MASTS Small Grant report – SG394: SK8CAMERA1 – Testing a baited timelapse camera lander to observe flapper (common) skates

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Flapper or common skates (*Dipturus* cf. *intermedia*) are large benthic elasmobranchs whose populations in northwest Europe have declined dramatically as a result of historic overexploitation. The *Loch Sunart to the Sound of Jura* Marine Protected Area (MPA) was created in 2016 to protect a relict population of skates in waters of coastal Argyll. To assess the status of this population, novel monitoring methods are required; photo-identification of individual skates by their dorsal spot patterns is emerging as a viable monitoring tool. Most data currently available on skates have been collected through sea angling; there is, however, a risk that skates caught by anglers represent a biased subsample of the overall population. In-situ observations of skates are therefore needed.

The MASTS Small Grant # SG394 enabled the testing of the hypothesis that skates could be reliably attracted to baited camera lander systems placed on the sea floor for long enough to obtain high-quality images, thereby generating an independent dataset on individual skate presence in the MPA. This experiment made use of an existing benthic lander (Fig.1A), the deployment and recovery of which was supported through the present MASTS Small Grant. The lander was equipped with a time-lapse camera programmed to take one picture every 2 minutes. In addition, a GoPro Hero4™ camera system (contained within a deepwater housing) and associated light sources were attached to the frame to record time-lapse video (15 minutes on, 5 minutes off).

A total of five deployments occurred within deep waters of the Firth of Lorn on three days (Table 1; Fig.2B). Deployment sites were preselected on the basis of bathymetry (between 100-150 m), slope (<10° preferred), distance from SAMS and advice from charter boat skippers. Prior to deployment, bait (mainly mackerel *Scomber scombrus* and octopus *Eledone* sp.) was inserted into (and attached to the outside of) a mesh bag suspended in the centre of the lander's bottom frame. Each deployment lasted approximately 2 hours to allow animals time to detect the scent trail and approach the lander.

Table 1. Overview of baited lander deployment efforts (see also Fig.1B).

Deployment	Date	Latitude	Longitude	Depth (m)
1	26/06/2017	56°24.022N	5°35.015W	128
2	30/06/2017	56°25.852N	5°36.098W	117
3	30/06/2017	56°23.931N	5°35.844W	133
4	03/07/2017	56°22.702N	5°39.339W	128
5	03/07/2017	56°22.233N	5°39.858W	128

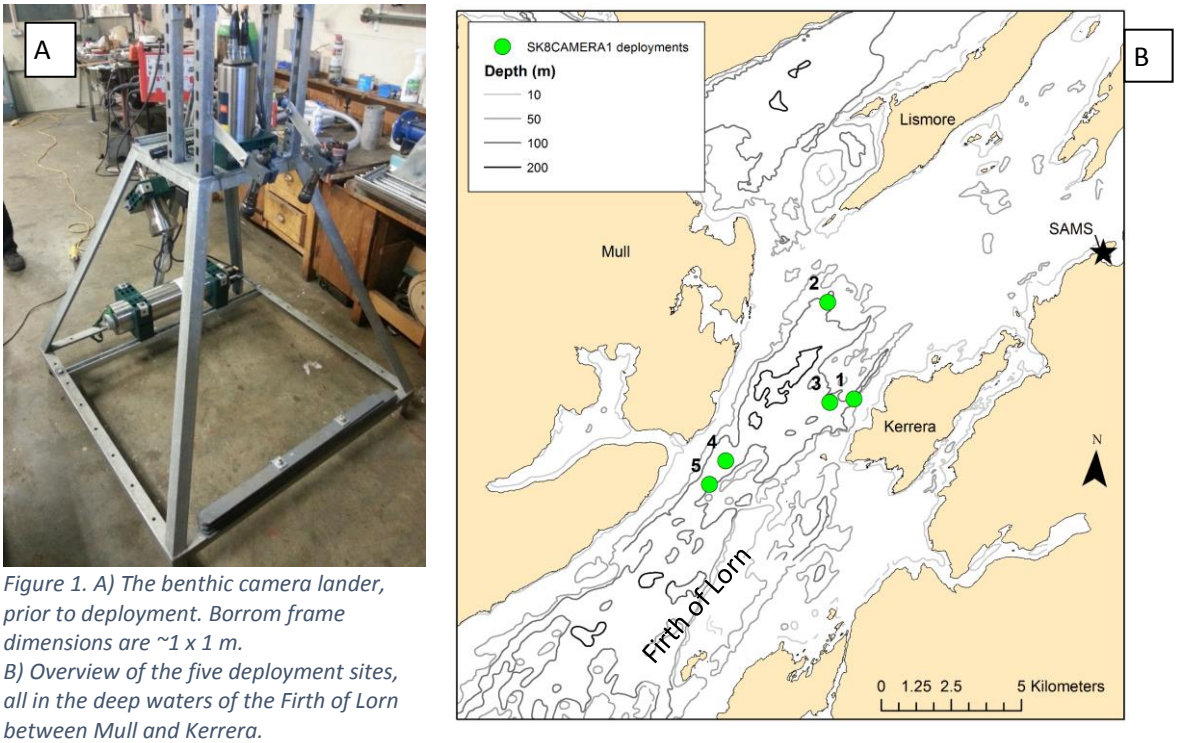

Figure 1. A) The benthic camera lander, prior to deployment. Borrom frame dimensions are ~1 x 1 m.
B) Overview of the five deployment sites, all in the deep waters of the Firth of Lorn between Mull and Kerrera.

Results were very positive; on two of five deployments (# 4 and #5) we succeeded in photographing at least four individually recognisable flapper skates (see example in Fig. 2). During all deployments, we also collected footage of numerous other species, including catsharks (*Scyliorhinus* sp.), spurdog (*Squalus acanthias*), thornback ray (*Raja clavata*), conger eel (*Conger conger*), poor cod (*Trisopterus minutus*) and numerous invertebrate species, mainly crustaceans such as *Nephrops*. Skates tried to feed on the bait and, in some cases, returned repeatedly to do so, validating our original hypothesis.

Figure 2. Flapper skate captured on GoPro™ video (3/07/2017 11:31 GMT, deployment #4).

The results prove that it is possible to attract flapper skates to baited camera landers at depth and obtain high-quality images that can be used for photo-identification purposes. Such analyses can feed into an assessment of the long-term efficacy of the Marine Protected Area. Following these encouraging results, this study will form the basis for future research in this area, including with multiple, improved landers. We would therefore like to thank MASTS for their financial support which made this work possible.