



Potential for advanced-moorings as management option for
Strangford Lough Marine Protected Areas (MPA) – Survey,
Permissions, Engagement
and Installation

19th May 2022

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1. INTRODUCTION

- 1.1** Seagrass beds are a blue carbon habitat, selected as such for their ability to fix and store carbon, in a similar way to how forests store carbon on land. They are a Northern Ireland Priority Marine Feature and on the Northern Ireland Priority Species list. They provide additional ecosystem services by acting as fish nursery areas, improving water quality and can protect the coast against storm damage.
- 1.2** Traditional moorings can scour the seabed with the dragging of the mooring chain and where such moorings are in sensitive habitats such as seagrass beds, dragging of the mooring can lead to damage and destruction of this protected habitat. Advanced moorings are a potential solution to the problem. They aim to reduce/eliminate the impact to the seabed by stopping the scouring caused by mooring chains.
- 1.3** Cuan Marine Services have been tasked by Newry Mourne and Down District Council, to: -
- 1.3.1 Assess the suitability of available advanced mooring systems for Strangford Lough MPA and provide best model for this trial of two different advanced mooring systems with allocated liabilities, costs, risks.
 - 1.3.2 Design two suitable advanced-mooring installations for local conditions considering depths, tides, sediment type, vessel size and possible risks including design revisions and associated costs.
 - 1.3.3 Produce a robust maintenance and safety plan for all eco-moorings
 - 1.3.4 Provide post installation costs for owners including any additional insurance costs and taking into consideration
 - 'Whole life' eco-mooring costs
 - Replacement, end of life costs
 - Costs for replacing advanced mooring system with old system after a 5-year trial period
 - Engagement with mooring owners to establish buy-in for eco-mooring installation
 - 1.3.5 Complete all necessary statutory approvals and legal documentation (including with mooring owners) for installation and hand-over, to include but not limited to the Habitats Regulation Assessment (HRA)

2. TRIAL SITE ASSESSMENT

- 2.1** Newry Mourne and Down District Council (NM&DDC) identified Ballyhenry Bay as an area within Strangford Lough with a good example of seagrass beds and significant numbers of vessel moorings occurring together.
- 2.2** A Spyball underwater survey conducted in association with DAERA on 13th January 2022 at the Ballyhenry Bay site identified that the Escape (54° 23.35N 005° 33.73W) and Rascal (54° 23.31N 005° 33.69W) moorings were suitable for trial. Where there was visual evidence of seagrass growth in the vicinity of these moorings, there was a distinct area within the immediate radius of each mooring block where there was no seagrass growth. This supported the hypothesis that mooring chain drag was scouring the seabed thus preventing growth.
- 2.3** MP4 Video files of the Spyball survey can be downloaded by accessing the hyperlink below <https://1drv.ms/u/s!AifWZwDc3oacgpw1IEwl4h3uPqDHsA?e=qImEcM>

3. STAKEHOLDER ENGAGEMENT

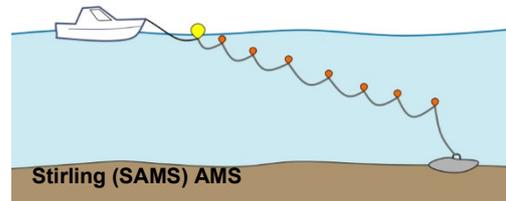
- 3.1** Following agreement with NM&DDC that the sites identified as being suitable for the trial the owners of the selected moorings were contacted (Appendix 1) with both agreeing to change their traditional mooring systems to the advanced systems proposed for trial.

3.2 A Habitats Regulations Assessment was submitted to Daera Marine Licencing Team on 21st February 2022 (Appendix 2) with permission to proceed with the trial granted on 28th February

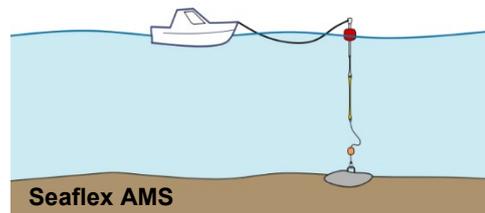
4. ADVANCED MOORING SYSTEMS SELECTED FOR TRIAL

4.1 Following an assessment of the physical environment two advanced mooring systems were agreed and considered suitable for trial.

4.2 The Stirling (SAMS) system provides the least change from the traditional anchor and chain mooring in terms of construct. The rode itself is plain chain however rather than acting as a typical catenary with a section of ground chain, a series of small buoys or floats are attached along the length, keeping the chain suspended in the water column. In this instance, the buoyant properties replace the effect of the mass of chain in the plain catenary, but still providing similar a spring effect but without interaction with the seabed. As with other AMS systems, the surface line (for vessel connection) can be equivalent to that used in a typical block and chain mooring, with the length driven by the boat owner or marina. Also, either traditional gravity anchors or helical screw anchors can be used.



4.3 Seaflex is a Swedish supplier of the similarly named product Seaflex AMS. The main part is a reinforced homogeneous rubber hawser. The system also includes a specific buoy type. The buoy incorporates a stiff arm at the top for connecting the surface line and at the bottom where a short sling joins to the top of the elastic rode. A length of synthetic line connects the rode to the anchor. The arrangement differs to that of the Hazelett in that the elastic rode is closer to the surface, whereas in the Hazelett system the rode is connected directly to the anchor. The Seaflex rode has novel elastomeric qualities, captured in modelling but not presented due to commercial sensitivity. The surface line (for vessel connection) can be equivalent to that used in a typical block and chain mooring, with the length specified by the boat owner or marina. It is possible to use either traditional gravity anchors or screw type anchors with the Seaflex arrangement.



5. INSTALLATION OF ADVANCED MOORING SYSTEMS

5.1 The selected advanced mooring systems were installed at Ballyhenry Bay in the presence of Ms J Caldwell (NM&DDC) and Mr P Stewart (DAERA) on 30th March 2022.

5.2 From Cuan Marines MCA registered Multicat workboat Cuan Strand, a diver was deployed to record for future comparison purposes, a baseline record of seagrass growth in the locus of each chosen mooring. It was noted that when compared with observations from the trial site selection survey completed in January 2022 the seagrass harvest appeared depleted. The baseline video record taken can be accessed and downloaded from the following hyperlink: -

<https://1drv.ms/u/s!AifWZwDc3oacgpw1IEwl4h3uPqDHsA?e=qImEcM>

A shot line was deployed at each of the proposed mooring locations thereby marking position for the AMS deployments. In turn each existing mooring was then lifted onto the deck and disconnected from their respective mooring block after which each of the trial systems (having been pre-assembled landside) were connected to each block.

Upon connection, the mooring blocks were lowered in stages until they were approximately 1m from the seabed. With a diver on the seabed communicating with the crane operator on the work boat, each mooring block was located at their original positions before finally being lowered on to the seabed.

- 5.3 The Seaflex AMS was installed at the location of the Escape (54° 23.35N 005° 33.73W) mooring and the SAM's system at Rascals mooring location (54° 23.31N 005° 33.69W).

6. MAINTENANCE AND SAFETY PLAN

- 6.1 As with a traditional mooring AMS's require an annual maintenance inspection to interrogate the durability of chains, float buoys, shackles, and in the case of the Seaflex system, the elastomeric rubber rode and synthetic lines connecting the rode to the anchor. Where components are found to be defective, they should be immediately replaced.

7. COSTINGS

- 7.1 Calculated costings based on one mooring are detailed in Table 1 below. Where more than one mooring can be maintained / renewed / re-established, economies of scale with resulting cost savings will be obtained.

Table 1	Annual Maintenance Costs			
	Divers	Workboat and crew	Fittings	Total Annual Maintenance Cost
SAMS AMS	-	£1200	£100	£1300.00
AMS Seaflex	£1800	£1200	£100	£3100.00
Additional Insurance	Insurance companies for the mooring owners have advised that no additional charges are required			£0.00

Table 2	Renewal Cost			
	Divers	Workboat and crew	Hardware Cost	Total Renewal Cost
SAMS AMS	£1800	£1200	500	£1300.00
Seaflex AMS	£1800	£1200	£5000.00	£8000.00

Table 3	Re-Establishment of Traditional Mooring Cost			
	Divers	Workboat and crew	Hardware Cost	Total Re-establish Cost
SAMS AMS		£1200	£100	£1300
Seaflex AMS	£1800	£1200	£100	£3100

- 7.2 Assuming a 5-year life cycle and considering the costs outlined in tables 1 and 2 above, the 'Whole Life' cost for each eco-mooring under trial is, for the Seaflex £20,400.00 and for the SAM's £6,500.00

8. FUTURE WORKS REQUIRED

8.1 Following installation of the AMS's, and to provide a meaningful assessment of their impact on the growth of seagrass, a number of follow up surveys and inspections (dependent upon the anticipated trial period) will be required i.e.

- Dive Survey to establish and compare seagrass growth against baseline video data
- Maintenance inspections
- Re-deployment of the traditional moorings at the end of the trial period

Mr K Bradley
7 Dakota Avenue
Newtownards
BT234QT

26th January 2022

Dear Mr Bradley

Re: - Cuan Marine Services Advanced Mooring System trial.

We refer to your recent conversations with Jeremy regarding the use of your mooring to undertake a trial of an Advanced Mooring System (AMS) on behalf of Newry Mourne and Down District Council.

By way of background information on the Project. Seagrass beds are a blue carbon habitat, selected as such for their ability to fix and store carbon, in a similar way to how forests store carbon on land. They are a Northern Ireland Priority Marine Feature and on the Northern Ireland Priority Species list. They provide additional ecosystem services by acting as fish nursery areas, improving water quality and can protect the coast against storm damage.

Traditional moorings can scour the seabed with the dragging of the mooring chain and where such moorings are in sensitive habitats such as seagrass beds, dragging of the mooring can lead to damage and destruction of this protected habitat. Advanced moorings are a potential solution to the problem. They aim to reduce/eliminate the impact to the seabed by stopping the scouring caused by mooring chains.

Ballyhenry Bay has been selected as an area within Strangford Lough with a good example of seagrass beds and where a significant numbers of vessels moor. Following a Spyball underwater survey, completed in association with DAERA on 13th January 2022, your mooring site was identified as suitable to trial the Stirling AMS (as described in the accompanying method statement).

The installed AMS will be regularly monitored, inspected, and maintained during the trial period and your traditional mooring will re-established when the trial ends.

We have attached an accompanying method statement for the Project, which you may wish to pass on to your insurance company and should there be an additional premium we will cover same accordingly.

Yours faithfully

Philip Shields
For and on behalf of Cuan Marine Services Ltd

07741 052004

Email philipshields@btinternet.com



Mr John Curran
80 High Street
Newtownards

26th January 2022

Dear Mr Curran

Re: - Cuan Marine Services Advanced Mooring System trial.

We refer to your recent conversations with Jeremy regarding the use of your mooring to undertake a trial of an Advanced Mooring System (AMS) on behalf of Newry Mourne and Down District Council.

By way of background information on the Project. Seagrass beds are a blue carbon habitat, selected as such for their ability to fix and store carbon, in a similar way to how forests store carbon on land. They are a Northern Ireland Priority Marine Feature and on the Northern Ireland Priority Species list. They provide additional ecosystem services by acting as fish nursery areas, improving water quality and can protect the coast against storm damage.

Traditional moorings can scour the seabed with the dragging of the mooring chain and where such moorings are in sensitive habitats such as seagrass beds, dragging of the mooring can lead to damage and destruction of this protected habitat. Advanced moorings are a potential solution to the problem. They aim to reduce/eliminate the impact to the seabed by stopping the scouring caused by mooring chains.

Ballyhenry Bay has been selected as an area within Strangford Lough with a good example of seagrass beds and where a significant numbers of vessels moor. Following a Spyball underwater survey, completed in association with DAERA on 13th January 2022, your mooring site was identified as suitable to trial the Seaflex AMS (as described in the accompanying method statement).

The installed AMS will be regularly monitored, inspected, and maintained during the trial period and your traditional mooring will re-established when the trial ends.

We understand that, during the sailing season Escape is mainly berthed at Portaferry Marina and that your mooring at Ballyhenry is only used occasionally during the season when the Marina is fully occupied. For the purposes of our trial, we intend to berth one of our own vessels on your mooring and to prevent its unauthorised use by others, we will remove the strop thereby preventing the mooring being easily picked up.

We have attached an accompanying method statement for the Project, which along with this letter you may wish to pass on to your insurance company. Should there be an additional premium we will cover the same accordingly.

Yours faithfully

Philip Shields

For and on behalf of Cuan Marine Services Ltd

07741 052004



Email philipshields@btinternet.com

Mr John Curran
80 High Street
Newtownards
BT22 1QU

13th February 2022

Dear Mr Curran

Re: - Cuan Marine Services Advanced Mooring System trial.

Thank you for agreeing to Cuan Marine Services Ltd using your mooring for the Advanced Mooring System trial.

As discussed with Jeremy and me last week, we would confirm that: -

The trial will commence upon the installation of the Seaflex mooring system which at present is planned for early March this year. At this stage, we anticipate that the trial will be completed by Spring 2024.

Your mooring hardware (Chains buoys etc.) will be disconnected from your mooring block and taken into safe storage until the trial ends.

Cuan Marine Services will regularly check the durability and integrity of the Seaflex mooring system during the trial period.

The Seaflex mooring system will be always available for your use during the sailing season.

Cuan Marine Services Ltd will ensure that any of their vessels using the mooring are fully insured.

Cuan Marine will remove the Strop and buoy from the mooring to prevent its inadvertent use by other third parties.

Upon completion of the trial, Cuan Marine Services will disconnect the Seaflex mooring and reinstate your traditional chain system after ensuring the integrity of all its components.

Yours sincerely

Philip Shields

For and on behalf of Cuan Marine Services Ltd



07741 052004

Email philipshields@btinternet.com

From: Rice, Darren <Darren.Rice@nmandd.org>
Sent: 14 March 2022 09:57
To: McQuoid, Trevor; cuanmarineservicesltd@gmail.com; philipshields@btinternet.com; Stewart, Philip
Cc: Black, Diane; Bennett, Stephanie; DAERA Marine Licensing Team; Steele, Ann
Subject: RE: Section 17 Exemption NMDDC Ballyhenry Bay Seagrass AMS trial - Final
Many thanks Trevor
Regards
Darren Rice
AONB and Geopark Manager

Council: Direct 0300 137 4000 Email: darren.rice@nmandd.org 07713 089225
line: 0330 137 4414 Mobile:

Mourne Gullion Strangford aUGGp StoryMap Think before you print!!



From: McQuoid, Trevor <Trevor.McQuoid@daera-ni.gov.uk>
Sent: 11 March 2022 12:01
To: Rice, Darren <darren.rice@nmandd.org>; cuanmarineservicesltd@gmail.com; philipshields@btinternet.com; Stewart, Philip <Philip.Stewart@daera-ni.gov.uk>
Cc: Black, Diane <Diane.Black@daera-ni.gov.uk>; Bennett, Stephanie <Stephanie.Bennett@daera-ni.gov.uk>; DAERA Marine Licensing Team <MarineLicensingTeam@daera-ni.gov.uk>; Steele, Ann <Ann.Steele@daera-ni.gov.uk> Subject: Section 17 Exemption NMDDC Ballyhenry Bay Seagrass AMS trial - Final
Importance: High

You don't often get email from trevor.mcquoid@daera-ni.gov.uk. Learn why this is important

CAUTION: This email originated outside of Council. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Good morning Darren,

Please find attached Section 17 exemption under Marine and Coastal Access Act to undertake AMS deployment to assess interaction with seagrass in comparison to traditional moorings at Ballyhenry Bay Strangford Lough. If you have any questions please do not hesitate in contacting me.

Best regards Trevor

Trevor McQuoid | Higher Scientific Officer | Marine Licensing Team | DAERA - Marine and Fisheries Division
1st Floor | Klondyke Building | Gasworks Business Park | Belfast | BT7 2JA

Habitats Regulations Assessment

In accordance with Regulation 43(1) of the Conservation (Natural Habitats, etc) (Northern Ireland) 1995 (as amended), DAERA Marine and Fisheries Division has considered whether the project, plan or proposal either alone or in combination (neither being directly connected with or necessary to the management of the site) is likely to have a significant effect on the Natura 2000 site.

As part of that consideration, DAERA Marine and Fisheries Division has:-

(a) taken into account the mitigation measures contained in the project, plan or proposal, along with all legally enforceable obligations designed to avoid environmental effects; and

applied the precautionary approach set out in European Commission Guidance: "Managing Natura 2000 Sites"¹ and by the European Court of Justice in C-127/02, Waddenzee, paragraphs 56 and 59.2

"The authorisation of a plan or project may only be granted if the Competent National Authority is certain that it will not have any adverse effect on the integrity of the site concerned. That is where no reasonable scientific doubt remains as to the absence of such effect."

consulted the Department and have regard to any representations made by it within such reasonable time as the competent authority may specify for the purposes of the assessment or determining whether an assessment is required for a plan or project. This is required by Regulation 43(3), The Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2007. 3

Some notes and hyperlinks to assist completion of this template have been inserted to help the Competent Authority/Public body complete their HRA. These can be removed.

Web link references for the above:

European Commission Guidance: "Managing Natura 2000 Sites"

http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf

European Court of Justice in C-127/02, Waddenzee, paragraphs 56 and 59

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:62002J0127:EN:PDF>

The Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2007

<http://www.legislation.gov.uk/nisr/2007/345/regulation/14/made>

Stage 1: Test of Likely Significance

Name of Project or Plan.	Installation of advanced mooring solutions as a management option to enhance the growth of seagrass in the Strangford Lough Marine Protected Areas
Reference (if available)	https://www.seaflex.com/products/seaflex-mooring-system/
Name and location of Natura 2000 site (s)	Strangford Lough SAC Strangford Lough SPA Strangford Lough Ramsar

<p>Natura 2000 site features:</p>	<p>Strangford Lough SPA:</p> <p><i>Branta bernicla hrota</i> (Light Bellied Brent Geese)</p> <p><i>Calidris canutus</i> (Knot)</p> <p><i>Sterna hirundo</i> (Common Tern)</p> <p><i>Sterna paradisaea</i> (Arctic Tern)</p> <p><i>Sterna sandvicensis</i> (Sandwich Tern)</p> <p><i>Tringa tetanus</i> (Redshank)</p> <p><i>Limosa lapponica</i> (Bar-tailed Godwit)</p> <p><i>Tadorna tadorna</i> (Shelduck)</p> <p><i>Pluvialis apricaria</i> (Golden Plover)</p> <p>Strangford Lough SAC:</p> <p>Mudflats and sandflats not covered by seawater at low tide</p> <p>Coastal lagoons</p> <p>Large shallow inlets and bays</p> <p>Reefs</p> <p>Annual vegetation of drift lines</p> <p>Perennial vegetation of stony banks</p> <p><i>Salicornia</i> and other annuals colonising mud and sand</p> <p>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</p> <p><i>Phoca vitulina</i></p> <p>Strangford Lough Ramsar:</p> <p>The site qualifies under Criterion 3a by regularly supporting over 20,000 waterfowl in winter. The five year winter peak mean for the period 1992-93 to 1996-97 was approximately 70,200 waterfowl, comprising 48,700 waders and 21,500 wildfowl.</p>
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Description of the Project or Plan

- Location and Task Description

Strangford Lough is protected as an SAC/SPA/MCZ/ASSI where Seagrass beds are a protected habitat. Traditional moorings can scour the seabed with the dragging of the mooring chain and where such moorings are in sensitive habitats such as seagrass beds dragging of the mooring can lead to damage and destruction of this protected habitat. Advanced moorings are a potential solution to the problem. They aim to reduce/eliminate the impact to the seabed by stopping the scouring caused by mooring chains.

Seagrass beds are a blue carbon habitat, selected as such for their ability to fix and store carbon, in a similar way to how forests store carbon on land. They are a Northern Ireland Priority Marine Feature and on the Northern Ireland Priority Species list. They provide additional ecosystem services by acting as fish nursery areas, improving water quality and can protect the coast against storm damage.

Cuan Marine Services have been tasked with: -

Assessing the suitability of available advanced mooring systems (AMS) suitable for use in the Strangford Lough MPA and to propose and trial two different systems including an assessment of the liabilities, costs, and risks associated with each.

Recommending suitable AMS considering local conditions i.e., depths/tides/sediment type/vessel size/any other limitations and completing system specific installation designs.

Detailing all possible risks including design revisions and associated costs.

Produce a robust maintenance and safety plan for all eco-moorings.

Providing post installation costs for owners to include any additional insurance costs.

Engaging with mooring owners to establish buy-in for eco-mooring installation.

Completing all necessary statutory approvals and legal documentation (including with mooring owners) for installation and hand-over, to include but not limited to the Habitats Regulation Assessment (HRA).

Providing comparison between AMS trialed and the locally prevalent ground chain and riser system.

Provide all installation services to the two approved AMS.

Photograph the seabed before and after mooring installation and report findings.

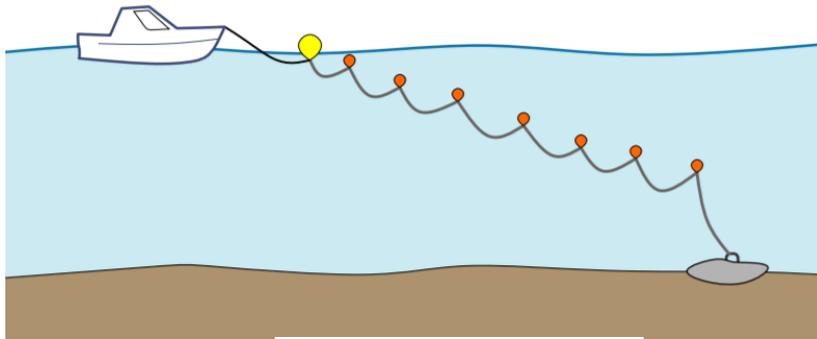
Ballyhenry Bay has been selected as an area within Strangford Lough with a good example of seagrass beds and where a significant numbers of vessel moor. Following a Spyball underwater survey, completed in association with DAERA on 13th January 2022 two moorings have been identified in Ballyhenry Bay as mooring sites suitable for the trial.

Methodology and Sequencing

Following an assessment of the physical environment two advanced mooring systems were considered suitable for trial.

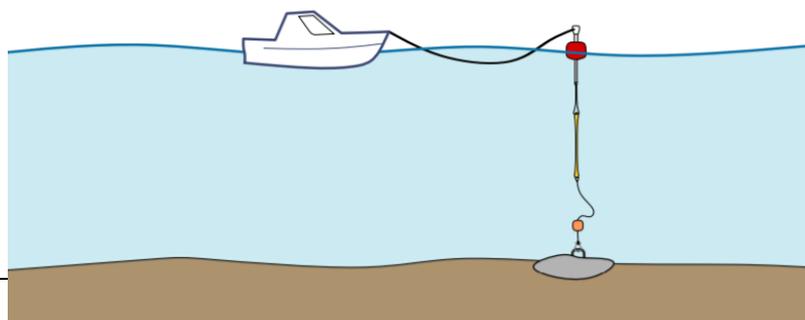
The Stirling (SAMS) system provides the least change from the traditional anchor and chain mooring in terms of construct. The rode itself is plain chain however rather than acting as a typical catenary with a section of ground chain, a series of small buoys or floats are attached along the length, keeping the chain suspended in the water column. In this instance, the buoyant properties replace the effect of the

mass of chain in the plain catenary, but still providing similar a spring effect but without interaction with the seabed. As with other AMS systems, the surface line (for vessel connection) can be equivalent to that used in a typical block and chain mooring, with the length driven by the boat owner or marina. Also, either traditional gravity anchors or helical screw anchors can be used.



1.4 Stirling (SAMS)

Seaflex is a Swedish supplier of the similarly named product Seaflex AMS. The main part is a reinforced homogeneous rubber hawser. The system also includes a specific buoy type. The buoy incorporates a stiff arm at the top for connecting the surface line and at the bottom where a short sling joins to the top of the elastic rode. A length of synthetic line connects the rode to the anchor. The arrangement differs to that of the Hazelett in that the elastic rode is closer to the surface, whereas in the Hazelett system the rode is connected directly to the anchor. The Seaflex rode has novel elastomeric qualities, captured in modelling but not presented due to commercial sensitivity. The surface line (for vessel connection) can be equivalent to that used in a typical block and chain mooring, with the length specified by the boat owner or marina. It is possible to use either traditional gravity anchors or screw type anchors with the Seaflex arrangement.



1.6 Seaflex

A Spyball underwater survey conducted in association with DAERA on 13th January 2022 at the Ballyhenry Bay site identified two existing mooring sites were suitable for trial. Where there was visual evidence of seagrass growth in the vicinity of these moorings, there was a distinct area within the immediate radius of each mooring block where there was no seagrass growth. This supported the hypothesis that mooring chain drag was scouring the seabed thus preventing growth.

Mooring Installations

Stirling (SAMS) AMS: - We will use the Multicat workboat Cuan Strand, an MCA registered vessel, to lift the existing mooring onto the deck and disconnect the mooring block. We will position the multi-Cat vessel and crane to ensure that the mooring is lifted vertically off the seabed thereby preventing drag and potential damage to seagrass harvests in the vicinity of the mooring block. A shot line will be deployed to mark the blocks exact position (with GPS co-ordinates recorded) to enable installation of the AMS at the same location.

The Stirling Advanced Mooring System (pre-assembled land side) will be connected to the mooring block and gently lowered in stages until it is approximately 1m from the seabed. Using an underwater camera, we will ensure that the mooring block is being located to its original position before finally lowering on to the seabed.

Upon deployment we will mobilise a diver at various times throughout the tidal cycle to photograph and ensure that the chain does not contact the seabed.

Seaflex AMS: -The existing mooring will be lifted on to the Multicat Cuan Strand which will be positioned such that the mooring is lifted vertically off the seabed thereby preventing drag and potential damage to seagrass harvests in the vicinity of the mooring block. A shot line will be deployed to mark the blocks exact position (with GPS co-ordinates recorded) to enable installation of the AMS at the same location.

The complete Seaflex mooring system (pre-assembled land side) will be attached to a new concrete mooring block complete with a centre fixing ring and lowered in stages until approximately 1m above the seabed. Using an underwater camera, we will ensure that the mooring block is being located to its original position before finally lowering on to the seabed.

Upon deployment we will mobilise a diver at various times throughout the tidal cycle to photograph and ensure that the synthetic line connecting the rode to the anchor block does not contact the seabed.

The removed pre-existing mooring system will be taken ashore, cleaned and stored should the requirement to redeploy arise.

AMS Maintenance

The two trial mooring systems will be inspected monthly from our Multicat workboat Cuan Strand using a remote underwater camera. We will be inspecting for: -

Degradation of mooring materials

Drift or drag of the mooring blocks by checking the GPS location of each anchor block

Camera inspection will be supplemented by a dive inspections every 3 months to complete a physical inspection of each system and to photograph and record the growth of seagrass in the vicinity of each mooring block, thereby enabling comparison with baseline records.

Reporting

Upon completion of the trial period a full report will be prepared and forwarded to the Newry Mourne and Down District Council Project Manager Mr Darren Rice

- Duration of construction, operation, de-commissioning etc;

Table 1 provides the key milestones which have been agreed with contractors for the project.

Table1: Key Milestones

Date:	Milestone Description
Early March 2022	Installation of Seaflex and Stirling mooring systems in Ballyhenry Bay
Monthly thereafter	Inspection of mooring systems for material degradation and block drag
Quarterly	Dive inspection to physically inspect mooring integrity and to record (through photographs and video) the growth of seagrass in the vicinity of each mooring block, thereby enabling comparison with baseline records.
Spring 2024	Report Findings and decommission Advanced Mooring Systems

- Other.

Throughout the Projects timescale, Cuan Marine Services will Liaise and share collected data with the Marine Protected Areas Officer, DAERA.

Is the proposal directly connected with or necessary to management of the site for conservation of N2K features?	Yes
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Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.

Mooring retrieval, refurbishment and deployment	Retrieval of existing mooring blocks and chains at site. Deploy new or refurbished mooring blocks and chains using multicat vessel	1 day
Inspection	Monthly visual inspection of Advanced Mooring systems using Spyball or similar underwater video.	16 half days
Physical dive inspection	Quarterly dive inspection to record growth of seagrass in the vicinity of the Advanced Mooring System	16 half days
		2 days
Mooring retrieval.	Retrieval of mooring blocks and chains at site using multicat vessel	1 day

N2K Feature: Mention all features	Describe any likely direct or indirect effects to the N2K features arising as a result of: loss; reduction of habitat area; disturbance; habitat or species fragmentation; reduction in species density; changes in key indicators of conservation value (e.g. water quality, climate change).	Effect significant/not significant? Why?
Strangford Lough SPA:		
Branta bernicla hrota (Light Bellied Brent Geese)	No impact foreseen with this species.	N/A
Calidris canutus (Knot)	As above	As above
Sterna hirundo (Common Tern)	As above	As above
Sterna paradisaea (Arctic Tern)	As above	As above
Sterna sandvicensis (Sandwich Tern)	As above	As above
Tringa tetanus (Redshank)	As above	As above
Strangford Lough SAC:		

Mudflats and sandflats not covered by seawater at low tide	Unlikely event of fuel or hydraulic fluid leaking from Hiab crane and generator.	Not Significant. Quantities on board are low and for the specific use of Hiab crane which will be serviced in advance of the activities. Absorbent spillage pads will be stored on-board and available to mop up any small amount of fuel or hydraulic fluid.
Coastal lagoons	As above	As above
Large shallow inlets and bays	No impact is foreseen	
Reefs	No impact is foreseen	
Annual vegetation of drift lines	Negligible blockage and entanglement on mooring lines and turbines.	Not significant. The accessible lines and turbines will be cleared daily.
Perennial vegetation of stony banks	The mooring blocks and chains will be as per traditional pleasure craft moorings in the Crown estates licensed area.	The mooring blocks and chain will be deployed on the seabed and therefore overall the level of impact to benthic communities is considered limited.
	The noise and vibration during installation and retrieval.	Not significant. Multicat will deploy moorings and position the platform during deployment and retrieval. This is low level noise similar to other craft used in the area of the Strangford Narrows.
	The noise and vibration during inspection	Not significant. This low level noise is considered to be minimal in respect to the background noise levels in the narrows.
	No impact if foreseen	
Salicornia and other annuals colonising mud and sand	No impact if foreseen	
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	No impact if foreseen	
Phoca vitulina (harbour seal)	Risk of collision Harbour seals:	Not significant. The increase in the number of vessels will be marginal, one powerboat, a moored workboat

		<p>or multicat. Given that an estimated one additional vessels will be present at any one time (a moored multicat). Other than the single movements to and from the mooring, the principal vessel movements will be between the Portaferry quay side and the mooring for personnel transit.</p> <p>The ferry service runs for approximately 16 hours each day, 364 days per year, making a journey between the harbours every fifteen minutes. Therefore, the AMS Project does not represent a significant increase in the number of vessel movements in the Narrows in comparison.</p> <p>The routes taken will be regular and predictable and transits will occur at maximum speeds of 10 kts with a reduction to 4 kts if any marine mammals are sighted during transits. Because of the small number of additional vessels and the low number of vessel movements over the project timeframe</p> <p>The impact of any collision risk to seals or cetaceans in the Narrows as a result of the trials activities is considered to be negligible.</p>
Phoca vitulina (harbour seal)	Risk of disturbance to Harbour seals. There are seal haul out sites within proximity to this project, however, disturbance should be minimum and not considered significant.	Vessel traffic already operates in this area daily; near continuous ferry crossings between Strangford and Portaferry, a small number of creel fishing boats, charter RIBs, other

		<p>work boats, the RNLI lifeboat and occasional leisure craft. In particular, the ferry service runs for approximately 16 hours each day, 364 days per year, making a journey between the harbours every fifteen minutes.</p> <p>Therefore, RIB and small works vessel activity will not represent a significant increase in the amount of vessel noise experienced by marine mammals in the Narrows. Given the low number of vessel movements compared to baseline levels in the Narrows, the infrequent nature and short duration of activity, the impact is deemed negligible.</p>
Strangford Lough Ramsar:	No impact if foreseen	Not Significant.
The site qualifies under Criterion 3a by regularly supporting over 20,000 waterfowl in winter. The five year winter peak mean for the period 1992-93 to 1996-97 was approximately 70,200 waterfowl, comprising 48,700 waders and 21,500 wildfowl.	No impact if foreseen	Not Significant.
Describe any potential effects on the Natura 2000 site as a whole in terms of: interference with the key relationships that define the structure or function of the site		

Provide details of any other projects or plans that together with the project or plan being assessed could (directly or indirectly) affect the site.	
Commercial Fisheries:	<p>Commercial fishing in Strangford Lough has declined rapidly in recent years. Concerns that the use of mobile fishing gear was causing severe damage to the seabed and, in particular, to the Modiolus reefs, has led to a temporary total ban of dredging and trawling within the lough (Royal Haskoning, 2005).</p> <p>The only fishing permitted within the Lough is potting. Potting only occurs in water less than 10 m deep in the Narrows. The small footprint of the tidal testing (including exclusion zone) will have negligible impact to potting activities. Pot fishing within the lough is for edible crab <i>Cancer Pagurus</i>, shore crab <i>Carcinus maenas</i>, velvet swimming crab <i>Necora puber</i>, lobomarus <i>gammarus</i>, whelk <i>Buccinum undatum</i>, and Dublin Bay prawn <i>Nephrops</i> spp.</p> <p>The <i>Nephrops</i> fishery is one of the largest in Northern Ireland in both volume and value; the majority of those crustaceans caught are by trawlers outside of the lough and in deeper water 30m to 50m+ but a few tonnes each year are caught by creel fishing within Strangford Lough. Therefore again this type of fishing within the Lough would be unaffected.</p> <p>The total value of County Down inshore fishery including Strangford Lough is around £5m per annum and is a small boat operations (1-2 man) using small nets and pots within inshore waters (within 12 miles offshore).</p> <p>Recreational angling also occurs within Strangford Lough with many chartered boats available to be hired for the purpose of fishing within the Lough.</p> <p>Therefore, the impact of the secluded research activities on commercial fisheries within Strangford Lough are negligible.</p>
Obstruction to Movement	The mooring location in Ballyhenry Bay is outside the main channel and away from ferry terminal and marinas in the narrows.
Shipping and Mobile Marine Fauna:	There is a negligible increase in vessel activity during the research. It's potential to impact upon mobile marine fauna that use Strangford Lough, such as fish species and marine mammals is small and unlikely. Basking sharks and marine mammals are mobile and able to move away from areas where the visual presence of the vessels may cause disturbance.

	<p>However due to the short time frame of the research the magnitude of the impact will be negligible. Any impact caused due to noise, of which there is limited self-noise from turbines turning, is limited. The platform will be clearly visible and marked with lighting, similar to moored yachts in the vicinity. This will have limited impact on the marine mammals and fish that can easily detect the structure and move around it.</p> <p>Commercial shipping traffic through the Narrows is extremely low and as the research will be conducted within an area presently used as a mooring site for pleasure vessels the impact on shipping is negligible</p>
Is the potential scale or magnitude of any effect likely to be significant? :	
Alone?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
In-combination with other projects of plans?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

List of Agencies / Organisations Consulted: Provide contact name and telephone or email address.	
Habitats Regulations Assessment Summary	<p>In summary the temporary nature of the research, combined with the day light hours of inspection with divers and video instrumentation the impact on the N2K site is negligible.</p> <p>Similar research has been conducted by QUB for a number of years with no instances or complaints.</p>

Conclusion: Is the proposal likely to have a significant effect on an N2K site?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Data collected to carry out the assessment

Who carried out the assessment?	
Sources of data	
Level of assessment completed	
Where can the full results of the assessment be accessed and viewed?	

Summary of response.	
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DO NOT PROCEED FURTHER IF YOU HAVE ESTABLISHED THAT THIS PROPOSAL IS UNLIKELY TO IMPACT A N2K SITE AND NO MITIGATION IS REQUIRED

