.00	10.00	1.33	3.52	0.00	0.00	0.00	0.00	15.00	1.20	3.90
Riparian vegetation	UnID grass	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.00	5.00	18.03
Riparian vegetation	UnID vascular plant	NA	0.00	0.00	0.00	0.00	40.00	2.67	10.33	0.00	0.00	0.00	0.00	10.00	0.67	2.58

Table 1-13 Median, Quartiles and Range of Relative Abundance of Marine Fish (count/quadrat) and Invertebrates (Sessile [% cover/quadrat] and Motile [count/quadrat]) Observed in Delusion Bay (*n*=4 transects)

Description	Common Name	Scientific Name	DB1 (n = 15)							DB2 (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Amphipod	gammarid amphipod	*Gammaridea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.33	0.90
Barnacle	common acorn barnacle	*Balanus glandula*	0.00	0.00	0.00	0.00	10.00	0.73	2.58	0.00	0.50	2.00	5.00	10.00	3.07	3.35
Bivalve	mussel	*Mytilus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.07	0.26
Isopod	oregon pill bug	*Gnorimosphaeroma oregonensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.27	0.70
Limpet	leather limpet	*Onchidella borealis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Limpet	limpet	*Lottia* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	10.00	1.67	3.18
Snail	periwinkle	*Littorina* spp.	0.00	0.00	0.00	0.00	3.00	0.33	0.90	0.00	0.00	5.00	35.00	100.00	19.73	29.15
Worm	polychaete worm	*Polychaeta* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.07	0.26

Table 1-13 Median, Quartiles and Range of Relative Abundance of Marine Fish (count/quadrat) and Invertebrates (Sessile [% cover/quadrat] and Motile [count/quadrat]) Observed in Delusion Bay (*n*=4 transects) (cont'd)

Description	Common Name	Scientific Name	DB3 (n = 15)							DB4 (n = 15)						
			Min	Q1	Median	Q3	Max	Mean	SD	Min	Q1	Median	Q3	Max	Mean	SD
Amphipod	gammarid amphipod	*Gammaridea* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	1.40	3.50
Barnacle	common acorn barnacle	*Balanus glandula*	0.00	0.00	1.00	10.00	25.00	6.40	8.91	0.00	0.00	0.00	8.00	70.00	9.07	19.26
Barnacle	small acorn barnacle	*Chthamalus dalli*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.40	1.06
Barnacle	thatched barnacle	*Semibalanus cariosus*	0.00	0.00	0.00	0.00	10.00	0.67	2.58	0.00	0.00	0.00	0.00	10.00	0.67	2.58
Bivalve	butter clam	*Saxidomus* spp.	0.00	0.00	0.00	0.00	1.00	0.07	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bivalve	macoma clam	*Macoma* spp.	0.00	0.00	0.00	0.00	2.00	0.13	0.52	0.00	0.00	0.00	0.00	8.00	0.80	2.24
Bivalve	mussel	*Mytilus* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.07	0.26
Crab	green shore crab	*Hemigrapsus oregonensis*	0.00	0.00	0.00	0.00	1.00	0.07	0.26	0.00	0.00	0.00	0.50	5.00	0.73	1.58
Crab	hermit crab	*Pagarus* spp.	0.00	0.00	0.00	0.50	1.00	0.27	0.46	0.00	0.00	0.00	1.00	12.00	1.33	3.15
Crab	purple shore crab	*Hemigrapsus nudus*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.20	0.56
Crab	shore crab	*Hemigrapsus* spp.	0.00	0.00	0.00	0.00	5.00	0.33	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Isopod	isopod	*Idotea* spp.	0.00	0.00	0.00	0.00	1.00	0.07	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Isopod	oregon pill bug	*Gnorimosphaeroma oregonensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00	1.40	4.24
Limpet	limpet	*Lottia* spp.	0.00	0.00	0.00	0.50	6.00	1.00	1.96	0.00	0.00	0.00	2.50	20.00	3.67	7.19
Mite	red mite	*Neomolgus littoralis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	0.53	2.07
Shrimp	ghost shrimp	*Neotrypaea californiensis*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.13	0.52
Snail	dogwinkle	*Nucella* spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.80	2.01
Snail	periwinkle	*Littorina* spp.	0.00	0.00	0.00	1.50	45.00	6.53	13.74	0.00	0.00	0.00	5.00	50.00	6.47	13.99
Worm	blood worm	*Glycera* spp.	0.00	0.00	0.00	6.00	22.00	4.00	6.55	0.00	0.00	0.00	6.00	10.00	2.93	3.84
Worm	polychaete worm	*Polychaeta* spp.	0.00	0.00	0.00	0.00	4.00	0.53	1.19	0.00	0.00	2.00	6.00	40.00	7.33	12.53
Worm	ribbon worm	*Nemertea* spp.	0.00	0.00	0.00	0.00	2.00	0.27	0.70	0.00	0.00	0.00	0.00	6.00	0.80	2.11
Worm	sand worm	*Nereis* spp.	0.00	0.00	0.00	2.00	18.00	2.27	4.83	0.00	0.00	0.00	0.00	2.00	0.13	0.52

APPENDIX 2

Subtidal ROV Surveys

Table 2-1 Coordinates, Depth and Length of Subtidal ROV Transects in Each Study Area

Transect	Start Coordinates		End Coordinates		Transect Depth (m)		Transect Length (m)
	Latitude	Longitude	Latitude	Longitude	Min	Max	
Casey Cove							
CC01	54.282415	-130.371575	54.281317	-130.382463	2	23	782
CC02	54.278983	-130.383212	54.280333	-130.370893	2	28	995
CC03	54.279105	-130.376673	54.282467	-130.376652	1	17	506
CC04	54.278792	-130.378813	54.281847	-130.378383	3	11	384
CC05	54.279157	-130.374410	54.283310	-130.375032	5	20	539
CC06	54.279093	-130.372315	54.284507	-130.372820	1	28	646
CC07	54.279555	-130.368753	54.278697	-130.371257	1	29	310
CC08	54.277783	-130.368445	54.277873	-130.370953	2	36	220
East Digby Island							
ED01	54.277000	-130.364000	54.276817	-130.370767	1	39	453
ED02	54.274542	-130.365252	54.274605	-130.371325	5	48	414
ED03	54.271792	-130.364407	54.271697	-130.370168	5	49	400
ED04	54.270767	-130.364617	54.270033	-130.370650	1	36	448
ED05	54.267783	-130.360333	54.267850	-130.369433	0	41	621
ED06	54.265033	-130.358350	54.265133	-130.365000	1	39	491
ED07	54.262583	-130.357900	54.262367	-130.364483	0	41	430
ED08	54.259900	-130.358800	54.259933	-130.363033	0	34	276
ED09	54.257483	-130.357083	54.257383	-130.361300	1	26	274
South Digby Island							
SD01	54.235473	-130.350100	54.229382	-130.375982	23	56	1899
SD02	54.237015	-130.351417	54.231068	-130.377353	17	44	1875
SD03	54.238872	-130.352445	54.238317	-130.393982	4	42	1850
SD04	54.240300	-130.354000	54.234617	-130.377352	1	28	1758

Table 2-1 Coordinates, Depth and Length of Subtidal ROV Transects in Each Study Area

Transect	Start Coordinates		End Coordinates		Transect Depth (m)		Transect Length (m)
	Latitude	Longitude	Latitude	Longitude	Min	Max	
SD05	54.241373	-130.351237	54.236708	-130.377318	1	39	1538
SD06	54.243493	-130.356468	54.238237	-130.378533	1	26	1558
SD07	54.245315	-130.357197	54.239677	-130.380310	1	30	1640
SD08	54.254868	-130.364310	54.235805	-130.350233	1	59	2324
SD09	54.244578	-130.360237	54.253572	-130.366433	1	27	1084
SD10	54.243968	-130.363527	54.254505	-130.371388	1	22	1300
SD11	54.243282	-130.366242	54.252037	-130.372093	1	11	1150
SD12	54.242468	-130.369327	54.250922	-130.375203	1	16	621
SD13	54.242017	-130.371972	54.255082	-130.381947	1	14	1771
SD14	54.229675	-130.375662	54.235212	-130.379415	2	26	749
SD15	54.243658	-130.373613	54.241595	-130.381942	0	15	611
SD16	54.255248	-130.382218	54.254170	-130.385497	1	4	259
SD17	54.253557	-130.380432	54.252718	-130.384642	1	5	298
SD18	54.251948	-130.379448	54.251038	-130.385418	1	5	329
SD19	54.250338	-130.378098	54.249297	-130.381368	1	6	289
SD20	54.248518	-130.376760	54.247673	-130.380613	1	11	277
SD21	54.246863	-130.375570	54.245713	-130.380972	1	12	387
SD22	54.245317	-130.374605	54.244163	-130.379365	1	10	353
SD23	54.254768	-130.360122	54.254867	-130.359333	1	43	513
SD24	54.251217	-130.357617	54.254800	-130.364300	2	34	564

Table 2-2 Algae, Marine Vegetation and Sessile Invertebrates Observed During the Casey Cove Subtidal ROV Survey

Scientific Name	Common Name	Transect							
		CC01	CC02	CC03	CC04	CC05	CC06	CC07	CC08
Algae and Marine Vegetation									
Alaria marginata	ribbon kelp							X	X
Fucus gardneri	rockweed			X					X
Laminaria spp.	tangle kelp	X	X	X	X	X	X	X	X
Lithothamnion spp.	pink rock crust					X		X	X
Nereocystis spp.	bull kelp			X		X	X	X	X
Ulva spp.	sea lettuce			X	X		X	X	X
UnID Corallinales	UnID crustose corraline algae							X	
UnID Heterokontophyta	UnID brown algae			X					
UnID Rhodophyta	UnID red algae		X		X	X	X	X	X
Zostera marina	eelgrass	X	X		X		X		
Sessile Invertebrates									
Aphrocallistes vastus	cloud sponge							X	
Balanophyllia elegans	orange cup coral					X			
Ciona savignyi	sea vase						X		
Halocynthia aurantium	Pacific sea peach	X	X					X	
Membranipora membranacea	lacy crust bryozoan			X	X	X	X	X	
Plocamia karykina	bright red sponge					X			
Syringella amphispicula	tough yellow branching sponge								X
UnID Hydrozoa	UnID hydroid								X
UnID Sabellidae	UnID feather duster worm					X			
UnID Serpulidae	UnID tubeworm	X	X						

NOTES:
X = observed

Table 2-3 Relative Abundance (# / 100 m) of Marine Fish and Motile Invertebrates Observed During the Casey Cove Subtidal ROV Survey

Scientific Name	Common Name	Transcect								Mean (± SD)	Median (IQR)	Total Count
		CC01	CC02	CC03	CC04	CC05	CC06	CC07	CC08			
Marine Fish												
Cymatogaster aggregata	shiner perch	0.00	0.00	5.53	0.00	0.00	0.00	0.00	0.00	0.69 (1.96)	0 (0-0)	28
Enophrys bison	buffalo sculpin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.06 (0.16)	0 (0-0)	1
Hemilepidotus	red irish lord	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Hexagrammos decagrammus	kelp greenling	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.07 (0.21)	0 (0-0)	3
Hexagrammos stelleri	whitespotted greenling	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.46	0.1 (0.18)	0 (0-0.08)	2
Lepidopsetta bilineata	rock sole	0.13	1.00	2.37	2.86	1.48	0.77	0.00	0.00	1.08 (1.09)	0.89 (0.1-1.71)	47
Lumpenus sagitta	snake prickleback	0.13	0.30	0.40	0.00	1.11	1.08	0.00	0.00	0.38 (0.47)	0.21 (0-0.57)	19
Microgadus proximus	Pacific tomcod	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.04 (0.11)	0 (0-0)	3
Ophiodon elongatus	lingcod	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.04 (0.11)	0 (0-0)	1
Parophrys vetulus	English sole	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.05)	0 (0-0.03)	2
Platichthys stellatus	starry flounder	0.00	0.00	0.00	0.26	0.00	0.15	0.00	0.46	0.11 (0.17)	0 (0-0.18)	3
Ronquilus jordani	northern ronquil	0.00	0.50	1.98	0.26	0.56	0.00	0.64	0.46	0.55 (0.63)	0.48 (0.2-0.58)	22
Sebastes caurinus	copper rockfish	0.00	0.00	0.00	0.00	0.00	0.00	2.26	0.00	0.28 (0.8)	0 (0-0)	7
UnID Agonidae	UnID poacher	0.00	0.00	0.00	0.26	0.00	0.15	0.00	0.00	0.05 (0.1)	0 (0-0.04)	2
UnID Bathymasteridae	UnID ronquil	0.13	0.30	0.00	0.00	0.37	0.00	0.32	0.46	0.2 (0.19)	0.21 (0-0.33)	8
UnID Cottidae	UnID sculpin	0.26	0.30	0.99	0.00	0.19	0.46	0.00	0.00	0.27 (0.33)	0.22 (0-0.34)	14
UnID Embiotocidae	UnID surfperch	0.13	0.00	0.40	1.30	1.11	3.72	0.64	0.00	0.91 (1.24)	0.52 (0.1-1.16)	40
UnID Fish	UnID fish	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.04 (0.11)	0 (0-0)	1
UnID Hexagrammidae	UnID greenling	0.13	0.00	0.20	0.00	0.37	0.00	0.32	0.00	0.13 (0.15)	0.06 (0-0.23)	5
UnID Pleuronectidae	UnID right eye flounder	0.13	0.10	0.59	0.00	0.00	0.15	0.00	0.00	0.12 (0.2)	0.05 (0-0.13)	6
UnID Stichaedae	UnID prickleback	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
UnID Zoarcidae	UnID eelpout	0.00	0.20	0.40	0.26	0.00	0.00	0.00	0.46	0.16 (0.19)	0.1 (0-0.29)	6
Crab and Shrimp												
Cancer productus	red rock crab	0.26	0.10	0.40	0.26	0.19	0.15	0.00	0.00	0.17 (0.14)	0.17 (0.08-0.26)	8
Chorilia longipes	longhorn decorator crab	0.26	0.30	0.00	0.00	0.19	0.15	0.00	0.00	0.11 (0.13)	0.08 (0-0.2)	7
Hyas lyratus	Pacific lyre crab	0.38	1.41	0.20	0.00	0.00	0.31	0.00	0.00	0.29 (0.48)	0.1 (0-0.33)	20
Metacarcinus magister	Dungeness crab	0.77	0.70	0.79	6.25	0.37	0.31	0.00	0.00	1.15 (2.08)	0.54 (0.23-0.77)	45
Oregonia gracilis	graceful decorator crab	0.26	1.21	0.00	0.00	0.19	2.17	0.00	0.00	0.48 (0.8)	0.09 (0-0.49)	29
Pugettia producta	northern kelp crab	0.00	0.00	0.00	0.52	0.19	0.77	0.32	0.00	0.23 (0.29)	0.09 (0-0.37)	9
UnID Paguroidea	UnID hermit crab	1.02	0.80	1.38	0.78	1.48	4.65	0.00	0.00	1.27 (1.47)	0.91 (0.59-1.41)	64

Table 2-3 Relative Abundance (# / 100 m) of Marine Fish and Motile Invertebrates Observed During the Casey Cove Subtidal ROV Survey

Scientific Name	Common Name	Transect								Mean (± SD)	Median (IQR)	Total Count
		CC01	CC02	CC03	CC04	CC05	CC06	CC07	CC08			
Other Marine Invertebrates												
Armina californica	striped nudibranch	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.04 (0.11)	0 (0-0)	2
Chlamys hastata	spiny scallop	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.04)	0 (0-0)	1
Cribrinopsis fernaldi	crimson anemone	0.13	0.00	0.20	0.00	0.00	0.15	0.00	0.00	0.06 (0.08)	0 (0-0.13)	3
Crossaster papposus	rose star	0.00	0.00	0.00	0.00	0.00	0.15	0.32	0.00	0.06 (0.12)	0 (0-0.04)	2
Dendronotus rufus	red dendronotus	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.05)	0 (0-0)	1
Dermasterias imbricata	leather star	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.2 (0.57)	0 (0-0)	5
Doris odhneri	giant white dorid	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.08 (0.23)	0 (0-0)	2
Evasterias troscheli	mottled star	0.00	0.00	0.00	0.26	1.48	0.15	0.00	0.46	0.29 (0.51)	0.08 (0-0.31)	11
Gorgonocephalus eucnemis	basket star	0.00	0.00	0.20	0.00	0.00	0.00	0.32	0.46	0.12 (0.18)	0 (0-0.23)	3
Hippasteria spinosa	spiny red star	0.00	0.00	0.40	0.00	0.00	0.15	0.32	0.00	0.11 (0.16)	0 (0-0.2)	4
Luidia foliolata	sandstar	0.13	0.20	0.20	0.26	0.56	0.15	0.00	0.00	0.19 (0.18)	0.18 (0.1-0.22)	9
Mediaster aequalis	vermilion star	0.51	0.50	0.00	0.00	0.19	0.46	3.87	2.28	0.98 (1.38)	0.48 (0.14-0.95)	30
Metridium farcimen	giant plumose anemone	0.64	0.90	1.98	1.30	1.85	0.93	0.00	0.46	1.01 (0.68)	0.92 (0.59-1.44)	46
Ophiura sarsii	brittle star	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Orthasterias koehleri	rainbow star	0.13	0.10	0.00	0.00	0.56	0.15	0.97	0.00	0.24 (0.35)	0.11 (0-0.26)	9
Parastichopus californicus	giant california sea cucumber	2.43	1.00	9.09	0.78	5.38	2.94	5.80	25.50	6.61 (8.12)	4.16 (2.07-6.62)	200
Psolus chitinoides	creeping pedal sea cucumber	0.13	0.00	0.00	0.00	2.78	6.04	0.00	2.28	1.4 (2.19)	0.06 (0-2.4)	60
Ptilosarcus gurneyi	orange sea pen	0.00	0.00	0.00	0.00	0.19	1.24	0.32	0.00	0.22 (0.43)	0 (0-0.22)	10
Pycnopodia helianthoides	sunflower star	0.64	0.50	0.99	0.78	1.85	2.01	3.22	3.19	1.65 (1.1)	1.42 (0.75-2.31)	58
Solaster dawsoni	morning sunstar	0.26	0.10	0.00	0.00	0.00	0.00	0.64	0.00	0.13 (0.23)	0 (0-0.14)	5
Solaster spp.	UnID sunstar	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.08 (0.23)	0 (0-0)	2
Stomphia didemon	swimming anemone	2.94	0.90	2.17	0.00	3.34	2.79	0.00	0.46	1.57 (1.39)	1.54 (0.34-2.83)	80
Strongylocentrotus franciscanus	red urchin	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.46	0.18 (0.36)	0 (0-0.11)	4
Stylasterias forreri	velcro star	0.00	0.10	0.00	0.00	0.19	0.00	0.32	0.91	0.19 (0.31)	0.05 (0-0.22)	5
UnID Pectinidae	UnID scallop	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.06 (0.16)	0 (0-0)	1

NOTES:
SD = Standard deviation. IQR = Interquartile range.

Table 2-4 Algae, Marine Vegetation and Sessile Invertebrates Observed During the East Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect								
		ED01	**ED02**	**ED03**	**ED04**	**ED05**	**ED06**	**ED07**	**ED08**	**ED09**
Algae and Marine Vegetation										
Agarum clathratum	sieve kelp		X	X						
Alaria marginata	ribbon kelp		X							
Costaria costata	ribbed kelp	X								
Fucus gardneri	rockweed	X					X	X		X
Hildenbrandia spp.	red rock crust	X			X					
Lithothamnion spp.	pink rock crust	X	X	X	X	X		X	X	X
Nereocystis spp.	bull kelp									X
Pleurophycus gardneri	broad-ribbed kelp							X		
Saccharina groenlandica	split kelp							X		X
Saccharina sessilis	sea cabbage		X							
Ulva lactuca	sea lettuce				X			X	X	
Ulva spp.	UnID Ulva							X		
UnID Chlorophyta	UnID green algae			X						
UnID Heterokontophyta	UnID brown algae		X	X	X		X			
UnID Rhodophyta	UnID red algae	X		X	X		X	X	X	X
Zostera marina	eelgrass				X	X		X	X	
Sessile Invertebrates										
Abietinaria spp.	coarse sea fir hydroids			X	X				X	X
Aglaophenia struthionides	ostrich-plume hydroids				X					
Ascidia paratropa	glassy sea squirt		X			X			X	
Balanophyllia elegans	orange cup coral	X			X					
Balanus glandula	common acorn barnacles	X			X	X	X	X		X

Table 2-4 Algae, Marine Vegetation and Sessile Invertebrates Observed During the East Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect								
		ED01	ED02	ED03	ED04	ED05	ED06	ED07	ED08	ED09
Balanus nubilus	giant acorn barnacles				X					
Chone aurantiaca	orange feather duster tubeworm				X		X			
Geodia mesotriaena	armoured ball sponge	X			X					
Halocynthia aurantium	Pacific sea peach	X			X	X				
Heteropora alaskensis	delicate staghorn bryozoan		X							
Heteropora Pacifica	northern staghorn bryozoan			X	X	X		X		
Hippodiplosia insculpta	fluted bryozoan				X					
Membranipora serrilamella	kelp encrusting bryozoan	X								X
Microporina borealis	stick bryozoan					X		X		
Plocamia karykina	bright red sponge				X					
Pseudochitinopoma occidentalis	Western calcareous tubeworms							X		
Rhabdocalyptus dawsoni	sharp lipped boot sponge				X					
Selaginopsis spp	fish-bone hydroid							X		
Semibalanus cariosus	thatched acorn barnacles	X			X					
Stylaster campylecus	white branching hydrocoral	X				X				
Stylaster norvigicus	pink branching hydrocoral	X	X	X	X	X				
Suberites domuncula	hermit crab sponge	X			X					
Thuiaria spp.	embedded sea fir hydroids	X			X					
UnID Annelida	UnID calcareous tubeworms	X								
UnID Barnacles	UnID barnacles	X		X	X	X		X	X	X

Table 2-4 Algae, Marine Vegetation and Sessile Invertebrates Observed During the East Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect								
		ED01	ED02	ED03	ED04	ED05	ED06	ED07	ED08	ED09
UnID Bryozoa	UnID bryozoans	X			X			X		X
UnID encrusting sponge	UnID encrusting sponge	X			X	X		X		X
UnID Hydrozoa	UnID hydroid	X	X	X	X	X		X	X	X
UnID Porifera	UnID encrusting yellow sponge							X		X
UnID Sabellidae	UnID feather duster worm				X	X	X			X
UnID Serpulidae	UnID tubeworm	X							X	
UnID Sponge	UnID sponge	X		X	X					X
UnID Tunicata	UnID tunicate		X		X					X

NOTES:
X = observed

Table 2-5 Relative Abundance (# / 100 m) of Marine Fish and Motile Invertebrates Observed During the East Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect									Mean (± SD)	Median (IQR)	Total Count
		ED01	ED02	ED03	ED04	ED05	ED06	ED07	ED08	ED09			
Marine Fish													
Artedius fenestralis	padded sculpin	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.08)	0 (0-0)	1
Aulorhynchus flavidus	tubesnout	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.05 (0.15)	0 (0-0)	2
Cymatogaster aggregata	shiner perch	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.03 (0.08)	0 (0-0)	1
Enophrys bison	buffalo sculpin	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Hemilepidotus spp.	UnID irish lord	0.44	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.1 (0.2)	0 (0-0)	4
Hexagrammos decagrammus	kelp greenling	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Lepidopsetta bilineata	rock sole	0.22	0.00	0.00	0.45	0.16	0.41	0.00	0.00	0.36	0.18 (0.19)	0.16 (0-0.36)	7
Leptocottus armatus	Pacific staghorn sculpin	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.05 (0.15)	0 (0-0)	2
Liparis spp.	UnID snailfish	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Lumpenus sagitta	snake prickleback	0.88	0.48	0.00	0.00	0.32	0.41	0.23	0.00	0.73	0.34 (0.32)	0.32 (0-0.48)	13
Lycodes Pacificus	blackbelly eelpout	0.00	0.00	0.00	0.67	0.00	0.00	0.23	0.00	0.00	0.1 (0.23)	0 (0-0)	4
Myoxocephalus polyacanthocephalus	great sculpin	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Oligocottus maculosus	tidepool sculpin	0.00	0.00	0.00	1.34	0.00	0.00	0.00	0.00	0.00	0.15 (0.45)	0 (0-0)	6
Parophrys vetulus	English sole	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Raja binoculata	big skate	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.08)	0 (0-0)	1
Ronquilus jordani	northern ronquil	1.10	0.00	0.25	0.45	0.48	0.41	1.63	0.73	0.00	0.56 (0.53)	0.45 (0.25-0.73)	22
UnID Cottidae	UnID sculpin	0.00	0.48	0.50	1.56	0.00	0.20	0.23	0.73	0.73	0.49 (0.49)	0.48 (0.2-0.73)	17
UnID Embiotocidae	UnID surfperch	0.44	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13 (0.27)	0 (0-0)	5
UnID Fish	UnID fish	1.54	0.48	0.25	0.89	0.81	1.02	0.70	0.73	3.28	1.08 (0.9)	0.81 (0.7-1.02)	38
UnID Gadidae	UnID cod	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.08)	0 (0-0)	1
UnID Hexagrammidae	UnID greenling	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
UnID Pleuronectidae	UnID right eye flounder	0.44	0.00	0.00	0.00	0.00	0.20	0.00	0.36	0.73	0.19 (0.27)	0 (0-0.36)	6
Crab and Shrimp													
Cancer productus	red rock crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45	0.00	0.16 (0.48)	0 (0-0)	4
Chionoecetes bairdi	tanner crab	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.07 (0.21)	0 (0-0)	4
Chorilia longipes	longhorn decorator crab	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.08)	0 (0-0)	1
Hemigrapsus spp.	shore crabs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.04 (0.12)	0 (0-0)	1
Hyas lyratus	Pacific lyre crab	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.08)	0 (0-0)	1
Metacarcinus magister	Dungeness crab	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.36	0.00	0.09 (0.19)	0 (0-0)	4
Munida quadrispina	squat lobster	1.32	0.24	0.50	0.22	0.16	0.00	1.63	0.00	0.00	0.45 (0.61)	0.22 (0-0.5)	18
Oregonia gracilis	graceful decorator crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.12 (0.36)	0 (0-0)	3
Pagurus spp.	hermit crab	2.43	0.00	0.25	0.67	1.29	0.41	0.70	0.73	0.00	0.72 (0.76)	0.67 (0.25-0.73)	30
Pandalus danae	coonstripe shrimp	0.44	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.1 (0.21)	0 (0-0)	4
Pandalus eous	spiny pink shrimp	0.22	0.48	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.11 (0.17)	0 (0-0.22)	4
Pandalus hypsinotus	humpback shrimp	0.44	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.07 (0.15)	0 (0-0)	3

Table 2-5 Relative Abundance (# / 100 m) of Marine Fish and Motile Invertebrates Observed During the East Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect									Mean (± SD)	Median (IQR)	Total Count
		ED01	ED02	ED03	ED04	ED05	ED06	ED07	ED08	ED09			
Pandalus platyceros	spot prawn	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.05 (0.16)	0 (0-0)	3
Pandalus spp.	UnID pandalus shrimp	211.74	108.65	56.19	22.34	169.14	346.17	372.07	148.67	0.00	159.44 (132.52)	148.67 (56.19-211.74)	6495
Pugettia producta	northern kelp crab	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.73	0.11 (0.25)	0 (0-0)	3
Pugettia richii	cryptic kelp crab	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Scyra acutifrons	sharp-nosed crab	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.05 (0.15)	0 (0-0)	2
UnID Crab	UnID crab	0.00	0.00	0.25	0.45	0.64	0.00	0.00	0.00	0.73	0.23 (0.3)	0 (0-0.45)	9
Other Marine Invertebrates													
Anthopleura xanthogrammica	green surf anemone	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Asterina miniata	bat star	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Calliostoma annulatum	purple-ringed topsnail	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.08)	0 (0-0)	1
Ceramaster patagonicus	cookie star	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.02 (0.05)	0 (0-0)	1
Chlamys hastata	spiny scallop	55.58	0.00	0.00	4.02	3.22	2.24	0.47	3.26	0.73	7.72 (18.01)	2.24 (0.47-3.26)	314
Chlamys rubida	smooth pink scallop	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22 (0.67)	0 (0-0)	8
Cribrinopsis fernaldi	crimson anemone	3.53	0.00	0.00	0.45	5.15	1.22	1.86	5.08	2.55	2.2 (2.02)	1.86 (0.45-3.53)	85
Crossaster papposus	rose star	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.07 (0.21)	0 (0-0)	4
Cucumaria miniata	red sea cucumber	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.73	0.11 (0.25)	0 (0-0)	3
Dendraster excentricus	Pacific sand dollar	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.02 (0.05)	0 (0-0)	1
Dendronotus dalli	dall's dendronotid	0.22	0.00	0.00	0.00	0.16	0.00	0.00	0.00	1.09	0.16 (0.36)	0 (0-0.16)	5
Dermasterias imbricata	leather star	0.00	0.24	0.25	0.45	0.64	0.41	0.23	0.36	3.28	0.65 (1)	0.36 (0.24-0.45)	21
Dirona albolineata	frosted dirona	0.00	0.00	0.00	2.01	0.00	0.00	0.00	0.00	0.00	0.22 (0.67)	0 (0-0)	9
Dirona pellucida	golden dirona	0.00	0.00	0.25	0.45	0.00	0.00	0.00	0.00	0.00	0.08 (0.16)	0 (0-0)	3
Enteroctopus dofleini	giant Pacific octopus	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Florometra serratissima	feather stars	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Halipteris willemoesi	sea whip	0.44	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.16 (0.27)	0 (0-0.24)	5
Henricia aspera	ridged blood star	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12 (0.37)	0 (0-0)	5
Henricia leviuscula	blood star	0.88	0.72	0.25	0.22	0.48	0.41	0.70	0.36	0.00	0.45 (0.28)	0.41 (0.25-0.7)	18
Henricia sanguinolenta	fat blood star	0.44	0.00	0.00	0.22	0.00	0.20	0.00	0.00	0.00	0.1 (0.16)	0 (0-0.2)	4
Mediaster aequalis	vermilion star	2.43	1.21	0.00	0.22	1.45	0.20	0.23	0.36	1.09	0.8 (0.8)	0.36 (0.22-1.21)	32
Metridium farcimen	giant plumose anemone	0.88	0.97	0.00	0.00	2.90	0.00	0.23	0.00	0.73	0.63 (0.94)	0.23 (0-0.88)	29
Orthasterias koehleri	rainbow star	0.22	0.00	0.00	0.22	0.00	0.00	0.47	0.00	0.36	0.14 (0.18)	0 (0-0.22)	5
Pachycerianthus fimbriatus	tube-dwelling anemone	0.00	0.00	0.25	0.45	0.32	0.00	0.23	1.09	0.00	0.26 (0.35)	0.23 (0-0.32)	9
Parastichopus californicus	giant california sea cucumber	18.75	17.87	13.24	30.83	12.40	7.74	15.58	11.24	12.39	15.56 (6.65)	13.24 (12.39-17.87)	597
Pisaster brevispinus	giant pink star	0.00	0.00	0.25	0.00	0.00	0.20	0.00	0.00	0.00	0.05 (0.1)	0 (0-0)	2
Pisaster ochraceus	ochre star	0.44	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.36	0.12 (0.18)	0 (0-0.23)	4
Pteraster tesselatus	slime star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.04 (0.12)	0 (0-0)	1
Ptilosarcus gurneyi	orange sea pen	0.00	0.97	0.50	0.45	0.81	0.00	0.00	0.00	0.00	0.3 (0.39)	0 (0-0.5)	13

Table 2-5 Relative Abundance (# / 100 m) of Marine Fish and Motile Invertebrates Observed During the East Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect									Mean (± SD)	Median (IQR)	Total Count
		ED01	ED02	ED03	ED04	ED05	ED06	ED07	ED08	ED09			
Pycnopodia helianthoides	sunflower star	0.22	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.05 (0.1)	0 (0-0)	2
Rossia Pacifica	stubby squid	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Stomphia didemon	swimming anemone	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Strongylocentrotus droebachiensis	green urchin	0.22	0.00	0.00	2.01	0.00	0.00	0.47	0.00	2.19	0.54 (0.9)	0 (0-0.47)	18
Strongylocentrotus franciscanus	red urchin	9.93	10.87	3.25	11.39	0.81	0.00	30.93	0.00	13.85	9 (9.85)	9.93 (0.81-11.39)	330
Strongylocentrotus pallidus	white urchin	6.62	12.56	7.24	14.74	0.81	0.00	5.12	0.00	6.56	5.96 (5.26)	6.56 (0.81-7.24)	222
Strongylocentrotus purpuratus	purple urchin	3.09	0.00	0.00	6.70	0.00	0.00	18.14	0.00	12.39	4.48 (6.67)	0 (0-6.7)	156
Synallectes challangeri	long-spined sea cucumber	0.00	0.00	0.00	0.00	0.16	0.20	0.00	0.36	0.36	0.12 (0.16)	0 (0-0.2)	4
Triopha catalinae	clown nudibranch	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.08)	0 (0-0)	1
Tritonia festiva	diamondback nudibranch	0.00	0.00	0.00	0.45	0.00	0.00	0.23	0.73	2.19	0.4 (0.72)	0 (0-0.45)	11
UnID Anthozoa	UnID anemone	2.87	4.10	3.00	0.67	0.64	0.41	0.47	0.00	1.46	1.51 (1.45)	0.67 (0.47-2.87)	57
UnID Asteroidea	UnID sea star	0.00	0.24	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.08 (0.18)	0 (0-0)	3
UnID Nudibranch	UnID nudibranch	0.44	1.21	0.25	0.89	0.16	0.00	0.00	0.00	0.00	0.33 (0.44)	0.16 (0-0.44)	13
UnID Pectinidae	UnID scallop	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05 (0.15)	0 (0-0)	2
UnID white anemone	UnID white anemone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.08 (0.24)	0 (0-0)	2
Urticina crassicornis	painted anemone	0.00	0.00	0.00	0.22	0.00	0.20	0.00	0.00	0.00	0.05 (0.09)	0 (0-0)	2
Virgularia spp.	white sea pen	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.36	0.1 (0.19)	0 (0-0)	3

NOTES:
SD = Standard deviation. IQR = Interquartile range.

Table 2-6 Algae, Marine Vegetation and Sessile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect																							
		SD01	SD02	SD03	SD04	SD05	SD06	SD07	SD08	SD09	SD10	SD11	SD12	SD13	SD14	SD15	SD16	SD17	SD18	SD19	SD20	SD21	SD22	SD23	SD24
Algae and Marine Vegetation																									
Agarum spp.	sieve kelp					X		X	X		X	X	X		X										
Alaria marginata	ribbon kelp				X					X		X			X	X						X			
Alaria spp.	winged kelp										X				X										
Constantinea rosa-marina	cup and saucer																							X	
Fucus gardneri	rockweed				X	X						X				X	X	X	X			X			
Halosaccion glandiforme	sea sac					X										X						X			
Laminaria saccharina	sugar kelp							X																	
Laminaria spp.	tangle kelp				X			X		X	X	X			X	X					X	X	X		
Lithothamnion spp.	pink rock crust			X		X	X	X	X	X			X		X									X	X
Mastocarpus papillatus	turkish washcloth					X		X		X						X									
Mastocarpus spp.	*mastocarpus* spp.										X														
Mazzaella splendens	splendid iridescent seaweed										X					X									
Mazzaella spp.	rainbow-leaf										X		X		X										
Neorhodomela spp.	black pine										X														
Nereocystis luetkeana	bull kelp			X	X	X	X		X	X	X	X	X	X	X										
Odonthalia spp.	UnID sea brush										X											X			
Opuntiella californica	red opuntia																							X	
Petrocelis spp.	tar spot seaweed																					X			
Pterosiphonia bipinnata	black tassel											X													
Saccharina groenlandica	split kelp																							X	
Saccharina spp.	kelp spp.			X	X	X	X	X	X	X			X		X	X									
Ulva spp.	UnID *Ulva*			X	X			X	X		X	X	X	X	X	X	X	X				X		X	
UnID algae	UnID algae				X	X		X	X	X			X	X	X										
UnID Bacillariophyceae	UnID diatom														X										
UnID Corallinales	UnID crustose corraline algae										X														
UnID Filamentous Red Algae	Filamentous red algae						X								X	X						X			
UnID Heterokontophyta	UnID brown algae			X		X																X		X	X
UnID Rhodophyta	UnID red algae			X					X						X									X	
Zostera marina	eelgrass			X				X			X	X	X	X		X	X	X	X	X	X			X	
Sessile Marine Invertebrates																									
Abietinaria spp.	coarse sea fir hydroids																							X	
Ascidia paratropa	glassy sea squirt	X																							
Balanophyllia elegans	orange cup coral		X																						
Balanus glandula	common acorn barnacles		X				X										X	X				X		X	
Chone aurantiaca	orange feather duster tubeworm	X																							

Table 2-6 Algae, Marine Vegetation and Sessile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect																							
		SD01	SD02	SD03	SD04	SD05	SD06	SD07	SD08	SD09	SD10	SD11	SD12	SD13	SD14	SD15	SD16	SD17	SD18	SD19	SD20	SD21	SD22	SD23	SD24
Ciona savignyi	sea vase								X	X															
Corella willmeriana	transparent tunicate	X									X														
Haliclona permollis	purple encrusting sponge			X																					
Heteropora Pacifica	northern staghorn bryozoan			X																				X	
Pseudochitinopoma occidentalis	Western calcareous tubeworms																								X
Rhabdocalyptus dawsoni	sharp lipped boot sponge								X																
Suberites montiniger	peach ball sponge								X																
UnID Barnacles	UnID barnacles																	X	X					X	X
UnID Bryozoa	UnID bryozoans										X				X									X	X
UnID Hydrozoa	UnID hydroid																							X	X
UnID Porifera	UnID encrusting yellow sponge						X																	X	
UnID Sabellidae	UnID feather duster worm		X	X	X		X	X	X															X	
UnID Serpulidae	UnID tubeworm	X	X		X		X	X			X														
UnID Sponge	UnID sponge		X	X			X	X								X								X	

NOTES:
X = observed

Table 2-7 Relative Abundance (# /100 m) of Marine Fish and Motile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect											
		SD01	SD02	SD03	SD04	SD05	SD06	SD07	SD08	SD09	SD10	SD11	SD12
Marine Fish													
Artedius fenestralis	padded sculpin	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymatogaster aggregata	shiner perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Enophrys bison	buffalo sculpin	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Gadus macrocephalus	Pacific cod	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hemilepidotus spinosus	brown irish lord	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00
Hemilepidotus spp.	UnID irish lord	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hexagrammos decagrammus	kelp greenling	0.00	0.12	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hexagrammos stelleri	whitespotted greenling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lepidopsetta bilineata	rock sole	0.00	0.22	0.32	0.19	0.17	0.13	0.18	0.51	0.28	0.00	0.00	0.00
Limanda aspera	yellowfin sole	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lumpenus sagitta	snake prickleback	0.12	0.12	2.02	0.32	0.00	0.13	0.12	0.09	0.00	0.00	0.17	11.08
Lycodes Pacificus	blackbelly eelpout	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lyopsetta exilis	slender sole	0.00	0.12	0.10	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Microstomus Pacificus	dover sole	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myoxocephalus polyacanthocephalus	great sculpin	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parophrys vetulus	English sole	0.06	0.31	0.32	0.06	0.17	0.00	0.00	0.26	0.00	0.00	0.00	0.00
Platichthys stellatus	starry flounder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00
Podothecus accipenserinus	sturgeon poacher	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poroclinus rothrocki	whitebarred prickleback	0.00	0.00	0.12	0.13	0.00	0.00	0.06	0.09	0.00	0.00	0.00	0.00
Psettichthys melanostictus	sand sole	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raja binoculata	big skate	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00
Ronquilus jordani	northern ronquil	0.75	0.37	0.54	0.06	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00
Scorpaenichthys marmoratus	cabezon	0.00	0.25	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Sebastes caurinus	copper rockfish	0.00	0.00	0.10	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00
Sebastes flavidus	yellowtail rockfish	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sebastes maliger	quillback rockfish	0.06	0.00	0.00	0.00	0.29	0.00	0.06	0.00	0.00	0.00	0.00	0.00
Sebastes melanops	black rockfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00
Syngnathus leptorhyncus	bay pipefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UnID Agonidae	UnID poacher	0.75	0.09	0.22	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00
UnID Bathymasteridae	UnID ronquil	0.00	0.00	0.30	0.25	0.00	0.06	0.12	0.00	0.28	0.00	0.00	0.00
UnID Cottidae	UnID sculpin	1.05	0.81	0.52	0.25	0.63	0.26	0.18	0.43	0.18	0.33	0.00	0.00
UnID Embiotocidae	UnID surfperch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UnID Fish	UnID fish	0.06	0.31	0.54	0.19	0.38	0.26	0.12	1.12	0.18	0.77	0.61	1.18
UnID Gadidae	UnID cod	0.00	0.12	0.10	0.00	0.00	0.00	0.79	0.52	0.00	0.00	0.00	0.00
UnID Gobiidae	UnID goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 2-7 Relative Abundance (# /100 m) of Marine Fish and Motile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect											
		SD01	SD02	SD03	SD04	SD05	SD06	SD07	SD08	SD09	SD10	SD11	SD12
UnID Pleuronectidae	UnID right eye flounder	0.56	0.38	0.30	0.19	0.25	0.26	0.12	0.17	0.28	0.73	0.26	1.11
UnID Rajidae	UnID skate	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00
UnID Sebastes spp.	UnID rockfish	0.00	0.00	0.10	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.09	0.00
UnID Stichaedae	UnID prickleback	5.88	1.33	2.83	0.63	0.58	0.96	2.50	0.51	0.00	1.43	0.35	2.14
UnID Zoarcidae	UnID eelpout	3.68	8.28	11.83	4.68	14.02	3.08	2.13	8.64	0.09	0.66	0.00	2.66
Crab and Shrimp													
Cancer productus	red rock crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.59
Chionoecetes bairdi	tanner crab	1.04	0.53	0.10	0.70	1.55	0.13	0.00	0.69	0.00	0.00	0.00	0.00
Chorilia longipes	longhorn decorator crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00
Hemigrapsus spp.	shore crabs	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lopholithodes foraminatus	brown box crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Majoidea	UnID decorator crab	0.00	0.00	0.40	0.00	0.17	0.13	0.12	1.46	0.28	0.00	0.00	0.00
Metacarcinus magister	Dungeness crab	0.00	0.00	0.22	0.25	0.46	0.00	0.12	0.26	0.28	0.33	0.26	0.22
Munida quadrispina	squat lobster	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oregonia gracilis	graceful decorator crab	0.12	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.22	0.00	0.89
Pagurus spp.	hermit crab	6.07	3.91	1.69	11.33	7.54	0.83	3.54	2.31	1.20	1.83	0.17	1.77
Pandalus danae	coonstripe shrimp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pandalus hypsinotus	humpback shrimp	0.43	0.12	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00
Pandalus platyceros	spot prawn	0.74	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pandalus spp.	UnID pandalus shrimp	0.06	24.96	0.35	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00
Pugettia producta	northern kelp crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pugettia richii	cryptic kelp crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Telmessus cheiragonus	helmet crab	0.00	0.00	0.00	0.00	0.08	0.13	0.00	0.00	0.00	0.00	0.00	0.00
UnID Crab	UnID crab	0.06	0.00	0.00	0.00	0.00	0.00	0.06	0.09	0.00	0.00	0.00	0.81
UnID Shrimp	UnID shrimp	8.83	0.00	11.88	0.00	0.00	0.00	0.00	1034.56	0.00	0.00	0.00	0.00
Other Marine Invertebrates													
Aldisa albomarginata	white-rimmed nudibranch	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Anthopleura artemisia	burrowing anemone	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Anthopleura xanthogrammica	green surf anemone	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Armina californica	striped nudibranch	0.00	0.00	0.12	0.00	0.00	0.00	0.06	0.00	0.00	0.11	0.00	0.00
Aurelia labiata	moon jellyfish	0.00	0.00	0.12	0.00	0.00	0.00	0.06	0.34	0.37	0.00	0.00	0.00
Chlamys hastata	spiny scallop	0.06	0.25	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
Chlamys rubida	smooth pink scallop	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crangon spp.	crangon spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crassadoma gigantea	giant rock scallop	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cribrinopsis fernaldi	crimson anemone	0.61	0.09	0.00	0.06	0.08	0.00	0.00	0.52	0.18	0.00	0.00	0.22

Table 2-7 Relative Abundance (# /100 m) of Marine Fish and Motile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect											
		SD01	SD02	SD03	SD04	SD05	SD06	SD07	SD08	SD09	SD10	SD11	SD12
Crossaster papposus	rose star	0.43	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cryptochiton stelleri	gumboot chiton	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.26	0.00	0.00	0.00	0.00
Cucumaria miniata	red sea cucumber	0.00	0.00	0.60	15.55	6.70	2.31	1.77	11.05	3.32	20.43	10.70	14.29
Dendronotus iris	giant nudibranch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dermasterias imbricata	leather star	0.00	0.22	0.12	0.56	0.46	0.00	0.18	1.20	0.18	0.00	0.00	0.00
Enteroctopus dofleini	giant Pacific octopus	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euspira spp.	UnID moon snail	0.56	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Evasterias troscheli	mottled star	0.12	0.37	1.00	0.00	0.76	0.13	0.06	0.77	0.83	0.88	0.43	0.00
Fusitriton oregonensis	oregon triton	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gephyreaster swifti	gunpowder sea star	0.06	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Halipteris willemoesi	sea whip	0.00	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00
Henricia leviuscula	blood star	0.12	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.09	0.00
Henricia sanguinolenta	fat blood star	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippasteria spinosa	spiny red star	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00
Leptychaster Pacificus	pale star	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Luidia foliolata	sandstar	1.80	1.18	0.34	0.44	0.46	0.06	0.18	1.38	0.09	0.00	0.09	0.00
Mediaster aequalis	vermilion star	4.83	3.92	4.23	1.90	5.99	2.50	0.37	1.46	0.55	0.66	1.30	0.59
Metridium farcimen	giant plumose anemone	0.06	0.43	1.19	0.13	0.79	0.13	3.48	1.46	0.28	0.00	0.00	0.44
Metridium senile	short plumose anemone	0.92	0.31	0.10	0.00	0.42	0.00	0.00	0.00	0.00	0.22	0.00	0.00
Nucella spp.	nucella spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Octopus rubescens	Pacific red octopus	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ophiura sarsii	brittle star	10.31	3.88	2.26	0.06	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00
Orthasterias koehleri	rainbow star	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.22
Pachycerianthus fimbriatus	tube-dwelling anemone	0.00	0.87	27.07	55.31	2.35	2.95	0.85	2.06	11.25	0.22	0.78	1.70
Parastichopus californicus	giant california sea cucumber	2.15	0.96	3.20	1.52	3.73	2.50	3.60	11.65	11.07	1.87	1.22	6.99
Pisaster brevispinus	giant pink star	0.00	0.09	0.52	0.13	0.79	0.26	0.18	0.43	0.28	0.00	0.35	0.00
Pisaster ochraceus	ochre star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ptilosarcus gurneyi	orange sea pen	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.09	0.18	0.77	0.00	0.00
Pycnopodia helianthoides	sunflower star	0.87	0.19	1.15	5.63	2.13	0.45	0.73	2.32	1.20	2.12	1.04	1.70
Rossia Pacifica	stubby squid	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
Solaster dawsoni	morning sunstar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00
Solaster paxillatus	orange sunstar	0.00	0.46	0.10	0.00	0.08	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Stomphia didemon	swimming anemone	6.54	0.96	2.70	1.20	5.47	1.60	1.46	2.42	0.18	4.17	0.17	1.11
Strongylocentrotus droebachiensis	green urchin	0.00	0.00	0.80	0.00	0.00	0.00	0.06	0.09	0.00	0.00	0.00	0.00
Strongylocentrotus franciscanus	red urchin	0.00	0.00	1.90	0.00	0.00	0.13	0.00	0.00	3.23	0.00	0.00	0.00
Strongylocentrotus pallidus	white urchin	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 2-7 Relative Abundance (# /100 m) of Marine Fish and Motile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect											
		SD01	SD02	SD03	SD04	SD05	SD06	SD07	SD08	SD09	SD10	SD11	SD12
Strongylocentrotus purpuratus	purple urchin	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.09	0.92	0.00	0.00	0.00
Strongylocentrotus spp.	urchin	0.00	0.00	0.20	0.13	0.29	0.06	0.00	0.00	1.11	0.00	0.00	0.00
Tectura spp.	limpet	0.00	0.00	0.00	0.00	0.00	3.59	0.00	0.00	1.38	0.00	0.00	0.00
Triopha catalinae	clown nudibranch	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Tritonia festiva	diamondback nudibranch	0.06	0.22	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.22
UnID Anthozoa	UnID anemone	0.25	0.41	0.54	0.00	0.17	0.19	0.00	0.17	0.00	0.44	0.09	0.22
UnID Asteroidea	UnID sea star	0.06	0.00	0.10	0.06	0.29	0.00	0.00	0.00	0.09	0.44	0.00	0.22
UnID Cnidaria	UnID jellyfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UnID Nudibranch	UnID nudibranch	0.43	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UnID Octopus	UnID octopus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00
UnID Ophiuroidea	UnID brittle star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00
UnID Pectinidae	UnID scallop	0.06	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Urticina grebelnyi	rose anemone	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00
Virgularia spp.	white sea pen	0.00	0.00	0.55	0.32	0.08	0.13	0.00	0.00	0.00	0.00	0.00	0.00

NOTES:
SD = Standard deviation. IQR = Interquartile range.

Table 2-8 Relative Abundance (# / 100 m) of Marine Fish and Motile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect												Mean (± SD)	Median (IQR)	Total Count
		SD13	SD14	SD15	SD16	SD17	SD18	SD19	SD20	SD21	SD22	SD23	SD24			
Marine Fish																
Artedius fenestralis	padded sculpin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05 (0.23)	0 (0-0)	3
Cymatogaster aggregata	shiner perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.18	0.08 (0.36)	0 (0-0)	10
Enophrys bison	buffalo sculpin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.01)	0 (0-0)	1
Gadus macrocephalus	Pacific cod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.14)	0 (0-0)	11
Hemilepidotus spinosus	brown irish lord	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.02)	0 (0-0)	1
Hemilepidotus spp.	UnID irish lord	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.01 (0.04)	0 (0-0)	1
Hexagrammos decagrammus	kelp greenling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.03)	0 (0-0)	2
Hexagrammos stelleri	whitespotted greenling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.01 (0.04)	0 (0-0)	1
Lepidopsetta bilineata	rock sole	0.46	0.13	0.30	0.39	0.00	0.00	0.00	0.72	0.00	0.28	0.19	0.00	0.19 (0.2)	0.17 (0-0.29)	33
Limanda aspera	yellowfin sole	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.04)	0 (0-0)	3
Lumpenus sagitta	snake prickleback	0.08	0.00	4.50	0.00	0.00	0.00	0.00	0.00	2.32	1.98	0.58	0.53	1.01 (2.4)	0.12 (0-0.55)	122
Lycodes Pacificus	blackbelly eelpout	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	1.42	0.08 (0.3)	0 (0-0)	10
Lyopsetta exilis	slender sole	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.07)	0 (0-0)	4
Microstomus Pacificus	dover sole	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.05)	0 (0-0)	4
Myoxocephalus polyacanthocephalus	great sculpin	0.16	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.05 (0.11)	0 (0-0)	6
Parophrys vetulus	English sole	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.19	0.18	0.08 (0.11)	0 (0-0.17)	16
Platichthys stellatus	starry flounder	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.08)	0 (0-0)	2
Podothecus accipenserinus	sturgeon poacher	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.01)	0 (0-0)	1
Poroclinus rothrocki	whitebarred prickleback	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04 (0.13)	0 (0-0)	7
Psettichthys melanostictus	sand sole	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.06)	0 (0-0)	1
Raja binoculata	big skate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.02)	0 (0-0)	2
Ronquilus jordani	northern ronquil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.11 (0.24)	0 (0-0.02)	16
Scorpaenichthys marmoratus	cabezon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.05)	0 (0-0)	3
Sebastes caurinus	copper rockfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.02)	0 (0-0)	2
Sebastes flavidus	yellowtail rockfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.02)	0 (0-0)	1
Sebastes maliger	quillback rockfish	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	4
Sebastes melanops	black rockfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.02)	0 (0-0)	1
Syngnathus leptorhyncus	bay pipefish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.02 (0.08)	0 (0-0)	2
UnID Agonidae	UnID poacher	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.06 (0.16)	0 (0-0)	7
UnID Bathymasteridae	UnID ronquil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04 (0.09)	0 (0-0)	13
UnID Cottidae	UnID sculpin	0.32	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.28	0.78	0.35	0.3 (0.3)	0.26 (0-0.45)	62
UnID Embiotocidae	UnID surfperch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.02 (0.11)	0 (0-0)	3
UnID Fish	UnID fish	0.16	0.00	0.60	0.00	0.00	0.00	0.00	1.08	0.52	0.28	1.75	2.31	0.52 (0.6)	0.3 (0.11-0.65)	83
UnID Gadidae	UnID cod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.18	0.08 (0.19)	0 (0-0.02)	23
UnID Gobiidae	UnID goby	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.01 (0.04)	0 (0-0)	1

Table 2-8 Relative Abundance (# / 100 m) of Marine Fish and Motile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect												Mean (± SD)	Median (IQR)	Total Count
		SD13	SD14	SD15	SD16	SD17	SD18	SD19	SD20	SD21	SD22	SD23	SD24			
UnID Pleuronectidae	UnID right eye flounder	0.88	0.00	1.92	0.00	0.34	0.00	1.73	1.08	0.77	0.85	0.00	0.35	0.52 (0.52)	0.32 (0.19-0.79)	72
UnID Rajidae	UnID skate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.02)	0 (0-0)	2
UnID Sebastes spp.	UnID rockfish	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.05)	0 (0-0)	4
UnID Stichaedae	UnID prickleback	1.95	0.13	6.30	0.00	0.00	0.00	0.00	0.36	12.14	14.44	0.00	0.00	2.27 (3.82)	0.61 (0-2.23)	329
UnID Zoarcidae	UnID eelpout	0.08	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	2.52 (4.09)	0.18 (0-3.23)	669
Crab and Shrimp																
Cancer productus	red rock crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.35	0.05 (0.14)	0 (0-0)	5
Chionoecetes bairdi	tanner crab	0.08	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.18	0.25 (0.41)	0 (0-0.27)	67
Chorilia longipes	longhorn decorator crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.02 (0.09)	0 (0-0)	4
Hemigrapsus spp.	shore crabs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.11)	0 (0-0)	1
Lopholithodes foraminatus	brown box crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.02 (0.07)	0 (0-0)	1
Majoidea	UnID decorator crab	0.08	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12 (0.31)	0 (0-0.12)	33
Metacarcinus magister	Dungeness crab	0.08	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.28	0.97	0.18	0.2 (0.25)	0.15 (0-0.26)	34
Munida quadrispina	squat lobster	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.02 (0.08)	0 (0-0)	2
Oregonia gracilis	graceful decorator crab	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.09 (0.22)	0 (0-0.02)	13
Pagurus spp.	hermit crab	7.16	0.67	2.22	0.77	1.01	0.91	0.69	4.69	0.77	4.25	2.34	0.71	2.85 (2.78)	1.8 (0.82-3.99)	598
Pandalus danae	coonstripe shrimp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.01 (0.07)	0 (0-0)	2
Pandalus hypsinotus	humpback shrimp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.07 (0.23)	0 (0-0)	21
Pandalus platyceros	spot prawn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.74	0.00	0.44 (1.99)	0 (0-0)	63
Pandalus spp.	UnID pandalus shrimp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	235.87	732.01	41.4 (154.77)	0 (0-0.02)	5546
Pugettia producta	northern kelp crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.01 (0.04)	0 (0-0)	1
Pugettia richii	cryptic kelp crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.02 (0.08)	0 (0-0)	2
Telmessus cheiragonus	helmet crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.03)	0 (0-0)	3
UnID Crab	UnID crab	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.18	0.06 (0.17)	0 (0-0.06)	8
UnID Shrimp	UnID shrimp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.97 (211.02)	0 (0-0)	12228
Other Marine Invertebrates																
Aldisa albomarginata	white-rimmed nudibranch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.01)	0 (0-0)	1
Anthopleura artemisia	burrowing anemone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.06)	0 (0-0)	1
Anthopleura xanthogrammica	green surf anemone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.02)	0 (0-0)	1
Armina californica	striped nudibranch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.03)	0 (0-0)	3
Aurelia labiata	moon jellyfish	0.23	0.00	0.00	0.00	1.01	0.30	0.00	0.72	0.00	0.00	0.00	0.00	0.13 (0.26)	0 (0-0.15)	17
Chlamys hastata	spiny scallop	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.92	0.00	0.14 (0.59)	0 (0-0)	20
Chlamys rubida	smooth pink scallop	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.03)	0 (0-0)	2
Crangon spp.	crangon spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.01 (0.04)	0 (0-0)	1
Crassadoma gigantea	giant rock scallop	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.01)	0 (0-0)	1
Cribrinopsis fernaldi	crimson anemone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	4.29	0.35	0.28 (0.87)	0 (0-0.19)	47

Table 2-8 Relative Abundance (# / 100 m) of Marine Fish and Motile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect												Mean (± SD)	Median (IQR)	Total Count
		SD13	SD14	SD15	SD16	SD17	SD18	SD19	SD20	SD21	SD22	SD23	SD24			
Crossaster papposus	rose star	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04 (0.12)	0 (0-0)	6
Cryptochiton stelleri	gumboot chiton	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.08)	0 (0-0)	8
Cucumaria miniata	red sea cucumber	0.00	0.27	7.20	0.00	0.00	0.00	0.00	0.36	0.00	0.85	0.19	0.00	3.98 (6.03)	0.48 (0-6.83)	697
Dendronotus iris	giant nudibranch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.02 (0.08)	0 (0-0)	2
Dermasterias imbricata	leather star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.18	0.15 (0.29)	0 (0-0.18)	30
Enteroctopus dofleini	giant Pacific octopus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.02)	0 (0-0)	1
Euspira spp.	UnID moon snail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.11)	0 (0-0)	5
Evasterias troscheli	mottled star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.97	0.00	0.28 (0.37)	0.03 (0-0.52)	59
Fusitriton oregonensis	oregon triton	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.06)	0 (0-0)	2
Gephyreaster swifti	gunpowder sea star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.01 (0.04)	0 (0-0)	3
Halipteris willemoesi	sea whip	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07 (0.23)	0 (0-0)	13
Henricia leviuscula	blood star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.04)	0 (0-0)	5
Henricia sanguinolenta	fat blood star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.01)	0 (0-0)	1
Hippasteria spinosa	spiny red star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.01)	0 (0-0)	1
Leptychaster Pacificus	pale star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.02)	0 (0-0)	1
Luidia foliolata	sandstar	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27 (0.49)	0 (0-0.36)	59
Mediaster aequalis	vermilion star	0.00	5.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	1.4 (1.94)	0.46 (0-2.05)	309
Metridium farcimen	giant plumose anemone	2.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.29	0.35	0.65 (1.17)	0.09 (0-0.53)	161
Metridium senile	short plumose anemone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08 (0.21)	0 (0-0)	26
Nucella spp.	nucella spp.	0.00	0.00	0.00	5.41	2.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32 (1.18)	0 (0-0)	21
Octopus rubescens	Pacific red octopus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.01)	0 (0-0)	1
Ophiura sarsii	brittle star	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.74 (2.23)	0 (0-0.1)	110
Orthasterias koehleri	rainbow star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.05)	0 (0-0)	4
Pachycerianthus fimbriatus	tube-dwelling anemone	0.24	36.70	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.57	0.00	0.00	5.97 (13.88)	0.45 (0-2.13)	1659
Parastichopus californicus	giant california sea cucumber	0.16	1.47	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	4.67	0.89	2.43 (3.28)	1.34 (0-3.3)	565
Pisaster brevispinus	giant pink star	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	1.17	0.00	0.21 (0.3)	0.05 (0-0.29)	45
Pisaster ochraceus	ochre star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.01 (0.04)	0 (0-0)	1
Ptilosarcus gurneyi	orange sea pen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05 (0.16)	0 (0-0)	7
Pycnopodia helianthoides	sunflower star	0.39	0.80	0.60	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.53	0.94 (1.23)	0.57 (0.14-1.16)	168
Rossia Pacifica	stubby squid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01 (0.05)	0 (0-0)	3
Solaster dawsoni	morning sunstar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.02 (0.07)	0 (0-0)	4
Solaster paxillatus	orange sunstar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03 (0.1)	0 (0-0)	7
Stomphia didemon	swimming anemone	0.55	0.27	0.30	0.00	0.00	0.00	0.00	0.36	0.00	1.13	0.19	0.00	1.28 (1.79)	0.46 (0.13-1.5)	321
Strongylocentrotus droebachiensis	green urchin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04 (0.16)	0 (0-0)	10
Strongylocentrotus franciscanus	red urchin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.24 (0.75)	0 (0-0)	58

Table 2-8 Relative Abundance (# / 100 m) of Marine Fish and Motile Invertebrates Observed During the South Digby Island Subtidal ROV Survey

Scientific Name	Common Name	Transect												Mean (± SD)	Median (IQR)	Total Count
		SD13	SD14	SD15	SD16	SD17	SD18	SD19	SD20	SD21	SD22	SD23	SD24			
Strongylocentrotus pallidus	white urchin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.01)	0 (0-0)	1
Strongylocentrotus purpuratus	purple urchin	0.00	6.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31 (1.26)	0 (0-0)	60
Strongylocentrotus spp.	urchin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07 (0.23)	0 (0-0)	18
Tectura spp.	limpet	0.08	0.00	3.60	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.37 (1.03)	0 (0-0)	83
Triopha catalinae	clown nudibranch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.01 (0.04)	0 (0-0)	2
Tritonia festiva	diamondback nudibranch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.06)	0 (0-0)	5
UnID Anthozoa	UnID anemone	0.08	0.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	1.13	1.36	0.71	0.28 (0.4)	0.13 (0-0.41)	45
UnID Asteroidea	UnID sea star	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.07 (0.13)	0 (0-0.08)	13
UnID Cnidaria	UnID jellyfish	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.01 (0.07)	0 (0-0)	1
UnID Nudibranch	UnID nudibranch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.09)	0 (0-0)	3
UnID Octopus	UnID octopus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.02)	0 (0-0)	1
UnID Ophiuroidea	UnID brittle star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 (0.02)	0 (0-0)	1
UnID Pectinidae	UnID scallop	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.92	0.00	0.13 (0.59)	0 (0-0)	18
Urticina grebelnyi	rose anemone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02 (0.1)	0 (0-0)	9
Virgularia spp.	white sea pen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05 (0.13)	0 (0-0)	13

NOTES:
SD = Standard deviation. IQR = Interquartile range.

APPENDIX 3

Crab Trapping

Table 3-1 Coordinates, Soak Time and Depth of Crab Traps Set Within Each Study Area

Date	Company	ID No	Easting	Northing	Soak Time (hr)	Depth (m)
Casey Cove						
23-Mar-15	Triton	CT19	410608	6015538	23	–
23-Mar-15	Triton	CT20	410358	6015527	23	–
23-Mar-15	Triton	CT21	410115	6015411	23	–
7-May-16	Stantec	CT38	410314	6015653	23	11.1
7-May-16	Stantec	CT39	410426	6015768	23	11.8
7-May-16	Stantec	CT42	410441	6015552	17	19.2
8-May-16	Stantec	CT43	410330	6015749	24	7.9
8-May-16	Stantec	CT44	410362	6015554	23	11.8
South Digby Island						
9-Aug-14	Triton	CT05	410381	6011764	22	13.4
9-Aug-14	Triton	CT06	410273	6011999	22	12.8
7-Aug-14	Triton	CT01	411331	6012133	25	11.5
7-Aug-14	Triton	CT02	411221	6012197	25	12
10-Aug-14	Triton	CT07	410542	6012127	48.5	5.4
10-Aug-14	Triton	CT08	410593	6012292	48.5	6
2-Aug-15	Stantec	CT23	411425	6011765	23.5	12.2
2-Aug-15	Stantec	CT24	411403	6011643	23.5	24
2-Aug-15	Stantec	CT25	411253	6012428	24	23.7
3-Aug-15	Stantec	CT26	411368	6011647	26	19.5
3-Aug-15	Stantec	CT27	411277	6011518	25.5	25
3-Aug-15	Stantec	CT28	411216	6012475	26	22.8
4-Aug-15	Stantec	CT29	411176	6011618	24	18
4-Aug-15	Stantec	CT30	411053	6011701	24	11
4-Aug-15	Stantec	CT31	411101	6011576	24	19.8
5-Aug-15	Stantec	CT32	410960	6011664	24	18
5-Aug-15	Stantec	CT33	411057	6011670	24	11
5-Aug-15	Stantec	CT34	411057	6011588	24	19.8
6-Aug-15	Stantec	CT35	411107	6011615	24	–
6-Aug-15	Stantec	CT36	410869	6011601	24	–
6-Aug-15	Stantec	CT37	410963	6011587	24	–
7-May-16	Stantec	CT41	411167	6011416	5	16.76
7-May-16	Stantec	CT41	411167	6011416	5	16.76
8-May-16	Stantec	CT46	411182	6012663	23	10.05
9-May-16	Stantec	CT47	411150	6012588	23	14.02
9-May-16	Stantec	CT48	411173	6012387	23	13.1

Table 3-1 Coordinates, Soak Time and Depth of Crab Traps Set Within Each Study Area

Date	Company	ID No	Easting	Northing	Soak Time (hr)	Depth (m)
9-May-16	Stantec	CT49	411183	6012288	23	9.44
9-May-16	Stantec	CT50	411088	6012493	23	11.27
10-May-16	Stantec	CT51	411101	6011305	8	17.06
10-May-16	Stantec	CT52	410978	6011430	8	8.22
10-May-16	Stantec	CT53	410981	6011900	8	5.18
10-May-16	Stantec	CT54	411004	6012316	8	3.65
East Digby Island						
7-May-16	Stantec	CT40	410993	6014104	23	7.62
8-May-16	Stantec	CT45	410967	6014185	23	10.9728
Tremayne Bay						
8-Aug-14	Triton	CT03	408924	6011558	24	21
8-Aug-14	Triton	CT04	409073	6011582	24	17
22-Mar-15	Triton	CT10	409667	6011409	23	–
22-Mar-15	Triton	CT11	409516	6011446	23	–
22-Mar-15	Triton	CT12	409309	6011417	23	–
22-Mar-15	Triton	CT13	409235	6011417	23	–
22-Mar-15	Triton	CT14	409031	6011770	23	–
22-Mar-15	Triton	CT15	408711	6011934	23	–

NOTE:
– information not recorded

Table 3-2 Catch During August 2014, March 2015 and August 2015 Crab Sampling Events

ID no.	Common Name	Scientific Name	Catch	Carapace Length (mm)	Weight (kg)	Sex
Casey Cove						
CT19	Dungeness crab	*Metacarcinus magister*	1	151	–	m
CT19	Dungeness crab	*Metacarcinus magister*	1	180	737.5	m
CT19	Dungeness crab	*Metacarcinus magister*	1	181	697	m
CT19	Dungeness crab	*Metacarcinus magister*	1	182	785	m
CT19	Dungeness crab	*Metacarcinus magister*	1	205	>1000	m
CT20	Dungeness crab	*Metacarcinus magister*	1	186	709	m
CT20	Dungeness crab	*Metacarcinus magister*	1	187	693	m
CT20	Dungeness crab	*Metacarcinus magister*	1	200	>1000	m
CT21	nfc	–	–	–	–	–
CT38	Dungeness crab	*Metacarcinus magister*	1	184	–	m
CT39	Dungeness crab	*Metacarcinus magister*	1	180	–	m
CT39	Dungeness crab	*Metacarcinus magister*	1	182	–	m
CT39	Dungeness crab	*Metacarcinus magister*	1	171	–	m
CT39	Dungeness crab	*Metacarcinus magister*	1	164	–	m
CT42	Dungeness crab	*Metacarcinus magister*	1	162	–	m
CT42	Dungeness crab	*Metacarcinus magister*	1	149	–	f
CT42	Dungeness crab	*Metacarcinus magister*	1	160	–	m
CT42	Dungeness crab	*Metacarcinus magister*	1	171	–	m
CT42	Dungeness crab	*Metacarcinus magister*	1	169	–	m
CT42	Dungeness crab	*Metacarcinus magister*	1	153	–	m
CT42	Dungeness crab	*Metacarcinus magister*	1	162	–	m
CT42	Dungeness crab	*Metacarcinus magister*	1	190	–	m
CT43	Dungeness crab	*Metacarcinus magister*	1	140	–	f
CT43	Dungeness crab	*Metacarcinus magister*	1	178	–	m
CT43	Dungeness crab	*Metacarcinus magister*	1	185	–	m
CT43	Dungeness crab	*Metacarcinus magister*	1	161	–	m
CT43	Dungeness crab	*Metacarcinus magister*	1	178	–	m
CT43	Dungeness crab	*Metacarcinus magister*	1	136	–	f
CT43	Dungeness crab	*Metacarcinus magister*	1	135	–	f
CT43	Dungeness crab	*Metacarcinus magister*	1	155	–	m
CT43	Dungeness crab	*Metacarcinus magister*	1	156	–	m
CT44	Dungeness crab	*Metacarcinus magister*	1	145	–	f
CT44	Dungeness crab	*Metacarcinus magister*	1	163	–	m
CT44	Dungeness crab	*Metacarcinus magister*	1	160	–	m
CT44	Dungeness crab	*Metacarcinus magister*	1	166	–	m

Table 3-2 Catch During August 2014, March 2015 and August 2015 Crab Sampling Events

ID no.	Common Name	Scientific Name	Catch	Carapace Length (mm)	Weight (kg)	Sex
South Digby Island						
CT01	sunflower star	*Pycnopodia helianthoides*	1	–	–	–
CT01	vermillion star	*Mediaster aequalis*	1	–	–	–
CT02	sunflower star	*Pycnopodia helianthoides*	1	–	–	–
CT05	nfc	–	–	–	–	–
CT06	Dungeness crab	*Metacarcinus magister*	1	143	–	m
CT06	Dungeness crab	*Metacarcinus magister*	1	155	–	m
CT07	nfc	–	–	–	–	–
CT08	Dungeness crab	*Metacarcinus magister*	1	250	–	–
CT23	nfc	–	–	–	–	–
CT24	Dungeness crab	*Metacarcinus magister*	1	179	650	m
CT24	Dungeness crab	*Metacarcinus magister*	1	–	–	f
CT24	red irish lord	*Hemilepidotus*	1	–	–	–
CT25	Dungeness crab	*Metacarcinus magister*	1	170	585	m
CT25	Dungeness crab	*Metacarcinus magister*	1	–	–	f
CT25	Dungeness crab	*Metacarcinus magister*	1	<165	–	m
CT26	tanner crab	*Chionoecetes bairdi*	1	–	–	–
CT27	nfc	–	–	–	–	–
CT28	Dungeness crab	*Metacarcinus magister*	1	170	550	m
CT28	Dungeness crab	*Metacarcinus magister*	1	–	605	m
CT28	Dungeness crab	*Metacarcinus magister*	1	200	980	m
CT28	Dungeness crab	*Metacarcinus magister*	1	208	1106	m
CT28	Dungeness crab	*Metacarcinus magister*	1	–	–	f
CT28	Dungeness crab	*Metacarcinus magister*	1	<165	–	m
CT28	great sculpin	*Myoxocephalus polyacanthocephalus*	1	–	–	–
CT28	red rock crab	*Cancer productus*	1	–	–	m
CT29	nfc	–	–	–	–	–
CT30	nfc	–	–	–	–	–
CT31	nfc	–	–	–	–	–
CT32	nfc	–	–	–	–	–
CT33	nfc	–	–	–	–	–
CT34	nfc	–	–	–	–	–
CT35	Dungeness crab	*Metacarcinus magister*	1	192	–	m
CT36	nfc	–	–	–	–	–
CT37	nfc	–	–	–	–	–

Table 3-2 Catch During August 2014, March 2015 and August 2015 Crab Sampling Events

ID no.	Common Name	Scientific Name	Catch	Carapace Length (mm)	Weight (kg)	Sex
CT41	Dungeness crab	*Metacarcinus magister*	1	160	–	f
CT41	Dungeness crab	*Metacarcinus magister*	1	128	–	f
CT41	Dungeness crab	*Metacarcinus magister*	1	130	–	f
CT41	Dungeness crab	*Metacarcinus magister*	1	144	–	f
CT41	Dungeness crab	*Metacarcinus magister*	1	167	–	m
CT41	Dungeness crab	*Metacarcinus magister*	1	132	–	f
CT41	Dungeness crab	*Metacarcinus magister*	1	184	–	m
CT41	Dungeness crab	*Metacarcinus magister*	1	150	–	f
CT46	red rock crab	*Cancer productus*	1	111	–	f
CT46	Dungeness crab	*Metacarcinus magister*	1	167	–	m
CT46	Dungeness crab	*Metacarcinus magister*	1	165	–	f
CT47	Dungeness crab	*Metacarcinus magister*	1	156	–	m
CT47	Dungeness crab	*Metacarcinus magister*	1	164	–	m
CT47	Dungeness crab	*Metacarcinus magister*	1	166	–	m
CT47	Dungeness crab	*Metacarcinus magister*	1	162	–	m
CT47	Dungeness crab	*Metacarcinus magister*	1	148	–	m
CT47	Dungeness crab	*Metacarcinus magister*	1	210	–	m
CT48	Dungeness crab	*Metacarcinus magister*	1	184	–	m
CT48	Dungeness crab	*Metacarcinus magister*	1	169	–	m
CT48	Dungeness crab	*Metacarcinus magister*	1	190	–	m
CT49	red rock crab	*Cancer productus*	1	146	–	m
CT49	Dungeness crab	*Metacarcinus magister*	1	196	–	m
CT49	Dungeness crab	*Metacarcinus magister*	1	191	–	m
CT49	Dungeness crab	*Metacarcinus magister*	1	176	–	m
CT50	Dungeness crab	*Metacarcinus magister*	1	156	–	f
CT50	Dungeness crab	*Metacarcinus magister*	1	136	–	f
CT50	Dungeness crab	*Metacarcinus magister*	1	185	–	m
CT50	Dungeness crab	*Metacarcinus magister*	1	188	–	m
CT50	Dungeness crab	*Metacarcinus magister*	1	187	–	m
CT51	Dungeness crab	*Metacarcinus magister*	1	160	–	m
CT52	Dungeness crab	*Metacarcinus magister*	1	157	–	f
CT53	Dungeness crab	*Metacarcinus magister*	1	128	–	f
CT53	Dungeness crab	*Metacarcinus magister*	1	148	–	f
CT53	Dungeness crab	*Metacarcinus magister*	1	167	–	f
CT54	nfc	–	–	–	–	–
East Digby Island						

Table 3-2 Catch During August 2014, March 2015 and August 2015 Crab Sampling Events

ID no.	Common Name	Scientific Name	Catch	Carapace Length (mm)	Weight (kg)	Sex
CT40	Dungeness crab	*Metacarcinus magister*	1	178	–	m
CT40	Dungeness crab	*Metacarcinus magister*	1	188	–	m
CT40	Dungeness crab	*Metacarcinus magister*	1	162	–	m
CT40	Dungeness crab	*Metacarcinus magister*	1	164	–	m
CT40	Dungeness crab	*Metacarcinus magister*	1	173	–	m
CT40	Dungeness crab	*Metacarcinus magister*	1	158	–	m
CT45	Dungeness crab	*Metacarcinus magister*	1	165	–	m
CT45	Dungeness crab	*Metacarcinus magister*	1	165	–	m
CT45	Dungeness crab	*Metacarcinus magister*	1	162	–	m
CT45	Dungeness crab	*Metacarcinus magister*	1	162	–	m
CT45	Dungeness crab	*Metacarcinus magister*	1	166	–	m
CT45	Dungeness crab	*Metacarcinus magister*	1	178	–	m
CT45	Dungeness crab	*Metacarcinus magister*	1	179	–	m
Tremayne Bay						
CT03	Dungeness crab	*Metacarcinus magister*	1	139	–	f
CT03	vermillion star	*Mediaster aequalis*	1	–	–	–
CT04	nfc	–	–	–	–	–
CT10	Dungeness crab	*Metacarcinus magister*	1	172	677	m
CT10	Dungeness crab	*Metacarcinus magister*	1	179	765.5	m
CT10	Dungeness crab	*Metacarcinus magister*	1	180	777	m
CT10	Dungeness crab	*Metacarcinus magister*	1	181	688.5	m
CT10	kelp crab	*Pugettia* spp.	20	–	–	–
CT11	nfc	–	–	–	–	–
CT12	nfc	–	–	–	–	–
CT13	nfc	–	–	–	–	–
CT14	nfc	–	–	–	–	–
CT15	Dungeness crab	*Metacarcinus magister*	1	178	742.5	m
CT15	Dungeness crab	*Metacarcinus magister*	1	187	748.5	m
CT15	Dungeness crab	*Metacarcinus magister*	1	190	597	m
CT15	Unid. flounder	Order Pleuronectiformes	1	–	–	–

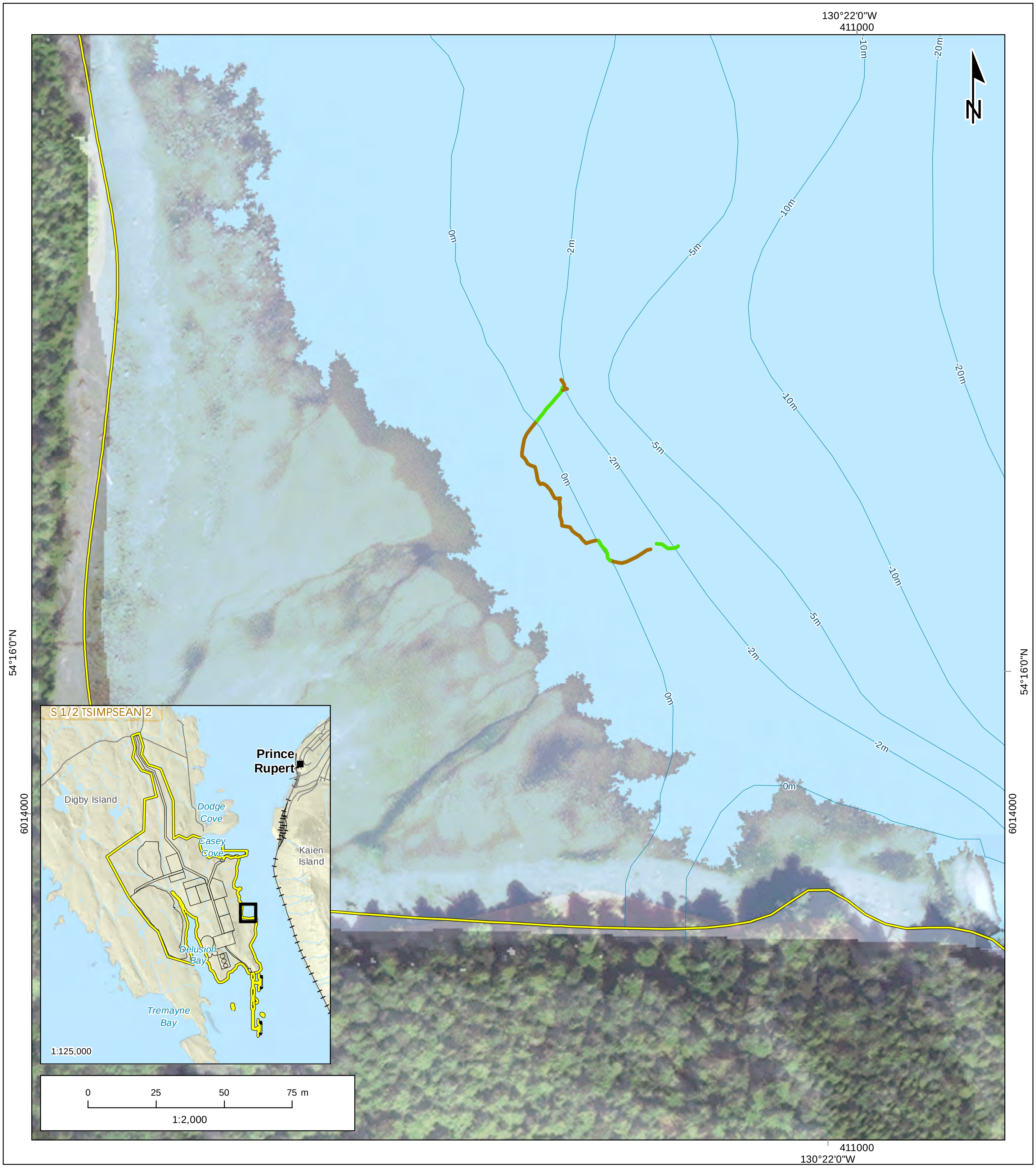
NOTES:
nfc: no fish caught
-: data not recorded

APPENDIX 4

Eelgrass Survey

VIDEO GROUND-TRUTHING IMAGERY

In addition to on-foot delineations, eelgrass extent was visually confirmed using underwater imagery in Delusion Bay, South Digby Island, and East Digby Island (Figure 4 - 1 to Figure 4 - 5).



- City, Municipality, or Town
- Road
- Railway
- Watercourse
- Bathymetric Contour
- First Nation Reserve
- Waterbody
- Project Component
- Project Development Area

Underwater Video Transect

- Bull Kelp
- Eelgrass

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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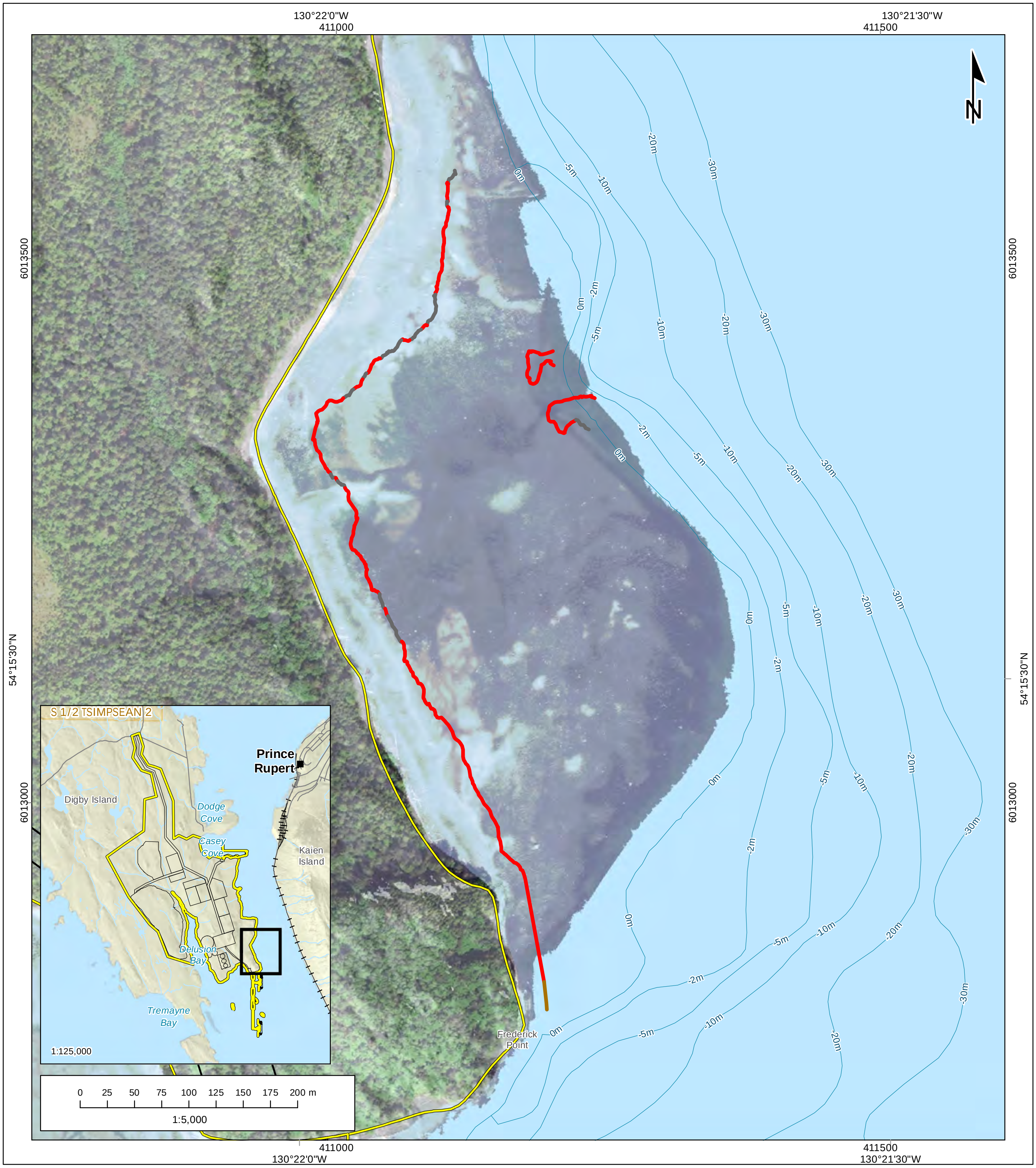
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

VIDEO GROUND TRUTH - EAST DIGBY ISLAND - PHILIPS POINT

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 4-1



- City, Municipality, or Town
- Road
- Railway
- Watercourse
- Bathymetric Contour
- First Nation Reserve
- Waterbody
- Project Component
- Project Development Area

Underwater Video Transect

- Algae
- Bare
- Bull Kelp

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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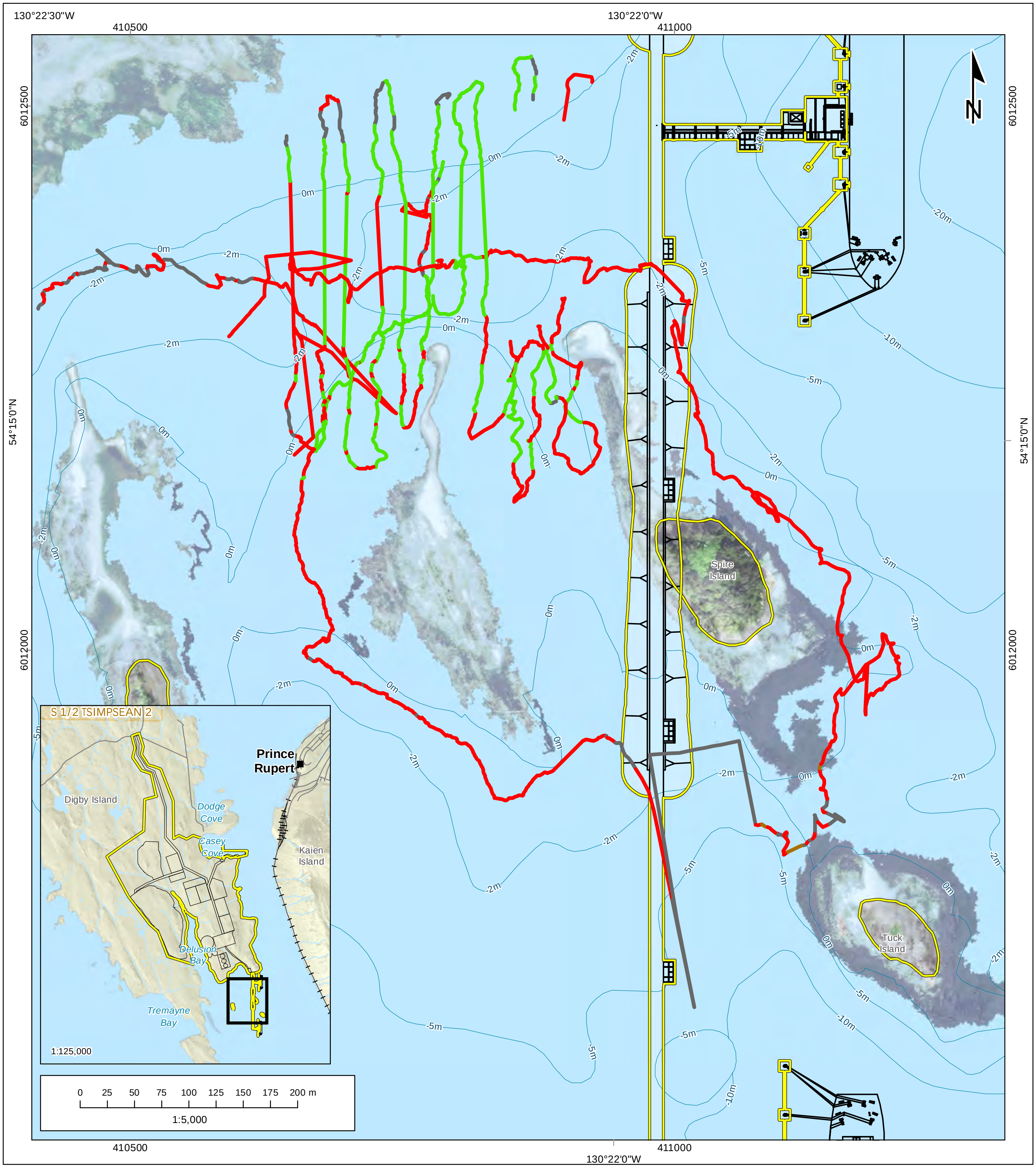
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

VIDEO GROUND TRUTH - EAST DIGBY ISLAND - FREDERICK POINT

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 4-2



■ City, Municipality, or Town
Road
Railway
Watercourse
Bathymetric Contour
First Nation Reserve
Waterbody
Project Component
Project Development Area

Underwater Video Transect

Algae
Bare
Bull Kelp
Eelgrass

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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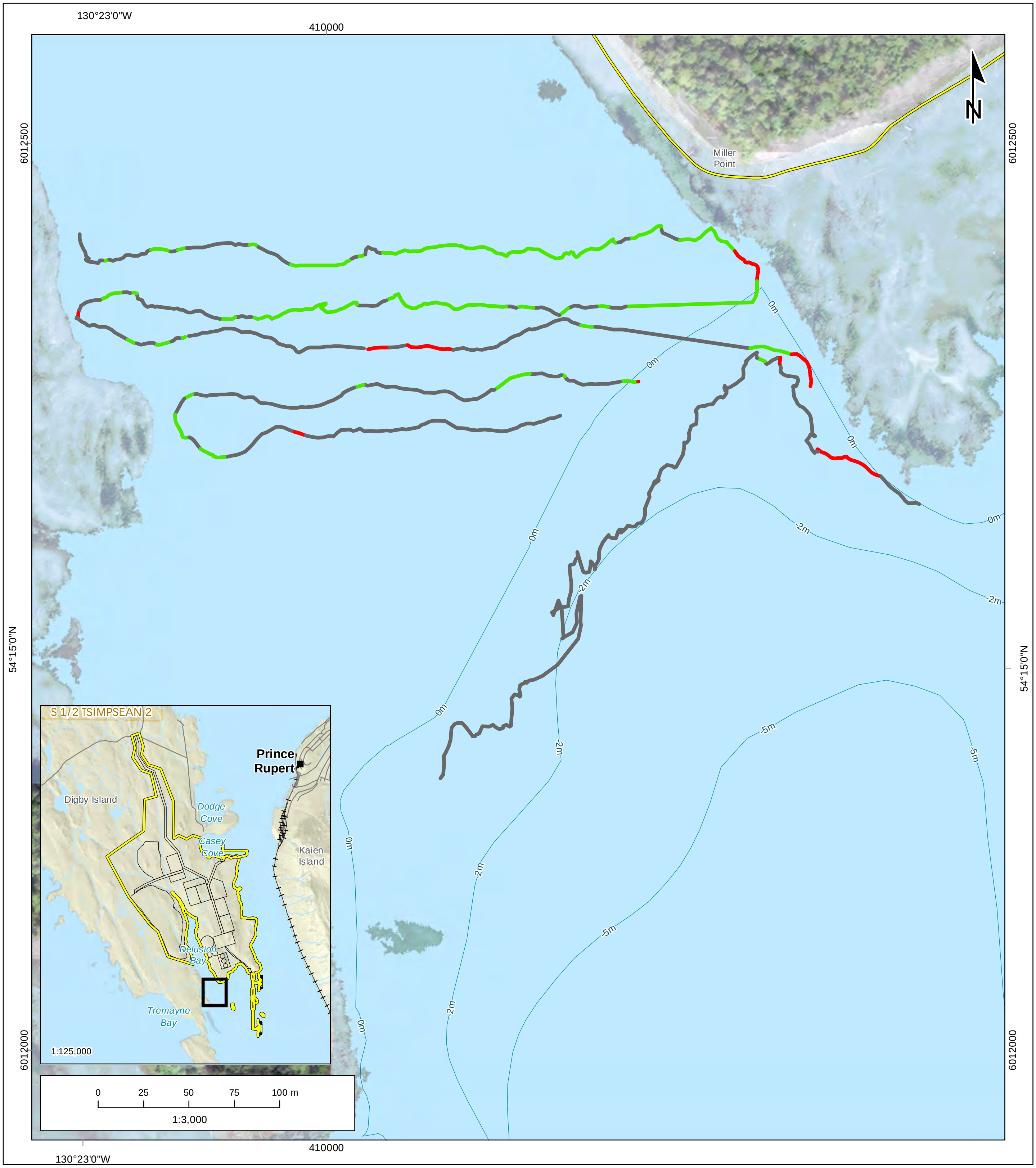
MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

VIDEO GROUND TRUTH - SOUTH DIGBY ISLAND

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 4-3



- City, Municipality, or Town
- Road
- Railway
- Watercourse
- Bathymetric Contour
- First Nation Reserve
- Waterbody
- Project Component
- Project Development Area

Underwater Video Transect

- Algae
- Bare
- Eelgrass

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MARINE FISH AND FISH HABITAT
TECHNICAL DATA REPORT

VIDEO GROUND TRUTH - SOUTHERN DELUSION BAY

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 4-4

■ City, Municipality, or Town
Road
Railway
Watercourse
First Nation Reserve
Waterbody
Project Component
Project Development Area

Underwater Video Transect

Algae
Bare
Bull Kelp
Eelgrass

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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MARINE FISH AND FISH HABITAT TECHNICAL DATA REPORT

VIDEO GROUND TRUTH - NORTHERN DELUSION BAY

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SW	FIGURE NO: 4-5

EELGRASS INTERPOLATION ERROR MATRIX

To estimate the relative accuracy of interpolation of eelgrass presence versus absence, an error matrix was calculated (Table 4-1). This matrix compares video ground-truthing points with a randomly-selected set of hydroacoustic points from throughout the study area and helps to understand the accuracy of interpolation through the quantification of errors of omission (EO), errors of commission (EC), consumer's accuracy (CA), and producer's accuracy (PA).

Table 4-1 Error matrix of site-wide eelgrass interpolation accuracy

		Hydroacoustic classification (points)			Error	
		Eelgrass Absent (<10%)	**Eelgrass Present (>10%)**	**Row Totals**	**EO (%)**	**EC (%)**
Video ground-truthing (points)	Eelgrass Absent	**1594**	119	1713	6.9	10.9
	Eelgrass Present	195	**1518**	1713	11.4	7.3
	Column Totals	1789	1637			
	CA (%)	89.1	92.7			
	PA (%)	93.1	88.6	Overall Accuracy (%)		90.8

Errors of omission describe the proportion of video ground truth points incorrectly classified by the map production process, thereby resulting in lost counts from a particular class. Of those points classified as 'eelgrass present', 6.9% (119 of 1713) were assigned to the wrong class, while 11.4% (195 of 1713) of points assigned to the 'eelgrass absent' category were found to actually contain eelgrass (Table 4-1). Conversely errors of commission account for the number of incorrect points gained by each class. In the 'eelgrass absent' class, 10.9% (195 of 1789) of points were due to EC while 7.3% (119 of 1637) of 'eelgrass present' points were the result of EC (Table 4-1).

The metric of consumer accuracy is a measure of the likelihood that a consumer (or user) of the hydroacoustic output will accurately find the eelgrass classes indicated at any given in-field location. Throughout the Project area, 89.1% (1594 of 1789) of 'eelgrass absent' map points are expected to be devoid of eelgrass on the ground, while a map user would expect 92.7% (1518 of 1637) of 'eelgrass present' map points to contain eelgrass.

Producer accuracy describes the relative proportion of correctly identified hydroacoustic mapping points, as compared to the 'eelgrass present' and 'eelgrass absent' categories ground-truthed through video review. Video-ground truthing points were correctly ascribed as 'eelgrass absent' 93.1% (1594 of 1713) of the time, while 88.6% (1518 of 1713) of 'eelgrass present' ground-truth points fell into the correct mapping category (Table 4-1).

Overall accuracy is calculated as the percentage of correctly classified points (1594 eelgrass absent and 1518 eelgrass present; total 3112 points) out of the total number of ground-truthed points (1713 eelgrass absent and 1713 eelgrass present; total 3426 points). Throughout the area surveyed, overall accuracy was estimated at 90.8% (Table 4-1).

APPENDIX 5

Triton Marine Fish Program

APPENDIX 6

Marine Fish Survey Program

Table 6 1 Substrate Classification

Substrate Type	Definition
Bedrock	Continuous solid rock exposed by the scouring forces of water
Boulder	Rocks greater than 256 mm in diameter
Cobble	Moderate to small-sized rocks 64 mm to 256 mm in diameter
Gravel	Small stones between 2 mm to 64 mm in diameter
Sand	Fine deposits frequently found on margins of streams or between rocks and stones, ranging from 0.06 mm to 2 mm in diameter
Mud	A material of organic origin with a greasy feel between the fingers and no apparent structure, less than 0.06 mm in diameter
Organics	A soft material composed of silt and clay and containing 85% or more organic materials such marsh plant root matrix and remnants of decayed aquatic plants; or large immovable logs
Shell	Calcareous remains of shellfish or invertebrates containing shells

SOURCES:
Williams (1993)

Table 6- 2 Water Quality Parameters Measured at 1 m Below Water Surface

	October 2015				February 2016			
Site	**Temperature (°C)**	**pH**	**Dissolved Oxygen (mg/L)**	**Water Clarity (m)**	**Temperature (°C)**	**pH**	**Dissolved Oxygen (mg/L)**	**Water Clarity (m)**
Casey Cove								
TN02	9.9	7.9	7.9	4.6	6.8	7.7	NA	4.1
TN03	10.2	7.8	8.9	3.2	7.7	8.0	NA	4.1
East Digby Island								
TN17	NA	NA	NA	NA	7.3	8.0	NA	3.2
South Digby Island								
TN05	10.0	8.3	8.4	3.0	NA	NA	NA	NA
TN06	9.7	7.7	8.1	2.5	6.7	8.0	NA	4.0
TN07	9.8	8.0	9.0	2.6	7.3	8.0	NA	3.1
TN08	9.9	7.6	9.9	2.5	6.9	8.0	NA	5.2
TN09	9.8	8.0	7.8	2.5	7.4	8.0	NA	3.0
TN10	9.8	7.9	10.4	2.4	7.0	8.0	NA	3.4
TN11	10.1	7.9	8.9	3.6	6.7	7.8	NA	2.1
Delusion Bay								
TN12	9.7	8.0	7.7	2.2	NA	NA	NA	NA
TN13	9.5	8.0	8.8	3.3	8.2	7.9	NA	2.1
Dodge Cove								
TN01	9.3	7.9	6.3	3.9	7.6	7.9	NA	2.6
TN16	NA	NA	NA	NA	7.1	7.3	NA	2.2
Tremayne Bay								
TN14	9.6	7.8	9.1	4.2	7.9	8.0	NA	4.1
TN15	9.5	8.0	6.8	3.4	7.2	7.9	NA	4.1

NOTES:

NA Water quality measurements not taken because tangle net not successfully set or because of equipment malfunction with water quality meter.

Table 6-3 Beach Seine (BS) Set and Tangle Net (TN) Sampling Sites, October 2015, February 2016, and May 2016

Site Id	Haul	Date Surveyed	Tide[b]	Deployment (Wade; Boat)	Max. depth sampled (m)	Set Rating[a]	Latitude	Longitude	Dominant Substrate (Type [%])	Secondary Substrate (Type [%])
Casey Cove										
BS02	1	October 24 2015	HS	boat	2.7	3	54.280784	-130.385949	gravel (95)	boulder (5)
BS02	2	October 24 2015	HS	boat	1.8	5	54.281319	-130.385849	gravel (100)	NA
BS02	3	October 24 2015	HS	boat	1.8	3	54.282572	-130.384917	gravel (97)	boulder (3)
BS02	1	February 13 2016	E	wade	0.5	5	54.281771	-130.383231	mud (70)	sand (30)
BS02	2	February 13 2016	E	wade	0.5	4	54.281622	-130.382919	mud (70)	sand (30)
BS02	3	February 13 2016	E	wade	0.6	5	54.281267	-130.382462	mud (80)	sand (20)
BS02	1	May 9 2016	F	wade	0.5	4	54.281688	-130.384260	sand (90)	gravel (10)
BS02	2	May 9 2016	F	boat	1.2	5	54.281415	-130.384953	sand (90)	gravel (10)
BS02	3	May 9 2016	F	boat	3	5	54.280355	-130.385678	gravel (90)	sand (10)
BS03	1	October 24 2015	HS	boat	2.1	5	54.278603	-130.375121	gravel (100)	NA
BS03	2	October 24 2015	HE	boat	2.3	5	54.278441	-130.374578	gravel (70)	shell (30)
BS03	3	October 24 2015	HE	boat	2.6	5	54.278578	-130.373682	gravel (98)	cobble (2)
BS03	1	February 12 2016	F	boat	4	2	54.278888	-130.375178	cobble (80)	gravel (20)
BS03	2	February 12 2016	LF	boat	4	5	54.278835	-130.375054	cobble (80)	gravel (20)
BS03	3	February 12 2016	F	boat	1.5	5	54.278724	-130.374528	cobble (50)	sand (50)
BS03	1	May 9 2016	HF	boat	2.4	5	54.278502	-130.374848	gravel (60)	sand (40)
BS03	2	May 9 2016	HF	boat	1.8	5	54.278577	-130.373588	gravel (80)	cobble (20)
BS03	3	May 9 2016	HF	boat	2.1	4	54.278660	-130.373419	cobble (80)	gravel (20)
TN02		October 24 2015	E	boat	8.2	NA	54.280406	-130.380358	NA	NA
TN02		February 13 2016	E	boat	3.5	NA	54.281120	-130.380429	NA	NA
TN03		October 29 2015	LF	boat	18.6	NA	54.281281	-130.373724	NA	NA
TN03		February 12 2016	F	boat	10.5	NA	54.279449	-130.376411	NA	NA

Table 6-3 Beach Seine (BS) Set and Tangle Net (TN) Sampling Sites, October 2015, February 2016, and May 2016

Site Id	Haul	Date Surveyed	Tide[b]	Deployment (Wade; Boat)	Max. depth sampled (m)	Set Rating[a]	Latitude	Longitude	Dominant Substrate (Type [%])	Secondary Substrate (Type [%])
East Digby Island										
BS04	1	October 26 2015	LF	boat	0.6	5	54.266616	-130.369789	mud (80)	gravel (20)
BS04	2	October 26 2015	LF	boat	0.9	1	54.266275	-130.369322	sand (90)	boulders (10)
BS04	3	October 26 2015	F	boat	1.8	3	54.265916	-130.369061	mud (95)	boulders (5)
BS04	1	February 11 2016	F	wade	1.2	4	54.266790	-130.369570	sand (90)	cobble (10)
BS04	2	February 11 2016	F	wade	1.1	5	54.266790	-130.369570	sand (60)	gravel (40)
BS04	3	February 11 2016	F	wade	1	5	54.266273	-130.370060	sand (60)	gravel (40)
BS04	1	May 5 2016	HE	boat	1.2	5	54.265817	-130.368967	sand (60)	gravel (40)
BS04	2	May 7 2016	F	boat	1.8	5	54.265826	-130.368842	sand (50)	gravel (50)
BS04	3	May 8 2016	F	boat	0.9	4	54.266647	-130.369503	sand (60)	gravel (40)
BS04	4	May 8 2016	F	boat	0.9	4	54.267253	-130.369608	sand (95)	cobble (5)
TN17	NA	February 11 2016	F	boat	4.5	NA	54.268253	-130.368237	NA	NA
South Digby Island										
BS05	1	October 28 2015	LF	wade	0.2	4	54.255667	-130.370761	mud (100)	NA
BS05	2	October 28 2015	LF	wade	0.6	4	54.255417	-130.371578	mud (97)	boulders (3)
BS05	1	February 11 2016	LS	wade	0.6	5	54.252901	-130.369002	sand (95)	boulders (5)
BS05	2	February 11 2016	LF	wade	0.6	4	54.253137	-130.369578	sand (95)	boulders (5)
BS05	1	May 8 2016	LS	boat	1.5	5	54.253008	-130.368504	sand (100)	NA
BS05	2	May 9 2016	LS	boat	2.1	5	54.252229	-130.371217	sand (95)	cobble (5)
BS05	3	May 10 2016	LF	boat	2.4	5	54.253164	-130.369113	sand (100)	NA
BS07	1	October 28 2015	LS	wade	0.4	5	54.250600	-130.367310	cobble (60)	gravel (40)
BS07	2	October 28 2015	LS	wade	0.4	5	54.250853	-130.367350	cobble (60)	gravel (40)
BS07	3	October 28 2015	LS	boat	1.2	5	54.250683	-130.369208	gravel (80)	cobble (20)

Table 6-3 Beach Seine (BS) Set and Tangle Net (TN) Sampling Sites, October 2015, February 2016, and May 2016

Site Id	Haul	Date Surveyed	Tide[b]	Deployment (Wade; Boat)	Max. depth sampled (m)	Set Rating[a]	Latitude	Longitude	Dominant Substrate (Type [%])	Secondary Substrate (Type [%])
BS07	1	February 10 2016	LS	wade	1.2	4	54.249528	-130.366803	gravel (70)	cobble (30)
BS07	2	February 10 2016	LS	boat	2.3	5	54.250724	-130.367534	shell (50)	gravel (50)
BS07	3	February 10 2016	LS	boat	1	5	54.249662	-130.369310	gravel (40)	shell (30)
BS07	4	February 10 2016	LF	wade	1	5	54.250028	-130.369475	gravel (70)	shell (30)
BS07	1	May 6 2016	LS	boat	2.4	5	54.250875	-130.367395	gravel (70)	sand (30)
BS07	2	May 7 2016	LS	boat	2.1	5	54.250751	-130.367579	gravel (50)	cobble (50)
BS07	3	May 7 2016	LF	boat	1.5	5	54.250615	-130.369190	cobble (80)	sand (20)
BS08	1	October 27 2015	LF	boat	2	5	54.246247	-130.363007	cobble (100)	NA
BS08	1	February 10 2016	F	boat	1.1	2	54.246344	-130.363045	cobble (80)	gravel (20)
BS08	1	May 6 2016	HF	boat	1.8	3	54.246176	-130.363069	cobble (80)	gravel (20)
BS08	2	May 6 2016	HF	boat	1.8	5	54.246153	-130.363169	cobble (90)	gravel (10)
BS11	1	October 27 2015	LS	boat	2.1	5	54.250363	-130.374384	gravel (60)	shell (40)
BS11	2	October 27 2015	LF	boat	1.1	5	54.250087	-130.374305	gravel (60)	shell (40)
BS11	3	October 27 2015	LF	boat	1.2	5	54.248758	-130.373943	gravel (70)	cobble (30)
BS11	1	February 10 2016	LF	boat	3.1	5	54.249719	-130.374545	shell (60)	gravel (40)
BS11	2	February 10 2016	LF	boat	1.4	5	54.250118	-130.374252	cobble (50)	shell (50)
BS11	3	February 10 2016	LF	wade	1	5	54.248979	-130.374030	boulder (50)	cobble (50)
BS11	1	May 7 2016	LF	boat	1.5	5	54.250383	-130.374399	gravel (50)	sand (50)
BS11	2	May 7 2016	LF	boat	NR	3	54.249852	-130.374318	cobble (70)	sand (20)
BS11	3	May 9 2016	LE	boat	2.1	NR	54.250170	-130.374430	gravel (70)	sand (30)
TN05	NA	October 27 2015	HS	boat	10.1	NA	54.251093	-130.369955	NA	NA
TN06	NA	February 13 2016	LF	boat	19.2	NA	54.253318	-130.366253	NA	NA
TN06	NA	October 28 2015	HF	boat	30	NA	54.252818	-130.364876	NA	NA

Table 6-3 Beach Seine (BS) Set and Tangle Net (TN) Sampling Sites, October 2015, February 2016, and May 2016

Site Id	Haul	Date Surveyed	Tide[b]	Deployment (Wade; Boat)	Max. depth sampled (m)	Set Rating[a]	Latitude	Longitude	Dominant Substrate (Type [%])	Secondary Substrate (Type [%])
TN07	NA	February 10 2016	F	boat	10.6	NA	54.249602	-130.362692	NA	NA
TN07	NA	October 27 2015	HF	boat	13.1	NA	54.249877	-130.363215	NA	NA
TN08	NA	February 13 2016	F	boat	3.4	NA	54.247681	-130.365606	NA	NA
TN08	NA	October 28 2015	HE	boat	12.4	NA	54.247407	-130.364988	NA	NA
TN09	NA	February 10 2016	F	boat	12	NA	54.243358	-130.364804	NA	NA
TN09	NA	October 28 2015	HF	boat	22.1	NA	54.243413	-130.365013	NA	NA
TN10	NA	February 11 2016	LS	boat	7.1	NA	54.245790	-130.372266	NA	NA
TN10	NA	October 28 2015	HS	boat	14.6	NA	54.246317	-130.372701	NA	NA
TN11	NA	February 11 2016	LE	boat	3	NA	54.250894	-130.378668	NA	NA
TN11	NA	October 27 2015	HF	boat	9.1	NA	54.251184	-130.378363	NA	NA
Delusion Bay										
BS12	1	October 27 2015	LF	boat	0.5	4	54.255824	-130.382071	cobble (80)	sand (20)
BS12	2	October 27 2015	HE	boat	1.1	4	54.257138	-130.382925	gravel (60)	sand (40)
BS12	1	February 9 2016	HS	boat	1.8	5	54.257328	-130.382720	sand (90)	gravel (10)
BS12	2	February 10 2016	F	wade	1.2	4	54.256473	-130.382047	cobble (60)	gravel (40)
BS12	3	February 10 2016	F	wade	1.2	4	54.256482	-130.382891	gravel (60)	cobble (40)
BS12	1	May 8 2016	HF	boat	1.2	3	54.258140	-130.383112	mud (90)	gravel (10)
BS12	2	May 7 2016	HF	boat	1.5	5	54.257209	-130.382834	sand (60)	gravel (40)
BS13	1	October 26 2015	HE	boat	1.8	1	54.259997	-130.388168	mud (80)	gravel (20)
BS13	2	October 26 2015	HE	boat	1.2	1	54.260257	-130.388493	mud (80)	gravel (20)
BS13	3	October 26 2015	HE	boat	0.6	3	54.260521	-130.388848	mud (95)	gravel (5)
BS13	4	October 27 2015	LF	boat	0.6	4	54.257808	-130.386174	mud (100)	NA
BS13	1	February 9 2016	HE	boat	1.1	3	54.259983	-130.387968	mud (80)	gravel (20)

Table 6-3 Beach Seine (BS) Set and Tangle Net (TN) Sampling Sites, October 2015, February 2016, and May 2016

Site Id	Haul	Date Surveyed	Tide[b]	Deployment (Wade; Boat)	Max. depth sampled (m)	Set Rating[a]	Latitude	Longitude	Dominant Substrate (Type [%])	Secondary Substrate (Type [%])
BS13	2	February 9 2016	HE	boat	1.1	4	54.260077	-130.388324	gravel (80)	cobble (20)
BS13	3	February 9 2016	HE	boat	0.6	4	54.260156	-130.388495	cobble (75)	gravel (25)
BS13	1	May 7 2016	HF	boat	1.2	5	54.260116	-130.388306	cobble (70)	gravel (30)
BS13	2	May 7 2016	HF	boat	1.2	5	54.260230	-130.388517	gravel (60)	sand (40)
BS13	3	May 8 2016	HS	boat	1.5	3	54.261719	-130.390314	mud (95)	cobble (5)
BS13	4	May 8 2016	HF	boat	1.2	5	54.257870	-130.386599	cobble (60)	gravel (40)
BS17	1	February 11 2016	HF	boat	1.2	5	54.268369	-130.392656	mud (50)	grass (50)
BS17	2	February 11 2016	HF	boat	1.4	5	54.268282	-130.392393	mud (50)	sand (50)
BS17	3	February 11 2016	HF	boat	1.5	4	54.268485	-130.392691	grass (50)	mud (50)
BS17	1	May 6 2016	HS	boat	0.9	5	54.268069	-130.392169	mud (100)	NA
BS17	2	May 6 2016	HS	boat	2.7	3	54.268206	-130.392173	mud (100)	NA
BS17	3	May 6 2016	HE	boat	1.5	5	54.268210	-130.392192	mud (100)	NA
TN12	NA	October 28 2015	HS	boat	5.8	NA	54.254032	-130.382421	NA	NA
TN13	NA	February 9 2016	HF	boat	2.1	NA	54.260647	-130.386501	NA	NA
TN13	NA	October 27 2015	HS	boat	3.5	NA	54.260318	-130.387731	NA	NA
Dodge Cove										
BS01	1	October 24 2015	HF	boat	2	1	54.288013	-130.379247	mud (90)	gravel (10)
BS01	2	October 24 2015	HF	boat	1.3	4	54.287831	-130.378130	mud (90)	gravel (10)
BS01	3	October 24 2015	HF	boat	2.3	3	54.286258	-130.380323	mud (95)	boulder (5)
BS01	1	February 12 2016	F	wade	0.8	5	54.278724	-130.374528	mud (90)	sand (10)
BS01	2	February 12 2016	F	wade	1	5	54.287725	-130.378207	mud (60)	sand (40)
BS01	3	February 12 2016	HF	boat	2.2	5	54.286428	-130.380023	cobble (60)	gravel (40)
BS01	1	May 10 2016	HF	boat	1.2	3	54.287654	-130.377975	mud (100)	NA

Table 6-3 Beach Seine (BS) Set and Tangle Net (TN) Sampling Sites, October 2015, February 2016, and May 2016

Site Id	Haul	Date Surveyed	Tide[b]	Deployment (Wade; Boat)	Max. depth sampled (m)	Set Rating[a]	Latitude	Longitude	Dominant Substrate (Type [%])	Secondary Substrate (Type [%])
BS01	2	May 10 2016	HF	boat	1.2	3	54.286954	-130.377784	silt (80)	gravel (20)
BS01	3	May 10 2016	HF	boat	1.5	3	54.286258	-130.380194	gravel (80)	boulders (20)
BS16	1	October 29 2015	LS	boat	1.2	5	54.290888	-130.381546	mud (100)	NA
BS16	2	October 29 2015	LS	boat	1.7	5	54.290855	-130.382046	mud (100)	NA
BS16	3	October 29 2015	LS	boat	1.1	5	54.290923	-130.382695	mud (100)	NA
BS16	1	February 12 2016	LE	wade	1	5	54.291010	-130.380960	mud (50)	sand (50)
BS16	2	February 12 2016	LE	wade	1.1	5	54.290942	-130.381434	mud (50)	sand (50)
BS16	3	February 12 2016	LS	wade	1.2	5	54.290885	-130.381693	mud (50)	sand (50)
BS16	4	February 12 2016	LS	wade	1.2	5	54.290845	-130.382045	sand (50)	mud (50)
BS16	1	May 10 2016	E	boat	2.4	5	54.290790	-130.381564	mud (100)	NA
BS16	2	May 10 2016	LS	boat	1.8	5	54.290752	-130.381910	mud (100)	NA
BS16	3	May 10 2016	HF	boat	3	5	54.290968	-130.382139	sand (100)	NA
TN01	NA	February 12 2016	F	boat	1.2	NA	54.288077	-130.381215	NA	NA
TN01	NA	October 26 2015	HF	boat	6.1	NA	54.287650	-130.380480	NA	NA
TN16	NA	February 12 2016	LE	boat	4.3	NA	54.290208	-130.382715	NA	NA
TN16	NA	October 29 2015	LF	boat	3.4	NA	54.289711	-130.383266	NA	NA
Tremayne Bay										
BS14	1	October 25 2015	HF	boat	2.1	4	54.241883	-130.384572	sand (100)	NA
BS14	2	October 25 2015	HF	boat	2.6	4	54.242268	-130.384172	sand (100)	NA
BS14	3	October 25 2015	HS	boat	2.4	2	54.244868	-130.387719	gravel (100)	NA
BS14	1	February 9 2016	F	boat	1.2	5	54.241761	-130.385008	sand (100)	NA
BS14	2	February 9 2016	F	boat	0.9	5	54.242082	-130.384435	sand (100)	NA
BS14	1	May 5 2016	LS	wade	0.6	5	54.242018	-130.385486	sand (70)	mud (30)

Table 6-3 Beach Seine (BS) Set and Tangle Net (TN) Sampling Sites, October 2015, February 2016, and May 2016

Site Id	Haul	Date Surveyed	Tide[b]	Deployment (Wade; Boat)	Max. depth sampled (m)	Set Rating[a]	Latitude	Longitude	Dominant Substrate (Type [%])	Secondary Substrate (Type [%])
BS14	2	May 5 2016	F	boat	1.5	4	54.242131	-130.384534	sand (70)	mud (30)
BS14	3	May 6 2016	LF	boat	1.5	5	54.244436	-130.387775	gravel (90)	sand (10)
BS15	1	October 25 2015	HE	boat	1.5	4	54.249684	-130.403694	gravel (100)	NA
BS15	1	February 9 2016	LF	boat	1.1	4	54.249196	-130.403537	sand (70)	gravel (30)
BS15	1	May 5 2016	F	boat	1.2	4	54.249354	-130.404595	gravel (90)	sand (10)
BS18	1	October 25 2015	HE	boat	1.2	4	54.251170	-130.412494	mud (80)	gravel (20)
BS18	2	October 25 2015	E	boat	0.8	3	54.250568	-130.412079	mud (60)	cobble (40)
BS18	1	February 9 2016	LF	wade	1	5	54.249852	-130.411280	mud (90)	cobble (10)
BS18	2	February 9 2016	LF	wade	1.3	4	54.250179	-130.411767	cobble (50)	gravel (50)
BS18	1	May 5 2016	HS	boat	1.2	4	54.251384	-130.413163	gravel (70)	sand (30)
BS18	2	May 5 2016	HS	boat	2.4	5	54.250864	-130.412518	cobble (90)	gravel (10)
TN14	NA	February 9 2016	F	boat	3.8	NA	54.243071	-130.386948	NA	NA
TN14	NA	October 25 2015	HS	boat	7.3	NA	54.243332	-130.387047	NA	NA
TN15	NA	February 9 2016	F	boat	6.7	NA	54.245871	-130.398805	NA	NA
TN15	NA	October 25 2015	HE	boat	11.3	NA	54.247075	-130.399093	NA	NA

NOTES:

[a] Set ratings range from 1 - 5, 1= poor (snagged multiple times) and 5= good (no snags). NA= not applicable. Set rating only recorded for beach seine sets.

[b] Tide categories are as follows: Low Slack (LS) defined as +/- hr from low tide; Low Flood (LF) defined as two hours following low slack; Flood (F) defined as the time between low flood and high flood; High Flood (HF) defined as the two hours before high slack; High Slack (HS) defined as +/- 1 hr from high tide; High Ebb (HE) defined as the two hours after high slack; Ebb (E) defined as the two hours preceding low slack.

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
Casey Cove	October 2015	Beach Seine	coho salmon	*Oncorhynchus kisutch*	3	78 ± 6
Casey Cove	October 2015	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	2	208 ± 48
Casey Cove	October 2015	Beach Seine	rock sole	*Lepidopsetta* spp.	4	257 ± 84
Casey Cove	October 2015	Beach Seine	shiner perch	*Cymatogaster aggregata*	36	67 ± 3
Casey Cove	October 2015	Beach Seine	starry flounder	*Platichthys stellatus*	8	158 ± 25
Casey Cove	October 2015	Beach Seine	surf smelt	*Hypomesus pretiosus*	10	105 ± 0
Casey Cove	October 2015	Beach Seine	tubesnout	*Aulorhynchus flavidus*	12	105 ± 12
Casey Cove	October 2015	Beach Seine	unidentified larval fish	NA	12	48 ± 3
Casey Cove	October 2015	Tangle Net	shiner perch	*Cymatogaster aggregata*	1	114 (NA)
Casey Cove	February 2016	Beach Seine	chum salmon	*Oncorhyncus keta*	1	44 ± NA
Casey Cove	February 2016	Beach Seine	English sole	*Parophrys vetulus*	11	55.5 ± 24.1
Casey Cove	February 2016	Beach Seine	Pacific herring	*Clupea pallasii*	11	92.7 ± 10.6
Casey Cove	February 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	35	64.3 ± 28.4
Casey Cove	February 2016	Beach Seine	pink salmon	*Oncorhyncus gorbuscha*	17	31.6 ± 2.8
Casey Cove	February 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	2	66.5 ± 0.7
Casey Cove	February 2016	Beach Seine	starry flounder	*Platichthys stellatus*	33	188.6 ± 68.3
Casey Cove	February 2016	Beach Seine	surf smelt	*Hypomesus pretiosus*	1	125.3 ± 19.3
Casey Cove	February 2016	Beach Seine	tubesnout	*Aulorhynchus flavidus*	5	110 ± NA
Casey Cove	February 2016	Beach Seine	unidentified flatfish	NA	19	39.4 ± 11.7
Casey Cove	February 2016	Beach Seine	unidentified larval fish	NA	1	48.1 ± 3.8
Casey Cove	February 2016	Beach Seine	unidentified sculpin	NA	1	47 ± NA
Casey Cove	February 2016	Tangle Net	Pacific staghorn sculpin	*Leptocottus armatus*	1	279 ± NA
Casey Cove	May 2016	Beach Seine	butter sole	*Isopsetta isolepis*	2	76 ± 8.5
Casey Cove	May 2016	Beach Seine	Chinook salmon	*Oncorhynchus tshawytscha*	1	93 ± NA

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
Casey Cove	May 2016	Beach Seine	chum salmon	*Oncorhyncus keta*	53	61.4 ± 8.6
Casey Cove	May 2016	Beach Seine	coho salmon	*Oncorhynchus kisutch*	12	101 ± 10.9
Casey Cove	May 2016	Beach Seine	Pacific herring	*Clupea pallasii*	2	95 ± 4.2
Casey Cove	May 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	22	99.5 ± 36.5
Casey Cove	May 2016	Beach Seine	pink salmon	*Oncorhyncus gorbuscha*	39	54.8 ± 14.8
Casey Cove	May 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	3	135 ± 11.3
Casey Cove	May 2016	Beach Seine	sockeye salmon	*Oncorhynchus nerka*	3	74.7 ± 11.7
Casey Cove	May 2016	Beach Seine	starry flounder	*Platichthys stellatus*	32	219.5 ± 58.7
Casey Cove	May 2016	Beach Seine	surf smelt	*Hypomesus pretiosus*	10	115.9 ± 9.8
Casey Cove	May 2016	Beach Seine	unidentified sculpin	Family Cottidae	3	50.3 ± 13.8
East Digby Island	October 2015	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	16	154 ± 89
East Digby Island	October 2015	Beach Seine	rock sole	*Lepidopsetta* spp.	9	131 ± 48
East Digby Island	October 2015	Beach Seine	shiner perch	*Cymatogaster aggregata*	18	67 ± 3
East Digby Island	October 2015	Beach Seine	starry flounder	*Platichthys stellatus*	17	175 ± 77
East Digby Island	October 2015	Beach Seine	Tubesnout	*Aulorhynchus flavidus*	24	109 ± 10
East Digby Island	October 2015	Beach Seine	unidentified larval fish	NA	11	42 ± 5
East Digby Island	February 2016	Beach Seine	chum salmon	*Oncorhynchus keta*	1	41 ± NA
East Digby Island	February 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	13	56.8 ± 14.8
East Digby Island	February 2016	Beach Seine	pink salmon	*Oncorhynchus gorbuscha*	4	33.8 ± 1.7
East Digby Island	February 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	1	72 ± NA
East Digby Island	February 2016	Beach Seine	starry flounder	*Platichthys stellatus*	7	162.4 ± 48.5
East Digby Island	February 2016	Beach Seine	unidentified flatfish	NA	1	58 ± NA
East Digby Island	February 2016	Beach Seine	unidentified sculpin	*Family Cottidae*	3	43 ± 1
East Digby Island	February 2016	Tangle Net	rock sole	*Lepidopsetta* spp.	1	299 ± NA

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
East Digby Island	May 2016	Beach seine	butter sole	*Isopsetta isolepis*	1	76 ± NA
East Digby Island	May 2016	Beach Seine	Chinook salmon	*Oncorhynchus tshawytscha*	3	114.3 ± 9.3
East Digby Island	May 2016	Beach Seine	chum salmon	*Oncorhyncus keta*	2	55 ± 2.8
East Digby Island	May 2016	Beach Seine	coho salmon	*Oncorhynchus kisutch*	5	112.6 ± 10.8
East Digby Island	May 2016	Beach Seine	cresent gunnel	*Pholis laeta*	1	125 ± NA
East Digby Island	May 2016	Beach Seine	fluffy sculpin	*Oligocottus snyderi*	3	55 ± NA
East Digby Island	May 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	1	115.5 ± 49
East Digby Island	May 2016	Beach Seine	pink salmon	*Oncorhyncus gorbuscha*	18	41 ± 14.4
East Digby Island	May 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	7	99.2 ± 21.8
East Digby Island	May 2016	Beach Seine	sockeye salmon	*Oncorhynchus nerka*	45	90 ± NA
East Digby Island	May 2016	Beach Seine	starry flounder	*Platichthys stellatus*	1	160.3 ± 49.7
East Digby Island	May 2016	Beach Seine	unidentified sculpin	Family Cottidae	22	43.2 ± 3
South Digby Island	October 2015	Beach Seine	buffalo sculpin	*Enophrys bison*	6	80 ± 93.8
South Digby Island	October 2015	Beach Seine	great sculpin	*Myoxocephalus polyacanthocephalus*	5	217.2 ± 84.3
South Digby Island	October 2015	Beach Seine	unidentified gunnel	Family Pholidae	1	79.9 ± 4.4
South Digby Island	October 2015	Beach Seine	Pacific herring	*Clupea pallasii*	10	49.5 ± 13.5
South Digby Island	October 2015	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	11	60 ± NA
South Digby Island	October 2015	Beach Seine	prickly sculpin	*Cottus asper*	4	76.7 ± 18.8
South Digby Island	October 2015	Beach Seine	rock sole	*Lepidopsetta* spp.	1	178.4 ± 62.4
South Digby Island	October 2015	Beach Seine	shiner perch	*Cymatogaster aggregata*	65	100.9 ± 20
South Digby Island	October 2015	Beach Seine	starry flounder	*Platichthys stellatus*	22	68 ± NA
South Digby Island	October 2015	Beach Seine	tubesnout	*Aulorhynchus flavidus*	13	44.3 ± 5
South Digby Island	October 2015	Beach Seine	unidentified larval fish	NA	38	49.9 ± 21.4

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
South Digby Island	October 2015	Beach Seine	unidentified sculpin	Family Cottidae	10	57 ± 18
South Digby Island	October 2015	Tangle Net	shiner perch	*Cymatogaster aggregata*	2	113 ± 5.7
South Digby Island	February 2016	Beach Seine	bay pipefish	*Syngnathus leptorhynchus*	1	124 ± NA
South Digby Island	February 2016	Beach Seine	chum salmon	*Oncorhynchus keta*	1	42 ± NA
South Digby Island	February 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	19	86.5 ± 46.1
South Digby Island	February 2016	Beach Seine	pink salmon	*Oncorhynchus gorbuscha*	4	34.8 ± 0.5
South Digby Island	February 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	6	71 ± 3.1
South Digby Island	February 2016	Beach Seine	starry flounder	*Platichthys stellatus*	22	206.2 ± 57.8
South Digby Island	February 2016	Beach Seine	unidentified flatfish	NA	13	54.3 ± 15.8
South Digby Island	February 2016	Beach Seine	unidentified larval fish	NA	12	48.8 ± 5.1
South Digby Island	February 2016	Beach Seine	unidentified sculpin	Family Cottidae	5	48.8 ± 10.8
South Digby Island	February 2016	Tangle Net	English sole	*Parophrys vetulus*	1	311 ± NA
South Digby Island	February 2016	Tangle Net	rock sole	*Lepidopsetta* spp.	1	284 ± NA
South Digby Island	May 2016	Beach Seine	bay pipefish	*Syngnathus leptorhyncus*	5	194.8 ± 62.9
South Digby Island	May 2016	Beach Seine	buffalo sculpin	*Enophrys bison*	14	69.4 ± 23.4
South Digby Island	May 2016	Beach Seine	butter sole	*Isopsetta isolepis*	30	71.2 ± 24.5
South Digby Island	May 2016	Beach Seine	Chinook salmon	*Oncorhynchus tshawytscha*	19	117.7 ± 15.4
South Digby Island	May 2016	Beach Seine	chum salmon	*Oncorhynchus keta*	67	70.6 ± 15.3
South Digby Island	May 2016	Beach Seine	C-O sole	*Pleuronichthys coenosus*	1	177 ± NA
South Digby Island	May 2016	Beach Seine	coho salmon	*Oncorhynchus kisutch*	53	103.9 ± 11
South Digby Island	May 2016	Beach Seine	crescent gunnel	*Pholis laeta*	43	130 ± 28.9
South Digby Island	May 2016	Beach Seine	Dolly Varden	*Salvelinus malma*	1	202 ± NA
South Digby Island	May 2016	Beach Seine	English sole	*Parophrys vetulus*	4	175.2 ± 25.3
South Digby Island	May 2016	Beach Seine	great sculpin	*Myoxocephalus*	1	460 ± NA

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
				polyacanthocephalus		
South Digby Island	May 2016	Beach Seine	high cockscomb	*Anoplarchus purpurescens*	1	104 ± NA
South Digby Island	May 2016	Beach Seine	kelp perch	*Brachyistius frenatus*	4	75.2 ± 2.5
South Digby Island	May 2016	Beach Seine	Needlefish	*Belonidae* spp.	1	105 ± NA
South Digby Island	May 2016	Beach Seine	Pacific herring	*Clupea pallasii*	54	97.4 ± 13.3
South Digby Island	May 2016	Beach Seine	Pacific snake prickleback	*Lumpenus sagitta*	4	226.2 ± 25
South Digby Island	May 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	19	127.1 ± 60.2
South Digby Island	May 2016	Beach Seine	penpoint gunnel	*Apodichthys flavidus*	1	220 ± NA
South Digby Island	May 2016	Beach Seine	pink salmon	*Oncorhynchus gorbuscha*	45	59.3 ± 13.9
South Digby Island	May 2016	Beach Seine	rock sole	*Lepidopsetta bilineata*	26	124.9 ± 49.5
South Digby Island	May 2016	Beach Seine	sand lance	*Ammodytidae* spp.	3	106.3 ± 3.2
South Digby Island	May 2016	Beach Seine	Sandfish	Family *Trichodontidae*	1	42 ± NA
South Digby Island	May 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	37	104.9 ± 23.8
South Digby Island	May 2016	Beach Seine	Snailfish	*Liparidae* spp.	2	40 ± NA
South Digby Island	May 2016	Beach Seine	sockeye salmon	*Oncorhynchus nerka*	82	72.1 ± 9.6
South Digby Island	May 2016	Beach Seine	speckled sanddab	*Citharichthys stigmaeus*	25	80.3 ± 28.3
South Digby Island	May 2016	Beach Seine	starry flounder	*Platichthys stellatus*	22	200.7 ± 86.6
South Digby Island	May 2016	Beach Seine	sturgeon poacher	*Podothecus accipenserinus*	1	72 ± NA
South Digby Island	May 2016	Beach Seine	surf smelt	*Hypomesus pretiosus*	27	112 ± 23.8
South Digby Island	May 2016	Beach Seine	tadpole sculpin	*Psychrolutes paradoxus*	1	46 ± NA
South Digby Island	May 2016	Beach Seine	tubesnout	*Aulorhynchus flavidus*	1	108 ± NA
South Digby Island	May 2016	Beach Seine	unidentified flat fish	*Pleuronectiformes* spp.	2	48.5 ± 9.2
South Digby Island	May 2016	Beach Seine	unidentified gadid	*Gadidae sp.*	3	24.3 ± 6.7
South Digby Island	May 2016	Beach Seine	unidentified sculpin	Family Cottidae	8	61.5 ± 10.4

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
South Digby Island	May 2016	Beach Seine	unidentified larval fish	*NA*	26	22 ± 3
South Digby Island	May 2016	Beach Seine	whitespotted greenling	*Hexagrammos stelleri*	4	218 ± 109.1
Delusion Bay	October 2015	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	17	41.6 ± 11.2
Delusion Bay	October 2015	Beach Seine	shiner perch	*Cymatogaster aggregata*	4	68.8 ± 4
Delusion Bay	October 2015	Beach Seine	starry flounder	*Platichthys stellatus*	21	176.6 ± 59
Delusion Bay	February 2016	Beach Seine	chum salmon	*Oncorhynchus keta*	2	41 ± 2.8
Delusion Bay	February 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	5	49.4 ± 15.6
Delusion Bay	February 2016	Beach Seine	unidentified larval fish	NA	11	49 ± 1.9
Delusion Bay	February 2016	Beach Seine	unidentified sculpin	Family Cottidae	8	53.5 ± 14.4
Delusion Bay	February 2016	Tangle Net	starry flounder	*Platichthys stellatus*	1	235 ± NA
Delusion Bay	May 2016	Beach Seine	Chinook salmon	*Oncorhynchus tshawytscha*	2	114 ± 5.7
Delusion Bay	May 2016	Beach Seine	chum salmon	*Oncorhynchus keta*	30	59.9 ± 7.3
Delusion Bay	May 2016	Beach Seine	coho salmon	*Oncorhynchus kisutch*	7	101.3 ± 10.2
Delusion Bay	May 2016	Beach Seine	Dolly Varden	*Salvelinus malma*	1	258 ± NA
Delusion Bay	May 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	35	70.8 ± 22.7
Delusion Bay	May 2016	Beach Seine	pink salmon	*Oncorhynchus gorbuscha*	4	44.8 ± 7.8
Delusion Bay	May 2016	Beach Seine	Sandfish	Family Trichodontidae	1	20 ± NA
Delusion Bay	May 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	29	131.3 ± 22
Delusion Bay	May 2016	Beach Seine	sockeye salmon	*Oncorhynchus nerka*	3	75.7 ± 27.1
Delusion Bay	May 2016	Beach Seine	starry flounder	*Platichthys stellatus*	4	169.5 ± 96.3
Delusion Bay	May 2016	Beach Seine	surf smelt	*Hypomesus pretiosus*	23	83.6 ± 26.8
Delusion Bay	May 2016	Beach Seine	threespine stickleback	*Gasterosteus aculeatus*	4	55 ± 6.2
Delusion Bay	May 2016	Beach Seine	unidentified sculpin	Family Cottidae	3	54 ± 16.4
Dodge Cove	October 2015	Beach Seine	bay pipefish	*Syngnathus leptorhynchus*	23	133.4 ± 63.3

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
Dodge Cove	October 2015	Beach Seine	buffalo sculpin	*Enophrys bison*	1	39 ± NA
Dodge Cove	October 2015	Beach Seine	coho salmon	*Oncorhynchus kisutch*	5	78.6 ± 7.6
Dodge Cove	October 2015	Beach Seine	crescent gunnel	*Pholis laeta*	1	145 ± NA
Dodge Cove	October 2015	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	2	90 ± 8.5
Dodge Cove	October 2015	Beach Seine	prickly sculpin	*Cottus asper*	15	71.8 ± 19.9
Dodge Cove	October 2015	Beach Seine	shiner perch	*Cymatogaster aggregata*	50	68.9 ± 10.8
Dodge Cove	October 2015	Beach Seine	starry flounder	*Platichthys stellatus*	2	109.5 ± 65.8
Dodge Cove	October 2015	Beach Seine	sturgeon poacher	*Podothecus accipenserinus*	2	208.5 ± 17.7
Dodge Cove	October 2015	Beach Seine	Tubesnout	*Aulorhynchus flavidus*	27	106.4 ± 15.8
Dodge Cove	October 2015	Beach Seine	unidentified flounder	NA	1	31 ± NA
Dodge Cove	October 2015	Beach Seine	unidentified larval fish	NA	1	71 ± NA
Dodge Cove	October 2015	Beach Seine	unidentified sculpin	Family Cottidae	3	73 ± 42.5
Dodge Cove	October 2015	Beach Seine	whitespotted greenling	*Hexagrammos stelleri*	1	320 ± NA
Dodge Cove	October 2015	Tangle Net	Pacific staghorn sculpin	*Leptocottus armatus*	3	295.3 ± 14.2
Dodge Cove	October 2015	Tangle Net	shiner perch	*Cymatogaster aggregata*	1	-
Dodge Cove	February 2016	Beach Seine	bay pipefish	*Syngnathus leptorhynchus*	2	168.5 ± 81.3
Dodge Cove	February 2016	Beach Seine	buffalo sculpin	*Enophrys bison*	4	81.8 ± 27
Dodge Cove	February 2016	Beach Seine	chum salmon	*Oncorhynchus keta*	1	46 ± NA
Dodge Cove	February 2016	Beach Seine	English sole	*Parophrys vetulus*	1	91 ± NA
Dodge Cove	February 2016	Beach Seine	great sculpin	*Myoxocephalus polyacanthocephalus*	1	8 ± NA
Dodge Cove	February 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	37	54.3 ± 22.2
Dodge Cove	February 2016	Beach Seine	pink salmon	*Oncorhynchus gorbuscha*	4	34.2 ± 0.5
Dodge Cove	February 2016	Beach Seine	starry flounder	*Platichthys stellatus*	7	96.6 ± 39.7

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
Dodge Cove	February 2016	Beach Seine	tubesnout	*Aulorhynchus flavidus*	25	114 ± 7.1
Dodge Cove	February 2016	Beach Seine	unidentified flatfish	NA	1	55 ± NA
Dodge Cove	February 2016	Beach Seine	unidentified sculpin	Family Cottidae	1	-
Dodge Cove	February 2016	Tangle Net	Chinook salmon	*Oncorhynchus tshawytscha*	1	260 ± NA
Dodge Cove	February 2016	Tangle Net	Pacific staghorn sculpin	*Leptocottus armatus*	1	13 ± NA
Dodge Cove	February 2016	Tangle Net	starry flounder	*Platichthys stellatus*	1	330 ± NA
Dodge Cove	May 2016	Beach Seine	bay pipefish	*Syngnathus leptorhynchus*	19	127.1 ± 15.5
Dodge Cove	May 2016	Beach Seine	buffalo sculpin	*Enophrys bison*	3	85.3 ± 37.2
Dodge Cove	May 2016	Beach Seine	butter sole	*Isopsetta isolepis*	7	73.7 ± 16.2
Dodge Cove	May 2016	Beach Seine	Chinook salmon	*Oncorhynchus tshawytscha*	2	84 ± 17
Dodge Cove	May 2016	Beach Seine	chum salmon	*Oncorhynchus keta*	53	62.8 ± 11.1
Dodge Cove	May 2016	Beach Seine	coho salmon	*Oncorhynchus kisutch*	19	101.8 ± 11.4
Dodge Cove	May 2016	Beach Seine	crescent gunnel	*Pholis laeta*	25	136.8 ± 24.8
Dodge Cove	May 2016	Beach Seine	great sculpin	*Myoxocephalus polyacanthocephalus*	3	139 ± 14.7
Dodge Cove	May 2016	Beach Seine	Pacific herring	*Clupea pallasii*	12	94.6 ± 7.1
Dodge Cove	May 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	34	131.6 ± 39
Dodge Cove	May 2016	Beach Seine	pink salmon	*Oncorhynchus gorbuscha*	10	56.8 ± 11.6
Dodge Cove	May 2016	Beach Seine	rock sole	*Lepidopsetta bilineata*	14	177.9 ± 44
Dodge Cove	May 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	46	101.5 ± 27.1
Dodge Cove	May 2016	Beach Seine	sockeye salmon	*Oncorhynchus nerka*	2	76.5 ± 2.1
Dodge Cove	May 2016	Beach Seine	speckled sanddab	*Citharichthys stigmaeus*	11	93.5 ± 39.1
Dodge Cove	May 2016	Beach Seine	starry flounder	*Platichthys stellatus*	22	134.8 ± 47
Dodge Cove	May 2016	Beach Seine	surf smelt	*Hypomesus pretiosus*	2	117.5 ± 22.1

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
Dodge Cove	May 2016	Beach Seine	tubesnout	*Aulorhynchus flavidus*	11	115.5 ± 11
Dodge Cove	May 2016	Beach Seine	unidentified sculpin	Family Cottidae	1	12 ± NA
Tremayne Bay	October 2015	Beach Seine	black prickleback	*Xiphister atropurpureus*	1	95 ± NA
Tremayne Bay	October 2015	Beach Seine	Chinook salmon	*Oncorhynchus tshawytscha*	4	82.5 ± 17.1
Tremayne Bay	October 2015	Beach Seine	coho salmon	*Oncorhynchus kisutch*	1	76 ± NA
Tremayne Bay	October 2015	Beach Seine	English sole	*Parophrys vetulus*	2	2 ± NA
Tremayne Bay	October 2015	Beach Seine	high cockscomb	*Anoplarchus purpurescens*	1	1 ± NA
Tremayne Bay	October 2015	Beach Seine	Pacific herring	*Clupea pallasii*	22	73.6 ± 13.3
Tremayne Bay	October 2015	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	11	81.9 ± 49.6
Tremayne Bay	October 2015	Beach Seine	prickly sculpin	*Cottus asper*	5	49.4 ± 8.1
Tremayne Bay	October 2015	Beach Seine	shiner perch	*Cymatogaster aggregata*	23	66.7 ± 3.3
Tremayne Bay	October 2015	Beach Seine	starry flounder	*Platichthys stellatus*	10	110.5 ± 57.9
Tremayne Bay	October 2015	Beach Seine	tubesnout	*Aulorhynchus flavidus*	2	112.5 ± 41.7
Tremayne Bay	October 2015	Beach Seine	unidentified larval fish	NA	15	46.2 ± 5.1
Tremayne Bay	October 2015	Beach Seine	unidentified sculpin	Family Cottidae	14	42 ± 12.9
Tremayne Bay	October 2015	Tangle Net	painted greenling	*Oxylebius pictus*	1	182 ± NA
Tremayne Bay	October 2015	Tangle Net	whitespotted greenling	*Hexagrammos stelleri*	1	310 ± NA
Tremayne Bay	February 2016	Beach Seine	buffalo sculpin	*Enophrys bison*	1	63 ± NA
Tremayne Bay	February 2016	Beach Seine	great sculpin	*Myoxocephalus polyacanthocephalus*	1	74 ± NA
Tremayne Bay	February 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	3	109 ± 40.1
Tremayne Bay	February 2016	Beach Seine	rock sole	*Lepidopsetta* spp.	2	223 ± 52.3
Tremayne Bay	February 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	2	72.5 ± 0.7
Tremayne Bay	February 2016	Beach Seine	starry flounder	*Platichthys stellatus*	7	122 ± 60.5

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
Tremayne Bay	February 2016	Beach Seine	surf smelt	*Hypomesus pretiosus*	7	153.9 ±12
Tremayne Bay	February 2016	Beach Seine	tubesnout	*Aulorhynchus flavidus*	5	101.1 ± 11.1
Tremayne Bay	February 2016	Beach Seine	unidentified flatfish	NA	44	68.8 ± 27.9
Tremayne Bay	February 2016	Beach Seine	unidentified larval fish	NA	2	50.9 ± 7.4
Tremayne Bay	February 2016	Tangle Net	kelp greenling	*Hexagrammos decagrammus*	1	450 ± NA
Tremayne Bay	February 2016	Tangle Net	kelp perch	*Brachyistius frenatus*	1	86 ± NA
Tremayne Bay	May 2016	Beach Seine	bay pipefish	*Syngnathus leptorhynchus*	1	270 ± NA
Tremayne Bay	May 2016	Beach Seine	brown Irish lord	*Hemilepidotus spinosus*	1	125 ± NA
Tremayne Bay	May 2016	Beach Seine	buffalo sculpin	*Enophrys bison*	12	72.3 ± 14.6
Tremayne Bay	May 2016	Beach Seine	butter sole	*Isopsetta isolepis*	14	71.1 ± 12.1
Tremayne Bay	May 2016	Beach Seine	Chinook salmon	*Oncorhynchus tshawytscha*	12	127.2 ± 15.5
Tremayne Bay	May 2016	Beach Seine	chum salmon	*Oncorhynchus kisutch*	11	63.6 ± 12.7
Tremayne Bay	May 2016	Beach Seine	coho salmon	*Oncorhynchus kisutch*	21	109.1 ± 10.2
Tremayne Bay	May 2016	Beach Seine	crescent gunnel	*Pholis laeta*	21	142.8 ± 28.2
Tremayne Bay	May 2016	Beach Seine	dolly varden	*Salvelinus malma*	2	165 ± 60.8
Tremayne Bay	May 2016	Beach Seine	Pacific herring	*Clupea pallasii*	1	162 ± NA
Tremayne Bay	May 2016	Beach Seine	Pacific staghorn sculpin	*Leptocottus armatus*	22	176.8 ± 85.9
Tremayne Bay	May 2016	Beach Seine	penpoint gunnel	*Apodichthys flavidus*	11	130.9 ± 47.8
Tremayne Bay	May 2016	Beach Seine	pink salmon	*Oncorhynchus gorbuscha*	8	58.4 ± 7.5
Tremayne Bay	May 2016	Beach Seine	rock sole	*Lepidopsetta* spp.	1	108 ± NA
Tremayne Bay	May 2016	Beach Seine	shiner perch	*Cymatogaster aggregata*	20	98.4 ± 24.8
Tremayne Bay	May 2016	Beach Seine	sockeye salmon	*Oncorhynchus nerka*	1	81 ± NA
Tremayne Bay	May 2016	Beach Seine	starry flounder	*Platichthys stellatus*	17	97.9 ± 14.5
Tremayne Bay	May 2016	Beach Seine	surf smelt	*Hypomesus pretiosus*	1	137.7 ± 30.5

Table 6-4 Mean Fork Length (mm +/- SD) of Fish Captured by Beach Seine or Tangle Net in October 2015, February 2016, and May 2016

Study Area	Survey Period	Method	Common Name	Scientific Name	Sample Size of Measured Fish*	Mean Length (mm +/- SD)
Tremayne Bay	May 2016	Beach Seine	tubesnout	*Aulorhynchus flavidus*	1	145 ± NA
Tremayne Bay	May 2016	Beach Seine	unidentified larval fish	*Osmeridae* spp.	12	12 ± NA
Tremayne Bay	May 2016	Beach Seine	unidentified sculpin	Family Cottidae	15	63.5 ± 25

NOTES:

* Sample size may not correspond to total catch because not all captured fish were measured

SD: standard deviation

NA (re. SD): standard deviation could not be calculated in instances where only one individual was captured or there was only one set

NA (re. scientific name): scientific name of the fish could not be determined

- : fork length not recorded

Table 6- 5 Summary of Beach Seining Effort Over Six Survey Periods

Study Area	April 2014		August 2014		March 2015		October 2015		February 2016		May 2016	
	H	**S**	**H**	**S**	**H**	**S**	**H**	**S**	**H**	**S**	**H**	**S**
Casey Cove	0	0	0	0	1	1	6	2	6	2	6	2
East Digby Island	3	1	0	0	0	0	3	1	3	1	4	1
South Digby Island	7	3	6	4	6	4	9	4	10	4	11	4
Delusion Bay	0	0	2	2	1	1	6	2	9	3	9	3
Dodge Cove	0	0	0	0	0	0	6	2	7	2	6	2
Tremayne Bay	0	0	4	2	4	2	6	3	5	3	6	3

NOTE:
H (beach seine haul) and S (beach seine site)

Table 6-6 CPUE (Fish/100 m²) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
Casey Cove	Chinook salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	Chinook salmon	2015-10-01	0	0	0	0	0	0	0	0	2	1312
Casey Cove	Chinook salmon	2016-02-01	0	0	0	0	0	0	0	0	2	3412
Casey Cove	Chinook salmon	2016-05-01	1	0	0	0	0	0.2	0	0	2	2585
Casey Cove	chum salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	chum salmon	2015-10-01	0	0	0	0	0	0	0	0	2	1312
Casey Cove	chum salmon	2016-02-01	1	0	0	0	0	0.2	0	0	2	3412
Casey Cove	chum salmon	2016-05-01	129	0	1.7	5.3	9.8	11.4	6	2.9	2	2585
Casey Cove	coho salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	coho salmon	2015-10-01	3	0	0	0	0.4	0.7	0.2	0	2	1312
Casey Cove	coho salmon	2016-02-01	0	0	0	0	0	0	0	0	2	3412
Casey Cove	coho salmon	2016-05-01	12	0	0	0.3	1	1.1	0.4	0.3	2	2585
Casey Cove	Pacific herring	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	Pacific herring	2015-10-01	0	0	0	0	0	0	0	0	2	1312
Casey Cove	Pacific herring	2016-02-01	11	0	0	0.2	0.4	0.5	0.3	0.1	2	3412
Casey Cove	Pacific herring	2016-05-01	2	0	0	0	0.1	0.2	0.1	0.1	2	2585
Casey Cove	pink salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	pink salmon	2015-10-01	0	0	0	0	0	0	0	0	2	1312
Casey Cove	pink salmon	2016-02-01	17	0	0	0	0.4	1.6	0.4	0.5	2	3412
Casey Cove	pink salmon	2016-05-01	104	0	0.1	1.7	10.8	16.8	7	8.9	2	2585
Casey Cove	sockeye salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	sockeye salmon	2015-10-01	0	0	0	0	0	0	0	0	2	1312
Casey Cove	sockeye salmon	2016-02-01	0	0	0	0	0	0	0	0	2	3412
Casey Cove	sockeye salmon	2016-05-01	3	0	0	0.1	0.2	1	0.2	0.2	2	2585

Table 6-6 CPUE (Fish/100 m^2) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
Casey Cove	starry flounder	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	starry flounder	2015-10-01	8	0	0	0.4	1.1	4.8	0.8	1.1	2	1312
Casey Cove	starry flounder	2016-02-01	76	0	0	0.4	2	6.4	1.6	2.2	2	3412
Casey Cove	starry flounder	2016-05-01	96	0	0	1.4	2.8	10.7	2.5	3.6	2	2585
Casey Cove	surf smelt	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	surf smelt	2015-10-01	1	0	0	0	0	0.4	0.1	0.1	2	1312
Casey Cove	surf smelt	2016-02-01	3	0	0	0	0	0.7	0.2	0.2	2	3412
Casey Cove	surf smelt	2016-05-01	10	0	0	0	0	5.6	0.7	1	2	2585
Casey Cove	unidentified larval fish	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	unidentified larval fish	2015-10-01	17	0	0	0	0	20.2	1.7	2.4	2	1312
Casey Cove	unidentified larval fish	2016-02-01	16	0	0	0.2	0.4	1.7	0.4	0.4	2	3412
Casey Cove	unidentified larval fish	2016-05-01	0	0	0	0	0	0	0	0	2	2585
Casey Cove	unidentified smelt	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Casey Cove	unidentified smelt	2015-10-01	0	0	0	0	0	0	0	0	2	1312
Casey Cove	unidentified smelt	2016-02-01	0	0	0	0	0	0	0	0	2	3412
Casey Cove	unidentified smelt	2016-05-01	0	0	0	0	0	0	0	0	2	2585
Delusion Bay	Chinook salmon	2014-08-01	0	0	0	0	0	0	0	0	2	1400
Delusion Bay	Chinook salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Delusion Bay	Chinook salmon	2015-10-01	0	0	0	0	0	0	0	0	2	908
Delusion Bay	Chinook salmon	2016-02-01	0	0	0	0	0	0	0	0	3	2151
Delusion Bay	Chinook salmon	2016-05-01	2	0	0	0	0	1.2	0.1	0.2	3	2950
Delusion Bay	chum salmon	2014-08-01	0	0	0	0	0	0	0	0	2	1400
Delusion Bay	chum salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Delusion Bay	chum salmon	2015-10-01	0	0	0	0	0	0	0	0	2	908

Table 6-6 CPUE (Fish/100 m^2) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
Delusion Bay	chum salmon	2016-02-01	2	0	0	0	0	2	0.1	0.3	3	2151
Delusion Bay	chum salmon	2016-05-01	35	0	0.2	0.6	1.1	10.7	1.5	2	3	2950
Delusion Bay	coho salmon	2014-08-01	0	0	0	0	0	0	0	0	2	1400
Delusion Bay	coho salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Delusion Bay	coho salmon	2015-10-01	0	0	0	0	0	0	0	0	2	908
Delusion Bay	coho salmon	2016-02-01	0	0	0	0	0	0	0	0	3	2151
Delusion Bay	coho salmon	2016-05-01	7	0	0	0	0	4	0.2	0.2	3	2950
Delusion Bay	Pacific herring	2014-08-01	0	0	0	0	0	0	0	0	2	1400
Delusion Bay	Pacific herring	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Delusion Bay	Pacific herring	2015-10-01	0	0	0	0	0	0	0	0	2	908
Delusion Bay	Pacific herring	2016-02-01	0	0	0	0	0	0	0	0	3	2151
Delusion Bay	Pacific herring	2016-05-01	0	0	0	0	0	0	0	0	3	2950
Delusion Bay	pink salmon	2014-08-01	0	0	0	0	0	0	0	0	2	1400
Delusion Bay	pink salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Delusion Bay	pink salmon	2015-10-01	0	0	0	0	0	0	0	0	2	908
Delusion Bay	pink salmon	2016-02-01	0	0	0	0	0	0	0	0	3	2151
Delusion Bay	pink salmon	2016-05-01	4	0	0	0	0	0.8	0.2	0.3	3	2950
Delusion Bay	sockeye salmon	2014-08-01	0	0	0	0	0	0	0	0	2	1400
Delusion Bay	sockeye salmon	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Delusion Bay	sockeye salmon	2015-10-01	0	0	0	0	0	0	0	0	2	908
Delusion Bay	sockeye salmon	2016-02-01	0	0	0	0	0	0	0	0	3	2151
Delusion Bay	sockeye salmon	2016-05-01	3	0	0	0	0	1.2	0.1	0.1	3	2950
Delusion Bay	starry flounder	2014-08-01	39	0.8	1.6	2.3	3.1	3.9	2.3	2.2	2	1400
Delusion Bay	starry flounder	2015-03-01	0	0	0	0	0	0	0	NA	1	225

Table 6-6 CPUE (Fish/100 m^2) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
Delusion Bay	starry flounder	2015-10-01	21	0.7	0.9	1.3	2.6	8.3	2	1	2	908
Delusion Bay	starry flounder	2016-02-01	0	0	0	0	0	0	0	0	3	2151
Delusion Bay	starry flounder	2016-05-01	4	0	0	0	0	0.8	0.1	0.1	3	2950
Delusion Bay	surf smelt	2014-08-01	0	0	0	0	0	0	0	0	2	1400
Delusion Bay	surf smelt	2015-03-01	1	0.4	0.4	0.4	0.4	0.4	0.4	NA	1	225
Delusion Bay	surf smelt	2015-10-01	0	0	0	0	0	0	0	0	2	908
Delusion Bay	surf smelt	2016-02-01	0	0	0	0	0	0	0	0	3	2151
Delusion Bay	surf smelt	2016-05-01	154	0	0	0	3.2	30.7	4.8	3.7	3	2950
Delusion Bay	unidentified larval fish	2014-08-01	0	0	0	0	0	0	0	0	2	1400
Delusion Bay	unidentified larval fish	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Delusion Bay	unidentified larval fish	2015-10-01	0	0	0	0	0	0	0	0	2	908
Delusion Bay	unidentified larval fish	2016-02-01	85	0	0	0	0	70.8	5.1	8.8	3	2151
Delusion Bay	unidentified larval fish	2016-05-01	0	0	0	0	0	0	0	0	3	2950
Delusion Bay	unidentified smelt	2014-08-01	0	0	0	0	0	0	0	0	2	1400
Delusion Bay	unidentified smelt	2015-03-01	0	0	0	0	0	0	0	NA	1	225
Delusion Bay	unidentified smelt	2015-10-01	0	0	0	0	0	0	0	0	2	908
Delusion Bay	unidentified smelt	2016-02-01	0	0	0	0	0	0	0	0	3	2151
Delusion Bay	unidentified smelt	2016-05-01	0	0	0	0	0	0	0	0	3	2950
Dodge Cove	Chinook salmon	2015-10-01	0	0	0	0	0	0	0	0	2	1545
Dodge Cove	Chinook salmon	2016-02-01	0	0	0	0	0	0	0	0	2	3130
Dodge Cove	Chinook salmon	2016-05-01	2	0	0	0	0	0.3	0.1	0.1	2	2234
Dodge Cove	chum salmon	2015-10-01	0	0	0	0	0	0	0	0	2	1545
Dodge Cove	chum salmon	2016-02-01	1	0	0	0	0	0.2	0	0	2	3130
Dodge Cove	chum salmon	2016-05-01	87	0	1.8	4	4.9	22.9	4.7	4	2	2234

Table 6-6 CPUE (Fish/100 m^2) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
Dodge Cove	coho salmon	2015-10-01	5	0	0	0	0.3	1.2	0.3	0.4	2	1545
Dodge Cove	coho salmon	2016-02-01	0	0	0	0	0	0	0	0	2	3130
Dodge Cove	coho salmon	2016-05-01	24	0	0.1	0.5	1.6	2.1	1	0.2	2	2234
Dodge Cove	Pacific herring	2015-10-01	0	0	0	0	0	0	0	0	2	1545
Dodge Cove	Pacific herring	2016-02-01	0	0	0	0	0	0	0	0	2	3130
Dodge Cove	Pacific herring	2016-05-01	12	0	0	0	1	1.4	0.5	0.3	2	2234
Dodge Cove	pink salmon	2015-10-01	0	0	0	0	0	0	0	0	2	1545
Dodge Cove	pink salmon	2016-02-01	4	0	0	0	0.1	0.7	0.1	0.1	2	3130
Dodge Cove	pink salmon	2016-05-01	10	0	0	0.2	0.7	3.5	0.6	0.6	2	2234
Dodge Cove	sockeye salmon	2015-10-01	0	0	0	0	0	0	0	0	2	1545
Dodge Cove	sockeye salmon	2016-02-01	0	0	0	0	0	0	0	0	2	3130
Dodge Cove	sockeye salmon	2016-05-01	2	0	0	0	0	0.3	0.1	0.1	2	2234
Dodge Cove	starry flounder	2015-10-01	2	0	0	0	0.2	0.4	0.1	0	2	1545
Dodge Cove	starry flounder	2016-02-01	7	0	0	0	0.4	1.3	0.2	0.2	2	3130
Dodge Cove	starry flounder	2016-05-01	26	0	0.1	0.3	2.2	4.3	1.6	2	2	2234
Dodge Cove	surf smelt	2015-10-01	0	0	0	0	0	0	0	0	2	1545
Dodge Cove	surf smelt	2016-02-01	0	0	0	0	0	0	0	0	2	3130
Dodge Cove	surf smelt	2016-05-01	211	0	0	0	0	28.1	7.4	10.5	2	2234
Dodge Cove	unidentified larval fish	2015-10-01	1	0	0	0	0	0.3	0.1	0.1	2	1545
Dodge Cove	unidentified larval fish	2016-02-01	0	0	0	0	0	0	0	0	2	3130
Dodge Cove	unidentified larval fish	2016-05-01	0	0	0	0	0	0	0	0	2	2234
Dodge Cove	unidentified smelt	2015-10-01	0	0	0	0	0	0	0	0	2	1545
Dodge Cove	unidentified smelt	2016-02-01	0	0	0	0	0	0	0	0	2	3130
Dodge Cove	unidentified smelt	2016-05-01	0	0	0	0	0	0	0	0	2	2234

Table 6-6 CPUE (Fish/100 m^2) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
East Digby Island	Chinook salmon	2014-04-01	0	0	0	0	0	0	0	NA	1	2250
East Digby Island	Chinook salmon	2015-10-01	0	0	0	0	0	0	0	NA	1	1005
East Digby Island	Chinook salmon	2016-02-01	0	0	0	0	0	0	0	NA	1	1690
East Digby Island	Chinook salmon	2016-05-01	3	0	0	0	0.2	0.8	0.2	NA	1	1993
East Digby Island	chum salmon	2014-04-01	1	0	0	0	0.1	0.1	0	NA	1	2250
East Digby Island	chum salmon	2015-10-01	0	0	0	0	0	0	0	NA	1	1005
East Digby Island	chum salmon	2016-02-01	1	0	0	0	0.1	0.1	0.1	NA	1	1690
East Digby Island	chum salmon	2016-05-01	2	0	0	0.1	0.2	0.3	0.1	NA	1	1993
East Digby Island	coho salmon	2014-04-01	0	0	0	0	0	0	0	NA	1	2250
East Digby Island	coho salmon	2015-10-01	0	0	0	0	0	0	0	NA	1	1005
East Digby Island	coho salmon	2016-02-01	0	0	0	0	0	0	0	NA	1	1690
East Digby Island	coho salmon	2016-05-01	5	0	0	0	0.3	1.4	0.3	NA	1	1993
East Digby Island	Pacific herring	2014-04-01	1	0	0	0	0.1	0.1	0	NA	1	2250
East Digby Island	Pacific herring	2015-10-01	0	0	0	0	0	0	0	NA	1	1005
East Digby Island	Pacific herring	2016-02-01	0	0	0	0	0	0	0	NA	1	1690
East Digby Island	Pacific herring	2016-05-01	0	0	0	0	0	0	0	NA	1	1993
East Digby Island	pink salmon	2014-04-01	265	0.1	2.7	5.3	17.6	29.9	11.8	NA	1	2250
East Digby Island	pink salmon	2015-10-01	0	0	0	0	0	0	0	NA	1	1005
East Digby Island	pink salmon	2016-02-01	4	0	0	0	0.4	0.8	0.2	NA	1	1690
East Digby Island	pink salmon	2016-05-01	7	0	0.1	0.3	0.6	0.7	0.4	NA	1	1993
East Digby Island	sockeye salmon	2014-04-01	0	0	0	0	0	0	0	NA	1	2250
East Digby Island	sockeye salmon	2015-10-01	0	0	0	0	0	0	0	NA	1	1005
East Digby Island	sockeye salmon	2016-02-01	0	0	0	0	0	0	0	NA	1	1690
East Digby Island	sockeye salmon	2016-05-01	1	0	0	0	0.1	0.3	0.1	NA	1	1993

Table 6-6 CPUE (Fish/100 m^2) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
East Digby Island	starry flounder	2014-04-01	1	0	0	0	0.1	0.1	0	NA	1	2250
East Digby Island	starry flounder	2015-10-01	17	1	1.1	1.2	1.9	2.7	1.7	NA	1	1005
East Digby Island	starry flounder	2016-02-01	7	0	0.1	0.1	0.6	1.2	0.4	NA	1	1690
East Digby Island	starry flounder	2016-05-01	25	0	0	1	1.9	2	1.3	NA	1	1993
East Digby Island	surf smelt	2014-04-01	165	0	1.5	3.1	11	18.9	7.3	NA	1	2250
East Digby Island	surf smelt	2015-10-01	0	0	0	0	0	0	0	NA	1	1005
East Digby Island	surf smelt	2016-02-01	0	0	0	0	0	0	0	NA	1	1690
East Digby Island	surf smelt	2016-05-01	0	0	0	0	0	0	0	NA	1	1993
East Digby Island	unidentified larval fish	2014-04-01	0	0	0	0	0	0	0	NA	1	2250
East Digby Island	unidentified larval fish	2015-10-01	11	0	0.1	0.3	1.6	3	1.1	NA	1	1005
East Digby Island	unidentified larval fish	2016-02-01	0	0	0	0	0	0	0	NA	1	1690
East Digby Island	unidentified larval fish	2016-05-01	0	0	0	0	0	0	0	NA	1	1993
East Digby Island	unidentified smelt	2014-04-01	4	0	0	0	0.3	0.5	0.2	NA	1	2250
East Digby Island	unidentified smelt	2015-10-01	0	0	0	0	0	0	0	NA	1	1005
East Digby Island	unidentified smelt	2016-02-01	0	0	0	0	0	0	0	NA	1	1690
East Digby Island	unidentified smelt	2016-05-01	0	0	0	0	0	0	0	NA	1	1993
South Digby Island	Chinook salmon	2014-04-01	0	0	0	0	0	0	0	0	3	5875
South Digby Island	Chinook salmon	2014-08-01	0	0	0	0	0	0	0	0	4	5300
South Digby Island	Chinook salmon	2015-03-01	0	0	0	0	0	0	0	0	4	1300
South Digby Island	Chinook salmon	2015-10-01	0	0	0	0	0	0	0	0	4	1340
South Digby Island	Chinook salmon	2016-02-01	0	0	0	0	0	0	0	0	4	4065
South Digby Island	Chinook salmon	2016-05-01	19	0	0	0	0.5	2.6	0.5	0.5	4	3556
South Digby Island	chum salmon	2014-04-01	32	0	0	0.2	1	1.3	0.6	0.2	3	5875
South Digby Island	chum salmon	2014-08-01	0	0	0	0	0	0	0	0	4	5300

Table 6-6 CPUE (Fish/100 m^2) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
South Digby Island	chum salmon	2015-03-01	0	0	0	0	0	0	0	0	4	1300
South Digby Island	chum salmon	2015-10-01	0	0	0	0	0	0	0	0	4	1340
South Digby Island	chum salmon	2016-02-01	1	0	0	0	0	0.4	0	0	4	4065
South Digby Island	chum salmon	2016-05-01	95	0	0.5	1.7	2.9	7.2	2.2	2.6	4	3556
South Digby Island	coho salmon	2014-04-01	0	0	0	0	0	0	0	0	3	5875
South Digby Island	coho salmon	2014-08-01	0	0	0	0	0	0	0	0	4	5300
South Digby Island	coho salmon	2015-03-01	0	0	0	0	0	0	0	0	4	1300
South Digby Island	coho salmon	2015-10-01	0	0	0	0	0	0	0	0	4	1340
South Digby Island	coho salmon	2016-02-01	0	0	0	0	0	0	0	0	4	4065
South Digby Island	coho salmon	2016-05-01	53	0	0	0.7	1.9	4.9	1.4	1.3	4	3556
South Digby Island	Pacific herring	2014-04-01	0	0	0	0	0	0	0	0	3	5875
South Digby Island	Pacific herring	2014-08-01	0	0	0	0	0	0	0	0	4	5300
South Digby Island	Pacific herring	2015-03-01	0	0	0	0	0	0	0	0	4	1300
South Digby Island	Pacific herring	2015-10-01	31	0	0	0	0	38.8	2.7	5.4	4	1340
South Digby Island	Pacific herring	2016-02-01	0	0	0	0	0	0	0	0	4	4065
South Digby Island	Pacific herring	2016-05-01	499	0	0	0.5	12.3	48.3	11.6	13.7	4	3556
South Digby Island	pink salmon	2014-04-01	892	0	1.1	3.6	26.2	56.3	16.7	11.7	3	5875
South Digby Island	pink salmon	2014-08-01	0	0	0	0	0	0	0	0	4	5300
South Digby Island	pink salmon	2015-03-01	13	0	0	0.7	1.8	3	1	1.2	4	1300
South Digby Island	pink salmon	2015-10-01	0	0	0	0	0	0	0	0	4	1340
South Digby Island	pink salmon	2016-02-01	4	0	0	0	0	0.8	0.2	0.4	4	4065
South Digby Island	pink salmon	2016-05-01	46	0	0	0.5	1.9	4.1	1.2	0.7	4	3556
South Digby Island	sockeye salmon	2014-04-01	0	0	0	0	0	0	0	0	3	5875
South Digby Island	sockeye salmon	2014-08-01	0	0	0	0	0	0	0	0	4	5300

Table 6-6 CPUE (Fish/100 m^2) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
South Digby Island	sockeye salmon	2015-03-01	0	0	0	0	0	0	0	0	4	1300
South Digby Island	sockeye salmon	2015-10-01	0	0	0	0	0	0	0	0	4	1340
South Digby Island	sockeye salmon	2016-02-01	0	0	0	0	0	0	0	0	4	4065
South Digby Island	sockeye salmon	2016-05-01	101	0	0	0	0.9	14.7	2.1	3.9	4	3556
South Digby Island	starry flounder	2014-04-01	2	0	0	0	0	0.2	0	0.1	3	5875
South Digby Island	starry flounder	2014-08-01	2	0	0	0	0	0.3	0.1	0.2	4	5300
South Digby Island	starry flounder	2015-03-01	0	0	0	0	0	0	0	0	4	1300
South Digby Island	starry flounder	2015-10-01	25	0	0	0	0	8	1.5	3	4	1340
South Digby Island	starry flounder	2016-02-01	31	0	0	0	0	2	0.4	0.9	4	4065
South Digby Island	starry flounder	2016-05-01	22	0	0	0	0.7	2.5	0.5	0.9	4	3556
South Digby Island	surf smelt	2014-04-01	0	0	0	0	0	0	0	0	3	5875
South Digby Island	surf smelt	2014-08-01	0	0	0	0	0	0	0	0	4	5300
South Digby Island	surf smelt	2015-03-01	19	0	0	0	3.4	5	1.2	2.4	4	1300
South Digby Island	surf smelt	2015-10-01	0	0	0	0	0	0	0	0	4	1340
South Digby Island	surf smelt	2016-02-01	0	0	0	0	0	0	0	0	4	4065
South Digby Island	surf smelt	2016-05-01	2213	0	0	21.7	79.5	226.8	48.9	68.6	4	3556
South Digby Island	unidentified larval fish	2014-04-01	0	0	0	0	0	0	0	0	3	5875
South Digby Island	unidentified larval fish	2014-08-01	1	0	0	0	0	0.1	0	0	4	5300
South Digby Island	unidentified larval fish	2015-03-01	244	0	0	0	34.9	75.5	15.2	30.5	4	1300
South Digby Island	unidentified larval fish	2015-10-01	38	0	0.7	2.5	5	12.5	4.3	3.8	4	1340
South Digby Island	unidentified larval fish	2016-02-01	12	0	0	0.1	0.4	1.7	0.6	0.8	4	4065
South Digby Island	unidentified larval fish	2016-05-01	26	0	0	0	0	9.4	0.8	1.5	4	3556
South Digby Island	unidentified smelt	2014-04-01	0	0	0	0	0	0	0	0	3	5875
South Digby Island	unidentified smelt	2014-08-01	11	0	0	0	0.3	1	0.3	0.5	4	5300

Table 6-6 CPUE (Fish/100 m²) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
South Digby Island	unidentified smelt	2015-03-01	0	0	0	0	0	0	0	0	4	1300
South Digby Island	unidentified smelt	2015-10-01	0	0	0	0	0	0	0	0	4	1340
South Digby Island	unidentified smelt	2016-02-01	0	0	0	0	0	0	0	0	4	4065
South Digby Island	unidentified smelt	2016-05-01	0	0	0	0	0	0	0	0	4	3556
Tremayne Bay	Chinook salmon	2014-08-01	0	0	0	0	0	0	0	0	2	6300
Tremayne Bay	Chinook salmon	2015-03-01	0	0	0	0	0	0	0	0	2	875
Tremayne Bay	Chinook salmon	2015-10-01	4	0	0	0.2	0.4	0.9	0.3	0.3	3	1274
Tremayne Bay	Chinook salmon	2016-02-01	0	0	0	0	0	0	0	0	3	1345
Tremayne Bay	Chinook salmon	2016-05-01	15	0	0.1	0.6	0.8	2.9	1.2	1.5	3	2295
Tremayne Bay	chum salmon	2014-08-01	0	0	0	0	0	0	0	0	2	6300
Tremayne Bay	chum salmon	2015-03-01	3	0	0	0	0.3	1.3	0.2	0.3	2	875
Tremayne Bay	chum salmon	2015-10-01	0	0	0	0	0	0	0	0	3	1274
Tremayne Bay	chum salmon	2016-02-01	0	0	0	0	0	0	0	0	3	1345
Tremayne Bay	chum salmon	2016-05-01	11	0.2	0.2	0.3	0.7	1.3	0.5	0.3	3	2295
Tremayne Bay	coho salmon	2014-08-01	0	0	0	0	0	0	0	0	2	6300
Tremayne Bay	coho salmon	2015-03-01	0	0	0	0	0	0	0	0	2	875
Tremayne Bay	coho salmon	2015-10-01	1	0	0	0	0	0.4	0.1	0.1	3	1274
Tremayne Bay	coho salmon	2016-02-01	0	0	0	0	0	0	0	0	3	1345
Tremayne Bay	coho salmon	2016-05-01	34	0	0.1	0.4	2.3	7	2	1.6	3	2295
Tremayne Bay	Pacific herring	2014-08-01	1161	0	0	0.1	3.2	81.6	21.5	30.3	2	6300
Tremayne Bay	Pacific herring	2015-03-01	0	0	0	0	0	0	0	0	2	875
Tremayne Bay	Pacific herring	2015-10-01	1368	0	0	0	152.7	376.8	154.3	197.4	3	1274
Tremayne Bay	Pacific herring	2016-02-01	0	0	0	0	0	0	0	0	3	1345
Tremayne Bay	Pacific herring	2016-05-01	1	0	0	0	0	0.2	0	0	3	2295

Table 6-6 CPUE (Fish/100 m²) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
Tremayne Bay	pink salmon	2014-08-01	0	0	0	0	0	0	0	0	2	6300
Tremayne Bay	pink salmon	2015-03-01	26	0	0	0.9	3.8	9.8	2	2.8	2	875
Tremayne Bay	pink salmon	2015-10-01	0	0	0	0	0	0	0	0	3	1274
Tremayne Bay	pink salmon	2016-02-01	0	0	0	0	0	0	0	0	3	1345
Tremayne Bay	pink salmon	2016-05-01	9	0	0	0.2	1	1.3	0.6	0.6	3	2295
Tremayne Bay	sockeye salmon	2014-08-01	0	0	0	0	0	0	0	0	2	6300
Tremayne Bay	sockeye salmon	2015-03-01	0	0	0	0	0	0	0	0	2	875
Tremayne Bay	sockeye salmon	2015-10-01	0	0	0	0	0	0	0	0	3	1274
Tremayne Bay	sockeye salmon	2016-02-01	0	0	0	0	0	0	0	0	3	1345
Tremayne Bay	sockeye salmon	2016-05-01	1	0	0	0	0	0.2	0	0.1	3	2295
Tremayne Bay	starry flounder	2014-08-01	0	0	0	0	0	0	0	0	2	6300
Tremayne Bay	starry flounder	2015-03-01	2	0	0	0	0.2	0.9	0.4	0.6	2	875
Tremayne Bay	starry flounder	2015-10-01	10	0	0.1	0.4	1.4	1.8	0.6	0.6	3	1274
Tremayne Bay	starry flounder	2016-02-01	7	0	0.4	0.5	0.7	1	0.4	0.4	3	1345
Tremayne Bay	starry flounder	2016-05-01	23	0	0	0	1.5	2.9	0.6	1.1	3	2295
Tremayne Bay	surf smelt	2014-08-01	0	0	0	0	0	0	0	0	2	6300
Tremayne Bay	surf smelt	2015-03-01	30	0	3.3	4.4	4.6	5	2.3	3.3	2	875
Tremayne Bay	surf smelt	2015-10-01	0	0	0	0	0	0	0	0	3	1274
Tremayne Bay	surf smelt	2016-02-01	10	0	0	0	0	4.4	0.8	1.4	3	1345
Tremayne Bay	surf smelt	2016-05-01	12	0	0	0.2	0.6	2.3	0.4	0.3	3	2295
Tremayne Bay	unidentified larval fish	2014-08-01	1	0	0	0	0	0.1	0	0	2	6300
Tremayne Bay	unidentified larval fish	2015-03-01	1046	0	81.3	116.9	159	260	80.5	113.8	2	875
Tremayne Bay	unidentified larval fish	2015-10-01	16	0	0	0.2	1	5.3	1.1	1.4	3	1274
Tremayne Bay	unidentified larval fish	2016-02-01	775	0	0.3	36	98	208.9	58.3	85.6	3	1345

Table 6-6 CPUE (Fish/100 m^2) Summary Statistics for Focal Species Observed in Beach Seine Catches in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Individuals Caught	CPUE (Fish/100 m2)								Seine Area (m)
				Min	Q1	Median	Q3	Max	Mean	SD	n	
Tremayne Bay	unidentified larval fish	2016-05-01	1	0	0	0	0	0.2	0	0.1	3	2295
Tremayne Bay	unidentified smelt	2014-08-01	0	0	0	0	0	0	0	0	2	6300
Tremayne Bay	unidentified smelt	2015-03-01	0	0	0	0	0	0	0	0	2	875
Tremayne Bay	unidentified smelt	2015-10-01	0	0	0	0	0	0	0	0	3	1274
Tremayne Bay	unidentified smelt	2016-02-01	0	0	0	0	0	0	0	0	3	1345
Tremayne Bay	unidentified smelt	2016-05-01	0	0	0	0	0	0	0	0	3	2295

Table 6- 7 Summary of Tangle Netting Effort Over Six Survey Periods

Study Area	Tangle Net Sites						
	April 2014	August 2014	March 2015	October 2015	February 2016	May 2016	Total
Casey Cove	0	0	7	2	2	0	**11**
East Digby Island	1	0	0	0	1	0	**2**
South Digby Island	4	19	7	7	6	0	**43**
Delusion Bay	2	6	0	2	1	0	**11**
Dodge Cove	0	0	0	2	2	0	4
Tremayne Bay	0	4	6	2	2	0	14
Total	**0**	**4**	**6**	**4**	**4**	**0**	**18**

Note: tangle nets were not set during May 2016 because of concerns about incidentally capturing diving marine birds

Table 6-8 CPUE (Fish/20 minute set) Summary Statistics for Focal Species Observed in Tangle Nets in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Min	Q1	Median	Q3	Max	Individuals Caught	Set Time (min)
Casey Cove	Chinook salmon	2015-03-01	0	0	0	0	0	0	580
Casey Cove	Chinook salmon	2015-10-01	0	0	0	0	0	0	60
Casey Cove	Chinook salmon	2016-02-01	0	0	0	0	0	0	462
Casey Cove	coho salmon	2015-03-01	0	0	0	0	0	0	580
Casey Cove	coho salmon	2015-10-01	0	0	0	0	0	0	60
Casey Cove	coho salmon	2016-02-01	0	0	0	0	0	0	462
Casey Cove	Pacific herring	2015-03-01	0	0	0	0	0	0	580
Casey Cove	Pacific herring	2015-10-01	0	0	0	0	0	0	60
Casey Cove	Pacific herring	2016-02-01	0	0	0	0	0	0	462
Casey Cove	pink salmon	2015-03-01	0	0	0	0	0	0	580
Casey Cove	pink salmon	2015-10-01	0	0	0	0	0	0	60
Casey Cove	pink salmon	2016-02-01	0	0	0	0	0	0	462
Casey Cove	starry flounder	2015-03-01	0	0	0	1	2	4	580
Casey Cove	starry flounder	2015-10-01	0	0	0	0	0	0	60
Casey Cove	starry flounder	2016-02-01	0	0	0	0	0	0	462
Casey Cove	surf smelt	2015-03-01	0	0	0	1.5	10	13	580
Casey Cove	surf smelt	2015-10-01	0	0	0	0	0	0	60
Casey Cove	surf smelt	2016-02-01	0	0	0	0	0	0	462
Delusion Bay	Chinook salmon	2014-04-01	0	0	0	0	0	0	74
Delusion Bay	Chinook salmon	2014-08-01	0	0	0	0	0	0	760
Delusion Bay	Chinook salmon	2015-10-01	0	0	0	0	0	0	40
Delusion Bay	Chinook salmon	2016-02-01	0	0	0	0	0	0	90
Delusion Bay	coho salmon	2014-04-01	0	0	0	0	0	0	74
Delusion Bay	coho salmon	2014-08-01	0	0	0	0	0	0	760
Delusion Bay	coho salmon	2015-10-01	0	0	0	0	0	0	40

Table 6-8 CPUE (Fish/20 minute set) Summary Statistics for Focal Species Observed in Tangle Nets in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Min	Q1	Median	Q3	Max	Individuals Caught	Set Time (min)
Delusion Bay	coho salmon	2016-02-01	0	0	0	0	0	0	90
Delusion Bay	Pacific herring	2014-04-01	0	0	0	0	0	0	74
Delusion Bay	Pacific herring	2014-08-01	0	0	0	0	0	0	760
Delusion Bay	Pacific herring	2015-10-01	0	0	0	0	0	0	40
Delusion Bay	Pacific herring	2016-02-01	0	0	0	0	0	0	90
Delusion Bay	pink salmon	2014-04-01	0	0	0	0	0	0	74
Delusion Bay	pink salmon	2014-08-01	0	0	0	0	1.3	1	760
Delusion Bay	pink salmon	2015-10-01	0	0	0	0	0	0	40
Delusion Bay	pink salmon	2016-02-01	0	0	0	0	0	0	90
Delusion Bay	starry flounder	2014-04-01	0	0.4	0.8	1.2	1.5	2	74
Delusion Bay	starry flounder	2014-08-01	0	0	0	0	0	0	760
Delusion Bay	starry flounder	2015-10-01	0	0	0	0	0	0	40
Delusion Bay	starry flounder	2016-02-01	0.2	0.2	0.2	0.2	0.2	1	90
Delusion Bay	surf smelt	2014-04-01	0	0	0	0	0	0	74
Delusion Bay	surf smelt	2014-08-01	0	0	0	0	1.3	1	760
Delusion Bay	surf smelt	2015-10-01	0	0	0	0	0	0	40
Delusion Bay	surf smelt	2016-02-01	0	0	0	0	0	0	90
Dodge Cove	Chinook salmon	2015-10-01	0	0	0	0	0	0	120
Dodge Cove	Chinook salmon	2016-02-01	0	0	0.1	0.1	0.2	1	444
Dodge Cove	coho salmon	2015-10-01	0	0	0	0	0	0	120
Dodge Cove	coho salmon	2016-02-01	0	0	0	0	0	0	444
Dodge Cove	Pacific herring	2015-10-01	0	0	0	0	0	0	120
Dodge Cove	Pacific herring	2016-02-01	0	0	0	0	0	0	444
Dodge Cove	pink salmon	2015-10-01	0	0	0	0	0	0	120
Dodge Cove	pink salmon	2016-02-01	0	0	0	0	0	0	444

Table 6-8 CPUE (Fish/20 minute set) Summary Statistics for Focal Species Observed in Tangle Nets in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Min	Q1	Median	Q3	Max	Individuals Caught	Set Time (min)
Dodge Cove	starry flounder	2015-10-01	0	0	0	0	0	0	120
Dodge Cove	starry flounder	2016-02-01	0	0	0.1	0.1	0.2	1	444
Dodge Cove	surf smelt	2015-10-01	0	0	0	0	0	0	120
Dodge Cove	surf smelt	2016-02-01	0	0	0	0	0	0	444
East Digby Island	Chinook salmon	2014-04-01	0	0	0	0	0	0	63
East Digby Island	Chinook salmon	2016-02-01	0	0	0	0	0	0	122
East Digby Island	coho salmon	2014-04-01	0	0	0	0	0	0	63
East Digby Island	coho salmon	2016-02-01	0	0	0	0	0	0	122
East Digby Island	Pacific herring	2014-04-01	0	0	0	0	0	0	63
East Digby Island	Pacific herring	2016-02-01	0	0	0	0	0	0	122
East Digby Island	pink salmon	2014-04-01	0	0	0	0	0	0	63
East Digby Island	pink salmon	2016-02-01	0	0	0	0	0	0	122
East Digby Island	starry flounder	2014-04-01	0	0	0	0	0	0	63
East Digby Island	starry flounder	2016-02-01	0	0	0	0	0	0	122
East Digby Island	surf smelt	2014-04-01	1	1	1	1	1	1	63
East Digby Island	surf smelt	2016-02-01	0	0	0	0	0	0	122
South Digby Island	Chinook salmon	2014-04-01	0	0	0	0	0	0	123
South Digby Island	Chinook salmon	2014-08-01	0	0	0	0	0	0	2207
South Digby Island	Chinook salmon	2015-03-01	0	0	0	0	0	0	140
South Digby Island	Chinook salmon	2015-10-01	0	0	0	0	0	0	140
South Digby Island	Chinook salmon	2016-02-01	0	0	0	0	0	0	754
South Digby Island	coho salmon	2014-04-01	0	0	0	0	0	0	123
South Digby Island	coho salmon	2014-08-01	0	0	0	0	0.9	1	2207
South Digby Island	coho salmon	2015-03-01	0	0	0	0	0	0	140
South Digby Island	coho salmon	2015-10-01	0	0	0	0	0	0	140

Table 6-8 CPUE (Fish/20 minute set) Summary Statistics for Focal Species Observed in Tangle Nets in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Min	Q1	Median	Q3	Max	Individuals Caught	Set Time (min)
South Digby Island	coho salmon	2016-02-01	0	0	0	0	0	0	754
South Digby Island	Pacific herring	2014-04-01	0	0	0	0	0	0	123
South Digby Island	Pacific herring	2014-08-01	0	0	0	0	2	3	2207
South Digby Island	Pacific herring	2015-03-01	0	0	0	0	0	0	140
South Digby Island	Pacific herring	2015-10-01	0	0	0	0	0	0	140
South Digby Island	Pacific herring	2016-02-01	0	0	0	0	0	0	754
South Digby Island	pink salmon	2014-04-01	0	0	0	0	0	0	123
South Digby Island	pink salmon	2014-08-01	0	0	0	0	4	1	2207
South Digby Island	pink salmon	2015-03-01	0	0	0	0	0	0	140
South Digby Island	pink salmon	2015-10-01	0	0	0	0	0	0	140
South Digby Island	pink salmon	2016-02-01	0	0	0	0	0	0	754
South Digby Island	starry flounder	2014-04-01	0	0	0	0.2	1	1	123
South Digby Island	starry flounder	2014-08-01	0	0	0	0	0	0	2207
South Digby Island	starry flounder	2015-03-01	0	0	0	0	0	0	140
South Digby Island	starry flounder	2015-10-01	0	0	0	0	0	0	140
South Digby Island	starry flounder	2016-02-01	0	0	0	0	0	0	754
South Digby Island	surf smelt	2014-04-01	0	0	0	0.8	3	3	123
South Digby Island	surf smelt	2014-08-01	0	0	0.7	3.5	17	44	2207
South Digby Island	surf smelt	2015-03-01	0	0	0	0	0	0	140
South Digby Island	surf smelt	2015-10-01	0	0	0	0	0	0	140
South Digby Island	surf smelt	2016-02-01	0	0	0	0	0	0	754
Tremayne Bay	Chinook salmon	2014-08-01	0	0	0	0	0	0	460
Tremayne Bay	Chinook salmon	2015-03-01	0	0	0	0	0	0	120
Tremayne Bay	Chinook salmon	2015-10-01	0	0	0	0	0	0	40
Tremayne Bay	Chinook salmon	2016-02-01	0	0	0	0	0	0	443

Table 6-8 CPUE (Fish/20 minute set) Summary Statistics for Focal Species Observed in Tangle Nets in Each Study Area

Study Area	Species	Date (yyyy/mm/dd)	Min	Q1	Median	Q3	Max	Individuals Caught	Set Time (min)
Tremayne Bay	coho salmon	2014-08-01	0	0	0	0	0	0	460
Tremayne Bay	coho salmon	2015-03-01	0	0	0	0	0	0	120
Tremayne Bay	coho salmon	2015-10-01	0	0	0	0	0	0	40
Tremayne Bay	coho salmon	2016-02-01	0	0	0	0	0	0	443
Tremayne Bay	Pacific herring	2014-08-01	0	0	0	0	0	0	460
Tremayne Bay	Pacific herring	2015-03-01	0	0	0	0	0	0	120
Tremayne Bay	Pacific herring	2015-10-01	0	0	0	0	0	0	40
Tremayne Bay	Pacific herring	2016-02-01	0	0	0	0	0	0	443
Tremayne Bay	pink salmon	2014-08-01	0	0	0	0	0	0	460
Tremayne Bay	pink salmon	2015-03-01	0	0	0	0	0	0	120
Tremayne Bay	pink salmon	2015-10-01	0	0	0	0	0	0	40
Tremayne Bay	pink salmon	2016-02-01	0	0	0	0	0	0	443
Tremayne Bay	starry flounder	2014-08-01	0	0	0	0	0	0	460
Tremayne Bay	starry flounder	2015-03-01	0	0	0	0	0	0	120
Tremayne Bay	starry flounder	2015-10-01	0	0	0	0	0	0	40
Tremayne Bay	starry flounder	2016-02-01	0	0	0	0	0	0	443
Tremayne Bay	surf smelt	2014-08-01	0	0.8	1	2.2	6	8	460
Tremayne Bay	surf smelt	2015-03-01	0	0	0	0	0	0	120
Tremayne Bay	surf smelt	2015-10-01	0	0	0	0	0	0	40
Tremayne Bay	surf smelt	2016-02-01	0	0	0	0	0	0	443