Chapter 7 SEAGRASSES

Seagrass meadows are prominent in aerial photographs of Green Island reef, particularly on the inshore flat to the north and north-west of the cay [Fig.1.2]. The dominant species within these dense meadows are Halodule uninervis and Cymodocea serrulata (Mellors, pers. comm.), with many species of blue-green and coralline algae associated with them (Kuchler, 1978). Though less apparent in photographs, low-density meadows (mainly Cymodocea rotundata and Thalassia hemprichii) are also widespread over much of the remainder of the reef flat (Mellors, pers. comm.). Table 7.1 lists the seagrass species recorded for Green Island reef.

Through photographic interpretation, Kuchler (1978) estimated the area of seagrass meadows to have increased markedly over the previous three decades [Table 7.2]. Hopley (1982) and Gourlay (1983) considered this increase to be a consequence of the discharge of sewerage effluent from the cay's resort, which has generally taken place at the south-western reef edge [Fig.2.1]. Following discussions with long-term residents of Green Island, which revealed that the sewerage outlet may once have been to the north of the cay, Kuchler (1978) unearthed effluent particles stored in the upper 20cm of sediment on the northern sand flat where seagrass was established.

Another possible contributing factor to the apparent expansion of the seagrass meadows may have been the redistribution of the fine sediments used in beach replenishment programs in 1973 and 1975. During winter, the prevailing south-easterly currents carried the sediment from the unprotected south-western beach to the north-west of the cay where it was deposited, providing an excellent substrate for seagrass colonisation (Kuchler, 1978).

The possibility also exists that, due to ecological succession within the seagrass community, the increase in seagrass meadow area may be only an apparent increase rather than a real increase. If they were present, the low-density Cymodocea rotundata/ Thalassia hemprichii meadows would have been difficult to detect in the early low-quality photographs from which Kuchler (1978) estimated seagrass meadow areas. These beds may then have been progressively replaced to the north-west of the cay by the more dense Cymodocea serrulata / Halodule uninervis meadows.

TABLE 7.1: Seagrass species recorded on Green Island reef.

SPECIES	LOCATION	SOURCE
Cymodocea rotundata	Southern flat	Mellors (pers. comm.)
Cymodocea serrulata	-	Kuchler (1978)
	North-western, northern and southern flat	Mellors (pers. comm.)
Halodule uninervis	-	Kuchler (1978)
	North-western, northern and southern flat	Mellors (pers. comm.)
Halophila ovata/ovalis	-	Kuchler (1978)
	North-western, northern and southern flat	Mellors (pers. comm.)
Syringodium isoetifolium	Uncommon	Mellors (pers. comm.)
Thalassia hemprichii	-	Kuchler (1978)
	North-western, northern and southern flat	Mellors (pers. comm.)

TABLE 7.2: Estimated areas of 'marine grass growth', 1945 - 1978 (from Kuchler, 1978).

YEAR	AREA (ha)
1945	0.09
1946	0.27
1959	1.48
1969	2.58
1972	3.89
1973	4.37
1978	13.56

SEAGRASS PRODUCTIVITY

Rates of productivity along transects through the seagrass meadows to the north-west of the cay were estimated in September 1988 by Baxter (1988, 1989). A floating data logger was utilised to determine productivity rates from changes in oxygen content, *p*H and temperature of water bodies traversing the meadows. The data are unpublished at present. Rates of calcification and calcium carbonate dissolution were also determined, and net dissolution was observed during both daytime and night-time traverses.