

Growth rate of eelgrass (*Zostera marina*) in Frenchman Bay

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Eelgrass (*Zostera marina*) is a sub-tidal marine angiosperm once abundant in Frenchman Bay. We here report measurements of growth rate of natural and re-introduced plants, and compare these to aquarium plants. Five sites were studied. Two grids were placed in the eelgrass tank at Myers Marine Aquarium. One grid (#1) received more natural sunlight than the other (#2) as it was closer to the edge of the roof. Three other plots were established at Hadley point in Frenchman bay. Plot A consisted of plants that were introduced to the area through restoration the previous summer. Plot B contained plants that appeared to be young sprouts that had detached from a grid and seeded the small area. Plot C consisted of plants that were growing naturally and primarily undisturbed. At each site 5-8 plants were chosen randomly and a colored rubber elastic band was placed around the bottom of each plant for identification. In *Z. marina*, the third youngest blade stops growing once a new blade emerges², which serves as the reference for measurement of younger blade elongation.³ We modified the method of Zieman and Wetzel⁴, poking a threaded needle through the youngest blade and an older blade that had stopped growing; the thread was then cut in the middle between these two blades to establish the marks. The distance between these two thread-halves was measured nearly every day. Three trials were performed at each site, with the exception of Plot A which was only done twice.

Condition	Mean growth, cm/day	SE	N	Mean light (fc)	SE	N	Notes
Restored patch (Plot A)	3.04	0.116	16	4950	1465	4	Measured on dock as simulaculum for natural conditions
Detached from restored (Plot B)	1.65	0.097	27	"	"	"	
Naturally-growing (Plot C)	3.31	0.106	26	"	"	"	
Tank near light (Grid 1)	1.50	0.081	76	527	218	20	Measured at side of tank
In tank, darker (Grid 2)	0.96	0.077	62	37	5.57	17	Measured at top of tank

Table. Growth rate of youngest eelgrass fronds and light intensities in various conditions. Plots A – C are in the wild, not attached to a grid; Grids 1 and 2 are in a tank in the Meyers Aquarium. Light intensities (Gossen "Panlux" meter) are variable with weather and time of day, but give some indication of relative intensity.

The growth of last summer's transplanted patch (Plot A) is not different from a natural stand of eelgrass (Plot C) ($P < 0.05$, 40 DF); suggesting that restored plants are fully competent. Small sprouts (Plot B) grew more slowly, perhaps due to a reduced root system due to recent disturbance. Plants in aquarium tanks were healthy but slower growing, probably due to lower light intensity¹. Since 30% of growth rate remains in 1% of natural light, sediment seems unlikely to account for die-off in the wild.

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