Attachment 4.6

Consistency of the proposed Maritime Usage with the objectives of the Marine Strategy Framework Directive (MSFD)

Introduction

Before determining a MUL, MARA is required to have regard to Directive 2008/56/EC as amended by Directive (EU) 2017/845, the Marine Strategy Framework Directive, and the associated implementing national legislation, European Communities (Marine Strategy Framework) Regulations, 2011. The Marine Strategy Framework Directive establishes a framework within which Member States must take the measures necessary to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest. The objective of the Directive is to protect and prevent deterioration of the marine environment and, where practical, restore marine ecosystems. Member States must prevent and reduce inputs in the marine environment, with a view to phasing out pollution, to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea. The Directive applies to waters, the seabed and subsoil on the seaward side of the baseline from which the extent of territorial waters is measured extending to the outmost reach of the area where a Member State has and/or exercises jurisdictional rights.

There are eleven categories by which good environmental status is measured and monitored. These are:

- D1 Biological diversity
- D2 Non-indigenous species
- D3 Population of commercial fish / shellfish
- D4 Elements of marine food webs
- D5 Eutrophication
- D6 Sea floor integrity
- D7 Alteration of hydrographical conditions
- D8 Concentration of contaminations
- D9 Contaminants in fish / seafood for human consumption
- D10 Marine Litter
- D11 Introduction of energy including underwater noise.

Ireland has developed targets and indicators with respect to measuring and monitoring these 11 descriptors, to ensure to ensure good environmental status. These are set out in Ireland's Marine Strategy Framework Directive Marine Strategy

MSFD assessment methodology

For the Zone of Influence (the area over which the proposed Maritime Usage could have had an ecological or other relevant impact), the current status of the 11 MSFD descriptors was assessed with reference to the indicators and targets set out in Ireland's Marine Strategy Framework Directive Marine Strategy. The potential effects of the proposed Maritime Usage on the achievement of these targets were then evaluated for each of the 11 descriptors.

Zone of Influence (ZOI)

The zone of influence for the proposed maintenance dredging encompasses two Water Framework Directive (WFD) water bodies: the Lower Shannon Estuary (IE_SH_060_0300), classified as a transitional water body, and the Mouth of the Shannon (IE_SH_060_0000), classified as a coastal water body. Under Irish implementation of the Marine Strategy Framework Directive (MSFD), transitional and coastal waters are assessed using existing WFD monitoring programmes, in line with MSFD Article 11's requirement to build on established monitoring networks. Accordingly, the ecological status, chemical status, and supporting quality elements reported under the WFD for these water bodies are used directly to inform the achievement of Good Environmental Status (GES) under the MSFD for relevant descriptors, including eutrophication (D5), contaminants (D8/D9) and hydrographical conditions (D7) as well as other listed below (Table 4.6.1).

MSFD Status

The 2025 assessment of Ireland's Marine Strategy Framework Directive (MSFD) status indicated variable progress across the descriptors, with several achieving Good Environmental Status (GES) while others remained only partially achieved or unknown. Biodiversity (D1) and commercial fish and shellfish (D3) continued to present challenges, as biodiversity was constrained by uncertainties in marine mammal status and by the poor condition of many fish populations, while less than half of assessed commercial fish stocks attained GES. In contrast, non-indigenous species (D2), eutrophication (D5), hydrographical conditions (D7), contaminants in the environment (D8), contaminants in seafood (D9), and underwater noise (D11) had achieved GES, reflecting effective management of these pressures. Seafloor integrity (D6) was found to be largely in good condition, with 74% of the assessed areas achieving GES, although gaps in assessment remained and 11% of the seabed did not meet the required thresholds. Marine litter (D10) represented the most prominent area of concern, as beach litter exceeded acceptable levels and knowledge gaps persisted for seafloor litter and microplastics. The status of food webs (D4) remained unknown, highlighting a significant knowledge gap. Nearly all descriptors are relevant in some way to maintenance dredging in the approach channel to Kilrush Marina, particularly those relating to biodiversity, seafloor integrity, contaminants, and litter. Table 4.6.1 outlines status of each MSFD descriptor and its relevance to the proposed Maritime Usage.

Table 4.6.1 MSFD Cycle 3 status of Descriptors and relevance to Maritime Usage

MSFD Descriptor	MSFD Status in Ireland (2025)	Relevance to Maritime Usage
D1 – Biological Diversity	GES partially achieved. Most marine bird species achieved GES. Most marine mammal GES unknown. GES Not Achieved for most fish species. Incidental bycatch remains a major issue	Relevant
D2 – Non-Indigenous Species	GES achieved	Relevant
D3 – Commercial Fish & Shellfish	GES partially achieved. GES achieved for 29 stocks. GES Not Achieved for 46 stocks and GES status is unknown for 99 stocks	Relevant

MSFD Descriptor	MSFD Status in Ireland (2025)	Relevance to Maritime Usage
D4 – Food Webs	GES status is unknown	Not relevant
D5 – Eutrophication	GES achieved	Relevant
D6 – Seafloor Integrity	GES has been achieved for 74% of seafloor, 15% remains either not assessed or unknown, 11% is not in good status.	Relevant
D7 – Hydrographical Conditions	GES achieved	Relevant
D8 – Contaminants in Environment	GES achieved (most contaminants below thresholds)	Relevant
D9 – Contaminants in Seafood	GES achieved (levels below EU food safety standards)	Relevant
D10 – Marine Litter	GES not achieved (beach litter). Seafloor macro litter unknown. Microplastics remain unassessed.	Relevant
D11 – Underwater Noise	GES achieved	Relevant

MSFD Indicators

Forty indicators were used for the third cycle of the MSFD assessment to evaluating progress towards Good Environmental Status across all 11 MSFD descriptors. These indicators allow complex ecological processes and pressures to be measured effectively, allowing comparability across regions and reporting cycles, enabling the identification of trends, and helps distinguish between natural variability and human-induced change. Indicators also serve a practical management function, providing policymakers with clear benchmarks against which the effectiveness of measures can be judged (Table 4.6.2).

Table 4.6.2 – Indicators used to assess criteria for each MSFD descriptor for the 3rd MSFD cycle

Descriptor	Criterion	Indicator(s)
D1 Biodiversity	D1C1 Mortality from incidental bycatch	Bycatch Mortality Indicator (ACS-IE-BycatchMortality2024)
	D1C2 Population abundance	Abundance of Marine Bird Species (ACS-IE-BirdAbundance2024); Seal Abundance Indicator (ACS-IE-SealAbundance2024); Cetacean Abundance Indicator (ACS-IE-CetaceanAbundance2024); Turtle Abundance Indicator (ACS-IE-TurtleAbundance2024); Fish Abundance Indicator (ACS-IE-FishAbundance2024)

Descriptor	Criterion	Indicator(s)
	D1C3 Population demographic characteristics	Population Demographics Indicator (ACS-IE-PopDemographics2024)
	D1C4 Distributional range	Distributional Range Indicator (ACS-IE-Distribution2024)
	D1C5 Habitat for species	Habitat Extent and Condition Indicator (ACS-IE-Habitat2024)
D2 Non-indigenous species	D2C1 Newly introduced NIS	Newly Introduced NIS Indicator (ACS-IE-NewNIS2024)
	D2C2 Established NIS	Established NIS Abundance Indicator (ACS-IE-EstablishedNIS2024)
D3 Commercial fish & shellfish	D3C1 Fishing mortality (F)	Fishing Mortality Indicator (ACS-IE-F2024)
	D3C2 Spawning Stock Biomass (SSB)	SSB Indicator (ACS-IE-SSB2024)
	D3C3 Population age/size distribution	Age/Size Distribution Indicator (ACS-IE-AgeSize2024)
D4 Food webs	D4C1 Diversity of trophic guilds	Diversity of the Trophic Guild Indicator (ACS-IE-TrophicGuildDiversity2024)
	D4C2 Balance of abundance among trophic guilds	Abundance Balance Indicator (ACS-IE-TrophicGuildAbundance2024)
	D4C3 Size distribution within trophic guilds	Size Distribution Indicator (ACS-IE-TrophicGuildSize2024)
	D4C4 Productivity of trophic guilds	Productivity Indicator (ACS-IE-TrophicGuildProductivity2024)
D5 Eutrophication	D5C1 Nutrient concentrations	Nutrient Concentrations Indicator (ACS-IE-Nutrients2024)
	D5C2 Chlorophyll-a concentrations	Chlorophyll-a Indicator (ACS-IE-Chlorophyll2024)
	D5C5 Dissolved oxygen	Dissolved Oxygen Indicator (ACS-IE-DO2024)
D6 Sea-floor integrity	D6C1 Physical loss of seabed	Seabed Loss Indicator (ACS-IE-SeabedLoss2024)
	D6C2 Physical disturbance of seabed	Seabed Disturbance Indicator (ACS-IE-SeabedDisturbance2024)
	D6C3 Adverse effects from disturbance	Benthic Community Condition Indicator (ACS-IE-BenthicCondition2024)

Descriptor	Criterion	Indicator(s)
	D6C4 Benthic habitat extent	Habitat Extent Indicator (ACS-IE-BenthicExtent2024)
	D6C5 Benthic habitat condition	Habitat Condition Indicator (ACS-IE-BenthicCondition2024)
D7 Hydrographical changes	D7C1 Permanent alteration of hydrographical conditions	Hydrographical Alteration Indicator (ACS-IE-HydroAlteration2024)
	D7C2 Adverse effects from alteration	Hydrographical Effects Indicator (ACS-IE-HydroEffects2024)
D8 Contaminants	D8C1 Concentrations of contaminants	Contaminant Concentrations Indicator (ACS-IE-Contaminants2024)
	D8C2 Adverse effects of contaminants	Biological Effects of Contaminants Indicator (ACS-IE-ContamEffects2024)
	D8C3 Acute pollution events	Acute Pollution Events Indicator (ACS-IE-AcutePollution2024)
D9 Contaminants in seafood	D9C1 Levels of contaminants in seafood	Contaminants in Seafood Indicator (ACS-IE-SeafoodContam2024)
D10 Marine litter	D10C1 Litter on coast & seafloor	Coastal Litter Indicator (ACS-IE-CoastalLitter2024); Seafloor Litter Indicator (ACS-IE-SeafloorLitter2024)
	D10C2 Micro-litter	Micro-litter Indicator (ACS-IE-MicroLitter2024)
D11 Underwater noise	D11C1 Impulsive noise	Impulsive Noise Indicator (ACS-IE-ImpulsiveNoise2024)
	D11C2 Continuous low-frequency sound	Continuous Noise Indicator (ACS-IE-ContinuousNoise2024)

Impact of Maritime Usage on each MSFD descriptor within the ZOI

Table 4.6.3 sets out how the proposed maintenance dredging in the approach channel to Kilrush Marina is consistent with the MSFD and Ireland's Marine Strategy.

Table 4.6.3 Assessment of MSFD Targets and the Potential Impacts of Proposed Maritime Usage

Target	Concise Description	Relevant Descriptor(s)	How proposed dredging will not affect achievement
D1T1	Bycatch mortality must remain below levels threatening species viability.	D1, D3, D4	Dredging does not involve fishing gear or cause bycatch; MMO, speed restrictions and slow-start up measures protect marine mammals.
D1T1-1	By 2028, reduce marine mammal bycatch below agreed limits.	D1, D3, D4	Dredging does not interact with marine mammals via bycatch; MMO, speed restrictions and slow-start up measures protect marine mammals.
D1T1-2	By 2026, establish monitoring for bird and reptile bycatch in fisheries.	D1	Dredging is not a fishing activity and does not cause bycatch; overwintering birds are protected by seasonal dredging restriction (1st October to 31st March).
D1T1-3	By 2026, participate in coordinated monitoring of non-target species bycatch.	D1	Dredging is unrelated to fisheries bycatch and will not impede monitoring or management.
D1T2	Species population abundance must not be adversely affected by human pressures.	D1, D3, D4	Dredging is temporary, localised to the approach channel, and conducted under operational controls; AA & NIS confirmed no adverse effects on population abundance.
D1T2-1	By 2026, maintain marine mammal populations at or above FRVs.	D1, D4	Dredging does not cause population-level impacts; MMOs ensure protection of Annex II species.
D1T2-2	By 2026, establish bird population monitoring.	D1	Dredging does not interfere with bird monitoring; closed periods protect overwintering birds.
D1T2-3	By 2026, improve knowledge and monitoring of turtle abundance.	D1	Dredging is not expected to affect turtle abundance or monitoring.
D1T4	Species distribution should align with natural conditions.	D1, D4	Dredging is localised and short-term; AA, NIS and ecological surveys confirmed species distribution aligned with natural conditions.
D1T5	Habitats must support species' life stages.	D1, D4	Dredging is short-term and confined to the navigational channel; AA, NIS and ecological surveys confirmed habitats remain functionally intact.
D1T5-1	By 2030, achieve 30% MPA coverage, representative and resilient.	D1, D3, D4	Dredging does not affect designation or management of MPAs.

Target	Concise Description	Relevant Descriptor(s)	How proposed dredging will not affect achievement
D1T5-3	By 2030, ensure Natura 2000 sites have management measures.	D1, D3, D4	Dredging will comply with Natura 2000 requirements; AA and NIS confirmed no impact on integrity of relevant European sites.
D1T5-4	By 2028, minimise bird collisions with offshore energy.	D1	Dredging does not involve wind energy infrastructure and poses no bird collision risk.
D2T1	Minimise new non-invasive species introductions to zero where possible.	D2, D1, D4	Dredging involves relocation of native sediments only; no ballast water or external material introduced. Vessel will be one used regularly in the Shannon Estuary from the SFPC.
D2T1-1	By 2026, implement a management plan for NIS.	D2	Dredging does not hinder non-invasive species management; compliance with regulations prevents risk.
D2T1-2	Reduce non-invasive species risks from ballast water and hull fouling.	D2	Dredging vessels comply with Ballast Water Convention and antifouling standards; no risk of non-invasive species introduction.
D3T1	Fishing mortality at or below Fmsy.	D3	Dredging does not involve or interact with commercial fishing.
D3T2	Spawning stock biomass above MSY levels.	D3	Dredging does not affect fish stock biomass.
D3T1-1	Manage all exploited stocks by MSY.	D3	Dredging has no role in fisheries management.
D4T1	Diversity of trophic guilds unaffected by pressures.	D4	Not relevant.
D4T2	Abundance balance between trophic guilds unaffected.	D4	Not relevant.
D5T1	Nutrient levels not at eutrophic conditions.	D5	Sediment relocation does not add nutrients beyond natural variability; suspended solids disperse rapidly with ebb tide into main estuary channel.
D5T1-1	By 2028, implement Water Action Plan to tackle eutrophication.	D5	Dredging will not hinder WFD eutrophication measures; background nutrient conditions maintained.
D5T2	Chlorophyll-a not at eutrophic levels.	D5	Dredging of this scale will not cause algal blooms within a naturally turbid dynamic large estuary.

Target	Concise Description	Relevant Descriptor(s)	How proposed dredging will not affect achievement
D5T3	Dissolved oxygen not reduced by eutrophication.	D5	No significant effect on dissolved oxygen; no eutrophication is expected from the dredging.
D6T1	Seafloor disturbance and loss must not threaten ecosystem function.	D6, D1, D3, D4	Confined to pre-existing approach channel; sediment deposition shallow and localised; benthic communities adapted to natural disturbance.
D6T1-1	Maintain physical loss <2% of seabed.	D6	Dredging footprint is 0.003% of the seabed extent of Mouth of the Shannon WFD waterbody of an existing modified approach channel. Physical loss of <2% seabed extent will be maintained.
D6T2	Habitat condition not significantly degraded by pressures.	D6	Temporary and localised disturbance; local habitats resilient to minimal dredging impacts.
D6T2-1	By 2030, adverse effects <25% of seabed extent.	D6	Dredging footprint is 0.003% of the seabed extent of Mouth of the Shannon WFD waterbody. This target will not be affected by the maintenance dredging.
D6T2-2	By 2040, restore two-thirds of degraded habitats.	D6	Dredging does not significantly impact local habitats. 2016-2021 WFD status of Mouth of the Shannon was Good.
D6T2-3	By 2040, assess 50% of benthic habitat condition.	D6	Monitoring programmes remain unaffected.
D6T2-4	By 2030, assess 50% of other benthic habitats.	D6	Dredging does not hinder habitat assessments.
D6T2-5	By 2030, restore 30% of degraded habitats.	D6	Dredging will not obstruct habitat restoration objectives.
D6T2-6	By 2028, implement nature-based solutions for habitat restoration.	D6, D1, D5	Dredging does not conflict with nature-based solutions.
D7T1	Hydrographical alterations must not harm ecosystems.	D7	Hydrographic changes temporary and minor; tidal flow, salinity, and morphology maintained. Approach channel has been present since 1990s.
D7T1-1	By 2026, ensure activities comply with regulatory regimes on hydro changes.	D7	Dredging will comply with hydrographic regulatory guidance; no permanent alteration.
D8T1a	Contaminants in coastal waters below thresholds.	D8, D9	Sediment testing confirms contaminants below thresholds; virtually clean natural material relocated.

Target	Concise Description	Relevant Descriptor(s)	How proposed dredging will not affect achievement
D8T1a-1	Maintain/reduce inputs of contaminants below thresholds.	D8, D9	Dredging virtually clean natural sediment will not add contaminants to sediment; monitoring programme under DaS permit ensures ongoing compliance.
D8T1b	Offshore contaminant levels below OSPAR criteria.	D8, D9	Dredging virtually clean natural sediment will not add contaminants to sediment; monitoring programme under DaS permit ensures ongoing compliance.
D8T1b-1	By 2030, ensure regulation of pollutants from offshore infrastructure.	D8, D9, D10, D11	Dredging complies with regulatory standards; no hindrance to pollutant management.
D8T2	Biological/ecological effects from contaminants below OSPAR criteria.	D8, D1	Latest sediment sampling for previous DaS permit confirmed contaminants were below biological/ecological impact limits (i.e. Higher Action limits).
D8T3	Acute pollution events minimised.	D8, D1, D3, D4	DaS permit limitations and monitoring programme minimises pollution risk; operational controls mitigate oil/fuel spill risk.
D9T1	Contaminants in seafood below EU safety limits.	D9, D8	No pathway for increased contaminants in seafood; sediment testing confirms low risk.
D10T1a	Litter levels not causing environmental harm.	D10, D1	Solid waste encountered will be disposed of appropriately on land; no additional litter generated.
D10T1a-1	By 2030, reduce coastline litter to 20 items/100m.	D10, D1	Plough dredging of in-situ sediment in approach channel does not contribute to coastal litter.

Statement of Authority

Dr. Aidan Long is a Principal Marine Consultant with over nine years of experience across consultancy, government, and academia, with a PhD in marine ecology from the University of Galway. His career has focused on the assessment and management of environmental impacts in the marine environment, with specialist expertise in Environmental Impact Assessment, Appropriate Assessment, Marine Usage Licences, and Dumping at Sea permits. He has successfully managed and delivered complex multidisciplinary projects for high-profile clients in Ireland, Australia, and Brazil in sectors including fisheries, aquaculture, offshore renewables, ports, and wastewater, authoring over 30 major technical reports. His background includes detailed ecological and environmental quality assessments, monitoring programme design, and statistical analysis, supported by peer-reviewed publications and international research collaborations. Drawing on this expertise and his in-depth knowledge of EU and Irish environmental legislation, Dr. Long is suitably qualified to provide a robust consideration of the project's consistency with the objectives of the Marine Strategy Framework Directive.