



Tralee Bay Coastal Communities Black Rock Pool Flowering Seagrass Study

**Report prepared by
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Introduction

Eelgrass is frequently found just off Kerry's coasts. This study focused on a very small bed located just off Banna Strand and situated in a shallow limestone rock pool. At high tide, this area was subject to heavy breaking seas and was not considered a likely location for *Zostera marina*.

Subtidal studies of Eelgrass usually require diving or snorkelling, which prevents casual observations by Citizen Science volunteers.

Clean Coasts provided insurance for members conducting this study and this site allowed access-on-foot to the entire seagrass bed without putting a foot into water!

Goal achieved in this project:

- Photographed hundreds of unique flora & fauna.
- Identified 69 species in this *Zostera marina* habitat.
- Recorded the timing of the six flowering stages of our local seagrasses.
- Observed the habitat-forming nature of seagrass.
- Mapped seagrass bed and created a georeferenced raster image.
- Disseminated our results.

Banna Coastcare, Banna Sea Rescue, Fenit Coast Conservation and the Maharees Conservation Association were the four coastal community partners undertaking this study.

"Reflections" by Patricia O'Halloran:

I was mesmerized by the complex, fascinating, beautiful, ever-changing, and interactive experience that unfolded by visiting the Blackrock Pool project site. It was a rockpool lesson in stopping to smell the roses. When record high water temperatures were in the news, I found myself thinking of the impacts on the sea hares and other sea life in our rockpool. With each visit I tread more carefully, having formed an immense appreciation for the life under my feet.



“What a wonderful way to inspire stewards of our environment. “



Our Citizen Science volunteers walked over Bogwood that has lain buried for perhaps 5,000 years to arrive at a very unique tidal pool containing our subtidal seagrass bed. The area is exposed to severe sea storms and it is absolutely amazing that *Zostera marina* managed to secure a foothold considering the waves that surround the Black Rock. But the beauty of this stretch of coast keeps bringing you back month after month.

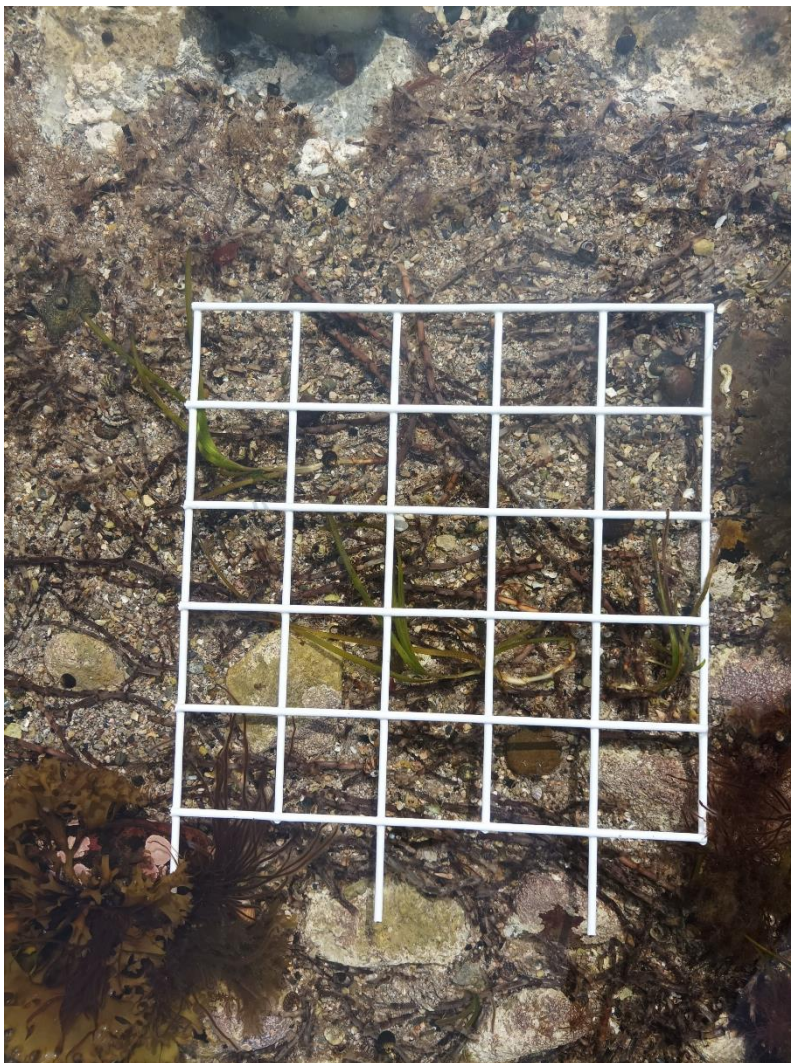


Biodiversity

Most of our observations were made from the side of the rock pool to avoid trampling the seagrass bed. Photographs were taken with our mobile phones backed up with two underwater Olympus TG-5/6 cameras. Individuals identified their discoveries and we shared our photographs on Google OneDrive.

Sarah O'Malley: *"Just wanted to add that a Seahare made it to the Biodiversity Photographer of the Year Ocean Category shortlist 2023!" (check out our title page)*

Gosia Shaikh-Horajska: *"I started in April, but there was not much change in this particular spot. In August, the sediment got disturbed and the seagrass was removed by current/tide."*



Zostera marina, commonly known as Eelgrass, is a habitat forming species. You could lift a thick layer of seagrass because the rhizomes are interlaced and their roots bind with the sand holding it firmly in place. The quadrat above measures 25 by 25 cm. There is an amazing variety of life to behold in each individual square. Limestone at the top of the image has become exposed as the seagrass in this area appears to be in decline with only 3 seagrass shoots remaining.

Gosia Shaikh-Horajska: *"It was lovely to visit Black Rock pool over summer months, looking at changes in the pool and learning about our seagrass habitat. I was able to discover, and got very interested in worms. Black Rock pool is a great place to start exploring the shore, learn new species and get into recording them with iNaturalist and ExploreYourShore".*



Feather Duster Worm

Coordinating the identification of our species as a team proved challenging.

iNaturalist was used towards the end of the project and we benefited from the feedback of over 33 external reviewers. Their contributions helped us to reconsider key differences between species.

With their guidance we realise the importance of including specific perspectives, recording measurements, and the use of tripods and better lighting for sharply focused images.

In the table on the next 2 pages, please note that CTRL+click (sometimes twice) on the "Scientific Name" you'll be able to view each iNaturalist submission and all associated comments.

Arthropoda		Molluscs (continued)	
Anurida maritima	Seashore Springtail	Mytilus edulis	Blue Mussel Complex
Bivalves		Nucella lapillus	Atlantic Dogwhelk
Chthamalidae	Chthamalid Barnacles	Nucella lapillus	Atlantic Dogwhelk
Cirripedia	Barnacles	Nudibranchia	Nudibranch eggs
Lepas anatifera	Pelagic Gooseneck Barnacle	Genus Patella	Limpet
Mimachlamys varia	Variiegated Scallop	Patella pellucida	Blue-rayed Limpet
Bryozoa		Patella vulgata	Common European Limpet
Electra pilosa	Hairy Sea-mat	Polycera quadrileata	Four-lined Polycera
Membranipora	Lacy Crust Bryozoans	Ruditapes decussatus	Grooved carpet shell
Cnidaria		Steromphala umbilicalis	Purple Topshell
Actinia equina	Atlantic Beadlet Anemone	Steromphala umbilicalis	Purple Topshell
Actinia equina	Atlantic Beadlet Anemone	TBD	netted dogwhelk
Actiniaria	Sea Anemones	Tritia	T.nitida or T.recticulata
Anemonia viridis	snakelocks anemone	Venus verrucosa	Warty Venus Clam
Velella velella	By-the-wind Sailor	Veneridae	(another Venus Clam?)
Crustaceans		Plants/Seaweeds	
Carcinus maenas	European Green Crab	Bifurcaria bifurcata	brown tuning-fork weed
Caridea	Caridean Shrimps	Chondrus crispus	Irish Moss
Pagurus bernhardus	Common Hermit Crab	Codium tomentosum	Velvet Horn
Palaemon elegans	Rockpool Prawn	Colpomenia peregrina	Oyster-thief
Echinodermata		Corallina officinalis	Common Coralline
Amphipholis squamata	Dwarf Brittle Star	Corallinaceae	coralline algae
Asterina gibbosa	Cushion Star	Genus Lithophyllum	Coralline algae
Ophiothrix fragilis	Common Brittle Star	Corallinales	Coralline algae
Psammechinus miliaris	Green Sea Urchin	Ectocarpales	Sea Cauliflower
Fish		Ericaria selaginoides	Rainbow Wrack
Actinopterygii	Ray-finned Fishes	Fucus serratus	Saw Wrack
Lipophrys pholis	Shanny	Fucus vesiculosus	Bladder wrack
Nerophis lumbriciformis	Worm Pipefish	Genus Lithothamnion	Coralline algae
Pomatoschistus flavescens	Two-spotted Goby	Genus Osmundea	
Insects		Leathesia marina	Sea Cauliflower
Pterygota	Winged Insects	Mastocarpus stellatus	False Irish Moss
Molluscs		Osmundea	Seaweed
Aeolidiella sanguinea	Orange Nudibranch	Palmaria palmata	Dulse
Aplysia punctata	Spotted Seahare (JW)	Pelvetia canaliculata	Channelled Wrack
Aplysia punctata	Spotted Seahare	Phaeophyceae	brown algae
Aplysia punctata	Spotted Seahare (mhor)	Sargassum muticum	Japanese Wireweed
Aplysia punctata	Spotted Seahare (SOM, POH)	Ulva	Sea Lettuces
Buccinum undatum	Common Whelk	Ulva	Ulva
Caenogastropoda	Caenogastropods	Ulva intestinalis	Gutweed
Cantharidinae	Top Shell	Zostera marina	Eelgrass (SOD)
Cantharidinae	Top Shell	Zostera marina	Eelgrass (RG)
Favorinus branchialis	White Aeolis Nudibranch	Zostera marina	Zm Six flowering stages
Littorina littorea	Common Periwinkle	Zostera marina	Eelgrass (SOMx18)
Littorina littorea	Common Periwinkle (SOD)	Zostera marina	Eelgrass SDG14 (POH)
Modiolus modiolus	Northern Horsemussel	Zostera marina	Eelgrass (JW)

Sponges & Squirts		Worms	
Asciadiacea	Sea Squirts	Arenicola marina	Blow Lugworm
Botryllus schlosseri	Star Tunicate	Eulalia	Green marine worm
Halichondria panicea	Bread-crumb Sponge	Eulalia viridis	Green Leaf Worm
Life	Possible Sponge	Lineus longissimus	Bootlace Worm
Ophlitaspongia papilla	Orange sponge	Polychaeta? (TBD)	Polychaete Worms
Porifera	Sponges between barnacles	Sabellinae	Feather Duster Worm
Porifera	Orange Sponges	Sigalionidae	Bristleworm
TBD	star arcadian	Spirobus spirobus	Spirobus
Unknown Sponge	Good laugh!	Sthenelais boa	Bristleworm
		Terebellidae	Spaghetti Worms

List of 69 species observed in the Black Rock Pool during 2023 ([Ctrl-Click to view observations](#))

There are about twice as many [observations recorded](#) as are included in the table above.

An alternative display of all species observed was also explored (see 2023-12-11 Species Photos).

Timing of the 6 Flowering Stages of *Zostera marina* in the Black Rock Pool

Latitude appears to play a major role in the timing of Zm flowering based on studies such as [Fred Short's paper](#). The following graph shows this trend from southern to more northerly climes.

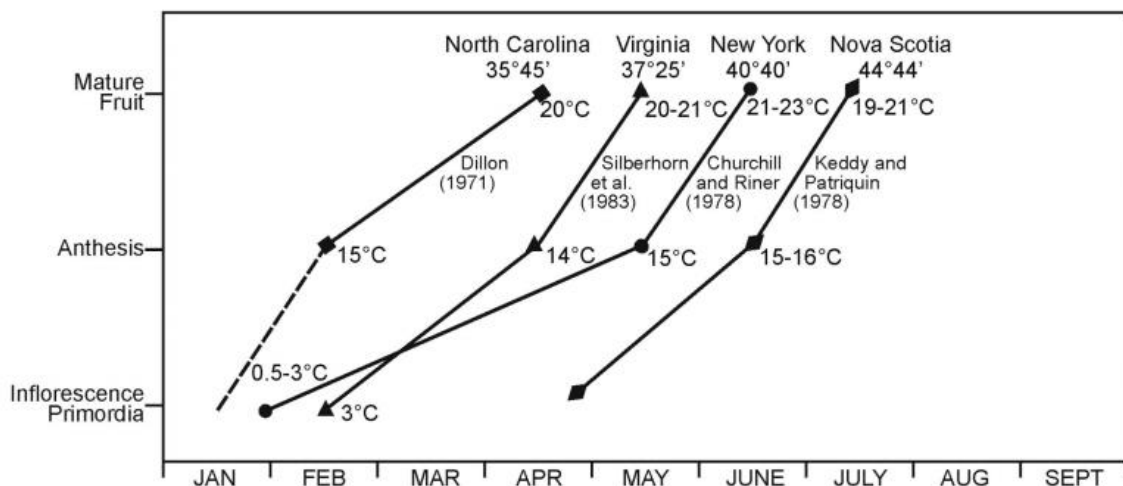


Figure 5.

Our latitude is 52 36' and we observed "mature fruit" at a maximum in late August. And like Nova Scotia, our first female flowers appeared in April. Of note is the fact that as the temperature of the sea began to decline, the flowering shoots began to bend and nearly all were lying on the seafloor by the end of August which is 3 weeks earlier than in 2022.

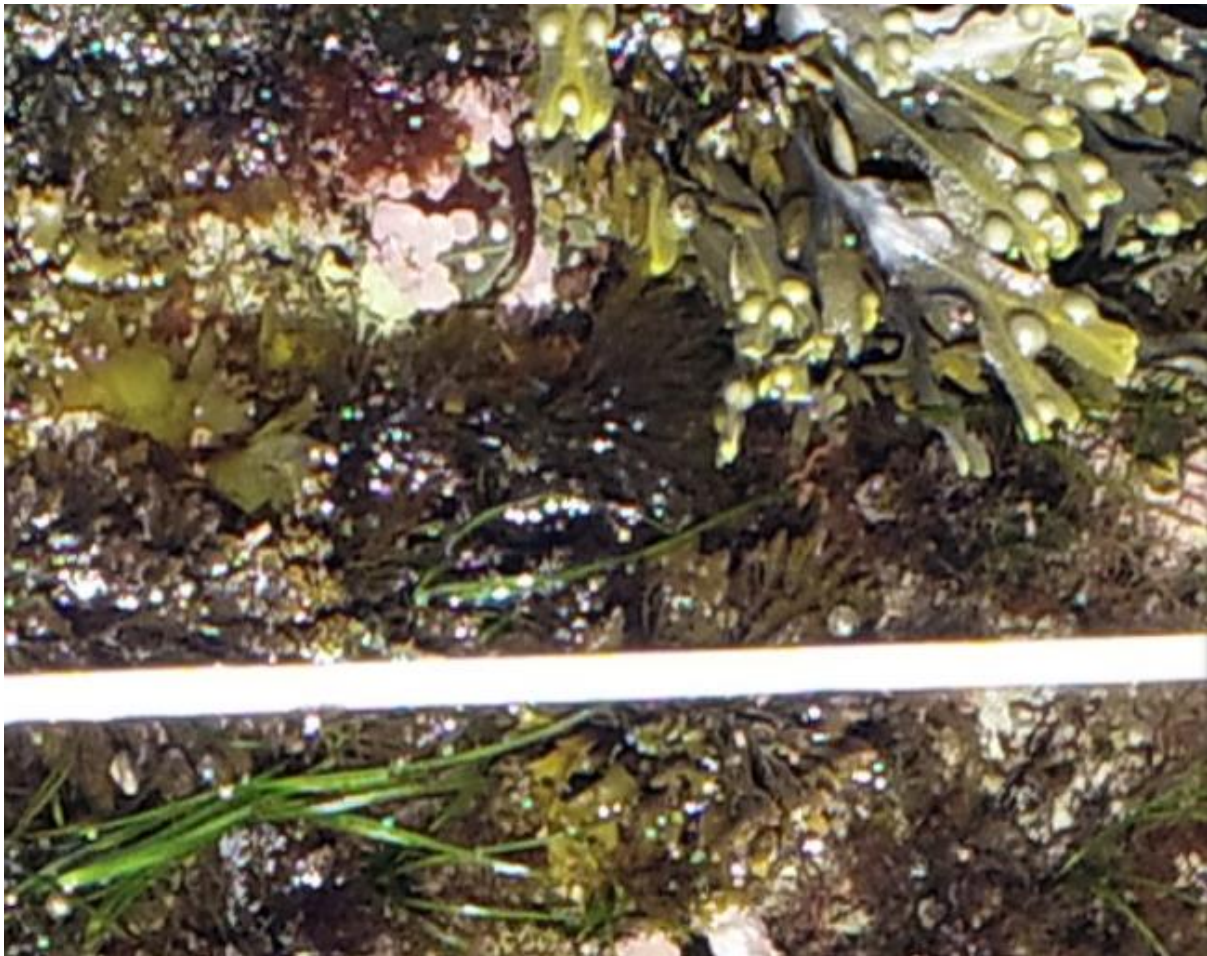
With a Motic dissecting microscope (40x), we were able to study the flowering stages in some detail and a [series of photos](#) were contributed to iNaturalist. To avoid destructive sampling in the small seagrass bed at BRP, it was decided to collect samples from the Fenit Island Tombolo strand (swept ashore & and from the southern end of the Zm seagrass meadow) for examination under the microscope. The remaining seeds and spathes were buried at a trial restoration site but the field markers were washed away and no sign of growth was noted.

Mapping details of the Black Rock Pool *Zostera marina* extent

Mapping the BRP extent of the seagrass bed was completed using a Garmin Forerunner 935 configured to run in dual-band mode. Accuracy is approximately 3m with a closure of 0.5m on the day of the survey. The GPS track was downloaded as a KML file using Garmin Connect. The total area is small at 152 square meters. A single *Zm* shoot was discovered growing 97m to the NE of the outflow of our rock pool site.

The use of drones to create Mosaics and to determine change over time

Supporters provided drone video of the site as well as significant footage from a height of 2.8 meters. The following image shows that details less than 3mm were achieved:



Individual leaves may be counted and the veins in the seaweeds are distinct.

However, prop wash was an issue at lower elevations. The camera angle needed to be fine-tuned; the flight direction was critical; the field-tape (white horizontal stripe in image above) was overblown and measurements were not readable; pre-programmed flight patterns are required for optimum overlap of frames and to minimise flight time. The software required for both pre-flight and post-processing were expensive.

Creation of a multiple raster images were georeferenced and overlain to produce the maps on the next page. GPS tracks were then layered over the resulting images.



The image to the left uses a Google Map image for the base layer.

Superimposed is a georeferenced raster image taken by a drone.

In red a track taken on-foot with a Garmin watch five months prior to the start of the project.



The crossing-white-lines are two field-tapes in the images to left and below.

The image below captured the exact extent of the seagrass bed. Note higher density of seagrass in the southern end of the image.

Also note the exact location (green triangle near top) where repeated observations were taken each month.



The following are delivered as part of this study:

- BRP iNaturalist [Observations](#)
- 2023-12-12 Folder of Species Observed in BRP
- 2023-01-27 Black Rock Pools KML File
- 2023-05-03 Marine Biodiversity Citizen Science Open Course (first to complete)
- 2023-08-17 Zm Eelgrass Flowering Data Entry Spreadsheet
- 2023-09-16 Blackrock Seagrass Poster by Gosia Shaikh-Horajska & Sarah O'Malley
- 2023-09-17 Tralee Bay Wetlands Seagrass Presentation by Patricia O'Halloran
- 2023-09-22 Citizen Science Fenit Seagrass Maps in support of Tralee Bay Oyster Society
- 2023-10-03 Smithsonian MarineGEO Presentation by Ed Sheldon
- 2023-11 Sea Grass Infographics by Sarah O'Malley
- 2023-11-22 IOLN Presentation by Ed Sheldon
- 2023-11 GIS options for Seagrass Mapping
- 2023-11 Practical tips for getting started with Irish Seagrass bed discoveries
- 2023-11-30 BRP Management Plan (requires MS Project)
- 2023-12-11 Species Photos
- 2023-12-12 Final Expenses Report
- 2023-12-17 Black Rock Pool Flowering Seagrass Study
- 2024 Team Presentation via Zoom with Galway Atlantiquaria
- 2023-12-01 Black Rock Pool Flowering Seagrass Study

Thanks to Noirin Burke and Maria Vittoria Marra for their support throughout this project; special thanks to the Smithsonian Marine GEO for their interest in our seagrass beds during their visit in May 2023 and sponsorship allowing one of our members to attend their Networking event in October 2023; to Clean Coast for their constant support and insurance coverage during our field-work around the edges of the BRP; to LAWPro for GIS software and enhanced ability to observe and improve image quality of marine species; to Nóirín Sheldon for proofreading and her infinite patience.

For access to Final Deliverables or to request supporting data email [Ed Sheldon](#).

