Bingham Sub-Aqua Club

Loch Sunart Conservation Project 2017

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Bingham Sub-Aqua Club is a branch of the British Sub-Aqua Club.

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Introduction

Loch Sunart became a Marine Protected Area (MPA) in 2014 [1]. The schedule lists three protected features:

Flame Shell Beds;
Northern feather star aggregations on mixed substrata;
Serpulid aggregations.

Flame Shells

Flame Shells are small bivalve molluscs, similar to scallops, which build nests, or aggregations on the sea floor. They are found from Lofoten in Norway to the Canary Isles, between low water and 100m [2]. An aggregation of Flame Shells, when building their nests together, has the effect of stabilising the seabed for other species [3].

Northern Feather Stars

The Northern Feather Star can be found between 40 and 110m in Loch Sunart [4]. These 10-armed filter feeders take plankton and detritus from the water column and can range in colour from white to banded red on the arms.

Serpulid Aggregations

Serpulid worms are common, what makes them special for the MPS is that they have formed aggregations (colonies) in Loch Teacius.

Unfortunately, these colonies have been destroyed, either naturally, or by human interference. This was discovered by research done in 2015.

Isle of Carna

The Isle of Carna Conservation Initiative has been set up to protect and improve the native Scottish wildlife on and around the island.

The Initial Project

As part of this initiative, Bingham Sub-Aqua Club carried out an expedition to perform an initial survey of the island to ascertain the feasibility of an on-going project to survey and document the life on the shores of Carna over time.

The boundaries of the project were set as low water mark to 50m depth, with surveys limited to 50m from the low water mark. The geography of the island is such that a portion of this area is shallow, allowing for longer dive times, whereas the 50m wall to one end will limit diving times significantly.

On completion of the feasibility study, we are now able to determine the diving characteristics of the island, with a known number of sites that are of interest and need to be monitored going forward. At the start of the expedition, this was an ‘unknown site’, but now we have completed the initial survey, it may be

deemed that this becomes a 'known site' where diving can be supervised by Dive Leaders, allowing more of the Club's members to take part.

Aim of this Project

The aim of this project is to identify a number of sites around the island where a suitable on going survey can be carried out. The project will look at the biotope (physical habitat and biological communities) at different locations around the island, the logistics of working on the island, the scope for safe diving, and the requirements for the follow up surveys.

The Expedition

Six divers from Bingham Sub-Aqua Club took part in the trip: Caroline Bishop, Steve Bishop, Sean Gallagher, Andrew Shipley, Sue Shipley and Mike Verner. We stayed in Carna Cottage on the island. This put us close to the dive sites and allowed us to dive at the times that suited the tides around the island. We used a boat provided by Ardnamurchan Charters, a Pioner Multi, a rugged workboat with a bow door.

Steve Bishop, Sean Gallagher, Andrew Shipley and Sue Shipley are BSAC Advanced Divers, Caroline Bishop and Mike Verner are BSAC Sports Divers.

Dive sites were selected to give a representation of the island's surrounding seabed structure and sea life – the biotope. Day to day diving was dictated by the weather and the tide. It was initially felt that we would need to dive on slack water, although later in the week we dived nearer to mid-tide.

The diving carried out was speculative, i.e. we had no known sites to look for, just areas on the chart that looked interesting. Our brief was to look at the four compass points on the island, and this we achieved, adding in some extra areas.

Appendix 1 shows where the dive site was for each buddy pair, and for each day, along with the species encountered.

The Findings

In general, the Eastern side of the island, and the North Eastern tip have a variety of life from the low water mark down to about 10 – 15m, after which the seabed falls away in a muddy slope, populated by innumerable Squat Lobsters.

The Initial dives from the jetty provided us with a taste of the marine life to find. Although the jetty sits in the flow from Loch Sunart into Loch Teacius, it is relatively wide, and deep at this point, meaning that there is not a great flow of water, unlike the South Bay and Caol Achadh Lic, where the flow is faster causing scouring of the silt. The chains holding the jetty in place are home to a collection of Fluted Sea Squirts, amongst other things.

The Northern tip, extending along the Western shore to the '4m shelf' is more a slope of cobbles, boulders and a sand / shell bottom, again with a variety of marine life. From about 12m on the 4m shelf, the bottom appears to have been dredged, although we cannot say at what point this happened. It was here that we (Sean and Mike) found the Northern Feather Stars on the edge of the dredged section. A Chiton was also found when diving from the North bay.

The 4m shelf dive was carried out in two parts – Caroline and Steve dived from a shot in 6m out Westwards to a depth of 13.5m before turning North East to arrive back in 6m. Sean and Mike then carried on the dive going West then North East. A pod of Porpoise joined the boat during this dive, and once Sean and Mike had been recovered. They came so close to the boat that we could hear their breathing.

The dive carried out on Bo Crithean revealed a very muddy bottom, but with plenty of life living in the mud. This dive was short lived due to the nature of the bottom being disturbed, making visibility a problem.

The shallow dive in the South Bay at Caol Achadh Lic, and the drift from this bay towards 'Christmas Tree Island' showed a sand / shell seabed with cobbles and boulders. There was plenty of life to be found in and amongst the kelp and Bootlace weed. Being shallow (a maximum of 5.2m was recorded), and fast moving, there is a scouring action that prevents the channel from silting up, but allowing for a diverse population to thrive.

'The Sump' proved to be the most unexpected find of all. The shotline was placed in about 4m to the South end of the sump, and was in a Kelp Forest. The water was moving Northwards, as we were on an Ebbing tide. Passing into the actual sump showed a carpet of Black Brittle Stars, and what appeared to be sea grass. On closer inspection, the sea grass turned out to be a very dense Green Brittle Stars. There is a definite ecological boundary between the two species, crossed by Edible Crabs, who don't appear to be to choosy in their meal type. As a crab passed through the Green Brittle Stars, they moved swiftly out of it's way, showing some kind of recognition, or communication, as only those directly

affected moved. There were large Spiny and Seven-Armed Starfish within both communities, along with urchins, crabs and hermit crabs.

The dives on Rubha na h' Eaglaise Point were carried out in two directions from the shot. Sean and Mike went North and East, finding the edge mentioned above; Caroline and Steve went West into shallower water. It was here that Caroline found the Strawberry worm under a rock, and possibly a Sepulid worm.

Species Distribution

From the data gathered by the divers, we found that the predominant species identified around Carna were Edible and Hermit Crabs, occurring in 74% of the observations. Common Starfish and Common Sea Urchins were also quite prevalent in 68% and 58% of the dives respectively. Although King and Queen Scallops were found on 47% of the dives, they were always classified as 'rare' in that they were found in ones and twos. There were no large beds of Scallops found, although the area towards the west of the island (the 4m Shelf dives) showed signs of dredging, so there may have been a Scallop bed here.

The distribution of Brittle Stars shows them as only occurring in 11% of the dives. This relates to them being concentrated in one particular area – The Sump, with two other recordings elsewhere. The concentration of the Brittle Stars in this one area was of great interest, especially the line between the two different species (Black and Green).

One thing that was noted was the physical size of some of the species found. The Edible Crabs, Spiny Starfish and Seven-Armed Starfish seen in The Sump were considered to be large. One Spiny Starfish found off the North Bay was measured at 200mm along each arm (photograph at the end of the report).

The other interesting point that was made was the lack of fish found in the waters around the island. There were good numbers of different Goby, and the occasional Cuckoo Wrasse, but no other larger species.

We did manage to locate Northern Featherstars on one site, but as the site had been dredged, this might explain why only two individuals were found.

Species	Distribution
Edible Crabs	74%
Hermit Crabs	74%
Common Starfish	68%
Common Sea Urchins	58%
King Scallops	47%
Queen Scallops (Queenies)	47%
Squat Lobster	47%
Common Sunstar	47%
Spiny Starfish	47%
Velvet Swimming Crabs	42%
Kelp	37%
Sand Goby	37%
Bootlace Weed	32%
Anemone – Burrowing	32%
Harbour Crabs	32%
Two Spot Goby	26%
Sugar Kelp	21%
Anemone – White Mud	21%
Bloody Henry	21%
Brittle Star – White	21%
Common Feather Star	21%
Sea Squirt – Red	16%
Anemone – Snakelock	16%
Sea Pen	16%
Pennant's Swimming Crabs	16%
Brittle Star – Black	16%
Sea Squirt – Fluted	11%
Northern Sea Fan	11%
Strawberry Worm	11%
Dead Men's Fingers	11%
Anemone – Firework	11%
Sea Hare	11%
Whelks	11%
Seal	11%
Porpoise	11%

Species	Distribution
Brittle Star – Sand	11%
Brittle Star – Green	11%
Sand Star	11%
Cuckoo Wrasse	11%
Pipe Fish	11%
Sea Squirt - Shabby	5%
Mossy Featherweed	5%
Peacock Worm	5%
Serpulid Worm - Single	5%
Sea Slugs	5%
Chiton	5%
Devonshire Cupcorals	5%
Long Legged Spider Crab	5%
Shore Crab	5%
Common Prawn	5%
Norway Lobster	5%
Northern Feather Star	5%
Seven Armed Starfish	5%
Leopard Goby	5%
Goldsinny	5%
Plaice	5%
Thornback Ray	5%
Dogfish – Lesser Spotted	5%
Anemone – Plumose	0%

Species	Dive Site	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Kelp					4		4	4	4		4	4			4					
Sugar Kelp											4	4	4			4				
Bootlace Weed		4			4			2			4	4			4					
Sea Squirt – Fluted													4			4				
Sea Squirt – Red		4									4	4								
Sea Squirt - Shabby													2							
Northern Sea Fan					3			4												
Mossy Featherweed					4															
Peacock Worm							3													
Serpulid Worm - Single																		3		
Strawberry Worm														3	3					
Sea Slugs								2												
Dead Men's Fingers																	2	3		
Anemone – Burrowing					3	2	3				3	3			3					
Anemone – Firework					3									3						
Anemone – Plumose																				
Anemone – Snakelock											2	2	3							
Anemone – White Mud		2								4				4				4		
King Scallops			2	2			2			2		2	3	2		3		2		
Queen Scallops (Queenies)		3	2	2	3		2		2			2		2				2		

Sea Pen	3		3						3										
Chiton							1												
Sea Hare	3					3													
Devonshire Cupcorals					2														
Whelks						2		2											
Seal										1	1								
Porpoise																1	1		
Edible Crabs	3	3	2	2		3	2		2	2	2	3			3	3		3	2
Harbour Crabs	2	4	2			2							2				2		
Hermit Crabs	4	4	2	4	4	2	4	2				4		4	4	3		3	2
Long Legged Spider Crab						3													
Pennant's Swimming Crabs	4											4			4				
Shore Crab													4						
Velvet Swimming Crabs		4		3						4	4			4		3		3	2
Common Prawn						3													
Norway Lobster									4										
Squat Lobster	3		2		4		4		2			3			3	2	4		
Bloody Henry	3	2										3			3				
Brittle Star – Sand						2											3		
Brittle Star – Green																4		4	
Brittle Star – Black																4		4	4
Brittle Star – White							1									3		3	4
Common Feather Star				4	4	2	4												

Northern Feather Star																		2		
Common Starfish		4	4		4	4	2	4			4	4	4		2	4	2		2	
Common Sunstar		3			3	2	3		3				3			3	3		3	
Sand Star							3						2							
Spiny Starfish					3		2	2	2		2	2			2				2	3
Seven Armed Starfish																			2	
Common Sea Urchins		3			2		2	4			2	2	3			3		2	2	2
Cuckoo Wrasse					1			2												
Sand Goby		4	4		4			2					4		4	4				
Two Spot Goby		2			4	4			4				2							
Leopard Goby								2												
Goldsinny			3																	
Pipe Fish											1	1								
Plaice			2																	
Thornback Ray				3																
Dogfish – Lesser Spotted														3						
Species	Dive Site	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

4 = Common: 3 = Rare: 2 = Occasional: 1 = Present

Areas of Further Investigation

Future diving should look at the following areas:

The 4m shelf

To determine the rate at which the habitat is restored, and which species are early adopters, and which follow. We would need to set up a fixed datum for this, and survey the same are time and again to provide a longitudinal study of the regeneration.

The area between Carna, Oronsay and Risga

We feel that this area may provide the right habitat for the Flame Shells, and we certainly found Northern Feather Stars in this area.

The Sump

This feature needs further investigation: why do the two species not interact? What area does the Green Brittle Star carpet cover? Is the Green Brittle Star area completely surrounded by Black Brittle Stars?

Rubha na h' Eaglaise Point

Along with the Strawberry Worm, are there any Flame Shells in this area?

Conclusion

The aim of the expedition was to provide a baseline of species around the Isle of Carna, looking specifically for Flame Shell beds, Northern Featherstars and Serpulid Worm aggregations.

In the week we achieved 19 buddy pair dives with a total of 21 hours dive time. Of the three species we were looking for, we found Northern Featherstars, although only two individuals. We didn't locate a Flame Shell bed, although we may have been looking in the wrong area. We did find Serpulid worms, but they were single individuals, not an aggregation.

The baseline of species has been carried out, and with more work could be improved upon. Multiple dives on the same sites will show up species that were missed in the first dives.

The surprising discovery was of the Brittle Star carpet in The Sump, and the demarcation between the two species. This is something that requires further investigation, as does the recovery of the dredged seabed.

Appendix 1 – Dive Sites

Dive Site - 1	Date:	27/8/17
Carna Jetty	Time:	16:25
	L/W Tobermory	16:46
	Dive Time:	0:25
	Max. Depth:	6.0m
	Who:	Caroline Bishop
		Steve Bishop

General
Shakedown dive from jetty into 4m water.
Seabed littered with scallop shells under jetty.
Bottom muddy silt with abundance of Sugar Kelp and Bootlace Weed.
Route took us Eastwards along 6m contour to old bath, then back again.

Species			Species	
Kelp			Edible Crabs	R
Sugar Kelp			Harbour Crabs	O
Bootlace Weed	C		Hermit Crabs	C
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	C
Sea Squirt – Red	C		Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	R
Serpulid Worm - Single			Bloody Henry	R
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	C
Anemone – White Mud	O		Common Sunstar	R
King Scallops			Sand Star	
Queen Scallops (Queenies)	R		Spiny Starfish	
Sea Pen	R		Seven Armed Starfish	
Chiton			Common Sea Urchins	R
Sea Hare	R		Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	C
Whelks			Two Spot Goby	O
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 2	Date:	27/8/17
Carna Jetty	Time:	17:02
	L/W Tobermory	16:46
	Dive Time:	0:45
	Max.Depth:	8.3m
	Who:	Andrew Shipley
		Susan Shipley

General
Shakedown dive from jetty into 4m water.
Seabed littered with scallop shells under jetty.
Bottom muddy silt with abundance of Sugar Kelp and Bootlace Weed.
Route past low rocks, anchor and bath.

Species			Species	
Kelp			Edible Crabs	R
Sugar Kelp			Harbour Crabs	C
Bootlace Weed			Hermit Crabs	C
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	C
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	
Serpulid Worm - Single			Bloody Henry	O
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	C
Anemone – White Mud			Common Sunstar	
King Scallops	O		Sand Star	
Queen Scallops (Queenies)	O		Spiny Starfish	
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	C
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise			Goldsinny	R
			Pipe Fish	
			Plaice	O
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 3	Date:	27/8/17
Carna Jetty	Time:	17:40
	L/W Tobermory	16:46
	Dive Time:	0:31
	Max Depth:	14.0m
	Who:	Sean Gallagher
		Mike Verner

General
Shoal of 2 spot Goby beneath the jetty.

Species			Species	
Kelp			Edible Crabs	O
Sugar Kelp			Harbour Crabs	O
Bootlace Weed			Hermit Crabs	O
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	O
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	
Anemone – White Mud			Common Sunstar	
King Scallops	O		Sand Star	
Queen Scallops (Queenies)	O		Spiny Starfish	
Sea Pen	R		Seven Armed Starfish	
Chiton			Common Sea Urchins	
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	R
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 4	Date:	28/8/17
Carna North Bay	Time:	16:00
	L/W Tobermory	17:46
	Dive Time:	0:32
	Max. Depth:	5.7m
	Who:	Caroline Bishop
		Steve Bishop

General

Species			Species	
Kelp	C		Edible Crabs	O
Sugar Kelp			Harbour Crabs	
Bootlace Weed	C		Hermit Crabs	C
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	R
Northern Sea Fan	R		Common Prawn	
Mossy Featherweed	C		Norway Lobster	
Peacock Worm			Squat Lobster	
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing	R		Brittle Star – White	
Anemone – Firework	R		Common Feather Star	C
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	C
Anemone – White Mud			Common Sunstar	R
King Scallops			Sand Star	
Queen Scallops (Queenies)	R		Spiny Starfish	R
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	O
Sea Hare			Cuckoo Wrasse	P
Devonshire Cupcorals			Sand Goby	C
Whelks			Two Spot Goby	C
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 5	Date:	28/8/17
Carna North Bay	Time:	17:30
	L/W Tobermory	17:46
	Dive Time:	0:45
	Max. Depth:	17.3m
	Who:	Andrew Shipley
		Susan Shipley

General
Down over sandy bottom with occasional low rocks and seaweed.

Species			Species	
Kelp			Edible Crabs	
Sugar Kelp			Harbour Crabs	
Bootlace Weed			Hermit Crabs	C
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	C
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing	O		Brittle Star – White	
Anemone – Firework			Common Feather Star	C
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	C
Anemone – White Mud			Common Sunstar	O
King Scallops			Sand Star	
Queen Scallops (Queenies)			Spiny Starfish	
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals	O		Sand Goby	
Whelks			Two Spot Goby	C
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 6	Date:	28/8/17
Carna North Bay	Time:	16:00
	L/W Tobermory	17:46
	Dive Time:	0:40
	Max. Depth:	12.0m
	Who:	Sean Gallagher
		Mike Verner

General
Gradual slope over shell / sand / rocks with kelp.

Species			Species	
Kelp	C		Edible Crabs	R
Sugar Kelp			Harbour Crabs	O
Bootlace Weed			Hermit Crabs	O
			Long Legged Spider Crab	R
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	R
Mossy Featherweed			Norway Lobster	
Peacock Worm	R		Squat Lobster	
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	O
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing	R		Brittle Star – White	
Anemone – Firework			Common Feather Star	O
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	O
Anemone – White Mud			Common Sunstar	R
King Scallops	O		Sand Star	R
Queen Scallops (Queenies)	O		Spiny Starfish	O
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	O
Sea Hare	R		Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks	O		Two Spot Goby	
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 7	Date:	29/8/17
Carna North Bay	Time:	12:25
	L/W Tobermory	18:19
	Dive Time:	0:52
	Max. Depth:	20.0m
	Who:	Steve Bishop
		Sean Gallagher
		Mike Verner

General
Slopes down through Kelp and Bootlace weed on muddy bottom with occasional boulders and patches of sand. At about 10m, descends into muddy slope covered with Squat Lobster burrows.
Abundant marine life on clean ground (not silty).

Species			Species	
Kelp	C		Edible Crabs	O
Sugar Kelp			Harbour Crabs	
Bootlace Weed	O		Hermit Crabs	C
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan	C		Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	C
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs	O		Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	P
Anemone – Firework			Common Feather Star	C
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	C
Anemone – White Mud			Common Sunstar	
King Scallops			Sand Star	
Queen Scallops (Queenies)			Spiny Starfish	O
Sea Pen			Seven Armed Starfish	
Chiton	P		Common Sea Urchins	C
Sea Hare			Cuckoo Wrasse	O
Devonshire Cupcorals			Sand Goby	O
Whelks			Two Spot Goby	
Seal			Leopard Goby	O
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 8	Date:	29/8/17
Carna North Bay	Time:	10:57
	L/W Tobermory	18:19
	Dive Time:	0:50
	Max. Depth:	12.8m
	Who:	Andrew Shipley
		Susan Shipley

General
Through Kelp, over a ledge through a boulder field to a muddy slope.

Species			Species	
Kelp	C		Edible Crabs	
Sugar Kelp			Harbour Crabs	
Bootlace Weed			Hermit Crabs	O
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	
Anemone – White Mud			Common Sunstar	R
King Scallops			Sand Star	
Queen Scallops (Queenies)	O		Spiny Starfish	O
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks	O		Two Spot Goby	C
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 9	Date:	28/8/17
Bo Crithean	Time:	14:17
	L/W Tobermory	19:36
	Dive Time:	0:16
	Max. Depth:	21.0m
	Who:	Sean Gallagher
		Mike Verner

General
Abundant marine life on silt.

Species			Species	
Kelp			Edible Crabs	O
Sugar Kelp			Harbour Crabs	
Bootlace Weed			Hermit Crabs	
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	C
Peacock Worm			Squat Lobster	O
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	
Anemone – White Mud	C		Common Sunstar	
King Scallops	O		Sand Star	
Queen Scallops (Queenies)			Spiny Starfish	
Sea Pen	R		Seven Armed Starfish	
Chiton			Common Sea Urchins	
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 10	Date:	30/8/17
South Bay – Caol Achadh Lic	Time:	16:25
	L/W Tobermory	19:36
	Dive Time:	0:30
	Max. Depth:	4.0m
	Who:	Caroline Bishop
		Steve Bishop

General
Very shallow dive through Kelp and Bootlace weed into tidal flow. Bottom starts muddy, but becomes sandy with boulders.

Species			Species	
Kelp	C		Edible Crabs	O
Sugar Kelp	C		Harbour Crabs	
Bootlace Weed	C		Hermit Crabs	
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red	C		Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	C
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing	R		Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock	O		Common Starfish	C
Anemone – White Mud			Common Sunstar	
King Scallops			Sand Star	
Queen Scallops (Queenies)			Spiny Starfish	O
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	O
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks			Two Spot Goby	
Seal	P		Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	P
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 11	Date:	30/8/17
Caol Achadh Lic Drift	Time:	16:25
	L/W Tobermory	19:36
	Dive Time:	0:30
	Max. Depth:	5.2m
	Who:	Steve Bishop
		Mike Verner

General
Fast drift from South Bay to Christmas Tree Island.

Species			Species	
Kelp	C		Edible Crabs	O
Sugar Kelp	C		Harbour Crabs	
Bootlace Weed	C		Hermit Crabs	
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red	C		Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	C
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing	R		Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock	O		Common Starfish	C
Anemone – White Mud			Common Sunstar	
King Scallops	O		Sand Star	
Queen Scallops (Queenies)	O		Spiny Starfish	O
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	O
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks			Two Spot Goby	
Seal	P		Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	P
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 12	Date:	30/8/17
Carna Jetty	Time:	19:00
	L/W Tobermory	19:36
	Dive Time:	0:19
	Max. Depth:	11.6m
	Who:	Caroline Bishop
		Sean Gallagher

General
Shoal of pelagic 2 spot Gobies under jetty. Old anchor covered in sea squirts.

Species			Species	
Kelp			Edible Crabs	R
Sugar Kelp	C		Harbour Crabs	
Bootlace Weed			Hermit Crabs	C
			Long Legged Spider Crab	
Sea Squirt – Fluted	C		Pennant's Swimming Crabs	C
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby	O		Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	R
Serpulid Worm - Single			Bloody Henry	R
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock	R		Common Starfish	C
Anemone – White Mud			Common Sunstar	R
King Scallops	R		Sand Star	O
Queen Scallops (Queenies)			Spiny Starfish	
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	R
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	C
Whelks			Two Spot Goby	O
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 13	Date:	31/8/17
Rubha na h' Eaglaise Point	Time:	10:45
	L/W Tobermory	08:23
	Dive Time:	0:32
	Max. Depth:	11.7m
	Who:	Sean Gallagher
		Mike Verner

General
Rocky ground soon gave way to silt slope.
Unusual in that at depth of 10m, shore crabs common on the slit.
Lots of mud life generally.
Filament brown algae on mud surface.

Species			Species	
Kelp			Edible Crabs	
Sugar Kelp			Harbour Crabs	O
Bootlace Weed			Hermit Crabs	
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	C
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm	R		Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	
Anemone – Firework	R		Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	
Anemone – White Mud	C		Common Sunstar	
King Scallops	O		Sand Star	
Queen Scallops (Queenies)	O		Spiny Starfish	
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	R

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 14	Date:	31/8/17
Rubha na h' Eaglaise Point	Time:	11:42
	L/W Tobermory	08:23
	Dive Time:	0:28
	Max. Depth:	7.5m
	Who:	Caroline Bishop
		Steve Bishop

General
Took Easterly direction from shotline into shallower water.
Bottom remained muddy, but had some boulders and rocks.

Species			Species	
Kelp	C		Edible Crabs	
Sugar Kelp			Harbour Crabs	
Bootlace Weed	C		Hermit Crabs	C
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	C
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm	R		Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing	R		Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	O
Anemone – White Mud			Common Sunstar	
King Scallops			Sand Star	
Queen Scallops (Queenies)			Spiny Starfish	O
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	C
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 15	Date:	31/8/17
The Sump	Time:	17:40
	L/W Tobermory	08:23
	Dive Time:	0:12
	Max. Depth:	10.7m
	Who:	Caroline Bishop
		Steve Bishop

General
Shotline was in 4m at Southern end of the Sump. Dived through Kelp to edge of sump, then into still water. Layer of silt sitting about 1 – 2m over bottom, possibly on a halocline.
Bottom of sump covered in two species of Brittle Stars – green and black, each on its own side of an invisible line.
Dive cut short as Caroline had a free-flow on the way in.

Species			Species	
Kelp			Edible Crabs	R
Sugar Kelp	C		Harbour Crabs	
Bootlace Weed			Hermit Crabs	C
			Long Legged Spider Crab	
Sea Squirt – Fluted	C		Pennant's Swimming Crabs	C
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	R
Serpulid Worm - Single			Bloody Henry	R
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	C
Anemone – White Mud			Common Sunstar	R
King Scallops	R		Sand Star	
Queen Scallops (Queenies)			Spiny Starfish	
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	R
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	C
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

Dive Site - 16	Date:	1/9/17
Carna 4m Shelf	Time:	09:33
	L/W Tobermory	09:50
	Dive Time:	0:31
	Max. Depth:	13.5m
	Who:	Caroline Bishop
		Steve Bishop

General
Slope down to 10-12m with life. Bottom after had been dredged, so little life left.
Needs monitoring for recovery.

Species			Species	
Kelp			Edible Crabs	R
Sugar Kelp			Harbour Crabs	
Bootlace Weed			Hermit Crabs	R
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	R
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	O
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	C
Dead Men's Fingers	O		Brittle Star – Black	C
Anemone – Burrowing			Brittle Star – White	R
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	O
Anemone – White Mud			Common Sunstar	R
King Scallops			Sand Star	
Queen Scallops (Queenies)			Spiny Starfish	
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise	P		Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

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Dive Site - 17	Date:	1/9/17
Carna 4m Shelf	Time:	10:37
	L/W Tobermory	09:50
	Dive Time:	0:44
	Max. Depth:	17.4m
	Who:	Sean Gallagher
		Mike Verner

General
Relatively 'clean ground'.
Lots of life.
Occasional Northern Feather Stars (with long 'legs').

Species			Species	
Kelp			Edible Crabs	
Sugar Kelp			Harbour Crabs	O
Bootlace Weed			Hermit Crabs	
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	C
Serpulid Worm - Single	R		Bloody Henry	
Strawberry Worm			Brittle Star – Sand	R
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers	R		Brittle Star – Black	
Anemone – Burrowing			Brittle Star – White	
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	O
Anemone – Snakelock			Common Starfish	
Anemone –White Mud	C		Common Sunstar	
King Scallop	O		Sand Star	
Queen Scallops (Queenies)	O		Spiny Starfish	
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	O
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise	P		Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

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Dive Site - 18	Date:	1/9/17
The Sump	Time:	15:50
	L/W Tobermory	09:50
	Dive Time:	0:33
	Max. Depth:	14.8m
	Who:	Caroline Bishop
		Steve Bishop

General
Longer dive in the sump.
Tracked North, North East, across unending carpet of Green Brittle Stars. They appear as a carpet, but can move quickly out of the way if an Edible Crab makes its way into them.
Large 7-armed Starfish also found – arms up to 300mm each. Spiny Starfish of similar size also observed.

Species			Species	
Kelp			Edible Crabs	R
Sugar Kelp			Harbour Crabs	
Bootlace Weed			Hermit Crabs	R
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	R
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	C
Dead Men's Fingers			Brittle Star – Black	C
Anemone – Burrowing			Brittle Star – White	R
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	O
Anemone – White Mud			Common Sunstar	R
King Scallops			Sand Star	
Queen Scallops (Queenies)			Spiny Starfish	O
Sea Pen			Seven Armed Starfish	O
Chiton			Common Sea Urchins	O
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

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Dive Site - 19	Date:	1/9/17
The Sump	Time:	16:48
	L/W Tobermory	09:50
	Dive Time:	0:32
	Max. Depth:	15.2m
	Who:	Sean Gallagher
		Mike Verner

General
Seabed covered in Brittle Stars (millions) with clear demarcation between common and black species.

Species			Species	
Kelp			Edible Crabs	O
Sugar Kelp			Harbour Crabs	
Bootlace Weed			Hermit Crabs	O
			Long Legged Spider Crab	
Sea Squirt – Fluted			Pennant's Swimming Crabs	
Sea Squirt – Red			Shore Crab	
Sea Squirt - Shabby			Velvet Swimming Crabs	O
Northern Sea Fan			Common Prawn	
Mossy Featherweed			Norway Lobster	
Peacock Worm			Squat Lobster	
Serpulid Worm - Single			Bloody Henry	
Strawberry Worm			Brittle Star – Sand	
Sea Slugs			Brittle Star – Green	
Dead Men's Fingers			Brittle Star – Black	C
Anemone – Burrowing			Brittle Star – White	C
Anemone – Firework			Common Feather Star	
Anemone – Plumose			Northern Feather Star	
Anemone – Snakelock			Common Starfish	
Anemone – White Mud			Common Sunstar	
King Scallops			Sand Star	
Queen Scallops (Queenies)			Spiny Starfish	R
Sea Pen			Seven Armed Starfish	
Chiton			Common Sea Urchins	O
Sea Hare			Cuckoo Wrasse	
Devonshire Cupcorals			Sand Goby	
Whelks			Two Spot Goby	
Seal			Leopard Goby	
Porpoise			Goldsinny	
			Pipe Fish	
			Plaice	
			Thornback Ray	
			Dogfish – Lesser Spotted	

C = Common: R = Rare: O = Occasional: P = Present

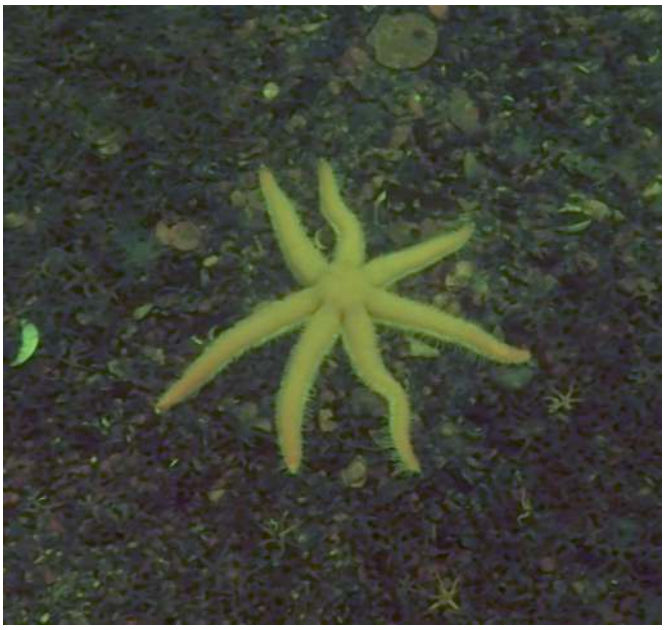
Appendix 2 – Species Distribution across Dive Sites

Species / Dive Site	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Kelp				C		C	C	C		C	C			C					
Sugar Kelp										C	C	C			C				
Bootlace Weed	C			C			O			C	C			C					
Sea Squirt – Fluted												C			C				
Sea Squirt – Red	C									C	C								
Sea Squirt - Shabby												O							
Northern Sea Fan				R			C												
Mossy Featherweed				C															
Peacock Worm						R													
Serpulid Worm - Single																	R		
Strawberry Worm													R	R					
Sea Slugs							O												
Dead Men's Fingers																O	R		
Anemone – Burrowing				R	O	R				R	R			R					
Anemone – Firework				R									R						
Anemone – Plumose																			
Anemone – Snakelock										O	O	R							
Anemone – White Mud	O								C				C				C		
King Scallops		O	O			O			O		O	R	O		R		O		
Queen Scallops (Queenies)	R	O	O	R		O		O			O		O				O		
Sea Pen	R		R						R										
Chiton							P												
Sea Hare	R					R													
Devonshire Cupcorals					O														
Whelks						O		O											
Seal										P	P								
Porpoise																P	P		
Edible Crabs	R	R	O	O		R	O		O	O	O	R			R	R		R	O
Harbour Crabs	O	C	O			O							O				O		
Hermit Crabs	C	C	O	C	C	O	C	O				C		C	C	R		R	O
Long Legged Spider Crab						R													
Pennant's Swimming Crabs	C											C			C				
Shore Crab													C						

Velvet Swimming Crabs		C		R						C	C			C		R		R	O
Common Prawn						R													
Norway Lobster									C										
Squat Lobster	R		O		C		C		O			R			R	O	C		
Bloody Henry	R	O										R			R				
Brittle Star – Sand						O											R		
Brittle Star – Green																C		C	
Brittle Star – Black																C		C	C
Brittle Star – White							P									R		R	C
Common Feather Star				C	C	O	C												
Northern Feather Star																	O		
Common Starfish	C	C		C	C	O	C			C	C	C		O	C	O		O	
Common Sunstar	R			R	O	R		R				R			R	R		R	
Sand Star						R						O							
Spiny Starfish				R		O	O	O		O	O			O				O	R
Seven Armed Starfish																		O	
Common Sea Urchins	R			O		O	C			O	O	R			R		O	O	O
Cuckoo Wrasse				P			O												
Sand Goby	C	C		C			O					C		C	C				
Two Spot Goby	O			C	C			C				O							
Leopard Goby							O												
Goldsinny		R																	
Pipe Fish										P	P								
Plaice		O																	
Thornback Ray			R																
Dogfish – Lesser Spotted													R						
Species / Dive Site	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

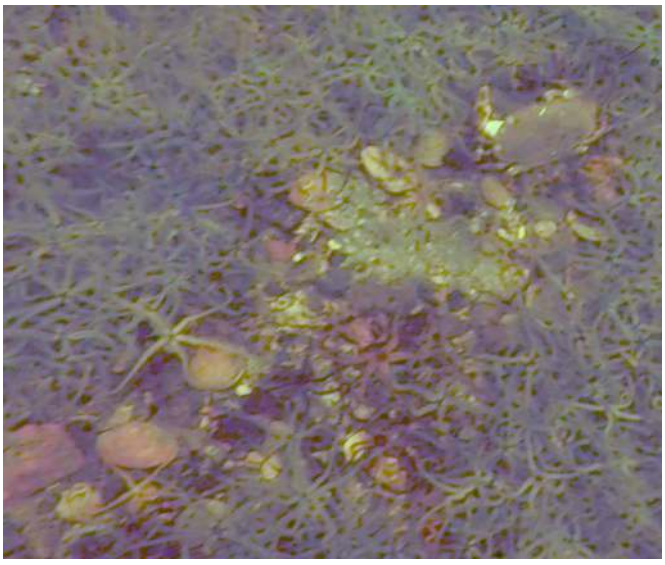
Appendix 3 – Some Photographs taken from the Go-Pro footage

Seven Armed Starfish.
Taken in The Sump.
Colour Adjusted.



Seven Armed Starfish and
Spiny Starfish on boundary of
Black and Green Brittle Stars.
Taken in The Sump.
Colour Adjusted.

Edible Crab making its way through the Green Brittle Star carpet.
Taken in The Sump.
Colour Adjusted.



Caroline on boundary of Black and Green Brittle Stars.
Taken in The Sump.
Colour Adjusted.

Edible Crab and Common Sunstart on boundary of Black and Green Brittle Stars.
Taken in The Sump.
Colour Adjusted.

Enclave of Black Brittle Stars in carpet of Green Brittle Stars.
Taken in The Sump.
Colour Adjusted.

Spiny Starfish.
Taken on The 4m Shelf.
Colour Adjusted.

Common Urchin and Squat Lobster.
Taken on The 4m Shelf.
Colour Adjusted.

Swimming Crab.
Taken off South Bay.
Colour Adjusted.

Feather Stars and Spiny Starfish in weed.
Taken off South Bay.
Colour Adjusted.

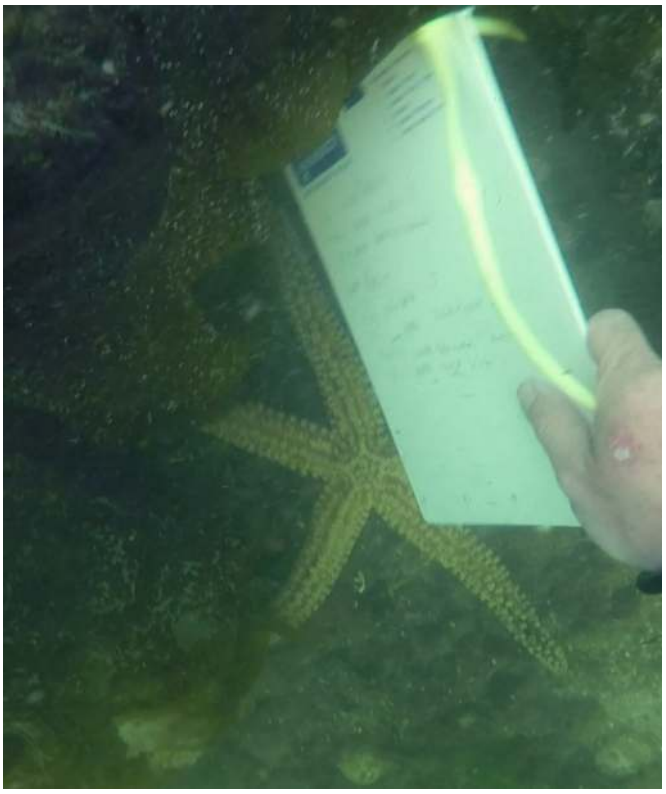
Chiton on a boulder.
Taken off North Bay.
Colour Adjusted.

Feather Stars.
Taken off North Bay.
Colour Adjusted.

Feather Stars.
Taken off North Bay.
Colour Adjusted.

Brittle Star.
Taken off North Bay.
Colour Adjusted.

Brittle Star.
Taken off North Bay.
Colour Adjusted.



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