

**FISHERIES AND OCEANS
CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA) 2012
DRAFT PROJECT EFFECTS DETERMINATION REPORT**

GENERAL INFORMATION

1. Project Title: Harbour Improvements (Phase 1 – Breakwater Construction), New Mills Small Craft Harbour	
2 Proponent: Fisheries and Oceans Canada, Small Craft Harbours (DFO-SCH)	
3. Other Contacts: Mylène Roy, Senior Environmental Specialist Public Works and Government Services Canada (PWGSC) Environmental Services, Moncton, New Brunswick	4. Role of Each Contact: OGD Consultant
5. Source of Project Information: Garth Holder – Project Manager (PWGSC)	
6. Project Review Start Date: 2015-05-01	
7. PATH No.:	8. DFO File No:
9. Provincial/Territorial File No.:	10. TC NPP File No.: 8200-2015-200080
11. Other relevant file numbers: PWGSC Project # R.075237.001	

BACKGROUND

12. Background about Proposed Development (including a description of the proposed development):

The proposed harbour improvements project will take place at a developed and active Small Craft Harbour facility. The harbour is a Class B facility (300 to 900 vessel metres) and is located within the Heron Channel of Chaleur Bay along the northern shore of New Brunswick (refer to **Figures 1 to 3** in **Appendix A**). New Mills is an active harbour servicing the commercial fishery and recreational user. The New Mills Small Craft Harbour is located on West Point Island accessed by causeway and currently consists of a concrete deck wharf, a parking/service area, a concrete haul-out ramp, one building (a former ice house), and an above-ground storage tank (AST) used for waste oil. A navigational light is also located at the end of the wharf.

Activities associated with the proposed harbour improvements project include the construction of a breakwater extending from the shoreline of West Point Island north of the existing wharf structure, construction of service/parking area and concrete boat ramp, as well as dredging of the new and existing harbour basins. The approximate coordinates of the project area are: 47°58'29"N and -66°11'18"W.

The current phase of the project (Phase 1) encompasses only the construction of the breakwater as details regarding construction and dredging activities are not finalized and the associated works are not anticipated to be undertaken in the foreseeable future. A Project Effects Determination Report encompassing these future Harbour Improvement project phases will be submitted for review and appropriate approvals ahead of the commencement of such activities.

The proposed schedule for the construction activities is for the work to commence in Summer of 2016 and is expected to be completed by the end of 2017.

PROJECT REVIEW

<p>13. DFO's rationale for the project review: Project is on federal land <input checked="" type="checkbox"/> and; <input checked="" type="checkbox"/> DFO is the proponent <input checked="" type="checkbox"/> DFO to issue <i>Fisheries Act</i> Authorization, <i>Species at Risk Act</i> Permit or other regulatory permit <input type="checkbox"/> DFO to provide financial assistance to another party to enable the project to proceed <input type="checkbox"/> DFO to lease or sell federal land to enable the project to proceed <input type="checkbox"/> Other</p>	<p>14. Fisheries Act Sections(s) (if applicable): Sections 35(1) and 35(2)(b).</p>
<p>15. Other Authorities (if applicable): DFO-Fisheries Protection Program (FPP)</p> <p>Transport Canada – Environmental Affairs and Aboriginal Consultation Unit and Navigation Protection Program (NPP)</p>	<p>16. Other Authorities Rationale for Involvement:</p> <p><u>Permit Requirement:</u> The project was referred to the DFO-Fisheries Protection Program (FPP) for review. DFO-FPP has determined that components of the project (including the breakwater construction) are likely to result in Serious Harm to Fish, which is prohibited under Section 35(1) of the <i>Fisheries Act</i>. An authorization under Section 35(2)(b) of the <i>Fisheries Act</i> will be sought and the proponent will comply with all/any conditions of the Authorization.</p> <p><u>Approval Requirement:</u> The <i>Navigation Protection Act</i> (NPA) approval and review process is being conducted for the proposed project. The proponent will comply with all/any conditions of the NPA approval.</p>
<p>17. Other Jurisdictions Involved in Review: New Brunswick Department of Natural Resources – License of Occupation for use of Crown Land New Brunswick Department of Environment and Local Government – Environmental Impact Assessment Registration</p>	
<p>18. Other Expert Departments Providing Advice: N/A</p>	<p>19. Areas of Interest of Other Expert Departments: N/A</p>
<p>20. Other Contacts and Responses: Ms. Sandra Comeau – DFO Aboriginal Program Area Coordinator Mr. Georges Moore – DFO Aboriginal Program Area Coordinator Ms. Christina LaFlamme – Amec Foster Wheeler Provincially Certified Wetland Biologist</p>	
<p>21. Scope of Project (details of the project subject to review):</p> <p><u>Project Description</u></p> <p>Harbour Improvements (Phase 1 – Breakwater Construction)</p> <p>The current phase of the proposed Harbour Improvements project at the New Mills DFO-SCH consists of the construction of a new breakwater north of the existing harbour. Activities associated with the breakwater construction will include the creation of a breakwater extending from the shoreline of West Point Island to the north of the existing wharf structure (approx. footprint = 5,750 m²). The breakwater will be constructed of one to two layers of 2-4 tonne armourstone (1 to 1.9 m thick) atop filterstone and core stone/fill. Refer to Figure 4 in Appendix A for a plan of the existing site and proposed work.</p> <p>Operation / Maintenance</p> <p>The Environmental Management System (EMS) with an integrated Environmental Management Plan (EMP) for the Harbour Authority of New Mills covers operational aspects of environmental management and is the mitigation measure for the environmentally responsible aspects of harbour operation (fuelling, waste disposal, activities on the property and water). The proposed project will not affect continued operations at the New Mills DFO-SCH.</p>	

Decommissioning / Abandonment

This facility is not presently planned to be decommissioned. At the time of decommissioning, Small Craft Harbours will develop a site-specific re-use or reclamation plan that is appropriate for the applicable environmental legislation and Fisheries and Oceans Canada policies.

Scheduling

The proposed construction is scheduled to commence in the summer of 2016. The timeline is subject to DFO-SCH approvals/funding, therefore completion of works could extend to the end of 2017.

22. Location of Project:

The New Mills DFO-SCH (Harbour Code 2601) is located within the Heron Channel of Chaleur Bay along the northern shore of New Brunswick in Restigouche County. The approximate coordinates of the project area are Latitude 47°58'29"N and Longitude -66°11'18"W. Refer to **Figures 1 to 3** in **Appendix A** for maps and an aerial photo showing the proposed project location and surrounding area.

23. Environment Description:

Socio-Economic Environment

New Mills DFO-SCH is located within the Heron Channel of Chaleur Bay along the northern shore of New Brunswick in Restigouche County. The Harbour is directly accessible from West Point Road off of NB Highway 134.

The Harbour Authority, through a lease agreement with DFO-SCH, manages the property and facilities. The structures occupying the site include a concrete deck wharf and parking area accessed by a causeway and a concrete haulout ramp that is located on the land-side of the causeway. One building, a former ice house, is located on the West Point Island and an AST use for waste oil is located adjacent to the former ice house. A privately-owned fisher container is located north of the causeway and a navigational light is located at the end of the wharf.

The New Mills DFO-SCH has capacity for approximately 12 – 15 m fishing vessels. The Harbour currently accommodates a home fleet of 11 full-time commercial fishing vessels operated by members of the Eel River Bar First Nation (G. Moore and S. Comeau, pers. comm., 2015). According to the DFO Aboriginal Program Area Coordinators the only commercial fisheries operated out of this harbour is lobster, which is harvested between the end of April and the end of June. The DFO Aboriginal Program Area Coordinators also indicated that there are no Aboriginal fisheries for food, social, or ceremonial purposes known to be occurring at the Harbour (G. Moore and S. Comeau, pers. comm., 2015).

There are no fish processing plants or lobster holding facilities located near the wharf. The nearest aquaculture site is located in Hardwicke, approximately 64 km east of the harbour near the Stonehaven DFO-SCH (New Brunswick Department of Agriculture, Aquaculture and Fisheries, 2015).

The land in the immediate vicinity of the Harbour has been developed to serve the general fishing industry and by some residential and small commercial properties. The nearest residential property is located on West Point Island, approximately 100 m east of the wharf.

Lands adjacent to the coastlines in the Maritimes tend to have high archaeological potential given their historic importance and proximity to transportation routes and fishing resources. The shoreline around and including New Mills is considered high potential for heritage and archaeological resources and the nearest registered archaeological site (CIDn-2) is located along Benjamin River, approximately 2 km southeast of the project site (New Brunswick Department of Tourism, Heritage and Culture, 2013).

Physical Environment

The New Mills DFO-SCH is located within the Heron Channel of Chaleur Bay along the northern shore of New Brunswick in Restigouche County. The coastal environment at New Mills consists of seabed and shoreline areas. The coastline in the area consists of low shoreline, interspersed with sandy and muddy beaches. The tides in the area generally range from less than 0.5 to 2.6 m in height. The New Mills DFO-SCH is situated approximately 3 km across the Heron Channel from Heron Island.

Based on available surficial geology maps, the native surficial soils likely consist of units of sand, silt, and some gravel and clay, generally 0.5 to 3 m in thickness (Rampton et. al., 1984). Geological mapping of the area indicates that the site is underlain with Silurian andesitic and basaltic flows, tuffs and related intrusive rocks (New Brunswick Department of Natural Resources and Energy, 2000).

A marine sediment sampling program completed at the harbour in 2010 shows the sediment at the site to be predominantly sand (28-53%) and silt (15-30%) with lesser amounts of gravel (9.9-45%) and clay (4.8-18%) (Stantec Consulting Ltd., 2010). Results of a recent marine sediment sampling program indicate the material within the maintenance dredging area consists primarily of silt (43%) and sand (40%) with lesser amounts of clay (15%) and gravel (2%), while the substrate within the capital dredging area consists primarily of gravel (58-66%) with lesser amounts of sand (25-33%), clay (1-6%), and silt (<1-11%) (Amec Foster Wheeler, 2015a). Substrate characteristics noted in a recent underwater benthic habitat survey program showed much of the area to north of the existing wharf structure to predominantly cobble with lesser amounts of rock and silt. The area to the south of the wharf is noted as predominantly silt (Amec Foster Wheeler, 2015b; **Appendix C**).

Regional surface drainage (apparent groundwater flow direction) appears to be to the north towards Chaleur Bay. Surface drainage at the site, which is flat, discharges into the adjacent harbour waters on all sides. Pits, lagoons, stressed vegetation, watercourses, ditches, or standing water were not observed on the subject property (Conestoga Rovers and Associates, 2010).

The vegetation on site is limited with some grass. The upland area on West Point Island and before the causeway contain some low shrubs, trees, and grass, but is primarily developed with harbour infrastructure and some commercial developments/residential properties.

Canadian Climate Normals (1981-2010) for the Charlo A climate station (47°59'00" N and 66°20'00" W), the station located closest to the project, indicate a mean annual temperature of 3.4°C with extremes ranging from -36.5°C to 35.2°C. Measurable precipitation per year is approximately 997.6 mm. Extreme daily precipitation of up to 113.2 mm has been recorded (Environment Canada, 2015a).

Biological Environment

Chaleur Bay is considered highly productive, supporting numerous pelagic fish species such as Atlantic herring (*Clupea harengus harengus*), capelin (*Mallotus villosus*), Atlantic mackerel (*Scomber scombrus*), and American smelt (*Osmerus mordax*); groundfish species such as Atlantic cod (*Gadus morhua*), American plaice (*Hippoglossoides platessoides*), and yellowtail flounder (*Pleuronectes ferruginea*); and shellfish species such as lobster (*Homarus americanus*) and scallop (*Placopectin magellanicus*). Beaches in the area also support various species of clams (soft-shell clam (*Mya arenaria*), bar clam (*Spisula solidissima*), bay quahog (*Mercenaria mercenaria*), and razor clam (*Ensis patula*)).

Macrofaunal life observed during the underwater benthic habitat survey completed in September 2015 was generally sparse with a total of 9 species observed and mainly with an uncommon occurrence. Species observed included Northern rock barnacle (*Semibalanus balanoides*), green crab (*Carcinus maenas*), periwinkle (*Littorina* sp.), rock crab (*Cancer irroratus*), Atlantic lobster (*Homarus americanus*), waved whelk (*Buccinum undatum*), and seastar (*Asterias* sp.) One species of fish, Atlantic silverside (*Menidia menidia*), was positively identified, however other unidentified fish were noted throughout the survey. Of note, in dense patches of eelgrass one fish was noted consistently and in large numbers. It could not be positively identified but is presumed to be young of the year Northern pipefish (*Syngnathus fuscus*). An extensive amount of shell hash was also noted within the areas surveyed (Amec Foster Wheeler, 2015b; **Appendix C**).

Macrofloral life was observed along the majority the areas surveyed, however cover was generally low with a negligible canopy in most areas. Species observed included encrusting algae (*Leptophyllum* sp.), bladderwrack (*Fucus vesiculosus*), sugar kelp (*Laminaria saccharina*), an epiphytic brown alga (*Pilayella littoralis*), eelgrass (*Zostera marina*), rockweed (*Ascophyllum nodosum*), green alga (*Spongomorpha* sp.), sea lettuce (*Ulva lactuca*) another brown alga (*Ectocarpus* sp.), and sea colander (*Agarum clathratum*). A high cover and robust canopy of both seaweeds (rockweed and bladderwrack) and eelgrass were noted in the area surveyed north of West Point Island where a rock outcrop exists, however, through recent revisions to project design, the construction of the breakwater has been located to avoid much of this area. An area of eelgrass cover ranging between 35 and 90% is noted within the future dredge area. Macrofloral debris was observed in all seven transects with coverage in some areas up to 90% (Amec Foster Wheeler, 2015b; **Appendix C**).

Habitat within much of the breakwater construction area footprint would be considered poor to marginal. In general, the substrate offers little refuge and there is no macrofloral canopy or cover other than some moderate patches of eelgrass. The area near the tidal island and bar did feature robust macrofloral canopies and boulder/rock habitat, which is considered to offer quality habitat, however as previously noted, much of this area is now avoided in the latest breakwater construction design. Fish habitat within the maintenance and capital dredging areas would be considered mostly poor to marginal, offering little refuge and no macrofloral canopy or cover besides moderate patches of eelgrass. An area consisting of dense eelgrass beds with cover ranging 35 and 90% and considered quality habitat is, however, noted to the south of the harbour within the area of future capital dredging (Amec Foster Wheeler, 2015b; **Appendix C**).

The Maritime Breeding Bird Atlas identifies a total of 87 species of birds in the geographical block which contains New Mills Harbour (19GP01), 14 of which are listed as confirmed for breeding (Bird Studies Canada, 2015).

The nearest provincially significant wetland is located approximately 200 m south of the existing wharf to the left of West Point Road prior to the causeway to West Point Island, while the nearest regulated wetland is located approximately 700 m southwest of the New Mills DFO-SCH (Government of New Brunswick, nd). Upon a review of aerial imagery and Google Street View by an Amec Foster Wheeler Provincially Certified Wetland Biologist, there is no evidence of hydrophytic vegetation or surficial wetland hydrology (e.g., ponded water or drainage patterns) within the area mapped as a Provincially Significant Wetland. The vegetation appears to be typical of mowed lawns/fields with evidence of clovers which are considered to be an upland species. Also, using Google Street View, ponded water is observed on the access road adjacent to the property but there is no evidence of surface saturation within the mapped wetland area, indicating that the area is well drained and lacks wetland hydrology. Based on the lack of hydrophytic vegetation and wetland hydrology it is of the wetland biologist's opinion that the area mapped as a Provincially Significant Wetland is not in fact a wetland, but a instead consists of a landscaped residential area (C. LaFlamme, pers. comm., 2016).

Species at Risk (Aquatic and Terrestrial)

A search of the Atlantic Canada Conservation Data Centre (ACDC) database was conducted. The ACCDC provided a list of rare/unique species (i.e. plants and animals) within a 5 km buffer zone (standard ACCDC procedure) of the site of the proposed work. All species were cross-referenced with Schedule 1 of the Species at Risk Act (SARA) listed as extirpated, endangered and threatened or of special concern. Only the eastern population of harlequin duck (*Histrionicus histrionicus*), which is listed under Schedule 1 of the SARA as a species of Special Concern, was identified within 5 km of the project site in New Mills (ACCDC, 2014). The harlequin duck, which is a small, subarctic sea duck, is also listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as a species of Special Concern. Four populations of the harlequin duck are found world-wide, two of them in Canada, with the western population occurring along the Pacific Coast and the eastern population along the Atlantic Coast. Harlequin ducks of the eastern population mostly breed throughout much of Labrador, along eastern Hudson Bay, and the Great Northern Peninsula of Newfoundland, however there are also known breeding populations along the north shore of the Gulf of St. Lawrence, the Gaspé Peninsula, northern New Brunswick, and southeastern Baffin Island in Nunavut. Their migration patterns are variable, with many spending the winter on the east and south coasts of Newfoundland, in southeastern Nova Scotia, in southern New Brunswick, in Maine, and at a few locations south of Cape Cod. Small groups may spend the winter along the Gaspé Peninsula and Anticosti Island of Québec and some individuals may spend the winter in Prince Edward Island. Harlequin ducks spend most of the year in coastal marine environments, but move inland each spring to breed along fast-flowing turbulent rivers. During the winter, the duck is often associated with offshore islands, headlands, and rocky coastlines where the surf breaks against rocks and ice buildup is minimal. These ducks also feed close to rocky shorelines or rock skerries. Harlequin ducks typically dive for food and generally feed on larvae and pupae often found under rocks, as well as aquatic animals, plant material, seeds, small fish, snails, and crabs (Environment Canada, 2015b).

Sensitive Environmental Areas

A search of the ACCDC database yielded two (2) records of sensitive environmental areas within 5 km of the New Mills Harbour which included the former Benjamin River PPR measuring approximately 10 hectares while Heron Island measuring approximately 473 hectares. Both areas are managed under local jurisdiction of the New Brunswick Department of Natural Resources.

The following areas are the nearest Environmentally Significant Areas (ESAs) designated by the Nature Trust of New Brunswick (2005) to New Mills harbour:

- **New Mills ESA** is located at the western end of an irregular shore zone that runs to Black Point, which is the only area in northeastern New Brunswick with attached algae *Fucus* and *Ascophyllum*. Silurian maroon volcanic boulder conglomerate is exposed at the New Mills wharf and dark grey basalt underlies the conglomerate a short distance to the east (Nature Trust of New Brunswick, 1995).
- **Fleming Island ESA** is located near the mouth of Benjamin River, approximately 300 m northeast of West Point Island, and consists of a forested circular island with, at one time, the largest nesting colony of eider (*Somateria mollissima*) in eastern New Brunswick. It is also used as a nesting site for various species of gulls (Nature Trust of New Brunswick, 1995).
- **Heron Island ESA** is the large island situated directly across Heron Channel from the New Mills DFO-SCH. This island is characterized by sandstone cliffs and plains, barrier spits and beaches, submerged sand bars and rapid shore erosion. It is forested with balsam fir (*Abies balsamea*), white birch (*Betula papyrifera*), poplar (*Populus*), Eastern white cedar (*Thuja occidentalis*), and includes rare plants. The island is noted as hosting colonies of double-crested

cormorants (*Phalacrocorax auritus*), black-crowned night heron (*Nycticorax nycticorax*), black guillemots (*Cephus grylle*), great blue heron (*Ardea herodias*), and osprey (*Pandion haliaetus*) (Nature Trust of New Brunswick, 1995).

- **Pointe La Roche ESA** is located along the shore between Charlo and New Mills, directly north of Blackland, approximately 3 km west of the New Mills DFO-SCH. Fossils of Silurian age, including corals, bryozoans and graptolites, are abundant in 135 m thick bluish-grey nodular limestone underlying Pointe la Roche, which is exposed at low tide. Basaltic volcanic rocks are exposed to the south with similar strike to the sediments (Nature Trust of New Brunswick, 1995).
- **Dickie Cove/Black Point ESA** is located between 5 and 8 km southeast of the New Mills DFO-SCH site and consists of an area of irregular shoreline with gravel beaches between New Mills and Black Point and is the only shoreline in northeastern New Brunswick with attached algae *Fucus* and *Ascophyllum*. There have also been numerous sightings of Atlantic white-sided dolphins (*Lagenorhynchus acutus*) and blue sharks (*Prionace glauca*) in the area. Grey seals (*Halichoerus grypus*) use the point as a haul-out area and migratory birds use the area as a stopover point (Nature Trust of New Brunswick, 2005).

Heron Island has also been designated as a national Important Bird Area which, as previously noted, supports a large colony of double-crested cormorants. IBA Canada indicates that it is also possible that great blue herons and black-crowned night herons breed on Heron Island, however nesting has yet to be confirmed. In addition, approximately 250 common eiders nest on the small rocky islands adjacent to the mainland (along the south shore of the Heron Channel) (IBA Canada, 2015).

There are no listed wildlife species or critical habitats (including wetlands) that will likely be affected by the project activities as there is no critical or limiting habitat at the proposed work site other than those already discussed above.

24. Environmental Effects of the Project:

Potential Project/Environment Interactions and their effects are outlined below.

Harbour Improvements (Phase 1 – Breakwater Construction):

- Project activities may result in debris/material entering the marine environment.
- Potential adverse effects to migratory birds during site access.
- Potential to enhance populations of predators in the harbour area.
- Potential for suspended solids/sediments and turbidity immediately adjacent to the project site affecting fish/fish habitat.
- Impacts to fish habitat within area of breakwater construction.
- Activities may result in construction related debris or toxic materials affecting soil and/or marine water quality.
- Potential for introduction of invasive species into the marine environment.
- Potential discovery and disturbance or loss of heritage/archaeological resources.
- Interference with vessel movement in the vicinity of the harbour.
- Interference with commercial, recreational, and Aboriginal use of the harbour.
- Noise and dust generated as a result of the construction activities.
- Use of heavy machinery may cause short-term elevated noise levels and emissions at the site.
- Safety hazards to workers during construction.

Operation / Maintenance:

- Safety hazards to workers during operation/maintenance.

Decommissioning / Abandonment:

- Safety hazards to workers during operation/maintenance.

Table 1 of Appendix B provides a matrix of potential project/environmental interactions, while **Table 2 of Appendix B** describes the assessment criteria for determination of significance.

25. Mitigation Measures for Project:

<u>Potential Effect</u>	<u>Mitigation</u>
Harbour Improvements (Phase 1 – Breakwater Construction)	
<p>Reversible, immediate degradation of soil quality occurring once and over the short term</p>	<ul style="list-style-type: none"> • Machinery must be checked for leakage of lubricants and fuel. Basic petroleum spill clean-up equipment must be kept on-site. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633). • Waste materials are not to be buried on site. Demolition debris and waste materials will be disposed of in accordance with Provincial Waste Management Regulations.
<p>Reversible, immediate degradation of groundwater/marine water quality and fish/fish habitat occurring once and over the short term.</p>	<ul style="list-style-type: none"> • An Application for Authorization inclusive of a plan to offset potential loss of habitat will be submitted to DFO-Fisheries Protection Program (FPP). The project will incorporate the recommended mitigation once an approval is received. • Activities must be completed in such a way as to minimize the amount of fines and organic debris that may enter nearby aquatic environments. • Visual monitoring of the turbidity will be required on a daily basis in the vicinity of the project to ensure that the turbidity is limited. If excessive change occurs in the turbidity that differs from the existing conditions of the surrounding water body (i.e., distinct colour difference) as a result of the project activities, the work must stop immediately to determine if further mitigation measures are required. • Any equipment that has been in the marine environment will be cleaned of any sediments, plants or animals and washed with freshwater and/or sprayed with undiluted vinegar prior to being mobilized to the project site. • If a marine mammal (specifically whales or porpoises) is identified within the vicinity of the project, work shall stop until the animal is gone. • Marine equipment may be inspected by PWGSC or DFO to ensure invasive species are not introduced to the marine environment. • Heavy machinery will not be allowed in the water. Machinery shall be operated on land above the high water mark, in a manner that minimizes disturbance to the banks and bed of the waterbody. • Any construction debris/material that enters the marine environment will be removed immediately. Waste materials are not to be buried on site. Demolition debris and waste materials will be disposed of in a provincially-approved manner. • No construction or infill material may be obtained from any coastal feature, namely a beach, dune, or coastal wetland. • Onsite crews must have emergency spill clean-up equipment, adequate for the activity involved, on-site. Spill equipment will include, as a minimum, at least one 250L (i.e., 55 gallon) overpak spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633).
<p>Small, immediate disturbance of birds/bird habitat over the short term</p>	<ul style="list-style-type: none"> • All machinery must be well muffled. If necessary, trucks may be required to avoid the use of “hammer” braking along specific sections of the route. • Adherence to the regulations set out by the <i>Migratory Birds Convention Act</i>. • Contractors must ensure that food scraps and garbage are not left at the work site. • Project staff and/or contractors shall not access beaches, sand spits, dunes, mud flats, or sand flats during any stage of the project.

	<ul style="list-style-type: none"> • Concentrations of seabirds, waterfowl, or shorebirds must not be approached when accessing the project site by water, or when ferrying supplies. • All equipment must be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products. • Refueling operations will take place at least 30 metres from any watercourse and harbour and the refueling will take place on a prepared impermeable surface with a collection system. • All equipment to be used in or over the marine environment is to be free from leaks or coating of hydrocarbon-based fluids and/or lubricants harmful to the environment. Hoses and tanks are to be inspected on a regular basis to prevent fractures and breaks. • Construction activities will be carried out during times acceptable to local authorities.
<p><u>Small, immediate</u> disturbance to territorial/aquatic species over the <u>short term</u></p>	<ul style="list-style-type: none"> • Wetlands or sensitive coastal habitats (i.e., any area in which plant or animal life or their habitats are either rare or especially valuable) must not be accessed nor used as staging areas. • All vessels and machinery should be well muffled, and maintained in proper working order and must be regularly checked for leakage of lubricants or fuel. • Waste or any miscellaneous unused materials must be recovered for either disposal in a designated facility or placed in storage. Under no circumstances will materials be deliberately thrown into the marine or terrestrial environment.
<p><u>Irreversible, immediate</u> disruption or loss of heritage/archaeological resource <u>once</u> and over the <u>short term</u></p>	<ul style="list-style-type: none"> • All construction personnel will be responsible for reporting any unusual materials unearthed during project activities to the Construction Supervisor. • In those situations where the find is believed to be an archaeological resource, the Construction Supervisor will immediately stop work in the vicinity of the find and notify his/her immediate supervisor and the PWGSC Project Manager. • Work in the area will be stopped immediately and an archaeological curator at the New Brunswick Department of Tourism, Culture and Heritage – Provincial Archaeological Services will be contacted at 506-453-3115. • Work can only resume in the vicinity of the find when authorized by the PWGSC Project Manager and Construction Supervisor, after approval has been granted by the New Brunswick Department of Tourism, Culture and Heritage. • In the event of the discovery of human remains or evidence of burials, the excavation work will immediately cease and nearest law enforcement agency will be contacted immediately by the PWGSC Project Manager and/or the Construction Supervisor.
<p><u>Intermittent, immediate</u> disruption of commercial and recreational harbour use over the <u>short term</u></p>	<ul style="list-style-type: none"> • The Harbour Authority will coordinate all construction/vessel activities within the harbour for the duration of the project so as to avoid unnecessary interference with harbour users. Any and all stipulations of federal, provincial, or municipal authorities or their officers must be strictly followed.
<p><u>Immediate</u> reduction in air quality due to noise and dust occurring <u>once</u> and over the <u>short term</u></p>	<ul style="list-style-type: none"> • Construction activities must be carried out during times acceptable to local authorities and smaller, less disturbing equipment will be used where possible. • Dust suppression by the application of water must be employed when required. The project authority shall determine locations where water is to be applied, the amount of water to be applied, and the times at which it shall be applied. Waste oil must not to be used for dust control under any circumstances.

Significance of Adverse Environmental Effects: Although the potential exists for short-term environmental effects during the project, the implementation of recommended mitigation measures will result in insignificant impacts. DFO and Transport Canada concludes that this project will not likely contribute to significant adverse environmental effects, provided that the above recommended mitigation measures are applied.

Operation/Maintenance and Decommissioning/Abandonment

Immediate worker health and safety hazards over the **short term**

- Site access must be restricted to construction personnel and authorized visitors.
- All personnel involved with activities must be adequately trained and utilize appropriate personal protective equipment.

Significance of Adverse Environmental Effects: Although the potential exists for short-term environmental effects during the project, the implementation of recommended mitigation measures will result in insignificant impacts. DFO and Transport Canada concludes that this project will not likely contribute to significant adverse environmental effects, provided that the above recommended mitigation measures are applied.

26. Description of any Significant Adverse Environmental Effects of the project (after applying mitigation):

Significant adverse environmental effects are unlikely, taking into account mitigation measures.

27. Other Considerations (Public Consultation, Aboriginal Consultation, Follow-up)

Public Consultation

The harbour improvements at New Mills Harbour will increase the overall operational capacity and safety of the harbour and for harbour users (harbour for fishers and occasional recreational user) to conduct harbour activities, allowing the harbour to continue being a viable resource to the commercial fishery. The proposed project will increase the sustainability of the commercial fisheries at this location. The adjacent land-owner has expressed concern over the potential loss of the sunset view from his property due to the proposed breakwater construction project. No other negative public concern is expected as a result of this project.

Aboriginal Consultation

PWGSC, on behalf of DFO-SCH, carried out an Aboriginal Assessment at New Mills Harbour in accordance with DFO-SCH's Preliminary Duty to Consult Assessment Guide. This Guide is intended to provide basic information to DFO-SCH in the Maritimes and Gulf Regions and to assist its Program Managers in making informed, prudent decisions that take into account statutory and other legal obligations, as well as policy objectives, related to Aboriginal and treaty rights.

The Supreme Court of Canada has held that the Crown has a duty to consult and, where appropriate, accommodate when the Crown contemplates conduct that might adversely impact potential or established Aboriginal or treaty rights. While there may be other reasons to undertake consultations (e.g. good governance, policy-based, etc.), three elements are required for a legal duty to consult to arise:

1. There is contemplated or proposed Crown conduct;
2. The Crown has knowledge of potential or established Aboriginal or treaty rights; and
3. The potential or established Aboriginal or treaty rights may be adversely impacted by the Crown

The DFO Area Aboriginal Program Coordinators advised, during the Duty to Consult (DTC) process that there are 11 Aboriginal vessels that fish commercially from the New Mills wharf but that, to their knowledge, the SCH facility is not utilized for Aboriginal traditional, food or ceremonial fisheries. The proposed project site was also reviewed for archaeological potential with known archeological sites (pre-contact, historic, burial) in the area of the site, the scope and type of work to be conducted to deduce a residual archaeological potential. As a result of the DTC assessment, aboriginal consultation was pursued further for this project as there may be impacts on potential or established Aboriginal or Treaty Rights. Letters have been sent to all aboriginal communities known to be and potentially operating from the harbour. A meeting was held on November 6, 2015 to discuss the proposed Harbour Improvements project with members of the Eel River Bar First Nation and a letter of endorsement for the project has since been received.

Government Consultation

Federal and provincial authorities likely to have an interest in the project were consulted by Public Works & Government Services Canada, Environmental Services during the course of this assessment. A project description was distributed to

the following federal and provincial authorities: Fisheries and Oceans Canada - Fisheries Protection Program, Transport Canada – Environmental Affairs and Aboriginal Consultation Unit, Transport Canada – Navigation Protection Program, New Brunswick Department of Environment and Local Government – Environmental Assessment Section, and New Brunswick Department of Natural Resources – Crown Lands Branch.

Accuracy and Compliance Monitoring

Site monitoring (accuracy and compliance monitoring) may be conducted to verify whether required mitigation measures were implemented. The proponent must provide site access to Responsible Authority officials and/or its agents upon request.

28. Other Monitoring and Compliance Requirements (e.g. Fisheries Act or Species at Risk Act requirements):

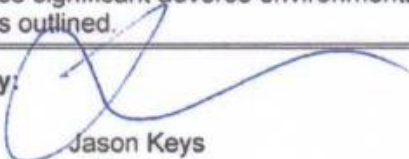
N/A

CONCLUSION

29. Conclusion on Significance of Adverse Environmental Effects:

The Federal Authority has evaluated the project in accordance with Section 67 of *Canadian Environmental Assessment Act (CEAA), 2012*. On the basis of this evaluation, the department has determined that the project is not likely to cause significant adverse environmental effects with mitigation and therefore can proceed using mitigative measures as outlined.

30. Prepared by:



31. Date: Feb 8/2016

32. Name: Jason Keys

33. Title: A/Senior Environmental Specialist, PWGSC

34. Approved by:

35. Date: 2016/02/10

36. Name: Raymond Losier



37. Title: DFO-SCH Senior Project Engineer, NB

DECISION

38. Decision Taken

- The project is not likely to cause significant adverse environmental effects, and DFO may exercise its power, duty or function.
- The project is likely to cause significant adverse environmental effects, and DFO has decided not to exercise its power, duty or function.
- The project is likely to cause significant adverse environmental effects, and DFO will ask the Governor in Council to determine if the significant adverse environmental effects are justified in the circumstances.

39. Approved by:

40. Date: 2016/01/10

41. Name: Raymond Losier



42. Title: DFO-SCH Senior Project Engineer, NB

43. Transport Canada

Project Title:	DFO-SCH #2601 NEW MILLS BREAKWATER CONSTRUCTION AND HARBOUR DREDGING
TC File No.:	NEATS: 39891
NPP File No.:	8200-2015-200080
EED Decision:	<p><input type="checkbox"/> Taking into account the implementation of any mitigation measures that Transport Canada considers appropriate, the project is not likely to cause significant adverse environmental effects and, as such, Transport Canada may exercise any power or perform any duty or function that would permit the project to be carried out in whole or in part.</p> <p><input type="checkbox"/> Taking into account the implementation of any mitigation measures that Transport Canada considers appropriate, the project is likely to cause significant adverse environmental effects that cannot be justified. As such, Transport Canada shall not exercise any power or perform any duty or function conferred on it by or under any Act of Parliament that would permit the project to be carried out in whole or in part, at this point in time.</p> <p>The project shall be referred to the Governor in Council to decide if those adverse environmental effects are justified under the circumstances pursuant to subsection 69(3) CEAA, 2012.</p>

Recommended by:	Sylvie Poirier Environmental Officer Environmental Affairs and Aboriginal Consultation Unit	
Signature:		Date:
Mailing Address:	Heritage Court, P.O. Box 42, Moncton, NB, E1C 8K6	
Tel:	506-962-1511	
Fax:	506-851-7542	
Email:	sylvie.poirier@tc.gc.ca	
Approved by:	Kevin LeBlanc Regional Manager Environmental Affairs and Aboriginal Consultation Unit	
Signature:		Date:

44. References:

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APPENDIX A: FIGURES

Location of proposed work –
New Mills DFO-SCH



Figure 1: Map of New Brunswick showing the location of the proposed project in New Mills Harbour, Restigouche County, New Brunswick

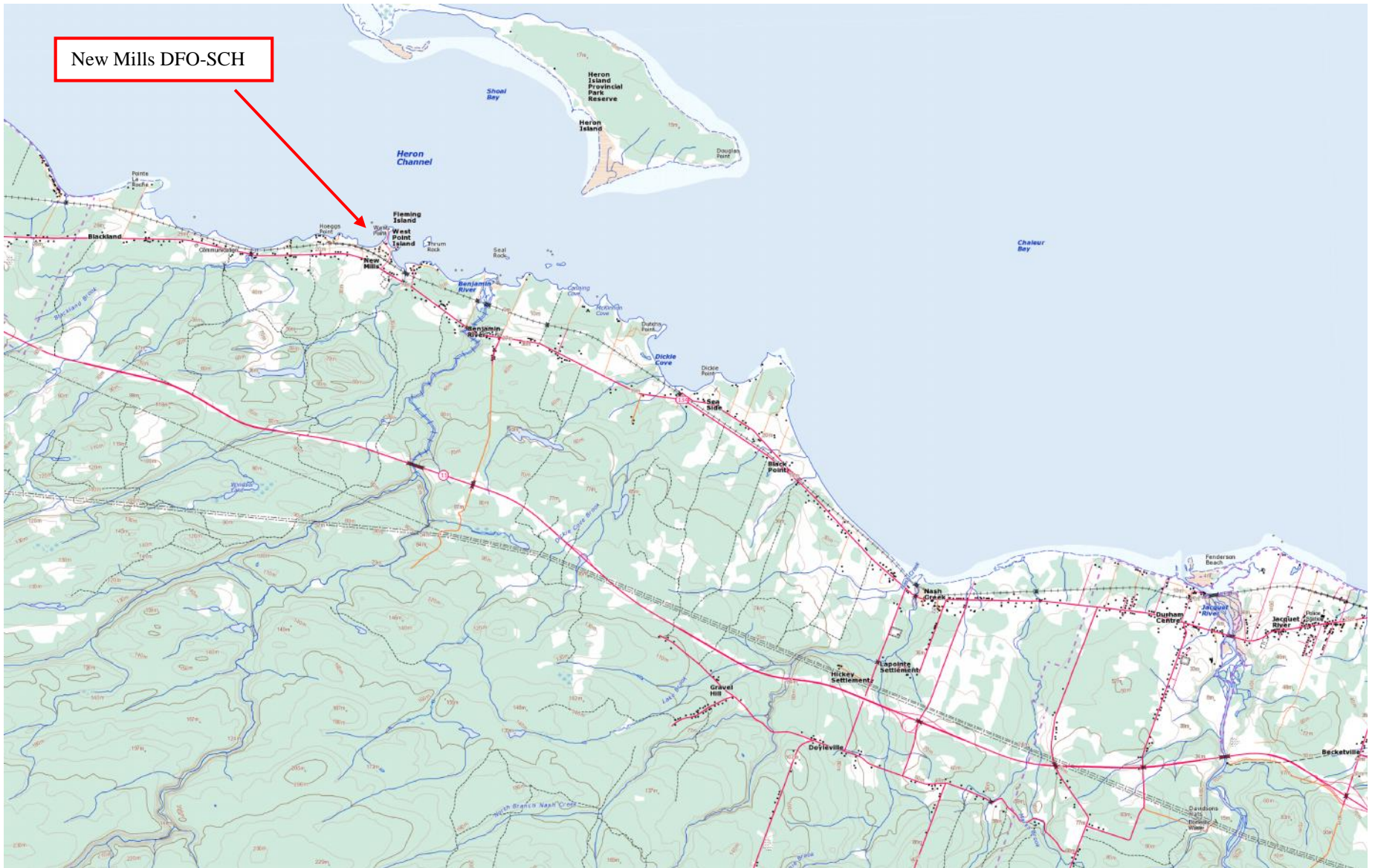


Figure 2: Topographic map indicating proposed project site, New Mills Harbour, Restigouche County, New Brunswick



Figure 3: Oblique aerial photo of New Mills DFO-SCH, Restigouche County, New Brunswick

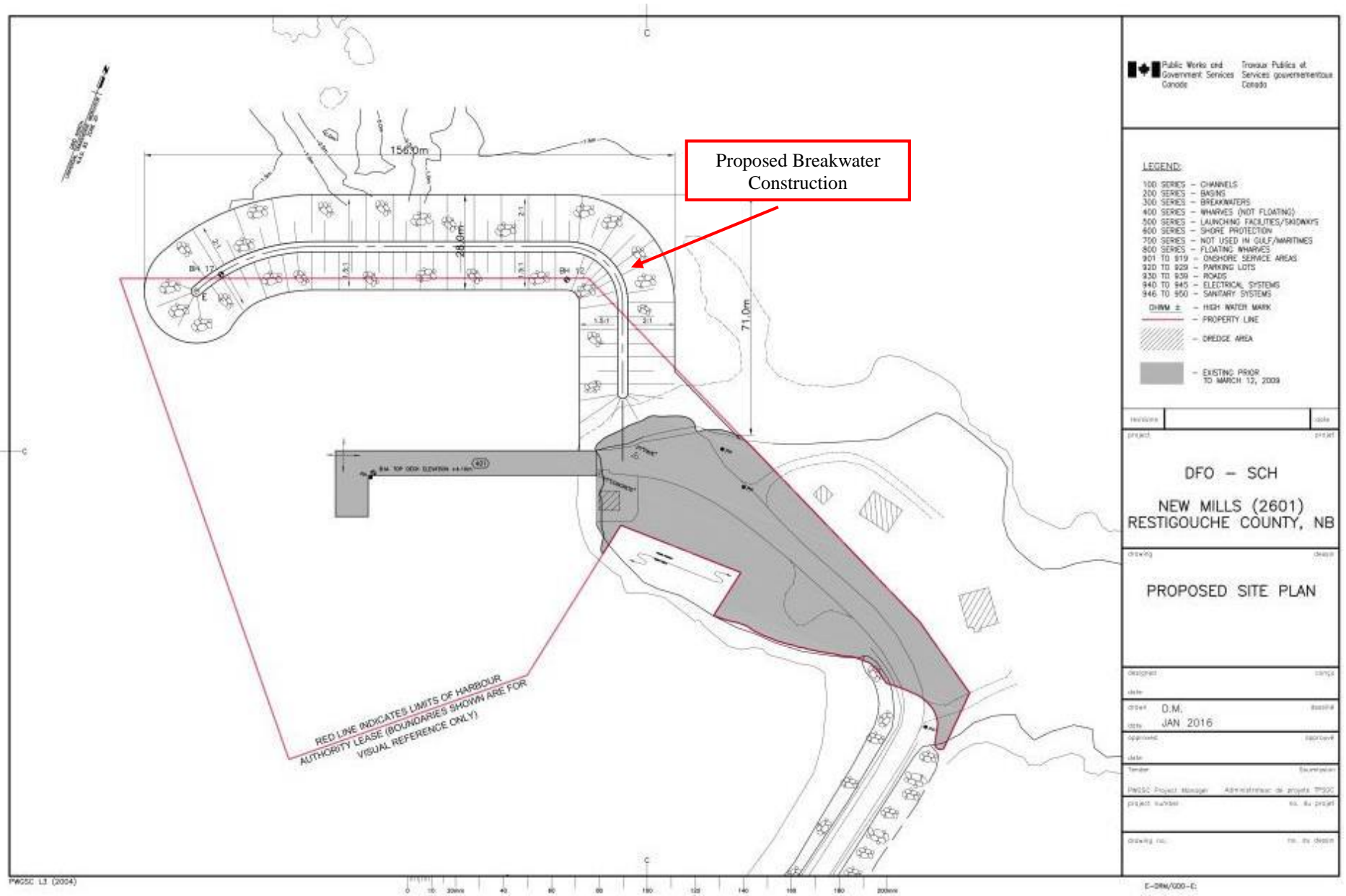


Figure 4: Site plan showing proposed breakwater construction at New Mills Harbour, Restigouche County, New Brunswick

APPENDIX B: TABLES

Scope of Effects Considered (CEAA Section 5(1) and 5(2))

Table 1: Matrix of Potential Project / Environmental Interactions

	As per Section 5(1)			Section 5(1c)				Section 5(2)			Due Diligence						
	Fish (Fisheries Act)	Aquatic Species (SARA)	Birds (MBCA)	Health and Socio economic	Physical and cultural heritage	Land use	HAPA* Significance	Health and Socio economic	Physical and cultural heritage	HAPA* Significance	Water (ground, surface, drainage, etc)	Wetlands	Terrestrial / Aquatic Species	Fish	Birds	Soil	Air Quality
Harbour Improvements (Phase 1)																	
Transportation of material and equipment	P	P	P	P	-	-	-	P	-	-	P	-	P	P	P	P	P
Construction of breakwater	P	P	P	P	-	-	P	P	-	P	P	-	P	P	P	-	P
Operation / Maintenance	P	P	P	P	-	-	-	P	-	-	P	-	P	P	P	-	P
Decommissioning / Abandonment	-	-	-	P	-	-	-	P	-	-	-	-	-	-	-	-	-

* structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

- = no interaction.

P = potential effect of project on environment.

Evaluation of Environmental Effects

The VECs selected in Table 1 are addressed in **Sections 24 and 25** of the **PED**. The physical works/activities and required mitigation measures are detailed.

The following ratings are based on:

- information provided by the proponent;
- a review of project related activities;
- an appraisal of the environmental setting, and identification of resources at risk;
- the identification of potential impacts within the temporal and spatial bounds; and
- Personal knowledge and professional judgment of the assessor.

Navigation Consideration

Environmental effects of the project on navigation are taken into consideration as part of the Project Effects Determination (PED) only when the effects are indirect, i.e. resulting from a change in the environment affecting navigation. Direct effects on navigation are not considered in the PED, but any measures necessary to mitigate direct effects will be included as terms and conditions associated work approved or permitted pursuant to the *Navigation Protection Act*.

- Only direct effects were identified; therefore the effects of the project on navigation are not addressed in this Project Effects Determination.
- Indirect effects were identified and have been addressed in this Project Effects Determination.

Determination of Significance

The significance of project related impacts was determined in consideration of their frequency, the duration and geographical extent of the effects, magnitude relative to natural or background levels, and whether the effects are reversible or are positive or negative in nature. These criteria are indicated in Table 2.

Table 2: Assessment Criteria for Determination of Significance

Magnitude	Magnitude, in general terms, may vary among Issues, but is a factor that accounts for size, intensity, concentration, importance, volume and social or monetary value. It is rated as compared with background conditions, protective standards or normal variability.	
	Small	Relative to natural or background levels
	Moderate	Relative to natural or background levels
	Large	Relative to natural or background levels
Reversibility	Reversible	Effect can be reversed
	Irreversible	Effects are permanent
Geographic Extent	Immediate	Confined to project site
	Local	Effects beyond immediate project site but not regional in scale
	Regional	Effects on a wide scale
Duration	Short Term	Between 0 and 6 months in duration
	Medium Term	Between 6 months and 2 years
	Long Term	Beyond 2 years
Frequency	Once	Occurs only once
	Intermittent	Occurs occasionally at irregular intervals
	Continuous	Occurs on a regular basis and regular intervals

Methodology

The environmental effects evaluation methodology used in this report focuses the evaluation on those environmental components of greatest concern. The Valued Ecological Components (VECs) most likely to be affected by the project as described are indicated above in Table 1. VECs were selected based on ecological importance to the existing environment (above), the relative sensitivity of environmental components to project influences and their relative social, cultural or economic importance. The potential impacts resulting from these interactions are described below.

Scoping

This environmental effects evaluation considers the full range of project / environment interactions and the environmental factors that could be affected by the project as defined above and the significance of related impacts with mitigation.

**APPENDIX C:
UNDERWATER BENTHIC HABITAT SURVEY**



**PWGSC PROJECT #R.075237.001
UNDERWATER BENTHIC HABITAT SURVEY
New Mills DFO-SCH
New Mills, New Brunswick**

FINAL REPORT

Submitted to:
Public Works and Government Services Canada
Moncton, New Brunswick

Submitted by:
Amec Foster Wheeler Environment & Infrastructure,
a Division of Amec Foster Wheeler Americas Limited
Moncton, New Brunswick

November 2015

TE131451



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foster
wheeler

06 November, 2015

TE131451

Ms. Mylène Roy
Senior Environmental Specialist
Environmental Services
Public Works and Government Services Canada
1045 Main Street
Moncton, New Brunswick
E1C 1H1

Dear Ms. Roy:

**Re: Underwater Benthic Habitat Survey at the New Mills Fisheries and Oceans Canada
Small Craft Harbour, New Mills, New Brunswick – Final Report**

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), is pleased to provide Public Works and Government Services Canada with the findings of an Underwater Benthic Habitat Survey undertaken within the footprint of proposed construction and dredge areas at the New Mills Fisheries and Oceans Canada – Small Craft Harbour in New Mills, New Brunswick.

Amec Foster Wheeler appreciates the opportunity to provide services to your organization. Please do not hesitate to call if you have any questions regarding this or any other matter.

Respectfully submitted,

**Amec Foster Wheeler Environment & Infrastructure,
a Division of Amec Foster Wheeler Americas Limited**

Christa Dubreuil, B.Sc., EP

Project Manager

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Appendix B	Annotated Species List
Appendix C	Photo Log
Appendix D	Limitations

1.0 INTRODUCTION

At the request of Public Works and Government Services Canada (PWGSC), an Underwater Benthic Habitat Survey (UBHS) program was completed on 19 September, 2015 within the footprint of proposed construction and dredge areas at the New Mills Fisheries and Oceans Canada (DFO) – Small Craft Harbour (SCH) in New Mills, New Brunswick (NB).

2.0 SCOPE AND METHODOLOGY

Qualitative and quantitative observations were obtained from the footprint of the proposed construction and dredge areas using video survey techniques to map substrate types and document macrofaunal and macrofloral species presence and abundance. Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler) contracted Diversified Divers Inc. to perform the diving and video surveillance services. An Amec Foster Wheeler representative was on-site to guide the dive crew in the event that any issues arose and to obtain supporting habitat and biological information.

A total of 890 metres (m) of video surveillance was divided into three transects (T1, T2, and T3) and four transect tie lines (TT1 to TT4) of various lengths from within the footprint of the proposed construction and dredge areas at the New Mills DFO-SCH (Figure 2.1). Maintenance dredging is required south of the wharf, in the area of T3, while capital dredging is required within the area between the wharf and the proposed breakwater.

A handheld Global Positioning System (GPS) was used to locate the pre-determined start and finish points of the transects.

The survey of the transects required the use of a video camera, operated by a Canadian Standards Association (CSA)-certified diver. Video at the New Mills DFO-SCH was collected both on land and in the water. Seabed characterization involved field observations made by the field crew and a review of the video survey recording. Observations along the video transect were made for every 5 m segment. All transects are described from point “a” to “b” as illustrated in Figure 2.1.

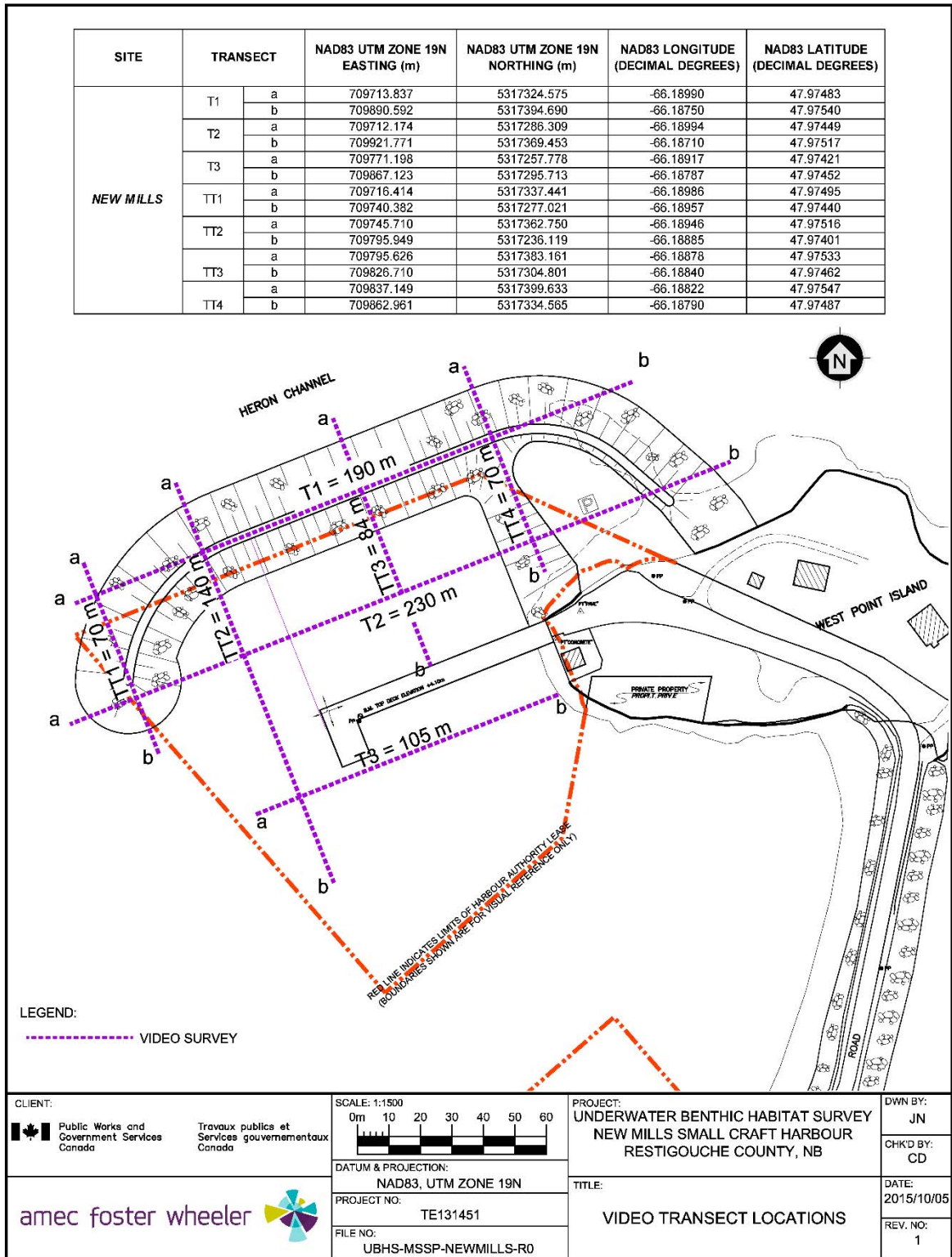


Figure 2.1 Benthic Transect Locations – New Mills DFO-SCH, New Mills, NB

3.0 UNDERWATER HABITAT SURVEY RESULTS

The results of the transect surveys for the proposed project footprint are presented in Appendix A (Tables A.1 to A.7), including the following information for each 5 m increment of transect line:

- visual determination of substrate type (in order of dominance);
- macrofaunal species identification and abundance; and
- macrofloral species identification and percent coverage.

A summary of the information provided in Tables A.1 to A.7 (Appendix A) is described in the following paragraphs. An annotated species list has been included in Appendix B. Photographs of habitat at the site have been included in Appendix C.

For the purposes of the video survey review and macrofaunal species identification and enumeration, four categories were developed to characterize the observed abundance levels. The categories are as follows:

A = Abundant

Numerous (not quantifiable) observations made throughout the entire 5 m segment.

C = Common

Numerous (not quantifiable) observations made intermittently along the 5 m segment.

O = Occasional

Quantifiable observations made intermittently along the 5 m segment.

U = Uncommon

Quantifiable observations made infrequently along the 5 m segment.

Observations of macrofaunal life were common and noted along all seven transects as further described in this section and in the associated tables in Appendix A (where encountered). Shell hash was also noted in all seven transects.

Macrofloral life was also noted in all seven of the transects as further described below and in the associated tables in Appendix A (where encountered). Macrofloral debris (i.e., detritus from macrofloral species) was noted along segments of all seven transects.

3.1 Transect 1 (T1)

Transect 1 (T1) was 190 m long. It runs through the length of the proposed breakwater construction area in an approximate northeast orientation.

Substrate:

The substrate along the first 165 m of the transect is predominantly cobble with lesser amounts of rock and silt. The next 15 m of the transect runs over a bar that is predominantly rock with lesser amounts of boulder, cobble, and rock. The last 10 m goes back to a predominantly cobble substrate with lesser amounts of rock and silt.

Macrofauna:

Macrofaunal life was dominated by common occurrences of Northern rock barnacles (*Semibalanus balanoides*), which were observed throughout the transect except for the last 20 m. Other macrofauna noted included occasional to uncommon observances of periwinkles (*Littorina* sp.) in five segments and uncommon observances of green crab (*Carcinus maenas*) in thirteen segments; American lobster (*Homerus americanus*) in two segments; and seastar (*Asterias* sp.) and waved whelk (*Buccinum undatum*) in one segment each. One occasional and thirteen uncommon observances of an unidentified fish species as well as one uncommon observance of Atlantic silverside (*Menidia menidia*) were noted. One segment (75-80 m) had a common abundance of unidentified fish species. A positive identification could not be made but it is surmised that the species seen were young of the year Northern pipefish (*Syngnathus fuscus*). The pipefish is not an obligate eelgrass species but is commonly associated with eelgrass habitat in the Maritime Provinces during some phases of its life cycle¹. A considerable amount of shell hash was noted throughout the transect.

Macroflora:

The macrofloral community through the first 165 m of the transect is generally sparse. Encrusting algae (*Leptophyllum* sp.) is noted throughout the entire transect, growing on both the hard bottom and the shell hash present with a cover of 5%. Bladderwrack (*Fucus vesiculosus*) was noted in rare occasions in this area with coverage between 5 and 10%. Other algal species noted in rare instances in this stretch included sugar kelp (*Laminaria saccharina*) and an epiphytic brown alga (*Pilayella littoralis*). Eelgrass (*Zostera marina*) was observed throughout the first 165 m of the transect with sparse cover between 5 and 15%. One 20 m section, between the 75-80 m and 90-95 m segments, had a higher cover of eelgrass. In this area the cover ranged between 25 and 40%. The last 25 m of the segment (165-190 m) goes through the intertidal zone on either side of a rock bar. The algal community is more robust through here with cover ranging between 60 and 100%, except for the last 5 m where it goes down to 35%. The species present include bladderwrack, sugar kelp, epiphytic brown alga, encrusting algae, rockweed (*Ascophyllum nodosum*), green alga (*Spongomorpha* sp.), sea lettuce (*Ulva lactuca*) and another brown alga (*Ectocarpus* sp.). No eelgrass was noted through this area. Macrofloral debris was rare throughout the transect with cover between 5 and 10%.

3.2 Transect 2 (T2)

Transect 2 (T2) was 230 m long. It ran in the same orientation as T1 (northeast) approximately halfway between T1 and the existing wharf (Figure 2.1). The 0-40 m and 145 to 225 m segments of the transect ran within the proposed construction areas. The 40-145 m portion of the transect ran through the proposed capital dredging area.

¹ Fisheries and Oceans Canada (DFO). 2009. Does eelgrass (*Zostera marina*) meet the criteria as an ecologically significant species? DFO Can. Sci. Advis. Rep. 2009/018.

Substrate:

The substrate along the first 175 m of the transect is predominantly cobble with lesser amounts of rock and silt. The next 25 m of the transect is predominantly boulder with lesser amounts of rock, gravel and cobble. After a 10 m section of cobble-dominated substrate that was part of a bar, the last 20 m was predominantly rock with lesser amounts of cobble and gravel.

Macrofauna:

Macrofaunal life was dominated by common occurrences of Northern rock barnacles, which were observed throughout the transect. Other macrofauna noted included occasional to uncommon observances of periwinkles, uncommon observances of green crab, seastar and an unidentified fish species. Common occurrences of an unidentified fish species, presumed to be Northern pipefish, were observed between the 140 and 150 m marks. A considerable amount of shell hash was noted throughout the transect.

Macroflora:

The macrofloral community through the first 140 m of the transect is generally sparse. Encrusting algae is noted throughout the entire transect, growing on both the hard bottom and the shell hash present with a cover of 5%. Bladderwrack was noted in rare occasions in this area with coverage between 5 and 10%. Eelgrass was observed throughout the first 170 m of the transect with sparse coverage between 5 and 15%. One 35 m section, between the 140-145 m and 165-170 m segments, had a higher cover of eelgrass. In this area the cover ranged between 40 and 90%. The last 55 m of the segment (170-225 m) goes through the intertidal zone on either side of a bar. The algal community is more robust through here with cover ranging between 25 and 100%. The species include bladderwrack, rockweed, and epiphytic brown alga. A low cover of eelgrass was noted after the 180 m mark. Macrofloral debris was rare throughout the transect.

3.3 Transect 3 (T3)

Transect 3 (T3) was 105 m long. It ran in the same orientation as T1 and T2 (northeast) just south of the existing wharf (Figure 2.1). The entire transect ran through the proposed maintenance dredging area.

Substrate:

The first 20 m of the transect were predominantly cobble with lesser amounts of silt, gravel, and rock. The next 10 m transitioned to predominantly silt with lesser amounts of gravel, cobble and rock. The remaining 75 m of the transect was comprised entirely of silt except for one 5% incidence of rock in one segment.

Macrofauna:

Macrofaunal life was dominated by common occurrences of Northern rock barnacles, which were observed throughout the transect. Other macrofauna noted included uncommon observances of green crab and periwinkles. There were occasional and uncommon observances of an unidentified fish species. Common occurrence of an unidentified fish species, presumed to be Northern pipefish, was observed in the 0-5 m segment. Shell hash was noted through the parts

of the transect featuring hard bottom. No observations were made between 90-100 m range due to limited visibility.

Macroflora:

Eelgrass was noted in the first 25 m of the transect with cover between 25 and 65%. It was also noted in four segments between the 25 and 75 m marks with a cover of only 5%. Other macroflora observed in the first 25 m of the transect included encrusting algae and bladderwrack, each with a cover of only 5%. Macrofloral debris was observed throughout the transect with cover between 5 and 90%. The highest cover of debris occurred near the end of the transect. No observations were made between 90-100 m range due to limited visibility.

3.4 Transect Tie Line 1 (TT1)

Transect tie line 1 (TT1) was 70 m long and ran perpendicular to, and crossed, T1 and T2. The first 10 m and last 15 m of the transect lie outside the proposed construction area, but was otherwise within the footprint.

Substrate:

The transect was predominantly cobble with lesser amounts of silt, gravel and rock.

Macrofauna:

Macrofaunal life was dominated by common occurrences of Northern rock barnacles, which were observed throughout the transect. Other macrofauna noted included uncommon observations of green crab and occasional and uncommon observations of periwinkles. There was one uncommon observation of an unidentified fish species. Shell hash was noted throughout the transect.

Macroflora:

Macrofloral life was noted in every segment of the transect, but with cover only ranging between 5 and 15%. Encrusting algae is noted through the entire transect, growing on both the hard bottom and the shell hash present with a cover of 5%. Bladderwrack, rockweed, and an epiphytic brown alga were noted in rare occasions in the transect with cover of 5%. Eelgrass was noted in less than 30% of the transect - mainly concentrated in the last 15 m. While present, eelgrass coverage was never higher than 5% in any segment. Macrofloral debris was rare.

3.5 Transect Tie Line 2 (TT2)

Transect tie line 2 (TT2) was 140 m long, running perpendicular to and crossing T1, T2, and T3 (Figure 2.1). The first 40 m ran in or near the proposed construction footprint; the 40-85 m section ran within the proposed capital dredging area and the last 55 m ran within or near the proposed maintenance dredging area.

Substrate:

The transect was predominantly cobble with lesser amounts of silt, boulder and rock.

Macrofauna:

Macrofaunal life was dominated by common occurrences of Northern rock barnacles, which were observed throughout the transect. Occasional and uncommon observances of periwinkles were noted. Other macrofauna noted included uncommon observances of green crab, rock crab (*Cancer irroratus*) American lobster and an uncommon observances of unidentified fish species. A single unidentified flatfish was noted in one segment. Between the 115 and 140 m marks, three common occurrences of a fish species, presumed to be Northern pipefish, were noted. Shell hash was noted throughout the transect.

Macroflora:

Macrofloral life was noted in every segment of the transect. Encrusting algae is noted throughout the entire transect, growing on both the hard bottom and the shell hash present with a cover of 5%. Bladderwrack, rockweed, and an ephyphitic brown alga were noted along the transect with cover of 5%. Eelgrass was observed throughout the transect with varying degrees of cover. In the first 115 m of the transect, eelgrass cover ranged between 5 and 15%, except in rare occasions when the cover ranged between 20 and 35% (15-20 m, 25-30 m, 50-55 m, and 110-115 m segments). Over the last 25 m of the transect, eelgrass cover was significantly higher, ranging between 65 and 90% cover. Macrofloral debris was noted in less than 20% of the transect with cover no greater than 5%.

3.6 Transect Tie Line 3 (TT3)

Transect tie line 3 (TT3) was 85 m long, running perpendicular to, and crossing, T1 and T2 (Figure 2.1). The first 40 m ran within or near the proposed construction area and the last 45 m ran within the proposed capital dredging area.

Substrate:

The transect was predominantly cobble with lesser amounts of silt and rock.

Macrofauna:

Macrofaunal life was dominated by common occurrences of Northern rock barnacles, which were observed throughout the first half of the transect. Uncommon observances of green crab, periwinkles, unidentified fish species and a single unidentified flatfish was noted. In the second half of the transect four common occurrences of a fish species, presumed to be northern pipefish, were noted. Shell hash was noted throughout the transect.

Macroflora:

Macrofloral life was noted in almost 90% of the transect. The algal community was sparse with encrusting algae, bladderwrack and rockweed observed in only 30%, 11% and 11% of the transect, respectively, with coverage of no more than 5% in any segment. Eelgrass was noted in approximately half of the transect. Between the start of the transect and the 40 m mark eelgrass did not have a coverage greater than 15% in any segment. In the 40-55 m portion of the transect eelgrass cover ranges between 35 and 55%. Eelgrass was also present in the last ten metres of the transect with cover between 25 and 30%.

3.7 Transect Tie Line 4 (TT4)

Transect tie line 4 (TT4) was 70 m long. It ran perpendicular to, and crossed, T1 and T2 (Figure 2.1). The entire transect ran within or near the proposed construction area.

Substrate:

The transect was predominantly cobble with lesser amounts of silt and rock.

Macrofauna:

Macrofaunal life was generally sparse within the transect. Common occurrences of Northern rock barnacles were noted in four segments. Occasional and uncommon observances of unidentified fish species were also noted in four segments and periwinkles in two segments. Uncommon observances of green crab and a single unidentified flatfish were noted. There was one observation of an abundant occurrence of a fish species, presumed to be Northern pipefish. Shell hash was noted throughout the transect.

Macroflora:

Macrofloral life was noted throughout the entire transect. The algal community was sparse over the first 70 m of the transect with cover ranging between 10 and 25%. Species noted included sea colander (*Agarum clathratum*), bladderwrack, sugar kelp, encrusting algae, and epiphytic brown algae. Algal coverage increased in the intertidal zone that marked the last ten metres of the transect. This portion saw 50-90% cover of bladderwrack and rockweed. Eelgrass was noted throughout the transect. Between the start and the 45 mark the cover ranged between 5 and 10%. Between the 45 and 60 m mark the cover of eelgrass increases to 50-70%. No eelgrass was noted in the last ten metres.

4.0 FISH HABITAT

Construction Area:

Habitat within the footprint of the proposed construction area was assessed by T1 and portions of T2, TT1, TT2, TT3, and TT4. In general, habitat west of TT4 would be considered poor. The substrate was predominantly cobble with some silt and rock and a large amount of shell hash which offered little refuge or habitat for benthic invertebrates. Macroflora was sparse with cover rarely greater than 25%, except for small patches where eelgrass cover was as high as 40%. Macrofaunal species were uncommon and, aside from the Northern rock barnacle and occasional periwinkles, consisted of mobile species such as crabs, lobster, and fish.

Habitat east of TT4 was higher quality, likely due the proximity of transects near a tidal island and bar. Portions of T1, T2, and TT4 completed in this area show a higher cover of algal species and eelgrass. The eastern ends of T1 and T2, which ran through the intertidal zone and over the bar, had algal cover of 60-100% with large canopies from the presence of bladderwrack and rockweed. Portions of T2 and TT4 had eelgrass cover ranging between 40-90%. Schools of fish were seen throughout these eelgrass beds. The fish could not be positively identified but are believed to be young of the year Northern pipefish. While unidentified fish were occasionally noted in other areas of the transects, they were not Northern pipefish. This area of the construction footprint was also

comprised of larger rocks and boulders which offered a higher degree of refuge for various species.

Capital Dredging Area:

Habitat within the footprint of the proposed capital dredging area was assessed by a large portion of T2 and TT2 and a smaller portion of TT3. The substrate was predominantly cobble with some silt and rock and a large amount of shell hash which offered little refuge or habitat for benthic invertebrates. Macroflora was sparse with cover rarely greater than 25%, except for small patches where eelgrass cover was as high as 45%. Macrofaunal species were uncommon and, outside of the Northern rock barnacle and occasional periwinkles, consisted of mobile species such as crabs, lobster and fish.

Maintenance Dredging Area:

Habitat within the footprint of the proposed maintenance dredging area was assessed by T3 and a small portion of TT2. Both transects show robust eelgrass beds with cover ranging between 35 and 90%. These beds were observed west of the end of the wharf. As described above, the Northern portions of TT2 in the capital dredging area had much poorer quality habitat. As T3 progressed to the east and to the 'inside' of the harbour, the habitat degraded. In the eastern 70% of T3, the substrate was comprised of silt with few macrofaunal species and eelgrass patches that had a cover of 5%. A cover of macrofloral debris served as further evidence of the depositional nature of the area. In general, the area inside the harbour would be considered poor habitat.

5.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

The diving crew was directed by an onsite Amec Foster Wheeler Biologist (Mr. Jessica McPhee, B.Sc.) who is experienced in data collection for environmental assessment project components. Ms. McPhee was responsible for the data collection and overall data quality as well as for ensuring that all standard operating procedures were followed and that adequate health and safety measures were taken.

6.0 SUMMARY

Characterization of the substrate and benthic communities along seven transects within the footprint of construction and dredge areas at the New Mills DFO-SCH in New Mills, NB was completed using a combination of visual field observations and underwater video survey techniques.

Much of T1, T2, TT1, TT2, TT3, TT4, and half of T3 was predominantly cobble with lesser amounts of rock and silt. The eastern half of T3 was silty and the eastern ends of T1 and T2 were predominantly rock and boulder.

Macrofaunal life was generally sparse with a total of 9 species observed and mainly with an uncommon occurrence. The predominant species observed was Northern rock barnacle which was noted as common through much of all seven transects. The green crab was uncommonly observed through all seven transects. Less commonly observed species included periwinkle,

rock crab, Atlantic lobster, and waved whelk. One species of fish, Atlantic silverside, was positively identified. Other unidentified fish were noted through the transects. Of note, in dense patches of eelgrass one fish was noted consistently and in large numbers. It could not be positively identified but is presumed to be young of the year Northern pipefish. An extensive amount of shell hash was noted in all seven transects.

Macrofloral life was observed along the majority of all seven transects surveyed. Macrofloral cover was generally low with a negligible canopy in most areas. TT4 and the portions of T1 and T2 west of TT4 had a high cover and robust canopy of both seaweeds (rockweed and bladderwrack) and eelgrass. The southern end of TT2 and the western end of T3 had eelgrass cover ranging between 35 and 90%. Macrofloral debris was observed in all seven transects with coverage in some areas up to 90%.

Habitat within much of the construction area footprint would be considered poor to marginal. In general, the substrate offers little refuge and there is no macrofloral canopy or cover other than some moderate patches of eelgrass. The eastern ends of T1 and T2 and TT4, near the tidal island and bar did feature robust macrofloral canopies and boulder/rock habitat. This area offered quality habitat.

Habitat within the capital dredging area would be considered poor to marginal. In general, the substrate offers little refuge and there is no macrofloral canopy or cover beside moderate patches of eelgrass.

Habitat in the maintenance dredging area was variable. Fifteen to thirty metres west of the wharf the transects showed dense eelgrass beds with cover ranging 35 and 90% and would be considered quality habitat. From the end of the wharf eastward to the end of T3 the habitat degrades, with little flora or fauna and a silt substrate. This portion of the area would be considered to have poor habitat.

7.0 CLOSING

This Report has been prepared for the sole benefit of PWGSC and DFO. The Report may not be used by any other person or entity without the express written consent of Amec Foster Wheeler, PWGSC and DFO. Any use which a third party makes of this Report, or any reliance upon decisions made based upon it, is the responsibility of such third parties. With respect to third parties, Amec Foster Wheeler has no liability or responsibility for losses of any kind whatsoever, including direct or consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.


The Report is based on data and information collected during the Site Assessment activities conducted by Amec Foster Wheeler. It is based solely on the conditions of the Site encountered during field investigation conducted in September, 2015. Except as otherwise may be specified, Amec Foster Wheeler disclaims any obligation to update this Report for events taking place, or with respect to information that becomes available to Amec Foster Wheeler after the time during which Amec Foster Wheeler has conducted the assessment.

Amec Foster Wheeler makes no representation or warranty with respect to this Report other than the work was undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. Any information or facts provided by others and referred to or utilized in the preparation of this Report was assumed by Amec Foster Wheeler to be accurate. Conclusions presented in this Report should not be construed as legal advice. The Report cannot be used or applied under any circumstances to another location or situation or for any other purpose without further evaluation of the data and related limitations.

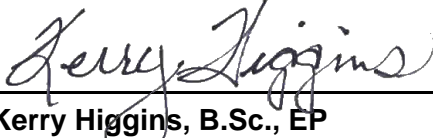
If any conditions become apparent that differ significantly from our understanding of conditions as presented in this Report, we request that we be notified immediately to reassess the conclusions provided herein. This Report was prepared by Amec Foster Wheeler Marine Biologist Bruce Moore, B.Sc. and reviewed by Kerry Higgins, B.Sc., EP. The Limitations of this document are provided in Appendix D.

Prepared by:

Reviewed by:



Bruce Moore, B.Sc.
Marine Biologist /
Intermediate Project Professional



Kerry Higgins, B.Sc., EP
Senior Project Professional



APPENDIX A
Transcript of Video and Onsite Observations

Table A.1 190 m Survey – Transect T1, 19 September, 2015

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
0-5 T1 Start (a)	0-5	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
5-10	5-10	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
10-15	10-15	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
15-20	15-20	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
20-25	20-25	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
25-30	25-30	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 2 individuals); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
30-35	30-35	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
35-40	35-40	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); American lobster (<i>Homarus americanus</i>) (U: 1 individual); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Unidentified fish species (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
40-45	40-45	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
45-50	45-50	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
50-55	50-55	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 3 individuals); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
55-60	55-60	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
60-65	60-65	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 3 individuals); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%)
65-70	65-70	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
70-75	70-75	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
75-80	75-80	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual)	Eelgrass (<i>Zostera marina</i>) (40%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
80-85	80-85	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (25%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
85-90	85-90	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (O: 15-20 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (40%); Bladderwrack (<i>Fucus vesiculosus</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
90-95	90-95	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (40%); Sugar kelp (<i>Laminaria saccharina</i>) (10%)
95-100	95-100	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (U: 1 individual); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
100-105	100-105	Cobble (55%); Silt (25%); Rock (20%)	Periwinkle (<i>Littorina</i> sp.) (U: 1 individual); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	No flora observed
105-110	105-110	Cobble (55%); Silt (25%); Rock (20%)	Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Atlantic silverside (<i>Menidia menidia</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (60%); Macrofloral debris (5%)
110-115	110-115	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 3 individuals)	Eelgrass (<i>Zostera marina</i>) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%)
115-120	115-120	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
120-125	120-125	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
125-130	125-130	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); American lobster (<i>Homarus americanus</i>) (U: 1 individual); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (35%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
130-135	130-135	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (25%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Sugar kelp (<i>Laminaria saccharina</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
135-140	135-140	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Macrofloral debris (5%)
140-145	140-145	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (15%); Macrofloral debris (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
145-150	145-150	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 2 individuals); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (15%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
150-155	150-155	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (15%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
155-160	155-160	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Waved whelk (<i>Buccinum undatum</i>) (U: 1 individual); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
160-165	160-165	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (15%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%); Macrofloral debris (5%)
165-170	165-170	Rock (45%); Boulder (20%); Cobble (15%); Silt (10%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (40%); Brown alga (<i>Ectocarpus</i> sp.) (20%); Sugar kelp (<i>Laminaria saccharina</i>) (20%); Brown alga (<i>Pilayella littoralis</i>) (15%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
170-175	170-175	Rock (60%); Boulder (25%); Gravel (15%)	Green crab (<i>Carcinus maenas</i>) (U: 4 individuals); Unidentified fish species (U: 1 individual); Shell hash	Brown alga (<i>Ectocarpus</i> sp.) (40%); Bladderwrack (<i>Fucus vesiculosus</i>) (20%); Brown alga (<i>Pilayella littoralis</i>) (15%); Green alga (<i>Spongomorpha</i> sp.) (5%); Sea lettuce (<i>Ulva lactuca</i>) (5%); Macrofloral debris (5%)
175-180	175-180	Rock (60%); Cobble (30%); Silt (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (O: 20-25 individuals); Green crab (<i>Carcinus maenas</i>) (U: 4 individuals); Seastar (<i>Asterias</i> sp.) (U: 1 individual); Unidentified fish species (U: 1 individual); Shell hash	Brown alga (<i>Ectocarpus</i> sp.) (40%); Sugar kelp (<i>Laminaria saccharina</i>) (10%); Brown alga (<i>Pilayella littoralis</i>) (10%); Macrofloral debris (10%); Rockweed (<i>Ascophyllum nodosum</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
180-185	180-185	Cobble (45%); Rock (40%); Silt (15%)	Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Green crab (<i>Carcinus maenas</i>) (U: 4 individuals)	Bladderwrack (<i>Fucus vesiculosus</i>) (20%); Macrofloral debris (20%); Sugar kelp (<i>Laminaria saccharina</i>) (15%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
185-190 T1 End (b)	185-190	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (U: 1 individual); Green crab (<i>Carcinus maenas</i>) (U: 1 individual)	Brown alga (<i>Ectocarpus</i> sp.) (10%); Macrofloral debris (10%); Eelgrass (<i>Zostera marina</i>) (5%); Sugar kelp (<i>Laminaria saccharina</i>) (15%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)

*A = Abundant, C = Common, O = Occasional, U = Uncommon (See below).
Anthropogenic debris was noted in the 180-185 m segment

Table A.2 230 m Survey – Transect T2, 19 September, 2015

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
0-5 T2 Start (a)	0-5	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 3 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
5-10	5-10	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
10-15	10-15	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (40%)
15-20	15-20	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
20-25	20-25	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
25-30	25-30	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
30-35	30-35	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Macrofloral debris (5%)

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
35-40	35-40	Cobble (55%); Silt (25%); Rock (20%)	Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
40-45	40-45	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Brown alga (<i>Ectocarpus</i> sp.) (5%)
45-50	45-50	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 2 individuals); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Brown alga (<i>Ectocarpus</i> sp.) (5%)
50-55	50-55	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 5 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Brown alga (<i>Ectocarpus</i> sp.) (5%)
55-60	55-60	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
60-65	60-65	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
65-70	65-70	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
70-75	70-75	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 3 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
75-80	75-80	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 3 individuals); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
80-85	80-85	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
85-90	85-90	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Brown alga (<i>Ectocarpus</i> sp.) (5%)
90-95	90-95	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (45%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
95-100	95-100	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
100-105	100-105	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 1 individual); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
105-110	105-110	Cobble (55%); Silt (20%); Rock (15%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 2 individuals); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (10%)
110-115	110-115	Cobble (55%); Silt (20%); Rock (15%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%)

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
115-120	115-120	Cobble (55%); Silt (20%); Rock (15%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (20%)
120-125	120-125	Cobble (50%); Silt (30%); Rock (10%); Gravel (10%)	Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%)
125-130	125-130	Cobble (50%); Silt (30%); Rock (10%); Gravel (10%)	Green crab (<i>Carcinus maenas</i>) (U: 1 individual)	Eelgrass (<i>Zostera marina</i>) (10%)
130-135	130-135	Cobble (50%); Silt (30%); Rock (10%); Gravel (10%)	Shell hash	Eelgrass (<i>Zostera marina</i>) (15%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Brown alga (<i>Ectocarpus</i> sp.) (5%)
135-140	135-140	Cobble (50%); Silt (30%); Rock (10%); Gravel (10%)	Shell hash	No flora observed
140-145	140-145	Cobble (50%); Silt (30%); Rock (10%); Gravel (10%)	Unidentified fish species (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (70%); Macrofloral debris (5%)
145-150	145-150	Cobble (50%); Silt (30%); Rock (10%); Gravel (10%)	Unidentified fish species (C); Seastar (<i>Asterias</i> sp.) (U: 2 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (75%)
150-155	150-155	Cobble (50%); Silt (30%); Rock (10%); Gravel (10%)	Unidentified fish species (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (90%)
155-160	155-160	Cobble (50%); Silt (30%); Rock (10%); Gravel (10%)	Periwinkle (<i>Littorina</i> sp.) (U: 5 individuals); Unidentified fish species (U: 2 individuals)	Eelgrass (<i>Zostera marina</i>) (40%); Bladderwrack (<i>Fucus vesiculosus</i>) (10%)
160-165	160-165	Cobble (50%); Silt (30%); Rock (10%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (70%); Bladderwrack (<i>Fucus vesiculosus</i>) (15%)
165-170	165-170	Cobble (50%); Silt (30%); Gravel (10%); Rock (5%); Boulder (5%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (70%); Brown alga (<i>Ectocarpus</i> sp.) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%)
170-175	170-175	Cobble (50%); Silt (30%); Gravel (10%); Rock (5%); Boulder (5%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (40%); Eelgrass (<i>Zostera marina</i>) (30%); Rockweed (<i>Ascophyllum nodosum</i>) (10%); Brown alga (<i>Pilayella littoralis</i>) (5%); Macrofloral debris (5%)
175-180	175-180	Boulder (60%); Cobble (25%); Gravel (15%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 4 individuals)	Bladderwrack (<i>Fucus vesiculosus</i>) (80%); Eelgrass (<i>Zostera marina</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%)
180-185	180-185	Boulder (60%); Cobble (25%); Gravel (15%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (85%); Brown alga (<i>Pilayella littoralis</i>) (5%)
185-190	185-190	Boulder (70%); Rock (15%); Gravel (10%); Cobble (5%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (40%); Rockweed (<i>Ascophyllum nodosum</i>) (10%); Brown alga (<i>Pilayella littoralis</i>) (5%)
190-195	190-195	Boulder (70%); Rock (15%); Gravel (10%); Cobble (5%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (50%); Rockweed (<i>Ascophyllum nodosum</i>) (35%)
195-200	195-200	Boulder (70%); Rock (15%); Gravel (10%); Cobble (5%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (50%); Rockweed (<i>Ascophyllum nodosum</i>) (35%)
200-205	200-205	Cobble (65%); Rock (20%); Gravel (15%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (40%); Rockweed (<i>Ascophyllum nodosum</i>) (30%)
205-210	205-210	Cobble (65%); Rock (20%); Gravel (15%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (25%); Rockweed (<i>Ascophyllum nodosum</i>) (15%)
210-215	210-215	Rock (55%); Cobble (30%); Gravel (15%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (15%); Rockweed (<i>Ascophyllum nodosum</i>) (10%)
215-220	215-220	Rock (55%); Cobble (30%); Gravel (15%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (20%); Rockweed (<i>Ascophyllum nodosum</i>) (5%)

220-225	220-225	Rock (55%); Cobble (30%); Gravel (15%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (50%); Rockweed (<i>Ascophyllum nodosum</i>) (10%)
225-230	225-230	Rock (55%); Cobble (30%); Gravel (15%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (60%); Rockweed (<i>Ascophyllum nodosum</i>) (40%)
T2 End (b)				

*A = Abundant, C = Common, O = Occasional, U = Uncommon (See below).

Anthropogenic debris was noted in the 50-55 m; 75-80 m; and 145-150 m segments

Table A.3 105 m Survey – Transect T3, 19 September, 2015

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
0-5 T3 Start (a)	0-5	Cobble (55%); Silt (20%); Rock (15%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (65%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
5-10	5-10	Cobble (55%); Silt (20%); Rock (15%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (60%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
10-15	10-15	Cobble (55%); Silt (20%); Rock (15%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (35%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
15-20	15-20	Cobble (55%); Silt (20%); Rock (15%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (O: 5-10 individuals); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (25%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
20-25	20-25	Silt (45%); Cobble (35%); Gravel (15%); Rock (5%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 3 individuals); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (25%); Brown alga (<i>Ectocarpus</i> sp.) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
25-30	25-30	Silt (70%); Cobble (15%); Gravel (10%); Rock (5%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Macrofloral debris (10%); Eelgrass (<i>Zostera marina</i>) (5%)
30-35	30-35	Silt (95%); Rock (5%)	Shell hash	Macrofloral debris (80%); Eelgrass (<i>Zostera marina</i>) (5%)
35-40	35-40	Silt (100%)	No fauna observed	Macrofloral debris (80%)
40-45	40-45	Silt (100%)	Seastar (<i>Asterias</i> sp.) (U: 1 individual)	Macrofloral debris (80%)
45-50	45-50	Silt (100%)	No fauna observed	Macrofloral debris (10%); Eelgrass (<i>Zostera marina</i>) (5%)
50-55	50-55	Silt (100%)	No fauna observed	Macrofloral debris (10%)
55-60	55-60	Silt (100%)	Green crab (<i>Carcinus maenas</i>) (U: 3 individuals); Unidentified fish species (U: 1 individual)	Macrofloral debris (80%)
60-65	60-65	Silt (100%)	Green crab (<i>Carcinus maenas</i>) (U: 2 individuals)	Macrofloral debris (80%)
65-70	65-70	Silt (100%)	No fauna observed	Macrofloral debris (40%)
70-75	70-75	Silt (100%)	No fauna observed	Macrofloral debris (15%); Eelgrass (<i>Zostera marina</i>) (5%)
75-80	75-80	Silt (100%)	No fauna observed	Macrofloral debris (30%)
80-85	80-85	Silt (100%)	Green crab (<i>Carcinus maenas</i>) (U: 1 individual)	Macrofloral debris (60%)
85-90	85-90	Silt (100%)	Unidentified fish species (U: 1 individual); Shell hash	Macrofloral debris (90%)
90-95	90-95	Silt (100%)	Limited visibility	Limited visibility
95-100	95-100	Silt (100%)	Limited visibility; Shell hash	Limited visibility
100-105 T3 End (b)	100-105	Silt (100%)	No fauna observed	Macrofloral debris (60%)

*A = Abundant, C = Common, O = Occasional, U = Uncommon (See below).

Anthropogenic debris was noted in the 30-35 m segment

Table A.4 70 m Survey – Transect TT1, 19 September, 2015

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
0-5 TT1 Start (a)	0-5	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
5-10	5-10	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
10-15	10-15	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
15-20	15-20	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
20-25	20-25	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
25-30	25-30	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Rockweed (<i>Ascophyllum nodosum</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%)
30-35	30-35	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Rockweed (<i>Ascophyllum nodosum</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%)
35-40	35-40	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
40-45	40-45	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Rockweed (<i>Ascophyllum nodosum</i>) (5%)
45-50	45-50	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
50-55	50-55	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Unidentified fish species (U: 1 individual)	Eelgrass (<i>Zostera marina</i>) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
55-60	55-60	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
60-65	60-65	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 3 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
65-70 TT1 End (b)	65-70	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)

*A = Abundant, C = Common, O = Occasional, U = Uncommon (See below).

Anthropogenic debris was noted in the 20-25 m, 60-65 m, and 65-70 m segments

Table A.5 140 m Survey – Transect TT2, 19 September, 2015

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
0-5 TT2 Start (a)	0-5	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Green crab (<i>Carcinus maenas</i>) (U: 3 individuals); American lobster (<i>Homarus americanus</i>) (U: 1 individual); Unidentified fish species (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
5-10	5-10	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
10-15	10-15	Cobble (55%); Silt (25%); Rock (20%)	Periwinkle (<i>Littorina</i> sp.) (U: 4 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
15-20	15-20	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (30%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
20-25	20-25	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
25-30	25-30	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (20%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
30-35	30-35	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
35-40	35-40	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
40-45	40-45	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals)	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
45-50	45-50	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals)	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
50-55	50-55	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 4 individuals); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (25%)
55-60	55-60	Cobble (60%); Silt (30%); Rock (10%)	Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
60-65	60-65	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
65-70	65-70	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 1 individual); Rock crab (<i>Cancer irroratus</i>) (U: 1 individual)	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
70-75	70-75	Cobble (60%); Silt (30%); Rock (10%)	Periwinkle (<i>Littorina</i> sp.) (U: 1 individual)	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
75-80	75-80	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals)	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
80-85	80-85	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Rockweed (<i>Ascophyllum nodosum</i>) (5%)
85-90	85-90	Cobble (60%); Silt (30%); Rock (10%)	Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Green crab (<i>Carcinus maenas</i>) (U: 2 individuals)	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
90-95	90-95	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
95-100	95-100	Cobble (60%); Silt (30%); Rock (10%)	Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
100-105	100-105	Cobble (60%); Silt (30%); Rock (10%)	Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
105-110	105-110	Cobble (60%); Silt (30%); Rock (10%)	Shell hash	Eelgrass (<i>Zostera marina</i>) (15%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
110-115	110-115	Cobble (60%); Silt (30%); Rock (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Green crab (<i>Carcinus maenas</i>) (U: 2 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (35%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
115-120	115-120	Cobble (60%); Silt (30%); Rock (10%)	Unidentified fish species (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (85%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
120-125	120-125	Cobble (60%); Silt (30%); Rock (10%)	Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Unidentified flatfish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (65%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
125-130	125-130	Cobble (60%); Silt (30%); Rock (10%)	Unidentified fish species (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (70%); Macrofloral debris (5%)
130-135	130-135	Cobble (55%); Silt (25%); Rock (15%); Boulder (5%)	Unidentified fish species (C); Rock crab (<i>Cancer irroratus</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (85%)
135-140 TT2 End (b)	135-140	Cobble (55%); Silt (25%); Rock (15%); Boulder (5%)	Unidentified fish species (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (90%)

*A = Abundant, C = Common, O = Occasional, U = Uncommon (See below).

Anthropogenic debris was noted in the 55-60, 60-65, 65-70, and 70-75 segments

Table A.6 85 m Survey – Transect TT3, 19 September, 2015

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
0-5 TT3 Start (a)	0-5	Cobble (55%); Silt (25%); Rock (20%)	Shell hash	No flora observed
5-10	5-10	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 3 individuals); Unidentified fish species (U: 1 individual); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (5%)
10-15	10-15	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Macrofloral debris (35%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
15-20	15-20	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 2 individuals); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
20-25	20-25	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified flatfish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
25-30	25-30	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (15%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Rockweed (<i>Ascophyllum nodosum</i>) (5%)

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
30-35	30-35	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Macrofloral debris (5%)
35-40	35-40	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Green crab (<i>Carcinus maenas</i>) (U: 3 individuals); Periwinkle (<i>Littorina</i> sp.) (U: 2 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%)
40-45	40-45	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Unidentified fish species (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (55%)
45-50	45-50	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (C); Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (35%)
50-55	50-55	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (35%)
55-60	55-60	Cobble (55%); Silt (25%); Rock (20%)	Shell hash	Macrofloral debris (5%)
60-65	60-65	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Rockweed (<i>Ascophyllum nodosum</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%)
65-70	65-70	Cobble (55%); Silt (25%); Rock (20%)	Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
70-75	70-75	Cobble (55%); Silt (25%); Rock (20%)	Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (5%)
75-80	75-80	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (25%); Macrofloral debris (5%)
80-85 TT3 End (b)	80-85	Cobble (55%); Silt (25%); Rock (20%)	Shell hash	Eelgrass (<i>Zostera marina</i>) (30%); Macrofloral debris (5%)

*A = Abundant, C = Common, O = Occasional, U = Uncommon (See below).
Anthropogenic debris was noted in the 80-85 segment

Table A.7 70 m Survey – Transect TT4, 19 September, 2015

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
0-5 TT4 Start (a)	0-5	Cobble (55%); Silt (25%); Rock (20%)	Shell hash	Sea colander (<i>Agarum clathratum</i>) (10%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%)
5-10	5-10	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (U: 2 individuals); Green crab (<i>Carcinus maenas</i>) (U: 2 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Sea colander (<i>Agarum clathratum</i>) (5%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%)
10-15	10-15	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (U: 2 individuals); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Sea colander (<i>Agarum clathratum</i>) (5%)
15-20	15-20	Cobble (55%); Silt (25%); Rock (20%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (U: 5 individuals); Unidentified fish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%); Macrofloral debris (5%)
20-25	20-25	Cobble (55%); Silt (25%); Rock (20%)	Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Macrofloral debris (5%)
25-30	25-30	Cobble (55%); Silt (25%); Rock (20%)	Green crab (<i>Carcinus maenas</i>) (U: 1 individual); Shell hash	Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%); Macrofloral debris (5%)
30-35	30-35	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (O: 5-10 individuals); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Eelgrass (<i>Zostera marina</i>) (5%); Sugar kelp (<i>Laminaria saccharina</i>) (5%)
35-40	35-40	Cobble (55%); Silt (25%); Rock (20%)	Unidentified flatfish species (U: 1 individual); Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)

Transect Distance (m)	Transect Tag Numbers	Substrate (Estimated % Coverage)	Macrofaunal Life Observed (Estimated Abundances*)	Macrofloral Life Observed (Estimated % Coverage)
40-45	40-45	Cobble (55%); Silt (25%); Rock (20%)	Shell hash	Eelgrass (<i>Zostera marina</i>) (10%); Bladderwrack (<i>Fucus vesiculosus</i>) (5%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%); Brown alga (<i>Pilayella littoralis</i>) (5%)
45-50	45-50	Cobble (55%); Silt (25%); Rock (20%)	Unidentified fish species (A); Shell hash	Eelgrass (<i>Zostera marina</i>) (70%); Bladderwrack (<i>Fucus vesiculosus</i>) (15%); Encrusting algae (<i>Leptophyllum</i> sp.) (5%)
50-55	50-55	Cobble (55%); Silt (25%); Rock (20%)	Shell hash	Eelgrass (<i>Zostera marina</i>) (60%); Bladderwrack (<i>Fucus vesiculosus</i>) (15%)
55-60	55-60	Boulder (60%); Cobble (25%); Gravel (15%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Shell hash	Eelgrass (<i>Zostera marina</i>) (50%); Bladderwrack (<i>Fucus vesiculosus</i>) (25%)
60-65	60-65	Boulder (70%); Cobble (20%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C); Periwinkle (<i>Littorina</i> sp.) (O: 5-10 individuals); Shell hash	Bladderwrack (<i>Fucus vesiculosus</i>) (85%); Rockweed (<i>Ascophyllum nodosum</i>) (5%)
65-70 TT4 End (b)	65-70	Boulder (70%); Cobble (20%); Gravel (10%)	Northern rock barnacle (<i>Semibalanus balanoides</i>) (C)	Bladderwrack (<i>Fucus vesiculosus</i>) (25%); Rockweed (<i>Ascophyllum nodosum</i>) (25%)

*A = Abundant, C = Common, O = Occasional, U = Uncommon (See below).

Anthropogenic debris was noted in the 80-85 segment

A = Abundant

Numerous (not quantifiable) observations made throughout the entire 5 m segment.

C = Common

Numerous (not quantifiable) observations made intermittently along the 5 m segment.

O = Occasional

Quantifiable observations made intermittently along the 5 m segment.

U = Uncommon

Quantifiable observations made infrequently along the 5 m segment.



APPENDIX B
Annotated Species List

Table B1 Annotated Species List

Classification	Common Name	Scientific Name
Macrofauna		
Crustacea	Northern rock barnacle	<i>Semibalanus balanoides</i>
	Green crab	<i>Carcinus maenas</i>
	Rock crab	<i>Cancer irroratus</i>
	American lobster	<i>Homarus americanus</i>
Mollusca	Periwinkle	<i>Littorina</i> sp.
	Waved whelk	<i>Buccinum undatum</i>
Enchinodermata	Seastar	<i>Asterias</i> sp.
Chordata	Atlantic silverside	<i>Menidia menidia</i>
Miscellaneous	Unidentified Fish	-----
Macroflora		
Angiosperm	Eelgrass	<i>Zostera marina</i>
Chlorophyta	Green alga	<i>Spongomorpha</i> sp.
	Sea lettuce	<i>Ulva lactuca</i>
Rhodophyta	Encrusting algae	<i>Leptophyllum</i> sp.
Phaeophyta	Bladderwrack	<i>Fucus vesiculosus</i>
	Rockweed	<i>Ascophyllum nodosum</i>
	Sugar kelp	<i>Laminaria saccharina</i>
	Sea colander	<i>Agarum clathratum</i>
	Brown alga	<i>Ectocarpus</i> sp.
	Brown alga	<i>Pilayella littoralis</i>



APPENDIX C
Photo Log

General Site Photos



Looking northeast from wharf toward outcropping



Cobble bar on tidal island

General Site Photos



Intertidal zone on rock outcropping



Intertidal zone on tidal island



APPENDIX D

Limitations

LIMITATIONS

1. The work performed in the preparation of this report and the conclusions presented are subject to the following:
 1. The Standard Terms and Conditions which form a part of our Professional Services Contract.
 2. The Scope of Services.
 3. Time and Budgetary limitations as described in our Contract.
 4. The Limitations stated herein.
2. The report has been prepared in accordance with generally accepted environmental study practices. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
3. The objective of this report was solely to characterize the seabed footprint of the proposed Project area.
4. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or the part, or any reliance thereon or decisions made based on any information or conclusions in the report is the sole responsibility of such third party. Amec Foster Wheeler accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.