

COMMERCIAL IN CONFIDENCE

INTERNAL REPORT

SCALLOP DREDGE SURVEY WITHIN THE VICINITY OF THE PROPOSED BELL BAY PULP-MILL EFFLUENT PIPELINE DIFFUSER

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July 2007



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1. Preamble

In July 2007, the Tasmanian Aquaculture and Fisheries Institute (TAFI) was contracted by the Tasmanian Department of Primary Industry and Water (DPIW) to conduct a scallop dredge survey within the vicinity of the planned effluent outfall diffuser associated with the proposed Bell Bay pulp mill. The fishing vessel *Dell Richey II* was selected to conduct the survey on the 11th and 12th July 2007.

2. Objectives

- ♦ Identify the location of any productive scallop beds in the immediate impact zone (500 m radius) and/or within a wider 1000 m radius of the proposed pipeline diffuser.
- ♦ Identify the location of any productive scallop beds within the broader area surrounding the proposed pipeline diffuser.
- ♦ Detail the extent, density and population size structure of any scallop beds identified.

3. Methods

3.1 Proposed Diffuser Region

The 200 meter long diffuser, at the end of the outfall pipe, is proposed to be located north of Five Mile Bluff, between 41.00251°S 146.86123°E and 41.00433°S 146.86175°E (decimal degrees, WGS 84) (Figs. 1, 2 and 3). To search for scallop beds in the immediate vicinity of the diffuser its location was mapped in the GIS program ArcView 3.2 for Windows, and a series of east-west transects spaced 200m apart plotted within a 2000 m by 2000 m box (Fig. 3). This design ensured that the start and finish locations of each transect were a minimum 1000m from any point of the proposed diffuser, and would therefore cover the area of the immediate impact zone (500 m radius) and the wider area of the diffuser (1000 m radius)(Fig. 3).

The *Dell Richey II* first conducted an acoustic survey along the mapped transects using the vessel depth sounder, starting at the south-east corner, in order to identify fishable grounds and avoid reef and unfishable habitats (see Fig. 4). If an entire transect was deemed to contain unfishable habitat, then the next transect was skipped, and the following transect completed. Once all transects were examined acoustically, sample dredge tows were completed within those areas designated as fishable (see Fig. 5).

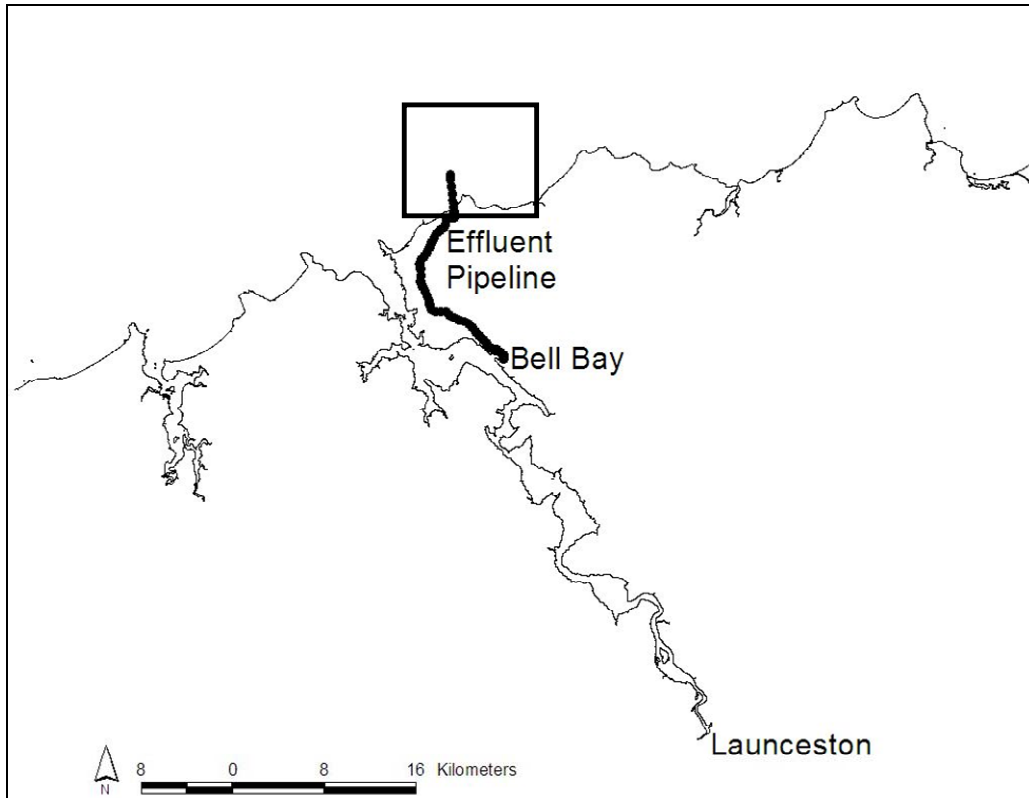


Fig. 1. General location of the effluent pipeline scallop survey study site (box). The solid black line shows the location of the proposed pulp mill effluent pipeline from Bell Bay to north of Five Mile Bluff.

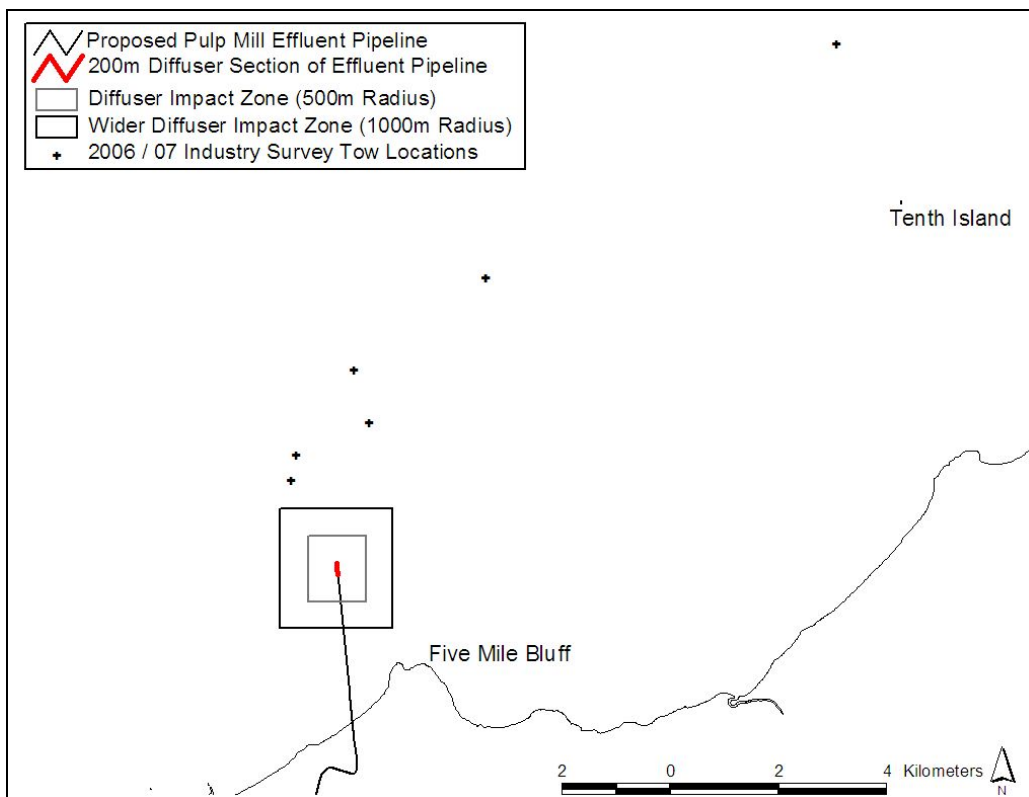


Fig. 2. Location of the proposed pulp mill effluent pipeline. The diffuser section of the pipeline (red) falls within the terminating portion of the pipe. The two boxes represent the impact zone (500m radius) and wider impact zone (1000m radius) around the diffuser. The location of previous industry survey tows conducted during 2006 and 2007 are also shown.

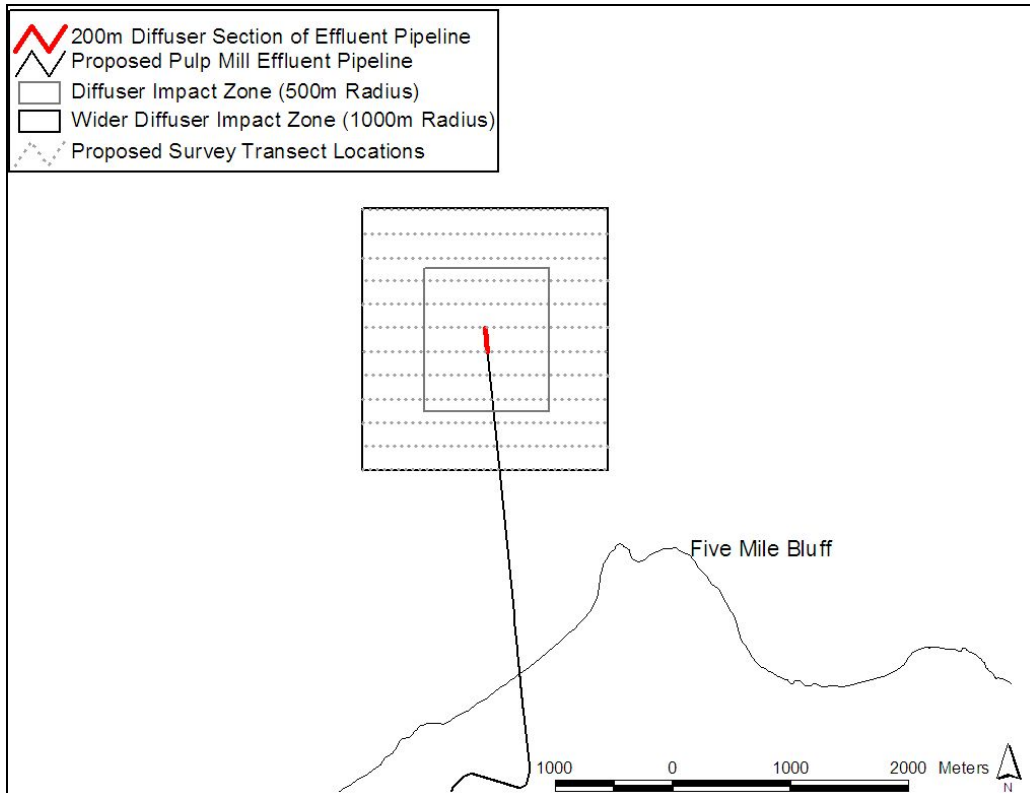


Fig. 3. Proposed transects (grey dotted lines) through the diffuser impact zone (500m radius) and wider diffuser impact zone (1000m radius).

3.2 Broader Region Surrounding the Proposed Diffuser

Locations of a limited number of sample dredge tows from industry surveys conducted in 2006 and 2007 (see Fig. 2), along with anecdotal information on the probable extent of suitable habitat, were used to define the broader survey area to the north/northeast of the proposed diffuser. The depth sounder of the survey vessel was used to identify fishable scallop habitat within this search region (see Fig. 5), and once such habitats were found, sample dredge tows were conducted (see Fig. 6). During the survey, it was noted that scallops tended to occur within the 34–40m depth range, and subsequently this depth range was predominately targeted when searching for fishable scallop habitat.

3.3 Dredge Sampling Procedure

A commercial scallop dredge with a width of 4.26m was used to conduct sample dredge tows. Sample tows were of 5 minutes duration, unless hard substrate was encountered and the sample tow aborted. Upon completion of each sample tow an estimate of the total catch in standard 30kg fish bins was made, and all scallops were sorted from the catch and counted. Approximately 100 randomly selected scallops, or the entire catch if less than 100 were caught, were measured using an electronic measuring and recording board.

3.4 Data Analysis

A GPS recording device was used to record the location of the survey vessel every 5 seconds, providing a detailed record of the track the vessel took throughout the survey. This device was also used to mark the locations of sample dredge tows. These locations were also recorded on a datasheet by the skipper of the survey vessel. The GPS track of the vessel was mapped using ArcView (see Figs. 4, 5, 8 and Appendix 1). Where the GPS signal was not collected (through poor satellite coverage) the track was extrapolated from the available recorded data. During a battery malfunction of the GPS device, the start / finish locations of the vessel movements were recorded manually.

The number of scallops caught within each 5 minute sample tow was used to display scallop density. Length frequency histograms of the scallop population structure for sample tows within the region north of the diffuser and the region near Tenth Island were constructed.

4. Results and Discussion

4.1 Proposed Diffuser Region

In total, 10 of the proposed 12 transects were conducted within the immediate region surrounding the proposed diffuser (Fig. 4). Two transects within the southern region were skipped because observations made during adjacent transects showed no fishable scallop habitat. The majority of the surveyed area within the immediate region surrounding the proposed diffuser was found to be unsuitable for scallops and/or dredging. There were three main categories of substrate observed using the depth sounder (Fig. 4):

- 1) Large hard (rocky) outcrops of up to 5 meters in height;
- 2) Low profile hard bottom (rocky)
- 3) Regions of softer substrates suitable for dredging.

Only three sample dredge tows could be conducted within the immediate region surrounding the proposed diffuser (Fig. 5, tows 1, 2 and 3), and no scallops were caught during these sample tows (Fig. 6 and Appendix 2). Furthermore, the habitat within both the immediate and wider impact zones was largely unsuitable for dredging/scallops. As such, it can be concluded that there are no productive scallop beds in the immediate impact zone (500 m radius) or wider impact zone (1000 m radius) of the proposed pipeline diffuser.

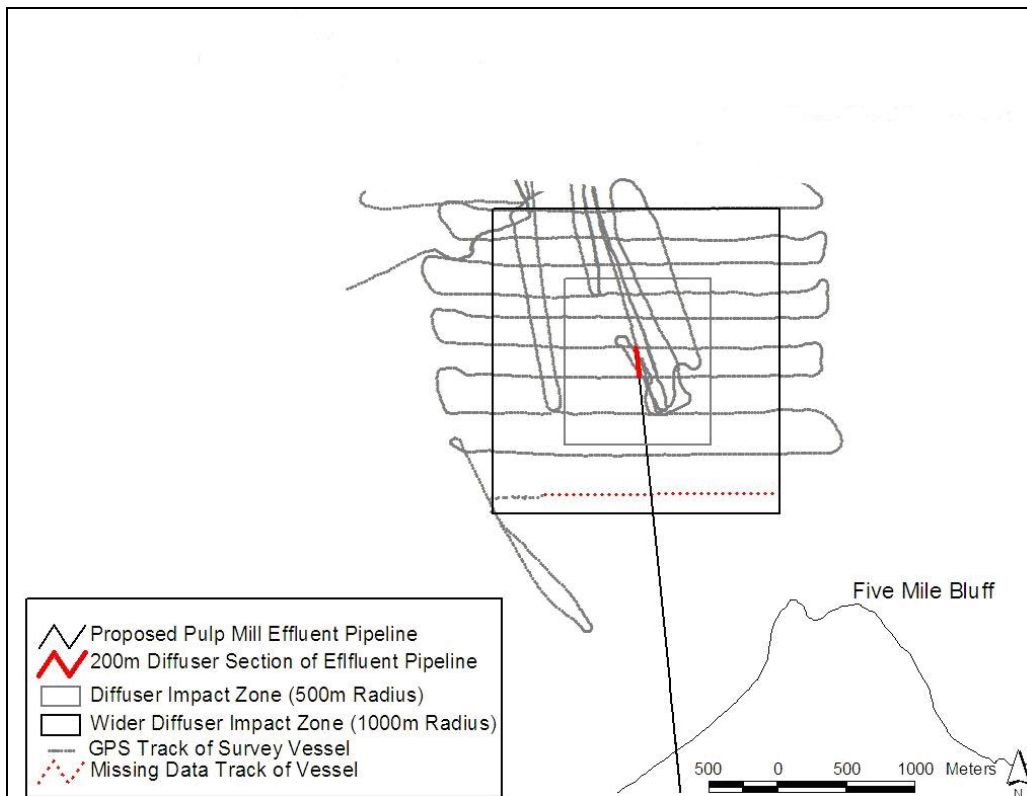


Fig. 4. Vessel survey track through the impact zone (500m radius) and wider impact zone (1000m radius) of the effluent pipeline diffuser. Tracks above the impact zones have been deleted (see Fig. 5). The missing GPS logger track was reconstructed using latitudes and longitudes recorded during the survey.

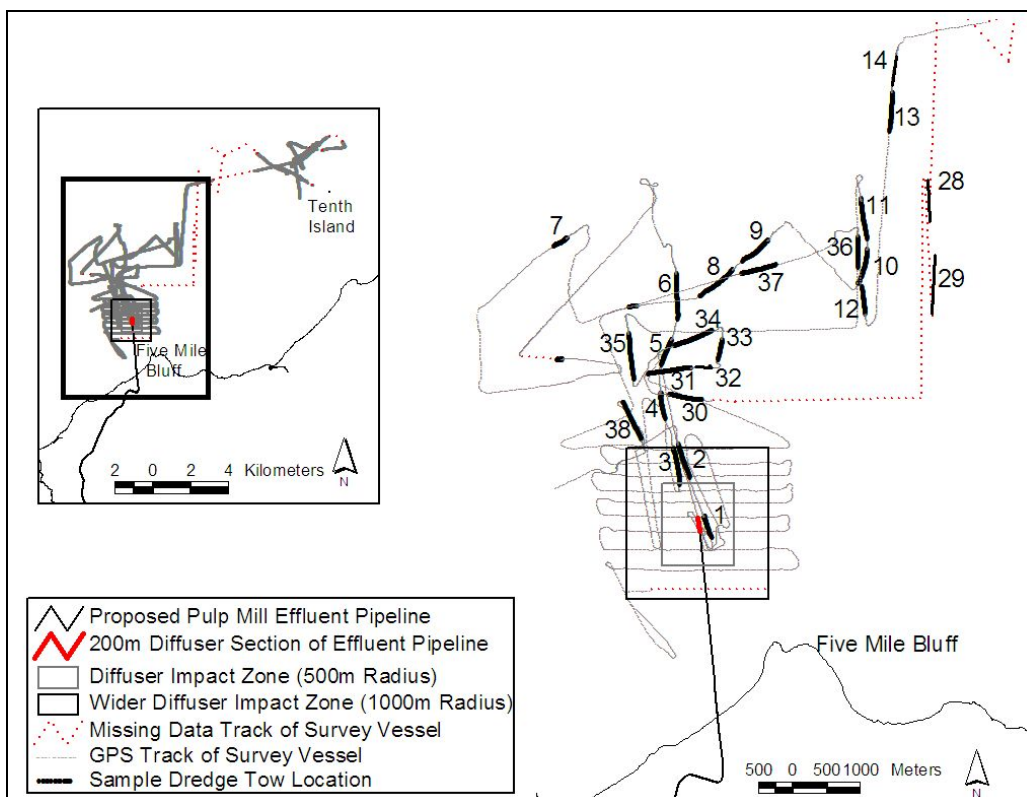


Fig. 5. Vessel survey track and location of dredge sample tows conducted within the impact zone, wider impact zone, and north of the wider impact zone. Numbers identify each sample dredge tow (see Appendix 2). The missing GPS logger track was reconstructed using latitudes and longitudes recorded during the survey.

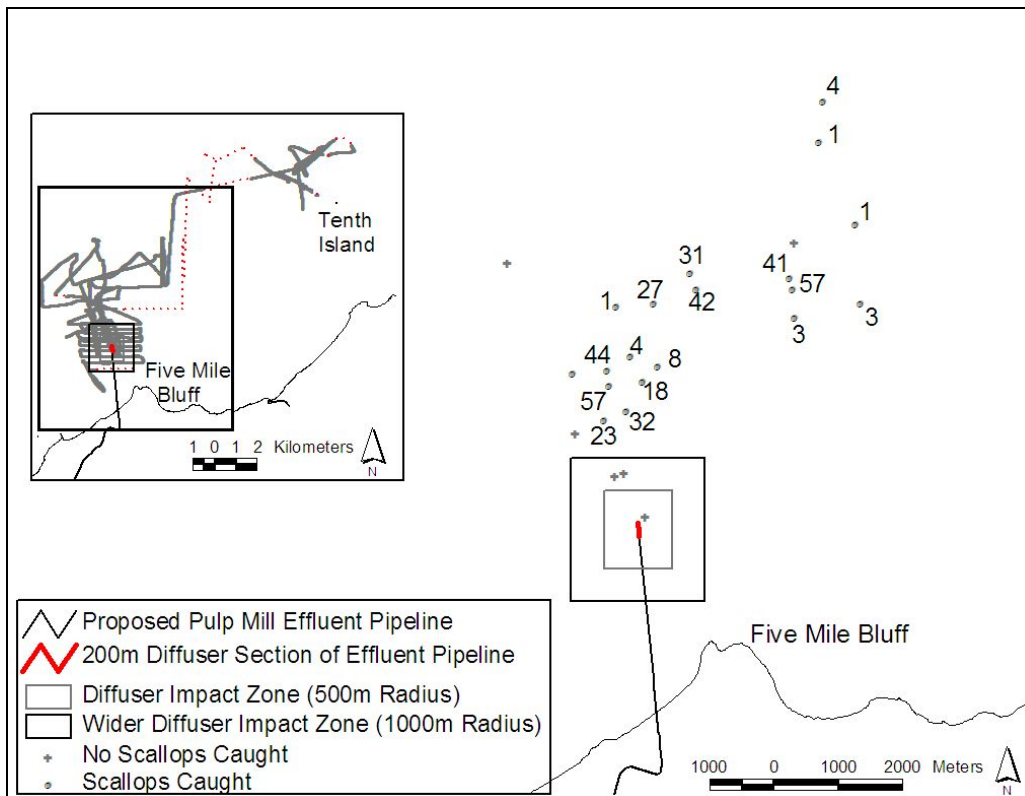


Fig. 6. Location of sample dredge tows within the impact zones and north of the wider impact zone. The numbers show the total scallops caught within each 5 minute tow. A cross indicates that no scallops were caught in that particular tow.

4.2 Broader Region Surrounding the Proposed Diffuser

A total of 22 sample tows were conducted within the region between 1.6km and 5.7km north of the proposed diffuser (Figs. 5, 6; Appendix 2). Low densities (<60 scallops/5 minute tow) of scallops were caught within these sample tows (Fig. 6; Appendix 2) over an area of approximately 3.5km x 1km. The majority (88%) of scallops caught within this region were smaller than the legal minimum size for commercial scallops (<90mm) (Fig. 7). A range of substrate types that were not suitable for scallops and/or dredging, were observed within this search region, on both the vessel sounder (Fig. 5) and within sample dredge tows (Appendix 2):

- 1) Large hard (rocky) outcrops of up to 5 meters in height.
- 2) Low profile hard bottom, characterised by flat rocks.
- 3) Regions covered with small hard rocks (15 – 20cm diameter).

Given the low densities of predominately undersize scallops observed within this area, this region could not currently be fished commercially, and as such could not be described as a productive scallop bed. Given the large areas of unsuitable scallop habitat, it is also unlikely that this area will, on its own, ever support a commercial scallop bed.

Higher abundances (between 116-753 scallop/5 minute tow) of scallops were located within a relatively small area (approximately 2km x 0.7km), 2km to the north/northwest of Tenth Island (Figs. 8 and 9) and approximately 12km from the proposed diffuser. The majority (79.5%) of scallops within this bed were undersize (Fig. 10), and as such could not currently be opened to commercial fishing. Once the discard rate (% undersize

scallops caught) is below 20%, this bed could potentially be fished commercially. However, given its relatively small size, fishing this bed would only be likely to contribute a small proportion of the annual 4,200 tonnes Tasmanian total allowable catch, unless more scallops are found within the vicinity (e.g. East of Tenth Island).

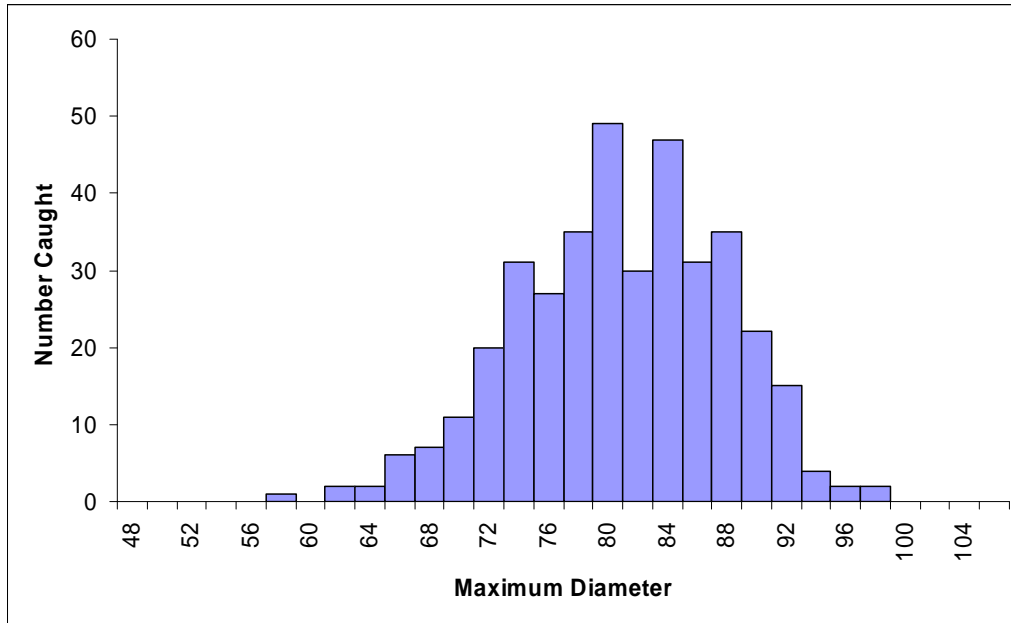


Fig. 7. Length Frequency histogram representing the population structure of scallops caught during those sample tows illustrated in Fig. 6.

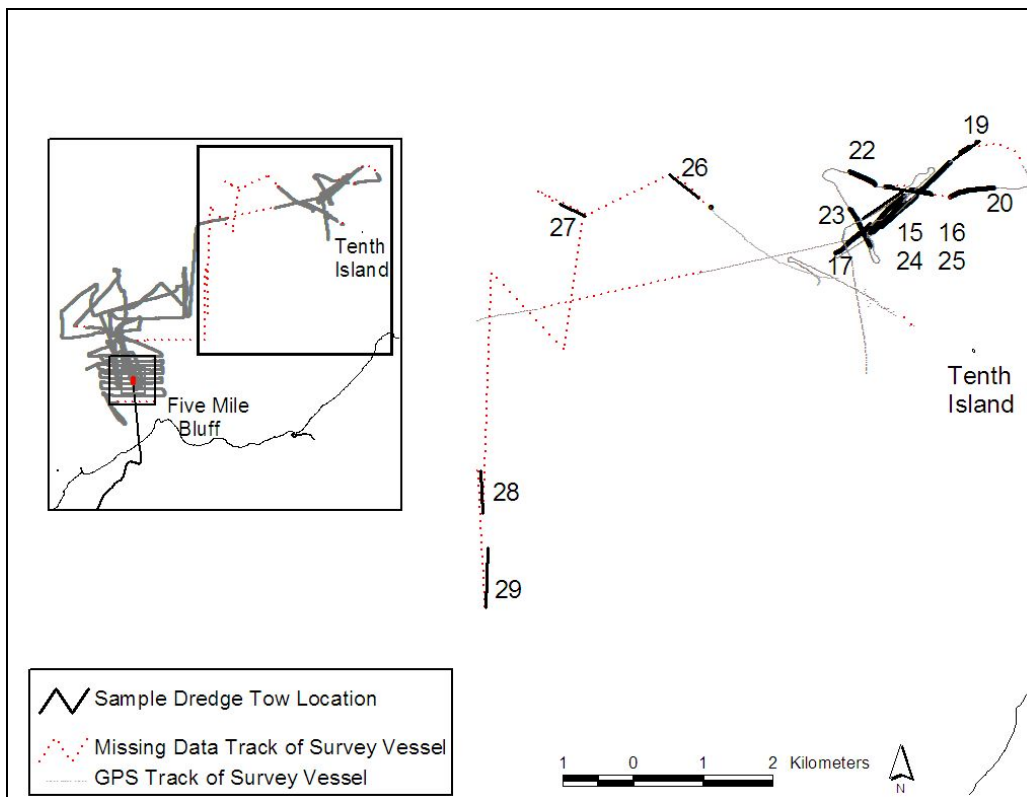


Fig. 8. Vessel survey track and location of survey tows conducted within the region near Tenth Island, northeast of the diffuser ‘impact zone’. The missing GPS logger track was reconstructed using latitudes and longitudes recorded during the survey. Numbers correspond to the relevant dredge tow (see Appendix 2).

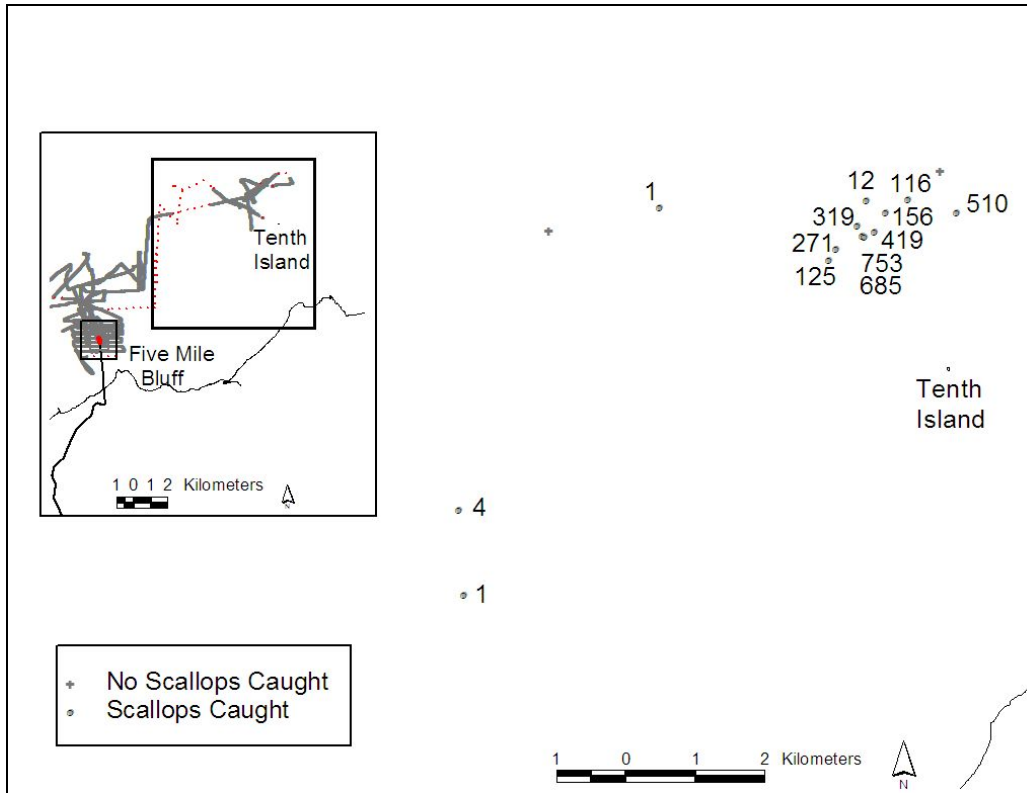


Fig. 9. Location of sample dredge tows within the survey region near Tenth Island, northeast of the diffuser 'impact zone'. The numbers show the total scallops caught within each 5 minute tow. A cross indicates that no scallops were caught in that particular tow.

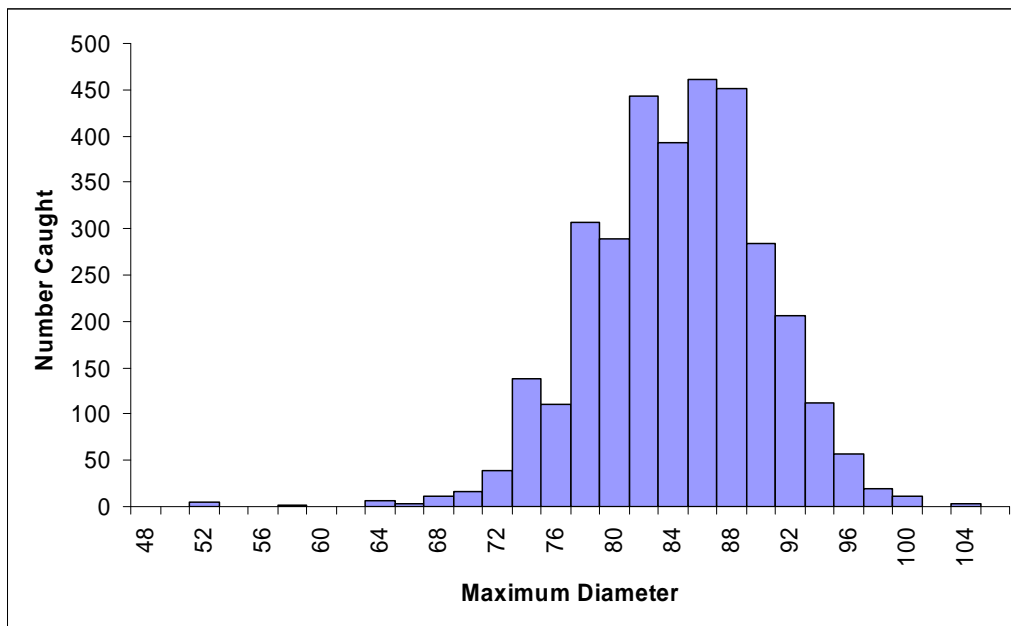
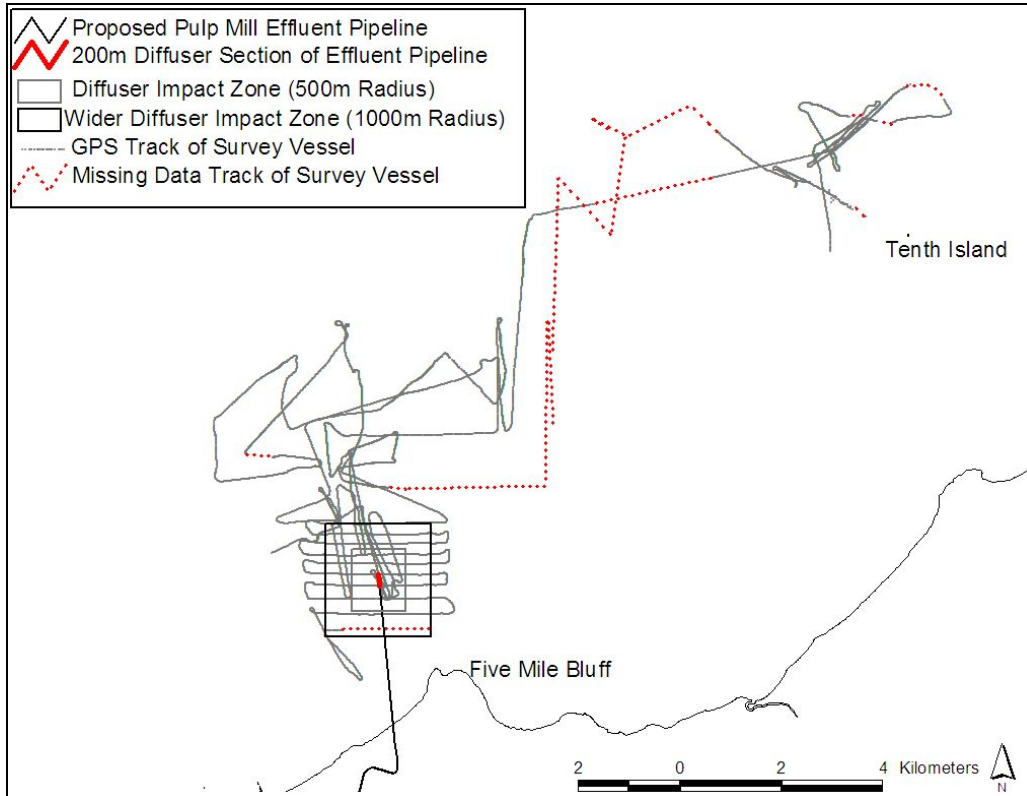


Fig. 10. Frequency histogram representing the scallop population structure of scallops caught during those sample dredge tows illustrated in Fig. 9.

5. Summary and Conclusions

- ♦ Very little suitable scallop habitat and no scallops were located within the impact zone (500 m radius) or within a 1000m radius from the proposed location of the effluent diffuser of the planned Bell Bay pulp mill pipeline.
- ♦ Low densities of predominately undersize scallops (88%) were found over an approximate 3.5 km² area directly north of the proposed diffuser.
- ♦ Higher densities of predominately undersize scallops (79.5%) were located in an approximate 1.4 km² bed near Tenth Island.
- ♦ Neither of the two areas of scallops could be fished currently due to high undersized discard rates but there is no reason to believe they would not grow to become legal sized.
- ♦ Only the scallop bed near Tenth Island could be considered commercially viable but it would not be expected to produce a large proportion of the annual total allowable catch.

6. Appendices



Appendix 1. Overview of the track taken by the survey vessel throughout the period of the survey. The grey line represents the track as recorded by the GPS logger, while the red line represents extrapolated and written GPS points of the vessel track.

Pipeline Diffuser Scallop Survey 2007

Appendix 2. Details of each survey dredge tow.

Date	Shot	Start Lat	Start Long	Finish Lat	Finish Long	Depth (m)	Duration (mins)	Catch (Bins)	Scallops (indiv.)	Scallops 5min tow	Comments
11-Jul-07	1	41.000	146.864	41.002	146.863	25	5	0	0	0	no catch
11-Jul-07	2	40.997	146.860	40.993	146.858	30	5	0	0	0	no catch
11-Jul-07	3	40.998	146.858	40.993	146.857	29	5	0	0	0	no catch
11-Jul-07	4	40.990	146.856	40.986	146.855	34	3	2	14	23	rock + very old shell
11-Jul-07	5	40.983	146.855	40.979	146.857	36	5	4	44	44	rock
11-Jul-07	6	40.975	146.858	40.969	146.857	38	5	16	1	1	rock + some sponge
11-Jul-07	7	40.967	146.835	40.965	146.840	50	3	0	0	0	no catch
11-Jul-07	8	40.973	146.862	40.970	146.867	38	5	2	27	27	old dead shell + rock
11-Jul-07	9	40.969	146.869	40.966	146.874	38	4	4	25	31	rock + shell
11-Jul-07	10	40.972	146.889	40.967	146.891	35	5	3	57	57	old dead shell
11-Jul-07	11	40.966	146.891	40.961	146.890	37	5	1	0	0	dead shell
11-Jul-07	12	40.972	146.890	40.975	146.891	34	4	5	2	3	majority rock
11-Jul-07	13	40.952	146.895	40.947	146.895	40	5	3	1	1	dead shell
11-Jul-07	14	40.945	146.896	40.941	146.896	41	4	6	3	4	dead shell + tunicates
11-Jul-07	15	40.928	146.968	40.923	146.974	38	5	5	685	685	dead/live scallop + sponge
11-Jul-07	16	40.923	146.976	40.927	146.970	37	5	4	419	419	dead + alive scallop
11-Jul-07	17	40.930	146.962	40.926	146.968	34	5	6	125	125	majority rock
11-Jul-07	18	40.922	146.976	40.918	146.981	41	5	4	116	116	dead shell
11-Jul-07	19	40.918	146.982	40.916	146.986	50	5	7	0	0	very old dead shell + grit
11-Jul-07	20	40.922	146.992	40.922	146.981	38	5	3	510	510	old dead shell
11-Jul-07	21	40.922	146.978	40.922	146.971	39	5	5	156	156	old dead shell
11-Jul-07	22	40.921	146.979	40.920	146.964	43	5	9	12	12	very old dead shell + grit
11-Jul-07	23	40.925	146.965	40.929	146.967	35	5	4	271	271	live and dead shell + rock
11-Jul-07	24	40.927	146.969	40.923	146.973	36	5	4	753	753	live and dead shell
11-Jul-07	25	40.922	146.973	40.925	146.966	36	5	3.5	319	319	dead and live shell
12-Jul-07	26	40.920	146.934	40.923	146.939	38	5	3	1	1	rocks
12-Jul-07	27	40.924	146.915	40.925	146.919	44	4	5	0	0	very old dead shell + grit
12-Jul-07	28	40.963	146.902	40.958	146.902	36	5	4	1	1	small rocks
12-Jul-07	29	40.975	146.902	40.968	146.903	34	5	14	3	3	small rocks
12-Jul-07	30	40.987	146.862	40.986	146.857	36	5	1	32	32	dead shell
12-Jul-07	31	40.983	146.852	40.983	146.860	36	5	2	57	57	rock + dead shell
12-Jul-07	32	40.982	146.861	40.983	146.864	36	2	0.75	7	18	dead shell
12-Jul-07	33	40.982	146.865	40.979	146.866	34	3	3	5	8	hard bottom
12-Jul-07	34	40.978	146.864	40.980	146.857	35	5	16	4	4	rock + sponge
12-Jul-07	35	40.984	146.850	40.978	146.849	35	5	12	13	13	rock
12-Jul-07	36	40.970	146.889	40.966	146.890	36	5	2.5	41	41	dead shell - some new
12-Jul-07	37	40.969	146.875	40.970	146.869	39	5	2.5	42	42	dead shell - some new
12-Jul-07	38	40.987	146.848	40.992	146.851		5	16		0	full of rock