Experiment data

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bommie # | Date | # urchins added | # urchins total | plant # | height | Height avg | % cov | Notes |
| 20(not old 20) | 28-Oct | 7 | 7 | 12 | 20 | 15 | 40 | taggeged with water bottle, short sarg, went back next day and there was some herbivory present and only 3 urchins were seen |
|  |  | tub1 |  |  | 20 |  |  |  |
|  |  |  |  |  | 10 |  |  |  |
|  |  |  |  |  | 10 |  |  |  |
| 12(not old 12) | 28-Oct |  | 4 | 20 | 26 | 30.42857143 | 50 | short and full, 2 eaten plants |
|  |  |  |  |  | 26 |  |  |  |
|  |  |  |  |  | 30 |  |  |  |
|  |  |  |  |  | 24 |  |  |  |
|  |  |  |  |  | 28 |  |  |  |
|  |  |  |  |  | 34 |  |  |  |
|  |  |  |  |  | 45 |  |  |  |
| 12 | 4-Nov |  | 7 | 19 | 19 | 17 | 40 | 1 baby plant, plants by urchin are small and eaten, not a lot of bladders, where did this tag come from |
|  |  |  |  |  | 22 |  | ?? |  |
|  |  |  |  |  | 17 |  |  |  |
|  |  |  |  |  | 10 |  |  |  |
| 20 | 4-Nov | 0 | 1 | 14 | 28 | 16.33333333 | 20 |  |
|  |  |  |  |  | 12 |  |  |  |
|  |  |  |  |  | 9 |  |  |  |
| 12 | 7-Nov |  | 7 | 21 | 26 | 28 | 40 |  |
|  |  |  |  |  | 30 |  |  |  |
|  |  |  |  |  | 28 |  |  |  |
| 20 | 7-Nov |  | 1 | 15 | 25 | 25 | 30 | maybe 2 urchins |
|  |  |  |  |  | 21 |  |  |  |
|  |  |  |  |  | 19 |  |  |  |
| 12 | 9-Nov |  | 8 | 25 | 17 | 26.66666667 | 25 | one baby urchin, not many bladders |
|  |  |  |  |  | 33 |  |  |  |
|  |  |  |  |  | 30 |  |  |  |
| 20 | 9-Nov |  | 2 | 19 | 24 | 20.66666667 | 30 |  |
|  |  |  |  |  | 21 |  |  |  |
|  |  |  |  |  | 17 |  |  |  |
| 30 | 2-Nov |  | 3 | 27 | 24 | 18.33333333 | 70 | 1 werid urchin, 2.5x.8 m |
|  |  |  |  |  | 16 |  |  |  |
|  |  |  |  |  | 10 |  |  |  |
|  |  |  |  |  | 24 |  |  |  |
|  |  |  |  |  | 15 |  |  |  |
|  |  |  |  |  | 21 |  |  |  |
| 31 | 2-Nov | ??? | 6 | too many |  |  | 95 | sarg on sides too looks very full only a few look eaten not many bladders |
|  |  |  |  |  |  |  |  |  |
| 32 | 2-Nov | 7 | 10 | 24 | 17 | 22.33333333 | 30 | lots of long skinny frail sarg (10), broke a plant, plants near blank tag have tons of bladders the other plants have normal |
|  |  |  |  |  | 27 |  |  |  |
|  |  |  |  |  | 23 |  |  |  |
| 33 | 2-Nov | 0 | 4 |  |  |  | 0 |  |
|  |  |  |  |  |  |  |  |  |
| 30 | 4-Nov | 0 | 3 | 26 | 20 | 18 | 80 | 1 weird urchin, 2 baby plants |
|  |  |  |  |  | 18 |  |  |  |
|  |  |  |  |  | 16 |  |  |  |
| 31 | 4-Nov | 0 | 6 | too many |  |  | 80 | 1 weird urchin |
|  |  |  |  |  |  |  |  |  |
| 32 | 4-Nov | 0 | 6 | 20 | 17 | 20.5 | 20 | plat a lot skinner at bottom than at top |
|  |  |  |  |  | 24 |  |  |  |
| 33 | 4-Nov | 0 | 7 |  |  |  | 0 | no sarg |
|  |  |  |  |  |  |  |  |  |
| 30 | 7-Nov |  | 2 | 28 | 25 | 25 | 60 | bad vis, really wavey |
|  |  |  |  |  | 23 |  |  |  |
|  |  |  |  |  | 27 |  |  |  |
| 31 | 7-Nov |  | 6 | too many | 25 | 26 | 95 | not a lot of bladders |
|  |  |  |  |  | 23 |  |  |  |
|  |  |  |  |  | 30 |  |  |  |
| 32 | 7-Nov |  | 4 | 19 | 25 | 29.33333333 | 20 |  |
|  |  |  |  |  | 35 |  |  |  |
|  |  |  |  |  | 28 |  |  |  |
| 33 | 7-Nov |  | 7 | 0 | 0 | 0 | 0 |  |
| 30 | 9-Nov |  | 3 | 29 | 26 | 27 | 70 | weird urchin and plants are full |
|  |  |  |  |  | 26 |  |  |  |
|  |  |  |  |  | 29 |  |  |  |
| 31 | 9-Nov |  | 6 | too many | 27 | 30.33333333 | 95 | looks like they ate the bladders |
|  |  |  |  |  | 33 |  |  |  |
|  |  |  |  |  | 31 |  |  |  |
| 32 | 9-Nov |  | 5 | 22 | 25 | 28.33333333 | 20 |  |
|  |  |  |  |  | 30 |  |  |  |
|  |  |  |  |  | 30 |  |  |  |
| 33 | 9-Nov |  | 5 | 0 | 0 | 0 | 0 | 1 werid one |
| 40 | 4-Nov | 7 | 10 | 30 | 16 | 12.33333333 | 60 | small plants, really small |
|  |  |  |  |  | 9 |  |  |  |
|  |  |  |  |  | 12 |  |  |  |
| 41 | 4-Nov | 0 | 3 | 4 | 18 | 12.5 | 10 | **control**, all eaten |
|  |  |  |  |  | 12 |  |  |  |
|  |  |  |  |  | 13 |  |  |  |
|  |  |  |  |  | 7 |  |  |  |
| 42 | 4-Nov | 7 | 10 | 14 | 12 | 17 | 20 | 1 werid one |
|  |  |  |  |  | 17 |  |  |  |
|  |  |  |  |  | 22 |  |  |  |
| 44 | 4-Nov | 7 | 9 | too many | 20 | 18.33333333 | 60 |  |
|  |  |  |  |  | 17 |  |  |  |
|  |  |  |  |  | 18 |  |  |  |
| 46 | 4-Nov | 7 | 9 | 18 | 18 | 20 | 90 |  |
|  |  |  |  |  | 25 |  |  |  |
|  |  |  |  |  | 17 |  |  |  |
| 45 | 4-Nov | 0 | 3 |  | 17 | 14.66666667 | 40 | also has 4 tag |
|  |  |  |  |  | 15 |  |  |  |
|  |  |  |  |  | 12 |  |  |  |
| 43 | 4-Nov | 0 | 0 | 7 | 16 | 14.33333333 | 10 |  |
|  |  |  |  |  | 15 |  |  |  |
|  |  |  |  |  | 12 |  |  |  |
| 48 | 4-Nov | 7 | 7 | 3 | 32 | 32 | 10 | 3 plants only 1 decent size |
| 40 | 7-Nov |  | 8 | 31 | 17 | 16 | 50 | all plants are very small |
|  |  |  |  |  | 15 |  |  |  |
|  |  |  |  |  | 16 |  |  |  |
| 41 | 7-Nov |  | 4 | 4 | 12 | 13.33333333 | 10 | 2 plants are small like sticks, 2 are normal. 41 is south of 40 |
|  |  |  |  |  | 18 |  |  |  |
|  |  |  |  |  | 10 |  |  |  |
| 46 | 7-Nov |  | 5 | 18 | 19 | 17.33333333 | 85 | 1 werid urchin |
|  |  |  |  |  | 17 |  |  |  |
|  |  |  |  |  | 16 |  |  |  |
| 45 | 7-Nov |  | 5 | 13 | 11 | 16.33333333 | 30 |  |
|  |  |  |  |  | 21 |  |  |  |
|  |  |  |  |  | 17 |  |  |  |
| 48 | 7-Nov |  | 2 | 2 | 32 | 32 | 5 | the fish is still stuck, one plant is less than 1 inch the other is |
| 43 | 7-Nov |  | 0 | 7 | 14 | 15 | 10 | skinny and eaten |
|  |  |  |  |  | 15 |  |  |  |
|  |  |  |  |  | 16 |  |  |  |
| 42 | 7-Nov |  | 10 or 11 | 15 | 12 | 14.66666667 | 20 |  |
|  |  |  |  |  | 12 |  |  |  |
|  |  |  |  |  | 20 |  |  |  |
| 44 | 7-Nov |  | 5 | too many | 26 | 17.33333333 | 50 | hard to count urchins bc dark ledge |
|  |  |  |  |  | 15 |  |  |  |
|  |  |  |  |  | 11 |  |  |  |
| 42 | 7-Nov |  | 6 | 12 | 22 | 17.66666667 | 6 | 2 weird urchins |
|  |  |  |  |  | 21 |  |  |  |
|  |  |  |  |  | 10 |  |  |  |
| 40 | 9-Nov |  | 9 | 23 | 15 | 16 | 40 | lots of short eaten plants, no bladders, empty stipes no leaves |
|  |  |  |  |  | 18 |  |  |  |
|  |  |  |  |  | 15 |  |  |  |
| 41 | 9-Nov |  | 3 | 5 | 19 | 13.33333333 | 10 | only 2 big plants |
|  |  |  |  |  | 13 |  |  |  |
|  |  |  |  |  | 8 |  |  |  |
| 44 | 9-Nov |  | 6 | too many | 27 | 18.33333333 | 60 | a lot eaten short and isolated |
|  |  |  |  |  | 14 |  |  |  |
|  |  |  |  |  | 14 |  |  |  |
| 42 | 9-Nov |  | 6 | 17 | 9 | 18 | 20 | 2 weird urchins |
|  |  |  |  |  | 22 |  |  |  |
|  |  |  |  |  | 23 |  |  |  |
| 43 | 9-Nov |  | 0 | 9 | 11 | 12 | 10 | frail looking |
|  |  |  |  |  | 15 |  |  |  |
|  |  |  |  |  | 10 |  |  |  |
| 45 | 9-Nov |  | 6 |  | 16 | 14 | 40 | 1 werid, no bladders, look eaten, diff lengths |
|  |  |  |  |  | 16 |  |  |  |
|  |  |  |  |  | 10 |  |  |  |
| 48 | 9-Nov |  | 2 | 3 | 27 | 15.5 | 5 | fish still stuck, lots of leaves eaten, lots of bladders missing |
|  |  |  |  |  | 4 |  |  |  |
| 46 | 9-Nov |  | 6 | 20 | 24 | 18 | 80 |  |
|  |  |  |  |  | 16 |  |  |  |
|  |  |  |  |  | 14 |  |  |  |

Survey Data

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| tape number | Coral in meters | |  | Sargassum |  |  |  | # of urchins | urchin normalized |  |  |  |
|  | Circumference | Height | area | # of plants | Circumference | Height | % coverage |  |  |  |  |  |
| 1 | 1.6 | 0.4 | 0.80424704 | 13 |  |  | 20 | 0 | 0 |  |  |  |
| 2 | 2.6 | 0.3 | 1.59278613 |  |  |  | 10 | 0 | 0 | some eaten nub plants | |  |
| 3 | 5.5 | 0.5 | 11.87913719 | 29 |  |  | 15 | 0 | 0 | some eaten |  |  |
| 4 | 3.3 | 0.4 | 3.42119151 | 8 |  |  | 40 | 1 | 0.292295826 | short fuller plants | |  |
| 5 | 3 | 0.2 | 1.4137155 | 10 |  |  | 90 | 0 | 0 | full tall plants | |  |
| 6 | 3.7 | 0.7 | 7.526464243 | 6 |  |  | 20 | 0 | 0 | medium sized | |  |
| 7 | 3 | 0.6 | 4.2411465 | 5 |  |  | 20 | 0 | 0 | baby plant |  |  |
| \*\* | \*\* | \*\* | #VALUE! | \*\*\* | \*\* | \*\* | \*\* | 2 weird urchins | #VALUE! |  |  |  |
| 8 | 4 | 0.7 | 8.796452 | 5 |  |  | 30 | ^^^^ | #VALUE! | full plants |  |  |
| 9 | 5 | 0.4 | 7.853975 | 25 |  |  | 70 | 0 | 0 | fat sarg, mostly full | |  |
| 10 | 3.7 | 0.5 | 5.376045888 | 6 |  |  | 20 | 1 | 0.186010317 | urchin is close and its tagged, 1 big and 1 baby plant | | |
| 11 | 4 | 1 | 12.56636 | 8 |  |  | 70 | 2 | 0.159155078 | Big diadema, one is next to the bommie and is tagged, full sargassum | | |
| 12 | 3.8 | 0.8 | 9.07291192 | 1 |  |  | 10 | 1 | 0.110218198 | biggg diadema | |  |
| 13 | 3.8 | 0.7 | 7.93879793 | 4 |  |  | 1 | 0 | 0 | really little plants, eaten? | | |
| \* | \* | \* | #VALUE! | \* | \* | \* | \* | 1 | #VALUE! | near 12 tag tape | |  |
| 15 | 3.1 | 0.6 | 4.528601985 | 9 |  |  | 80 | 0 | 0 | full, lots of coral on it, not good for urchins to live in holes | | |
| 16 | 5 | 0.9 | 17.67144375 | 16 |  |  | 50 | 0 | 0 | full but short | |  |
| 17 | 2.2 | 0.4 | 1.52052956 | 5 |  |  | 90 | 0 | 0 | 1 plant had lots of holdfasts, all very full | | |
| 18 | 4 | 0.7 | 8.796452 | 7 |  |  | 40 | 0 | 0 | puffer fish, hole in sand, dead crab inside? | | |
| 19 | 4.1 | 0.8 | 10.56202558 | 15 |  |  | 30 | 3 | 0.284036426 | some eaten nub plants | |  |
| 20 | 4.1 | 0.6 | 7.921519185 | 20+ |  |  | 85 | 0 | 0 | some babies mostly full | |  |
| 23 | 4 | 0.5 | 6.28318 | 20+ |  |  | 80 | 1 | 0.159155078 |  |  | all next to each other |
| 21 | 4 | 0.2 | 2.513272 | 11 |  |  | 20 | 2 | 0.795775388 |  |  |  |
| 22 |  |  | 0 |  |  |  |  | 1 | #DIV/0! | TAGGED BIG ONE | |  |
| 20 |  |  | 0 | 12 |  |  | 40 | 0 | #DIV/0! |  |  |  |
| 12 |  |  | 0 | 20 |  |  | 50 | 4 | #DIV/0! |  |  |  |
| 30 | 3.6 | 0.6 | 6.10725096 | 26 |  |  | 80 | 3 | 0.491219375 |  |  |  |
| 31 |  |  | 0 | too many |  |  | 95 | 6 | #DIV/0! |  |  |  |
| 32 | 3.8 | 0.85 | 9.639968915 | 24 |  |  | 30 | 3 | 0.311204323 |  |  |  |
| 33 |  |  | 0 | 0 |  |  | 0 | 4 | #DIV/0! |  |  |  |
| 40 | 2.7 | 0.7 | 4.007883443 | 30 |  |  | 60 | 3 | 0.748524762 |  |  |  |
| 41 | 2 | 0.5 | 1.570795 | 4 |  |  | 10 | 3 | 1.90986093 |  |  |  |
| 42 | 7 | 0.3 | 11.54534325 | 14 |  |  | 20 | 3 | 0.259845025 |  |  |  |
| 43 | 2.5 | 0.4 | 1.96349375 | 7 |  |  | 10 | 0 | 0 |  |  |  |
| 44 | 5.3 | 0.65 | 14.34018025 | too many |  |  | 60 | 2 | 0.139468261 |  |  |  |
| 45 |  |  | 0 | 13 |  |  | 30 | 3 | #DIV/0! |  |  |  |
| 46 | 2.4 | 0.65 | 2.94052824 | 18 |  |  | 90 | 2 | 0.680149904 |  |  |  |
| 48 | 3 | 0.5 | 3.53428875 | 3 |  |  | 10 | 0 | 0 |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |