

NPWS

Reen Point Shingle SAC
(site code: 002281)

**Conservation objectives supporting document-
Coastal habitats**

Version 1

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Contents

1	Introduction.....	2
2	Conservation Objectives.....	2
3	Perennial vegetation of stony banks.....	3
3.1	Overall Objective.....	3
3.2	Area.....	4
3.2.1	Habitat area	4
3.3	Range.....	4
3.3.1	Habitat distribution	4
3.4	Structure and Functions	4
3.4.1	Physical structure: functionality and sediment supply.....	5
3.4.2	Physical structure: disturbance	5
3.4.3	Vegetation structure: zonation	5
3.4.4	Vegetation composition: communities and typical species.....	6
3.4.5	Vegetation composition: negative indicator species	6
3.4.6	Vegetation composition: non-native species.....	7
4	References.....	7
	Appendix I – Distribution map of perennial vegetation of stony banks in Reen Point Shingle SAC	8
	Appendix II – Reen Point site report and habitat map from the Vegetated Shingle Monitoring Project (VSM).....	9

Please note that the opinions expressed in the site report from the Vegetated Shingle Monitoring Project (VSM) are those of the authors and do not necessarily reflect the opinion or policy of NPWS.

Please note that this document should be read in conjunction with the following report: NPWS (2017) Conservation Objectives: Reen Point Shingle SAC 002281. Version 1.0. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

1 Introduction

Achieving Favourable Conservation Status (FCS) is the overall objective to be reached for all Annex I habitat types and Annex II species of European Community interest listed in the Habitats Directive 92/43/EEC (European Commission, 2013). It is defined in positive terms such that a habitat type or species must be prospering and have good prospects of continuing to do so.

Reen Point Shingle SAC is a small Special Area of Conservation (SAC) located approximately 6km south-west of Durrus, Co. Cork, on the northern side of Dunmanus Bay.

Reen Point Shingle SAC (site code: 002281) is selected for 1220 Perennial vegetation of stony banks. The habitat is the sole Qualifying Interest for this SAC.

The mapped distribution of perennial vegetation of stony banks in Reen Point Shingle SAC is presented in Appendix I.

2 Conservation Objectives

A conservation objective aims to define the favourable conservation condition of a habitat or species at a particular site. Implementation of the objective will help to ensure that the habitat or species achieves favourable conservation status at a national level.

This supporting document sets out the conservation objective for perennial vegetation of stony banks in Reen Point Shingle SAC, which is defined by a list of parameters, attributes and targets. The main parameters are (a) Range (b) Area and (c) Structure and Functions, the last of which is broken down into a number of attributes, including physical structure, vegetation structure and vegetation composition.

The targets set for perennial vegetation of stony banks (vegetated shingle) are based in part on the findings of the Vegetated Shingle Monitoring Project (VSM) (Martin *et al.*, 2017), which was carried out in 2016 on behalf of the National Parks and Wildlife Service (NPWS). This document should be read in conjunction with that report.

Vegetated shingle within Reen Point Shingle SAC was also recorded during the National Shingle Beach Survey (NSBS), which was carried out in 1999 on behalf of NPWS (Moore and Wilson, 1999).

The VSM surveyed, mapped and assessed a single sub-site associated with Reen Point Shingle SAC (Martin *et al.*, 2017):

Reen Point (VSM site code 016)

As part of the VSM, a detailed individual site report and a habitat map were produced for the Reen Point sub-site and these are included in Appendix II at the end of this document.

The conservation objective for perennial vegetation of stony banks in Reen Point Shingle SAC is based on the findings of the VSM. It is thought that the sub-site as surveyed by the VSM represents the entire area of perennial vegetation of stony banks within Reen Point Shingle SAC.

3 Perennial vegetation of stony banks

The following definition of perennial vegetation of stony banks habitat in Ireland is based on the data collected during the VSM (Martin *et al.*, 2017) and is an adaptation of the definitions used in European Commission (2013) and NPWS (2013).

Perennial vegetation of stony banks occurs along the coast where shingle (cobbles, pebbles, and gravel $\geq 2\text{mm}$) has accumulated to form elevated ridges or banks above the high tide mark. The majority of the rocky material should be between 2mm and 256mm in diameter to be considered in this habitat category. On the upper beach, the pioneer community can be characterised by perennial species such as sea beet (*Beta vulgaris* subsp. *maritima*), sea-kale (*Crambe maritima*), rock samphire (*Crithmum maritimum*), cleavers (*Galium aparine*), yellow-horned poppy (*Glaucium flavum*), sea pea (*Lathyrus japonicus*), wild radish (*Raphanus raphanistrum* subsp. *maritimus*), curled dock (*Rumex crispus*), sea campion (*Silene uniflora*), perennial sow-thistle (*Sonchus arvensis*) and sea mayweed (*Tripleurospermum maritimum*). The majority of the area within this pioneer community is usually bare shingle. At the top of the beach, and moving inland, a wider range of vegetation types can be found at larger shingle sites, including a lichen-rich community and coastal forms of grassland, heath and scrub. The grassland community can be characterised by grass species such as common bent-grass (*Agrostis capillaris*), creeping bent-grass (*A. stolonifera*), false oat-grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*), spreading meadow-grass (*Poa humilis*), sand couch (*Elytrigia repens*), red fescue (*Festuca rubra*), Yorkshire fog (*Holcus lanatus*) and crested hair-grass (*Koeleria macrantha*), field wood-rush (*Luzula campestris*), and broadleaf herbs such as yarrow (*Achillea millefolium*), thrift (*Armeria maritima*), common mouse-ear (*Cerastium fontanum*), wild carrot (*Daucus carota*), autumn hawkbit (*Leontodon autumnalis*), common bird's-foot trefoil (*Lotus corniculatus*), buck's-horn plantain (*Plantago coronopus*), ribwort plantain (*P. lanceolata*), silverweed (*Potentilla anserina*), common sorrel (*Rumex acetosa*), dandelion (*Taraxacum officinale* agg.), lady's bedstraw (*Galium verum*), red clover (*Trifolium pratense*) and white clover (*T. repens*). The scrub community can be characterised by the woody species honeysuckle (*Lonicera periclymenum*), blackthorn (*Prunus spinosa*), bramble (*Rubus fruticosus* agg.), gorse (*Ulex europaeus*) and the climber hedge bindweed (*Calystegia sepium*). These more inland communities have less bare shingle and vegetative cover usually dominates. The majority of the grassland and scrub communities are rooted within soil, whereas the pioneer community is usually rooted in gravel, sand or organic matter (e.g. decomposing seaweed and other plant material). Once the soil layer on top of the shingle is more than 30cm deep, the community is no longer defined as perennial vegetation of stony banks.

3.1 Overall Objective

The overall objective for 'Perennial vegetation of stony banks' in Reen Point Shingle SAC is to 'maintain the favourable conservation condition'.

This objective is based on an assessment of the recorded condition of the habitat under a range of attributes and targets. The assessment is divided into three main headings: (a) Range, (b) Area and (c) Structure and Functions.

3.2 Area

3.2.1 Habitat area

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. The target for favourable condition is that there is no decrease from the established baseline. Bearing in mind that coastal systems are naturally dynamic and subject to change, even within a season, this target is assessed subject to natural processes, including erosion and succession.

The VSM (Martin *et al.*, 2017) mapped the area of vegetated shingle where it occurred. The area of perennial vegetation of stony banks recorded by the VSM in Reen Point Shingle SAC was 0.43ha (Martin *et al.*, 2017).

The target is that the habitat area should be stable or increasing, subject to natural processes, including erosion and succession.

3.3 Range

3.3.1 Habitat distribution

The recorded location of the surveyed vegetated shingle site in Reen Point Shingle SAC, as mapped by Martin *et al.* (2017), is presented in Appendix I.

The Reen Point sub-site comprises two vegetated ridge barriers, with a lagoon separating them (Martin *et al.*, 2017).

The NSBS (Moore and Wilson, 1999) classified the perennial vegetation of stony banks in this SAC as vegetated shingle spits and they are defined as fringing beaches following Chapman (1976).

The NSBS (Moore and Wilson, 1999) ranked each surveyed site as either High, Medium or Low interest, based on site representativity, species diversity, habitat diversity and the presence of rare or scarce species. Reen Point was ranked as a 'High interest' site by the NSBS (Moore and Wilson, 1999) due to it being a unique system. A 'High interest' ranking denoted a site that is of high conservation value and perhaps of interest botanically and/or geomorphologically (Moore and Wilson, 1999).

The target is that there should be no decline or change in the distribution of the habitat, unless it is the result of natural processes, including erosion and succession.

3.4 Structure and Functions

A fundamental aim of shingle conservation is to facilitate natural mobility. Shingle beaches are naturally dynamic systems, making them of geomorphological interest, as well as ecological interest. They are constantly changing and shingle features are rarely stable in the long-term.

3.4.1 Physical structure: functionality and sediment supply

The health and on-going development of the habitat relies on a continuing supply of shingle sediment. This may occur sporadically as a response to storm events rather than continuously. Interference with the natural coastal processes, through offshore (or onshore) extraction or coastal defence structures in particular, can interrupt the supply of sediment and lead to beach starvation.

The shingle in the SAC comprises cobble and pebble as defined using a modified version of the particle size ranges defined in Fossitt (2000). Cobble is the major component in all stops with exposed shingle in Reen Point Shingle SAC (Martin *et al.*, 2017).

Table 1. Shingle composition (as defined in Fossitt (2000) with minor modifications) of perennial vegetation of stony banks in Reen Point Shingle SAC during the VSM 2016. Percentage (%) cover shown, recorded to the nearest 5%. Only stops with exposed shingle could contribute to the data presented.

	Stop 1	Stop 3	Stop 4
Boulder (>256 mm)	0	0	0
Cobble (>64-256 mm)	80	70	85
Pebble (>16-64 mm)	20	30	15
Gravel (2-16 mm)	0	0	0

The target is to maintain, or where necessary restore, the natural circulation of sediment and organic matter, without any physical obstructions.

3.4.2 Physical structure: disturbance

Damage to the habitat due to disturbance was assessed as a negative indicator by Martin *et al.* (2017). Disturbance can include damage from heavy trampling, vehicle damage and removal of substrate.

The target is that no more than 20% of the habitat is affected by disturbance.

3.4.3 Vegetation structure: zonation

Ecological variation within this habitat type depends on stability, the amount of fine material accumulating between the pebbles, climatic conditions, width of the foreshore and past management of the site. The ridges and lows also influence the vegetation patterns, resulting in characteristic communities and zonations of bare and vegetated shingle. In the frontal, less stable areas of shingle, the vegetation tends to be dominated by short-lived salt-tolerant perennials (pioneer community). Where the shingle is more stable, it becomes more vegetated and may include grassland, heathland and scrub communities, depending on the exact nature of the site. The presence of lichens indicates long-term stability of the shingle structure. Further information on the communities of perennial vegetation of stony banks is found in Martin *et al.* (2017).

The VSM (Martin *et al.*, 2017) recorded one community of perennial vegetation of stony banks in Reen Point Shingle SAC. The only community recorded within the SAC was the pioneer community, found towards the front of the system.

Vegetated shingle is part of a naturally dynamic coastal system. In order to ensure the ecological functioning of all of the vegetated shingle communities present, it is vital to maintain the zonations and transitions to other habitats, including lagoon, saltmarsh and sand dune habitats.

Habitats associated with perennial vegetation of stony banks in Reen Point Shingle SAC include dry heaths, saltmarsh habitats and a lagoon (Martin *et al.*, 2017).

The target is to maintain the range of coastal habitats, including transitional zones, subject to natural processes, including erosion and succession.

3.4.4 Vegetation composition: communities and typical species

The degree of exposure, as well as the coarseness and stability of the substrate, determines species diversity. Typical species lists for the three main vegetated shingle communities (pioneer, grassland and scrub) are presented in Martin *et al.* (2017).

As mentioned above, the shingle in Reen Point Shingle SAC includes one community of perennial vegetation of stony banks that was recorded during the VSM (Martin *et al.*, 2017) – a pioneer community, which was recorded towards the front of the system within the boundary of the SAC. Table 2 presents the typical species recorded within the pioneer community of perennial vegetation of stony banks in Reen Point Shingle SAC.

Table 2. Typical species recorded within the pioneer community of perennial vegetation of stony banks in Reen Point Shingle SAC. Negative and non-native species are excluded from the list.

Pioneer community	
<i>Agrostis stolonifera</i>	<i>Lotus corniculatus</i>
<i>Anthyllis vulneraria</i>	<i>Plantago lanceolata</i>
<i>Atriplex prostrata</i>	<i>Polygonum aviculare</i>
<i>Beta vulgaris</i> subsp. <i>maritima</i>	<i>Potentilla anserina</i>
<i>Calystegia sepium</i>	<i>Raphanus raphanistrum</i> subsp. <i>maritimus</i>
<i>Cerastium fontanum</i>	<i>Rubus fruticosus</i> agg.
<i>Cochlearia officinalis</i>	<i>Rumex crispus</i>
<i>Festuca rubra</i>	<i>Silene uniflora</i>
<i>Galium aparine</i>	<i>Sonchus arvensis</i>
<i>Geranium robertianum</i>	<i>Trifolium repens</i>
<i>Holcus lanatus</i>	<i>Tripleurospermum maritimum</i>
<i>Leontodon autumnalis</i>	

No notable species were recorded within the perennial vegetation of stony banks habitat in Reen Point Shingle SAC during the NSBS (Moore and Wilson, 1999) or the VSM (Martin *et al.*, 2017).

The target for this attribute is to ensure that occurrence of the typical species within the range of vegetated shingle communities is maintained.

3.4.5 Vegetation composition: negative indicator species

Negative indicator species can include species indicative of changes in nutrient status e.g. nettle (*Urtica dioica*), and species not considered to be typical of the habitat, e.g. bracken (*Pteridium aquilinum*). The list of negative indicator species commonly found in the habitat is presented in Appendix I of Martin *et al.* (2017).

Negative indicator species were recorded within two monitoring stops in the habitat in Reen Point Shingle SAC during the VSM (Martin *et al.*, 2017). Perennial rye-grass (*Lolium perenne*) and greater plantain (*Plantago major*) were recorded in stop 4 and common ragwort (*Senecio jacobaea*) in stop 2, but in both cases at less than 1% cover.

The target for negative indicator species is that no species is present in more than 60% of stops and the combined cover in any individual stop is 25% or less.

3.4.6 Vegetation composition: non-native species

Non-native species can be invasive and have deleterious effects on native vegetation. Low targets are set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances.

The VSM (Martin *et al.*, 2017) recorded the invasive non-native species montbretia (*Crocsmia x crocosmiiflora*) within the vegetated shingle habitat in the SAC.

The target for non-native species is that no species is present in more than 20% of stops, the combined cover in any individual stop is 1% or less, and the cover across the whole site 1% or less. At a site level, if a non-native species has been under-recorded, or not recorded, via the stops the percentage cover for the species across the site should be recorded and assessed.

4 References

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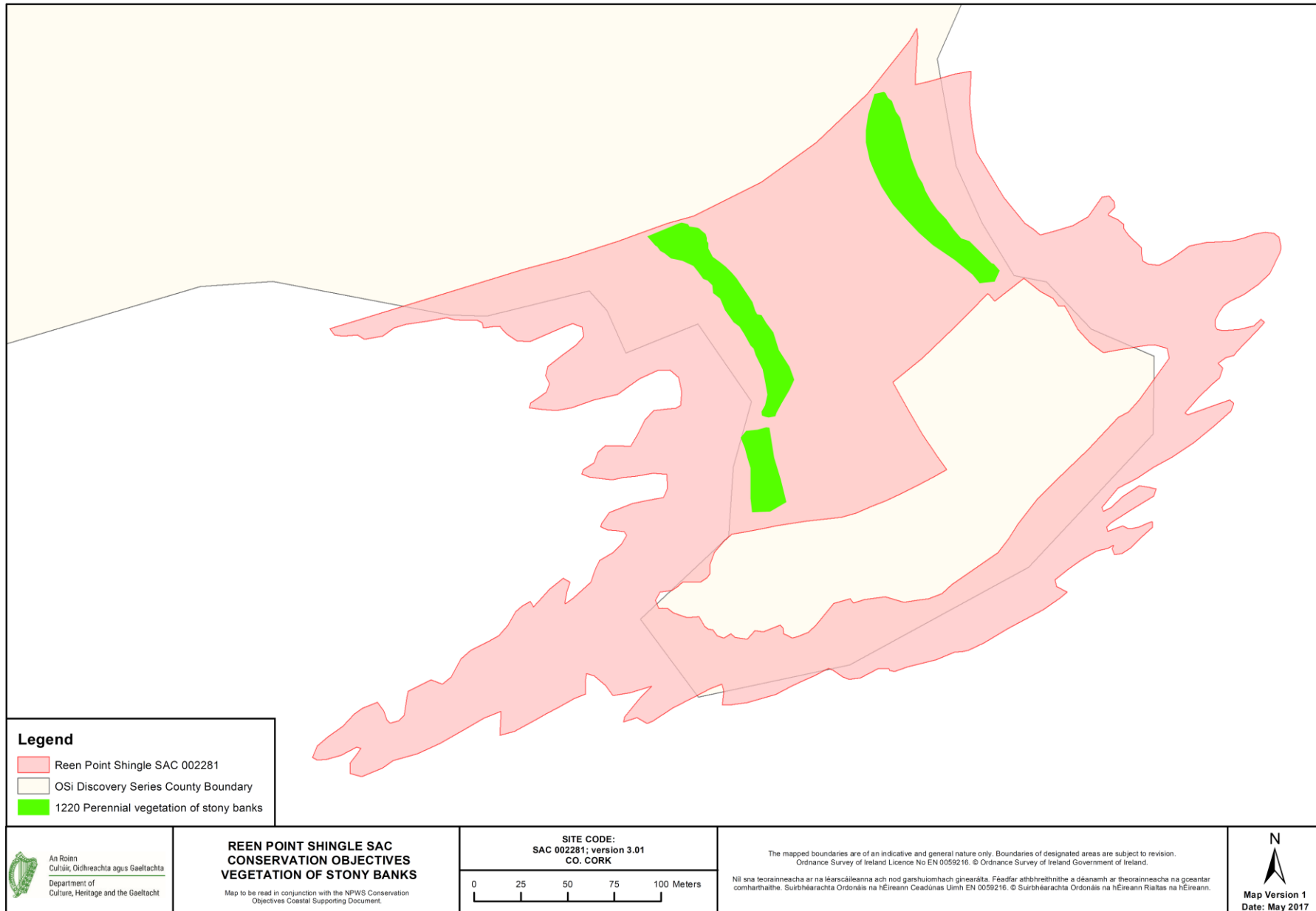
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Moore, D. and Wilson, F. (1999) National Shingle Beach Survey of Ireland 1999. Unpublished report to National Parks and Wildlife Service, Dublin.

NPWS (2013) The status of EU protected habitats and species in Ireland. Volume 2. Habitat Assessments. Version 1.1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.

Appendix I – Distribution map of perennial vegetation of stony banks in Reen Point Shingle SAC



Appendix II – Reen Point site report and habitat map from the Vegetated Shingle Monitoring Project (VSM)

SITE 016 REEN POINT

The following individual site report should be read in conjunction with the main report (Martin *et al.*, 2017). Please note that NSBS refers to the National Shingle Beach Survey (NSBS) (Moore & Wilson, 1999), CMP refers to the Coastal Monitoring Project (Ryle *et al.*, 2009), SDM refers to the Sand Dunes Monitoring Project (Delaney *et al.*, 2013) and VSM to the Vegetated Shingle Monitoring Project (Martin *et al.*, 2017).

The shingle at this location is referred to as Site 109 Reen Point by the NSBS.

1 SITE DESCRIPTION

Reen Point is a small site located approximately 6 km southwest of Durrus, Co. Cork, on the northern side of Dunmanus Bay. Reen Point comprises two vegetated ridge barriers, with a lagoon separating them. It is part of the Reen Point Shingle SAC (002281) (NPWS, 2014). This site was not surveyed by either the CMP or the SDM. It was, however, surveyed during the NSBS for the Annex I habitat **1220 Perennial vegetation of stony banks**, though no conservation assessment was made. It was ranked as a ‘High interest’ site by the NSBS due to it being a unique system.

Annex I habitats associated with the **1220 Perennial vegetation of stony banks** surveyed at Reen Point include ***1150 Lagoons**, **1410 Mediterranean salt meadows (*Juncetalia maritimi*)** and **4030 European dry heaths** that are all present in the centre of the site between the two shingle banks. No noteworthy species were observed during the NSBS or VSM.

Reen Point may have some recreational use as evidenced by the trampling impacts observed, although most of the observed trampling appeared to be due to cattle moving across the shingle to reach the grassland on the point.

2 CONSERVATION ASSESSMENTS

2.1 Overview

Reen Point was surveyed on the 16th of August 2016. **1220 Perennial vegetation of stony banks** was recorded during the NSBS, and again during the VSM. The **1220 Perennial vegetation of stony banks** has one vegetation community present - a pioneer community. The results of the conservation assessment of **1220 Perennial vegetation of stony banks** are presented in Table 16.1.

Table 16.1. Conservation assessment results for **1220 Perennial vegetation of stony banks** surveyed at Reen Point, Co. Cork.

Habitat	Area	Structure & Functions	Future Prospects	Overall result
1220 Perennial vegetation of stony banks	Favourable	Favourable	Unfavourable -Inadequate	Unfavourable -Inadequate

2.2 1220 Perennial vegetation of stony banks habitat assessment

The conservation status of the Annex I habitat **1220 Perennial vegetation of stony banks** at Reen Point is discussed below. As this habitat was not previously assessed, no trend can be ascribed to the conservation status. Areas recorded in 2016 are compared with the 1995 aerial photograph series. Due to the quality of these aerial photographs, only gross changes in area are noticeable. It should be borne in mind that natural processes such as erosion, deposition and succession are primary drivers of change on coastal habitats.

2.2.1 Area

The area of the pioneer vegetation community of Annex I **1220 Perennial vegetation of stony banks** is presented in Table 16.2. Based on 1995 aerial photographs there has been no change in the area of the habitat as a whole. It should be noted that due to the quality of the aerial photographs taken in 1995, only gross changes in area would be noticeable. Area was assessed as Favourable (stable) during the VSM.

Table 16.2. Area of the vegetation community of Annex I **1220 Perennial vegetation of stony banks** at Reen Point based on aerial photographs (APs) from 1995 for baseline areas and areas mapped during the VSM.

Habitat	1995 APs (ha)	Vegetated Shingle Monitoring Project (ha)
1220 Perennial vegetation of stony banks		
Pioneer community	0.43	0.43
Total	0.43	0.43

2.2.2 Structure and Functions

Structure and Functions were assessed for **1220 Perennial vegetation of stony banks** recorded at Reen Point during the VSM. Table 16.3 shows the results of the Structure and Functions assessment.

Table 16.3. Annex I **1220 Perennial vegetation of stony banks** at Reen Point for which Structure and Functions were assessed, with the number of monitoring stops, assessment criteria and the number of criteria that failed.

Habitat	No. monitoring stops	Total no. assessment criteria	No. failed criteria
1220 Perennial vegetation of stony banks	4	7	0

None of the assessment criteria failed for **1220 Perennial vegetation of stony banks**. Structure and Functions of **1220 Perennial vegetation of stony banks** were assessed as Favourable during the VSM.

2.2.3 Future Prospects

Impacts and activities recorded at Reen Point are presented in Table 16.4. Impact codes are assigned according to Ssymank (2011). Three negative impacts were recorded at Reen Point. The presence of litter and dog waste was recorded as a low-intensity negative impact, while trampling from cattle and humans and the invasive non-native species *Crocsmia x crocosmiiflora* (montbretia) were medium-intensity negative impacts. Coastal defences were recorded as a high intensity neutral impact affecting 10% of the habitat. The coastal defences are associated with the adjacent road, and are also

used to stabilise the shingle bank to facilitate the movement of cattle. There were no positive impacts recorded at Reen Point.

Table 16.4. Impacts recorded in Annex I **1220 Perennial vegetation of stony banks** at Reen Point in 2016. Source refers to whether the impact being scored originates inside or outside the Annex I habitat being assessed.

Habitat code	Impact code	Impact description	Intensity	Effect	Percent of habitat	Source
1220	G05.01	Trampling, overuse	Medium	Negative	2	Inside
1220	H05.01	Garbage and solid waste	Low	Negative	<1	Inside
1220	I01	Invasive non-native species	Medium	Negative	<1	Inside
1220	J02.12.01	Sea defence or coast protection works, tidal barrages	High	Neutral	10	Inside

No impacts on **1220 Perennial vegetation of stony banks** were recorded during the NSBS. Future Prospects were assessed as Unfavourable-Inadequate during the VSM, largely due to trampling and invasive non-native species.

2.2.4 Conservation assessment

Area and Structure and Functions were assessed as Favourable, while Future Prospects were assessed as Unfavourable-Inadequate. The conservation status of **1220 Perennial vegetation of stony banks** at Reen Point was assessed as Unfavourable-Inadequate.

3 DISCUSSION

3.1 Species lists for 1220 Perennial vegetation of stony banks communities

One community of **1220 Perennial vegetation of stony banks** was recorded during the VSM. Table 16.5 presents the positive indicator species recorded within this pioneer community of **1220 Perennial vegetation of stony banks** at Reen Point.

Table 16.5. Positive indicator species recorded within the pioneer community of **1220 Perennial vegetation of stony banks** at Reen Point. Negative and non-native species are excluded from the list.

Pioneer community	
<i>Agrostis stolonifera</i>	<i>Lotus corniculatus</i>
<i>Anthyllis vulneraria</i>	<i>Plantago lanceolata</i>
<i>Atriplex prostrata</i>	<i>Polygonum aviculare</i>
<i>Beta vulgaris s. maritima</i>	<i>Potentilla anserina</i>
<i>Calystegia sepium</i>	<i>Raphanus raphanistrum s. maritimus</i>
<i>Cerastium fontanum</i>	<i>Rubus fruticosus ag.</i>
<i>Cochlearia officinalis</i>	<i>Rumex crispus</i>
<i>Festuca rubra</i>	<i>Silene uniflora</i>
<i>Galium aparine</i>	<i>Sonchus arvensis</i>
<i>Geranium robertianum</i>	<i>Trifolium repens</i>
<i>Holcus lanatus</i>	<i>Tripleurospermum maritimum</i>
<i>Leontodon autumnalis</i>	

3.2 Shingle vegetation substrate and composition

The vegetation of **1220 Perennial vegetation of stony banks** is rooted within an organic substrate for stop 1, and in an organic-gravel substrate mix for stops 2 to 4. The shingle comprises cobble and pebble as defined using a modified version of the particle size ranges defined in Fossitt (2000). In all stops with exposed shingle, cobble is the major component (Table 16.6).

Table 16.6. Shingle composition (as defined in Fossitt (2000) with minor modifications) of **1220 Perennial vegetation of stony banks** at Reen Point during the VSM 2016. % cover shown, recorded to the nearest 5%. Only stops with exposed shingle could contribute to the data presented.

	Stop 1	Stop 3	Stop 4
Boulder (>256 mm)	0	0	0
Cobble (>64-256 mm)	80	70	85
Pebble (>16-64 mm)	20	30	15
Gravel (2-16 mm)	0	0	0

3.3 Stabilising effects of permanent structures

Any anthropogenic structures which prevent the natural habitat dynamics of **1220 Perennial vegetation of stony banks** must be looked upon unfavourably. The site-specific conservation objective for **1220 Perennial vegetation of stony banks** in Reen Point Shingle SAC (SAC 002281) states that "A fundamental aim of shingle conservation is to facilitate natural mobility", with a target "to maintain the natural circulation of sediment and organic matter, without any physical obstructions". There are coastal defences associated with the adjacent road which are also used to stabilise the shingle bank to facilitate the movement of cattle, and these are artificially stabilising the **1220 Perennial vegetation of stony banks** habitat. Following the approach undertaken by the SDM most permanent built infrastructure, such as coastal defences and coastal roads, that were in place on the 1995 aerial photographs and had not undergone significant modifications or improvements since 1995 were scored as neutral.

3.4 Climate change

Due to the extensive erosion of coastal systems within Ireland during the winter storms of 2013/14 and evidence that an increase in Atlantic storms over the last few decades could be due to climate change (Masselink *et al.*, 2016), the impact of climate change on **1220 Perennial vegetation of stony banks** should be assessed. Based on comparisons between the VSM mapping recorded in 2016 and aerial photography taken in 2010 it appears that the area of **1220 Perennial vegetation of stony banks** at this site is unchanged and any impacts from storm activity have been minor. The impact of climate change has not been assessed for this site as it would be more appropriate if an assessment of this impact was made at the national level.

3.5 Other impacts

The non-native invasive species *Crocoshmia x crocosmiiflora* (montbretia), which has invaded the site since the NSBS survey in 1999, should be eradicated from the site as soon as possible.

A site-specific management plan addressing the issues discussed in sections 3.3 and 3.5 would help improve the Future Prospects of **1220 Perennial vegetation of stony banks**, and this would ultimately improve the overall conservation assessment for the habitat.

4 REFERENCES

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