

# Community Marine Monitoring Demonstration Event



SAMS, Oban  
11<sup>th</sup> -12<sup>th</sup> June 2019



WILLIAM GRANT  
FOUNDATION

Coastal Communities Network  
Scotland

# Event Programme

## Day 1 – Tuesday 11<sup>th</sup> June 2019

| Time  | Description   |
|-------|---|
| 10:30 | Welcome Presentation  |
| 11:00 | <p><a href="#"><u>Session 1: Community-led monitoring in action</u></a><br/>           CAOLAS citizen science project Mark Woombs<br/>           Seasearch Scotland Owen Paisley<br/>           Rocky shore survey in Little Loch Broom Pat Brunton</p> |
| 12:30 | <b>Lunch</b>  |
| 13:30 | <p><a href="#"><u>Session 2: Survey Planning</u></a><br/>           Marine data demo and survey planning workshop</p>   |
| 14:45 | <b>Tea &amp; Coffee</b>   |
| 15:00 | <p><a href="#"><u>Session 3: Drop Down Video Systems (DDV)</u></a><br/>           Outdoor demonstrations of drop down video systems.</p>  |
| 16:45 | <b>Reflections</b>  |
| 17:15 | <b>Day end</b>  |
| 19:30 | Evening Dinner - Oban   |

## Day 2 – Wednesday 12<sup>th</sup> June 2019

| Time  | Description   |
|-------|---|
| 09:00 | <p><a href="#"><u>Session 4: Intertidal Rocky Shore</u></a><br/>           Outdoors – live participant survey.<br/>           Dunstaffnage community rocky shore survey</p>                         |
| 11:00 | <b>Reflections</b>  |
| 11:45 | MSc community research project Josie Williams   |
| 12:00 | <b>Lunch</b>  |
| 12:45 | <p><a href="#"><u>Session 5: Remotely Operated Vehicles (ROV)</u></a><br/>           ROVs for Community Monitoring SSSI<br/>           Outdoor demonstrations of ROV and drop down camera pole.</p> |
| 14:45 | <b>Tea &amp; Coffee</b>   |
| 15:00 | <p><a href="#"><u>Session 6: Community Led Monitoring Project – what's next?</u></a><br/>           Discussions facilitated session reflections</p>   |
| 16:00 | <b>Day end</b>  |

## Background

Coastal communities, local groups and individuals around Scotland's coast are well-placed to lead on the active stewardship of their associated marine environment, and have expressed greater participation in the decisions that affect its management. Indeed, many communities are already actively involved in the marine surveying of their inshore areas, and the collection of information and evidence that underpins marine management decisions.

Through this collaborative community marine monitoring project - a partnership between Scottish Natural Heritage (SNH), Fauna & Flora International (FFI), coastal communities, local groups and individuals (with support of funding from the William Grant Foundation\*) - we aim to enhance participation in community collection of marine data, through the surveying and monitoring of local inshore waters.

The first phase of the project aims to co-produce a set of marine biodiversity survey methodologies, tailored to community needs and capabilities, and aided by the delivery of a community marine biodiversity monitoring handbook. This demonstration event was held to support the development of community skills and knowledge, to trial equipment and provide some hands-on knowledge exchange between coastal communities, and to aid the final production of the handbook.

### **Post event community group monitoring actions:**

- COAST has got their ROV wet in the water and are in the process of commissioning it. They have a new MPA Project Officer starting soon who can engage further with surveying.
- Fairlie Coastal Trust has put an ROV in the water for the first time to investigate dredging damage.
- SSSI members are excited to continue their adventure exploring the seabed with their ROV and have since discovered another patch of seagrass in their loch system. Gavin from SSSI has successfully made a drop down GoPro cam and is looking at building on this with the potential for kayaking with a GoPro cam. The group have also started looking into data storage systems and have opened dialogue with DASHH and MEDIN.
- Little Loch Broom has discussed the need to meet and create a project plan for their community group marine survey and monitoring
- The St Abbs and Eyemouth VMR has a new coordinator starting very soon who can engage the reserve in the project further. The rangers have also made a drop-down camera on a pole. They have tested it out in shallow and deeper waters and are excited about the prospect of using the drop down cam as an engagement tool with visitors. Specifically, to let visitors see what is below the seabed on boat trips as an alternative to them currently using photographs

*\*The William Grant Foundation is a non-profit association established to support charitable causes in Scotland. Its work is funded by William Grant and Sons Ltd.*

## **Presentations**

### **CAOLAS citizen science project**

*Mark Woombs, CAOLAS*

CAOLAS has recently started a new citizen science project to get the local community to the shoreline, surveying the intertidal rocky reefs of the west coast. This project has been developed by Mark Woombs, and the CAOLAS team, with support from Fauna & Flora International and the Sunart Community Company. The project contains a programme of training, which is provided by local marine ecology expert Mark Woombs, before the community begin undertaking surveys. The training which is provided equips the participants with identification and survey skills, providing a foundation of rocky shore knowledge to undertake detailed surveys. This is followed by undertaking rocky reef surveys with experts on hand to assist with the survey and marine species identification.

This project connects participants with the spectacular and diverse marine features in the area, from protected serpulid aggregations and wig wrack beds. The project started in June 2019, with many training and survey days' planned, throughout multiple west coast locations over the summer months. These include Kilchoan on the Ardnamurchan Peninsula and Strontian in Sunart. It was great to hear about the CAOLAS project at this early stage and we look forward to watching it develop and hearing all about the survey findings and outcomes.

### **Seasearch Scotland**

*Owen Paisley, Seasearch*

As the Seasearch West Coast coordinator, Owen introduced the fundamentals of the Seasearch diving survey programme, from getting involved in the programme by diving or snorkelling to the different difficulty levels of surveys. The Seasearch programme has been established for 30 years and volunteer divers submit around 100-200 survey forms per year in recent years. To support the programme training courses are run every year for both their observer and surveyor levels.

We heard about the logistics of undertaking and coordinating diving surveys and about the work Seasearch has supported within local community groups, such as with snorkelling courses on Arran and diving surveys in Wester Ross.

## Rocky shore survey in Little Loch Broom

*Pat Brunton, Little Loch Broom Marine Life*

Little Loch Broom Marine Life is a new community group formed around a love for the ocean and an interest to get involved in marine survey and monitoring to explore the amazing marine creatures of Little Loch Broom. They undertook their first rocky shore survey in April at Durnamuck on a very low tide.



A total of 13 adults and 5 children came along to the shore enthused to explore and get involved in the survey that was organised by Sue Pomeroy. The highlight of the survey was the high diversity and abundance of marine life found, such as species of crab that have not been documented in the area previously. Pat finished with a thought provoking SWOT analysis of their group's marine survey project.

The group are keen to complete more rocky shore surveys and get involved in snorkelling surveys very soon.

## Masters (MSc) community research project

*Josie Williams and Peter Cunningham, Edinburgh University & SWFT*

Local communities proposed a series of research projects that they would like investigated in their local area by university MSc students. Josie Williams undertook one of these projects in Wester Ross with support from the local community, in particular Peter Cunningham and Sara Nason. Josie's research was focussed on maerl and associated biodiversity monitoring in the Wester Ross MPA.



Josie and Peter discussed their survey technique using a drop down camera for undertaking maerl transects and using a baited remote underwater video (BRUV) system to survey fish diversity and abundance associated with maerl beds. This included a taster of some of the footage they captured on the video systems, sharing the obstacles they had to overcome along the way and resulting successes to complete their survey work.

Josie will complete her research report in the months to come and is keen to continue her work with the community in Wester Ross in the future.

## **ROVs in community monitoring**

*Eileen Armstrong and Gavin Malarky, South Skye Seas initiative*

Eileen from South Skye Seas initiative (SSSi) took us through the journey that SSSi have been on, from previously directing their efforts around risks of commercial development to focussing their efforts on biological recording, habitat mapping and ecological research. This was made possible by the purchase of an underwater remotely operated vehicle (ROV) with funding support from SNH, William Grant Foundation and the generosity of an individual. The ROV is enabling the group to survey and monitor the sea bed of their local sea loch system. While this is the beginning of their journey they have had success of finding a seagrass bed on their first ROV launch from a boat.



Image ©Cecilie Dohm.

Gavin introduced how to use the ROV and underwater GPS system and provided examples of the footage they are capturing using this system. This was followed by a live demo of the kit in the ROV practical session.



## Workshop Sessions

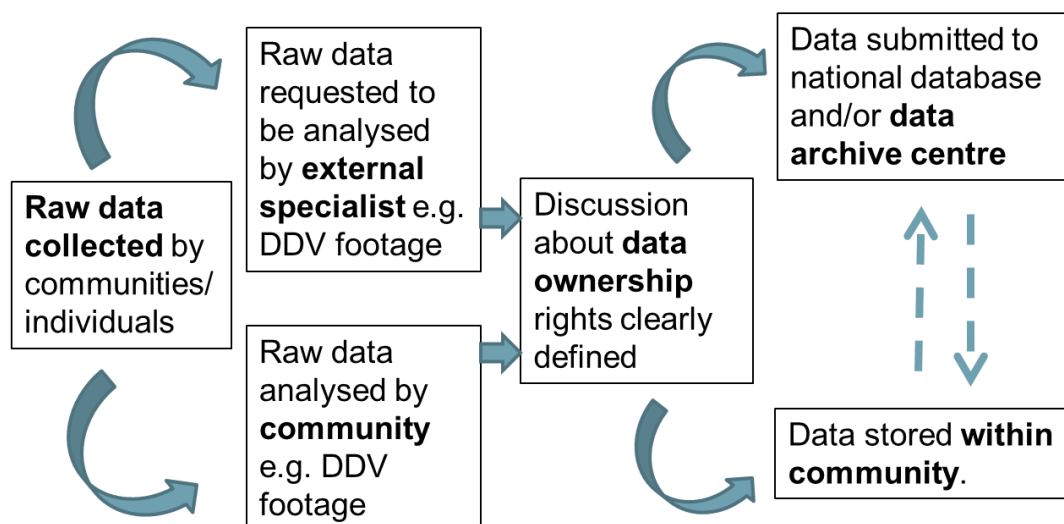
### Session 2: Marine Data and Survey Planning

#### Part 1: Marine Data

Within this session Rona Sinclair, SNH marine data officer, ran through marine data fundamentals, including:

- ✓ Robust methodologies – instil **confidence** in data quality and lineage
- ✓ Well recorded – **consistent** and **accurate** data & metadata
- ✓ Quality assured – **reliable**
- ✓ Re-usable - **accessible** and **available** to others
- ✓ Fit for purpose

There was a brief introduction to using [MEDIN](#) as a tool for good data management and data achieving centres, such as [DASSH](#) to store and achieving data.



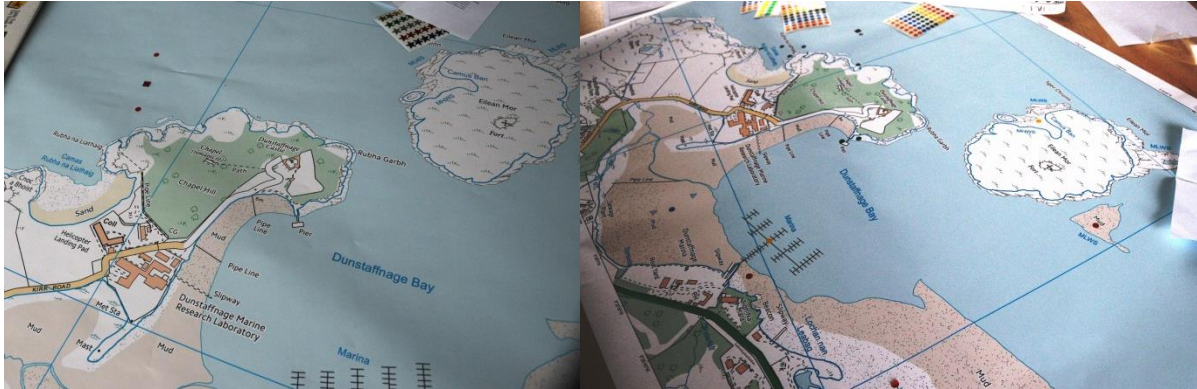
**Fig 1:** Diagram of potential of data flows for community survey data.

#### Part 2: Survey Planning

In this session participants worked in groups to create a survey plan for the Dunstaffnage area, considering:

- ✓ Survey aim
- ✓ Station selection (what and where)
- ✓ Survey methods (DDV, intertidal etc)
- ✓ Logistics and H&S considerations

Groups were provided this an A0 map of the area with the known location of Priority Marine Features (PMFs) within the area labelled on the map. Groups were to label their map with survey stations that they would like to survey as part of a survey plan.



**Fig 2:** Map of survey stations that a groups would be interested to survey in the Dunstaffnage area. Image on the left group 1, right group 2. Images ©Owen McGrath.

The two groups went about planning the survey in different ways, one group focussing on one known feature to survey (kelp) while the second group focussed on planning to survey a large area to answer a specific research question.

**Group 1 Aim:**

Determine the extend & condition of the kelp beds

**Group 2 Aim:**

Option 1: is the increase in activity in the marina having an impact on biodiversity of species?

Option 2: Find what species and habitats are present in shallow waters off the shore.



### Session 3: Drop Down Video Systems (DDV)

In this session participants were split into two stations, one station demonstrating the purpose-made community drop down video system and the other session looking at the SNH drop down video system.

#### **SNH DDV Kit Summary**

- GoPro in a robust aluminium housing
- Metal sled frame
- Requires generator to power the surface control and provide power down to the drop down video by a 150m tether
- 400W LED Underwater lights
- Two lasers to determine scale
- Depth sensor
- GPS information from the boat position
- GPS (Lat & Long) and Depth Overlay



**Fig 3:** SNH Drop-down video system. Image ©Cecilie Dohm.

### Community DDV Kit Summary

- Custom built Blue Robotics Blue ROV2 (without any thrusters but setup for camera /lights only use)
- Depth rated to 100m
- Battery life ~6hours with lights at 75%– quick swappable batteries
- Lights – 1500 lumens and 135 degree beam angle
- 150m Tether – Kevlar weight bearing to 45kg, slightly positive
- Depth and temperature sensor
- Camera 1080p HD Video, 110 degrees field of view and tilt range of +/- 90 degree
- Topside device requires “A computer with at least 8Gb RAM, an SSD, Nvidia or AMD graphics and an i5 or better CPU” –Windows 10 Surface Pro 6 tablet used
- Gaming style hand controller for camera tilt and lights dim/bright
- system set up in a hard plastic frame
- Software uses free Blue ROV system which is easy to use and has depth, temp, Lat/Long etc overlay

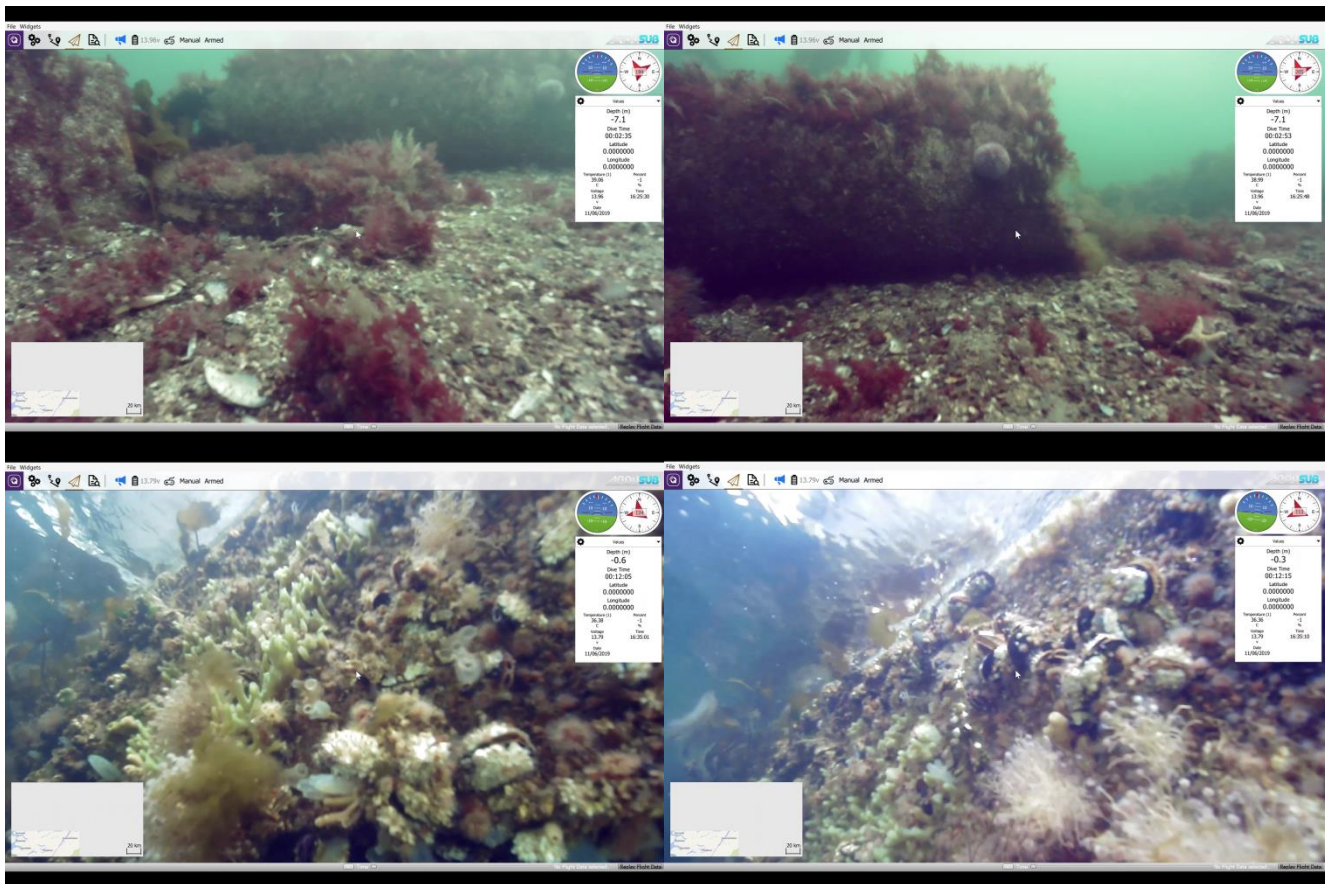
#### **Price** – estimated cost

|  |                   |
|--|-------------------|
| DDV system including everything required excluding laptop/tablet & GPS | £2700 + VAT       |
| Tablet - Windows 10 Surface Pro 6                                      | £800              |
| GPS Receiver   | £36               |
| <b><u>TOTAL</u></b>  | <b>£3536 +VAT</b> |



**Fig. 4:** Images of the DDV system. Image on left: participants using community DDV, image on right: photo of community DDV system. Images ©Owen McGrath & Caitlin Orr.





**Fig. 5:** Screen grabs of the video footage collected at the demonstration using the community DDV system.

**DDV Reflections:**

**Table 1:** Participants reflected on the pros and cons of community use of DDV for marine surveying.

| Pros   | Cons  |
|--|---|
| Light and portable                             | Fragile incl. hardware, software and laptop ruggedness                            |
| HD Camera provides good quality footage        | Inability to control direction camera moves                                       |
| Can be used in deep water                      | Time consuming to cover an area   |
| Unlikely to get tangled                        | Not 100% positioning  |
| Easy to get GPS position of camera             | Requires a boat to use (boat used will need to be coded, legal + cost associated) |
| Safe   | Limited access to shallow areas   |
| Easy to use with simple training               | Heavy system  |
| Good battery life                              | Could be cumbersome to use  |
| Live feed of footage to the surface underwater |   |

## Session 4: Intertidal Rocky Shore

This session was a live community survey of the Dunstaffnage rocky shore. The purpose of this session was to test the survey methods created for the handbook, provide an opportunity for participants to practice skills in undertaking and organising a rocky shore surveys and test the potential to use the [iNaturalist](#) app for species ID and community quality assurance.

Participants met at Dunstaffnage castle at 9am, read and familiarised themselves with the survey methods and worked in a group to determine a plan for the survey before heading to the shore.

The survey consisted with 3 different methods that are intended to be used to complement each other; rocky reef zonation survey, advanced add-on 1 – shore profile, advanced add-on 2 – quadrat sampling. The advanced methods should be used in conjunction with completing the entry-level rocky reef zonation survey.

The participants split into 2 groups to complete the survey, both selecting to complete all 3 methods within the 1.5hrs available. This was successfully completed by both groups within the time assigned.

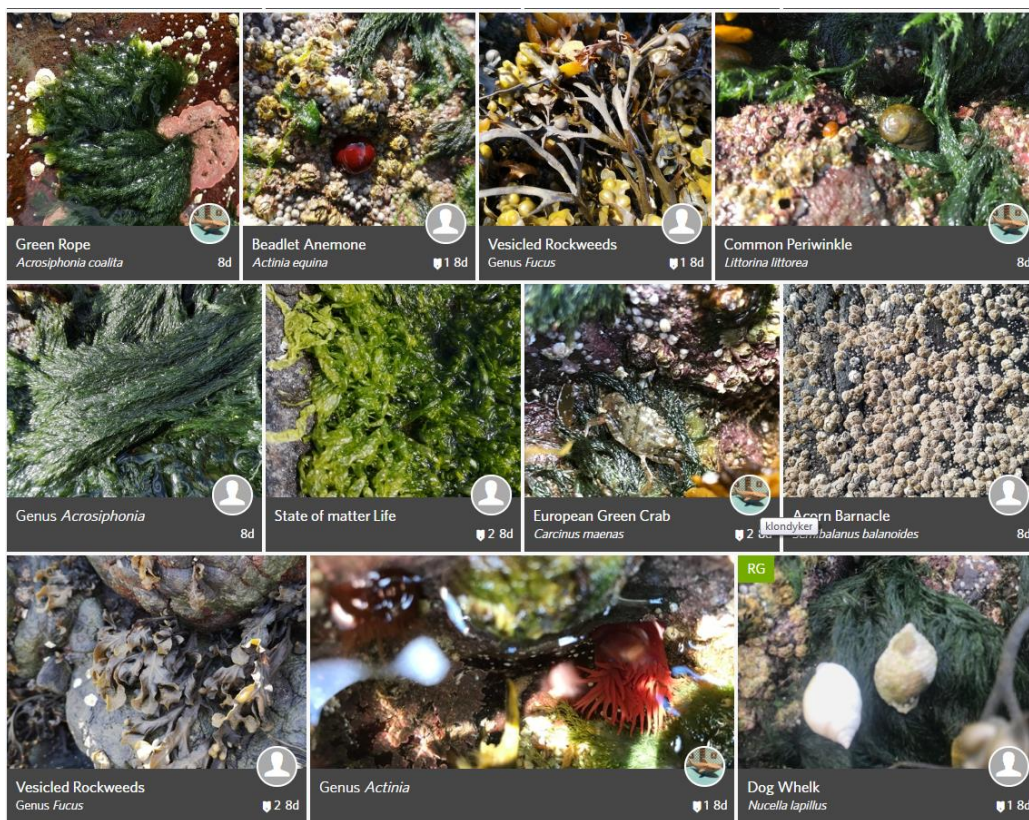


**Fig 6:** Event Rocky shore survey. Image ©Cecilie Dohm.



## **iNaturalist**

A project was set up on iNaturalist for the survey – [Dunstaffnage Marine Survey](#). This platform can offer community groups an engagement tool to help share their findings within and between community groups, it can be a tool to help identify the species found and also has potential to serve as a community quality assurance tool. For quality assurance, iNaturalist will make observations as ‘Research Grade’ is they meet certain criteria, including the online community agreeing on species identification. Once observations gain a research grade ranking, this data can then be exported out of the platform to be used as species and habitat distribution evidence.



**Fig 7:** Images of the species identified using the project page on the iNaturalist app.

## Session 5: Remotely Operated Vehicles (ROV) & GoPro Pole Cam

This session was split into two stations, one station consisting of a live demonstration of the SSSI ROV and a second station demonstrating a GoPro drop down pole camera system.

### ROV Station

South Skye Sea initiative provided a live demonstration of their ROV in the water, headed up by pilot Gavin Malarky. The ROV was launched from a sandy bay on the west coast of Dunstaffnage, walked into the water by Owen McGrath wearing a dry suit to allow for sufficient water depth to launch.

Participants were introduced to how to operate the ROV and could get involved with the different roles required to operate the ROV, including tether control, watching the screen and helping with navigation.



**Fig 8:** Images of the ROV demonstration. Images ©Cecilie Dohm.



**Fig 9:** Example of a seagrass bed discovered off Torrin Beach, Loch Slapin by South Skye Seas initiative using the ROV earlier in June. Image ©SSSi.



## GoPro Pole Cam

In this station another type of drop down camera was demonstrated using a GoPro pole set up. GoPro cameras have a built in WIFI that allows external devices (such as mobile phones or tablets) to connect to and control GoPro cameras. This allows the device to be used as a remote and provides of live feed of the GoPro footage.

The set-up demonstrated was a GoPro Hero 7 Black attached to a 5m pole with an underwater light and a 20ft auxiliary cable to transmit the GoPro's WIFI to the surface, attached at a budget android tablet. The cable can be purchased from [Cam-do](#) in lengths 20ft, 125ft and 300ft. Alternatively the cable can be home made using an auxiliary cable, you can find instructions on how to do this [online](#).

Controlling the GoPro on a pole as demonstrated is one potential way to deploy this set up. Alternatively, the GoPro could be attached to a smaller weighted pole and dropped to the seabed using a rope with cable attached. This set-up described would be better suited for kayaking or deeper habitats.



**Fig 10:** GoPro Pole cam demonstration. Image ©Caitlin Orr.

## Next Steps

- The creation of an equipment library will be developed very soon
- The handbook is on track for delivery in October 2019. Feedback from the event will be used to improve survey methodology. We would also like to invite communities to pilot the methodology further over the months to come.
- We are planning to host a project event in 2020 and 2021 to support the project in the years to come with embedding community led marine monitoring.
- Continue collaborative working to support community marine monitoring

Finally, we would like to thank everyone who helped out at the event, presented their projects, hosted a demonstration session and to everyone who came along and got involved.

