SUMMARY

The Queensland Department of Primary Industries, Northern Fisheries Centre, was contracted by the Great Barrier Reef Marine Park Authority to test for persistence of a silt layer identified in a November 1998 seagrass survey of the Oyster Point Region and which covered seagrasses in the northern part of the survey area. Seagrass surveys of this area prior to the present survey were contracted by the Department of State Development to provide maps of seagrasses at Oyster Point, Cardwell, prior to, during and after capital and maintenance dredging of the boat channel and marina at the Port Hinchinbrook development. The aim of these surveys was to assess possible impacts of dredging on adjacent seagrass habitats. This included measuring any changes in seagrass biomass, species composition and distribution that may result from changes in hydrology, sediment transport and depth profiles. These original surveys also reported on the type and abundance of animals of fisheries value found in the seagrass meadows.

In the present report, an assessment of changes in seagrass distribution and abundance since the baseline (November 1995) and previous monitoring surveys of December 1997 and November 1998 is included. We provide a quantification of changes between years and comment on the possible impacts of the dredging program.

Seagrass survey methodology was based on standard techniques developed for monitoring seagrasses in tropical Queensland ports (see Coles et al. 1996b; Lee Long et al. 1996). Information collected from transect sites and from randomly located sites were used to map the seagrass meadow boundaries and to estimate biomass (by species) in the monitoring area. Sampling was conducted in late spring (November/December) each year to allow comparison between years without a seasonal component. Estimates of aboveground seagrass biomass, percent seagrass species composition of biomass, percent cover of algae and sediment characteristics were recorded at each site. Differential GPS fixes (±1.5m) and the depths to the nearest decimetre at each survey site were also recorded. All survey data were entered onto the Geographic Information System (GIS) (MapInfo®) for presentation of seagrass species distribution and abundance. Meadow boundaries drawn on GIS maps are based on above-ground seagrass presence/absence information and location of sample sites.

Major Findings include:

1. There were initial losses of low-density seagrasses (up to 0.3 ha) where capital dredging of the access channel cut through existing meadows. There has been no seagrass regrowth in the dredged channel and regrowth is not expected because of tidal flows and low light intensities under the turbid silt layer. The seagrass community on the edges immediately adjacent to the dredged access channel was similar each year before and after dredging.

2. The silty layer identified in November 1998 north of the access channel did not persist through to December 1999. The source of the silty layer could not be linked to sediments found in the dredged channel. Seagrasses that were showing signs of recent silt burial in November 1998 had mostly recovered by December 1999.

3. Six species of seagrasses occurred at Oyster Point during the study (1995-1999). The three dominant species (*Halophila ovalis*, *Halophila decipiens* and *Halodule uninervis/pinifolia*) are fast-growing and naturally highly variable in abundance. *Halophila spinulosa* and *Halophila tricostata* occurred in small amounts in baseline surveys, and were uncommon, or not found, in later surveys.

4. Above-ground biomass, area and depth ranges for each of the major seagrass species at Oyster Point decreased between 1995 and 1998, then recovered (back to near 1995 levels) in 1999. Apart from the initial loss of seagrass in the dredged channel, these changes are within the ranges of natural variation for these seagrass species measured at other tropical locations in Queensland, and are natural biological processes. Increased wind and cloud and reduction in light reaching the seagrass from 1995 to 1998 are the likely causes of the declines in seagrass biomass.

5. Total area of seagrass habitat mapped in the survey area varied little ranging from 252 ±16 ha in November 1998 to 312 ±14 ha in December 1999.

6. The distribution and biomass of *Halophila decipiens* varied widely between years. Reductions occurred between November 1995 and November 1998, followed by increases in 1999. These changes were in areas well away from Oyster Point, and included the “reference” areas, indicating that changes were widespread.

7. Maximum depth ranges of the major species shallowed in 1997, 1998 and 1999. There were, however, no changes in the distribution and location of the seagrass meadows or in the sea floor topography that could explain these differences in seagrass depth. Decreases in maximum depth ranges observed in 1997 and 1998 are likely a result of lower light availability caused by increased wind driven turbidity in the two month period leading up be these surveys.

8. *Halophila decipiens* had the deepest mean depth of occurrence in each survey. Mean depth below Mean Sea Level (MSL) for *Halophila decipiens* at Oyster Point was significantly shallower in December 1997 and November 1999 than in November 1995 (0.28m and 0.24m respectively). *Halophila ovalis* and *Halodule pinifolia/uninervis* average depths did not change significantly.

9. There were declines in seagrass biomass (all species pooled) in the study area from 1995 to 1998, followed by a return to near pre-dredging (1995) biomass in 1999. The changes were within the ranges of natural variability measured in the region and were uneven across the study area.

10. Long-term monitoring (15 to 20 years) is required for a complete assessment of changes in seagrasses adjacent to Oyster Point. This 4-year study provides a useful starting point and a baseline for further monitoring.