

Working Draft

Marine Foreshore Environmental Assessment Procedure

1.0 INTRODUCTION

Shellfish aquaculture projects have the potential to effect fish¹ and fish habitat². Fisheries and Oceans Canada (DFO) is responsible for the protection and management of fish habitat under the authority of the Fisheries Act and may request plans, specifications and environmental assessments specific to such projects where more detailed information is required. Presented below are standardized, transect-based assessment procedures intended to provide DFO with the basic information required to determine the potential effects of proposed developments on fish habitat.

2.0 METHODS

2.1 Assessment Area

The assessment area should include the proposed tenure area, as well as the adjacent foreshore, for comparative purposes. This will provide a context for the project and may provide data about cumulative effects, if similar developments already occur on or adjacent to the site. A large scale site plan, preferably an enlargement of the hydrographic chart, with a small scale insert of the general geographic location will serve as a base map of the study area.

2.2 Transects

Transects should be established perpendicular to the shoreline at regular intervals, in order to assess a representative sample of the fish habitats across the site. The number of transects will vary depending on the size of the proposed tenure and the variability of fish habitats sustained by the site. Transects should begin at the HHWM (highest high water mark) and extend to the -20m depth at a minimum (-30m, if development has the potential to effect deeper benthic habitats). Intertidal projects will only require intertidal transects, but care must be taken to ensure that a representative sample across the proposed development area is collected (intertidal clam or benthic invertebrate sampling may be recommended; sampling manuals for these assessments are available from DFO). It is recommended that a reconnaissance swim or walk be undertaken prior to establishing transects in order to determine site variability.

To ensure that marine plants and animals in the photic zone will be assessed completely, deeper transects may be necessary. Deeper transects may also be required to determine distribution of sunken debris or woodwaste accumulations resulting from existing or former developments. Transect lengths will normally extend from the HHWM to a point extending approximately 25 m beyond the tenure boundary and spaced approximately 25 m apart. The number of transects required will depend on the nature of the proposed

¹ shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals;

² spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes;

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activity, the anticipated affects of the development and the local site conditions (tides and currents, habitat variability, geography, fetch, geology, etc.). Transects should be individually numbered and indicated on the site plan, with the commencement point of the transects referenced to benchmarks, where possible.

2.3 Habitat Observations

Habitat inventories should be conducted during more productive spring/summer periods when seaweeds and saltmarsh species are more readily identifiable. Habitat observations are to be recorded every 5 m along the transect or at significant changes in habitat type. Observations should include substrate type and composition, marine plants, sessile and motile marine animals and other features (i.e. debris). The information should be compiled in tabular form, by transect. Common names of observed animals and plants are acceptable for the data table, however, a species list with scientific names should be included as an appendix to the report. Observations of substrate type, presence and relative abundance of marine animals and plants and other features should be correlated with tidal height or water depth and their position along the transect.

2.3.1 Substrate

Substrate type and relative composition are recorded along the transect. Substrate types are to be subdivided into the following size class categories:

- Bedrock
- Boulder (>256 mm diameter)
- Cobble (64-256 mm diameter)
- Gravel (2-64 mm diameter)
- Sand (0.0625-2 mm diameter)
- Silt/Mud/Clay (<0.0625 mm diameter)

Substrate types are cumulative and recorded as percentages out of a total of 100.

E.g. Boulder 5%; Cobble 15%; Gravel 60%, Sand 20%

2.3.2 Marine Plants

Marine plants include rooted vascular vegetation (eelgrass, saltmarsh vegetation) and marine algae (seaweed/kelp). Marine plant observations are recorded as percent areal coverage estimates per 5m x 1m transect segment. Observations can be recorded as percentages (5%, 10%, 15% etc.) or by utilizing the following areal coverage classes:

- + <5%
- 1 5-25%
- 2 >25-50%
- 3 >50-75%

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4 >75-100%

2.3.3 Sessile Animals

Many marine animals become permanently attached to substrates as part of their life history. These animals also function as habitats that are important to fish. Barnacles and mussels are examples of animals that function as fish habitat in the marine environment. Sessile animals are recorded as percent areal coverage along the transect line. Observations can be recorded as percentages (5%, 10%, 15% etc.) or by utilizing the areal coverage classes presented above.

2.3.4 Motile Animals

Motile animals include fish and marine invertebrates such as crabs and snails. These can be counted along the transect line, or, in cases where they are too numerous, estimates of their numbers can be recorded. Estimates will most likely be applied to species such as herring or mysid shrimp that occur in large numbers.

3.0 HABITAT MAPPING

General marine plant categories (i.e.: rockweed, eelgrass, bull kelp, saltmarsh etc) and any other notable features should be sketched to scale directly on a copy of the site plan, drawings or photographs of the site. A site profile should be prepared for each transect showing the slope of the foreshore, with the location of indicator marine plants or invertebrates marked directly on the profile. A sketch of proposed tenure works (long line locations, anchor locations, seed holding areas, areas with predator netting etc.) should be superimposed over the site plan, so that the effect of the project on fish habitat characteristics, is clear. Maps should be presented at no greater than 1:1000 scale for ease of interpretation.

Tidal Height/Water Depth

The lowest normal tide (0.0m), or chart datum, will be used as the reference point for the measurement of tidal height and water depth to accompany the assessment. Tidal height is recorded as positive relative to chart datum, while water depth below chart datum will be recorded as a negative value (i.e. if the assessment is made when the tide is at 2.0m, and a record is taken at a water depth of 8.0m, then the depth will be recorded as -6m). Tidal height will be corrected using the closest secondary port to the reference port found in the Canadian Tide and Current Tables, with further correction made for daylight savings time as required.

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4.0 VIDEO AND STILL PHOTOGRAPHY

Video and photographs provide a real-time record of the fish habitat characteristics of the site and can be used to assess future impacts based on site monitoring.

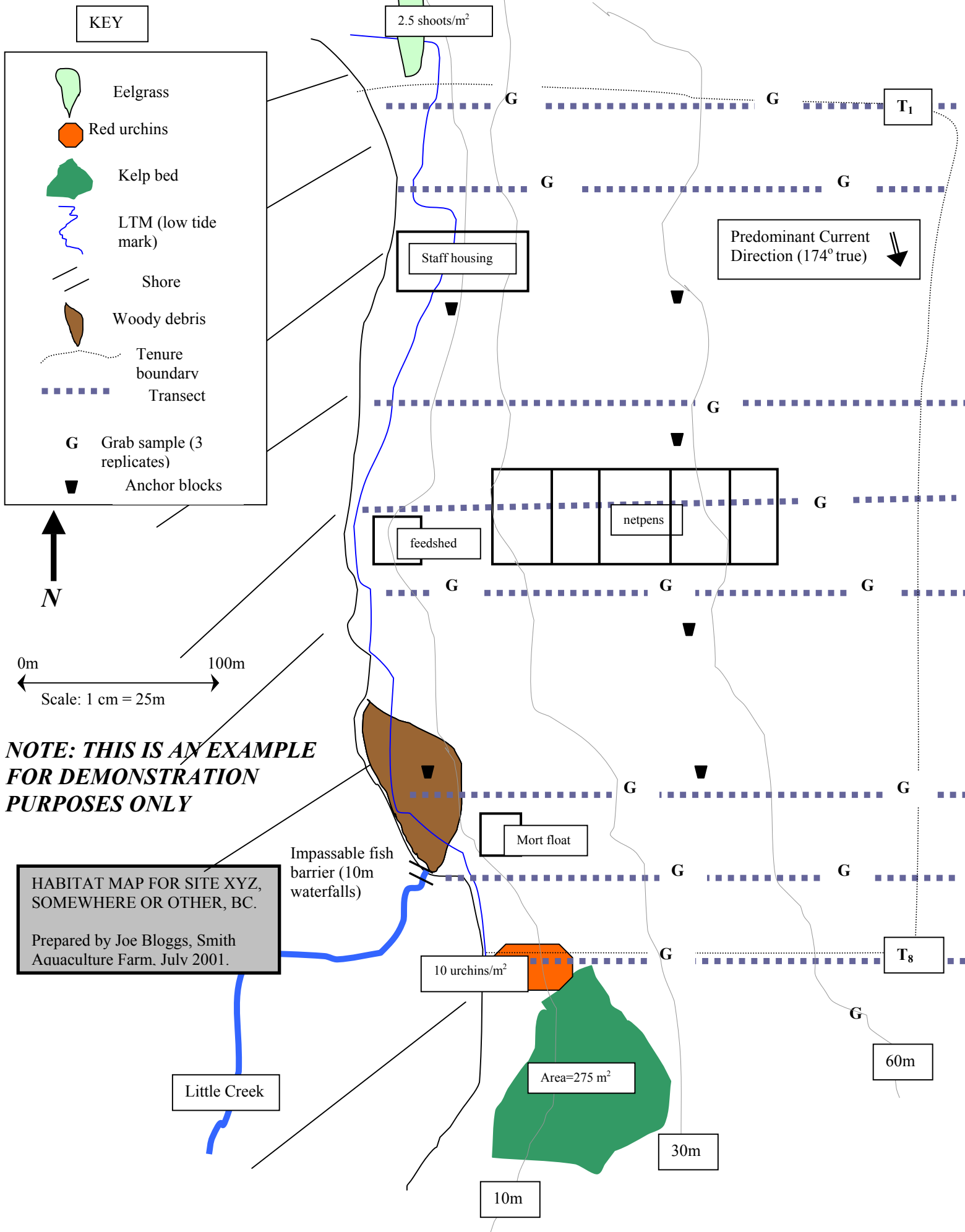
An unedited, labelled copy of video transects should be submitted with the report. The video footage should be referenced with additional information (time, date, depth, heading etc.) for later analysis. A written or recorded interpretation should accompany the video.

For best results, photographic records should be collected during the more productive spring/summer seasons. If timing is critical, interpretation of the results should include references to data collected during the most productive seasons in the year (i.e. although rockfish may not be observed in rocky reef habitats during the winter, they will likely be present during the spring and summer). Seaweeds and saltmarsh species are more readily identifiable during the spring and summer and a better impression of the productive capacity of the site can be made. Visibility may, however, be a problem, and appropriate tidal levels and midday lighting conditions are recommended.

Aerial photos are often useful as well, and these should preferably be taken at low tide. Such photographs will help the assessor to put the site into context with the surrounding area, and verify information provided from other sources.

5.0 SUMMARY OF INFORMATION TO BE SUBMITTED

1. Base map showing tenure area boundaries, surrounding area, transect locations and sampling stations.
2. Shoreline video/photographs of intertidal zone.
3. Underwater video/photographs of transects
4. Tabular data for each transect.
5. Habitat map showing location of different substrate types, plants, animals and operational infrastructure.
6. Profile diagrams of each transect showing slope, sediment types and the major marine plants or animals observed.
7. Photographs of site and aerial photographs if available.



CROSS-SECTION PROFILE OF TRANSECT T₂ : 50° 49' 48" N, 127°19'55" W.

