2025

Strangford Lough Eco Mooring Seagrass Survey 2025

Report Update 2025. Prepared for Newry, Mourne and Down District Council (NMDDC)

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Summary

1. Introduction

This report serves as a follow-up to the submission from spring 2025. The Ballyhenry seagrass meadows have now completed the seed production phase, and growth rates are in decline with the approach of colder winter conditions. The seagrass blades are nearing maximumal length and will soon enter the seasonal die-back phase. Advanced Mooring System surveys were conducted at both trial sites (see Figure 1), with minor adjustments once again implimented to the methods to accommodate the height of the seagrass blades.

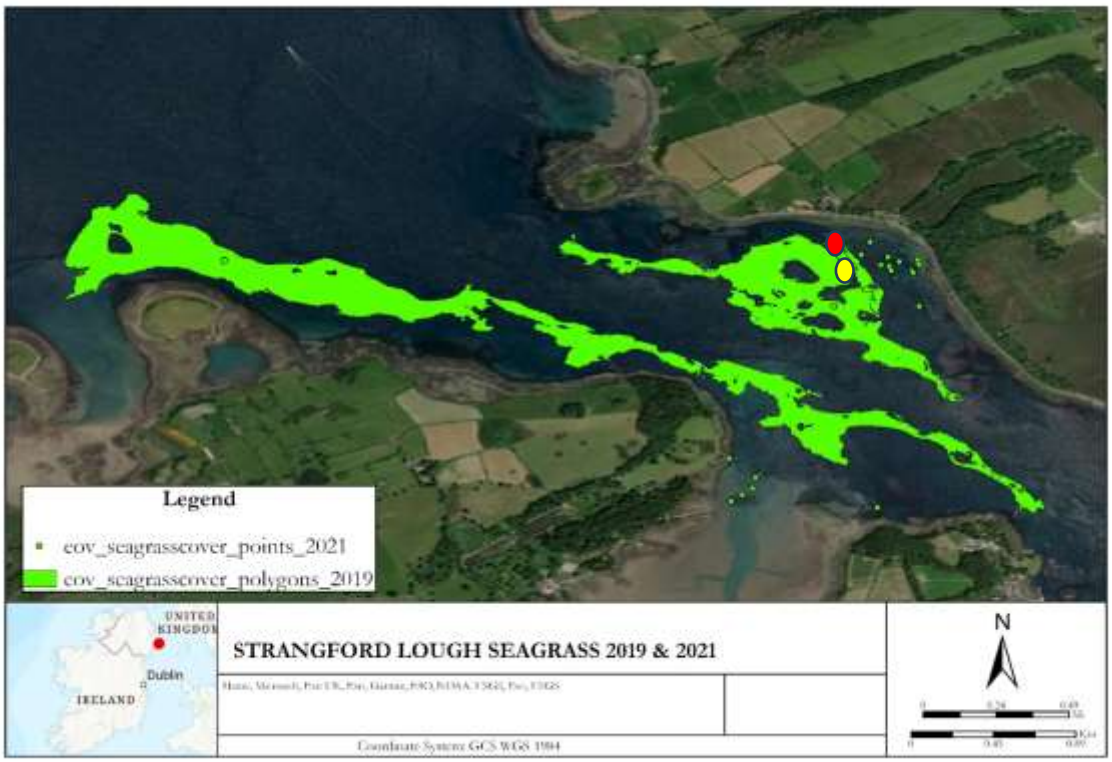

Figure 1. Advanced Mooring Systems deployed in Ballyhenry Bay, Stirling© N 540 23.352'; W 0050 33.739' and Seaflex© N 540 23.295'; W 0050 33.751'.

2. Advanced Mooring System Surveys and Regional Context

The Council may wish to note that, during the period of the Ballyhenry trial, several AMS active projects have commenced in other regions of the United Kingdom. Seaflex and Stirling type moorings show shown significant promise for seagrass recovery by lifting mooring chains off the seabed, reducing damage, and allowing natural growth. The Plymouth Sound and Studland Bay AMS projects have recorded an increase in seagrass cover of more than 90% around installed AMS, within four years. The success highlights the potential of such systems to restore vital habitats, support biodiversity, and mitigate climate change impacts, though successful implementation also requires community engagement and education. These initiatives have achieved notable success, with multiple hectares of seagrass meadow now protected and previously damaged seagrass biotopes demonstrating signs of recovery.

Figure 2. Studland Bay community mooring buoy sites have reduced the incidents of unchecked anchoring in the conservation zone.

The NMDDC's proposed introduction of AMS to Strangford Lough's pristine *Zostera marina* seagrass meadows, will undoubtably have similar benefits as those seen in Plymouth and Studland in protecting these important ecosystem engineering habitats.

3. Methods AMS comparison

The environmental conditions during the 2025 survey matched those seen in 2024. Due to the thick coverage and long seagrass blades, video transect surveys replaced random quadrat surveys. Quadrat dimensions were deemed insufficient for accommodating the maximal blade lengths. The deployment of a 30m video transect proved to be an appropriate approach for assessing vegetative coverage in seagrass habitats. Analysis using simple linear regression on the spring survey data revealed a highly significant correlation between results obtained via both the video search and transect survey techniques ($R^2 = 0.999$; $p < 0.0001$). Aside from the transition to video assessment over a fixed distance, all other methodological aspects remained consistent with those used in the spring survey.

A circular cardinal compass survey evaluated impacts on the seabed at both Advanced Mooring Systems locations: Stirling© (N 54°23.352', W 05°33.739') and Seaflex© (N 54°23.295', W 05°33.751'). Divers entered at each mooring's surface buoy, followed the rope to the block, and attached a transect line. Diver 1 swam 16 m transects in S, SW, W, NW, N, NE, E, and SE directions: Diver 2 recorded video on SW, NW, NE, and SE lines. Videos were analyzed for seagrass and associated flora/fauna cover, with transient fauna identified visually in situ and through expert video review. Researchers measured sediment type and seagrass canopy height at the beginning, middle, and end of every transect.

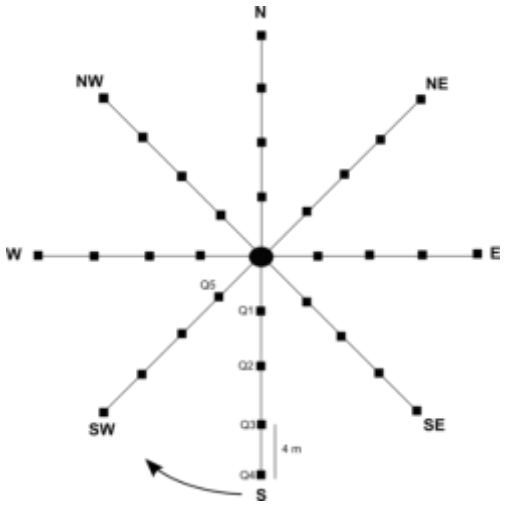

Figure 3. Compass rose showing where each quadrat was placed in relation to the direction.

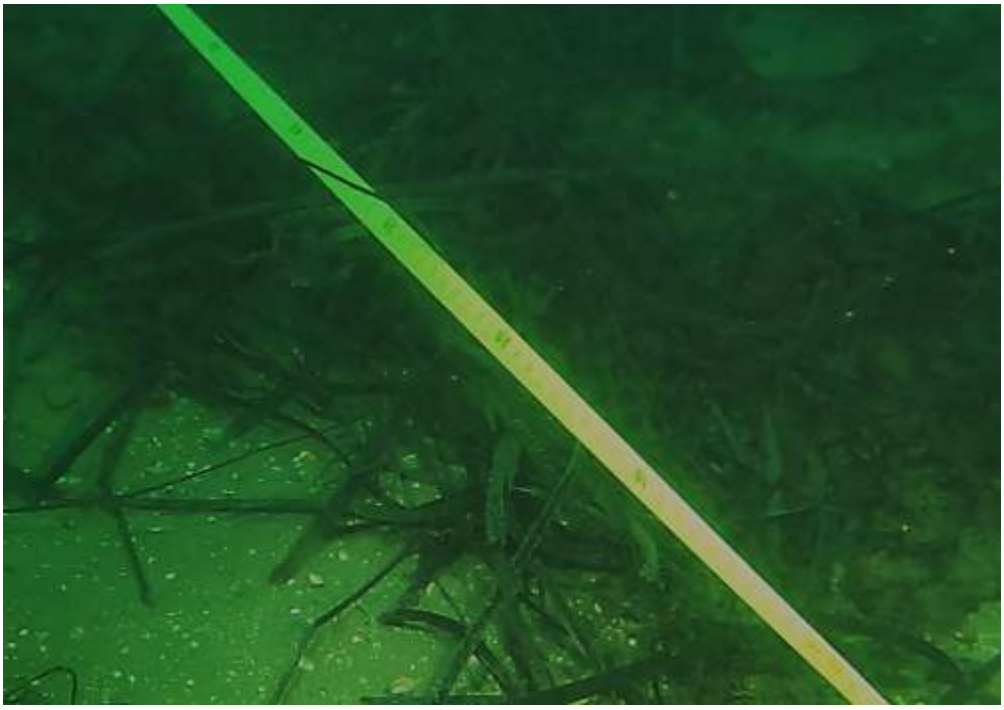

Figure 4. North to south transect line *in-situ* at Sterling AMS site.

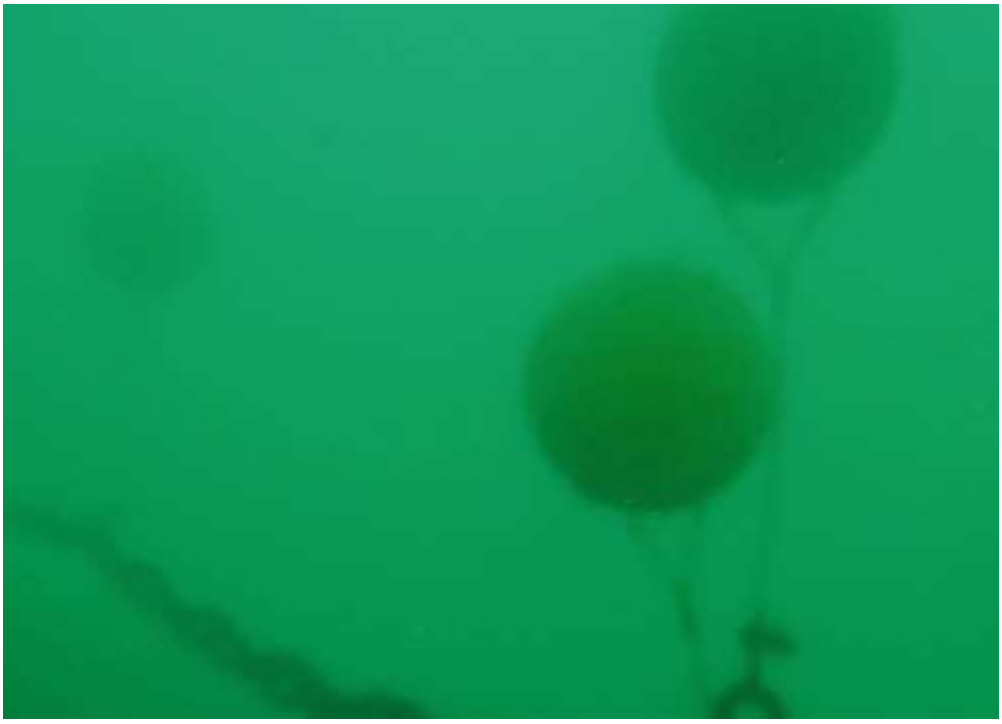

Figure. 5 Stirling support buoys holdng mooring chain off the seabed.

Figure. 6 QUB taxonomist R.Bajko collecting species images at Stirling AMS.

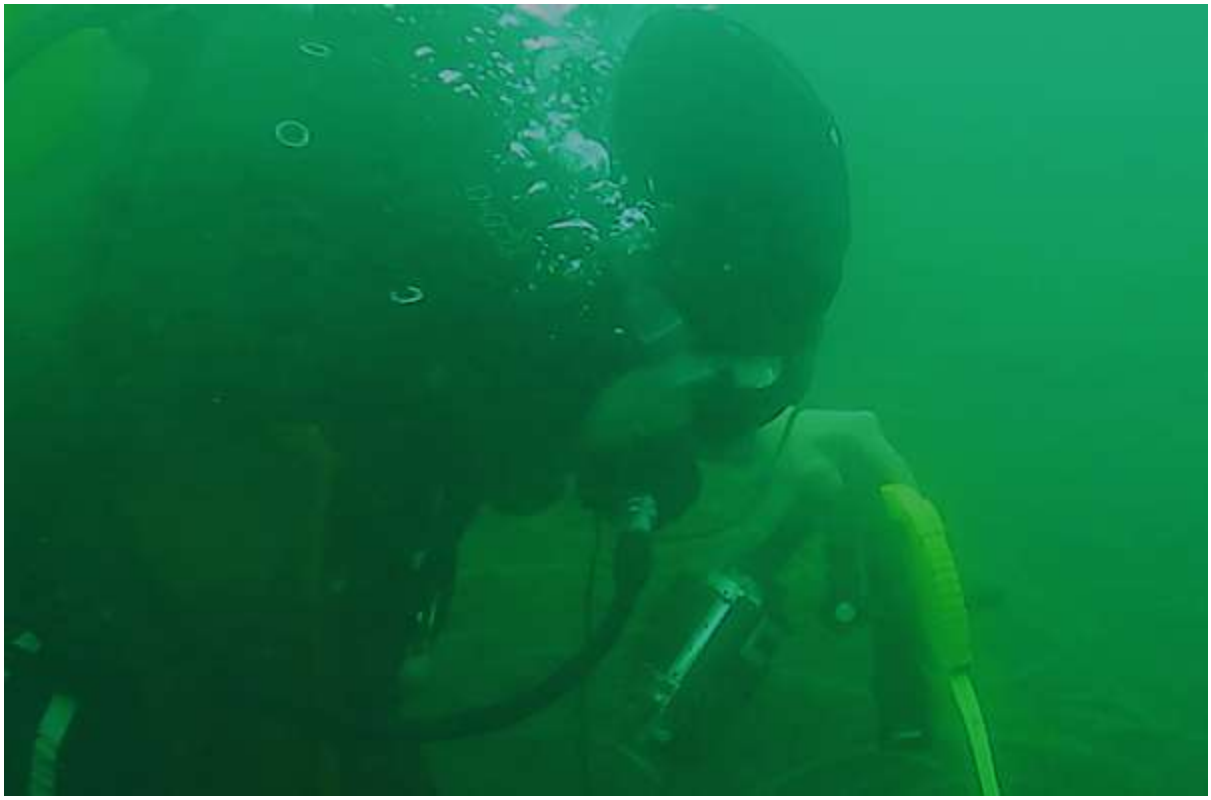

Figure. 6 Laying the transect line at the Seaflex © AMS.

Figure. 7 Gastropods grazing on seagrass blades at the Seaflex© AMS site.

4. **Survey outcomes**

5. **Stirling© AMS**

Divers surveyed the Stirling© at N 54° 23.352'; W 5° 33.739' AMS, reaching a maximum depth of 7.2m. The AMS and support buoys were intact, and there was no chain scour around the mooring block or along cardinal transects. The steel wire and crimped attachment system worked well, offering a practical alternative to the Seaflex© system.

The Stirling© AMS is now located at the edge of the Ballyhenry seagrass meadow, between 6 and 8 metres deep. This depth marks the highest point where *Zostera marina* seagrass grows best. Evaluating the Stirling© system at the shallower Seaflex© site is recommended to allow for a direct comparison of the two AMS models. Such an approach would enhance confidence in the suitability of Stirling© deployments across varying depths and environmental conditions.

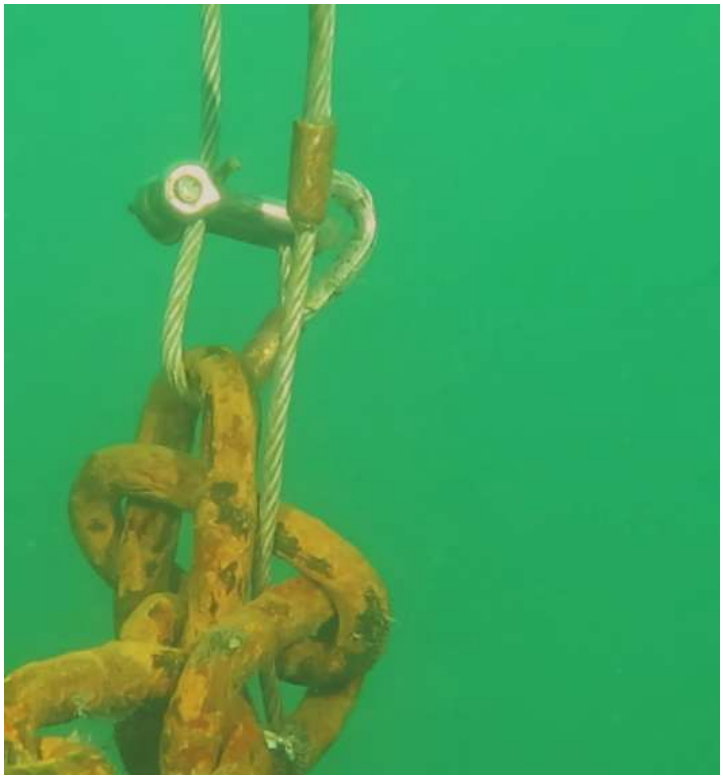

Figure. 8 Steel wire crimp and shackle attachment on the Stirling© AMS.

6. Seaflex© AMS

Divers conducted an inspection of the Seaflex© at coordinates N 54° 23.295’; W 005° 33.751’ AMS, reaching a maximum depth of 3.6 meters. The system was found to be in optimal working condition. Seagrass coverage remained dense and uninterrupted from the mooring block to the perimeter of the survey plot.

Figure 12. Seaflex© mooring block attachment secure and in good condition.

Figure 13. Thick seagrass coverage throughout the Seaflex© site.

7. Substrate type

There were no observed differences in substrate type or JNCC biotope species among the AMS sites. The substrate consistently matched clean, muddy sand, fitting the Joint Nature Conservation Committee code SS.SMp.SSgr.Zmar for *Zostera marina* beds on subtidal or infralittoral clean or muddy sand (Table 1).

Table 1. Ballyhenry Bay physical habitat description for both AMS trial sites.

Salinity	Full (30-35 ppt), Variable (18-35 ppt) only in event of a fresh water run-off incident
Wave exposure	Moderately exposed, Sheltered,
Tidal streams	Moderately strong (1-3 kn), Weak (>1 kn), Very weak on slack
Substratum	Clean sand to muddy fine sand or mud
Zone	Infralittoral to subtidal
Depth Band	0-5 m, 5-10 m

8. Seagrass habitat species composition and recorded macrofauna

Both AMS sites were characterised by extensive areas of clean or muddy fine sand and sandy mud in shallow water (2–6 m deep), supporting dense stands of *Zostera marina*. Seagrass habitats such as those at Ballyhenry that correspond to the SS.Smp.SSgr.Zmar UK Government biotope code typically host a flora and fauna community dominated by species associated with *Zostera*. Since the survey was conducted in October 2025, many sessile and motile species usually observed in summer were not present. However, this pattern is likely to change during summer, when the variety of seasonal species tends to rise.

A thorough list of characteristic species associated with seagrass bed biotopes, corresponding to the substrate and sediment types present at Ballyhenry, has been gathered throughout different seasons (see Table 2). Species recorded during the March 2023 to October 2025 surveys at each AMS site are identified in the table below.

Table 2. Species recorded from 2023 to 2025 AMS Ballyhenry survey recorded in a characterising species list for a designated SS.SMp.SSgr.Zmar seagrass habitat (x present and 0 absent).

Taxon	**Importance of taxon for defining biotope (%)**	**Typical abundance**	**% records where taxon was recorded**	**Stirling© AMS 03/23**	**Seaflex© AMS 03/23**
Zostera marina	52	Abundant	81-100%	0-10%	70-90%
Corophium volutator	9	Abundant	21-40%	0	0
Nemertea	6	Common	41-60%	x	x
Nematoda	5	Commo	21-40%	x	x
Scoloplos armiger	5	Abundant	41-60%	0	x
Chorda filum	4	Frequent	21-40%	x	x
Tubificoides benedii	4	Frequent	21-40%	0	0
Ampelisca brevicornis	3	Frequent	21-40%	*Ampelisca sp. x*	*Ampelisca sp. x*
Anemonia viridis	3	Occasional	21-40%	0	0
Arenicola marina	3	Occasional	21-40%	0	0
Carcinus maenas	3	Occasional	41-60%	0	x
Fabulina fabula	3	Occasional	21-40%	x	x
Kurtiella bidentata	3	Common	21-40%	0	0
Platynereis dumerilii	3	Frequent	21-40%	0	x

Taxon	Importance of taxon for defining biotope (%)	Typical abundance	% records where taxon was recorded	Stirling© AMS 03/23	Seaflex© AMS 03/23
Abra alba	2	Common	21-40%	Valves only	x
Asterias rubens	2	Occasional	21-40%	0	x
Nototropis swammerdamei	2		21-40%	0	0
Capitella capitata	2	Common	21-40%	0	0
Dexamine spinosa	2	Frequent	21-40%	0	*Dexamine sp.*
Tritia reticulata	2	Occasional	21-40%	x	x
Saccharina latissima	2	Occasional	21-40%	x	x
Pagurus bernhardus	2	Occasional	21-40%	0	x
Thyasira flexuosa	2		1-20%	x	0
Urothoe elegans	2		21-40%	0	0
Ulva	2	Occasional	21-40%	x	x
Palmaria palmata				x	x
Idotea balthica	1		21-40%	0	0
Oligochaeta	1	Frequent	21-40%	0	0
Amphipholis squamata	1	Abundant	21-40%	0	x
Apseudopsis latreillii	1	Frequent	21-40%	0	0
Cancer pagurus	1	Frequent	21-40%	0	x
Liocarcinus depurator	1	Common	1-20%	0	x
Necora puber	1	Occasional	21-40%	0	x
Leseurigobius friesii	1	Common	21-40%	x	x
Sagartia elegans	1		21-40%	0	x

9. Seagrass percentage cover at Ballyhenry AMS sites

Seagrass coverage at AMS sites showed considerable variation, mainly due to differences in light availability and hydrodynamic factors. The AMS systems did not affect coverage results, as both the Seaflex and Stirling moorings were functioning properly. As a result, the percentage cover reflects the maximum seagrass coverage possible with both systems.

10. Seagrass canopy height

Seagrass canopies were directly measured at both AMS locations. Although Ballyhenry meadows are vulnerable to storm damage because of their shallow location, no such effects were observed. The shallower Seaflex© AMS, considered more at risk, had seagrass blades over 45 cm long. Average blade lengths from Seaflex© AMS to the plot boundary ranged from 20 to 35 cm, indicating healthy plants.

At the Stirling© AMS site, intact seagrass blades averaged between 15 and 25 cm in length. This is attributed to environmental factors such as reduced light availability and increased hydrodynamic activity throughout the tidal cycle.

In Summary

Advanced Mooring System (AMS) surveys were carried out at both trial sites Stirling© and Seaflex© with minor methodological adjustments made to accommodate the maximal length of seagrass blades. The survey used video transects instead of quadrats, and both Stirling© and Seaflex© moorings were inspected for integrity and environmental impact.

Notably, Seaflex and Stirling type moorings continue to demonstrate promise for seagrass recovery, as they lift mooring chains off the seabed, reducing damage and

supporting natural habitat restoration. Recent projects elsewhere in the UK, such as in Plymouth Sound and Studland Bay, have recorded over 90% increases in seagrass cover around AMS installations within four years, illustrating the systems' potential for habitat restoration and biodiversity support.

Dense stands of *Zostera marina* were present, with associated characteristic macrofauna and flora recorded at each site. The Stirling© AMS, placed at the edge of the seagrass meadow at depths of 6–8 metres, and the Seaflex© AMS, at a shallower 3.6 metres, were both in good working order without evidence of chain scour or damage. Differences in seagrass cover and canopy height between sites were attributed to environmental conditions rather than AMS type, with the Seaflex© site showing blade lengths over 45 cm and the Stirling© site averaging 15–25 cm.

Overall, the AMS installations at Ballyhenry have maintained seagrass cover and supported healthy plant growth, mirroring successful outcomes observed in other UK regions. The report suggests further trials of the Stirling© system in shallower areas to assess its suitability across a wider range of seagrass habitats.