Draft Dursey Island Visitor Management Plan

October 2020

Cork County Council
Comhairle Contae Chorcaí

Fáilte Ireland
National Tourism Development Authority

ROD
ROUGHAN & O'DONOVAN

Dursey Island Visitor Management Plan

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Acknowledgements

Thank you to Mr. Tadhg Twomey, who provided photographs for inclusion in this Plan.

1. INTRODUCTION

1.1 Statement of Purpose

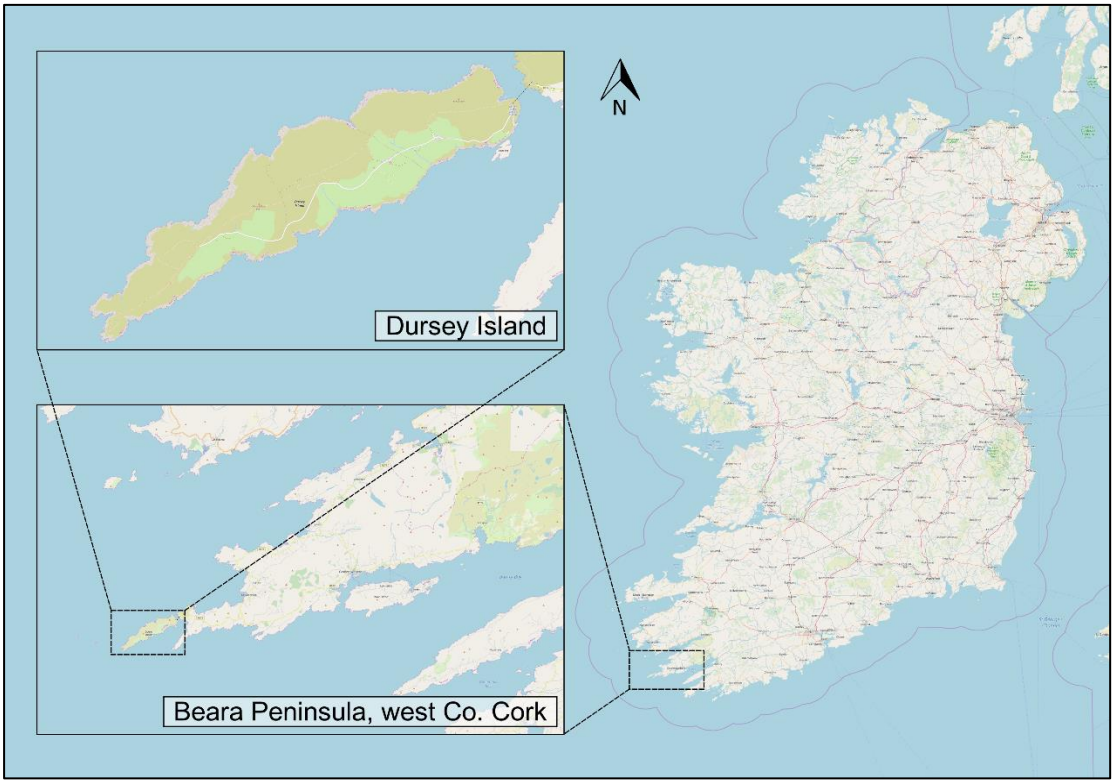

Figure 1 Location of Dursey Island (© OpenStreetMaps, 2020)

In 2018, Cork County Council commissioned Roughan & O'Donovan Consulting Engineers to develop a Visitor Management Plan for Dursey Island. The need for such a plan was first identified in 2010, in the West Cork Islands Integrated Development Strategy, and was later reiterated by Cork County Council in the West Cork Municipal District Local Area Plan (2017). Fáilte Ireland's policy for the Wild Atlantic Way also states the need for "better visitor management in areas [on the Wild Atlantic Way] achieving greater visitor numbers".

> *"In the immediate future, it is considered […] appropriate to maximise the island's tourism potential as a means of attracting residents, visitors and activity to the island […]. It is important however, in developing opportunities in tourism to ensure that visitor numbers to the island are not excessive and do not take from the sense of remoteness that is an attraction to the island itself. A visitor management plan should be developed to control numbers to an acceptable level given the sensitivity of the island."*
>
> - West Cork Islands Integrated Development Strategy (2010, p. 98)

Cork County Council is currently proposing to re-develop the Dursey Island Cable Car as a tourism destination. This proposal will result in increased numbers of visitors travelling to the island. As such, development of a Visitor Management Plan for the

island is prescient and the impact of traffic on this route (R572) as well as car parking capacity on the site is a key consideration in the preparation of the plan.

> The overarching aim of this document is to present a plan which, if implemented, shall ensure that visitor numbers and activities on Dursey Island and in the vicinity on the Beara Peninsula do not threaten natural or cultural heritage assets, character or resident community of the area.

As stated in the West Cork Islands Integrated Development Strategy, the purpose of the Visitor Management Plan should be "to control numbers to an acceptable level given the sensitivity of the island" (p. 98). Under the scope of the Environmental Impact Assessment (EIA) Appropriate Assessment (AA) and response to request for further information (RFI) from An Bord Pleanála in relation to the Dursey Island Cable Car and Visitor Centre development (Appendix A), a numerical carrying capacity has been recommended for the island (Section 3.1.1). This Visitor Management Plan builds on this and other measures to deliver an enhanced level of protection to the island.

This Plan details all of the mitigation measures (hereafter referred to as 'actions') related to visitor management which have been set out in the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) for the Dursey Island Cable Car and Visitor Centre development (and subsequently updated under the scope of the response to an RFI from An Bord Pleanála), plus any additional actions considered necessary to achieve the aim and objectives set out herein.

1.2 Disposition

The contents of this Plan are set out as follows:

- Chapter 2 describes the existing context on Dursey Island in terms of:
  - Natural heritage (Section 2.1);
  - Cultural heritage (Section 2.2);
  - Community (Section 2.3);
  - Tourism and site visitors (Section 2.4);
  - Traffic and parking (Section 2.5); and
  - Management regime (Section 2.6).

- Chapter 3 identifies existing and potential future visitor management issues on the island in relation to the above-stated aspects of the environment. Where management issues are identified, corresponding objectives and actions are set out.

- Chapter 4 describes the monitoring programmes which shall be implemented to inform visitor management on the island. Corresponding objectives and actions are set out.

- Finally, Chapter 5 presents the 'Implementation Framework' – a matrix of all of the objectives and actions set out in the Visitor Management Plan.

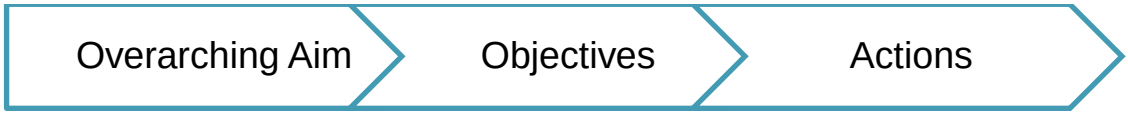

Figure 2 Aim, objectives and actions – the concepts which form the basis of this Visitor Management Plan

2. SITE CONTEXT

Dursey Island is situated just off the west coast of the Beara Peninsula in west Co. Cork. The island has an area of roughly 6km² and is orientated in a north-westerly to south-easterly direction. It is separated from the mainland by the 'Dursey Sound' – a rocky and dangerous tidal channel. Access to the island for pedestrians is provided by the Dursey Island Cable Car and by boat for heavy equipment, vehicles and livestock. A high elevation spine runs along the length of the island, from its south-western to its north-eastern points.

The Dursey Island Cable Car is accessed via the R572 regional road. The R572 commences at Glengarriff, 55km to the east, where it connects with the N71 National Road, and it passes through Adrigole and Castletownbere. The road forms part of the Beara Way route along with the R575 from Bealbarnish Gap and then the R571 continuing along the north side of the peninsula via Allihies and Ardgroom and connecting back to the N71 at Kenmare approximately 70km to the northeast. The regional road network is shown on the map in Figure 3.

On the final approach to the cable car site, the R572 at the western end of the Beara Peninsula extends 8 km from its junction with the R575 at Bealbarnish Gap to the site. Much of this section of the R572 is only wide enough for one-way traffic, and traffic in opposing directions must give-way at suitable passing places.

Figure 3 Road Network – Regional Area

2.1 Natural Heritage

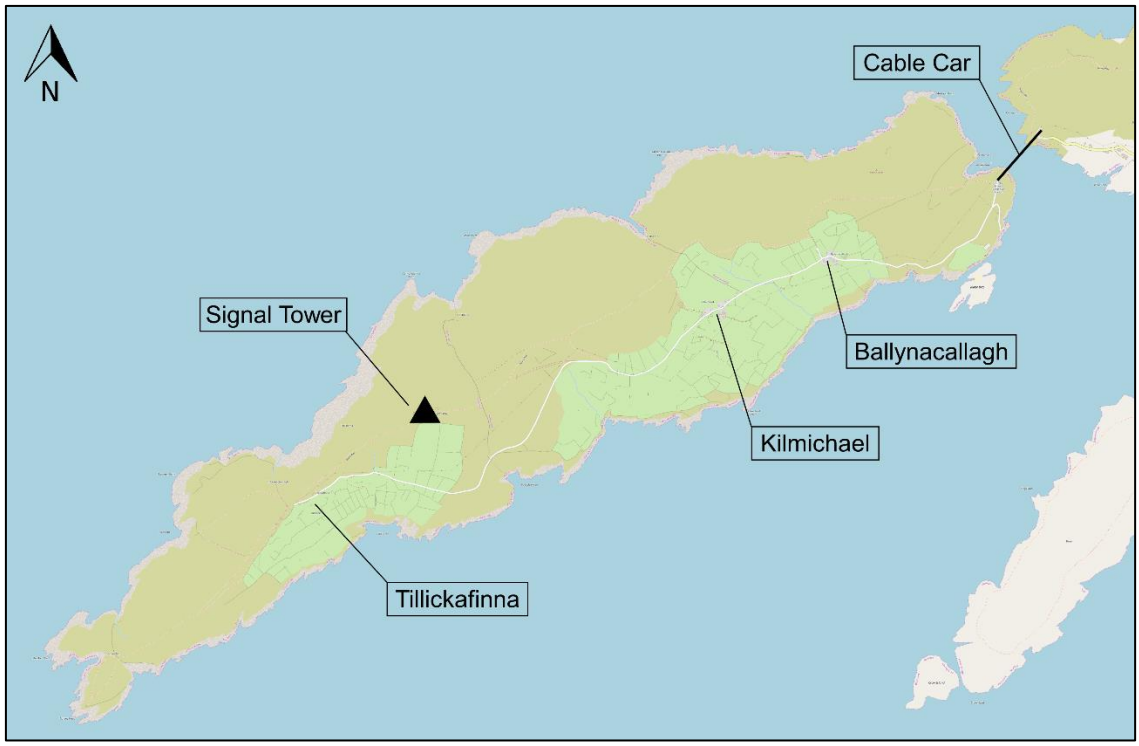

Figure 4 Dursey Island (© OpenStreetMaps, 2020)

> *"Dursey is different than the relatively sheltered islands of Roaringwater and Bantry Bay. Spectacular in a bare, ascetic way, in winter, the landscape is brown, the sea grey, the view romantic when soft rain blows like veils across the small green fields and ruined cottages. It is sun-baked in good summers, for there are no trees, and no shade."*
>
> - Damien Enright (Irish Examiner, 2013)

The Beara Peninsula and Dursey Island are situated in a remote, coastal, rural area. The environment here is one of exceptional beauty, shaped by the dual influences of the Atlantic Ocean and traditional sheep farming. The rugged landscape is dominated by undulating landforms, indented rocky coastline and open Atlantic seascapes. The Cork County Development Plan (2014) categorises this landscape type as 'Rugged Ridge Peninsulas', which has been attributed a Very High value and Very High sensitivity.

From sea level, where the landscape is defined by crashing waves and inhospitable rocky inlets, islets, caves and cliffs, the landform rises at a steep incline to gently rolling hilltops. Thin peaty soils are punctuated by outcrops of purple and green sandstone and siltstone. Vegetation is largely comprised a mosaic of dry siliceous heath and dry to humid acid grassland. Sheep are ubiquitous on the island and grazing pressure is quite high. As a result, vegetation is generally very closely cropped and (with the exception of a few gardens) the landscape is treeless. However, in certain localised areas, de-stocking of land is evidenced by succession of vegetation to Bracken thicket.

The island is highly scenic. For the visitor walking from east to west, the island yields one stunning vista after another. On clear days, there are views to the Bull Rock and

its lighthouse, the Cow Rock, the Heifer and Calf Rocks and, on especially fine days, further north to the Skelligs. Facing eastwards from high ground, there are also dramatic views inland towards the Kenmare Bay, and the coastlines of the Beara and Iveragh Peninsulas. The landscape on the sheltered southern flank of the island is most typical of the rest of the west of Ireland. This side of the island features a network of fields enclosed by dry-stone walls, a weathered public road and three small clusters of houses – Ballynacallagh, Kilmichael and Tilickafinna (Figure 4). The high-elevation spine and north-facing flank of the island, in contrast, are wild, windswept and undeveloped (with the exception of the Napoleonic Signal Tower on the summit of Cnoc Bólais).

Dursey Island is of substantial ecological merit and, during public consultations, local residents have expressed a desire to see the natural heritage assets of the island conserved. Appendix B presents a list of the rare and protected species of flora and fauna recorded on the island, based on records from the National Biodiversity Data Centre (NBDC) and surveys carried out on behalf of CCC to inform the EIA and AA for the proposed Dursey Island Cable Car and Visitor Centre development[1].

Dursey is a particularly important site for bird life and is a popular spot among birdwatchers. In addition to the resident bird species which are known to breed on the island each year (including Red-billed Chough, Northern Fulmar, Herring Gull and Raven, among many others), a host of other species can be spotted here, including winter visitors (such as Merlin, Redwing and Ruddy Turnstone), passage migrants of varying rarity (including Black Redstart, Short-toed Lark, Richard's Pipit, Red-backed Shrike and Ortolan Bunting), and very uncommon blow-ins (such as Northern Goshawk, Eurasian Hobby and American Golden Plover). Many of the resident seabirds nest on sea cliffs or in buildings, but a number of ground-nesting species also occur here, including Northern Wheatear, Skylark, Meadow Pipit and Stonechat. Offshore of Dursey are the Bull and Cow Rocks, which support important seabird colonies. Among others, Gannets, Kittiwakes, Guillemots, Storm Petrels and Razorbills can be spotted flying and foraging offshore.

Dursey is also a highly regarded whale and dolphin watching spot. Marine mammals, including Minke Whale, Risso's Dolphin, Bottle-nosed Dolphin and Harbour Porpoise, can occasionally be seen here.

Two protected European sites overlap with the study area: the Beara Peninsula Special Protection Area (SPA) and the Kenmare River Special Area of Conservation (SAC). The entirety of the island has also been classified at the national level as a proposed Natural Heritage Area (pNHA). The Qualifying Interests[2] of the Beara Peninsula SPA are Red-billed Chough and Fulmar, both of which breed on Dursey Island. The rather large Kenmare River SAC has been designated for a range of species (including Otter and Harbour Seal) and Annex I habitats[3] (including 'Submerged or partially submerged sea caves', 'European dry heaths' and 'Vegetated sea cliffs of the Atlantic and Baltic coasts'). Protected sites and their Qualifying Interests are detailed in Appendix C.

A number of 'near threatened'[4] floral species have also been recorded on the island – they are Allseed, Autumn Lady's-tresses, Yellow Bartsia and Chamomile.

[1] It should be noted that this does not constitute a comprehensive list of the species which have occurred on the island.
[2] The habitats and species protected under the Nature Directives for which the sites have been designated.
[3] Habitats of community interest whose conservation requires the designation of SACs, as set out in the Habitats Directive.
[4] As identified in the Irish Red List of Vascular Plants (Jackson *et al*., 2016).

2.2 Cultural Heritage

The Beara Peninsula and Dursey Island have a rich history. Beara is perhaps best known as the historic home of the famed O'Sullivan Beare chiefdom – the last bastion of Irish resistance in the Nine Years' War. In 1602, after defeating the allied Irish and Spanish forces at the Battle of Kinsale, English soldiers under the command of George Carew, First Commander of Queen Elizabeth I, marched on the Beara Peninsula. Local people, fleeing from the approaching forces, sought shelter in the O'Sullivan Beare Castle on an islet just off the south coast of Dursey Island, Illane Beg (or Small Island). Carew's men travelled to Dursey by boat, discovered the poorly defended stronghold and promptly laid siege to it. Here, on Illane Beg, some 300 persons were put to the sword by Carew's men. This event has become known as the 'Dursey Massacre'.

In the aftermath of this event, chieftain Donal Cam O'Sullivan Beare gathered 1,000 local people and mercenaries and fled north-east to seek refuge with kinsmen in Ulster. Along the length of their quest, the caravan faced starvation and ambush by the forces of local chieftains allied to the English. It is said that, of the 1,000 that set out, only 35 of the party reached safe haven at Leitrim Castle, home of the rebel O'Rourke of Breifne. The Beara-Breifne Way, Ireland's longest national waymarked walking route, extends from Dursey Island to Co. Leitrim, commemorating the epic march of Donal Cam and his followers.

Appendix D presents a list of the known archaeological monuments on Dursey Island. Among these are the trace remains of the aforementioned O'Sullivan Beare Castle and associated structures on Illane Beg, including a drawbridge and cluster of huts. Remnants of Iberian pottery vessels found during a 2003 excavation of one of these huts indicates trade with Spain. Also present are the remains of a church in Kilmichael, and another church near the cable car landing point, believed by to have been "built by Bonaventura, a Spanish Bishop, but dismantled by pirates" (Byrne, 1903, p. 156). In a number of places in the upland areas of the island, evidence has been found of rearrangement of the remains of stone enclosures and field boundaries to form turf stands (now disused), reflective of traditional turf cutting on the island.

In terms of the built environment, Dursey Island is largely undeveloped. The majority of extant structures on the island are detached homes, many of which are in various stages of dereliction. There are four structures on Dursey Island which have been included in the National Inventory of Architectural Heritage (NIAH): (1) a detached house in Ballynacallagh, built c. 1860 (NIAH Ref. 20912604); (2) a detached house in Kilmichael, built c. 1800 (NIAH Ref. 20912603); (3) the old Dursey Island Schoolhouse in Kilmichael, built in 1891 (NIAH Ref. 20912602); and (4) the Napoleonic Signal Tower on the summit of Cnoc Bólais, built c. 1805 (NIAH Ref. 20912601).

The Dursey Island Signal Tower is a fine example of the numerous defensive structures which were constructed on the coast of Ireland during the early nineteenth century in anticipation of a Napoleonic (French) invasion. A single-storey extension to the eastern side of the tower was built at a later date, and is now partially collapsed. The original Signal Tower, on the other hand, is largely intact.

During World War II, an 'ÉIRE' sign of whitewashed stone was constructed on Cnoc Bólais, facing westward and immediately behind the Signal Tower, the remains of which are still intact. These signs were constructed to inform pilots flying overhead that they were passing over neutral Ireland.

"Sited in remote coastal locations, most of these lone, grey signal towers were constructed, furnished and staffed between 1804 and 1806 … The towers were a defensible quarters for the signal crew, which normally comprised a naval lieutenant, a midshipman, two signalmen and a military guard (usually eight to 12 men) … The signalling system, referred to as an optical telegraph, required that each signal station be visible to its counterparts on either side. Sending a message involved raising and lowering a large rectangular flag, a smaller blue pendant and four black balls in various combinations along a system centred on a tall wooden mast … If all of the 81 stations proposed in the 1804 - 6 plans were operating simultaneously (some accounts suggest this was never the case), a signal could travel 1,076 km around the coast of Ireland. Its average journey between stations was 13.5 km … The threat of invasion was significantly diminished following Napoleon's defeat at Waterloo in 1815. Maintenance of the structures was costly, and many were abandoned … some have completely disappeared."

- Nick Hogan (Irish Times, 2013)

The construction of the house in Kilmichael dated c. 1800 is considered characteristic of the vernacular tradition of housebuilding – and such buildings are increasingly rare in Ireland. While none of these buildings have been included in the Record of Protected Structures of the Cork County Development Plan (2014), they are of architectural heritage and historic value in the context of Dursey Island and the wider Beara region. Each of these structures contributes positively to the visual character of the island and sense of cultural and historical context.

It is important to note that the existing Dursey Island Cable Car itself is also an important local landmark of cultural heritage and industrial heritage value. In 1969, British Ropeway Engineering Co. Ltd. provided the original infrastructure, which was subsequently replaced in 1981 and again in 2004, making the current cable car the third incarnation. Due to corrosion of the steelwork, the pylons were dismantled, and two new galvanised steel structures were erected in their place in 1977. Apart from these upgrades, and the replacement of serviceable components such as ropes and fixings, many of the original components remain. As part of the Dursey Island Cable Car and Visitor Centre development (Appendix A), it is planned to retain elements of the historic cableway, including the mainland-side pylon and the cable car itself, in order to facilitate ongoing appreciation of these relics by the general public.

Fig. 5 maps the known sites and structures of archaeological and / or architectural heritage value on Dursey Island.

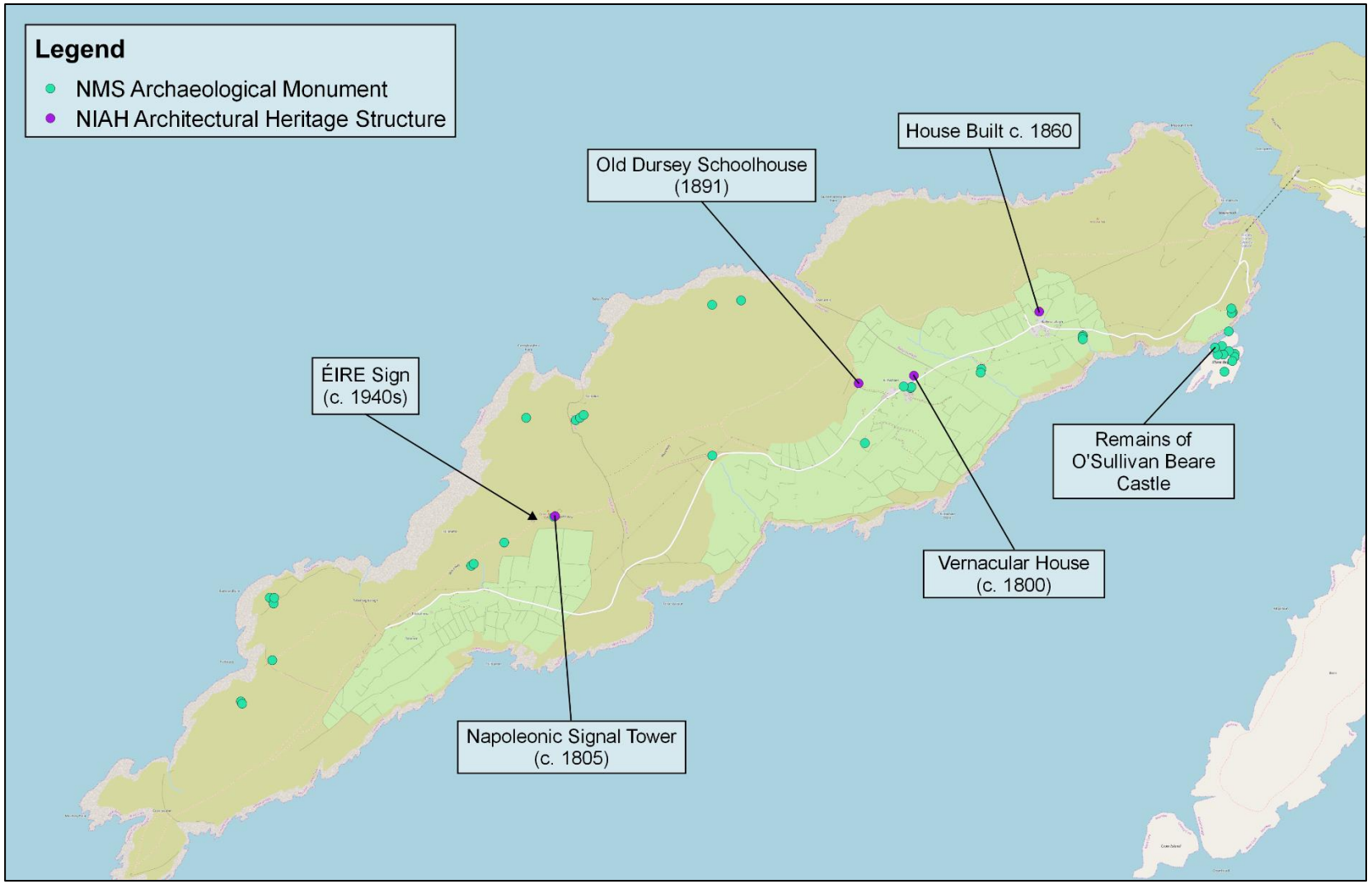

Figure 5 Sites of archaeological and architectural heritage value on Dursey Island

2.3 Community

Dursey Island is one of the 7 inhabited islands that lie off the west coast of Co. Cork. It is situated at the western tip of the Beara Peninsula. Dursey is the only inhabited west Cork island to not have a dedicated ferry route. The cableway infrastructure is situated on the south coast of Ireland on the Beara Peninsula in the townland of Ballaghboy. Castletownbere is the nearest major town, at approx. 22km from the site of the proposed development. The smaller village of Allihies is approx. 12km away. Cork City is located approx. 147km away.

The Kilnamanagh Electoral District, which comprises a 37km² area of the western end of the Beara Peninsula and Dursey Island had a population of approximately 342 persons (i.e. approximately 9 persons per km²) in 2016. According to census data, the permanent (full-time) population of Dursey, once a thriving island community, has declined dramatically in recent years, such that there are now just two full-time residents (Fig. 6). During the summer months, the population of the island increases due to occupancy of holiday homes. The key issue for the island identified in the West Cork Local Area Plan (2017) is "the need to stabilise and increase the permanent population". As it stands, the island is at risk of permanent depopulation in the short to medium-term. As discussed previously, there are three distinct, historic hamlets at Ballynacallagh, Kilmichael and Tilickafinna (from east to west). This settlement pattern is unique among the inhabited islands of west Cork, where dwellings tend to be dispersed. The majority of dwellings on the island are either abandoned (and in various phases of dereliction), or temporarily occupied holiday homes.

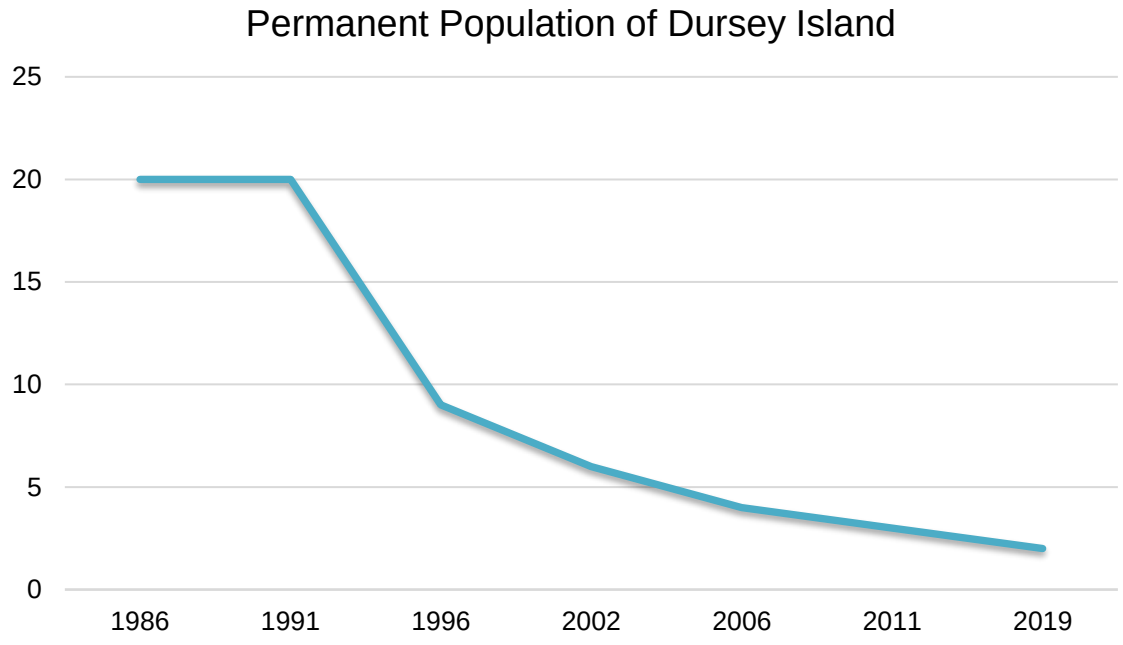

Figure 6 **Permanent population of Dursey Island over time. Source: Census data, with exception of 2019 data, which was provided by Cork County Council**

Land use in the Kilnamanagh Electoral District includes transport infrastructure, agricultural land and associated dwellings or one-off housing, amenity, recreation and tourism uses. The area is popular for tourism and recreation. The WAW traverses the area in a number of locations, and Dursey Island itself is a Signature Discovery Point on this route. The cableway is the principal visitor attraction in the area. The area also features a number of popular national waymarked walking routes, including the Beara-

Breifne Way, Beara Way and Garinish Loop. There are plenty of options for sight-seeing along the Beara Penninsula, including the many archaeological and architectural sites of interest; on Dursey for instance, there are the Signal Tower and St. Mary's Abbey, while on the mainland there are Loughane More Ring Fort and the wedge tomb at Killough, among others. Dursey Island itself is popular for birdwatching and whale and dolphin watching.

Agriculture is the principal land use type on the island. Farming is predominantly pastoral, with both sheep and cattle farming represented. Farming is concentrated on the southern flank of the island while the more exposed northern flank is dominated by open heathland. While the area is coastal, and nearby Castletownbere is the country's major white fish port, fishing activity on Dursey Island has been limited by the exposed nature of the coastline.

There is no school, medical facility or place of worship in the Kilnamanagh Electoral District. Lehanmore Community Centre (run by Lehanmore Community Co-Operative Society Ltd.) is immediately adjacent to the R572 in the townland of Loughane More (and within the study area) and serves the communities of Cahermore, Lehanmore and Garinish. It provides facilities for community events, camps, festivals and classes. The Community Centre also contains the Cable Car Café, a bar, and shop which stocks gifts, beach, and fishing equipment, and campervan parking facilities (all of which are open seasonally). The nearest Garda Station and pharmacy are located in Castletownbere. The nearest major hospital is Bantry General Hospital, located approximately 66 km from Dursey island. Castletownbere also has a Community Hospital which serves the entire Beara Peninsula including Bere Island and Dursey Island and provides long stay, respite, community support and palliative care.

Dursey Island itself has little in the way of community facilities. The island has no brick-and-mortar shops, bars or restaurants. The town of Castletownbere and the village of Allihies are the nearest commercial centres, at c. 22 km and 12 km from the cable car, respectively. Nearby on the mainland, there are a primary school, community centre, church and a Buddhist meditation centre / café-restaurant. The nearest medical facilities, Garda station and fire station are at Castletownbere.

Community infrastructure is also somewhat limited. There is currently no formal infrastructure in place for gas supply, wastewater drainage / treatment or broadband connectivity. Additionally, there are presently no public toilets on the island for site visitors to use – however, a public toilet block is planned for the island under the scope of the re-development of the cable car. While there is a small-scale drinking water supply and treatment system in place, which serves approx. 12 houses and 9 farms, it is of limited capacity. No formal solid waste collection service has been implemented on the island, and evidence of illegal dumping of household waste and cars has been observed in the area. Inadequate community infrastructure and utilities – particularly the limited water supply, inadequate waste collection services, and poor surfacing of the public road on the island – have been highlighted by local residents during public consultations.

Seafaring conditions in the Dursey Sound are often hazardous. As a result, Dursey is the only of the west Cork islands without a commercial ferry service in operation, and the cable car is the principal means of accessing the island. The cableway conveys visitors and tourists – and to a much lesser degree, islanders – to-and-from the island. Island residents are entitled to skip queues (which at times are very long) and also travel on the cable car free-of-charge. As has been pointed out in the West Cork Islands Integrated Development Strategy (2010), the cable car does not benefit from the state subsidies which apply to the ferry services to other islands, which are regarded as life-

line transport services for the communities of offshore islands by the Department of Culture, Heritage and the Gaeltacht.

The cable car was originally used to transport livestock to-and-from the island. However, since 2012, this activity has ceased, and livestock are now transported in small private boats and occasionally in barges provided by Cork County Council. There is a slipway and animal crush on the island and to the south of the cable car on the mainland. The cable car is used by island farmers to transport groceries and agricultural supplies to-and-from the island, as required. The inhabitants and farmers of the island are heavily reliant on the cable car for access to basic goods and services, and unexpected interruptions to the service (e.g. as a result of inclement weather, blackouts or staffing issues) have inconvenienced islanders in the past.

In the West Cork Municipal District Local Area Plan, investment in infrastructure, services and sustainable tourism are regarded as the keys to improving the viability of residence on Dursey Island.

> *"To retain permanent residents on the island, the level of basic services needs to be improved. The main tools to [achieve] this are in promoting the expansion of facilities and employment opportunities, encouraging appropriately scaled tourist facilities and economic diversification, and protecting the environmental qualities which attract tourists as well as having their own intrinsic merit."*
>
> - West Cork Municipal District Local Area Plan (2017)

2.4 Tourism and Site Visitors

The South West region, comprising the counties of Cork and Kerry received 2.51 million overseas visitors in 2018, an average annual rate of increase from 2014 of 3% to reach 2.51 million. Domestic trips to the region grew more rapidly at 13% a year to reach 2.4 million. After Dublin and Galway, the next most visited counties are the two constituents of the South West region, with 1.7 and 1.6 million overseas visitors respectively in 2017.

Modest growth rates in overseas tourist arrivals were recorded in Cork County in the middle years of the last decade but strong growth - 17% - was achieved in 2017, when arrivals grew 228,000 to reach 1.6 million.

The 2015-2020 Cork tourism plan – Growing Tourism in Cork: a Collective Strategy – projected an increase in visitor numbers of 21.3% over the period i.e. an average rate of growth of 3.9% a year, with a 'stretched' growth of 30% (or 5.4% a year).

An Annual Report prepared by Cork Co Co specific to the Dursey Island website (durseyisland.ie) from 1st Jan 2019 to 31st Dec 2019 indicated that, for non-EU visitors over the 12-month period, the site was visited by potential visitors from 78 different countries with the USA making up the majority of non-EU visits (70%), followed by Canada, Australia, South Korea and New Zealand. It also noted that 85% of site visits are new visitors, while 15% returning visitors.

The Dursey Island Cable Car, originally constructed for the use of local residents and farmers, is now a major tourist attraction in west Co. Cork. Dursey Island itself is one of fifteen Signature Discovery Points on Fáilte Ireland's Wild Atlantic Way tourist route.

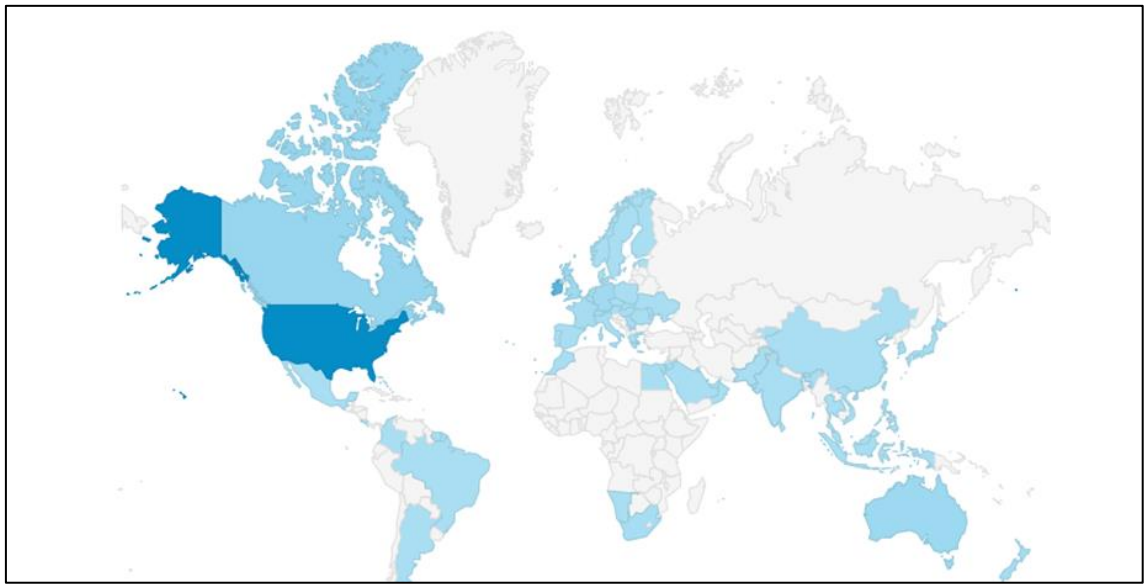

Figure 7 Annual visitor spread to the durseyisland.ie website 2019

Visitor numbers to Dursey Island have been increasing in recent years but remain highly seasonal. The popularity of the cable car – and its inability to meet current levels of demand – are attested to by lengthy queues of up to two hours on the mainland and island during the peak months. In July and August, the cableway is currently operating continuously and at capacity (during its opening hours), transporting approx. 4,650 persons to-and-from the island per month. This number is roughly the upper monthly limit which can be accommodated by the existing infrastructure, which can transport 6 persons at a time and takes roughly 6 – 7 ½ minutes to complete a trip in each direction.

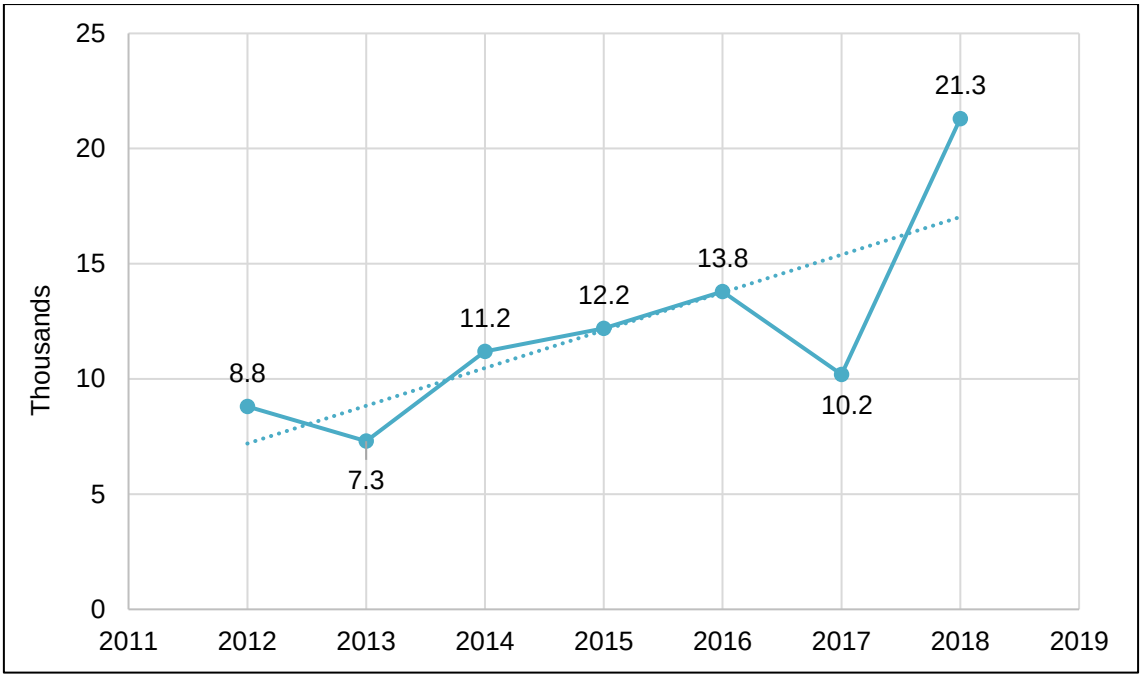

Figure 8 Annual visitors to Dursey Island 2012 – 2018 (cable car ticket sales)

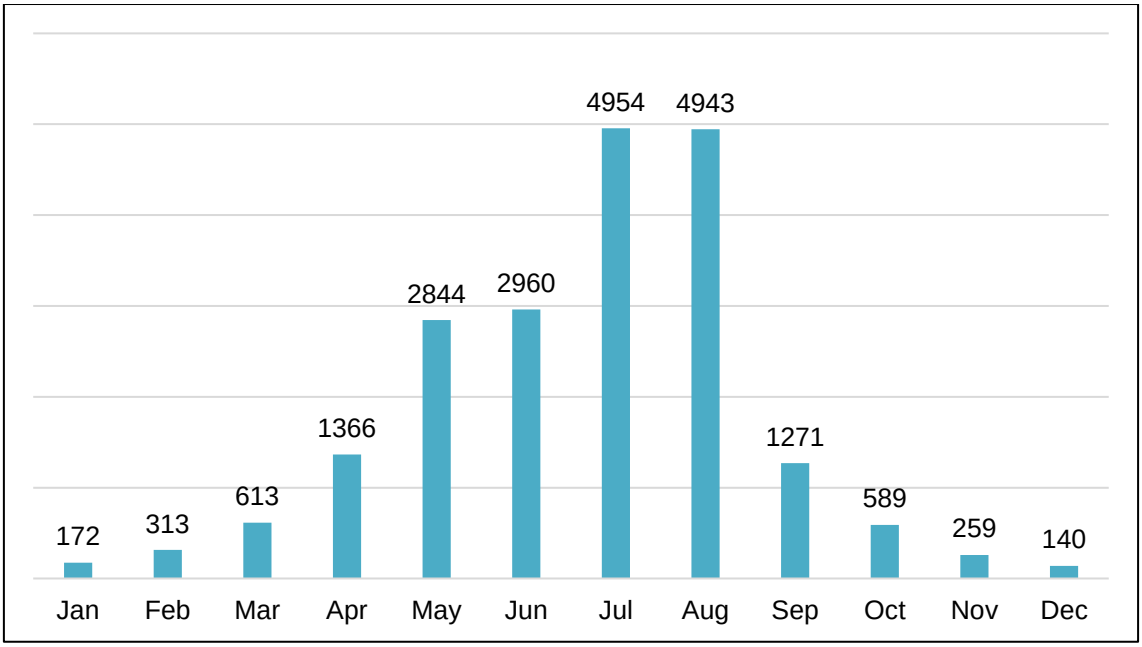

Figure 9 Monthly visitors to Dursey Island 2017/18 (cable car ticket sales)

The re-development of the cable car site (Appendix A) will permit an increased number of visitors to travel to Dursey Island in a given time. If operated without limit, the infrastructure has the capability to convey 200 - 300 passengers per hour in each direction. It should be emphasised that this is a theoretical upper operational capacity and it is not intended to operate the cable car at this level of capacity. It is expected that the development will also result in a 'smoothing' of the distribution of visitor numbers across months – this is since the proposal includes the provision of indoor areas (the Visitor Centre), as well as sheltered outdoor waiting areas and welfare facilities on both island and mainland, all of which are expected to make the site a more appealing destination outside of the summer months.

A 310 respondent Visitor Survey was carried out with visitors to the Dursey island Cable Car between August and October 2018 in order to identify key strengths and weaknesses of the existing tourism proposition. Half of the 319 visitors surveyed were Irish. The next greatest proportion (16%) were German. Twelve per cent of visitors surveyed were British. The remainder of respondents were from other EU states (8%), North America (10%) and Australia or New Zealand (4%).

Respondents were asked to identify what they liked most about the cable car experience. Responses are summarised in Figure 10. Beautiful views was the most commonly cited quality (mentioned by roughly a third of respondents). Other important positive characteristics mentioned were the authenticity and simplicity of the experience, the sense of adventure derived from the experience, the friendliness of the staff, and the uniqueness and novelty of the experience.

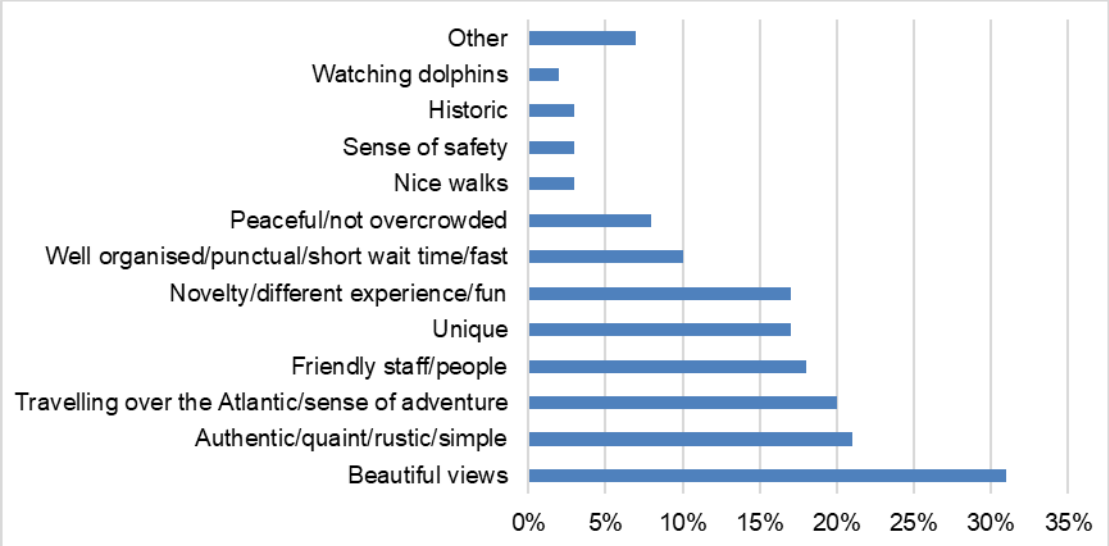

Figure 10 Positive characteristics of cable car experience

Survey respondents were also asked to identify what they liked least about the cable car experience. Responses are summarised in Figure 11. The principal complaints of site visitors were long waiting times and safety concerns regarding the ageing appearance of the cableway infrastructure. Some respondents also complained about the lack of facilities and amenities, including the lack of public toilets on the Island and the lack of shelter and seating areas in general. Notably, just under a third of respondents had no complaints to make about the cable car experience.

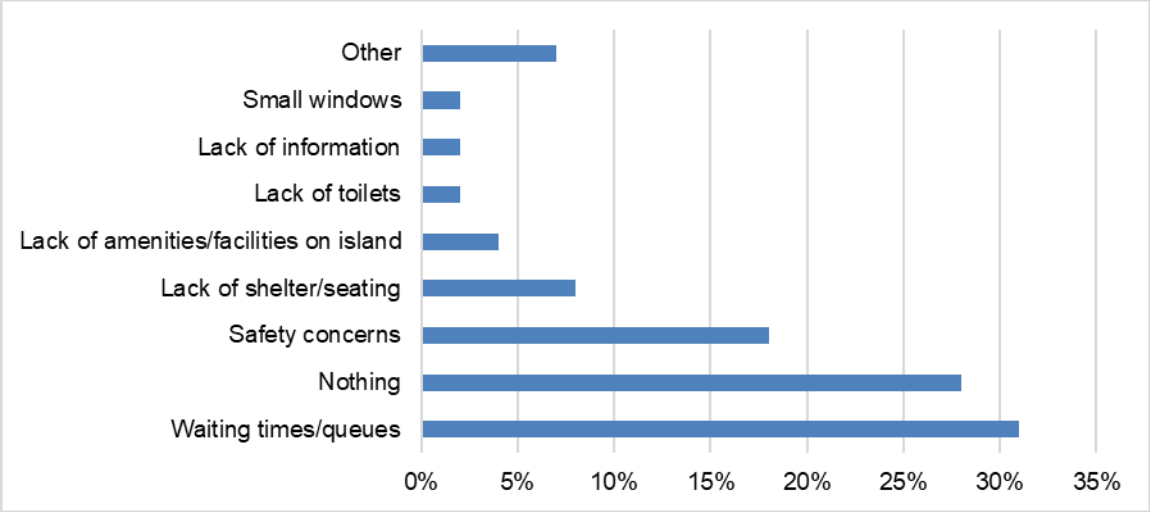

Figure 11 Negative characteristics of cable car experience

In June and July 2019, a survey of visitors to Dursey Island was carried out in order to obtain information on the movements and activities of visitors on the island. Survey sheets were distributed to visitors upon their return to the mainland by the cable car operator. Participation in the survey was voluntary. A total of 537 surveys were completed over the course of the two months.

Key findings were as follows:

- 68% of respondents indicated that they wandered off established trails at some point on the island.
- Visitors tend to travel to Dursey in groups, and the average group has three persons.
- The average time spent on the island is 3 ½ hours.
- Visitors are currently being allowed to bring dogs and bicycles onto the island via the cable car.
- Some visitors are unhappy about a lack of information regarding walks on the island (routes and durations).

Visitors were asked to mark where they walked to on a map of the island, provided with the survey. Out of all 537 survey respondents, 365 persons (or 68%) completed this task. An analysis of their hand-drawn maps found that:

- Half of persons walked in and around the eastern half of the island only;
- A further 23% of persons walked as far as the Signal Tower / Tilickafinna area, but no further; and
- A further 26% of persons walked as far as the western end of the island.

In terms of walking routes on Dursey Island, there is a public road running along the southern flank of the island from east to west, which links Ballynacallagh, Kilmichael and Tilickafinna. There are a number of informal trails on private land, which generally run in parallel to the public road, from east to west. The road and trails are largely situated inland and not near sea cliffs. With the exception of the western end of the island (beyond Tilickafinna), trails are fairly well defined and walkers tend to stick to them. On the extreme western end of the island, however, there is no defined trail, and walkers tend to spill out over open habitat.

While there is a long (>10 km) looped walk on the island, which includes the public road and off-road trails, it is poorly advertised and marked (with waymarkers quite widely spaced) and it is possible to lose the trail and end up walking over open heathland in upland parts of the island. Additionally, there is little information available to visitors regarding the duration or difficulty of the walk, and no alternative routes are provided for visitors who do not wish to undertake such a lengthy hike.

Walking is the principal activity of visitors to Dursey Island. Other popular activities include birdwatching and whale and dolphin watching, although it would not appear that there are any commercial operators facilitating these activities on the island. During the summer months, a private coach is operated on the island, which carries visitors from the cable car to the western end of the road on the island (i.e. Tillickafinna).

2.5 Traffic and Parking

The R572, at the western end of the Beara Peninsula, extends 8 km from its junction with the R575 at Bealbarnish Gap to the Dursey Island Cable Car. Much of this section of the R572 is only wide enough for one-way traffic, where traffic in opposing directions must give-way at suitable passing places.

The 8km stretch of the R572 regional road from Bealbarnish Gap to the cable car site is the only route to Dursey Island and also provides access to in excess of 130 private properties, which also generate local traffic.

Detailed traffic surveys were undertaken in May and June bank holiday weekends in 2019 to ascertain the current levels of traffic at the site. A summary of the results are as follows:

- The existing peak season traffic to the Dursey Island Cable Car site on the R572 is estimated at 434 two-way vehicles per day
- The busiest hour at the site in terms of access is from 12:00 – 13:00 with 68 two-way vehicles.

The car park at the existing cable car site currently accommodates approximately 70 vehicles, however this is often oversubscribed during peak season. This can lead to cars being parked informally at the side of the road and drivers making awkward U-turn movements, which can result in traffic congestion in the area.

There is car parking available near the end of the peninsula at Lehanmore and Garnish where up to 60 additional cars can be accommodated. This car parking could accommodate people who wish to explore other parts of the headland and to walk along the waymarked routes, including the Beara Way, which extends onto Dursey Island.

There are two Bus Éireann services that operate on the Beara Peninsula as follows:

- Route 236 – operates between Cork City and Glengarriff & Castletownbere – with two services to / from Castletownbere and five services to / from Glengarriff during the week, and one service to / from Castletownbere and three to / from Glengarriff on weekends / public holidays.
- Route 282 - operates on the Ring of Beara from Kenmare during the summer months only (end of June to end of August) with two services per day, one in the morning and one in the afternoon. The route goes from Kenmare to Glengarriff – Castletownbere – Eyeries Cross and back to Kenmare.

There are a number of other private bus service that operate between Castletownbere / Glengarriff and Cork or Killarney and there are a number of local mini-bus / taxi services that operate around the Ring of Beara and connect to the existing cable car site.

There are a number of waymarked walk and cycle ways on the Beara Peninsula. The Beara Way is a trail that provides a circular route on the Beara Peninsula extending nearly 200km. The route follows a mixture of public roads and tracks and connects to the main towns and villages on the Peninsula including Glengarriff, Kenmare, Lauragh, Ardgroom, Eyeries, Allihies and Castletownbere. It extends out to Dursey Sound from Allihies along a route that is mostly off-road on the north side of the peninsula and it then continues across onto Dursey Island via the cableway. A section of the Beara Way, either side of Dursey Sound is shown on Figure 12 below.

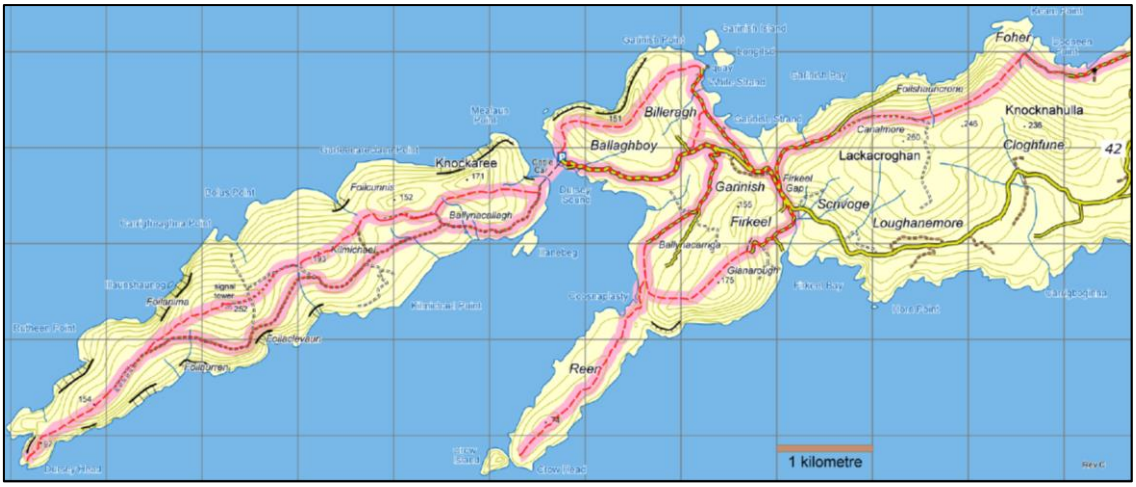

Figure 12 Beara Way

The Beara Way Cycling Route is a National Cycling Route and for most parts is on country roads. The route travels along the entire Beara Peninsula, following the Ring of Beara and passing through all the towns and villages along the way. It extends along the R572 to the cable car site.

2.6 Management

With the exception of the land immediately surrounding the cable car landing point (which is owned by CCC), the land on Dursey Island is largely under private ownership or is commonage land grazed by multiple farmers. As such, any visitor management interventions carried on these lands will require agreement from all affected landowners.

As discussed previously, the island overlaps with two European sites – the Beara Peninsula SPA and the Kenmare River SAC. Management of these sites falls within the jurisdiction of the Southern Division of the National Parks and Wildlife Service.

In terms of visitor management, there are no formal measures in place on Dursey Island at present. According to the 2016 WAW Environmental Monitoring Report (CAAS, 2016, p.28), "Visitors are strongly advised to not bring any dogs […] to the Island because of the large volume of sheep and wildlife" but feedback received from visitors would indicate that this is not the case.

3. IDENTIFICATION OF VISITOR MANAGEMENT ISSUES AND REQUIREMENTS

3.1 Natural Heritage

It is considered that, without appropriate management interventions, visitors to Dursey Island pose the following potential adverse effects on the natural heritage assets of the island:

- Disturbance of wildlife;
- Deterioration and destruction of terrestrial habitats;
- Introduction and dispersal of invasive alien species; and
- Littering.

Each of these is considered in turn in the following sections.

3.1.1 Disturbance of Wildlife

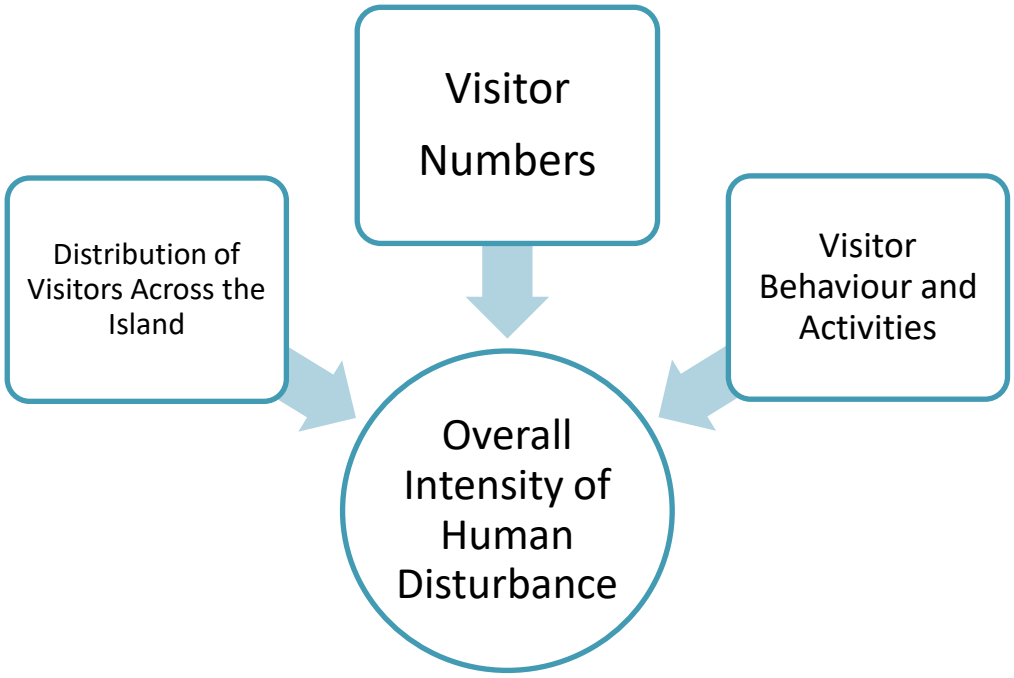

Figure 13 Three key factors influencing intensity of human disturbance of wildlife on Dursey Island, at which management measures will be targeted

There are a number of resident species on Dursey Island which are potentially susceptible to human disturbance, including Red-billed Chough and ground-nesting birds such as Northern Wheatear, Skylark, Meadow Pipit and Stonechat.

Different species are affected differently by the presence of humans in their habitats (Blanc *et al*., 2006; George & Crooks, 2006). Additionally, a particular species may be more or less susceptible to human disturbance at different times during the year (the breeding season tends to be a particularly sensitive period for bird species) (e.g. Keribiou *et al*., 2009) and at different times of the day (Knight & Cole, 1995; Cole & Monz, 2003; George & Crooks, 2006; Naylor *et al*., 2009). There is also evidence to indicate that populations of certain species can become habituated to human disturbance, exhibiting greater tolerance over time (Jiménez *et al*., 2011).

> *"The principal way in which human presence can impact on wildlife is by altering the ability of animals to exploit important resources. This can operate either through directly restricting access to resources such as food supplies, nesting sites or roosting sites, or by altering the actual or perceived quality of these sites. Direct restriction of access to resources can occur through animals avoiding areas where humans are present."*
>
> - Gill (2017)

Human disturbance is a complex issue, which is a function of many factors. It is not simply the presence of humans which creates a problem, but also the behaviour / activities of the humans in question, the proportion of the habitat which is subject to human disturbance (i.e. the dispersal / density of people across the area), the frequency of disturbance and the ecology of the species affected, among other factors.

Measures shall be implemented to minimise human disturbance of wildlife on Dursey Island. These measures shall target three key factors: (i) visitor numbers, (ii) the distribution of visitors across the area of the island (i.e. area of habitat affected), and (iii) the behaviour and activities of visitors.

Visitor Numbers

Under the scope of the planning application process for the Dursey Island Cable Car and Visitor Centre development, a numerical carrying capacity has been developed for Dursey Island. This carrying capacity was developed with the aim of preventing harmful levels of human disturbance on Red-billed Chough. It has been extrapolated for Dursey Island from a case study on a French Island, where high levels of human disturbance are threatening the conservation of the resident population of Red-billed Chough (Keribiou *et al*., 2009). Keribiou and co-authors used eight years of data on chough breeding success and visitor numbers on the island to calculate a carrying capacity for the month of August – when birds on the French island were found to be especially vulnerable to disturbance. Based on a comparison of the areas of chough foraging habitat on the two islands, a monthly numerical carrying capacity of 11,716 was extrapolated for Dursey. As a precautionary measure, this limit on visitor numbers shall be implemented year-round, i.e. no more than 11,716 visitors shall be permitted to travel to Dursey Island in any month of the year. This limit shall be implemented using a carefully coordinated, web-based ticketing system. It shall not apply to the residents or farmers of Dursey Island.

As discussed in Section 4, CCC have committed to carrying out a programme of monitoring for the first 10 years of operation of the proposed Dursey Island Cable Car and Visitor Centre development. This monitoring programme will involve breeding season surveys of Chough, and monitoring of visitor numbers and activities, climate and habitats on the island, including grazing regime. After ten years of data have been gathered, CCC currently expects to enlist a suitably qualified ecological professional to calculate a new, bespoke carrying capacity for the island, based on the longitudinal data gathered. If, at this future date, the Council intends to propose the implementation of this new limit on visitor numbers, it will be the subject of a separate application for planning permission to the Competent Authority, for which environmental assessments (including AA) will be completed, as appropriate. Otherwise, the carrying capacity which is set out herein is to be regarded as a fixed monthly upper limit on visitor numbers to Dursey Island.

Distribution of Visitors Across the Island

In order to minimise the area of natural habitat affected by human disturbance, measures shall be implemented to (i) establish a convenient, clearly marked and well-managed network of walking trails and (ii) encourage visitors to stick to them. These measures are detailed in Section 3.1.2.

Visitor Behaviour and Activities

In terms of visitor behaviour and activities, two ongoing activities have been identified on the island which might exacerbate disturbance of wildlife: dog-walking and mountain biking.

The presence of visitors' dogs on the island is likely to result in increased levels of disturbance of wildlife, particularly of birds (Yalden & Yalden, 1990; Mainini *et al*., 1993; Banks & Bryant, 2007; Langston *et al*., 2007; Marzano & Dandy, 2012). Certain species may be more disturbed by the presence of dogs than humans (Yalden & Yalden, 1990; Mainini *et al*., 1993; Miller *et al*., 2001). Indeed, research has shown that the walking of dogs in natural recreation areas can lead to a 35% reduction in avian species diversity and a 41% reduction in abundance (Banks & Bryant, 2007). Visitors' dogs may also engage in sheep worrying while on the island, with negative implications for the welfare of sheep and the livelihood of farmers, and potentially giving rise to conflict between visitors and farmers. Since the cable car is the only feasible means of visitor access to the island, implementation of a ban on visitors' dogs would be straightforward to implement. It is important to note that the residents and farmers of Dursey Island may own dogs as pets or working dogs, and these should of course be excluded from this restriction. Likewise, the restriction would not apply to visually impaired visitors with guide dogs.

While there are no bike rental facilities on the island, visitors are currently being permitted to bring bicycles to the island via the cable car. On one occasion in 2019, bird surveyors working on behalf of CCC witnessed visitors engaging in off-trail mountain biking across open habitat and flushing foraging birds. Research indicates that mountain biking in outdoor recreational areas does result in disturbance of wildlife (Cessford, 1995; Taylor & Knight, 2003; George & Crooks, 2006; Naylor *et al*., 2009; Scholten *et al*., 2018). While research indicates that wildlife do not find cyclists to be more disturbing than hikers when both are travelling on trails (Papouchis *et al*., 2001; Taylor & Knight, 2003; *c.f.* Naylor *et al*., 2009), it is conceivable that the presence of cyclists could cause a wider area to be subject to human disturbance, particularly in contexts in which the landscape is open and accessible, as is the case in the upland areas of Dursey Island – and research indicates that wildlife are more disturbed by off-trail than on-trail activity (Mainini *et al*., 1993; Miller *et al*., 2001; Taylor & Knight, 2003; Blanc *et al*., 2006). Also, because cyclists cover more ground in a given time than do walkers, they might also disturb more animals per unit time (Taylor & Knight, 2003). Mountain biking may also result in habitat degradation and destruction (Section 3.1.2).

Additionally, as agreed in consultation with a private landowner on the island and as disclosed in the response to the RFI in relation to the Dursey Island Cable Car and Visitor Centre development, measures will be implemented to ensure the protection of a known Chough nest site at an undisclosed location (information withheld to protect the nest site in question).

3.1.2 Deterioration and Destruction of Terrestrial Habitats

An unmanaged increase in visitor numbers on Dursey Island might result in deterioration or destruction of terrestrial habitats and soil compaction / erosion due to

repeated trampling of vegetation or bare ground. Rare and protected species of plants might also be adversely affected. In order to prevent these adverse impacts, measures shall be put in place to (i) establish a convenient, clearly marked and well-managed network of walking trails, (ii) to encourage visitors to stick to them, using a visitor education campaign and (iii) to prohibit mountain biking. As has been mentioned previously (Section 3.1.1), implementation of these measures shall also contribute to reducing human disturbance of wildlife.

Walking Trails

Research indicates that the greatest part of damage to vegetation and soils as a result of walkers and other trail users occurs at the early stages of use, i.e. when new paths are being formed (Cole, 1982; 1986; Cordell *et al*., 1990; Cessford, 1995). This would highlight the need for the provision of convenient and well-managed paths that are free of obstacles (including muddy patches), in order to discourage the creation of new trails. Once trails are established, footfall usually creates a compacted, de-vegetated surface which is relatively resistant to erosion. However, in certain contexts – particularly where the terrain is poorly drained, steeply sloping or very rocky, and where there are high levels of rainfall – erosion can occur, as well as emergence of braided / parallel trails, where visitors have taken alternative routes (Weaver & Dale, 1978; Wilson & Seney, 1994; Cessford, 1995; Olive & Marion, 2009).

Waymarked walking trails are widely used in outdoor recreation areas as a means of guiding the movement of visitors (Slaymaker, 2017). According to the National Trails Office (NTO) (2012, p.4), "Developing recreational trails is a very effective way of managing recreational activity in the outdoors and protecting the natural environment". Indeed, research indicates that walkers tend to stick to established paths, even when they have the 'right to roam' (Keirle & Stephens, 2004; Synge, 2004; Kuba *et al*., 2018). However, as outlined in Section 2.4, the existing looped walk on the island is not sufficiently formalised or advertised, and visitors frequently wander off trails. Waymarkers are widely spaced and, particularly in the upland reaches of the walk, it is easy to lose the trail.

Research conducted on Bear Island in Maryland, U.S.A. (Hockett *et al*., 2010), found that principal reasons for visitors to wander off established trails were:

1. To view and / or photograph a scenic vista;
2. To pass other walkers on the trail;
3. To avoid challenging trail conditions; and also
4. Because of poor waymarking.

In short, trails should offer opportunities for scenic vistas / photos, should be well marked and should be convenient to use.

In order to address the existing deficit in Dursey's walking infrastructure, a network of formalised, waymarked walking trails shall be established. This network shall be established using existing trails, as well as the public road, avoiding the need for construction of any new trails (and associated habitat destruction). This network shall include three looped walks of varying durations (Fig. 14). To discourage walkers from wandering off the beaten track, clearly visible, colour-coded waymarker posts (of recycled plastic) shall be placed at regular intervals alongside the trails. These posts shall feature colour-coded directional arrows. Where appropriate, a single post may feature directional arrows for more than one loop walk.

At the western end of the island, where trails give way to an area of open grassland, which is known to be an important foraging habitat for Red-billed Chough, emotionally

engaging signage and island caretakers (during the breeding season) shall be employed to discourage walkers from spilling out onto open habitat. CCC has consulted with Beara Walks, who manage the Beara Way walking route. The route, as mapped on the sportireland.ie website, currently extends to the western end of Dursey Island. Beara Walks have indicated that they are willing to cooperate with and assist CCC in implementing the proposed new measures in relation to trails on the island.

The direction of all three looped walks shall be anticlockwise, with walkers travelling along the established off-road trails on the outbound journey, and returning via the public road on the return journey. Trails have been routed to provide walkers with plenty of photo opportunities on the outbound journey so that, by the time they have reached the Signal Tower / Tilickafinna, walkers might feel less compelled to wander further in search of social-media-worthy views. Furthermore, provision of complete (and conservative) information on the nature and duration of routes, coupled with the provision of two shorter trail options, may discourage less enthusiastic walkers from attempting the full loop and travelling to the western end of the island. Any existing signage which contradicts or confuses these new trails shall be removed.

A mapboard shall be erected at the trailhead (i.e. near the cable car on the island) where it will be seen by all walkers on the island, displaying a map of colour-coded routes with (i) length (km); (ii) duration (hours / minutes), (iii) conservative estimate of difficulty level as per NTO guidelines (2008); and (iv) a message instructing walkers to stay on the trails.

Trailside signage shall be erected at key sensitive locations for human disturbance and habitat destruction. At a minimum, this shall include (i) a note on the trailhead mapboard instructing visitors to stay on the trails and (ii) a sign at the westernmost point on the Tilickafinna / Signal Tower Loop instructing walkers not to venture further westward onto the chough hotspot. All signage shall be in accordance with the recommendations for educational media set out below ('Visitor Education').

During the months of June – September (inclusive), an island caretaker will be stationed at the westernmost point of the proposed new network of trails shown in Fig. 14, below (location marked with a star). Fundamentally, the role of this island caretaker will be to discourage visitors from travelling further westward. They will engage with walkers who appear to be headed towards the western end of the island, generally advising them that:

- They are working on behalf of CCC;
- The area westward is a hotspot for foraging and breeding Red-billed Chough, a protected species of bird;
- Choughs are sensitive to human disturbance at this time of year; and that
- CCC have changed the walking routes on the island to protect the birds and they would appreciate if visitors would refrain from walking further westward and, instead, stick to the signposted trails.

For walkers who are intent on heading westward, the island caretaker will advise such persons to stay clear of birds and refrain from disruptive behaviours. The island caretaker should be of suitable qualifications and character such that they can engage with visitors in a personable and persuasive manner, while also being able to talk confidently about wildlife on the island (particularly Chough).

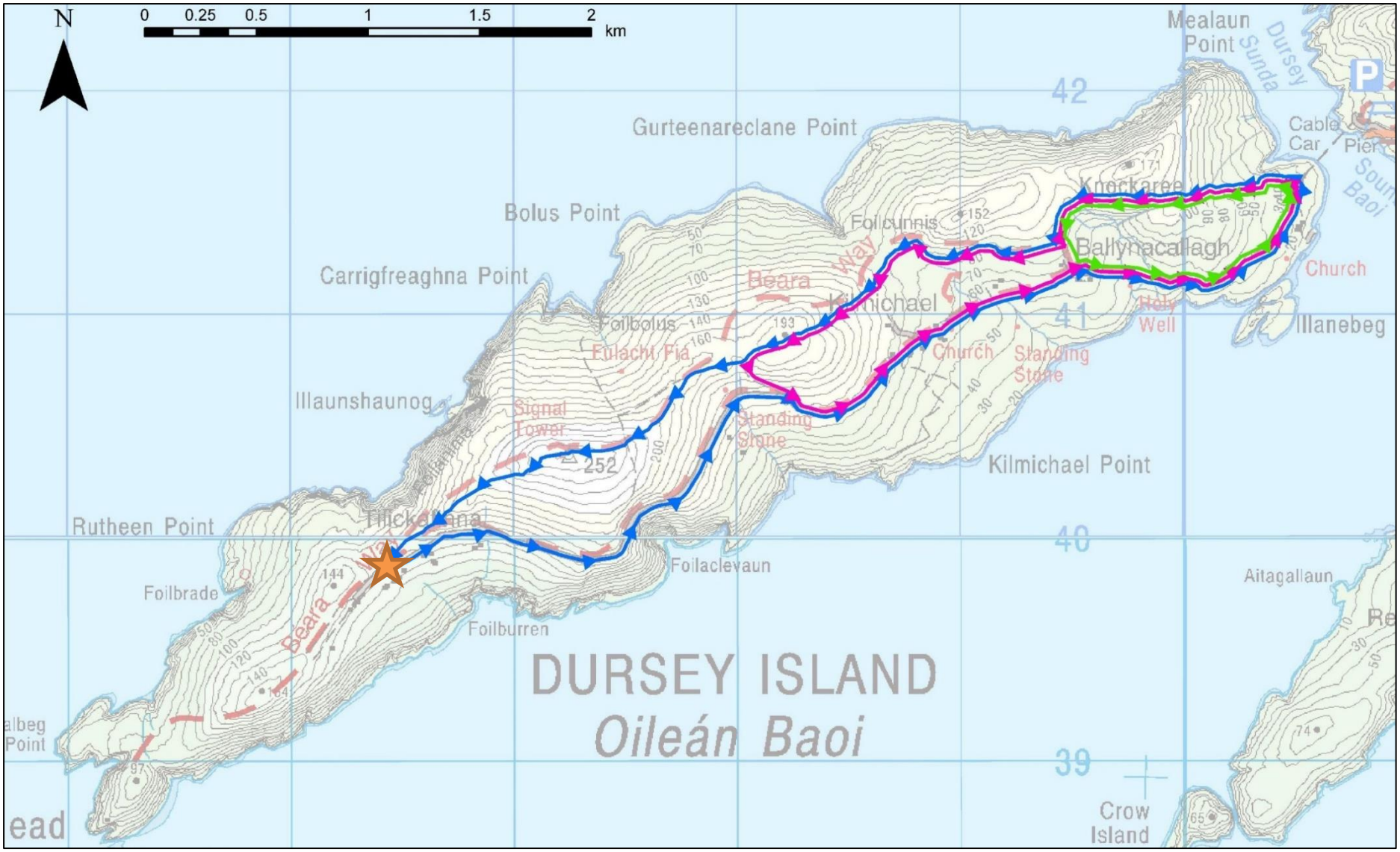

Figure 14 **Three waymarked loop walks for Dursey Island. Ballynacallagh Loop (green) = 2.7km; Kilmichael Loop (pink) = 6km; Tillickafinna / Signal Tower Loop (blue) = 10km; Orange star = approx. location of breeding season island caretaker**

Visitor Education

> *"Visitor education programmes recognise that most [visitor-related environmental] impacts are not from malicious acts, but result from insensitivity to the consequences of one's actions or a lack of knowledge regarding appropriate low-impact behaviours… Education programmes encourage visitors to consider the environmental and social consequences of their actions, promoting enhanced ethics and a self-directed modification of their personal behaviour. Visitor education designed to persuade visitors to adopt low-impact practices is considered a more appropriate, light-handed and indirect management response to reduce resource impacts or improve visitor experiences… The objective of educational programmes is not to 'control' visitor behaviour; rather, land managers seek to provide a cognitive basis to encourage appropriate low impact visitor behaviour in recreation settings… Visitors retain their freedom of choice but information that considers the consequences of their actions guides their behaviour."*
>
> - Marion & Reid, 2007, p. 6

In order to promote pro-environmental behaviour among visitors to Dursey Island, it is considered appropriate to implement a visitor education campaign. A literature review on the subject indicates that such educational campaigns can be effective in prompting pro-environmental behaviour among outdoor recreationists (Marion & Reid, 2007).

The environmental education campaign for visitors to Dursey Island shall have the principal objective of getting visitors to voluntarily stick to the network of waymarked trails described above. It shall use different types of media in different contexts, communicated to the visitor at different points during their visit. It shall be a three-tiered campaign, in that it will feature educational media (i) in the Visitor Centre, (ii) in the cable car itself, as well as (iii) in the natural environment on Dursey Island. On Dursey Island, the need for strategically placed 'minimum impact behaviour' (MIB) signage shall be carefully balanced with the approach of minimum intervention on the island, and care shall be taken to limit the number and visual intrusiveness of signage such that the visual character of the site is not adversely affected and visitors are not bombarded with too much information.

Research indicates that 'minimum impact behaviour' (MIB) signage can be effective in promoting pro-environmental behaviour (Baltes & Hayward, 1976; Reiter & Samuel, 1980; Durdan *et al*., 1985; Austin *et al*., 1993; Sussman & Gifford, 2012; Meis & Kashima, 2017; Parker *et al*., 2018), including in natural recreation areas (McCool & Cole, 2000; Duncan & Martin, 2002; Bradford & McIntyre, 2007; Medeiros *et al*., 2007; Hockett *et al*., 2010). Research from Portugal, for instance, has shown that erection of such signage can effectively reduce the impact of human disturbance on breeding little tern (*Sterna albifrons*), with a 34-fold greater likelihood of breeding success at nest sites with such protective measures in place (Medeiros *et al*., 2007). It has also been found that the majority of hikers (between 74 – 85%) stop to read trailside signs, regardless of sex or educational level (Cole, 1998; McCool & Cole, 2000).

However, in addition to capturing the attention of walkers, trailside signs need to present a persuasive message. Various factors can influence the effectiveness of

outdoor signage in promoting desirable behaviour. The following message characteristics have been linked to effectiveness:

- Use of a clear behavioural recommendation (e.g. 'stop here', 'stay on the trail') (Meis & Kashima, 2017);
- Concise messaging (Cole *et al*., 1997; McCool & Cole, 2000);
- Inclusion of a persuasive explanation as to the reason for the recommendation being made (e.g. 'this is a chough hotspot', 'this area is being managed for chough', 'chough are sensitive to human disturbance', 'this habitat supports native wildlife') (Ham, 1992; Gramann *et al*., 1995; Duncan & Martin, 2002; Bradford & McIntyre, 2007; Marion & Reid, 2007);
- Use of a positive, encouraging tone (Winter *et al*., 2000);
- Use of a moral / ethical argument (Daniels & Marion, 2005; Marion & Reid, 2007);
- Avoidance of 'plea' type messages (Cole, 1998; Bradford & McIntyre, 2007); and
- Avoidance of overly simple statements (Ham, 1992).

In short, signage should be used which tells the walker *what* to do, tells them *why* they should do it, and encourages them to *feel good* about doing it.

Fig. 15 provides a good example of outdoor signage for natural recreation areas. Signage on Dursey Island could follow a similar format to these – and should avoid the approach shown in Fig. 16. Signage should be graphic and emotionally engaging and avoid the 'official', authoritarian style exhibited in Fig. 16.

It is important that the message used is persuasive in a general sense but also in terms of the typical 'type' of visitor to the island. Because of its rather isolated location, on the western tip of a peninsula on the west coast of Ireland, it may be assumed that the site attracts a relatively low proportion of casual, happenstance visitors. On the contrary, the site is popular among walkers, birdwatchers and whale and dolphin watchers, groups which may be assumed to largely exhibit positive attitudes with respect to environmental conservation, and to engage in relatively a lot of outdoor recreation activities in a given year (i.e. 'experienced visitors'). Indeed, during the breeding bird surveys which were carried out to inform the EIAR for the cable car re-development, surveyors reported seeing very little deliberately ecologically harmful behaviour (the exceptions being two instances of littering).

Figure 15 **Example of signage which is simple and to-the-point but, critically, provides a practical and moral rationale for the recommended behaviour. Source: Stonehouse Designs**

Figure 16 **Example of ineffective signage at the Cliffs of Moher, Co. Clare. This sign is overly simple and does not make a rational or ethical argument for the recommended behaviour.**

Furthermore, of all of the visitors to Dursey Island, the subset who complete the entirety of the existing loop walk (approx. 10km, plus a climb to a high point of approx. 250m), are likely to be predominantly more experienced walkers with an interest in the natural environment. Research has found that 'experienced visitors' (i.e. those who visit a higher number of natural recreation areas in a year) are more likely to attend to trailside signs (Mc Cool & Cole, 2000). Thus, it may be considered likely that, if outdoor signage is placed in an obvious location on Dursey Island, it will be read by the majority of walkers. It is also considered that the typical 'type' of visitor to Dursey Island is likely to be susceptible to pro-environmental messages regarding habitats and wildlife.

Non-native English-speaking European nationalities (particularly Germans) constitute a significant cohort of site visitors (Germans being the second largest group after Irish). For this reason, signage should include German and French translations of the key message(s).

All outdoor signage shall be designed for the exposed and corrosive nature of the site.

In terms of the educational media to be employed in the Visitor Centre and cable car, there are more options for the types of media which can be employed. Research indicates that person-to-person communication (e.g. from an employee), and visitor-activated audiovisual presentations have been effective (Fazio, 1979). It is important that the message conveyed to visitors regarding appropriate behaviour while on the island is consistent, regardless of the media / source.

Mountain Biking and Habitat Deterioration / Destruction

As mentioned previously, in addition to disturbing wildlife, cycling as a recreational activity on the island could also contribute to the trampling of vegetation and soil compaction / erosion (Cessford, 1995). While there is no reason to believe that the mechanical action of bicycle wheels is significantly more damaging to vegetation / soils than the equivalent footfall (Cessford, 1995; Thurston & Reader, 2001), a group of

mountain bikers have the mobility to potentially affect a much greater area of habitat in a given time than do the same number of hikers (Marzano & Dandy, 2012), particularly in open, obstacle-free landscapes, such as that of the Dursey uplands. Indeed, research has found that habitat alteration and fragmentation as a result of mountain biking in moorland can result in diminished breeding success among ground-nesting birds, even when the species in question does not appear to be affected by disturbance as a result of the biking (Davis *et al*., 2010).

Additionally, the presence of mountain bikes in outdoor recreation areas may be *perceived* as 'inappropriate' or harmful by other site visitors (Cessford, 1995). Indeed, it might be argued that the presence of mountain bikers on Dursey Island would detract from the sense of peacefulness and isolation appreciated by many of its visitors.

Considering these potential adverse environmental and social impacts of mountain biking, the prohibition of the transportation of bicycles to the island seems a reasonable measure, which would be straightforward in terms of implementation. Bicycles for personal use by residents and farmers shall be excluded from this restriction.

It should be pointed out that bike rental schemes are in place on other offshore islands. On Inis Óirr, for instance, such rental services have been immensely successful. In this case, where the landscape is enclosed by dry-stone walls, the roads are well surfaced, the coastline is relatively safe and the character of the island is more developed, cycling is a much more appropriate means of mobility for visitors.

3.1.3 Introduction and Dispersal of Invasive Alien Species

As an island, Dursey is particularly susceptible to the adverse ecological effects of invasive alien species (IAS). There is a risk that visitors to Dursey Island could introduce IAS to the island or spread those which are already present on the island. IAS may be inadvertently spread by individuals, who may pick attractive or edible material of invasive alien plant species, for instance, and drop it somewhere else, or who may unknowingly transport IAS on shoes / clothes (Turton, 2005; Cushman & Mentemeyer, 2008). Vector material of invasive alien plant species, as well as other pests and pathogens, may also be introduced to new areas on the tyres of bicycles. Furthermore, disturbance of habitats (e.g. as a result of de-vegetation, soil compaction / erosion) may also increase their susceptibility to colonisation by IAS (Newsome *et al*., 2002).

Three species of Third Schedule[5] invasive alien plant species were identified on Dursey Island during the course of the surveys carried out to inform the EIAR for the Dursey Island Cable Car and Visitor Centre development:

1. Japanese Knotweed, *Fallopia japonica*,
2. Three-cornered Leek, *Allium triquetrum*, and
3. Hottentot-fig, *Carpobrotus edulis*.

All were single occurrences and, as such, it is important that prompt efforts are made to eliminate (where possible) or prevent the spread of these species at this early stage of colonisation.

Hottentot-fig has a very limited distribution in Ireland and it was tentatively believed that the species had been eradicated from the country until recently (W. Earle, pers. comm., 2019). This confirmed record on Dursey Island reveals that this is not the case.

[5] Non-native species which are listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 and subject to restrictions under Regulations 49 and 50 of same.

However, it is possible that this occurrence is one of a very small number of occurrences in Ireland. Additionally, it is the first record of the species on the west coast of Ireland. As such, it is imperative that every effort is made to eradicate this localised occurrence, in agreement with the private landowner. This record provides an opportunity to contribute to the national eradication of a High Impact IAS before colonisation reaches a stage when eradication is much more challenging or no longer feasible.

Hottentot-fig can be effectively removed off site via physical removal, and chemical means can be employed for control in cases in which physical removal is not practical (e.g. on inaccessible sea cliffs). In this case, since the occurrence in question is quite localised and is situated in a fully accessible location (on a stone wall in a private garden at Kilmichael), it is considered that physical removal would be practical and effective and should be undertaken in agreement with the landowner in question. The situation of the occurrence on a public roadside creates the risk of dispersal by tourists who may pick the attractive flowers or foliage or inadvertently transport plant fragments or seeds on boots/clothing. Seabirds may also disperse the species to sensitive habitats (including Annex I habitat, Vegetated Sea Cliffs of the Atlantic and Baltic coasts) when gathering nesting materials. Therefore, every effort should be made to treat the occurrence at the earliest possible convenience. Early, appropriate treatment of this species will avoid medium to long-term ecological impacts and financial costs.

Treatment options for Japanese Knotweed and Three-cornered Leek are not as straightforward and, in these cases, prevention of dispersal may be the most appropriate course of action.

3.1.4 Littering

Opinions expressed by local residents indicate that litter may be an existing issue on Dursey Island – albeit at a low level. Certainly, with greater number of visitors travelling to the island each year, the occurrence of littering is likely to increase accordingly. The presence of litter on the island would detract from its pleasant visual character and could potentially create a hazard for wildlife, who may consume or become entangled in waste material.

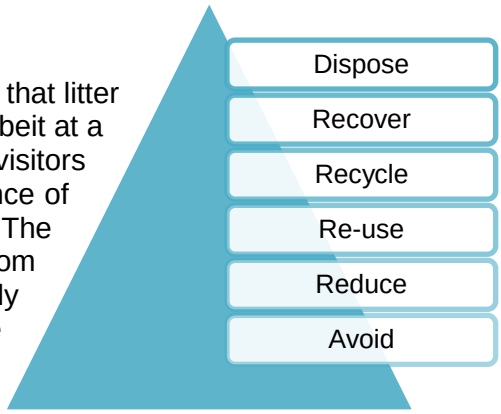

Figure 17 The Waste Hierarchy

In order to promote sustainable waste management and prevent littering in the vicinity (including on Dursey Island), the Dursey Island Cable Car and Visitor Centre development should be operated in accordance with waste hierarchy, where avoiding the generation of waste is the most preferred option and disposal to landfill is the least preferred option. Accordingly, the development should operate in a manner which, in the first instance, avoids insofar as is feasible, the generation of solid waste (especially throwaway, single-use items) and which provides convenient and clearly marked segregated waste bins for unavoidable waste.

3.1.5 Objectives and Actions

In order to address the visitor management issues identified above, a suite of objectives and corresponding actions have been set out, as follows:

Objectives – Natural Heritage:

NHO1: Numbers and behaviour of visitors to Dursey Island are managed on an ongoing basis such that human disturbance does not threaten the conservation of species of wildlife.

NHO2: Numbers and behaviour of visitors to Dursey Island are managed on an ongoing basis such that habitats and vegetation (particularly protected and rare flora) are not significantly adversely affected.

NHO3: No new invasive species are introduced to Dursey Island.

NHO4: Invasive species already present on Dursey Island are managed to prevent further dispersal and, where feasible, eradicated from the island.

NHO5: The Visitor Centre is managed in accordance with waste hierarchy (avoid > reduce > re-use > recycle >recover > dispose to landfill)

NHO6: Dursey Island is a litter-free environment.

Actions – Natural Heritage:

NHA1: A numerical carrying capacity of 11,716 visitors per month shall be implemented for Dursey Island in all months of the year. This limit shall not apply to island residents or farmers. This numerical carrying capacity shall be implemented using a strictly enforced ticketing system.

NHA2: If CCC intends to propose a new carrying capacity for Dursey Island based on the results of the 10-year monitoring programme, this new limit on visitor numbers would be the subject of an application for planning permission to the Competent Authority at this future date, for which the necessary environmental assessments, including AA, will be completed, as appropriate.

NHA3: In agreement with all affected landowners, CCC shall establish a network of walking trails on Dursey Island, using existing trails, as described above, prior to the commencement of the operation of the Dursey Island Cable Car and Visitor Centre. CCC shall be responsible for the maintenance of these trails, as required, based on the results of trail monitoring (Section 4.1).

Actions – Natural Heritage:

NHA4: Once the Dursey Island Cable Car and Visitor Centre is operational, an island caretaker will be employed by CCC on an annual basis, during the months of June – September (inclusive), with the primary role of discouraging visitors from travelling beyond the proposed network of looped walking trails onto the western end of the island, as described above.

NHA5: Visitors shall be prohibited from bringing dogs to Dursey Island via the cable car. This shall not apply to guide dogs or the dogs of island residents / farmers.

NHA6: Visitors shall be prohibited from bringing bicycles to Dursey Island via the cable car. This restriction shall not apply to residents / farmers of the island.

NHA7: CCC shall implement an environmental education campaign for visitors, as described above. The media in question shall be in place prior to the commencement of the operation of the Dursey Island Cable Car and Visitor Centre.

NHA8: As agreed in consultation with a private landowner on the island and as disclosed in the response to the RFI in relation to the Dursey Island Cable Car and Visitor Centre development, measures will be implemented to ensure the protection of a known Chough nest site at an undisclosed location (information withheld to protect the nest site in question).

NHA9: Subject to landowner agreement, CCC shall commit to undertaking Hottentot-fig eradication treatment(s) by a competent professional, in accordance with Appendix I, prior to the commencement of operation of the Dursey Island Cable Car and Visitor Centre.

HNA10: CCC shall implement the Invasive Alien Species Management Plan which has been developed under the scope of the EIAR for the Dursey Island Cable Car and Visitor Centre development (Appendix I).

NHA11: CCC shall place segregated waste bins at appropriate sheltered locations on the mainland and island-side of the cable car site, with clear instructional signage regarding correct use of bins, prior to the commencement of operation of the Dursey Island Cable Car and Visitor Centre.

NHA12: CCC shall ensure that a discount is offered for users of re-usable cups and food containers at the café in the Visitor Centre.

NHA13: CCC shall ensure that facilities are made available at the Visitor Centre for the re-filling of reusable water bottles for personal use (at no cost to the visitor).

3.2 Cultural Heritage

There are no major concerns in relation to the conservation of the cultural heritage assets of Dursey Island and it is not considered that increased visitor numbers as a result of the Dursey Island Cable Car and Visitor Centre development will result in significant damage or destruction of any sites of archaeological, historical or architectural heritage value.

There is reason to believe that, in the absence of adequate welfare facilities, the extension to the Napoleonic Signal Tower is currently being used as a toilet by some site visitors; however, it is considered that the provision of public toilets on the island, as part of the re-development of the cable car, will address this problem.

As noted in Section 2.2, the buildings of architectural heritage value on the island have not been included in the Record of Protected Structures (RPS) of the Cork County Development Plan (2014). Inclusion of one or more of these structures in the RPS would provide for greater protection, and should be considered in the development of the next County Development Plan.

During surveys undertaken for the purposes of the EIA for the Dursey Island Cable Car and Visitor Centre development, complaints were received regarding a lack of information on the history of the island. Provision of interpretative information regarding the history of the island is planned for the exhibition space in the Visitor Centre. This exhibit should relate the historical information to key structures of archaeological and architectural heritage value on the island. It is considered that provision of this information will foster a greater appreciation of the history and heritage of Dursey Island. The Interpretation Plan for the development details the proposal for the Visitor Centre exhibition space.

3.2.1 Objectives and Actions

In order to address the visitor management issues identified above, the following objective and corresponding action have been set out:

Objective – Cultural Heritage:

CHO1: The sites and structures of archaeological, historical and architectural heritage value on Dursey Island are conserved and appreciated.

Action – Cultural Heritage:

CHA1: CCC shall consider the inclusion of the NIAH architectural heritage structures on Dursey Island in the Record of Protected Structures of the next Cork County Development Plan.

3.3 Community

Inadequate infrastructure, services and economic opportunities on Dursey Island have resulted in ongoing population decline. Total disappearance of the full-time population base is now a conceivable outcome in the short to medium-term.

During public consultations carried out to inform the proposed re-development of the cable car, a number of locals expressed concerns that the new attraction would deliver only limited economic benefits to local people. Future management of visitors to Dursey Island should aim to ensure maximum economic returns to the community of the island, as well as to the greater Beara region.

While greater tourism on the island does have the potential to improve the economic viability of full-time residence, it is imperative that growth in tourism on Dursey is balanced with provision of adequate infrastructure and services to support islanders and visitors alike and considered management of visitor numbers and activities in order to conserve the assets and character of the island – which themselves support the attractiveness of the island as a place to live and visit.

A number of locals have emphasised the importance of the cable car as a means by which Dursey Island residents and farmers transport essential goods to-and-from the island. There is a risk that, if appropriate provisions were not put in place for these cable car users, that the viability of living and working on the island would be negatively affected.

3.3.1 Objectives and Actions

In order to address the visitor management issues identified above, a suite of objectives and corresponding actions have been set out, as follows:

Objectives – Community:

COO1: Tourism on Dursey Island is managed to ensure maximum economic returns to the island community.

COO2: The Dursey Island community is engaged in the management of visitors.

Actions – Community:

COA1: CCC shall promote longer dwell times and greater expenditure among visitors by promoting businesses, activities and attractions throughout the Beara Penninsula and on Dursey Island in the Visitor Centre.

COA2: In consultation with the island community and prior to the commencement of the operation of the Dursey Island Cable Car and Visitor Centre, CCC shall make provisions (e.g. a written agreement) for the movement of goods to-and-from the island in the cable car by island residents and farmers.

COA3: CCC shall facilitate public participation (particularly of Dursey Islanders) in subsequent iterations of the Dursey Island Visitor Management Plan. Accordingly, a Community Workshop shall be held at a time and location that are most convenient for residents of Dursey Island, but also broadly suitable for stakeholders from the greater Beara and West Cork regions, prior to the development of the next iteration of the Visitor Management Plan. Stakeholders shall be provided with sufficient prior notice regarding the event.

3.4 Potential Future Developments

It should be noted that, since the Dursey Island Cable Car and Visitor Centre development will increase visitor numbers on the island, it is also likely to prompt further development of the built environment on the island – particularly that which relates to tourism and recreation. The nature of this potential future development is hypothetical and the potential implications on the character of Dursey Island and its natural and cultural heritage assets cannot be foreseen at the present time – although negative impacts on any of the aforementioned are possible as a result of future development related to visitors.

As a Competent Authority, CCC has every intention to manage development in the area in accordance with the objectives of this Visitor Management Plan, as well as the relevant national, regional and local policies, including the West Cork Island Integrated Development Strategy (2010), the Cork County Development Plan 2014 – 2020, and the West Cork Municipal District Local Area Plan (2017), the latter of which states that "Development on [Dursey Island] will only be permitted where it is shown that it is compatible with the requirements of the Habitats Directive and the protection of these sites".

> *"There are a significant number of ruins and derelict houses in [Ballynacallagh, Kilmichael and Tilickafinna] and any future development should be directed towards renovation or sensitive replacement where necessary, of those structures, apart from exceptional circumstances where new build may be necessary to provide a particular facility."*
>
> - West Cork Islands Integrated Development Strategy (2010)

3.4.1 Objectives and Actions

In order to address the visitor management issues identified above, the following objective has been set out:

Objective – Future Development

FDO1: Future development of the built environment on Dursey Island shall be in accordance with the objectives of the following documents, until such time as they are superseded by new versions, at which point those will be adhered to instead:

- The Dursey Island Visitor Management Plan
- The West Cork Islands Integrated Development Strategy
- The Cork County Development Plan
- The West Cork Municipal District Local Area Plan

3.5 Traffic, Parking & Visitor Number Management

3.5.1 Accessing Dursey Island – Existing Road Network

The Dursey Island Cable Car is accessed via the R572 regional road. The R572 commences at Glengarriff, 55km to the east, where it connects with the N71 National Road, and it passes through Adrigole and Castletownbere. The average journey time by car from Glengarriff to the site is 1 hour, which gives an average travel speed of 55kph. The R572 from Glengarriff forms part of the Ring of Beara route along with the R575 from Bealbarnish Gap and then the R571 continuing along the north side of the peninsula via Allihies and Ardgroom and connecting back to the N71 at Kenmare approximately 70km to the northeast.

The road network along the Beara Peninsula from Glengarrif to Dursey Island is shown in Figure 18 below.

Figure 18 Road Network – Regional Area

On the final approach to the proposed visitor centre, the R572 at the western end of the Beara Peninsula extends 8 km from its junction with the R575 at Bealbarnish Gap, as shown in Figure 19 below. This section of the R572 is a narrow road with numerous tight bends and limited forward visibility. The average journey time by car from Bealbarnish Gap to the Dursey Island Cable Car is 12 minutes, which gives an average travel speed of 40kph, although the journey times can increase at busy times. Much of this section of the R572 is only wide enough for one-way traffic, where traffic in opposing directions must give-way at suitable passing places. Only 30% of the R572 from Bealbarnish Gap to the Visitor Centre has a width of 4.8m or wider, which allows for comfortable passing of cars and light commercial vehicles at low speeds (mini-buses, camper vans, etc..). The other 70% of the route is too narrow for two-way traffic and traffic must pass at localised passing places, such as localised widening, accesses and side roads. This often requires opposing traffic to give-way, and at times vehicle are forced to reverse to suitable passing locations, which can lead to traffic congestion at busy times.

Figure 19 Road Network – Local Area

3.5.2 Road and Car Park Improvements

The approach roads along the R572 from Glengarriff and the R571 & R575 from Kenmare to Bealbarnish Gap have considerable landscape character and do not need to be upgraded for the small increase in traffic during peak season attracted to the proposed Visitor Centre.

An assessment of the forward visibility was carried out on the 8km section of the R572 between the junction of the R575 at Bealbarnish Gap and the proposed visitor centre The existing road has little or no verge width along its length, which restricts the forward visibility on bends. Along some lengths of the road, motorists can potentially see oncoming vehicles across the low stone walls which border the road.

The forward visibility assessment considered a driver's-eye-position and target-position in the horizontal plane taken from the middle of the carriageway. A driver's eye height of 1.05m and a target height of 0.26m were used. The forward visibility was then calculated in accordance with TII Publications DN-GEO-03031, using the "Visibility Check" feature of Civil 3D software. Separate checks were carried out at 5-metre intervals in each direction. This exercise highlighted several locations where forward visibility is severely restricted, but it is also noted that traffic speeds at a number of these locations is suitably reduced to reflect the road layout and visibility. While the road has a speed limit of 80kph the average traffic speed along this section of the road is 40kph and traffic speeds on these blind bends has been observed to much less than this, where the risks of driving at higher speeds are obvious to the driver.

Improvement works are required on the 8km stretch of the R572 Regional Road, from Bealbarnish Gap at the R572 / R575 junction to the Visitor Centre, to address existing congestion problems and facilitate anticipated volumes of traffic generated by the proposed development. Several new and improved two-way sections of road and passing locations are to be created to provide sufficient traffic capacity. The locations of the two-way sections of road and passing bays have been designed so that the distances between two-way / passing sections of road is suitably reduced and also located so that opposing traffic can see each other in sufficient time to give-way at the narrow sections. Other road improvements will include some verge widening to provide adequate forward visibility and pavement strengthening works. This will ensure that the road does not become blocked and minimises the risk that some vehicles would need to reverse to the next nearest passing point. These road improvements measures will also allow the approach road to better deal with camper vans and mini-buses, including the local school bus service.

These road improvement works along the 8km stretch of the R572 from Bealbarnish Gap to the proposed visitor centre, include;

- the widening of the carriageway at 11 locations (10 no. passing bays and 1 no. visibility splay);
- further road improvements to include pavement and verge works at a number of other locations;
- improvements to the junction visibility at Bealbarnish gap and;
- completion of several local improvements to improve visibility) on the mainland-side approach road R572. The locations of these improvements are spaced to reduce the distances between two-way sections and passing bays and in order to allow opposing drivers to see each other in sufficient time to give way at one-way road sections.
- Traffic information signage will be provided using variable messaging signs (VMS).

The proposed car park improvement works include;

- The visitor centre car park on the mainland will be increased from 70 spaces to 100 spaces.
- Provision of a mini-bus set down area will be located at the front of the Visitor Centre building entrance.
- The layout of the car park has been designed with a one-way loop road to provide improved traffic circulation and minimise delays for traffic searching for a space and turning around.
- Camper vans will not be accommodated at the proposed car park.
- On the island side of the site, it is proposed to retain the existing 10-space residents' car park.

These modest road and car parking improvement works have been designed to be consistent with the existing landscape character of the area, to accommodate the small increase in traffic proposed at peak times and alleviate the existing congestion that occurs on particularly bus days, and to help ensure that excessive traffic volumes or hight traffic speeds does not develop.

3.5.3 Process for Determining Capacity for Traffic and Parking

As detailed in Section 3.1.1 the visitor management plan is to ensure that no more than 11,716 visitors shall be permitted to travel to Dursey Island in any month of the year.

The capacity of the visitor centre at peak times during the peak season is also determined by the capacity on the approach along the R572 from Bealbarnish Gap to the Visitor Centre.

It is anticipated that 80% of the visitors to the mainland site will make the trip across the new cable car to the island. Therefore, the visitor management plan is to ensure that no more than 14,645 visitors per month during the peak season are permitted at the Visitor Centre. Taking into account the existing spread of visitors during peak season it is anticipated that the busiest days will see 20% more visitors than the average day during the peak season. It is therefore proposed to limit the visitor numbers during the peak season, through visitor management measures, to 586 visitors per day. Based on an average vehicle occupancy of 2.4 persons and an average visit duration of 3 hours, the peak demand for cars based on the current visitor arrival profiles is estimated at 90 vehicles during the peak seasons and peak times. The proposed visitor management measures will restrict the number of visitors that can access the site at busy times and will result in a better spread of visitor arrivals during the day. The proposed visitor centre car park on the mainland will be increased from 70 spaces to 100 spaces. It is not desirable to provide any additional car parking spaces on site, due to site constraints including biodiversity and landscape. This increase in car parking will accommodate the peak parking demand.

The busiest hour would see approximately ⅛ of the daily traffic arriving or departing, equating to a peak of 60 two-way vehicles per hour. The total daily traffic at peak season on the R572 at the visitor centre entrance is 480 two-way . This represents an increase in traffic of only 15% per day during peak season compared to current traffic numbers, and this is reflected in the modest road improvement measures that are proposed.

In summary the peak season visitor numbers that are to be controlled by the Visitor Management Plan is as follows:

- 11,716 visitors to Dursey Island per month;

- 14,645 visitors to the mainland Visitor Centre per month;
- 3,380 visitors to the mainland Visitor Centre per week;
- 586 visitors to the mainland Visitor Centre per day;
- 240 vehicles to the mainland Visitor Centre per day; and
- 60 vehicles to the mainland Visitor Centre per hour.

3.5.4 Management of the Visitor Numbers

The proposed visitor management measures are designed to so that visitor numbers are controlled at peak times and to ensure a more evenly spread of visitors throughout the season and during the day to reduce the sharp peak periods. This will ensure that both the approach road capacity and the proposed car parking capacity and that the capacity of the island to accommodate visitors will be managed.

Contemporary visitor attractions are adopting increasingly sophisticated ticketing and reservations systems that also incorporate capacity management systems. Most large attractions now find it essential to manage volumes and ensure that visitors are not disappointed. Online reservations are essential and expected in the industry. Most systems now amalgamate reservations and ticketing and many other associated features. Examples of reservations systems in other visitor attractions that adopt these principles include the Cliffs of Moher, Bunratty Castle and Folk Park, numerous OPW visitor attractions (the OPW manage hundreds of visitor attractions across the country including Rock of Cashel and Kilmainham Gaol), and Tourism Exchange Great Britain (a one-stop shop for English tourism suppliers including accommodation providers, visitor attractions and experiences, to link to distributors with international reach).

Central to this management strategy is the establishment of a bespoke, web-based portal with an integrated reservations system for the Dursey Island Cable Car and Visitor Centre. The bespoke ticketing system will need to be implemented for the operational phase in order to implement the proposed monthly carrying capacity in a controlled manner, to ensure an even and economically sustainable distribution of visitors numbers throughout the days, weeks, months and seasons, and to ensure the car parking facilities can meet visitor demand. This system will be designed such that, while the overall daily visitor numbers will slightly increase, the peak demand will not increase significantly. This will ensure that both the car parking capacity and that the capacity of the island to accommodate visitors will be managed and will not negatively impact on either the biodiversity of the island or traffic congestion on the approach roads.

In parallel with the proposed reservation system a range of compatible visitor management measures, designed to influence long term visitor behaviour patterns, shall be implemented including;

- Marketing of events, school tours seasonal activity outside of the peak months;
- Advertising of essential pre-booking;
- Availability of discount price tickets for off-peak times; and
- The provision of real time car park information at strategic locations and restricting travel times for the cable car.

To avoid congestion on the approach roads to Dursey Island, it is essential that as much advance warning as possible is given to advise motorists travelling along the Wild Atlantic Way and the Ring of Beara of the real-time traffic and capacity conditions at the visitor centre. A permanent automatic electronic car park monitoring system will be provided to record real time occupancy rates at the Visitor Centre car park and will be linked to these Variable Message Signs (VMS). At busy times when the Visitor Centre is at capacity, the VMS's will alert drivers to the lack of parking and this will allow people to alter their plans well before they get to the end of the peninsula.

The location of the proposed Variable Message Signs are indicated on Figure 19 and they have been strategically located as follows;

1. R572 Bealbarnish Gap (junction of R575 / R572),
2. the R572 / R571 Junction at Castletownbere-Bearhaven,
3. the R575 / R571 Junction at Eyeries Cross and
4. the N71 / R572 Junction at Glengarriff.

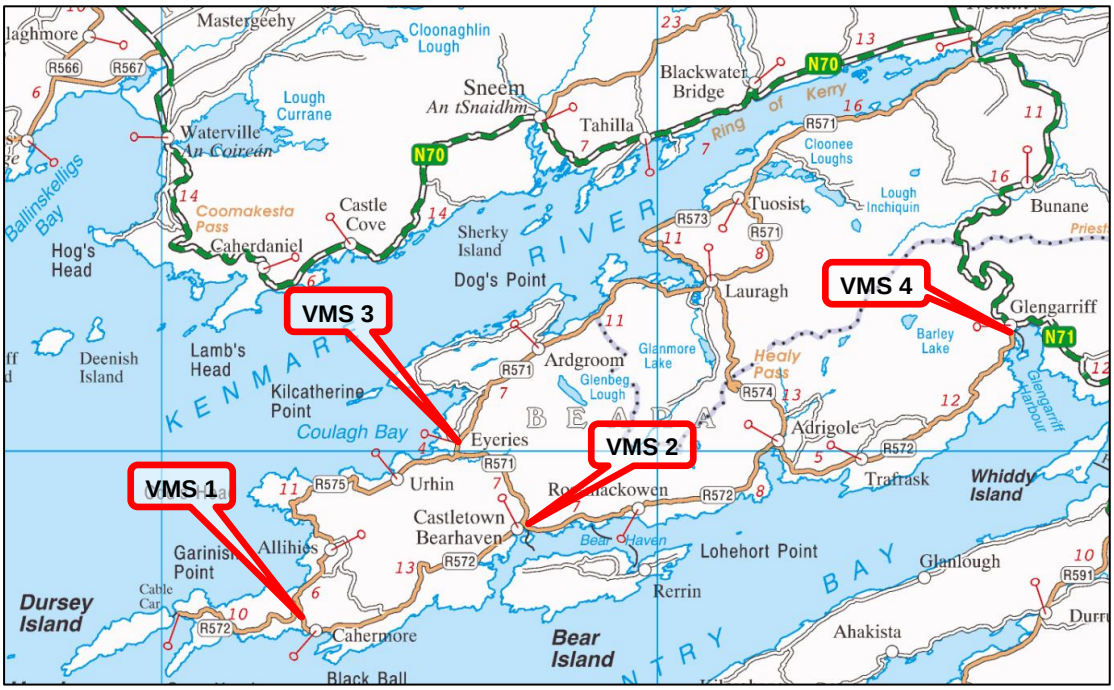

Figure 19 **Proposed locations of VMS to inform visitors of visitor centre/car park capacity**

3.5.5 Objectives and Actions

In order to address the visitor management issues identified above, a suite of objectives and corresponding actions have been set out, as follows:

Objectives – Traffic & Parking:

TPO1: Necessary infrastructure, services and systems are in place to manage traffic volumes and visitor numbers in a sustainable manner.

Actions – Traffic & Parking:

TPA1: CCC shall implement a real-time omni-channel management system that provides an overview of all available capacity at the cable car and visitor centre facilities, including the car park, to enable ongoing capacity management.

TPA2: CCC shall implement a bespoke, web-based ticketing system which:

- Allows visitors to book online for specific time slots;
- Enforces the monthly carrying capacity on the island of 11,716;
- Promotes an even distribution of visitors across days, weeks, months and seasons;
- Has the ability to offer specific pricing models that meet the customer requirements, including discounts, group bookings, special requirements, seasonal offerings, *etc*; and
- Shall be capable of continuous product development to avoid becoming a legacy system.

4. ADAPTIVE MANAGEMENT & MONITORING

Management of visitors to Dursey Island shall be adaptive, in that it will evolve in response to new visitor management requirements, as identified on the basis of ongoing monitoring and public consultation. The Visitor Management Plan itself shall be updated to provide enhanced protections, if required – but never scaled back to provide a lesser level of protection. Additionally, a new Visitor Management Plan for Dursey Island shall be developed no more than 10 years after the commencement of the operation of the Dursey Island Cable Car and Visitor Centre.

In order to facilitate adaptive management, it will be necessary to monitor the access to and environment on Dursey Island, as it relates to visitors and their potential impacts. This section describes the 10-year monitoring programmes which will be implemented by CCC on Dursey Island. It describes the minimum requirements for these monitoring programmes; additional parameters may be added to any of these programmes, as deemed necessary by CCC.

Surveys shall be carried out or supervised (as appropriate) by a competent and suitably qualified professional. Data and reports from all monitoring carried out shall be retained by CCC, used to inform the management of Dursey Island and the cable car site, and made available to interested parties on demand. The possibility of partnering with research institutions for the delivery of all or part of this monitoring shall be considered.

If any issues in relation to visitor management which are not adequately addressed in this Visitor Management Plan are identified as a result of this monitoring programme, appropriate management interventions shall be implemented in a timely manner.

CCC are committed to continuing monitoring for as long as is necessary to ensure tourism at the location of the proposed development and on Dursey Island is managed in an environmentally sustainable manner. When the 10-year monitoring period described above is drawing to a close, CCC will consider (on the basis of the results on the ongoing monitoring) what metrics will need to be monitored beyond the 10-year period.

As stated above, using the results of the 10-year monitoring programme, the Council currently intends to propose a new, bespoke carrying capacity for the island, calculated by a suitably qualified ecological professional on the basis of the longitudinal data gathered. If, at this future date, the Council intends to propose the implementation of this new limit on visitor numbers, it will be the subject of a separate application for planning permission to the Competent Authority, for which environmental assessments (including AA) will be completed, as appropriate. Otherwise, the carrying capacity which is set out herein (of 11,716 per month) is to be regarded as a fixed monthly upper limit on visitor numbers to Dursey Island.

The data gathered as a result of all monitoring undertaken shall be shared with Fáilte Ireland so that it can feed into their WAW Environmental Surveying and Monitoring Programme, and can inform the development and management of similar/related developments, plans and projects. Information will also be shared with NPWS and, upon request, and as appropriate, with research institutions and state authorities. Results of monitoring shall be analysed and conclusions drawn in terms of management implications for developments of a similar nature/environmental context and for visitor management at the cable car site and on Dursey Island.

The following sections describe the elements of the proposed 10-year monitoring programme.

4.1 Monitoring of Visitors and Trails

Trail counters shall be installed at suitable locations on walking trails on Dursey Island, on the Garinish Loop walk and on the walk at Crow Head. On Dursey Island, a trail counter shall be placed at an appropriate location on the western end of the island, so as to record approximately how many visitors leave the established trail (disregarding the MIB sign) to wander onto this key area for chough. CCC shall be responsible for the maintenance of these counters.

The condition of the trail network described herein shall also be monitored, including identification of any off-trail areas of de-vegetation, soil compaction or soil erosion, identification of any areas where protected / rare flora is being adversely affected by visitors, and recommendations on management interventions required, if any.

A visitor survey shall be carried out on an annual basis, to establish approximately how visitors respond to MIB signage, what proportion of visitors follow each of the three looped trails, and what proportion of visitors remain on established trails and vice versa.

4.2 Monitoring of Traffic and Parking

Monitoring of traffic numbers and the availability of car parking spaces at the site during the operational phase shall be continually monitored using (e.g. using real time data traffic counters / sensors) to provide CCC, visitors and other road users in the vicinity with real time information to allow informed decisions to be made in relation to the management of the site.

In addition, the following surveys shall be undertaken annually;

- Traffic counts at the Car Park entrance, the R572 at the Bealbarnish Gap and on the R575. The traffic count data shall be recorded during both peak and off-peak periods.

- Visitor survey to establish the level of satisfaction in relation to the traffic and parking infrastructure provided.

4.3 Monitoring of Red-billed Chough, Habitats and Climate

The conservation status of the Dursey Island chough population shall be monitored on an annual basis (during the breeding season) for 10 years, commencing in the first year of operation of the proposed development. The monitoring programme in question shall, at a minimum, involve the measurement (by a suitably qualified and competent ecologist) of the following parameters:

- Number of breeding pairs (confirmed, probable and possible);
- Locations of nest sites; and
- Productivity of population.

The conservation status of the habitats on Dursey Island shall be monitored on an annual basis (seasonally). The monitoring programme in question shall, at a minimum, involve identification (by a suitably qualified and competent ecologist) of any areas where the ecological integrity of habitats is being negatively affected by land use (especially grazing regime) and/or any other pressures/threats. There is some overlap here with the monitoring of trails described above and it may be appropriate to have

these elements of the monitoring executed at the same time and / or by the same personnel.

Climate (precipitation and air temperature, at a minimum) shall be monitored continuously. The objective of this aspect of the monitoring programme is primarily to establish whether there appears to be any relationship between climatic factors (e.g. the occurrence of extreme weather events) and the status of the Chough population.

The effectiveness of the environmental education campaign described herein shall also be monitored – quantitatively, insofar as possible, and otherwise qualitatively (e.g. via a visitor survey).

4.4 Monitoring of Invasive Alien Plant Species

Wherever control or eradication efforts have been implemented in the management of invasive alien plant species (e.g. Hottentot-fig), monitoring shall be carried out by a competent and qualified professional for five years post-treatment to ensure no re-growth or dispersal has occurred. If re-growth or dispersal is found to have occurred, prompt management efforts shall be implemented, as appropriate. If it is found that Hottentot-fig has re-grown and eradication is still a feasible objective, eradication efforts shall be repeated.

4.5 Monitoring of Archaeological and Architectural Heritage Sites / Structures

A visual inspection of the known archaeological and architectural heritage sites on Dursey Island will be carried out every three years, commencing the first year of operation of the Dursey Island Cable Car and Visitor Centre, and terminating after the third visual inspection has been completed, provided no significant ongoing conservation threats have been identified.

If any threats to the conservation of these sites / structures are identified, recommendations shall be made for appropriate management interventions.

4.6 Monitoring of Litter

Monitoring will be carried out of the amount and type(s) of litter on the island, and recommendations on management interventions required, if any. This element of the monitoring will be ongoing.

4.7 Objectives and Actions

In order to implement the monitoring programmes outlined above, the following objective and corresponding actions have been set out:

Objectives – Adaptive Management:

AMO1: Visitor management on Dursey Island is informed by ongoing monitoring regarding the activities of visitors and their potential impacts on Dursey Island – its character and natural and cultural heritage assets.

Actions – Adaptive Management:

AMA1: CCC shall implement monitoring programmes in relation to the following, as described above:

- Visitors and trails
- Traffic and parking
- Red-billed chough, habitats and climate
- Invasive alien species
- Archaeological and architectural heritage sites / structures
- Litter

AMA2: CCC shall develop a new Visitor Management Plan for Dursey Island no more than 10 years after the commencement of operation of the Dursey Island Cable Car and Visitor Centre. This new Plan shall be informed by public consultation (as described in Action COA6), the findings of the monitoring programmes, and any other relevant information.

5. IMPLEMENTATION FRAMEWORK

To facilitate ease of implementation, this section presents a consolidated list of all the objectives and actions set out in this Visitor Management Plan for Dursey Island. To facilitate monitoring of the status of implementation of the Plan, it also sets out a suite of indicators (mostly qualitative), which correspond to the Actions listed. Please note that, in some cases, one Action may contribute to the achievement of multiple Objectives. In such cases, the Action in question is repeated in the framework.

CCC is the authority responsible for implementing the actions set out in this management plan. It is assumed that resources and funding will be mobilised, as required, for the purposes of implementation.

Visitor Management Plan Implementation Framework

Objective	Action	Timescale for Implementation	Indicator
NHO1: Numbers and behaviour of visitors to Dursey Island are managed on an ongoing basis such that human disturbance does not threaten the conservation of species of wildlife.	**NHA1:** A numerical carrying capacity of 11,716 visitors per month shall be implemented for Dursey Island in all months of the year. This limit shall not apply to island residents or farmers. This numerical carrying capacity shall be implemented using a strictly enforced ticketing system.	Immediately	Visitor numbers per month (#)
	NHA2: If CCC intends to propose a new carrying capacity for Dursey Island based on the results of the 10-year monitoring programme, this new limit on visitor numbers would be the subject of an application for planning permission to the Competent Authority at this future date, for which the necessary environmental assessments, including AA, will be completed, as appropriate.	At least 10 years post-commencement of operation, if it is decided to take this approach.	Application for planning permission submitted to Competent Authority in relation to new proposed carrying capacity? (y/n)
	NHA3: In agreement with all affected landowners, CCC shall establish a network of walking trails on Dursey Island, using existing trails, as described above, prior to the commencement of the operation of the Dursey Island Cable Car and Visitor Centre. CCC shall be responsible for the maintenance of these trails, as required, based on the results of trail monitoring (Section 4.1).	Prior to commencement of operation of new cableway	All elements of network, as described in Section 3.1.2 in place? (y/n)
	NHA4: Once the Dursey Island Cable Car and Visitor Centre is operational, an island caretaker will be employed by CCC on an annual basis, during the months of June – September (inclusive), with the primary role of discouraging visitors from travelling beyond the proposed network of looped walking trails onto the western end of the island, as described above.	Annual seasonal measure (June to September, inclusive) during operation of proposed development	Caretaker performing role in specified timeframe at specified location? (y/n)
			Proportion of walkers who take advice of caretaker (i.e. who do not walk further westward but would otherwise have done so). (%)
	NHA5: Visitors shall be prohibited from bringing dogs to Dursey Island via the cable car. This shall not apply to guide dogs or the dogs of island residents / farmers.	Immediately	Restriction enforced? (y/n)
	NHA6: Visitors shall be prohibited from bringing bicycles to Dursey Island via the cable car. This restriction shall not apply to residents / farmers of the island.	Immediately	Restriction enforced? (y/n)

Objective	Action	Timescale for Implementation	Indicator
	NHA7: CCC shall implement an environmental education campaign for visitors, as described in Section 3.1.2.	Prior to commencement of operation of new cableway	All media as described in Section 3.1.2 in place? (y/n)
	NHA8: As agreed in consultation with a private landowner on the island and as disclosed in the response to the RFI in relation to the Dursey Island Cable Car and Visitor Centre development, measures will be implemented to ensure the protection of a known Chough nest site at an undisclosed location (information withheld to protect the nest site in question).	Prior to commencement of operation of new cableway	Works completed? (y/n)
NHO2: Numbers and behaviour of visitors to Dursey Island are managed on an ongoing basis such that habitats and vegetation (particularly protected and rare flora) are not significantly adversely affected.	**NHA1:** A numerical carrying capacity of 11,716 visitors per month shall be implemented for Dursey Island in all months of the year. This limit shall not apply to island residents or farmers. This numerical carrying capacity shall be implemented using a strictly enforced ticketing system.	Immediately	Visitor numbers per month (#)
	NHA2: If CCC intends to propose a new carrying capacity for Dursey Island based on the results of the 10-year monitoring programme, this new limit on visitor numbers would be the subject of an application for planning permission to the Competent Authority at this future date, for which the necessary environmental assessments, including AA, will be completed, as appropriate.	At least 10 years post-commencement of operation, if it is decided to take this approach.	Application for planning permission submitted to Competent Authority in relation to new proposed carrying capacity? (y/n)
	NHA3: In agreement with all affected landowners, CCC shall establish a network of walking trails on Dursey Island, using existing trails, as described above, prior to the commencement of the operation of the Dursey Island Cable Car and Visitor Centre. CCC shall be responsible for the maintenance of these trails, as required, based on the results of trail monitoring (Section 4.1).	Prior to commencement of operation of new cableway	All elements of network, as described in Section 3.1.2 in place? (y/n)
	NHA4: Once the Dursey Island Cable Car and Visitor Centre is operational, an island caretaker will be employed by CCC on an annual basis, during the months of June – September (inclusive), with the primary role of discouraging visitors from travelling beyond the proposed network of looped walking trails onto the western end of the island, as described above.	Annual seasonal measure (June to September, inclusive) during operation of proposed development	Caretaker performing role in specified timeframe at specified location? (y/n)

Objective	Action	Timescale for Implementation	Indicator
	NHA6: Visitors shall be prohibited from bringing bicycles to Dursey Island via the cable car. This restriction shall not apply to residents / farmers of the island.	Immediately	Restriction enforced? (y/n)
	NHA7: CCC shall implement an environmental education campaign for visitors, as described in Section 3.1.2.	Prior to commencement of operation of new cableway	All media as described in Section 3.1.2 in place? (y/n)
NHO3: No new invasive species are introduced to Dursey Island.	**NHA10:** CCC shall implement the Invasive Alien Species Management Plan which has been developed under the scope of the EIAR for the Dursey Island Cable Car and Visitor Centre development (Appendix E).	Immediately	Plan being implemented? (y/n)
NHO4: Invasive species already present on Dursey Island are managed to prevent further dispersal and, where feasible, eradicated from the island.	**NHA9:** Subject to landowner agreement, CCC shall commit to undertaking Hottentot-fig eradication treatment(s) by a competent professional, in accordance with Appendix E.	As soon as possible; prior to commencement of construction of new cable car development	Eradication treatment undertaken by competent, qualified professional? (y/n)
NHO5: The Dursey Island Cable Car and Visitor Centre development is managed in accordance with waste hierarchy (avoid > reduce > re-use > recycle >recover > dispose to landfill)	**NHA11:** CCC shall place segregated waste bins at appropriate sheltered locations on the mainland and island-side of the cable car site, with clear instructional signage regarding correct use of bins.	Prior to commencement of operation of new cableway	Segregated waste bins and clear signage, as described, in place on island and mainland? (y/n)
	NHA12: CCC shall ensure that a discount is offered for users of re-usable cups and food containers at the café in the Visitor Centre.	Prior to commencement of operation of new cableway	Discount being implemented? (y/n)
	NHA13: CCC shall ensure that facilities are made available at the Visitor Centre for the re-filling of reusable water bottles for personal use (at no cost to the visitor).	Prior to commencement of operation of new cableway	Facilities in place and being advertised? (y/n)
NHO6: Dursey Island is a litter-free environment.	**NHA11:** CCC shall place segregated waste bins at appropriate sheltered locations on the mainland and island-side of the cable car site, with clear instructional signage regarding correct use of bins.	Prior to commencement of operation of new cableway	Segregated waste bins and clear signage, as described, in place on island and mainland? (y/n)
	NHA12: CCC shall ensure that a discount is offered for users of re-usable cups and food containers at the café in the Visitor Centre.	Prior to commencement of operation of new cableway	Discount being implemented? (y/n)
	NHA13: CCC shall ensure that facilities are made available at the Visitor Centre for the re-filling of reusable water bottles for personal use (at no cost to the visitor).	Prior to commencement of operation of new cableway	Facilities in place and being advertised? (y/n)

Objective	Action	Timescale for Implementation	Indicator
CHO1: The sites and structures of archaeological, historical and architectural heritage value on Dursey Island are conserved and appreciated.	**CHA1:** CCC shall consider the inclusion of the NIAH architectural heritage structures on Dursey Island in the Record of Protected Structures of the next Cork County Development Plan.	Prior to drafting of next County Development Plan	Matter considered by responsible persons? (y/n)
COO1: Tourism on Dursey Island is managed to ensure maximum economic returns to the island community.	**COA1:** CCC shall promote longer dwell times and greater expenditure among visitors by promoting businesses, activities and attractions throughout the Beara Penninsula and on Dursey Island in the Visitor Centre.	Prior to commencement of operation of new cableway and to be updated on an ongoing basis	Promotional media on island businesses in place and up-to-date? (y/n)
	COA2: In agreement with the island community, CCC shall make provisions (e.g. a written agreement) for the movement of goods to-and-from the island in the new cable car by island residents and farmers.	Prior to commencement of operation of new cableway	Formal / informal agreement in place? (y/n)
COO2: The Dursey Island community is engaged in the management of visitors.	**COA3:** CCC shall facilitate public participation (particularly of Dursey Islanders) in subsequent iterations of the Dursey Island Visitor Management Plan. Accordingly, a Community Workshop shall be held at a time and location that are most convenient for residents of Dursey Island, but also broadly suitable for stakeholders from the greater Beara and West Cork regions. Stakeholders shall be provided with sufficient prior notice regarding the event.	Prior to development of next iteration of the Dursey Island Visitor Management Plan?	Stakeholders (incl. all islanders) provided with prior notice? (y/n) Public consultation event held? (y/n) Number of attendees (#)
FDO1: Future development of the built environment on Dursey Island shall be in accordance with the objectives of the following documents, until such time as they are superseded by new versions, at which point those will be adhered to instead: • The Dursey Island Visitor Management Plan • The West Cork Islands Integrated Development Strategy • The Cork County Development Plan The West Cork Municipal District Local Area Plan	N/A	Ongoing	N/A

Objective	Action	Timescale for Implementation	Indicator
TPO1: Necessary infrastructure, services and systems are in place to manage traffic volumes and visitor numbers in a sustainable manner.	**TPA1:** CCC shall implement a real-time omni-channel management system that provides an overview of all available capacity at the cable car and visitor centre facilities, including the car park, to enable ongoing capacity management.	System to be in place and fully operational prior to commencement of operation of new cableway.	System in place? (y/n)
	TPA2: CCC shall implement a bespoke, web-based ticketing system which: (i) Allows visitors to book online for specific time slots; (ii) Enforces the monthly carrying capacity of 11,716; (iii) Promotes an even distribution of visitors across days, weeks, months and seasons; (iv) Has the ability to offer specific pricing models that meet the customer requirements, including discounts, group bookings, special requirements, seasonal changes, *etc*; and (v) Shall be capable of continuous product development to avoid becoming a legacy system.	System to be in place and fully operational prior to commencement of operation of new cableway.	System in place? (y/n)
AMO1: Visitor management on Dursey Island is informed by ongoing monitoring regarding the activities of visitors and their potential impacts on Dursey Island – its character and natural and cultural heritage assets.	**AMA1:** CCC shall implement monitoring programmes in relation to the following, as described above: • Visitors and trails • Traffic and parking • Red-billed chough, habitats and climate • Invasive alien species • Archaeological and architectural heritage sites / structures • Litter	Ongoing, as described in Sections 4.1 – 4.4	Data and discussion for all parameters related to visitors and trails listed in Section 4.1 (at a minimum) received from competent, qualified professional on annual basis for at least 10 years, commencing in first year of operation? (y/n)
			Data and discussion for all parameters related to traffic and parking listed in Section 4.2 received from competent, qualified professional on annual basis for at least 10 years, commencing in first year of operation? (y/n)
			Data and discussion of all parameters related to Dursey population of Red-billed Chough, habitats and climate listed in Section 4.3 received from competent, qualified professional on annual basis for at least 10 years, commencing in first year of operation? (y/n)

Objective	Action	Timescale for Implementation	Indicator
			Results of 5-year post-treatment alien invasive species re-growth / dispersal monitoring received from competent, qualified professional? (y/n)
			Results and discussion of visual inspection of archaeological and architectural heritage sites received from competent, qualified professional every three years, commencing first year of operation of new cable car, and repeated min. of three times? (y/n)
			Results of litter monitoring being gathered on an ongoing basis? (y/n)
	AMA2: CCC shall develop a new Visitor Management Plan for Dursey Island, which shall be informed by public consultation (Section 3.3), the findings of the monitoring programmes (Sections 4.1 – 4.4), and any other relevant information.	To be published no more than 10 years after commencement of operation of new cable car.	2nd Dursey Island Visitor Management Plan published?

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APPENDIX A

DESCRIPTION OF THE DURSEY ISLAND CABLE CAR AND VISITOR CENTRE DEVELOPMENT

Description of the Dursey Island Cable Car and Visitor Centre Development

The objective of the development is to create a coherent, distinct environmentally sensitive and considered tourism destination at the existing location of the Dursey Island Cable Car, which is owned and operated by Cork County Council.

The development involves the decommissioning of the existing Dursey Island cableway, demolition of associated structures (with exceptions discussed below), and the construction of a new cableway and associated structures, including a Visitor Centre and café on the mainland. Some elements of the existing infrastructure (the mainland pylon, the carrier cabin and a section of the hauling machinery on the mainland) will be retained on-site as relics of the historic cableway, in order to promote their industrial architecture and cultural heritage value.

It will also involve upgrades to supporting infrastructure and utilities in the surrounding area to facilitate the provision of improved welfare facilities and to accommodate the anticipated increase in visitor numbers associated with the development. It has been projected that the development will facilitate an anticipated annual maximum of 100,000 visitors to the mainland side of the site by 2030 (with a maximum of 80,000 visitors making the cable car journey to Dursey Island).

The development will include the construction / completion of the following elements at the site of the existing Dursey Island Cable Car and on the R572 Regional Road on the mainland:

- Erection of a two-car desynchronised reversible ropeway cableway ('cableway' hereafter)[1] with a capacity of 200-300 passengers per hour in each direction;
- Erection of two supporting line structures ('pylons' hereafter) - one on the mainland and one on the island;
- Construction of a mainland-side drive station ('mainland station' hereafter) including all necessary operating machinery, facilities for operating staff, and a platform for embarking/disembarking;
- Construction of an island-side return station ('island station' hereafter) including all necessary operating machinery, platform for embarking/disembarking, a sheltered waiting area and welfare facilities;
- Construction of a mainland-side interpretive exhibition centre with a gift shop ('Visitor Centre' hereafter);
- Construction of a mainland-side café with seating for 40 indoors, an additional 44 seats on an outdoor terrace/balcony overlooking the Dursey Sound, and welfare facilities;
- Construction of a mainland-side visitor car park with approx. 100 no. parking spaces and 1 no. bus bay;
- Retention of the existing residents' car park on Dursey Island;
- Upgrades of associated utilities infrastructure (including mainland water supply and telecommunications connectivity and mainland and island wastewater treatment systems);

[1] The term 'Cable Car' refers to the carrier cabin which conveys passengers to and from the island via the cableway.

- Completion of road improvement works (construction of 10 no. passing bays and 1 no. visibility splay, and completion of a number of local improvements to enhance forward visibility) on an 8km stretch of the R572 (between the R572-R575 junction at Bealbarnish Gap and the mainland side of the cable car site);

- Demolition/removal of some elements of the existing cableway infrastructure (ropeway, island-side pylon), mainland-side visitor car park and island and mainland station buildings;

- Erection of interpretive/informative signage at strategic locations;

- Erection of 4 no. Variable Message Signs (VMS) at four locations along the approach roads to the site:

    1. Bealbarnish Gap;
    2. R572 at Castletownbere;
    3. R575 at Eyeries Cross; and
    4. N71 at Glengarriff;

- Retention of the cable car, mainland pylon and a section of the mainland-side hauling machinery of the existing cableway in order to facilitate ongoing appreciation of their industrial architectural and cultural heritage value;

- Soft and hard landscaping; and

- All other ancillary works.

The new cableway will run parallel to the existing alignment offset by approximately 14m to the north. The end-to-end length of the proposed cableway will be approximately 375m (roughly the same as that of the existing cableway).

APPENDIX B

RARE AND PROTECTED SPECIES RECORDED ON DURSEY ISLAND

Rare and Protected Species Recorded on Dursey Island

Acronyms used: HD = EU Habitats Directive (Roman numerals indicate Annex(es)); WA = Wildlife Acts; Ospar = Ospar List of Threatened / Declining Species; BD = EU Birds Directive (Roman numberals indicate Annex(es)); BoCCI = BirdWatch Ireland - Birds of Conservation Concern in Ireland (Amber = Amber-listed, Red = Red-listed); NT = Near Threatened on Irish Red Data List; EN = Endangered on Irish Red Data List; VU = Vulnerable on Irish Red Data List.

Common Name	Scientific Name	Status / Statutory Protections	Date of Record	Dataset	Source
Marine Mammals					
Common (Harbour) Porpoise	*Phocoena phocoena*	HD Annex II; HD Annex IV; WA; Ospar	04/08/2010	IWDG Casual Cetacean Sightings	NBDC 1km Squares
Grey Seal	*Halichoerus grypus*	HD Annex II; HD Annex V; WA	10/09/2012	Grey Seal Distribution 2009 - 2014	NBDC 1km Squares
Minke Whale	*Balaenoptera acutorostrata*	HD Annex IV; WA	04/08/2010	IWDG Casual Cetacean Sightings	NBDC 1km Squares
Risso's Dolphin	*Grampus griseus*	HD Annex IV; WA	22/09/2011	IWDG Casual Cetacean Sightings	NBDC 1km Squares
Bottle-nosed Dolphin	*Tursiops truncatus*	HD Annex II; HD Annex IV; WA	19/10/2013	IWDG Casual Cetacean Sightings	NBDC 1km Squares
Common Dolphin	*Delphinus delphis*	HD Annex IV; WA	30/08/2013	IWDG Casual Cetacean Sightings	NBDC 1km Squares
Terrestrial Mammals					
Eurasian Otter	*Lutra lutra*	HD II, IV	01/01/2017	Mammals of Ireland 2016-2025	NBDC 1km Squares
Eurasian Pygmy-Shrew	*Sorex minutus*	WA	28/11/2015	Atlas of Mammals in Ireland 2010 - 2015	NBDC 1km Squares
Common Pipistrelle	*Pipistrellus pipistrellus*	HD IV	30/09/2018	n/a	ROD Surveys
Soprano Pipistrelle	*Pipstrellus pygmaeus*	HD IV	30/09/2018	n/a	ROD Surveys
Reptiles					
Leatherback turtle	*Dermochelys coriacea*	HD IV; Ospar	31/12/1984	Irish Marine Turtle Database	NBDC 1km Squares
Common lizard	*Zootoca vivipara*	WA	06/09/2015	Amphibians and reptiles of Ireland	NBDC 1km Squares
Unidentified turtle	*Testudines* spp.	HD IV	31/12/1957	Irish Marine Turtle Database	NBDC 1km Squares
Birds					
Raptors					
Merlin	*Falco columbarius*	WA; BD Annex I; BoCCI Amber	31/12/2012	Birds of Ireland	NBDC 1km Squares
Northern Goshawk	*Accipiter gentilis*	WA; BoCCI Amber	03/11/1996	Rare birds of Ireland	NBDC 1km Squares
Eurasian Hobby	*Falco subbuteo*	WA	19/05/2012	Rare birds of Ireland	NBDC 1km Squares
Montagu's Harrier	*Circus pygargus*	WA	13/05/2006	Rare birds of Ireland	NBDC 1km Squares
Peregrine Falcon	*Falco peregrinus*	WA	2019	n/a	ROD Surveys
Kestrel	*Falco tinnunculus*	WA; BoCCI Amber	2019	n/a	ROD Surveys
Passerines					
Starling	*Sturnus vulgaris*	WA; BoCCI Amber	31/12/2012	Birds of Ireland	NBDC 1km Squares
Skylark	*Alauda arvensis*	WA; BoCCI Amber	29/05/2016	Birds of Ireland	NBDC 1km Squares
Wood Lark	*Lullula arborea*	WA	21/10/2007	Rare birds of Ireland	NBDC 1km Squares

Common Name	Scientific Name	Status / Statutory Protections	Date of Record	Dataset	Source
Richard's Pipit	*Anthus richardi*	WA	16/11/2012	Rare birds of Ireland	NBDC 1km Squares
Black Redstart	*Phoenicurus ochruros*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Blackbird	*Turdus merula*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Robin	*Erithacus rubecula*	WA; BoCCI Amber	31/12/2012	Birds of Ireland	NBDC 1km Squares
Fieldfare	*Turdus pilaris*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Dunnock	*Prunella modularis*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Meadow Pipit	*Anthus pratensis*	WA; BoCCI Red	31/12/2012	Birds of Ireland	NBDC 1km Squares
Siberian Chiffchaff	*Phylloscopus collybita subsp. tristis*	WA	27/10/2010	Rare birds of Ireland	NBDC 1km Squares
Pied Wagtail	*Motacilla alba*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Redwing	*Turdus iliacus*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Rock Pipit	*Anthus petrosus*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Song Thrush	*Turdus philomelos*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Stonechat	*Saxicola torquata*	WA; BoCCI Amber	31/12/2012	Birds of Ireland	NBDC 1km Squares
Wren	*Troglodytes troglodytes*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Yellow-breasted Bunting	*Emberiza aureola*	WA	09/10/2010	Rare birds of Ireland	NBDC 1km Squares
Arctic Redpoll	*Carduelis hornemanni*	WA	10/06/2014	Rare birds of Ireland	NBDC 1km Squares
Arctic Warbler	*Phylloscopus borealis*	WA	13/09/2013	Rare birds of Ireland	NBDC 1km Squares
Barred Warbler	*Sylvia nisoria*	WA	30/10/2014	Rare birds of Ireland	NBDC 1km Squares
Blackpoll Warbler	*Dendroica striata*	WA	10/10/2006	Rare birds of Ireland	NBDC 1km Squares
Western yellow wagtail / Blue-headed Wagtail	*Motacilla flava subsp. flava*	WA; BoCCI Amber	08/05/2000	Rare birds of Ireland	NBDC 1km Squares
Bluethroat	*Luscinia svecica*	WA	20/10/2004	Rare birds of Ireland	NBDC 1km Squares
Blyth's Reed Warbler	*Acrocephalus dumetorum*	WA	27/09/2010	Rare birds of Ireland	NBDC 1km Squares
Northern Wheatear	*Oenanthe oenanthe*	WA; BoCCI Amber	29/05/2016	Birds of Ireland	NBDC 1km Squares
Nightingale	*Luscinia megarhynchos*	WA	09/05/1995	Rare birds of Ireland	NBDC 1km Squares
Rosefinch	*Carpodacus erythrinus*	WA	12/10/2013	Rare birds of Ireland	NBDC 1km Squares
Dartford Warbler	*Sylvia undata*	WA	22/05/1999	Rare birds of Ireland	NBDC 1km Squares
Eastern Olivaceous Warbler	*Hippolais pallida*	WA	16/09/1977	Rare birds of Ireland	NBDC 1km Squares
European Bee-eater	*Merops apiaster*	WA	19/04/2014	Rare birds of Ireland	NBDC 1km Squares
Greater Short-toed Lark	*Calandrella brachydactyla*	WA	02/05/2004	Rare birds of Ireland	NBDC 1km Squares
Greenish Warbler	*Phylloscopus trochiloides*	WA	08/09/2005	Rare birds of Ireland	NBDC 1km Squares
Grey-cheeked Thrush	*Catharus minimus*	WA	03/10/2013	Rare birds of Ireland	NBDC 1km Squares
Hawfinch	*Coccothraustes coccothraustes*	WA	03/04/2013	Rare birds of Ireland	NBDC 1km Squares
Icterine Warbler	*Hippolais icterina*	WA	14/09/2006	Rare birds of Ireland	NBDC 1km Squares
Little Bunting	*Emberiza pusilla*	WA	16/10/2006	Rare birds of Ireland	NBDC 1km Squares
Melodious Warbler	*Hippolais polyglotta*	WA	08/09/2014	Rare birds of Ireland	NBDC 1km Squares
Northern Parula	*Parula americana*	WA	25/09/1989	Rare birds of Ireland	NBDC 1km Squares
Olive-backed Pipit	*Anthus hodgsoni*	WA	05/10/1992	Rare birds of Ireland	NBDC 1km Squares

Common Name	Scientific Name	Status / Statutory Protections	Date of Record	Dataset	Source
Ortolan Bunting	*Emberiza hortulana*	WA	02/10/2013	Rare birds of Ireland	NBDC 1km Squares
Ovenbird	*Seiurus aurocapilla*	WA	25/09/1990	Rare birds of Ireland	NBDC 1km Squares
Red-backed Shrike	*Lanius collurio*	WA	02/10/2013	Rare birds of Ireland	NBDC 1km Squares
Red-eyed Vireo	*Vireo olivaceus*	WA	12/10/2010	Rare birds of Ireland	NBDC 1km Squares
Red-flanked Bluetail	*Tarsiger cyanurus*	WA	10/11/2009	Rare birds of Ireland	NBDC 1km Squares
Red-throated Pipit	*Anthus cervinus*	WA	14/10/2011	Rare birds of Ireland	NBDC 1km Squares
Rosy Starling	*Sturnus roseus*	WA	15/10/2011	Rare birds of Ireland	NBDC 1km Squares
Rustic Bunting	*Emberiza rustica*	WA	14/10/2000	Rare birds of Ireland	NBDC 1km Squares
Sardinian Warbler	*Sylvia melanocephala*	WA	14/05/2014	Rare birds of Ireland	NBDC 1km Squares
Subalpine Warbler	*Sylvia cantillans*	WA	08/05/2008	Rare birds of Ireland	NBDC 1km Squares
Tawny Pipit	*Anthus campestris*	WA	16/09/2011	Rare birds of Ireland	NBDC 1km Squares
Thrush Nightingale	*Luscinia luscinia*	WA	22/10/2013	Rare birds of Ireland	NBDC 1km Squares
White-crowned Sparrow	*Zonotrichia leucophrys*	WA	27/05/2003	Rare birds of Ireland	NBDC 1km Squares
Wilson's Warbler	*Wilsonia pusilla*	WA	21/09/2013	Rare birds of Ireland	NBDC 1km Squares
Woodchat Shrike	*Lanius senator*	WA	03/05/2010	Rare birds of Ireland	NBDC 1km Squares
Yellow-rumped Warbler	*Dendroica coronata*	WA	06/10/2012	Rare birds of Ireland	NBDC 1km Squares
Rock Dove	*Columba livia*	WA	2019	n/a	ROD Surveys
House Sparrow	*Passer domesticus*	WA; BoCCI Amber	2019	n/a	ROD Surveys
Wood Pigeon	*Columba palumbus*	WA	2019	n/a	ROD Surveys
Linnet	*Carduelis cannabina*	WA; BoCCI Amber	2019	n/a	ROD Surveys
Yellowhammer	*Emberiza citronella*	WA; BoCCI Red	2019	n/a	ROD Surveys
Waders, Waterfowl, Gulls and Other Seabirds					
Gannet	*Morus bassanus*	WA; BoCCI Amber	21/08/1995	European Seabirds at Sea 1980 – 2003	NBDC 1km Squares
Guillemot	*Uria aalge*	WA; BoCCI Amber	21/08/1995	European Seabirds at Sea 1980 – 2003	NBDC 1km Squares
Manx Shearwater	*Puffinus puffinus*	WA; BoCCI Amber	21/08/1995	European Seabirds at Sea 1980 – 2003	NBDC 1km Squares
Herring Gull	*Larus argentatus*	WA; BoCCI Red	02/06/2000	Seabird 2000	NBDC 1km Squares
Black Guillemot	*Cepphus grylle*	WA; BoCCI Amber	11/05/1999	Seabird 2000	NBDC 1km Squares
Black-legged Kittiwake	*Rissa tridactyla*	WA; Ospar; BoCCI Amber	21/08/1995	European Seabirds at Sea 1980 – 2003	NBDC 1km Squares
Lesser Black-backed Gull	*Larus fuscus*	WA; BoCCI Amber	02/06/2000	Seabird 2000	NBDC 1km Squares
Razorbill	*Alca torda*	WA; BoCCI Amber	02/06/2000	Seabird 2000	NBDC 1km Squares
Shag	*Phalacrocorax aristotelis*	WA; BoCCI Amber	29/05/2000	Seabird 2000	NBDC 1km Squares
Snipe	*Gallinago gallinago*	WA; BD Annex II; BD Annex III; BoCCI Amber	31/12/2012	Birds of Ireland	NBDC 1km Squares
Oystercatcher	*Haematopus ostralegus*	WA; BoCCI Amber	31/12/2012	Birds of Ireland	NBDC 1km Squares
Great Black-backed Gull	*Larus marinus*	WA; BoCCI Amber	31/12/2012	Birds of Ireland	NBDC 1km Squares

Common Name	Scientific Name	Status / Statutory Protections	Date of Record	Dataset	Source
Cormorant	*Phalacrocorax carbo*	WA; BoCCI Amber	31/12/2012	Birds of Ireland	NBDC 1km Squares
Common (Mew) Gull	*Larus canus*	WA; BoCCI Amber	31/12/2012	Birds of Ireland	NBDC 1km Squares
Northern Fulmar	*Fulmarus glacialis*	WA	21/08/1995	European Seabirds at Sea 1980 – 2003	NBDC 1km Squares
Ruddy Turnstone	*Arenaria interpres*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
American Golden Plover	*Pluvialis dominica*	WA	22/10/2013	Rare birds of Ireland	NBDC 1km Squares
Eurasian Dotterel	*Charadrius morinellus*	WA	10/10/2010	Rare birds of Ireland	NBDC 1km Squares
Eurasian Golden Oriole	*Oriolus oriolus*	WA	04/06/2013	Rare birds of Ireland	NBDC 1km Squares
Fea's Petrel	*Pterodroma feae*	WA	23/09/2013	Rare birds of Ireland	NBDC 1km Squares
Great Snipe	*Gallinago media*	WA	22/10/1983	Rare birds of Ireland	NBDC 1km Squares
Little Ringed Plover	*Charadrius dubius*	WA; BoCCI Amber	08/05/2000	Rare birds of Ireland	NBDC 1km Squares
Stone-curlew	*Burhinus oedicnemus*	WA	26/04/1999	Rare birds of Ireland	NBDC 1km Squares
Upland Sandpiper	*Bartramia longicauda*	WA	24/09/1991	Rare birds of Ireland	NBDC 1km Squares
White-rumped Sandpiper	*Calidris fuscicollis*	WA	14/09/1978	Rare birds of Ireland	NBDC 1km Squares
Whimbrel	*Numenius phaeopus*	WA	27/07/2012	Birds of Ireland	NBDC 1km Squares
Corvids					
Red-billed Chough	*Pyrrhocorax pyrrhocorax*	WA; BD Annex I; BoCCI Amber	29/05/2016	Birds of Ireland	NBDC 1km Squares
Magpie	*Pica pica*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Raven	*Corvus corax*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Hooded Crow	*Corvus (corone) cornix*	WA	31/12/2012	Birds of Ireland	NBDC 1km Squares
Jackdaw	*Corvus monedula*	WA	2015	n/a	Derek Scott 2015 data
Rook	*Corvus frugilegus*	WA	2015	n/a	Derek Scott 2015 data
Carrion Crow	*Corvus (corone) corone*	WA	10/1991	n/a	Derek Scott 2018 data
Other Birds					
Crane	*Grus grus*	WA	08/12/1978	Rare birds of Ireland	NBDC 1km Squares
Eurasian Wryneck	*Jynx torquilla*	WA	03/11/2013	Rare birds of Ireland	NBDC 1km Squares
Alpine Swift	*Apus melba*	WA	27/07/1980	Rare birds of Ireland	NBDC 1km Squares
Pheasant	*Phasianus colchicus*	WA	2019	n/a	ROD Surveys
Barn Swallow	*Hirundo rustica*	WA; BoCCI Amber	2019	n/a	ROD Surveys
House Martin	*Delichon urbicum*	WA; BoCCI Amber	2019	n/a	ROD Surveys
Fish					
Basking shark	*Cetorhinus maximus*	Ospar	31/03/2012	IWDG Chondrichthyan Database	NBDC 1km Squares
Invertebrates					
Grayling	*Hipparchia semele*	NT	06/09/2015	Butterflies of Ireland	NBDC 1km Squares
Small Heath	*Coenonympha pamphilus*	NT	06/09/2015	Butterflies of Ireland	NBDC 1km Squares
Wall	*Lasiommata megera*	EN	06/09/2015	Butterflies of Ireland	NBDC 1km Squares
Moss Carder-bee	*Bombus muscorum*	NT	04/10/2014	Bees of Ireland	NBDC 1km Squares

Common Name	Scientific Name	Status / Statutory Protections	Date of Record	Dataset	Source
Plants					
Allseed	*Radiola linoides*	NT	08/07/2008	National Vegetation Database	NBDC 1km Squares
Autumn Lady's-tresses	*Spiranthes spiralis*	NT	12/09/2015	Atlas of Vascular Plants 2012 – 2020	NBDC 1km Squares
Yellow Bartsia	*Parentucellia viscosa*	NT	18/07/2016	Atlas of Vascular Plants 2012 – 2020	NBDC 1km Squares
Chamomile	*Chamaemelum nobile*	NT	19/08/2019	Atlas of Vascular Plants 2012 – 2020	NBDC 1km Squares

APPENDIX C

DESIGNATED SITES ON DURSEY ISLAND

Designated Sites on Dursey Island

Acronyms used: SPA = 'Special Protection Area'; SAC = 'Special Area of Conservation'; NHA = 'Natural Heritage Area'; pNHA = 'Proposed NHA'

Site Name	Qualifying Interests
Beara Peninsula SPA	Chough (*Pyrrhocorax pyrrhocorax*)
	Fulmar (*Fulmarus glacialis*)
Kenmare River SAC	Large shallow inlets and bays
	Reefs
	Perennial vegetation of stony banks
	Vegetated sea cliffs of the Atlantic and Baltic coasts
	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
	Mediterranean salt meadows (*Juncetalia maritimi*)
	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
	Fixed coastal dunes with herbaceous vegetation (grey dunes)
	European dry heaths
	Juniperus communis formations on heaths or calcareous grasslands
	Calaminarian grasslands of *Violetalia calaminariae*
	Submerged or partially submerged sea caves
	Narrow-mouthed whorl snail (*Vertigo angustior*)
	Lesser horseshoe bat (*Rhinolophus hipposideros*)
	Otter (*Lutra lutra*)
	Harbour seal (*Phoca vitulina*)
Dursey Island pNHA	n/a

APPENDIX D

RECORDED NMS ARCHAEOLOGICAL MONUMENTS ON DURSEY ISLAND

Recorded NMS Archaeological Monuments on Dursey Island

NMS Ref.	Class	Townland	Details of Note
CO126-012004-	Tomb – Unclassified	Ballynacallagh	Vaulted stoned tomb associated with church (CO126-012005-) and graveyard (CO126-012003-). Bears inscription: "This tomb was erected for Dan O'Sullivan who departed this life Jan [?] 1787".
CO126-012005-	Church	Ballynacallagh	Situated within graveyard (CO126-012003-) are the poorly preserved remains of a church with chancel and nave. It has been suggested that this church may have replaced the earlier Kilmichael church (CO126-009002-) as a chapel-of-ease when Dursey joined with the parish of Killaconenagh (Lunham, 1908, p. 74). According to the soldier-writer and native of Dursey, Philip O'Sullivan-Beare, writing in 1621, it was a "monastery, built by Bonaventura, a Spanish Bishop, but dismantled by pirates" (Byrne, 1903, p. 156).
CO126-012003-	Graveyard	Ballynacallagh	-
CO126-012002-	Bridge	Ballynacallagh	Twelve rock-hewn steps indicate site of former drawbridge which connected Illane Beg (Small Island) and O'Sullivan Beare Castle (CO126-012001-) to Dursey proper.
CO126-012001-	Castle – Unclassified	Ballynacallagh	O'Sullivan Beare Castle, garrisoned by Donal Cam O'Sullivan Beare in 1602 but taken by George Carew before the fall of Dunboy (Healy 1988, 196).
CO126-050----	Promontory fort – Coastal	Ballynacallagh	See note on CO126-030005-
CO126-030001-	Hut site	Ballynacallagh	See note on CO126-030005-
CO126-030002-	Hut site	Ballynacallagh	See note on CO126-030005-
CO126-030003-	Hut site	Ballynacallagh	See note on CO126-030005-
CO126-030004-	Hut site	Ballynacallagh	See note on CO126-030005-
CO126-030005-	Hut site	Ballynacallagh	Test excavations at this particular hut site were carried out by Colin Breen in 2003 under the scope of a broader study on the medieval landscape of Bantry and Beara. It was found that the material culture was dominated by Iberian pottery and tiles, probably reflecting the community's involvement with the continental fishing industry. It is considered likely that this cluster of seven huts (CO126-030001- through CO126-030007-) was associated with O'Sullivan Beare Castle and also burned during the course of the siege on same (i.e. the Dursey Massacre).
CO126-030006-	Hut site	Ballynacallagh	See note on CO126-030005-
CO126-030007-	Hut site	Ballynacallagh	See note on CO126-030005-
CO126-011003-	Cupmarked stone	Ballynacallagh	-
CO126-011002-	Ritual site – Holy well	Ballynacallagh	-
CO126-011001-	Cupmarked stone	Ballynacallagh	-
CO126-010001-	Cupmarked stone	Ballynacallagh	-
CO126-010002-	Standing stone	Ballynacallagh	-
CO126-009001-	Burial ground	Kilmichael	Burial ground associated with Kilmichael Church (CO126-009002-).

CO126-009002-	Church	Kilmichael	Remains of Kilmichael Church, first documented in the papal taxation list of 1302 - 7 (Durell, 1996, p. 213). Local tradition recorded that it was destroyed as part of Carew's 1602 assault on Dursey (ibid.). Indeed, it is considered possible that Carew's forces destroyed the church as an act of vandalism, although at that time the structure was already in ruins. Part of the west gable was still extant until the mid-nineteenth century, where the stones were removed and incorporated into other buildings in the village (ibid.). When inspected in 1985, only a fragment of the east gable with a base batter stood to the west of the burial ground (CO126-009001-); part of the north in-going of the east window and traces of a wall press also survived (Power *et al*. 1992). The east gable collapsed in 1995 (Durell, 1996, p. 213).
CO126-008----	Bullaun stone	Kilmichael	-
CO126-007----	Hut site	Kilmichael	-
CO126-006----	Standing stone	Kilmichael	-
CO126-029----	Enclosure	Kilmichael	Remains of enclosure which have been rearranged to make two, now abandoned, rectangular turf stands.
CO126-039----	Field boundary	Kilmichael	Here again, some material from the relict boundaries has been used to construct rectangular turf stands (now abandoned).
CO126-028002-	Fulacht fia	Kilmichael	-
CO126-028003-	Field boundary	Kilmichael	As per note for CO126-039----
CO126-028001-	Enclosure	Kilmichael	As per note for CO126-039----
CO126-040----	Field boundary	Tilickafinna	As per note for CO126-039----
CO126-005----	Signal tower	Tilickafinna	Rectangular, two-storey, Napoleonic signal tower with semi-basement, lintelled 1st floor door on western wall with machiculation overhead, bartizan on south-eastern and north-eastern corner, chimney stack on eastern wall and remnants of weather-slating on exterior. Also present is standalone one-storey addition to east.
CO126-046----	Standing stone	Tilickafinna	-
CO126-027001-	Hut site	Tilickafinna	-
CO126-027----	Anomalous stone group	Tilickafinna	-
CO126-026001-	Hut site	Tilickafinna	-
CO126-026----	Enclosure	Tilickafinna	-
CO126-026002-	Field boundary	Tilickafinna	-
CO126-041----	Field boundary	Tilickafinna	-
CO126-042002-	Hut site	Tilickafinna	-
CO126-042001-	Enclosure	Tilickafinna	-

APPENDIX E

INVASIVE ALIEN SPECIES MANAGEMENT PLAN FOR THE DURSEY ISLAND CABLE CAR AND VISITOR CENTRE DEVELOPMENT

IAS Management Plan for the Dursey Island Cable Car and Visitor Centre Development

Statement of Purpose

The Invasive Alien Species (IAS) Management Plan outlines the management measures to be followed to manage and control the spread of identified IAS during construction and operation phase of the proposed development. The primary objectives of this Plan are to facilitate the (i) prevention of the spread of the IAS as a result of the construction and operation of the proposed development, and (ii) eradication of High Risk IAPS, where possible. CCC is the authority responsible for the implementation of this Plan.

Legislative Context

In the course of devising and implementing the most effective eradication methods, the Invasive Alien Species (IAS) Management Plan must comply with all legislation regulating the treatment and management of IAS. The relevant standards and legislation that will dictate how eradication is undertaken include:

- *European Communities (Plant Protection Products) Regulations, 2012 (SI No. 159/2012);*
- *European Communities (Sustainable Use of Pesticides) Regulations, 2012 (SI No. 155/2012);*
- *Waste Management Acts, 1996 to 2013, and related legislation;*
- *Safety, Health and Welfare at Work Act, 2005;*
- *Safety, Health and Welfare at Work (Construction) Regulations, 2013;*
- *Safety, Health and Welfare at Work (General Application) Regulations, 2007;*
- *Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001;*
- *European Communities (Birds and Natural Habitats) Regulations, 2011 to 2015; and,*
- *Wildlife Acts 1976-2012.*

To comply with Sustainable Use of Pesticides Legislation, the application of herbicide should only be undertaken by registered professional users. Only a Registered Pesticide Advisor (RPA) should approve procedures prior to Works commencing. All professional users should demonstrate proper use, ensuring only authorised products are used and all treatments are catalogued and documented pursuant to the requirement of Plant Protection Products Regulations.

In scenarios where disturbance, movement and disposal of IAS material is required, the RPA will review applications submitted to the relevant licensing authorities prior to the commencement of such disturbance, movement and disposal.

Introduction

In October 2018, Invasive Plant Solutions were appointed by CCC, through Roughan & O'Donovan Consulting Engineers (ROD), to carry out an Invasive Alien Plant Species (IAPS) survey for the purposes of the Environmental Impact Assessment for the proposed Dursey Island Cable Car and Visitor Centre development. A survey was undertaken on the R572 approach road between the junction with the R572 (Bealbarnish Gap) and the site, and on the CCC lands in the vicinity of the mainland side of the site, in October 2018. EirEco Environmental Consultants were also appointed through ROD and carried out further IAPS surveys on Dursey Island in May 2019.

Site Description

The study area comprises the R572 between Castletownbere and the mainland side of the existing Dursey Island Cable Car Station on the mainland at Ballaghboy and the landing station at Ballylean East, on Dursey Island. The topography of the lands surveyed mainly comprised public lands and paths. All lands associated with the survey were sufficiently accessible to enable the undertaking of the survey.

Survey Results

A walkover survey was conducted within the study area, including a drive through inspection of the R572 approach road, as well as areas immediately beyond the defined boundaries, where these could be identified and where the areas were either easily or safely accessible from the study area. This survey confirmed the presence of five Third Schedule S.I. 477/2011 invasive alien species; Japanese knotweed (*Fallopia japonica*), Rhododendron (*Rhododendron ponticum*), Three-cornered leek (*Allium triquetrum*), Giant-rhubarb (*Gunnera tinctoria*), and Hottentot-fig (*Carpobrotus edulis*).

Japanese Knotweed

Japanese knotweed (*Fallopia japonica*) is a fast growing, perennial, herbaceous plant, with a vast underground rhizome system, originating from East Asia. It was introduced to Ireland as an ornamental plant in mid to late 1800s and is now well established in the natural/semi-natural environment. Although there are only female plants in Ireland, the species is able to successfully reproduce at a rapid rate by rhizome extension and vegetative propagation (new plants can grow from small fragments of rhizomes and stems). The species is known to colonise a wide range of habitats in Ireland, including riparian habitats, low-lying and disturbed areas, roadsides, and coastal shores and islands. The species is particularly harmful in riparian habitats, where it outcompetes native species by forming dense stands, creating shade and reducing species diversity.

In total, thirteen sites within the study area were found to contain stands of Japanese knotweed (Table 1).

Table 1 Details of identified sites with Japanese Knotweed in the Study Area

Japanese Knotweed	X Co - ordinates	Y Co-ordinates	Description
JK1	463057	543661	Mature stand (10 x 5m) growing within roadside hedgerow on eastern side of R572, extending eastwards down steep sloping ground.
JK2	463044	543566	Several related stands (15 x 3m) growing on both sides of stone walls forming northern and eastern sides of viewing point, on east side of R572. Growing from field into lay-by area, through stone walls.
JK3	461345 / 461269	541912 / 541856	Series of stands (1km in length) on north side of R572. Main easterly stand set back form roadside on fringe of woodland and extending northwards along stream. Central stand being cut as part of management of residential boundary. Westerly stand interspersed amongst native vegetation of hedgerow.
JK4	461221	541790	Single stand (8 x 2.5m) on north side of R572, at stream crossing. Growing on eastern side of stream, directly behind bridge wall. Likely to be spreading downstream and potentially present upstream.
JK5	460075 / 460011	541314 / 541269	Series of stands (stretching for 75m) on both sides of R572. Main stand on north side of road on rough ground adjacent to house entrance. Southerly stand very

Japanese Knotweed	X Co - ordinates	Y Co-ordinates	Description
			extensive, encroaching onto roadway and spreading south towards stream. Secondary growth within and above stone boundary wall of house. Also likely to be present in stream.
JK6	459586 / 459551	441266 / 541267	Stands (30m in length) on both sides of R572. Stand on north side of road at stream crossing and extending almost continuously northwards along stream. Southerly stand very extensive and spreading south towards related stream. Both stands encroaching onto roadway, with evidence of cutting and re-growth, particularly on south side. Full extent likely to be much greater, with further presence downstream. Significant spread risk from cutting.
JK7	452796	541814	Single strand (8 x 7m), growing within native scrub on elevated ground along southern side of R572. Northern limit of stand currently set back approx. 2m from roadside. Evidence of spread northwards towards roadway, with potential for encroachment in future growing seasons.
JK8	454471	541018	Large stands around cottage to south of road. Outside of parking bay location. Subject to treatment but still extant.
JK9	451700	541861	Extensive stand in vicinity of derelict cottage immediately west of junction.
JK10	452120	542644	Small stand alongside drain downstream of road culvert at White Strand.
JK11	452077	542054	Moderate stand around farm buildings at top of laneway (Garinish Loop Walk) leading from Garinish to R572. Subject to treatment but still extant.
JK12	451924	541841	Small amount of stems in edge of garden on north side of road.
JK13	449459	541927	Stands in garden on Dursey Island, just outside Ballynacallagh. Present both at front and rear of house. Not very well established and may be of recent origin.

Rhododendron

Rhododendron (*Rhododendron ponticum*) is a large perennial evergreen shrub, which originates from the Iberian Peninsula and Asia. It was introduced to Ireland as an ornamental plant during the 1700s due to its brightly coloured flowers. The species has become established in the natural/semi-natural environment and is invasive in the west, north-west and south-west of the country. The species is typically found in areas with acidic soil conditions; mild, moist climatic conditions; and may be present in a variety of habitats, including urban areas, agricultural land, grasslands, wastelands and roadsides. Plants outcompete native flora by forming large, dense thickets which shade a wide area underneath, preventing growth. *Rhododendron* is capable of reproducing by seeds and by vegetative means via suckering of roots and layering where its branches touch the ground.

In total, nine sites within the study area were found to contain stands of Rhododendron (Table 2).

Table 2 Details of identified sites with Japanese Knotweed

Rhododendron	X Co - ordinates	Y Co-ordinates	Description
RHO 1	466915	545345	Mature stand (5 x 8m) on northern side of R572, immediately west of Castletownbere, growing within native hedgerow by town identification sign. Some spread westwards along and behind roadside margin.
RHO 2	4669 / 465995	545345 / 544699	Series of small stands and individual plants interspersed amongst 1km of native hedgerows and grass margins, scattered mainly along northern roadside on R752, between larger, established stands of RHO 1 and RHO 3.
RHO 3	465995 / 465959	544699 / 544645	Large, linear, mature stand (70 x 2m) on northern side of R572, west of Castletownbere. Interspersed with and growing within native hedgerow and roadside margin.
RHO 4	465750 / 465704	544498 / 544492	Large, linear, mature stand (75 x 2m) on northern side of R572, interspersed with and growing within native hedgerow and roadside margin. On roadside, rock outcrops, and in woodland on southern side of roadway.
RHO 5	465504 / 465456	544489 / 544456	Long, linear, mature stand (50 x 2m) on northern side of R572, interspersed with and growing within native hedgerow and roadside margin.
RHO 6	465206 / 464694	544374 / 544480	Series of stands and individual plants interspersed amongst 1km of native hedgerows and grass margin, scattered along northern side of R572. Also a significant presence to south of road, spreading across open ground.
RHO 7	464109	544294	Single mature stand (3m in diameter) on northern side of R572, immediately east of driveway entrance to cottage.
RHO 8	453442	544048	Single mature stand (8 x 6m) on north-eastern side of R572, growing amongst native upland scrub on fringe of nearby woodland. Located approx. 4m in from roadside. Evidence of new plants spreading southwards.
RHO 9	461261	541846	Single mature stand (9 x 2m) on northern side of R572, immediately west of driveway entrance to a bungalow.

Three-cornered Leek

Three-cornered leek (*Allium triquetrum*) is a spring-flowering, bulbous, perennial herb originating from the west and central Mediterranean. It is a garden plant and often found in long grasses, and in the natural environment can be found along roadsides, hedgerows and disturbed ground. The species is capable of reproducing by both seed, and via its long-lived bulbs.

In total, two sites within the study area have been found to contain Three-cornered leek (Table 3).

Table 3 Details of identified sites with Three-cornered leek

Three-cornered leek	X Co - ordinates	Y Co-ordinates	Description
TCL 1	451924	541841	Reasonably abundant within garden.
TCL 2	448999	541065	Stems recently dumped on grass verge on opposite side of road

Giant-rhubarb

Giant-rhubarb (*Gunnera tinctoria*) is a large, perennial plant originating from Argentina and Chile. It was introduced to Ireland in the 1800s as an ornamental plant due to its exotic features. However, this species is now very prominent along the west coast of Ireland. It proliferates in constantly moist environments, often occupying grassland areas, waterways, coastal cliffs, heaths and bogs. It outcompetes native flora by forming large, dense stands which shade a wide area underneath, preventing growth Giant-rhubarb can spread by both sexual and asexual reproductive methods, and can also regenerate from root fragments, leaf cuttings and rhizomes.

In total, two sites within the study area have been found to contain Giant-rhubarb (Table 4).

Table 4 Details of identified sites with Giant-rhubarb

Giant - rhubarb	X Co - ordinates	Y Co-ordinates	Description
GR 1	453141	541445	Single young plant on southern roadside within passing bay site.
GR 2	451300	541798	Small number of young plants along northern side of road in footprint of passing bay. Larger stand to south of road adjacent to boundary wall of Coast Guard houses.

Hottentot-fig

Hottentot-fig (*Carpobrotus edulis*) is a ground-creeping plant originating from South Africa. It was introduced to Ireland as an ornamental plant and as a dune stabiliser and is often found in coastal habitats. It outcompetes native species due to its aggressive growth and ability to propagate both vegetatively from fragments and via seed production. One site within the study area was found to contain Hottentot-fig. The occurrence is in a private garden on Dursey Island (coordinates: 448999; 541065), where the plant may be seen growing on a roadside stone wall and spilling out onto the road.

Distribution of the species in Ireland is quite limited and it was believed that the species had been eradicated in Ireland following a concerted eradication effort (W. Earle, pers. comm., 2019); however, this record on Dursey Island reveals that, regrettably, this is not the case. It is not known whether the IAPS occurs elsewhere in Ireland at present, but every effort should be made by CCC and the landowner in question to eradicate this occurrence. The localised occurrence of the species on Dursey Island should facilitate complete and successful eradication.

Brief Description of Invasive Alien Species (IAS) Management Plan

The measures to be implemented in the management plan are based on '*The Knotweed Code of Practice: Managing Japanese knotweed on development sites'* (EA, 2013), '*Best Practice Management Guidelines for Japanese Knotweed'* (Kelly *et al*., 2008) and '*Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads'* (TII, 2010b). These documents provide very detailed information on the control of Japanese knotweed and Rhododendron, and Giant–rhubarb, including instructions for chemical

treatment and non-chemical control. They have been developed by experts in the control of IAPS and informed by the successes and failures of hundreds of IAS management plans, and are widely accepted to represent the current best practice in the management of such species.

The Knotweed Code of Practice provides some general guidance on the preferred treatment options that should be used:

"*Unless an area of Japanese Knotweed is likely to have a direct impact on the development, you should control it in its original location with herbicide over a suitable period of time, usually two - five years.*

You should only consider excavating Japanese Knotweed as a last resort, and if so you should keep the amount of knotweed excavated to a minimum.

Soil containing Japanese Knotweed material may be buried on the site where it is produced to ensure that you completely kill it. In this case, you must bury material at least 5m deep, or at 2m if enclosed in a root barrier membrane

Where local conditions mean you cannot use burial as an option, it may be possible to create a Japanese Knotweed bund. The purpose of the bund is to move the Japanese Knotweed to an area of the site that is not used. This 'buys time' for treatment that would not be possible where the Japanese Knotweed was originally located.

Sometimes, due to shortage of time and location, landfill is the only reliable option, but it should be treated as a last resort. Landfill is very expensive for the development industry, and needs haulage, which increases the risk of Japanese Knotweed spreading.

When you transport soil infested with Japanese Knotweed to landfill, it is essential to carry out strict hygiene measures. If you do not follow these standards, this may lead to Japanese Knotweed spreading. Japanese Knotweed is a particular problem along transport corridors, where it interferes with the line of vision and can cause accidents."

The following sections contain descriptions of the most suitable control measures for the IAPS identified in the Study Area.

Japanese Knotweed

Construction Phase Management Measures

Management measures that should be implemented for Japanese Knotweed for the construction phase of the proposed development are as follows:

- The location of the stands should be circulated to all construction workers and involved parties, with their positions incorporated into relevant drawings and specifications, to ensure that the risk of disturbance as a result of project enabling works and design development is mitigated.
- With the nature of the locations, the absence of existing mitigation measures, and current encroachment onto the public road, the stands should be fenced off, incorporating recommended safe buffer zones, and with advisory / warning signage put in position.
- Discussions should be held with affected land and property owners, to ensure that any future actions on their part do not contribute to the further spread of viable plant material along the route.
- Where the Japanese Knotweed sites extend into the broader environment, further survey work should be carried out to establish the full extent of the Japanese Knotweed infestations.

- At these sites, ecological assessment and screening of the wider environment should be carried out, to identify the ecological sensitivities present, and to assess them in the context of any proposed Japanese Knotweed management programme.
- All land-based construction works shall be executed in accordance with the TII guidelines, '*Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads*' (2010). The Contractor shall ensure that the construction machinery during proposed works is not fouled with any IAS prior to its arrival at the site. Efforts shall also be made to ensure that any plant/equipment (including PPE equipment) is not carrying seeds or plant materials from IAS. The Contractor shall refer to the Invasive Species Ireland '*Marina Operators Code of Conduct*'
- the Contractor shall prepare a Biosecurity Method Statement and Invasive Species Management Plan detailing his/her proposed approach to ensuring that invasive species are not imported or spread during construction. These documents will be approved by the Project Ecologist prior to their acceptance and implementation.
- A construction stage inspection / monitoring programme should be put in place, to assess the identified locations for potential disturbance, and to inspect the works route for new infestations

Operational Phase Management Measures

Management measures that should be implemented for Japanese Knotweed for the operation of the proposed development are as follows:

- The relevant authorities and their contractors should be formally notified, to ensure that routine operations and maintenance at the locations do not contribute to the further spread of Japanese Knotweed.
- A multi-phase Japanese knotweed Management Plan should be developed and implemented by CCC prior to the operation of the proposed development. This Plan should consider:
    - The immediate management measures required to mitigate particular risks associated with the proposed development works at the site; and
    - Longer term management proposals, which would include broader habitat and catchment management measures, to ensure the effective control of the full extent of Japanese Knotweed present in the environment

Long-term Management Programme Options

Options for long-term management of Japanese knotweed are as follows:

- Chemical Control
- Excavation and burying;
- Excavation and disposal to licensed landfill/incinerator; and,
- Bunding and treatment.

The appropriate management strategy will be determined by site conditions and in consultation with NPWS in terms of the most suitable management strategy from a programme and cost perspective. There are a number of issues that will affect the management strategy on the site, including the following:

- Accessibility and space available;
- Proximity to open water;

- Land ownership and cooperation of private landowners;
- Proximity to designated sites and environmentally sensitive areas; and,
- Proximity to areas used by the general public and/or defined vulnerable groups.

Chemical Control Option

This option involves application of herbicides *in situ* until there is no re-growth of plant material. This may take c. 3-5 years and would require repeated survey and re-treatment each year until the occurrence has been eradicated from the location. If highly persistent herbicides are used, it may be possible to eradicate the plant within one or two years. However, since this will not be appropriate given the ecological significance of the wider area, the use of less-persistent herbicides, e.g. glyphosate, will be necessary to re-treat regularly in years two and three, and then to conduct annual spot-checks in May/June of subsequent years to identify and retreat any re-growth.

The current most widely recommended chemical for Japanese Knotweed control is glyphosate, which breaks down in the soil relatively quickly. Glyphosate is potentially damaging to non-target plants. Great care is therefore necessary during application of this herbicide and should be used in compliance with the product label in accordance with *Good Plant Protection Practice* as prescribed in the *European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (SI No. 83/2003).*

As the majority of herbicides rely on the presence of living foliage for them to be effective, it is important to consider whether the Japanese Knotweed is in leaf or is dormant when choosing a suitable herbicide. As the majority of herbicides are not effective during the winter dormant stage, the most effective time to apply a non-persistent herbicide is between May and September, when the plant is in leaf. This will stunt the growth of the plant, consequently reducing the amount of viable above ground material and the height of the stand.

For infestations, products containing 2,4-D amine can be used. 2,4-D amine has the advantage of being selective and specific to broad-leaved plants. However, in general, it has a greater persistency when compared to glyphosate. Products containing 2,4-D amine should be applied in May, with a follow up treatment in late September or early October. Care is required in the selection of the appropriate product and method of application.

In making the selection of which herbicide to use, regard should be given to, *inter alia*, the abundance of the plants, the location of the stand, the proximity and nature of sensitive receptors, and the season. When using herbicide treatment, plant and protection products and sustainable use of pesticides regulations as well as health and safety measures outlined in this Plan (below) must be followed at all times.

Non-Chemical Control

These options are applied in situations where eradication is required within a short space of time. Non-chemical methods typically involve excavation and disposal of infested topsoils and/or plant material.

Excavation & Burying at Depth

The Japanese Knotweed rhizome rarely penetrates deeper than 3m and in certain cases excavation is the best method for isolation and removal of the infestation. During this method it is advisable to apply a non-persistent herbicide at least once to reduce the growth of infestation. Avoiding excess spoil, and ensuring excavated material does not contaminate surplus soil that is free from infestation, is critical.

Disposal and treatment on site can be done through burying material at least 5m deep and covering it with a root barrier membrane layer to prevent any regeneration. This can involve large scale engineering operations and large holes within the site. Various root barrier membranes are available which can prevent plants penetrating. These membranes need to be specially laid under expert supervision in order to be effective, protecting the surrounding soil. Any burial must be accurately mapped and recorded to prevent potential disturbance through any future development. To be effective, the root barriers used need to be: undamaged; of a large size to minimise the need for seals; where necessary sealed securely; of material that remains fit for purpose (intact) for at least 50 years; and resistant to damage on exposure to ultra violet/sunlight. A vertical root barrier membrane can be been used to prevent the horizontal growth of Japanese knotweed.

Excavation and Burying at Shallow Depth

Where it is not possible to bury 5m deep, it may be possible to bury 2m deep if the contaminated soil is completely sealed in a proprietary root barrier membrane in an area that can be guaranteed will not be disturbed by building work or excavation for services, etc. The excavation and shallow burial option involves a series of 8 stages:

1. Calculate volume required and excavate site, allowing for 2m depth of burial.
2. Protect the integrity of the root barrier membrane with a layer of sand and provide shutter ply supports for the edge of the cell.
3. Put root barrier membrane in place, allowing enough material along the edges to eventually provide a seal.
4. Protect the root barrier membrane from tyre damage with a layer of sand.
5. Fill the cell with the knotweed infested soil. No other material, contaminants, or wastes should be included.
6. Make sure that dedicated vehicles are used and cleaned properly after they have been used. Haulage routes must be protected.
7. Put the surface of the root barrier membrane in place and make sure the cell is adequately sealed.
8. Protect the surface of the cell with sand and bury deep enough to prevent disruption in the future.

Excavation and Disposal Off-Site

In scenarios where there are constraints on available space and/or the programme of site works and no other alternatives exist, then excavation and disposal of contaminated soil at a licensed landfill facility is an effective but expensive option.

Bunding

Bunding is a method designed to concentrate the rhizome into the upper surface of a raised or excavated shallow area of contaminated soil typically 0.5m deep where Japanese Knotweed will grow and be controlled by herbicide. This method is used where conditions do not allow for burial and is usually only suitable for large sites as even small infestations, with limited above ground growth, can be very large. The bund method is used when it is not possible to treat Japanese knotweed in the area where it was originally located by moving it to an area that is not used. Bunds should be located at least 10m away from site boundaries to prevent spread. The bund can be raised, on top of the ground or placed within an excavation. The material within the bund is treated as often as is necessary to prevent growth and spread. Bunds should use a root barrier membrane if being constructed in an area free of Japanese Knotweed.

Rhododendron

Construction Phase Management Measures

Management measures that should be implemented for Rhododendron for the construction phase of the proposed development are as follows:

- The location of the stands should be circulated to all construction workers and involved parties, with their positions incorporated into relevant drawings and specifications, to ensure that the risk of disturbance as a result of project enabling works and design development is mitigated.
- The stands should be fenced off, with advisory/ warning signage put in position, to protect the stands from the risk of third party disturbance.
- All land-based construction works shall be executed in accordance with the TII guidelines, '*Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads*' (2010). The Contractor shall ensure that the construction machinery used during proposed works is not fouled with any IAS prior to its arrival at the site. Efforts shall also be made to ensure that any plant/equipment (including PPE equipment) is not carrying seeds or plant materials from IAS. The Contractor shall refer to the Invasive Species Ireland '*Marina Operators Code of Conduct*'.
- the Contractor shall prepare a Biosecurity Method Statement and an Invasive Species Management Plan detailing his/her proposed approach to ensuring that invasive species are not imported or spread during construction. These documents will be approved by the Project Ecologist prior to their acceptance and implementation.
- A construction stage inspection / monitoring programme should be put in place, to assess the identified locations for potential re-growth, and to inspect the works route for new infestations.

Operational Phase Management Measures

Management measures that should be implemented for Rhododendron for the operation of the proposed development are as follows:

- The relevant authorities and their contractors should be formally notified, to ensure that routine operations and maintenance at the locations do not contribute to the further spread of the plants
- A management plan should be developed and implemented, to seek to have the sites physically remediated by the controlled removal of plants, in conjunction with stump treatment and multi-annual follow up inspections

Long-term Management Programme Options

The physical removal of above-ground Rhododendron can be achieved by cutting and removing the stems by hand or chainsaw as close to the ground as possible. The cut material will need to be removed from the site for effective follow-up work. Flailing is another successful method of clearing Rhododendron and involves flailing the thickets down to ground level, using mechanical flail head mounted on a tracked machine. However, this method is not suitable for use in sloping or wet areas.

The removal of above-ground biomass of Rhododendron will not prevent re-growth as the species is able to proliferate from cut stems and stumps. There are four management options that can be applied to prevent re-growth:

1. Digging the stumps out;
2. Direct stump treatment;
3. Spraying of re-growth and large seedlings; and,

4. Stem injection.

Each of these options is discussed in turn below[1].

Digging the stumps out

The digging out of stumps is an effective method of eradicating Rhododendron from the area as it maximises the removal of all viable roots. The digging out can be carried out manually or assisted by machinery if the terrain allows it. To prevent re-growth, as much soil as possible must be removed from the dug-out root system, while the stumps should be turned upside down to expose roots to the air, as well as removing as much soil as possible. The removed roots and stumps should be burned at a licensed facility to prevent re-growth. Although effective, this method results in high degree of soil disturbance, and may not be suitable in sensitive areas.

Direct stump treatment

Direct stump treatment involves the application of herbicide solution or spot spraying of freshly cut stumps (i.e. within minutes of it being cut). When using herbicide treatment, health and safety measures outlined in this Plan (below) must be followed at all times. This method should be implemented in dry conditions so as to prevent wash-off of applied solution. The direct stump treatment has been observed to be most effective outside the spring sap flow timeframe. It is recommended to use vegetable dye to mark treated stumps, as all stumps should be targeted to maximise eradication of Rhododendron. The following herbicides can be applied to treat the stump:

- Glyphosate (20% solution): can be applied to all freshly cut stump surfaces using a knapsack sprayer at low pressure, a forestry spot gun fitted with a solid stream nozzle, a cleaning saw fitted with a suitable spray attachment, or a paint brush. For best results, the application should occur between October and February.
- Triclopyr 'Garlon 4' (8% solution): can be applied to all freshly cut stump surfaces using a knapsack sprayer at low pressure, a forestry spot gun fitted with a solid stream nozzle, a cleaning saw fitted with a suitable spray attachment, or a paint brush. The herbicide can be applied any time between cutting and appearance of new growth.
- Ammonium sulphamate (40% solution): when applied, this herbicide has the best results between June and September.

Although this method often results in complete lysis of the stumps, re-growth has been observed at times, which is usually slow and stunted. To achieve complete kill, carefully timed foliar application of herbicides to the re-growth must occur. When using herbicide treatment, plant and protection products and sustainable use of pesticides regulations as well as health and safety measures outlined in Plan (below) must be followed.

Spraying of re-growth and large seedlings

Spraying of herbicide, typically glyphosate on re-growth (stumps and seedlings of less than 1.5m in height) can be achieved once the re-growth is allowed to proliferate for 1-3 seasons before spraying. Spraying should not be delayed for more than three years after initial cutting, as this can often result in a more severe infestation.

To efficiently spray the re-growth to achieve complete kill, several factors need to be taken into consideration:

[1] Maguire, C.M., Kelly, J. and Cosgrove, P.J. (2008). Best Practice Management Guidelines Rhododendron *Rhododendron ponticum* and Cherry Laurel *Prunus laurocerasus*. Prepared for NIEA and NPWS as part of Invasive Species Ireland.

- Glyphosate must be sprayed in dry weather. Additionally, the plant must be dry at the time of herbicide application and remain dry for at least 6 hours to allow for complete absorption of solution by the plant.
- The addition of a surfactant can reduce the amount of dry time required by increasing the absorption of solution into the plant. However, surfactants are often more environmentally damaging than herbicides, and must be handled with care, especially in proximity to aquatic habitats.
- Spraying of herbicide must occur in near windless conditions to maximise contact with the plant, and its absorption. Spraying in windy conditions should not be practiced as this is likely to result in damage to nearby native flora.
- At all times, measures should be in place to prevent the chemical solutions from entering aquatic habitats.

Spraying is often not fully effective, and will require two or more applications, before the plant is killed completely. Other common herbicides used for spraying are ammonium sulphamate, Imazapyr and Triclopyr. When using herbicide treatment, plant and protection products and sustainable use of pesticides regulations as well as health and safety measures outlined in Plan (below) must be followed.

Stem injection

Stem injection is a method often used to manage Rhododendron where terrain is sloping, and where other methods are impractical. This method uses the 'drill and drop' methodology[2] to control the growth of established Rhododendron bushes with access to the main stem which is large enough for drilling a hole. The equipment to be used comprises a handheld cordless drill and a spot gun. It is recommended that a glyphosate (25% solution) is to be applied. The methodology used for stem injection treatment is as follows:

- Inspect the size of the Rhododendron stems, to ensure that they are more than 3cm in diameter.
- Position the drill as close to the main root system as possible.
- To effectively hold and insert the herbicide solution, drill as vertically as possible with a drill bit of 11 -16mm in diameter.
- The herbicide solution must be inserted into the hole immediately after drilling. The recommended amount of herbicide to be inserted into each stem is 2ml
- To prevent the overflow of herbicide, a spot gun with a calibrated 10ml chamber should be used as it permits accurate application of herbicide solution.
- Each treated plant should be marked immediately with either coloured paint or by attaching a biodegradable tape.
- Stem injection can be carried out in dry weather or light rain conditions.

This method has been observed to be the most effective during the months of March, April and May. Although the treated Rhododendron bushes can be left on site to decay, they may persist for approximately 10 – 15 years. Alternatively, the recommended option is to cut and remove the treated Rhododendron off site and assess the effectiveness of the treatment every 12 months. When using herbicide treatment, plant and protection products and sustainable use of pesticides regulations as well as health and safety measures outlined in Plan (below) must be followed.

[2] Edwards, C. (2006). Managing and Controlling Invasive Rhododendron. Forestry Commission Practice Guide, Forestry Commission, Edinburgh.

Three-cornered Leek

Three-cornered leak can be managed via an herbicide treatment or mechanical control.

Mechanical control

The species can be removed from site mechanically by digging, which is recommended to be carried out in spring when surface vegetation is present. Removal by excavation should ensure that all plant material and bulbs are to be removed from site. It is likely that follow up mechanical cutting will be required to ensure reduction of the seed bank.

Herbicide Treatment

A solution of Glyphosate should be sprayed in April before flowering. To maximise absorption of the herbicide by the plant, the leaves should be slightly bruised before treatment. The application of herbicide treatment should be repeated every 2-3 months to prevent re-growth and bulb bank left by this species. When using herbicide treatment, plant and protection products and sustainable use of pesticides regulations as well as health and safety measures outlined in Plan (below) must be followed.

Giant- rhubarb

Giant-rhubarb can be permanently removed from the Study Area through application of several commonly used methods: mechanical control, chemical or biological control, or a combination of these[3].

Mechanical Control

Physical removal of smaller plants can be achieved using spades by cutting the above-ground biomass at an angle as close to the root as possible. The area must be monitored as plant material can be missed during the first removal, which will subsequently need to be removed. If a large area of land is to be cleared from Giant-rhubarb, it is recommended that a restoration protocols to be implemented to prevent reinvasion of Giant-rhubarb or of any other unwanted flora on the bare area.

Chemical Control

Chemical control experiments have been carried out on Achill Island[4], to identify the effectiveness of herbicide treatments on controlling Giant-rhubarb infestation. Glyphosate-based herbicides have been shown to be effective in treating this species. The end of growing period between August to September has been shown to be an optimum timeframe to apply the treatments, with re-growth observed after two years. The re-growth is attributed to the presence of viable rhizomes in the ground, as well as subsequent seedling germination, prompting further application of herbicide to stunt the growth. There are three methods that can be used to apply chemical control for Giant-rhubarb:

1. Spraying;
2. Cut-and-paint method; and,
3. Rhizome injection.

Each of these options of discussed in turn below:

Spraying

[3], Armstrong, C., Osborne, B., Kelly, J. and Maguire, C.M. (2009). Giant Ruhbarb (*Gunnera tinctoria*) Invasive Species Action Plan. Prepared for NIEA and NPWS as part of Invasive Species Ireland.

[4] Armstrong, C., Osborne, B., Kelly, J. and Maguire, C.M. (2009). Giant Ruhbarb (*Gunnera tinctoria*) Invasive Species Action Plan. Prepared for NIEA and NPWS as part of Invasive Species Ireland.

Spraying of herbicide-based solution (see manufacturers recommended dosage) is often carried out using a backpack sprayer, which is applied on all leaves. Spraying of this species must occur in dry, and windless weather conditions to prevent run-off of herbicide solution and to avoid damage to nearby native flora.

Cut-and-paint method

This method involves the cutting of the leaf stalk at the base and immediately applying the herbicide on the remaining surface using either a brush or a sponge. This method can be useful when the large size of the plant makes it too difficult and/or too dangerous for spraying. Additionally, this method proves to be cost-effective due to the small quantities of herbicide used.

Rhizome injection

Using a hand-held drill, small holes are drilled into the rhizome of the Giant-rhubarb plant. The herbicide is immediately injected into the wells. Refer to the section on Rhododendron control, where a similar method is applied for the treatment of rhizomes.

When using herbicide treatment, plant and protection products and sustainable use of pesticides regulations as well as health and safety measures outlined in Plan (below) must be followed.

Hottentot-fig

Hottentot-fig has a very limited distribution in Ireland and it was thought the IAPS had been eradicated from the country (W. Earle, pers. comm., 2019). This confirmed record on Dursey Island reveals that, unfortunately, this is not the case. However, it is possible that this occurrence is the only occurrence or one of a few occurrences in Ireland. Additionally, it is the first record of the species on the west coast of Ireland. As such, it is imperative that every effort is made to eradicate this localised occurrence, in agreement with the private landowner in question. Hottentot-fig can be effectively removed off site via physical removal, and chemical means can be employed for control in cases in which physical removal is not practical (e.g. on inaccessible sea cliffs)[5]. In this case, since the occurrence in question is quite localised and is situated in a fully accessible location, it is considered that physical removal would be practical and effective and should be undertaken in agreement with the landowner in question. The situation of the occurrence on a public roadside creates the risk of dispersal by tourists who may pick the attractive flowers or foliage or inadvertently transport plant fragments or seeds on boots/clothing. Therefore, every effort should be made to treat the occurrence at the earliest possible convenience. Early, appropriate treatment of this species will avoid medium to long-term ecological impacts and financial costs.

Physical Removal

The most effective and typical means of eradication of Hottentot-fig from an area is through removal by hand. It is important to ensure that no fragments of this species are left behind during removal, and no plant fragments are transported to a different site. Matting can be placed to ensure no plant fragments remain at the site. Absolutely all plant material should be removed in sealed bags and disposed of appropriately. It is vital that the biosecurity measures outlined in this Plan (see '*Biosecurity Protocols for Invasive Alien Species'* below) are followed.

Limitations and Threats to Control Measures

The primary risk is during the site preparation and construction phases when the excavation of materials and movement of vehicles potentially transporting contaminated material can

[5] Kelly, J. and Maguire, C.M. (2009). Hottentot Fig (Carpobrotus edulis) Invasive Species Action Plan. Prepared for NIEA and NPWS as part of Invasive Species Ireland.

facilitate the spread of IAS. The presence of Japanese Knotweed and Rhododendron, in particular, may result in limitations to overall site management objectives during the construction process, in particular, through the following:

- Delays in scheduling of works, due to treatment of identified locations;
- Structural damage or future potential damage caused by IAPS (particularly Japanese Knotweed); and,
- Potential for spread of IAPS from within and outside the site boundary, e.g. within the site or from adjacent land.

The type of herbicide applied, and the timing of treatment should be cognisant of the receiving environment. The Japanese Knotweed and Rhododendron should be treated with a non-persistent herbicide (certain plant protection products containing glyphosate are non-persistent). It is important to note that certain plant protection products have a specified period of activity, which will be described on the product label and which will dictate when the product can be applied.

Biosecurity Protocols for Invasive Alien Species

Personnel entering an area infested within IAS must take precautionary measures to avoid their spread to wider areas. An exclusion zone or a buffer zone must be set up around the IAS. For instance, in the case of Japanese Knotweed, a 7m buffer zone must be in place. Exclusion zones should be clearly marked and fenced off in order to prevent accidental incursion. Routes within the exclusion zone should be overlaid with a geotextile that has a layer of sand on-top to protect it from being damaged by heavy machinery. The geotextile will prevent potentially contaminated soil/spoil from being transferred onto tracks, tyres or boots.

The following measures are to be followed by all persons entering any infested zones:

- The traffic volume in and out of the zones should be kept to a minimum all times and should remain outside the zone where possible.
- All PPE, other equipment and machinery that enter an infested zone must be cleaned before entering;
- *Inspect, Remove Dispose, Report*: Before leaving an infested area, individuals must thoroughly inspect their clothing, PPE, any equipment and their footwear for rhizomes, or other plant fragments that may be stuck on;
- All personnel should carry a hoofpick or similar implement to thoroughly clean the treads of their footwear with. All footwear must be thoroughly cleaned before leaving an infested zone.
- All PPE, other equipment and machinery, clothing and footwear must be thoroughly cleaned with soapy water and a stiff bristled brush at designated wash-down area(s) before leaving an infested zone.
- As good practice, all staff should follow Inland Fisheries Ireland Biosecurity Protocols when they have entered water or a riparian zone;
- If machinery/plant has entered or worked in an infested zone, it must be thoroughly washed down before leaving the area or working in an infested location; and
- A power washer must be provided for effective cleaning of machinery, along with stiff bristled brushes.

Key Legislation Related to the Use of Pesticides and Plant Protection Products:

Legislation regulating the use of herbicides (or 'plant protection products') have implications for the management of IAPS. As stated in the Preamble to the *Plant Protection Products*

Regulations, the use of plant protection products (such as herbicides) *"may involve risks and hazards for humans, animals and the environment, especially if used incorrectly"*. As such, it is important that proper protocols and procedures are adhered to when undertaking chemical treatment of IAPS. Those involved in the management of IAPS will need to be aware of, and comply with (at a minimum), the following laws and policies:

- *Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC (hereinafter referred to as the 'Plant Protection Products Regulation')*; and,
- *European Communities (Plant Protection Products) Regulations, 2012 (S.I. No. 159 of 2012)*.
- *Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides ('Sustainable Use of Pesticides Directive')*; and,
- *European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012)*.

This section outlines key stipulations of these regulations/policies related to the use of chemical control measures for the management of IAPS. However, it should be noted that this text serves as an overview only, and the respective policies should be consulted in their entirety prior to the planning or commencement of any chemical IAPS treatment measures.

According to the *Plant Protection Products Regulations*, plant protection products should be used:

1. In accordance with their authorisation;
2. Having regard to the principles of integrated pest management (IPM); and
3. Giving priority to non-chemical and natural alternatives wherever possible.

The Preamble to the Regulations also states that the user should follow instructions provided on the product label of plant protection products.

Those proposing to use plant protection products to manage IAPS should be well informed of the stipulations of the authorisation in question, should identify what plants and plant products are proposed to be used, and the land use type(s) in the area where the treatment is proposed to be applied.

When choosing the plant protection products, only those entered on a register of authorised and permitted plant protection products can be used, or those which have been granted a trial permit. Consequently, it is important to check that the proposed product is entered on the register[6], or has been granted a trial permit before application.

Article 31 (2) of *Plant Protection Product Regulations* states that the authorisation shall set out the requirements relating to the use of the plant protection product.[7] Furthermore, Article 31 (3) provides that the authorisation must also include, where applicable:

- The maximum dose per hectare in each application;
- The period between the last application and harvest; and,

[6] Register of plant protection products: http://www.pcs.agriculture.gov.ie/products/

[7] Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC Article 31(2).

- The maximum number of applications per year.[8]

Article 31 (4) provides further that the requirements relating to the use of the plant protection products may include, *inter alia*:

- a restriction with respect to the use of the plant protection products in order to protect the health of the users, bystanders, residents or the environment (such restrictions shall be included on the label);
- the obligation to provide prior notice to any neighbours who could be exposed to the spray drift and those who have requested to be informed;
- indications for proper use according to the principles of IPM;
- designation of categories of users, such as professional and non-professional; and,
- the approved label.[9]

According to Article 67 (1) of the *Plant Protection Product Regulations*, professional users need to practice record keeping of the plant protection products used for at least 3 years. Records should contain "*the name of the plant protection product, the time and the dose of application [and] the area and the crop where the plant protection product was used*".[10]

The *Sustainable Use of Pesticides Regulations* state that those persons seeking to manage IAPS using pesticides must ensure that they procure the services of registered and appropriately trained advisors and professional users. The professional user must be aware of the contents of any relevant Invasive Species Action Plan prior to commencing work. Additionally, the professional user must have pesticide application equipment[11] inspected and certified for compliance with the relevant standard by a registered inspector at least every five years up to the 1st of January 2020, and at least once in every three years following that date.[12]

Regulation 9 (2) provides further that "[a] *professional user shall only apply pesticides with equipment that is correctly calibrated and is appropriate for the use intended*."[13] Regulation 9 (3) provides that "[a] *professional user shall only apply pesticides with* [the equipment specified], *if it has been inspected and certified as satisfying the appropriate standard* [...]."[14] Furthermore, it is very important to note that the *Sustainable Use of Pesticides Directive*[15] and related Irish transposing Regulations[16] place additional restrictions and, in some cases, prohibitions, on the use of pesticides in certain specified areas. Such areas include:

[8] Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC Article 31(3).

[9] Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC Article 31(4).

[10] Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC Article 67(1).

[11] Schedule 1 to the European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012).

[12] European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012) Regulation 9(1).

[13] European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012) Regulation 9(2).

[14] European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012) Regulation 9(3).

[15] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides.

[16] European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012).

- Areas in or near the aquatic environment
- Areas for the abstraction of drinking water;
- Transport routes (such as railway lines);
- Areas with sealed or very permeable surfaces;
- Groundwater vulnerable areas;
- Areas used by the general public or defined vulnerable groups; and,
- European (i.e. Natura 2000) sites.

In this case, restrictions related to European sites (i.e. Natura 2000 sites) are especially relevant, due to the presence of a number of such sites within and immediately adjacent to the site of the proposed development. The following sections outline restrictions related to certain specified areas:

In or Near Aquatic Environment

The *Sustainable Use of Pesticides Directive* highlights that the aquatic environment is especially sensitive to pesticides, which means that particular attention is required to avoid polluting surface water and groundwater when using pesticides.[17] Measures to avoid such pollution may include, for example, the establishment of buffer zones and, the planting of hedges to reduce exposure of water bodies to spray drift, drain flow and run-off.[18] The Directive indicates that the dimensions of buffer zones will depend on the circumstances of each case.[19] It also indicates that the use of pesticides in areas for the abstraction of drinking water, on or along transport routes (such as railway lines); and on sealed or very permeable surface can lead to higher risks of pollution of the aquatic environment.[20] The Directive also states that, in such areas, pesticide use should be minimised, or eliminated, if appropriate.[21]

Near Wells, Boreholes, Abstraction Points, and Groundwater Vulnerable Areas

The *Sustainable Use of Pesticides Regulations* details "*Prohibitions on pesticides near aquatic environment and drinking water*".[22] The Regulations provide that a person shall not use a pesticide within specified distances of certain water sources.[23] The specified water sources and distances are listed in Schedule 2 to the Regulations:

Table 5 Water sources listed in Schedule 2 of the *Sustainable Use of Pesticides Regulations*

Water Source	Distance
Abstraction point of any surface waters, borehole, spring or well used for the abstraction of water for human consumption in a water scheme supplying 100m^3 or more of water per day or serving 500 or more persons,	200m

[17] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides Recital 15 of the Preamble.

[18] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides Recital 15 of the Preamble.

[19] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides Recital 15 of the Preamble.

[20] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides Recital 15 of the Preamble.

[21] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides Recital 15 of the Preamble.

[22] European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012) Regulation 11.

[23] European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012) Regulation 11(1).

Water Source	Distance
Abstraction point of any surface waters, borehole, spring or well used for the abstraction of water for human consumption in a water scheme supplying 10m^3 or more of water per day or serving 50 —500 persons,	100m
Abstraction point of any surface waters, borehole, spring or well used for the abstraction of water for human consumption in a water scheme supplying 1-10m^3 of water per day or serving 10-50 persons,	25m
Abstraction point of any surface waters, borehole, spring or well used for the abstraction of water for human consumption in a water scheme supplying 1m^3 or less of water per day or serving 10 or less persons,	5m[24]

Regulation 11 (2) states further that "*A person shall not use a pesticide within 15 metres of a landscape feature that is known to be a ground water vulnerable area including karst areas, sinkholes and collapse features"*[25] Regulation 11 (3) provides that "*Subject to paragraphs (1) and (2), a person shall not use a pesticide close to water other than in accordance with the conditions set out in the approved label for that pesticide*."[26]

'Specific Areas'

In relation to '*Specific Areas*', Regulation 12 (1) of the *Sustainable Use of Pesticides Regulations* provides that, subject to paragraph (2), a person shall not apply a pesticide in:

a) areas used by the general public or by defined vulnerable groups;[27] and,

b) a European (i.e. Natura 2000) site.[28]

Health and Safety

An appropriate risk assessment, which includes Health & Safety considerations, should be carried out before any control or survey work is undertaken. Protective clothing must be worn when attempting control. All works to be compliant with the *Safety, Health and Welfare at Work Act, 2005* as well as the *Safety, Health and Welfare at Work (General Application) Regulations, 2007.*

Chainsaws should only be used by competent persons. The use of chainsaws should adhere to the *Guide to Safe Working with Timber and Chainsaws* (HSA, 2010). Chainsaws and equipment should be maintained and correct protective equipment should be used at all times.

Health and Safety during Chemical Control

While using herbicide, it is paramount that clearly visible signs stating the use of herbicide and its risk to children and animals are in place until treated plants are dry. Symptoms of ingestion by human and animals consist of burns to the mouth and throat, salivating, nausea, vomiting and diarrhoea. If herbicide ingestion is suspected, medical treatment should be sought immediately.

[24] Schedule 2 to the European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012).

[25] Regulation 11(2) of the European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012).

[26] Regulation 11(3) of the European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012).

[27] Regulation 12(1)(a) of the European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012).

[28] Regulation 12(1)(b) of the European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012).

Glyphosate has a low known toxic effect on aquatic life. However, water for mixing of a 10% solution should be sourced from a private source (pre-collected and stored).

It is very important that the *Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001* as well as the *European Communities (Authorisation, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003* are consulted.

The success of the management plan for chemically treated stands will be based on the initial reduction in area IAS ascertained from annual pre-treatment monitoring followed by the complete eradication from the site within 5 years.

To comply with the Quality Control procedures for *Sustainable Use of Pesticides Legislation*, the application of herbicide can only ever be undertaken by registered professional users. Registered Pesticide Advisors (RPA) can provide Quality Control by approving procedures prior to works. Professional users will also demonstrate proper use, ensuring only authorised products are used and all Works are catalogued and documented pursuant to the requirement of *Plant Protection Products Regulations*.

These documents include measures to aid the identification of relevant species, with details for the timing, chemicals and methodology for chemical control and for measures to avoid environmental damage during the use of herbicides. It is recommended that the Contractor should prepare a specific plan in accordance with the relevant guidelines.

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