EU Habitats Directive: Annex IV

Species at Risk Assessment

Document in support of a Marine Usage License Application presented to the Maritime Area Regulatory Authority for the Harvest of Seaweed in Bertraghboy Bay

COMMERCIALLY CONFIDENTIAL

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1. Introduction

The Government of Ireland has recently appointed the Maritime Area Regulatory Authority (MARA) to license the harvesting of seaweed. Arramara Teo has been harvesting and processing seaweed, primarily *Ascophyllum nodosum* and to a lesser extent *Fucus vesiculosus* (both species will be referred hereafter to *Ascophyllum*), for over 78 years along the western coast of Ireland. It purchases seaweed from over 200 harvesters and provides employment for 21 employees at its processing plant located in Kilkieran, County Galway. This report evaluates the potential for likely significant impact on Annex IV species while harvesting *Ascophyllum* along the rocky foreshore of Bertraghboy Bay located in County Galway (Figure 1).

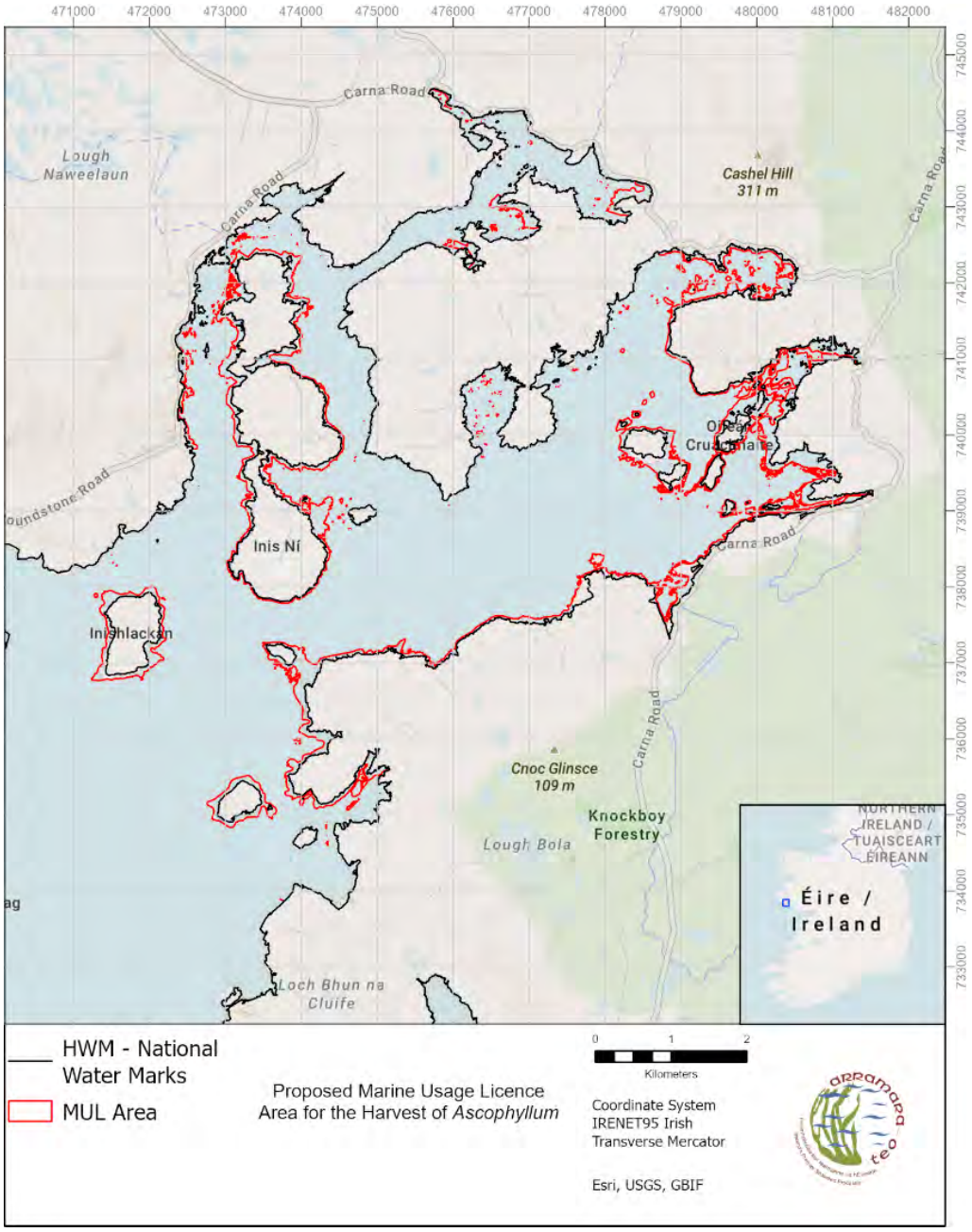

Figure 1 - Proposed areas of foreshore for the harvest of Ascophyllum

There is a long history of commercial harvesting of *Ascophyllum* in the region (Guiry and Morrison, 2013) and many of the *Ascophyllum* beds have been harvested for several decades. As described in detail in the individual SISAA reports, Arramara Teo has developed a thorough management plan for the harvest of *Ascophyllum*. This is based on years of experience harvesting *Ascophyllum* in the region combined with expertise from the development and implementation of similar management plans for the harvest of *Ascophyllum* in Canada, United States, and Scotland. The main components of the management plan include:

- **A single licensee per region** - This ensures that the resource is not overharvested because of competitive pressure from multiple companies. It also allows for the licensee to exert some control over the quantity of resource removed on a yearly basis.
- **The implementation of area-based management** - The foreshore is divided into sectors that form the management unit. A biomass assessment is conducted within each sector to evaluate the available biomass of *Ascophyllum*. Based on these assessments, a yearly quota is established for each sector.
- **Harvest quotas per sector** - A maximum of 20% of the standing stock of *Ascophyllum* is harvested annually in any sector. This level of harvest is commonly used in Canada, United States, and Scotland. It has proven to be sustainable after more than two decades of continuous commercial harvesting, having no long-term impact on the biomass, length, or morphology of *Ascophyllum*.

Arramara Teo conducts biomass assessments and monitors the condition of the resource. Arramara Teo also employs a resource team that oversee the harvesting activities, manage the harvesters, and ensure that annual quotas are respected.

Arramara Teo has been sustainably harvesting *Ascophyllum* in the region for several decades, and the present Maritime Usage License (MUL) application aims to allow Arramara Teo to continues its harvesting activities. Arramara Teo has relied on local harvesters to obtain *Ascophyllum* and will continue to do so.

This MUL application only applies to state-owned foreshore and excludes any portion of the foreshore for which a seaweed appurtenant right has been identified by the Property Registration Authority of Ireland.

2. Scope of Work

Arramara Teo's harvesters employ two different methods to harvest *Ascophyllum*: the hand harvest at low tide and the boat and rake method.

Traditional harvesting involves using one to two local harvesters, also known as cutters, working within a specific section of the foreshore. The seaweed is cut on foot at low tide within a 20 m x 20 m section of bed using a knife or sickle, leaving at least 25 cm attached to the substrate to ensure re-growth of the plant. This traditional harvesting is carried out in strict rotation to allow the *Ascophyllum* to regrow, with harvesters only returning after 3 to 5 years.

Using a fork, the seaweed is then gathered into bundles (called "climíní" in Connemara Irish) of approximately 2 to 3 tonnes, which are bound by 20-meter-long nets and ropes and left on the intertidal shoreline. These bundles float at high water and are towed by a small boat (3 to 4 metres in length, 20 to 30 HP outboard engine) to a suitable pier for collection by a lorry with a crane that lifts the climíni onto the lorry, where it is inspected by a resource team member before a haulier transports the seaweed to Arramara Teo for processing (usually in 20-tonne loads). Hauliers access the lorry through the road networks and existing tracks.

For the boat and rake method, harvesters manoeuvre their boat (maximum length 3 to 4 metres, 30 HP outboard engine) to the bed they wish to harvest on the rising tide. The boats are specifically designed to carry a load of 3 to 4 tonnes of seaweed. The harvester cuts the seaweed using a specially designed cutting rake that allows the harvester to target and trim the upper portion of individual plants and bring the cut portion into the boat. All rakes are equipped with a 15-cm rail to prevent cutting from occurring too close to the holdfast.

Once full, the boats are unloaded at a landing site directly into a truck or stored into nets for collection within a few days after the initial cut. Harvesting from the boat allows harvesters to operate during high tide and store the seaweed in the boat rather than leaving it on the shore. Because their vessel is constantly moving with the tide and currents, harvesters gather *Ascophyllum* plants in a patchy and pruning fashion. This process leaves ample canopy for other intertidal inhabitants, allows for a rapid regeneration of seaweed shoots and minimizes the disturbance of the habitat architecture. Overall, our research finds the boat and rake method to be a highly sustainable practice.

Note that the extent of foreshore included in this license application is considered unencumbered state-owned foreshore free of any seaweed-related appurtenant rights. All maritime areas that have mapped appurtenant seaweed rights have been excluded from the application. In the case of unmapped appurtenant seaweed rights, the maritime area contiguous to the townland of all folios with appurtenant seaweed rights has been excluded based on an abundance of caution.

3. Receiving Environment: Annex IV Species

Arramara Teo harvesting will be carried out on the intertidal zone. Transport of seaweed on the water is limited to small distances within each bay, and as such, we have limited this assessment of Annex IV species to those that may be encountered or affected by those operations. Data from the Global Biodiversity Information Facility (GBIF, GBIF.org) and the National Biodiversity Data Center (biodiversityireland.ie) were used to assess which species could potentially be impacted and within the zone of influence of the proposed seaweed harvesting activities. Since harvesting activities occur on very small areas along the coast, we have focused our attention to observations within 500 m of any *Ascophyllum* bed. For each species of concern, we calculated the number of sightings within this buffer zone for each bay (Table 1).

	Short-Beaked Dolphin		Harbour Porpoise		Bottlenose Dolphin		European Otter		Leatherback Sea Turtle
MUL	0		0		0		6		1
Total Ireland	**1587**		**1457**		**478**		**7968**		**2077**

Table 1 - Number of sightings of selected Annex IV species within 500 m of any Ascophyllum harvesting beds in the MUL as well as for Ireland

3.1. Cetaceans

Of all cetaceans present in Ireland, most are not observed within the areas surrounding the proposed foreshore for *Ascophyllum* harvesting.

Only three species, the short-beaked dolphin, *Delphinus delphis* (Figure 2), the harbour porpoise, *Phocoena phocoena* (Figure 3), and the common bottlenose dolphin, *Tursiops truncates* (Figure 4), are occasionally observed near the bays where harvesting activities take place. No sightings were reported within the buffer zone around each harvesting area in any of the bays. None of these species utilise the intertidal zone where *Ascophyllum* harvesting activities take place.

The overall status of all three species of cetaceans found within the zone of influence of the proposed seaweed harvesting activities is currently Favourable (NPWS 2019). All three species are among the most commonly observed species in Irish waters.

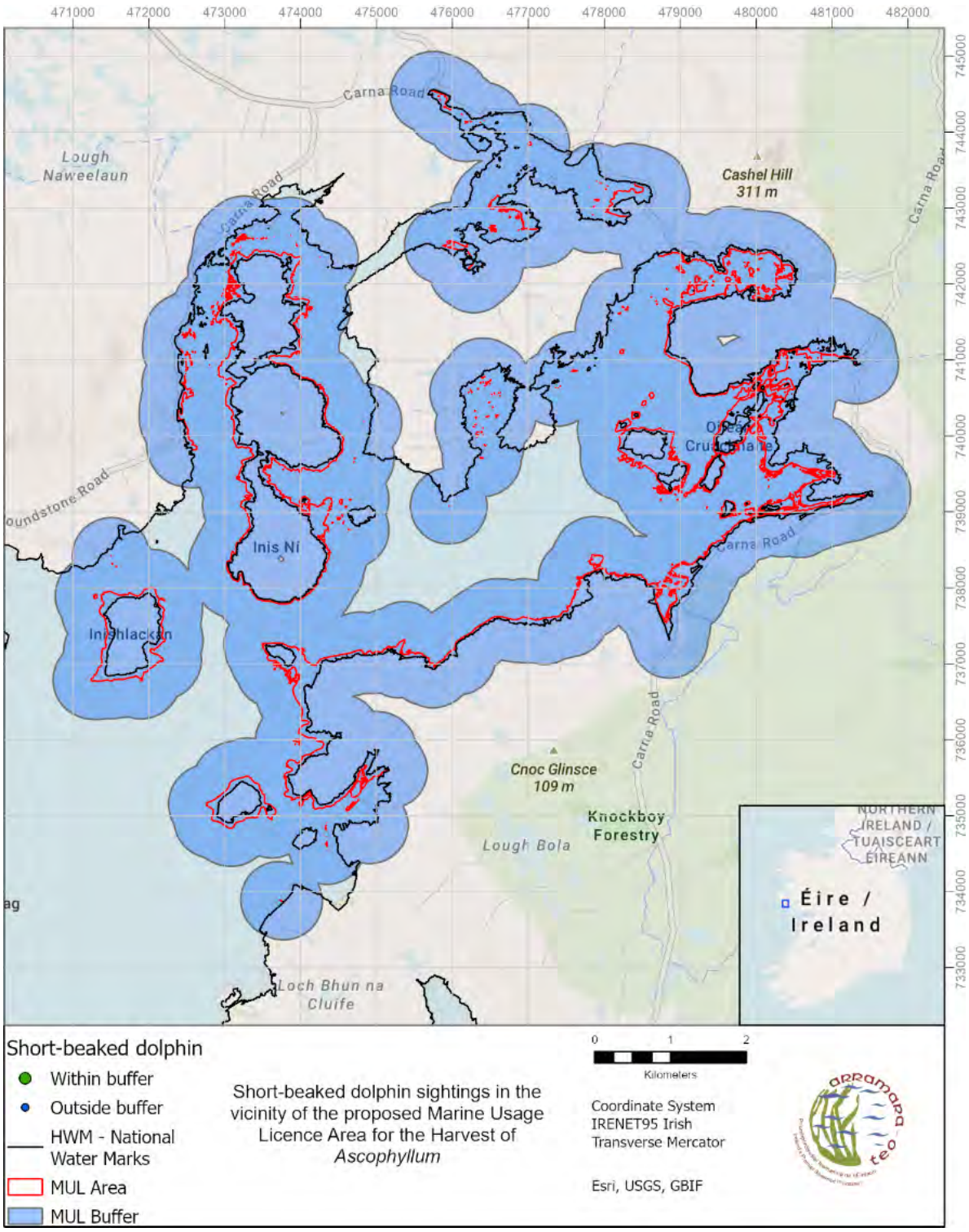

Figure 2 - Sightings of short-beaked common dolphins (Delphinus delphis) in the vicinity of the seaweed harvesting areas

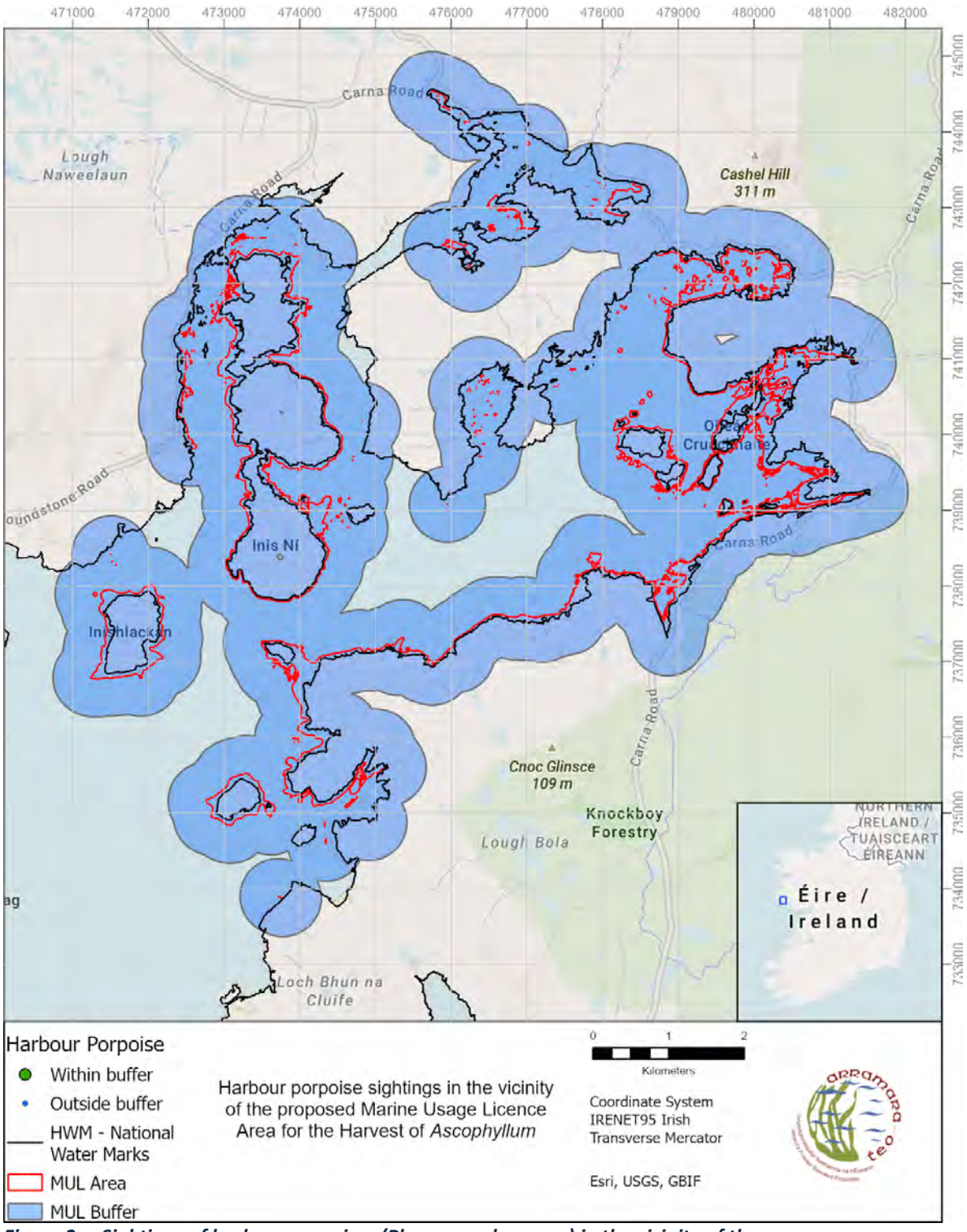

Figure 3 - Sightings of harbour porpoises (Phocoena phocoena) in the vicinity of the seaweed harvesting areas.

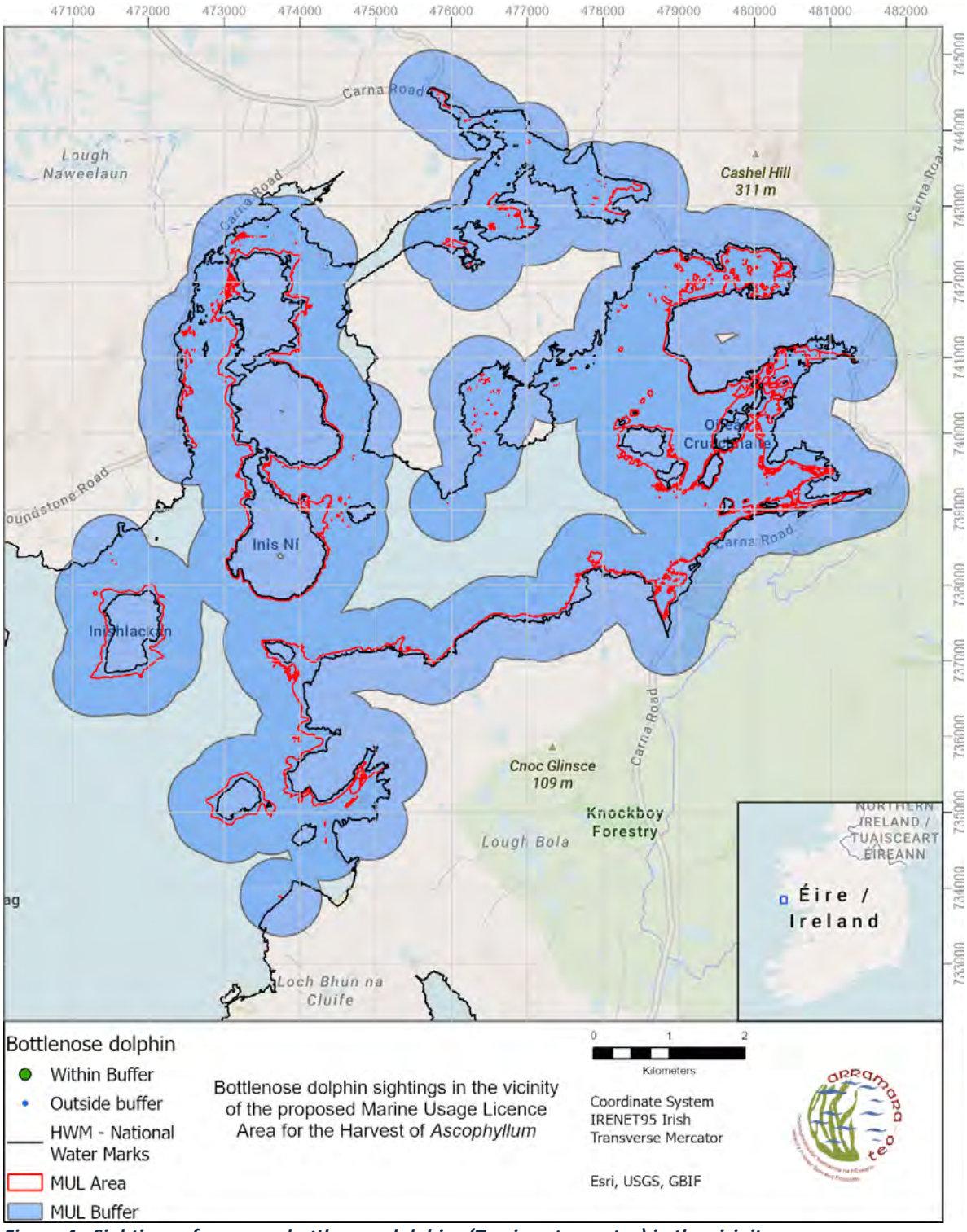

Figure 4 - Sightings of common bottlenose dolphins (Tursiops truncatus) in the vicinity of the seaweed harvesting areas.

3.2. Otters

European otters (*lutra lutra*) are widely distributed throughout Ireland (Figure 5), and their abundance has remained constant since the first surveys in the early 1980's with the breeding female population estimated at 7,000 to 10,000. Otters use rivers, lakes and the coast to feed and to seek refuge. The main threats to the otter stem from pollution and accidental death from road traffic or fishing gear. None of the threats are considered likely to significantly impact the species, which continues to have a Favourable status.

Close to 8,000 sightings of otters are recorded for Ireland, of those, 6 were observed within the buffer zone around the proposed harvesting areas.

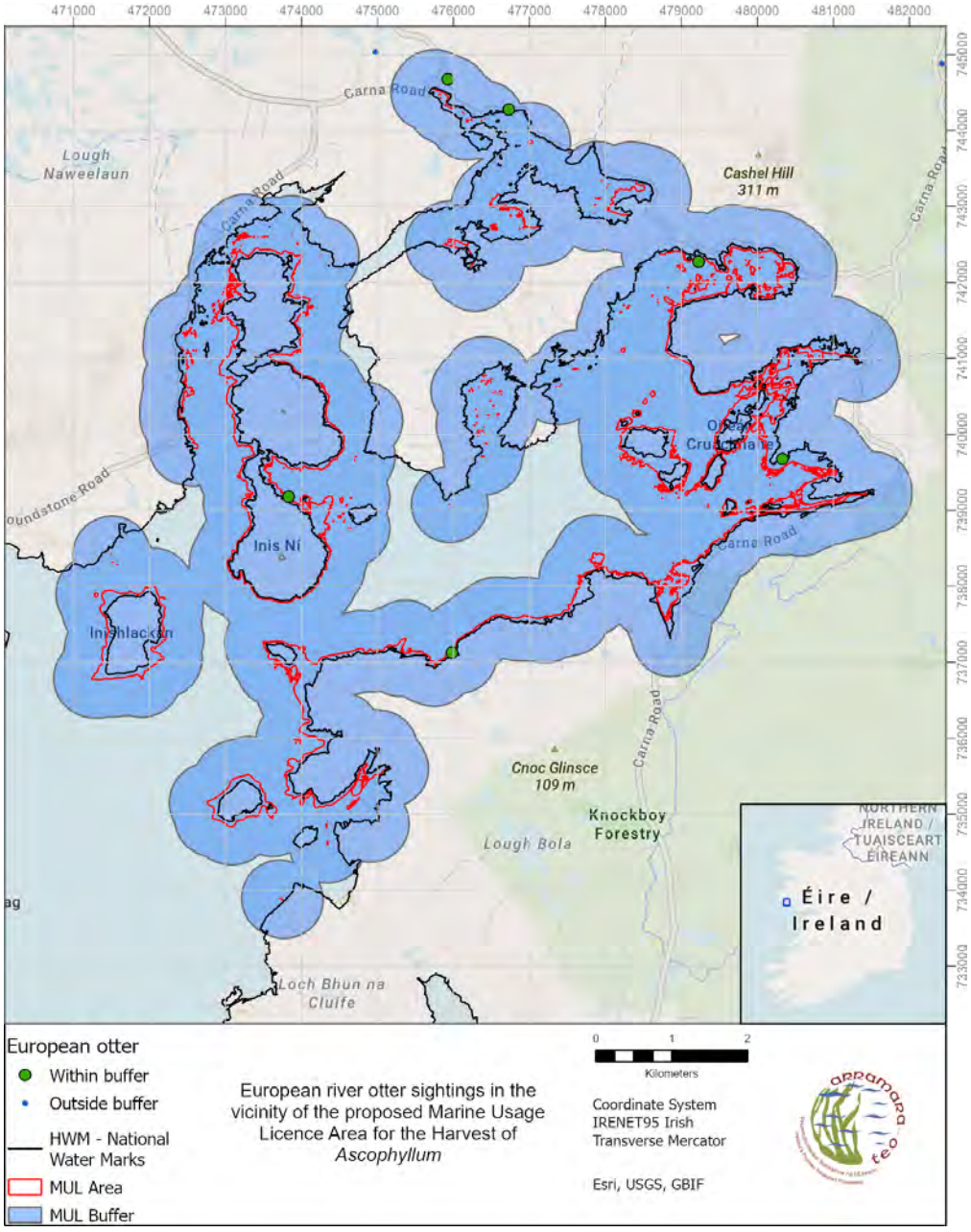

Figure 5 - Sightings of European otters (Lutra lutra) in the vicinity of the seaweed harvesting areas.

3.3. Marine Turtles

Only one species of marine turtle, the leatherback sea turtle *(Dermochelys coriacea*) is listed in Annex IV and present in the vicinity of the harvesting areas (Figure 6). Only one sighting of leatherback sea turtles were reported throughout the buffer area surrounding the proposed MUL.

Leatherback sea turtles are widely distributed and are present in most oceans although their breeding is confined to tropical regions. As such, they are only present in the region during summer months. Mortality of juveniles in nesting areas and fishing related mortality of adults at sea are two possible causes for concerns for the species. The overall conservation status of the species is unknown.

The loggerhead sea turtle (*Caretta caretta*) is very rarely observed around Ireland and is not included in this analysis.

3.4. Others

Several species of bats are listed under Annex IV and are present in terrestrial environment adjacent to the harvesting areas. Bats are nocturnal and harvesting activities are limited by daylight. No harvesting activities will take place at night and any interactions with bats is deemed unlikely and this group will not be assessed further.

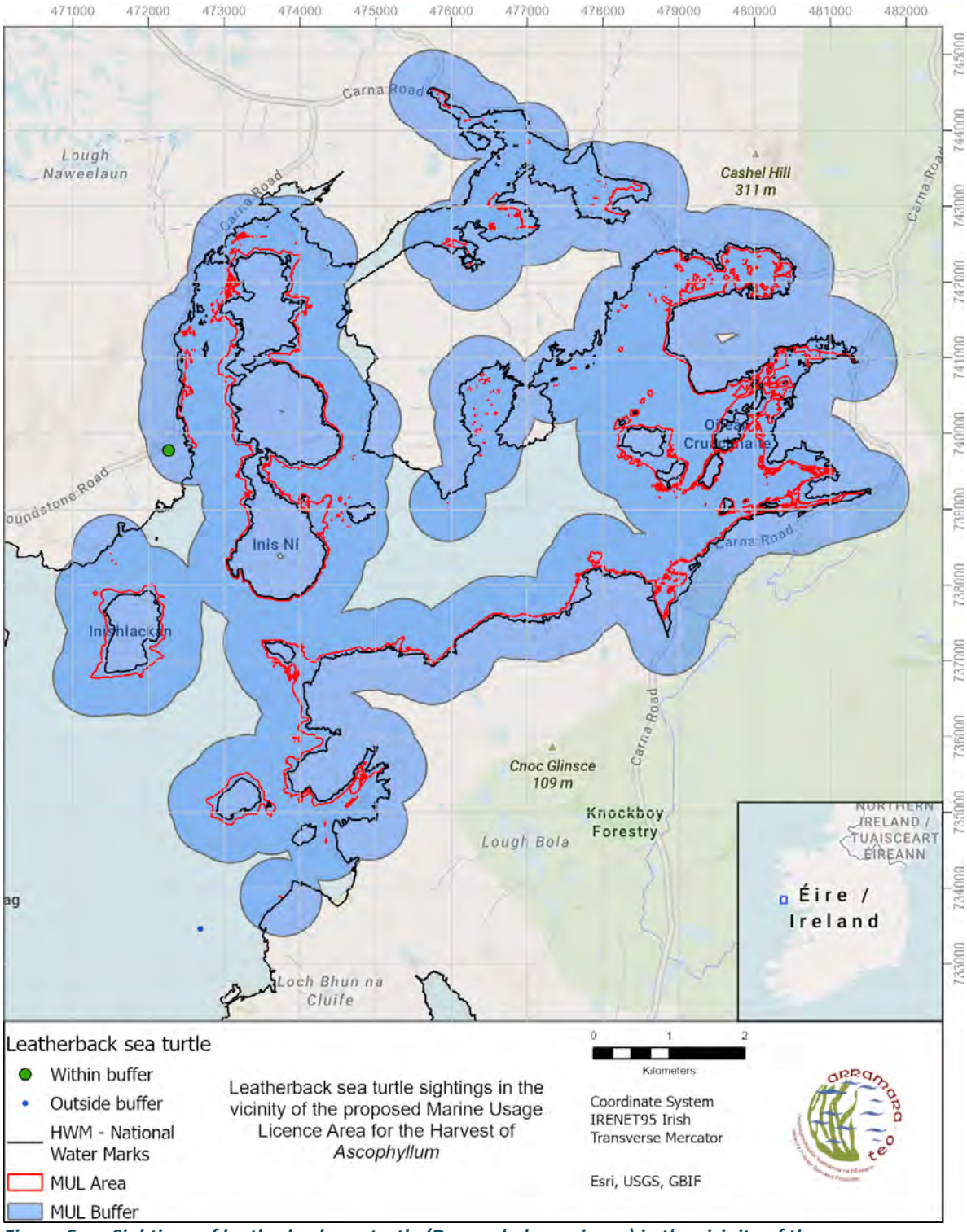

Figure 6 - Sightings of leatherback sea turtle (Dermochelys coriacea) in the vicinity of the seaweed harvesting areas.

4. Risk Assessment

Article 12 of the Habitats Directive requires that Member States to protect Annex IV species from:

- all forms of deliberate capture or killing of specimens of these species in the wild;
- deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration;
- deliberate destruction or taking of eggs from the wild;
- deterioration or destruction of breeding sites or resting places.

Based on the distribution and occurrence of the species identified in Section 3, an assessment of the likely impact of seaweed harvesting activities is conducted regarding the protection offered by Article 12.

The proposed management plan for the harvest of *Ascophyllum* along the foreshore is designed to ensure minimal impact on the resource and on the associated ecosystem. Long-term studies have shown that using a similar management plan resulted in no significant changes the biomass, length (Lauzon-Guay et al 2021), or morphology of *Ascophyllum* (Lauzon-Guay et al 2023), or on the abundance of most abundant invertebrates (Lauzon-Guay et al. 2023). Field studies have also not detected any significant long-term impact of *Ascophyllum* harvesting on the fish (Van Guelpen and Pohle 2014) and invertebrate communities or invertebrates (Fegley 2001, Hamilton and Nudds 2003, Trott and Larsen 2012, Phillippi et al 2014) communities associated with *Ascophyllum* beds. As such, it is unlikely that any negative effect from *Ascophyllum* harvesting, as proposed in this management plan, would be impacting the availability of food prey items or a reduction in habitat provision for species of cetaceans and sea turtles who do not usually visit *Ascophyllum* beds. Therefore, the risk assessment will be conducted on the harvest activities themselves.

4.1. Cetaceans

For all three species, the main pressure involves commercial vessel-based activities, mainly related to geophysical seismic exploration, and the removal of prey species through commercial fishing (NPWS 2019). At the moment, the pressure from such activities in Irish waters is not considered to be of a sufficient magnitude to negatively impact populations of these species (NPWS 2019).

Small fishing vessels generate sounds of approximately 150 dB (250-100 Hz, DAHG 2014). *Ascophyllum* harvesting along the foreshore using small skiffs equipped with low horse-powered outboard travelling at low speed in shallow water will not produce sounds of a magnitude sufficient (threshold 215 dB non-pulse, Southall et al 2007) for cause permanent injury to cetaceans. Noise from small boats can cause behavioural change in cetaceans such as harbour porpoises (Hermannsen et al 2019 https://doi.org/10.1038/s41598-019-51222-9), but often requires several boats travelling at high speed in the same area. Harvesters using boats travel at low speed and generally on their own. The outboard engine is not used during harvesting, it is only used to travel between the pier and the harvesting site. This travel is generally less than 30 minutes in either direction. Other recreational and small-scale fishing activities also take place within those bays using similar boats and outboard motors. *Ascophyllum* harvesting on its own or in combination with others, will not add a significant level of noise to create significant disturbances. At all times, harvesters using boats will follow the guidelines

for correct procedures when encountering cetaceans in coastal waters (DCMNR 2015). Specifically, if any marine mammal is observed during boating, harvesters will be required to maintain a minimum distance of 100 m from the animal. If an animal is observed within a distance less than 100 m from the boat, the harvester will maintain a speed less than 7 knots until it has moved away from the animal.

4.2. Otter

Otters are numerous and observed throughout the proposed harvesting areas and are known to use the coastal environment for foraging. Therefore, harvesting activities may occur near otters resting or feeding. Considering that harvesters usually operate either alone or in a group of two persons working together on a section of foreshore, and that harvesting activities within a section of foreshore will be limited to a few days throughout the year, it is deemed unlikely that harvesting activities will create a significant disruption to otters. Nonetheless, interactions between harvesting activities and otters may occur and mitigation measures may be required to minimize risk of significant negative impact.

4.3. Marine Turtles

Considering the unlikeliness of occurrence of a sea turtle in the vicinity of the harvesting areas, combined with the very low boat traffic that the harvesting activities will produce, it is concluded that the risk is minimal, and no special mitigation measure are required. Nonetheless, harvesters will follow the same procedures as for encounter with cetaceans (DCMNR 2015) which will reduce even further any potential risk.

5. Conclusion

The proposed management plan for the harvesting of *Ascophyllum* along the foreshore has been developed with an ecosystem approach and has been shown to have minimal impact on the resource and associated animal communities. The harvest activities are done at a very small scale, 1-2 harvesters using small skiffs travelling at low speed. After reviewing the occurrence of Annex IV species in the vicinity of the proposed harvesting areas and the potential risks associated with the harvest of *Ascophyllum*, it is concluded that there is only a potential risk of significant negative impact on otters (*Lutra lutra*).

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