

Monitoring Fact Sheet

KELP

Background

Port Otago Ltd need to modify the shipping channel to accommodate the next generation of container ships. The modification involves dredging the approaches to Port Chalmers and berth area and deepening of the channel. A few areas would also require widening. The material will be disposed of at the existing maintenance dredge disposal sites but most will be disposed of at a site about 6.5 km to the NE of Taiaroa Head

Kelp beds & species

Kelp beds are a taonga species, and are an important ecological habitat for a range of faunal species, providing food and habitat for a diversity of macroinvertebrate and fish species. The country's largest kelp species is *Macrocystis pyrifera* (bladder kelp). The coast from the Otago Peninsula to Cape Wanbrow probably contains the largest beds of *Macrocystis pyrifera* around the New Zealand mainland. It develops extensive surface canopies along this coastline but its extent is highly variable with time, depending on recent storm history and wave climate. Other species of kelp are present within the kelp beds and forests in the coastal Otago area.



What is the issue?

Increased levels of suspended sediments as a result of dredging can reduce light reaching kelp beds, affecting photosynthesis and subsequently growth and survival. This can result in reduced biomass, which has flow-on effects to herbivorous invertebrates and fish. Increased sedimentation can also directly smother beds, resulting in reduced growth and production. These impacts are more likely to affect juvenile kelp than adults, as the development and settlement of spore may be sensitive to sedimentation, depending on the timing and sediment load.

Recruitment processes are important in determining the distribution and abundance of these communities. Although seasonal patterns of growth are not considered important the kelp *Macrocystis pyrifera* has a "recruitment window" when light and temperature requirements are met and allow the establishment of sporophytes. Based on modelling, the coastal area on the outside of Otago Peninsula and north would receive negligible amounts of sediment on occasions (<0.1 mg/l SSC in surface waters, <0.5 mm over dredging period). These levels are well below thresholds that would be likely to impact on biota.



What has been done?

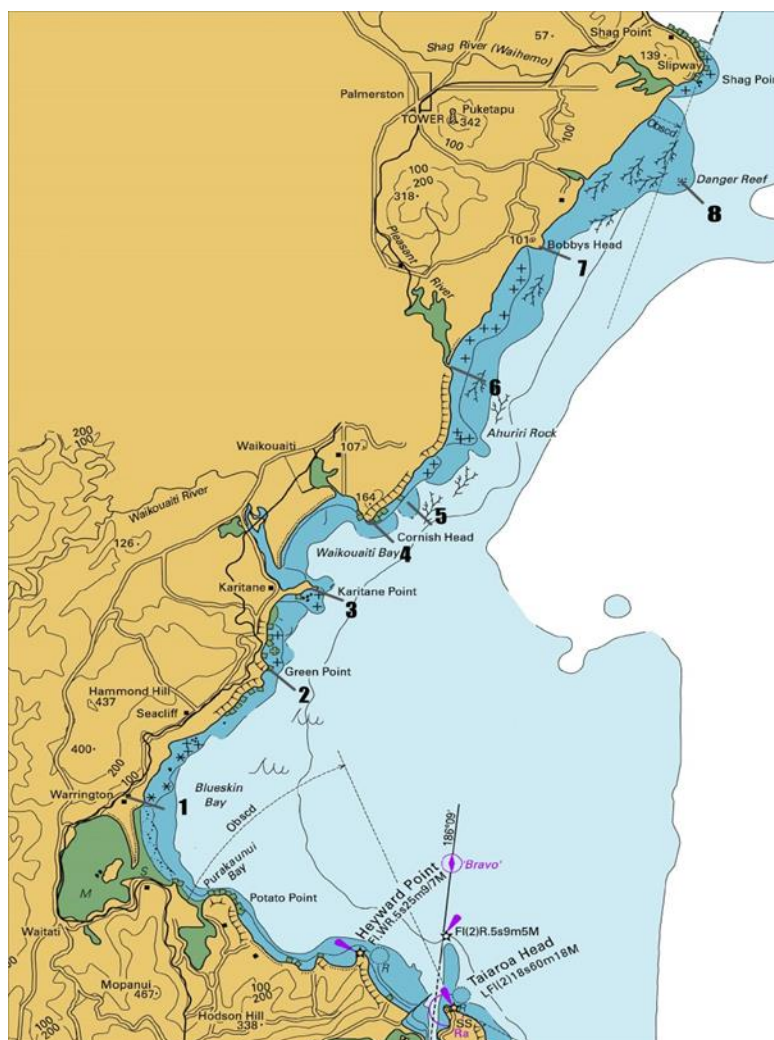
Plume modelling has been undertaken to determine the spatial extent and relative concentrations of sediments likely to be generated during dredging activities.

Near the coast, turbidity levels are highly variable, making it difficult to differentiate naturally elevated levels from those associated with disposal of dredged sediment. Modelling suggests that areas south of Shag Point are likely to receive only low sediment concentrations. By comparison, Cornish Head may potentially be exposed to pulses of elevated sediment concentrations, under certain conditions (for example, during periods where north-east winds predominant). The area around Karitane is unlikely to be subjected to increased sediment concentrations, even during north east winds.

A Technical Group and Manawhenua Consultative Group has been set up to facilitate communication, provide input to monitoring review reports and identify ways to avoid, remedy or mitigate adverse effects on environmental and cultural values if they were to occur.

What is Port Otago doing about it?

Port Otago have developed an Environmental Management Plan (EMP). As part of this plan, kelp monitoring will be done at 8 sites from Warrington to Shag Point (see below). Each permanent transect will be monitored for kelp recruit abundance, adult kelp abundance and sediment cover. In addition, light will be monitored at two depths at each permanent transect location. Monitoring will be undertaken over a 2 year period every 3 months, with the purpose of detecting any change in the composition of the kelp forests. In addition, aerial photography at critical times of the year will give an indication of coverage.



Further information can be found at

www.nextgenerationportotago.nz