SOUTH EAST DEVON HABITAT REGULATIONS PARTNERSHIP

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# Agenda for South and East Devon Habitat Regul Executive Committee Wednesday, 24th April, 2024, 2.00 pm

**Members of South and East Devon Habitat Regulations Executive Committee**

Councillors P Bialyk (Chair), M Wrigley and G Jung

**Venue:** Council Chamber, East Devon District Council, Blackdown House, Border Road, Heathpark Industrial Estate, Honiton EX14 1EJ

**Contact:** Debbie Meakin 01395 517540; email dmeakin@eastdevon.gov.uk

(or group number 01395 517546)
26 March 2024

1 Minutes of the previous meeting (Pages 3 - 6)

To agree the minutes of the previous meeting held on 27 April 2023.

2 Apologies

3 Declarations of interest

Guidance is available online to Councillors and co-opted members on making declarations of interest

4 Public speaking

Information on public speaking is available online.

5 Matters of urgency

Information on matters of urgency is available online

6 Confidential/exempt items

East Devon Exeter City Council Teignbridge District Council South Devon

To agree any items to be dealt with after the public (including the Press) have been excluded. There are no items which officers recommend should be dealt with in this way.

7 Monitoring Petalwort at Dawlish Warren (Pages 7 - 32)

8 Dawlish Warren NNR - 2023 trampling and nutrient enrichment assessment (Pages 33 - 83)

9 Branding update (Pages 84 - 90)

10 Habitat mitigation team update (Pages 91 - 103)

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Members of the public exercising their right to speak during Public Question Time will be recorded.

Decision making and equalities

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**EAST DEVON DISTRICT COUNCIL**

# Minutes of the meeting of South and East Devon Habitat Regulations Executive Committee held at Yarty Room, Blackdown House, Honiton on 27 April 2023

**Attendance list at end of document**
The meeting started at 2.00 pm and ended at 2.45 pm

## 112 Public speaking

There were no members of the public registered to speak.

## 113 Minutes of the previous meeting held on 3 November 2022

Minutes of the South East Devon Habitat Regulations Executive Committee meeting held on 3 November 2022 were agreed by the committee.

## 114 Declarations of interest

Cllr Martin Wrigley: personal interest – his property overlooks the estuary and he is a member and Treasurer of Cockwood Boat Club.

Cllr Geoff Jung – Affects non-registerable interest: Member of Woodbury Parish Council, the area of which includes part of the Pebblebed Heath (minutes 117 – 122).

## 115 Matters of urgency

There were no matters of urgency.

## 116 Confidential/exempt items

There were none.

## 117 2022-23 Annual Business Plan - annual report

The Delivery Manager introduced the 2022-23 Annual Business Plan annual report, which outlined the progress made in the delivery of ongoing mitigation measures set out in previous annual business plans and ongoing measures established in the Plan which was approved in May 2022. The following points were highlighted:

- New mitigation measures in progress were set out in Table 2.
- The items for Dawlish Warren, set out in Table 4, were currently on hold due to the Environment Agency work, and this would be considered as part of the developing Mitigation Strategy.

Comments from the Committee included:

- Thanks to all involved for the progress made in so many areas.
- It is right that the mitigation measures for Dawlish Warren should be on hold because the potential consequences of what is being discussed are significant and complex.
- It is understood that the geotube could be removed from the back of the Dawlish Warren in 2025. This will certainly impact on the Dawlish Warren and whole of the Exe estuary,

however there is a large amount of uncertainty and it is not possible to predict what is going to happen and what the impact will be.

- This Committee is concerned with protecting habitat, but there will be other interests that are as important to other people e.g. railways, flooding of residential properties. This Committee will need to ensure that in protecting things that are their responsibility, other organisations do so in a way that does not upset the habitat more than absolutely necessary. The Committee would welcome a steer from Natural England.
- Members were in agreement that they would like this Committee to be involved in development of the new Mitigation Strategy. The Strategy will need to be more flexible than the previous structure, so that the Committee can respond appropriately to the changing situation.

The Principal Solicitor stated that from a legal and governance perspective, the role of this Committee is to deliver the identified mitigation measures set out by the three Councils; it would be for discussions to take place within each of the authorities to explore whether they wish to see the Committee's terms of references broadened, so that it has a different role.

The Committee agreed that it has a responsibility to highlight its concerns and request that the three authorities consider how they want to take this forward, given that the current format cannot work in such a changing environment.

**RESOLVED** that the Executive Committee

- Requests that the senior leaders of the three authorities meet to discuss how to react to the changing protection of the Exe estuary generally.
- Notes the progress made in delivering the 2022/23 annual business plan
- Notes the status of mitigation measures from each of the plans, as well as explanations given for measures subject to delay and revised completion dates.

## 118 Habitat mitigation team update report

The team updates were outlined in the report, including:

- There are two Wildlife Wardens in place, one of whom is full time.
- Details of their activities covering October 2022 – March 2023.
- Devon Loves Dogs update covering the period since November 2022, including Waggy Walks, a presentation to the Devon Countryside Access Forum and participation in a Recreational Disturbance & Responsible Recreation Seminar hosted by the RSPB.

Comments from the Committee included:

- Thanks to the team for a helpful report, in the context of the challenges arising from staff changes.
- The Friends of the River Exe group are holding an event in September which is a celebration of the River Exe and the Exe estuary, and this would be an opportunity to demonstrate what the authorities and this Committee are doing.
- The Committee recognised that its values and objectives align with those of the Friends of the River Exe group, and it would be beneficial to work the group as much as possible.

**RESOLVED** that the Executive Committee:

- Notes the updates provided by the Wildlife Warden and Devon Loves Dogs coordinator.
- Receives a further update at the next meeting of the Executive.
- Encourages the team to explore ways of working with the Friends of the River Exe.

## 119 Communications report update

The Committee received the update report which reviewed the performance against key performance indicators, for the period from March 2022 to February 2023. The Delivery Manager highlighted that the April 2022 results were affected by issues with Google Analytics which is why the data is skewed.

The Committee commended the team for the good work.

**RESOLVED** that the Executive Committee:

- Notes the results of the communications report for the period March 2022 – February 2023.
- Will receive the next communication report in March 2024.

## 120 Finance report

The Finance report provided a detailed overview of the financial position of the Partnership including the expenditure against budget for the 2022-23 Annual Business Plan and reasons for any variance.

Comments from the Committee included:

- The Committee was pleased to see the new SANGS coming into place.
- The figures are within budget which puts the Partnership in a good position to protect the habitat.

**RESOLVED** that the Executive Committee:

- Notes the update on the overall financial position including contributions received, expenditure and anticipated contributions (from signed S106 and CIL).
- Notes the expenditure against budget for the 2022-23 Annual Business Plan and reasons given for any variance.

## 121 Risk Register update report

The Delivery Manager introduced the report which provided an overview of all identified risks and plans for how those risks will be treated. The following points were highlighted:

- Rising inflation and the situation in Eastern Europe could affect the housing market in the UK.
- Rising inflation is also affecting the costings of mitigation measures, potentially impacting both income and expenditure.

In discussion, the Committee suggested that the team reconsiders the 'medium' impact rating for risk number 6 – Dawlish Warren coastal realignment – given what might happen and the wider impact on the areas that they are actively trying to protect.

**RESOLVED** that the Executive Committee

- Notes the identification, categorisation and prioritisation of risks as recorded in the accompanying Risk Register, associated with delivery of the South-east Devon European Site Mitigation Strategy.
- Notes the control measures in place to mitigate the risks identified.
- Receives an updated Risk Register report in 12 months.

## 122 2023-24 Annual Business Plan and 5 Year Delivery Plan

The Delivery Manager introduced the report which set out the annual business plan and the actions proposed to be undertaken by the team, together with an update on the 5 Year Delivery Plan.

The Committee was pleased to see within in the 5 Year Delivery Plan a recommendation to receive a further report relating to the proposed changes to the Mitigation Strategy regarding the Dawlish Warren, and accepted this subject to the recommendation set out at minute 117, that the senior leaders of the three authorities meet to discuss how to react to the changing protection of the Exe estuary generally.

**RESOLVED** that the Executive Committee:

- Approves the 2023-24 Annual Business Plan (Appendix A) and the commitments and actions set out therein.
- Notes the updated 5 Year Delivery Plan also shown in Appendix A.
- Receives a further report relating to any proposed changes to the mitigation strategy regarding Dawlish Warren and the Exe estuary in relation to the Dawlish Warren Beach Management Scheme. Timing dependent on completion of a review by the Environment Agency.

The Chair thanked everyone for attending and expressed his gratitude to officers and all contributors for their hard work.

## Attendance List

**Councillors present:**
G Jung (Chair) (EDDC)
R Sutton (EDC)
M Wrigley (TDC)

**Officers in attendance:**
Anita Williams, Principal Solicitor (Deputy Monitoring Officer)
Naomi Harnett, Delivery Manager

**Also in attendance:**
Neil Sherwood, Natural England

Chair: ..... Date: .....

SOUTH EAST DEVON
HABITAT REGULATIONS
PARTNERSHIP

# South East Devon Habitat Regulations Executive Committee

*Vegetation Survey & Assessment –*
*Petalwort monitoring at Dawlish Warren 2023*

*January 2024*

East Devon
Exeter City Council
Teignbridge DISTRICT COUNCIL South Devon

Legal comment/advice:

There are no substantive legal issues to be added to this report.

Finance comment/advice:

No direct financial implication arise from the report.

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|---|---|
| **Public Document:** | Yes |
| **Exemption:** | None |
| **Review date for release** | None |

## Recommendations

It is proposed that the Executive Committee:

1. Notes the vegetation survey and assessment report and the recommendations set out therein.
2. Receives an update from Teignbridge District Council at the next meeting regarding the status of the proposed Petalwort translocation scheme.
3. Subject to (2) above, considers funding the next survey on the conservation assessment of Petalwort in 2026.

Equalities impact: Low

Risk: High.

The attached report, included here as Appendix A, suggests that without management intervention there is a high risk that Petalwort may disappear from Dawlish Warren entirely.

### 1. Summary

1.1 Petalwort is a small, pale green plant which is one of the special interest features for which Dawlish Warren Special Area of Conservation (SAC) is designated. It is nationally scarce in the UK, being widely but sparsely distributed. Dawlish Warren is one of seven sites in England where the plant is recorded.

1.2 Petalwort was originally identified at Dawlish Warren in 1997 by Dr David Holyoak in two general areas of Dawlish Warren, one population close to the Visitor Centre and the second broadly spread across the Greenland Lake grassland. Subsequent surveys took place in 1999, 2001, 2003, 2012 and 2019.

1.3 Following the Beach Management Scheme, initiated by the Environment Agency in 2017, it is likely that a dynamic dune system will redevelop in parts of the site. If the dunes erode as predicted by the Environment Agency, the second area may become inundated with seawater, destroying the existing population and decreasing the chance of natural regeneration through spore dispersal.

1.4 Teignbridge District Council (TDC) Green Spaces Rangers at the Warren have already undertaken some experimental translocations of Petalwort and habitat creation to areas behind the newly constructed wall near the Visitor Centre (most likely to be protected from any inundation by the sea), under licence from Natural England.

1.5 The 2012 survey of Petalwort at the Warren developed a baseline dataset to enable identification of population trends and the overall condition of the plant across the site. This survey recorded two areas where populations of the plant could be found, referred to as the Greenland Lake Slack (a dune slack is a low-lying area which is seasonally flooded and has low nutrient levels) and the area to the west of the visitor centre.

1.6 Monitoring of the success/failure of these translocations and the status of the plant onsite was approved by HREC in June 2016. Subsequent delays related to consent for Petalwort habitat creation meant that the first study funded through the mitigation Strategy took place in 2019.

1.7 The 2019 study found that populations of Petalwort were found in Greenland Lake Slack in seven hollows, with a total of 1301 thalli (the main body of the plant) counted. Both sexes were recorded in three hollows and female plants only in another two. The total population of Petalwort in Greenland Lake Slack in 2019 was estimated to be 1300-1700 thalli.

1.8 In comparison with earlier studies, the number of thalli recorded fell between 2003 and 2012 and remained stable to 2019. Their distribution remained fairly consistent, with much local variation. Shallower hollows were considered less suitable as they are more likely to be dominated by grass and sedges.

1.9 Unfortunately, despite intensive searches, no thalli were found in either of the slacks where plants had been introduced to the west of the visitor centre or in the Visitor Centre Slack. This suggested that transplanting was unsuccessful and that the Visitor Centre Slack population (i.e., the population deemed “safe” from inundation by salt water in the future) was now extinct.

1.10 The 2019 report warned that the failure of attempts to establish Petalwort in areas to the west of the Visitor Centre means that if the Greenland Lake Slack population continues to decline, there is no reliable way of ensuring the survival of the plant at Dawlish Warren.

1.11 The report concluded that the prognosis for Petalwort at Dawlish is very poor without an extensive and imaginative translocation programme. It was recommended this must include experimental translocation, combined with habitat management. Recognising that the entire population of Petalwort (and other species) is likely to be lost, the report went on to say that there should be no constraint on potential for experimental manipulation of populations within Greenland Lake Slack.

1.12 Understanding the impacts on the plant from increasing visitor pressure is a nuanced issue. On one hand, if not inundated by saltwater, predicted increases in visitor pressure on Greenland Lake Slack could actually benefit Petalwort by increasing pressure on other plants and thereby maintaining bare habitat. However, too much trampling on newly translocated turves may destroy the plant before it can establish a foothold.

1.13 A translocation project initiated by TDC Rangers to relocate turves of Petalwort to a “safe” area west of Greenland Lake was successful in attracting funding from a bid to Natural England in 2023. Unfortunately, the funding deadline expired before works could be initiated, due to delays in the consenting process at NE. The bid has therefore been resubmitted.

**2. 2023 survey and assessment.**

2.1 The botanist and vegetation ecologist Sharon Pilkington was awarded the contract to carry out the survey and report work.

2.2 Main objectives of the survey were:

- survey and map the current metapopulation of Petalwort at Dawlish Warren to update the baseline;
- undertake a condition assessment of the species and the habitat supporting it using the approach of Lansdown (2019) and cross-referencing the results of that assessment and others before it; and
- review the impacts of human activities and other influences on the species and its habitat and make relevant location-specific recommendations to maintain favourable status for Petalwort going forward.

2.3 Included here as Appendix A, the survey was undertaken in March 2023 and initially attempted to use an identical method to that employed by Lansdown in 2019. However, this soon became impractical because the hollows were not visible as discrete entities within the slack. This problem was compounded by a lack of geographical co-ordinates for individual hollows that could have helped to accurately relocate them.

2.4 Therefore, a slightly different approach was taken. A careful search of habitat that appeared to have potential to support Petalwort thalli in Greenland Lake Slack was undertaken and, where discrete colonies were found, they were georeferenced using a Garmin hand-held navigational receiver.

2.5 A search of the slack just west of the Visitor Centre where Petalwort had previously been translocated was also made but proved unsuccessful.

2.6 A comparison of the total number of thalli and their distribution across Greenland Lake Slack was made as far as practicable with the two most recent monitoring assessments.

2.7 Ground conditions were broadly favourable for the fieldwork, with no surface water lying in any part of Greenland Lake Slack. However, the slack had been flooded for a prolonged period in the winter months prior to the survey and this rendered much of it unsuitable for spring growth of thalli. Generally, Petalwort avoids areas which flood for prolonged periods, but notwithstanding that, any plants present in low-lying parts of the slack that might start into growth later than usual would not have been visible at the time of survey.

## 3. Monitoring results

3.1 619 thalli were found in approximately 300m2 of Greenland Lake Slack, in more or less similar places to where it has been seen previously. Most colonies supported relatively low numbers of individuals (fewer than 100).

3.2 It was not possible to directly compare the location of the colonies of Petalwort found in this assessment with those found from previous years because of uncertainty about the precise locations of the damp hollows they were previously mapped in.

3.3 The results indicate that the main track verge is currently the most important microhabitat for Petalwort at Dawlish Warren. 508 thalli (82% of the metapopulation) were found within 1-2 metres of the track edge over a distance of around 190 metres,

3.4 18% of the local group of connected populations of Petalwort (metapopulation, (111 thalli)) occupied ground north of the main track. There is less disturbance across this area, although the majority of thalli were associated with flat terrain that is compacted and scuffed by either vehicular movements or frequent human footfall.

## 4. Discussion

4.1 Monitoring of the metapopulation of Petalwort at Dawlish Warren has now been undertaken for 20 years. In that time, the counts of Petalwort have varied greatly.

4.2 It is unclear how many thalli were present before 2003, although the counts from previous surveys indicate that at least 2000 were counted from the site at that time. The most reliable count is from 2003, with a total of ca. 3100 thalli in the two slacks. Lansdown (2019) suggested that counts fell after that and stabilised in 2012, although by then the population was confined to Greenland Lake Slack.

4.3 The current findings indicate that numbers of thalli have halved since 2019. It is not clear if the prolonged flooding of parts of Greenland Lake Slack may have played a significant role in the numbers of visible thalli at the time of the most recent assessment. The assessment places emphasis on the findings that east of the main track, the only thalli seen were in areas where the slight changes in ground height would have elevated the plants above the main flood zone.

4.4 The current assessment reinforces the Lansdown (2019) position that reliance on a monitoring approach that requires clear delimitation of damp hollows is no longer practical. The 2019 monitoring provided an opportunity to test the condition assessment attributes and targets previously recommended (Lansdown 2012). He proposed an alternative target encompassing extent and abundance expressed in a simple form:

***If five or more hollows support Petalwort and the total number of thalli recorded exceeds 1,000, including male and female individuals, then the metapopulation may be considered to be in favourable condition.***

4.5 Because of the difficulty of locating and identifying the wet hollows, it is unclear how many were occupied in March 2023. Survey indicates that a minimum of five hollows were occupied, possibly more. Both sexes were represented but the total thallus count falls well short of the stated target. On this basis, the population would be considered to be in unfavourable condition.

4.6 For future monitoring, the survey proposes that it would be pertinent to employ an alternative target for metapopulation extent and condition assessment:

***If Petalwort occupies 20 or more 10m OS grid squares and the total number of thalli recorded exceeds 1,000, including male and female individuals, then the metapopulation may be considered to be in favourable condition.***

4.7 According to either target condition, the total thallus count results from 2023 indicate the population is in unfavourable condition.

4.8 The report suggests that the likely reasons for the decline in number of thalli seen in the current assessment may be complicated and, without further investigation of e.g., ground hydrology, entirely speculative. However, it may have been driven by the interplay of three main factors:

• natural succession and gradual drying of Greenland Lake;

• changed patterns of recreational trampling by visitors and vehicular movements by staff across Greenland Lake Slack; and

• climate change-linked increased summer desiccation and winter flooding of slack habitat reducing the availability of suitable Petalwort habitat. It is also possible that climate change could be affecting the water table. 2022 was the hottest year on record in England and the driest since 1935.

**5. Prognosis/Conclusion**

5.1 To address immediate concerns about the declining population of Petalwort in Greenland Lake Slack and longer-term issues relating to seawater inundation in this arear, the report recommends two approaches to management.

5.2 The first approach is the implementation of short-term measures to create new habitat niches in Greenland Lake. Encouragement of more directed footfall or vehicular movements would help to create new habitat niches. Any such action should of course avoid areas where other rarities are known.

5.3 The second approach returns to the idea of translocating turves to areas thought to be safe from ingress by seawater, encouraging a population to establish away from Greenland Lake Slack.

5.4 With the first attempt to translocate Petalwort to the slack just west of the Visitor Centre seemingly now unsuccessful, it remains to be seen how successful plans to relocate turves to another translocation (to a different place) will be.

5.5 In the slack immediately west of the Visitor Centre, promotion of greater public access across the edge of the slack may naturally restore suitable trampled habitat within a few years. Hence, even if Petalwort does not find its own way there, future translocation of turves containing Petalwort from Greenland Lake Slack may 'take' better than into other receptor sites.

**South East Devon**
**Habitat Regulations**
**Executive Committee**

**January 2024**

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| Natural England comment:<br><br>Natural England have reviewed the report and have no further comment. |

VEGETATION SURVEY & ASSESSMENT

# Petalwort *Petalophyllum ralfsii* Monitoring at Dawlish Warren National Nature Reserve in 2023

REPORT TO EAST DEVON DISTRICT COUNCIL

May 2023

**CONTENTS**




Sharon Pilkington BSc (Hons) MSc CEnv MCIEEM
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# 1. INTRODUCTION

## 1.1 Petalwort

*Petalophyllum ralfsii* (Wils.) Nees & Gottsche (Petalwort) is a thallose liverwort belonging in the family Petalophyllaceae. *P. ralfsii* thalli can grow in solitary rosettes or in mats, each thallus generally measuring up to 10 mm in diameter and up to 15mm long. A subterranean lipid-packed rhizome-like stem allows it to perennate and withstand long periods of desiccation, with the visible parts of the plant dying back during dry conditions in summer.

*P. ralfsii* is dioicous and often fertile; Spore-producing capsules are carried by female plants from December to June. The spores are relatively large and may persist in the diaspore bank for long periods until environmental conditions become suitable for new plant growth. No asexual propagules are known, but P. *ralfsii* can reproduce clonally by means of bifurcation whereby the thallus splits into two and underground branches can also give rise to new thalli.

Plate 1. Several thalli of *Petalophyllum ralfsii* at Dawlish Warren

In Britain and Ireland, *P. ralfsii* is mainly a coastal species of calcareous sand dunes and machair where it behaves as a pioneer along the edges of dune slacks subject to inundation in the winter. However, it avoids ground that is deeply flooded in winter or is heavily shaded. In some sites it is strongly dependent on light disturbance and compaction provided by the movements of vehicles, humans and/or large animals. It is invariably a species of base-rich substrates with pH in the range of 7.4-7.7 and is absent from otherwise suitable base-poor habitats. It rarely grows on pure sand, instead preferring more water-retentive peaty sands. *P. ralfsii* has a Mediterranean-Atlantic distribution, and is widespread in the Mediterranean region, including North Africa and Turkey, extending northwards along the Atlantic seaboard to Britain and Ireland (Blockeel et al., 2014).

*P. ralfsii* is known from 29 Ordnance Survey 10km grid squares (hectads) in Britain, and 28 in Ireland. Indeed, Ireland holds the highest proportion of the world population of *P. ralfsii* of any country in the

world, and probably also the largest individual populations. There are also some substantial populations in the major Welsh dune systems. In England, there are particularly strong populations at a number of dune complexes in Devon and Cornwall. Whilst some colonies have increased in recent years, others have declined due to a trend of sand-dune stabilisation which over time causes dune slacks to dry out as a result of the processes of natural succession.

*P. ralfsii* is a species of high conservation importance and it is listed on Schedule 8 of the Wildlife & Countryside Act 1981 (as amended), receiving full legal protection. It is also listed under the Habitats Directive (92/43/EEC) as an Annex II species. In Britain, the species is also recognised as Nationally Scarce (Pescott, 2016) and is regarded as Vulnerable in the current Red List (Callaghan, 2022).

## 1.2 Dawlish Warren

Dawlish Warren National Nature Reserve is a 505 acre sand spit and dune complex at the mouth of the Exe Estuary. It has been designated as a Site of Special Scientific Interest (SSSI) and is part of the Exe Estuary Special Protection Area (SPA) and Ramsar site.

The site has also been designated as a Special Area of Conservation (SAC) under the provisions of the Habitats Directive. Its humid dune slacks are a type of Annex I habitat that is a primary reason for selection of this SAC and they support the *P. ralfsii* for which the site is also selected.

*P. ralfsii* was discovered at Dawlish Warren in 1997 by David Holyoak, who monitored the population until 2003. Richard Lansdown subsequently assessed the condition of the population (Lansdown 2012, 2019). The most recent estimate of population size was 1360 thalli occupying eight discrete damp hollows in Greenland Lake Slack in 2019.

Dawlish Warren is an unusual site for *P. ralfsii* as its sandy substrates are generally base-poor. The population is thought to be influenced by the proximity of concrete, masonry debris or limestone gravel, or alternatively from deposition of more basic Old Red Sandstone carried to Dawlish via long-shore drift.

## 1.3 Project Objectives

As one of the most important species of Dawlish Warren NNR, and its only Annex II species for selection as an SAC, regular monitoring of *P. ralfsii* is essential.

Sharon Pilkington (trading as Vegetation Survey & Assessment Ltd) was asked to undertake a repeat condition assessment of the *P. ralfsii* interest feature in 2023. Specifically, this work set out to:

- survey and map the current metapopulation of *P. ralfsii* at Dawlish Warren to update the baseline;
- undertake a condition assessment of the species and the habitat supporting it using the approach of Lansdown (2019) and cross-referencing the results of that assessment and others before it; and
- review the impacts of human activities and other influences on the species and its habitat and make relevant location-specific recommendations to maintain favourable status for *P. ralfsii* going forward.

## 2. METHODS

### 2.1 Fieldwork

The monitoring survey was undertaken on 21st March 2023 by Sharon Pilkington, an independent professional botanist and vegetation ecologist specialising in bryophytes.

The survey methodology aimed to replicate the wet hollow-focussed approach of Lansdown (2019). However, it quickly became apparent that this would be impractical because the hollows were not visible as discrete entities within the slack. This problem was compounded by a lack of geographical co-ordinates for individual hollows that could have helped to accurately relocate them.

To counter this, a slightly different approach was taken. A careful search of habitat that appeared to have potential to support *P. ralfsii* thalli in Greenland Lake Slack was undertaken (Figure 1) and, where discrete colonies were found, they were georeferenced using a Garmin GPSMAP64S hand-held navigational receiver[1]. A search of the slack just west of the Visitor Centre where *P. ralfsii* had previously been translocated was also made but proved unsuccessful.

Other bryophytes of high conservation importance, including any Nationally Rare and Nationally Scarce species (Pescott, 2016) were not specifically searched for, but were recorded incidentally wherever they were found.

### 2.2 Evaluation and Condition Assessment

A comparison of the total number of thalli and their distribution across Greenland Lake Slack was made as far as practicable with the two most recent monitoring assessments.

Quantum GIS software (QGIS Development Team, 2023) was used in planning fieldwork and the digitisation, presentation and analysis of results. Use of the Tom.bio QGIS plugin also enabled the overlay of 100m Ordnance Survey grid squares and the visualisation of 10m Ordnance Survey grid square occupancy.

### 2.3 Limitations

Ground conditions were broadly favourable for the fieldwork, with no surface water lying in any part of Greenland Lake Slack. However, the slack had been flooded for a prolonged period in the winter months prior to the survey and this rendered much of it unsuitable for spring growth of the thalli of *P. ralfsii*. Generally, *P. ralfsii* avoids areas which flood for prolonged periods, but notwithstanding that, any plants present in low-lying parts of the slack that might start into growth later than usual would not have been visible at the time of survey.

### 2.4 Nomenclature

The nomenclature used in this report follows the taxonomy of Blockeel et al., (2021) for mosses and liverworts and Stace (2019) for higher plants.

[1] This receiver connects to GPS and GLONASS satellite networks to give a typical positioning accuracy of 3m in open terrain.

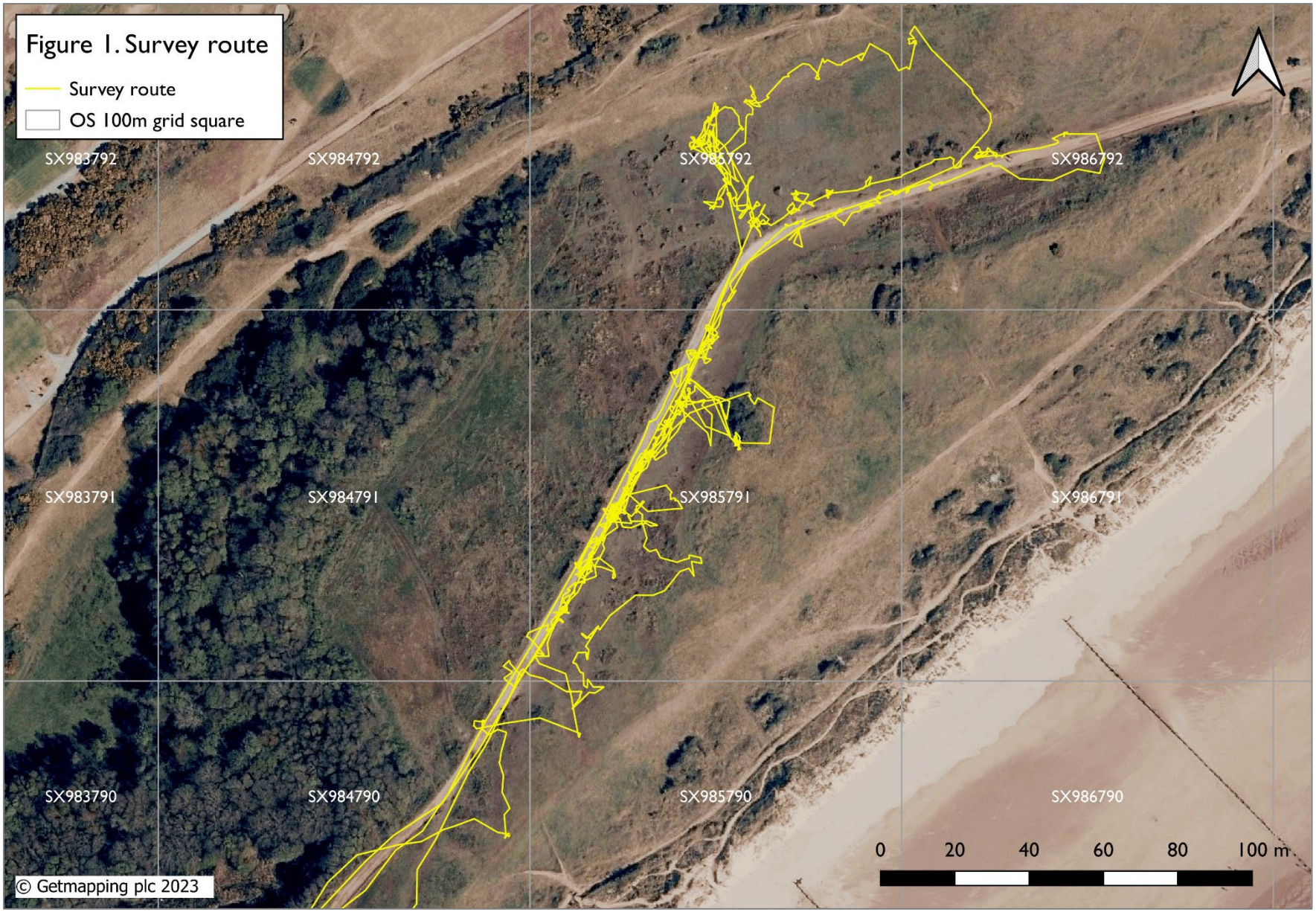
Figure 1. Survey route
Survey route
OS 100m grid square
SX983792
SX984792
SX985792
SX986792
SX983791
SX984791
SX985791
SX986791
SX983790
SX984790
SX985790
SX986790
0
20
40
60
80
100 m
© Getmapping plc 2023

## 3. FINDINGS

### 3.1 Petalwort Metapopulation Size and Extent

619 thalli were found in approximately 300m$^2$ of Greenland Lake Slack, in more or less similar places to where it has been seen previously. Figure 2 shows the locations of colonies (some of which are linear and are scattered over some distance (Table 1). Most colonies supported relatively low numbers of individuals (fewer than 100) and a limited number of thalli had reproductive structures, including immature capsules. Across the whole area, *P. ralfsii* was found to have an occupancy of 24 10m OS grid squares (Figure 3).

It was not possible to directly compare the location of the colonies of *P. ralfsii* found in this assessment with those found from previous years because of uncertainty about the precise locations of the damp hollows they were previously mapped in. However, Figure 4 indicates the *approximate* locations of these hollows to assist with broad interpretation of the findings.

The results indicate that the main track verge is currently the most important microhabitat for *P. ralfsii* at Dawlish Warren. 508 thalli (82% of the metapopulation) were found within 1-2 metres of the track edge over a distance of around 190 metres, mainly on its south-eastern verge. Its habitat here is sparsely vegetated and disturbed (compacted and scuffed) ground that lies a few centimetres higher than the adjacent track surface and low-lying slack. Plate 2 shows an example of this.

18% of the metapopulation of *P. ralfsii* (111 thalli) occupied ground north of the main track. There is less disturbance across this area, although the majority of thalli were associated with flat terrain that is compacted and scuffed by either vehicular movements or frequent human footfall (Plates 3 and 4).

Plate 2. 125 thalli along 21m of track verge at PR06. Individual thalli/clusters are marked by sticks.

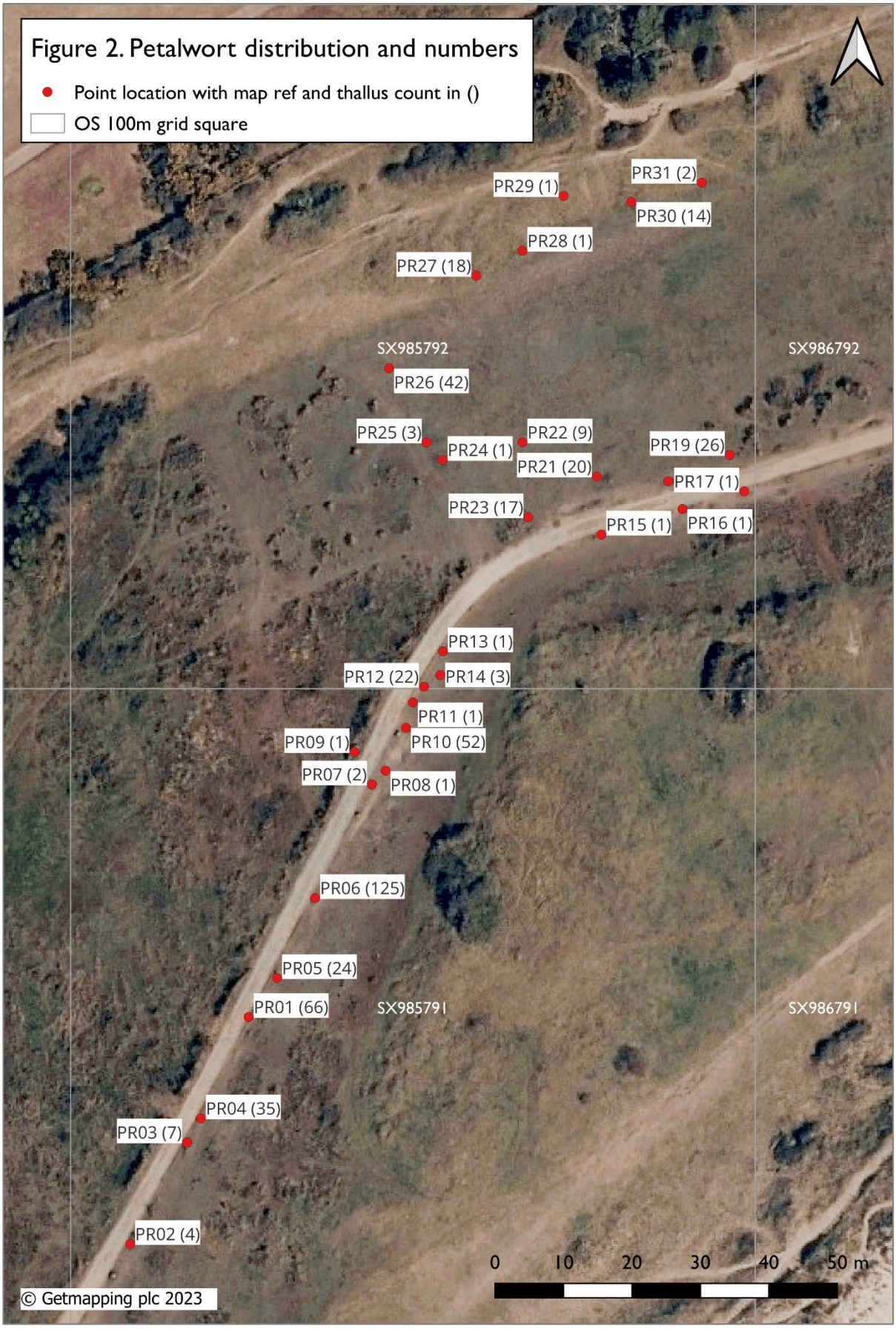
Figure 2. Petalwort distribution and numbers
Point location with map ref and thallus count in ()
OS 100m grid square
PR29 (1)
PR31 (2)
PR30 (14)
PR28 (1)
PR27 (18)
SX985792
SX986792
PR26 (42)
PR25 (3)
PR24 (1)
PR22 (9)
PR21 (20)
PR19 (26)
PR17 (1)
PR23 (17)
PR15 (1)
PR16 (1)
PR13 (1)
PR12 (22)
PR14 (3)
PR11 (1)
PR09 (1)
PR10 (52)
PR07 (2)
PR08 (1)
PR06 (125)
PR05 (24)
PR01 (66)
SX985791
SX986791
PR04 (35)
PR03 (7)
PR02 (4)
0
10
20
30
40
50 m
© Getmapping plc 2023

**Table 1. March 2023 *P. ralfsii* population details (see also Figure 2)**

| Map ref | Gridref | No. of thalli | Comment |
|---|---|---|---|
| PR01 | SX98525791 51 | 66 | In 8 x 1m area of eastern track verge. No fertile plants seen. |
| PR02 | SX98507791 20 | 4 | In 2 x 1m of eastern track verge. |
| PR03 | SX98516791 36 | 7 | In 30 x 30cm area on eastern track verge. None fertile but some plants quite robust. |
| PR04 | SX98517791 37 | 35 | In 7m of slightly raised ground on eastern track verge. None fertile. All plants within 60cm of track surface. |
| PR05 | SX98527791 58 | 24 | In 16m of slightly raised ground on eastern track verge. All within 1.5m of track. |
| PR06 | SX98535791 69 | 125 | Scattered over 21m of eastern track verge where ground is slightly raised. A few more than 2m from track in low raised vegetated 'islands' in slack. Some female plants with capsules present. |
| PR07 | SX98543791 86 | 2 | |
| PR08 | SX98545791 88 | 1 | Within 30cm of track edge. |
| PR09 | SX98540791 91 | 1 | On western verge of track where vehicles cross the verge into the slack. |
| PR10 | SX98546791 95 | 52 | A very small but dense patch on eastern verge within 1m of track. |
| PR11 | SX98549791 97 | 1 | About 3m from track edge. |
| PR12 | SX98550791 99 | 22 | In 1m² area within 1m of track. Some capsules present. |
| PR13 | SX98550792 03 | 1 | At edge of mound raised above slack. |
| PR14 | SX98553792 01 | 3 | On raised ground around boulder at track edge. |
| PR15 | SX98575792 28 | 1 | On eastern verge 30cm from track. |
| PR16 | SX98587792 31 | 1 | On eastern verge of track. |
| PR17 | SX98592792 35 | 1 | On eastern verge of track. |
| PR18 | SX98624792 49 | 46 | In 3m of raised, trampled track verge (north of track). |
| PR19 | SX98593792 41 | 26 | In 2m of raised, trampled track verge (north side of track). |
| PR20 | SX98583792 40 | 72 | Male and female thalli on side of low trampled bank on north side of track. |
| PR21 | SX98576792 36 | 20 | Growing with *Cheilothela chloropus* on north side of track. |
| PR22 | SX98566792 36 | 9 | On north side of track in area where people walk across dense vegetation. |
| PR23 | SX98564792 27 | 17 | Northern verge of track. |
| PR24 | SX98557792 37 | 1 | In quite dense *Carex flacca* - *Trichostomum crispulum* vegetation. |
| PR25 | SX98552792 36 | 3 | On slight north-facing slope in slack. |
| PR26 | SX98556792 45 | 42 | Scattered across 27 x 2m area of slack with *Cheilothela chloropus*. |
| PR27 | SX98559792 67 | 18 | Some large thalli in 1m² area. |
| PR28 | SX98565792 63 | 1 | |
| PR29 | SX98572792 71 | 1 | On heavily used grassy path below bank. |
| PR30 | SX98581792 70 | 14 | At edge of heavily used grassy path below bank. |
| **Total no. of thalli** | | **619** | |

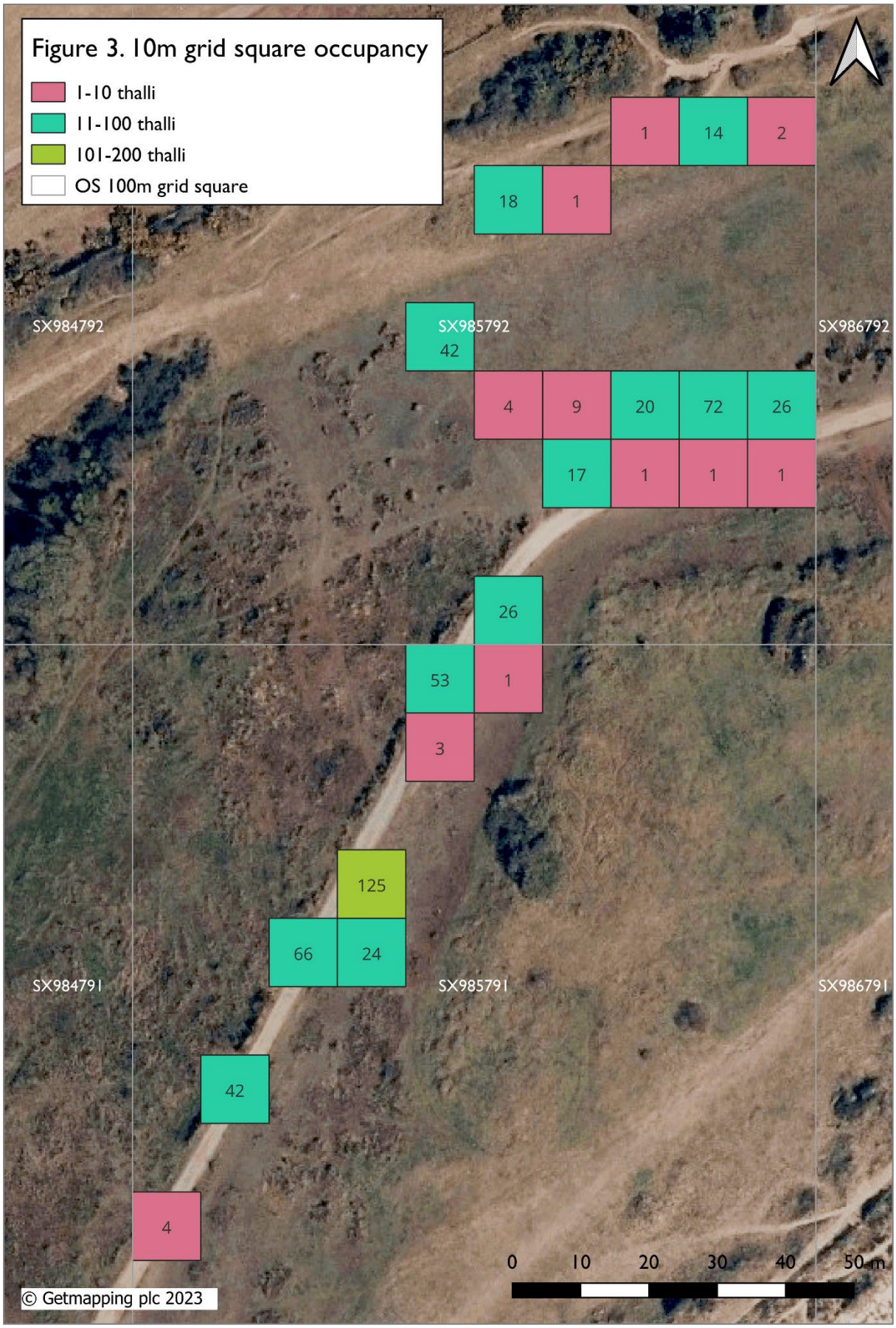
Figure 3. 10m grid square occupancy
1-10 thalli
11-100 thalli
101-200 thalli
OS 100m grid square
SX984792
SX985792
SX986792
SX984791
SX985791
SX986791
1
14
2
18
1
42
4
9
20
72
26
17
1
1
1
26
53
1
3
125
66
24
42
4
0
10
20
30
40
50 m
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*Important: the locations of the damp hollows shown in this figure should be regarded as approximate*

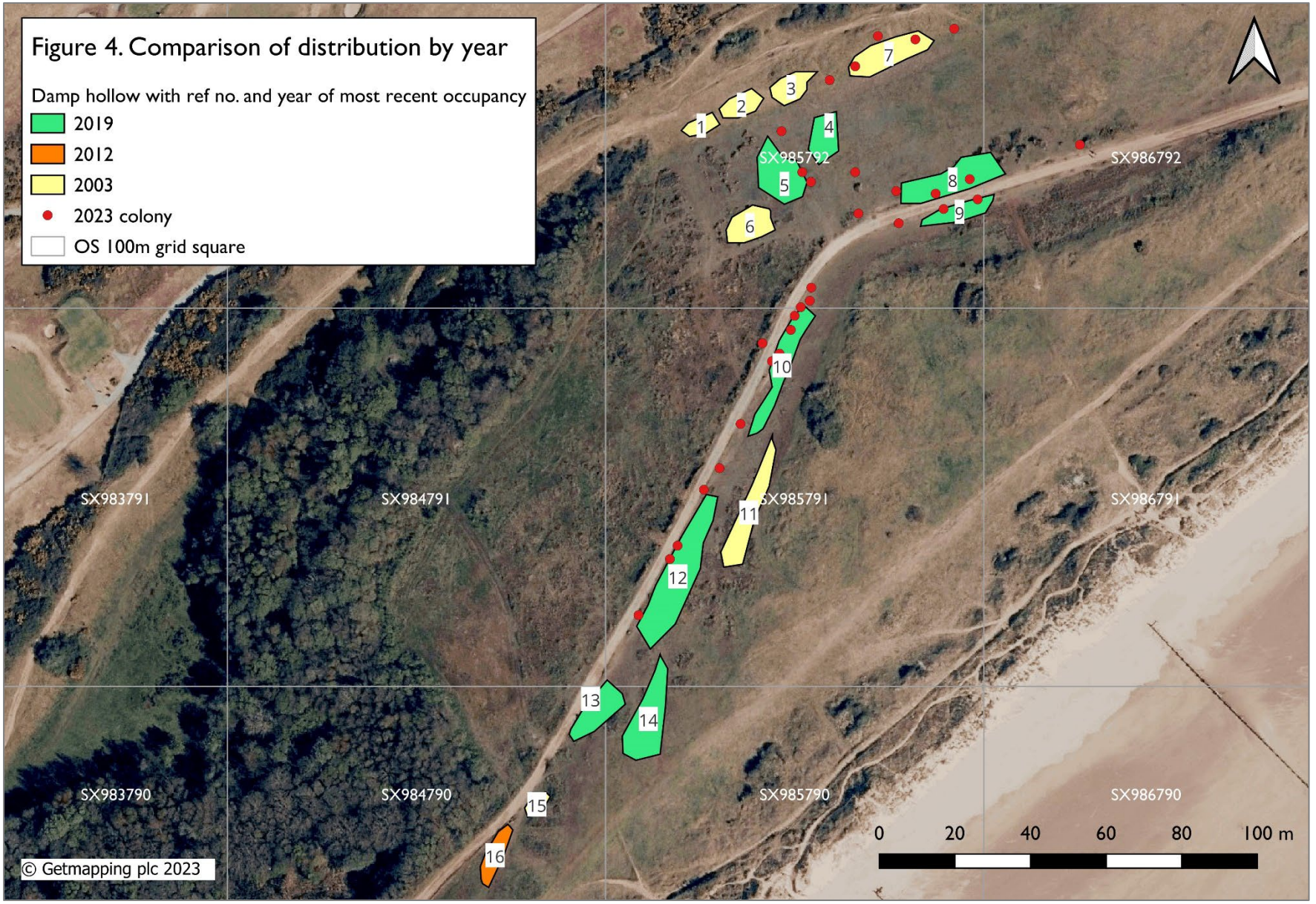

Plate 3. 42 thalli marked by sticks in trampled ground at PR26.

Plate 4. Heavily trampled path supporting *P. ralfsii* at PR31 (golf course to the right of the bank)

## 3.2 Other Rare Species

Dawlish Warren is the only place in Britain where *P. ralfsii* grows with *Cheilothela chloropus* (Rabbit-moss). This Nationally Rare moss is known from a handful of sites in Somerset and south Devon. In all of its other sites it is found in dry, unimproved Carboniferous limestone grassland, so its population in Greenland Lake Slack is highly unusual. The slack supports a very large population of *C. chloropus*, probably numbering many thousands of plants across an area approximately 50m x 40m and possibly more (Figure 5 and Table 2).

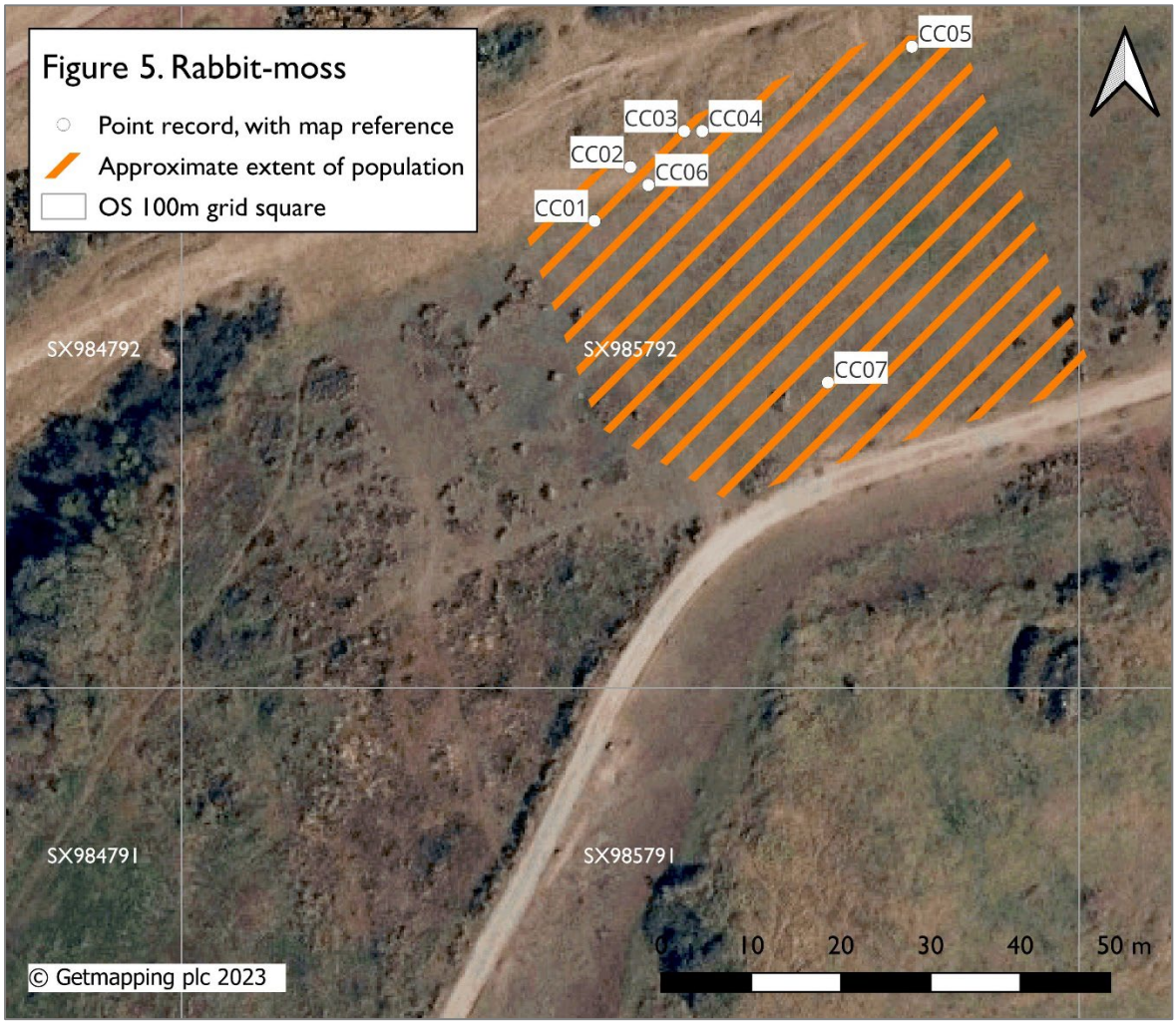


**Table 2. *Cheilothela chloropus* population details**

| Map ID | Gridref | Comment |
|---|---|---|
| CC01 | SX9854679251 | A few patches, looking moribund after winter flooding of slack. |
| CC02 | SX9855079257 | About 100cm², with *Petalophyllum ralfsii*. |
| CC03 | SX9855579262 | 30 x 20cm patch. |
| CC04 | SX9855879261 | Thousands of shoots growing across an area at least 30m x 40m, likely to cover a wider area going north. |
| CC05 | SX9858179270 | |
| CC06 | SX9855179256 | Numerous plants going north. |
| CC07 | SX9857279233 | Near track. Around 15 healthy-looking patches with scattered *Petalophyllum* in area 1m². |

## 4. DISCUSSION

### 4.1 Condition Assessment

Monitoring of the metapopulation of *P. ralfsii* at Dawlish Warren has now been undertaken for 20 years. In that time, the counts of *P. ralfsii* have varied greatly (Table 3).

**Table 3. Comparison of *P. ralfsii* monitoring results**

| Survey Month and Year | Visitor Centre Slack | Greenland Lake Slack | Notes |
|---|---|---|---|
| April 1997 | Few | No information | Brief survey following discovery of species new to site |
| May 1997 | 76 | 3 | Probably too late in the spring to be effective |
| December 1999 | >1000 | 1,000-10,000 | Survey under good conditions |
| December 2001 | ca. 200 | ca. 250 | Survey probably inadequate |
| April 2003 | ca. 600 | ca. 2500 | Slacks flooded January to March 2003 |
| February 2012 | 1 | 1250-1600 | 3 dry winters prior to survey |
| April 2019 | 0 | ca. 1360 | Hollow no. 9 inundated, not surveyed |
| March 2023 | 0 | 619 | Good survey conditions after slacks flooded over winter |

It is unclear how many thalli were present before 2003, although the figures in Table 3 indicate that at least 2000 were counted from the site at that time. The most reliable count is from 2003, with a total of ca. 3100 thalli in the two slacks. Lansdown (2019) suggested that counts fell after that and stabilised in 2012, although by then the population was confined to Greenland Lake Slack.

The current findings indicate that numbers of thalli have halved since 2019. It is not clear if the prolonged flooding of parts of Greenland Lake Slack may have played a significant role in the numbers of visible thalli at the time of the current assessment. It is telling that east of the main track, the only thalli seen were in areas where the microtopography would have elevated the plants above the main flood zone.

As Lansdown (2019) noted, direct comparison between the results of the most recent monitoring and the older ones is not straightforward. The current assessment reinforces the position that reliance on a monitoring approach that requires clear delimitation of damp hollows is no longer practical. The 2019 monitoring provided an opportunity to test the condition assessment attributes and targets previously recommended (Lansdown 2012). As it did not work well, he proposed an alternative target encompassing extent and abundance expressed in a simple form:

***If five or more hollows support* P. ralfsii *and the total number of thalli recorded exceeds 1,000, including male and female individuals, then the metapopulation may be considered to be in favourable condition.***

Because of the difficulty of locating and identifying the wet hollows, it is unclear how many were occupied in March 2023. Figure 4 indicates that a minimum of five hollows were occupied, possibly more. Both sexes were represented but the total thallus count falls well short of the stated target. On this basis, the population would be considered to be in unfavourable condition.

For future monitoring, it would be pertinent to employ an alternative target for metapopulation extent. Using GIS, it is easy to calculate occupancy of 10m OS grid squares and therefore, it is proposed that future condition assessment should this modified target:

***If* P. ralfsii *occupies 20 or more 10m OS grid squares and the total number of thalli recorded exceeds 1,000, including male and female individuals, then the metapopulation may be considered to be in favourable condition.***

## 4.2 Reasons for Decline

*P. ralfsii* is a species that is relatively mobile and it can move around both vegetatively and via spores to take advantage of fresh habitat opportunities. However, its area of occupancy at Dawlish has never been very large, and so its opportunities to disperse are limited.

The likely reasons for the decline in number of thalli seen in the current assessment may be complicated and, without further investigation of e.g., ground hydrology, entirely speculative. However, it may have been driven by the interplay of three main factors:

- natural succession and gradual drying of Greenland Lake ;
- changed patterns of recreational trampling by visitors and vehicular movements by staff across Greenland Lake Slack; and
- climate change-linked increased summer desiccation and winter flooding of slack habitat reducing the availability of suitable *P. ralfsii* habitat. It is also possible that climate change could be affecting the water table. 2022 was the hottest year on record in England and the driest since 1935.

## 5. RECOMMENDATIONS

As Greenland Lake Slack will be vulnerable to saline incursion flooding after relaxation of local sea defences in the future, it is recommended that the next management steps to maintain its population of *P. ralfsii* should take a twin-headed approach.

Firstly, it is important to halt the decline in the size and extent of the metapopulation in Greenland Lake Slack by implementing short-term measures to create new habitat niches.

It is clear from the current work that *P. ralfsii* has a high fidelity to ground that is regularly trampled by human footfall, or vehicular movements. It avoids parts of the slack which are regularly flooded. Although there are various informal paths across the slack, only the main surfaced track and a heavily walked grass track south of the golf course bund (connecting to the main track) are currently occupied by *P. ralfsii*.

In sites elsewhere in SW England, *P. ralfsii* also prefers tracks but they do not need to be wide or heavily used to support it. At a site near Hayle, it follows the lightly but regularly used path of donkeys moving across paddocks. At Braunton Burrows it can be found in lightly trampled but regularly used dog-walker's paths.

Much of the vegetation in Greenland Lake Slack is currently too tall and closed to support *P. ralfsii*, but encouragement of more directed footfall or vehicular movements (Figure 6) would help to create new habitat niches. Any such action should of course avoid areas where other rarities are known.

Secondly, for the long-term survival of *P. ralfsii* at Dawlish Warren, the population must be encouraged to establish away from Greenland Lake Slack. Translocation has been attempted into a slack close to the Visitor Centre; the first was unsuccessful and it remains to be seen how successful another translocation (to a different place) in 2023 will be. In the slack immediately west of the Visitor Centre, promotion of greater public access across the edge of the slack may naturally restore suitable trampled habitat within a few years. Hence, even if *P. ralfsii* does not find its own way there, future translocation of turves containing *P. ralfsii* from Greenland Lake Slack may 'take' better than into other receptor sites.

## 6. ACKNOWLEDGMENTS

The author would like to express grateful thanks to Neil Harris and Phil Chambers for their help with survey organisation, background information and access to Dawlish Warren for this round of monitoring.


Figure 6. Path management areas
Potential path creation/restoration area
0 20 40 60 80 100 m
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SOUTH EAST DEVON
HABITAT REGULATIONS
PARTNERSHIP

# South East Devon Habitat Regulations Executive Committee

*Dawlish Warren National Nature Reserve –*
*2023 trampling and nutrient enrichment assessment.*

*January 2024*

East Devon
Exeter City Council
Teignbridge District Council
South Devon

Legal comment/advice:

There are no substantive legal issues to be added to this report.

Finance comment/advice:

No direct financial implication arise from the report other than any increase in surveying will incur/require increased funding.

**Public Document:** Yes
**Exemption:** None
**Review date for release:** None

## Recommendations

It is proposed that the Executive Committee:

1. Notes the results of the trampling and nutrient enrichment assessment relating to impacts associated with human activity at Dawlish Warren NNR.
2. Receives an updated trampling and nutrient enrichment survey report as part of the ongoing monitoring programme in 2026.

## Equalities impact: Low

## Risk: Low

The attached report, included here as Appendix A, provides a detailed and updated methodology and baseline with which to assess future trends and patterns of impacts associated with human activity at Dawlish Warren NNR.

### 1. Summary

1.1 Dawlish Warren National Nature Reserve (NNR) comprises 505 acres centred on a 1.5 mile long, double sand spit extending out into the mouth of the Exe Estuary. The site is designated as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) and is part of the Exe Estuary Special Protection Area (SPA) and Ramsar site.

1.2 In 2010, Teignbridge District Council (TDC) commissioned a report[1] to consider the impacts of recreation on Dawlish Warren and to identify the extent to which access was impacting the site.

1.4 That report, which later fed into the South East Devon European Site Mitigation Strategy, found that the impact of recreational pressure on Dawlish Warren was closely intertwined with other factors operating on the site, most notably coastal erosion, the presence of sea defences, the naturally dynamic state of sand dune habitats and management practices. The role of trampling (people treading on plants) in particular was ambiguous. In some places it contributed to maintaining the preferred habitat conditions, whereas in other places it was leading to significant erosion problems.

1.5 The report went on to state that, in the absence of significant rabbit grazing, trampling was playing a positive role in maintaining the short, open sward required by many of the characteristic plants of the fixed dune grassland at Dawlish Warren. However, the diffuse trampling required to do this is difficult to achieve and the level of visitor pressure which was creating a suitable sward in some places was also leading to significant wear and erosion in other places.

[1] *Lake, S. (2010) Assessment of recreational impacts on Dawlish Warren Special Area of Conservation. Teignbridge District Council/Footprint Ecology*

1.6 Trampling was found to play a similar role in the humid dune slacks (areas seasonally inundated with water), where a level of diffuse trampling is thought to create suitable conditions for specific communities and species. At the time of the report there was insufficient data available to establish the extent to which these communities benefited from trampling and when/where the tipping point was likely to be reached.

1.7 Separately, the report found that despite a "pick up" policy, nutrient enrichment, presumed from dog faeces, was evident near access points in the fixed dune grassland, where the characteristic dune grassland flora is in places replaced by coarser vegetation more likely to benefit from increased nutrient levels.

1.8 The last decade has seen substantial changes to the habitats and management of Dawlish Warren. Most significantly with the Dawlish Warren Beach Management Scheme (DWBMS), which during 2017 saw the removal of much of the hard engineering from the dunes along most of the frontage of the site and a beach recharge which allows a greater percentage of the site to become more dynamic. There has also been the continued use of winter Pony grazing, a scrub reduction programme and increased use of tractor mounted mechanised cutting devices.

1.9 The 2019 botanical survey was co-funded by Teignbridge District Council and the South East Devon Habitat Regulations Partnership (SEDHRP).

1.10 Following the timescales recommended in the 2019 report, a repeat survey was commissioned by SEDHRP in 2022 and, due to site conditions, carried out in 2023. A full botanical survey of the site (such as was carried out in 2019) is outside of the scope of the required survey and therefore no additional funding was sought from TDC.

1.11 The 2023 assessment is the first report since the baseline was established in 2019 and will contribute to ongoing monitoring to ensure that the site is in favourable conservation status and that national and international obligations are being met.

## 2. The survey

2.1 Devon Biodiversity Records Centre (DBRC) were again awarded the contract to carry out the survey and report work.

2.2 Main objectives of the survey in relation to human impacts on the site (and therefore within the scope of SEDHRP funding) were unchanged from 2019:

- Produce detailed, colour coded heat maps of areas of fixed dune and dune slack vegetation subject to significant trampling pressure.
- Identify, and list in order of severity, any areas of fixed dune and/or dune slack vegetation at risk of significant erosion from trampling pressure.
- Identify and map areas of fixed dune and/or dune slack subject to nutrient enrichment from dog fouling.

2.3 The report in its entirety is included here as Appendix A. As described in sections 2.2 and 2.3 of the report, different methods were used to collect data in order to assess (a) trampling impact and risk; and (b) patterns of eutrophication (increased nutrient) impacts on the site's vegetation.

**3 Trampling impact and risk.**

3.1 Aligning with the Footprint study of 2010 and the 2019 botanical survey, the site was split into 25m x 25m grids via a computer Geographic Information System (GIS) and thereafter a 5-point scale was defined to estimate trampling intensity and erosion risk. This scale ranged from (1) Slight risk/impact areas to (5) Very high risk/impact areas.

3.2 The assessment of 573 cells was initially carried out by interpretation of high resolution, recent aerial photography. Seasonal variation in aerial imagery and the impacts of drought in the summer of 2022 meant that certain cells were considered ambiguous or determined with low levels of certainty. These areas were therefore included in the list of squares to be assessed in the field.

3.3 To "ground truth" the assessment, a sample of 183 cells were assessed onsite by the surveyors, with an independent re-assessment of the 5-point scale in the field. Of the ground-trothed cells, 39 were changed from the initial desk-based scoring, giving it an accuracy of around 79%

3.4 The report rightly states that sand dune systems are, by their nature, dynamic and there is a complex interaction between natural processes which cause erosion and changes caused by human activity. The independent reassessment of the situation on the ground was aimed at minimising this effect, which could result if only a desk-based study of aerial imagery was undertaken.

3.5 The data from these assessments were rendered as a "heatmap" (see Appendix B) covering the site, for visualisation of trampling impacts.

**4. Eutrophication assessment.**

4.1 To standardise the survey methodology on increased nutrient risk to the site's vegetation, the 2019 methodology was adapted. Cells from the 25m x 25m grid were selected for vegetation assessment based on the location of quadrats used in previous assessments. This selection was then expanded to provide a wider and representative coverage of the site.

4.2 As in the trampling assessment, the surveyor utilised GIS to determine the location of squares, and their own GPS position. The surveyor would then compile a species list from the centre of the square and take photographs of the vegetation present. Species abundance was estimated and noted using the DAFOR (Dominant, 1, Abundant, 2, Frequent, 3, Occasional, 4, Rare, 5) scale.

4.3 The DAFOR value was then weighted with a Fertility indicator score[2] against the number of species within a cell to calculate an overall score for that cell.

[2] *The Ellenberg score (Hill et al. 1999)*

4.4. A composite score for each quadrat was then calculated and used to generate a separate heatmap visualisation (see Appendix C) to indicate areas of enrichment from all sources.

4.5 All instances of dog (and other) waste encountered during surveying were recorded and superimposed on the heatmap. This was not a systematic survey but was considered helpful in terms of providing supplementary information about the distribution of excess nutrients as a result of recreational use of the site.

4.6 Analysis of composite fertility indicator scores does not in itself distinguish between nutrient enrichment caused by recreational use of the site and pockets of soil and habitat which have naturally developed fertility through autogenic processes (accumulation of soil organic matter, Nitrogen (N) fixation etc).

4.7 To go some way to remedy this, another stage of analysis was undertaken using the species list referred to in 4.2 (above). From this list, a subset of indicator species which are known to be indicative of soil "improvement" and enrichment from human-derived sources was established. These were either species of intermediate to high fertility scores or generalist species known to invade and out-compete specialist plants reliant upon low nutrient levels.

4.8 For each cell, a composite score based on the relative abundance of any of the indicator species present was calculated by summing their DAFOR values.

4.9 With these scores, a second heatmap was generated (see Appendix D), showing the relative concentration of these indicator species and annotated with records of recent dog fouling. This could then be used to aid interpretation of the indicative soil fertility map, focusing on specific, human-derived enrichment.

## 5. Results

5.1 As found in the 2019 survey, the pattern of trampling and erosion risk throughout the site remains complex. The majority of hotspots are centred around access points to the reserve, path nodes and corridors between the amenity beach and the interior of the site.

5.2 There has been significant coastal erosion around the edge of Warren Point. A large number of squares assessed in the previous survey no longer contain vegetation. The 2019 pattern of linear pressure from walkers that follow the edge of the beach and dunes around the point has simply been replicated along the newly eroded edges of established vegetation.

5.3 The results of the indicative soil fertility mapping show higher levels of fertility:

1. in and around the southern end of the site near the entrance gates and in a corridor between the entrance and the visitor centre.
2. in the dune slack to the west of the main trackway.
3. at the narrowing west of groynes 8 to 10.
4. in some diffuse areas within the Marram grassland on Warren Point

5.4 Looking at the results with a focus on species considered indicative of dog fouling indicates that 1 (above) is the key area of risk with some more moderate effects scattered along the back path and in the area of grassland between the main trackway/Greenland Lake and the dune ridge level with groynes 5 to 8.

## 6. Conclusion

6.1 The significant areas of risk from erosion from recreational trampling pressure are mostly associated with the frontal dune ridge. These are often in areas which technically belong to mobile dune vegetation types but are partially stabilised. Specifically for fixed dune and dune slack habitats the risk areas in order of decreasing severity are:

1. A small area of dune grassland at the extreme south end of the reserve next to the pedestrian entrance and adjacent to the buffer zone.
2. A particularly high density of path nodes and desire lines concentrates pressure on a relatively small area where the site narrows to the dune ridge level with groyne 8. Here there are a mixture of grassland types including dry and damp communities with the dune slack habitat reaching its northern limit flanked by areas of both fixed and semi-fixed turf.
3. The turf in a corridor on both sides of the main access track and footpath from the south end of the reserve to the visitor centre. Abrasion is frequent in these areas and is necessary to maintain the habitat suitable for some notable species present but risk of abrasion turning to net erosion and habitat loss is still significant.
4. The turf along the back path and in a corridor linking the back path and main trackway between the visitor centre and pond (i.e., along south edge of flood bank). Impacts are more diffuse in these areas but moderately high locally.

6.2 The impact of dog waste (including urine and faeces) deposited on the low nutrient soils of sand dune habitats is not well understood. There is little empirical evidence or research from which to draw on for mitigation or management strategies. Jones et al. (2004) found that the varying habitats and soils within a sand dune system responded to atmospheric N deposition in complex and non-linear ways.

6.3 The report notes that an assumption that dog fouling causes increasing levels of nutrient in the soil and is available to plants has been anecdotally connected to observations of the spread of generalist (or nutrient demanding) plants (at the expense of specialist less competitive species of more open habitats). Whilst N values have been used in the study as a proxy for mapping fertility, it should be noted that it is an untested assumption that a causal relationship between dog fouling and increased N values exists in dune vegetation.

6. 4 The map (Appendix C) therefore gives context on the distribution of species and vegetation associated with higher fertility soils but does not necessarily indicate human-derived nutrient enrichment (from recreational use and dog fouling). A further layer of interpretation drawing on the incidence of indicator species (Appendix D) has been applied to interpret the areas listed at 5.3 (above):

1. the southern end of the site near the entrance gates and in a corridor between the entrance and the visitor centre.

Although no systematic survey of dog use was undertaken, the occurrence of visible dog fouling was recorded during the survey, and this broadly coincided with the areas where dog faeces were most encountered and the highest recorded abundance of indicator species. It is also a high-pressure area for trampling.

2. the dune slack to the west of the main trackway.

Contrary to the map (Appendix D), indicator species were not abundant in this area. The vegetation data indicate that the apparent fertility here is more likely to be driven by autogenic ("natural") than anthropogenic (human derived) processes. However, it is possible that dog fouling does contribute and that nutrients deposited in adjacent areas of higher usage may collect here.

3. the narrowing west of groynes 8 to 10.

Although this is an area of higher trampling pressure (with the potential for dog fouling effects to be concentrated) the apparent fertility is thought to be related more to vegetation and disturbance history in this area than direct effects of dog fouling. This area has supported rank grassland and scrub in the past (Wheeler and Wilson 2013, DBRC 2020) and subsequent management or the persistence of woody vegetation may influence nutrient levels.

4. some diffuse areas within the Marram grassland on Warren Point.

It is unlikely that this is directly influenced by recreation, due to the limited footfall (and dog ban) within the area. When reviewing the species data of high scoring quadrats within Warren Point, the majority of them supported frequent populations of bramble and evening primrose, which both score 5 on the fertility indicator scale. The abundance of these species has weighted the scores towards the upper end of the scale and could suggest that the lack of disturbance or over stabilization of dune grassland in these areas is resulting in succession and accumulation of organic matter and nutrients.

6.5 Areas subject to high and moderate risk from dog fouling have been identified and recorded. An area of dune grassland approximately 0.25ha in size in the SE corner of the reserve is most prone to nutrient enrichment. The level of enrichment here is comparable with that in the buffer zone (towards the resort), immediately to the SE of this area.

6.6 The area of fixed dune grassland adjacent to the above (west of the main access path) and extending in a wedge shape northeast towards the visitor centre is not as severely affected but considered high-moderate risk and this also supports notable species.

6.7 The survey has attempted to provide a comparable dataset to the previous assessments of trampling and eutrophication, to help managers and decision makers visualise and understand the possible impacts that they have had over time. Additionally, the survey sought to develop a means of data collection that can be relatively easily repeated. Monitoring the effects of nutrient enrichment does however pose significant challenges.

6.8 71% of the area has not changed in terms of its trampling assessment (319 of 447 squares). Approximately 20% of the area is assessed as experiencing higher trampling pressure and risk than in 2019 and 9% with some relaxation of trampling.

6.9 93 squares (21% of the area) changed to a minor degree of one scale increment (for example the assessment score altered from 2 to 3 or 5 to 4 between 2019 and 2023). Only 8% of the area (35 squares) changed by 2 or more increments.

6.10 The net increase in trampling risk and pressure over the whole site (the sum of all changes to individually assessed squares) equates to a mean increase in the trampling index of 16%. This figure is derived from the qualitative 5-point scale used in the assessment and it is not suggested to demonstrate an absolute index of recreational pressure. Nevertheless, it suggests a small but significant increase since the previous assessment.

6.11 The assessment finds that the overall spatial pattern of trampling risk has, unsurprisingly, not changed since 2019 and the heatmaps produced for 2019 and 2023 are very similar. However, there is evidence that some pressures have been slightly redistributed within the site.

6.12 The principal areas of change are:

1. The southern end of the site between the beach, pedestrian entrance and visitor centre. A new path and fencing has been installed. This may have encouraged greater use of the path for visitors wishing to access the amenity beach via the nature reserve, but it has also provided an obstacle to using some of the adjacent parts of the site for recreation. Thus, some mitigation of trampling pressure in this area seems to have been achieved, although it remains the highest risk part of the reserve for fixed dune habitats.

2. The vegetated margins of Warren Point. The mapped increase in pressure here is caused by a reduction in the extent of habitat due to coastal erosion, so that the route navigated by walkers passes through squares which were formerly in the interior of the dunes and less accessible.

6.13 121 squares showed an apparent increase in trampling and erosion. However, 78 of those are located around the northern edge of warren point and are likely to be attributed, predominantly at least, to natural processes. The other 43 squares are predominantly located along the edge of the main path through the dunes, which is more susceptible to erosion from footfall and environmental conditions. Another cluster of squares are also located within the centre of the site at a main pinch point between those accessing the beach and the central areas of the reserve.

6.14 Although the survey's objectives were focused on erosion caused locally by visitors, it has effectively 'logged' the scale of natural erosion occurring around the northern extent of Warren Point, with many of the previously surveyed squares no longer existing, or now being occupied by beach sand or bare mobile sand. The current beech-vegetation front around Warren Point is still mapped as high risk for trampling.

6.15 Although this part of the system may have the appearance of being under control of natural processes, even relatively low levels of trampling in this area have potential to impact the dune habitat succession profoundly. There is evidence that past trampling pressure on the Point has interfered with or prevented the initiation of embryo dunes around the strandline (de Lemos 1992, Lake 2010).

6.16Trampling of the circuit around Warren Point is still evident and to what extent historical trampling has affected the resilience of the habitats to storm damage or impacted the ability of the dune system to migrate is unknown. The report suggests that a neat disentanglement of coastal erosion processes and trampling impact on the embryo and foredune habitat is probably not possible.

6.17 Analysis of change in the effects of nutrient enrichment since 2019 is more limited as no absolute comparison is possible between the 2019 and 2023 datasets.

6.18 The broad scale pattern shown on indicative fertility maps produced in 2019 and 2023 is very similar. Small differences are as likely to stem from differences in the way the data were collected (derived from vegetation data collected for other purposes in 2019 and the result of a more limited but purposely collected dataset in 2023) as change.

6.19 The only significant discrepancy between these maps is that in 2019 the reedbeds are shown as a fertility hotspot but show as a neutral area in 2023. This is because they were sampled for NVC work in 2012 and 2019 but not prioritised under the objectives of the present survey.

6.20 The best judgement from the available data in the current survey is that the spatial distribution of nutrient enrichment effects from dog fouling is substantially the same as in 2019. These data do not allow an assessment of whether there have been any significant changes in severity, either at individual locations or for the whole site.

6.21 The ecology of dog-fouling derived nutrient inputs in sand dunes is complex and not yet well studied. A future assessment employing the same approach as used in the present survey could be capable of detecting changes if they were sizeable.

6.22 However, the survey suggests that it is likely that a more labour-intensive design of study, possibly employing direct measurement of nutrient loads and probably entailing a more complete inventory of the vegetation, would be needed to meaningfully monitor these impacts. This would increase the funding required due to the increased complexity and labour-intensive nature of the study.

**South East Devon**
**Habitat Regulations**
**Executive Committee**

**January 2024**

| |
|---|
| Natural England comment:<br><br>Natural England have reviewed the report and have no further comment. |

# Dawlish Warren NNR

# trampling & nutrient enrichment assessment

# 2023

December 2023

## Contents

# 1 INTRODUCTION

## 1.1 BACKGROUND

An assessment of recreational impacts on Dawlish Warren SAC in 2010 by Footprint Ecology (Lake 2010) concluded that trampling from high footfall, eutrophication from dog fouling, and wildfires were the main anthropogenic factors affecting vegetation on site.

In 2019 Devon Biodiversity Record Centre (DBRC) surveyed the habitats and vegetation of Dawlish Warren NNR on behalf of Teignbridge District Council. The report included a mapped assessment of trampling and eutrophication pressures, funded by the South East Devon Habitat Regulations Partnership (SEDHRP), as an adjunct to the main survey (DBRC 2020).

Subsequent study of visitor numbers at the site (Caals, Panter & Liley 2022) indicates a significant increase since 2010 with the implication that this may translate into higher recreational pressures in the form of damage to habitats and species in the NNR through trampling and nutrient enrichment.

In order to keep a continuing monitoring brief on these trends SEDHRP instructed DBRC in 2023 to provide an updated assessment on the pressures of trampling and nutrient enrichment on Dawlish Warren NNR.

## 1.2 OBJECTIVES

The objectives of this project were to

- Produce detailed, colour coded heat maps of areas of fixed dune and dune slack vegetation subject to significant trampling pressure.
- Identify, and list in order of severity, any areas of fixed dune and/or dune slack vegetation at risk of significant erosion from trampling pressure.
- Identify and map areas of fixed dune and/or dune slack subject to nutrient enrichment from dog fouling.
- Analyse, compare and interpret emerging patterns, trends and/or points of difference between the 2019 survey and the 2023 survey.

# 2 METHODOLOGY

## 2.1 STUDY AREA

The objectives of the current study specifically relate to fixed dune and dune slack vegetation. In 2019 the whole dune system within the NNR boundary (i.e. including areas of mobile dune and some other habitats) was included in the primary assessments of trampling risk and nutrient enrichment risk. Mobile dune communities (and mosaics involving them) covered approximately one third of the vegetated area of the NNR in 2019). Impacts on these habitats indirectly, if not directly, affect fixed

dune and dune slack habitats and to provide a consistent basis for comparison with the earlier work the same study area was assessed (i.e. not excluding mobile dunes) on the basis that conclusions specific to fixed dune and dune slack habitats could still be drawn.

## 2.2 TRAMPLING ASSESSMENT

The collection of trampling data followed the same methodology as used in 2019 (DBRC 2020).

The survey area was gridded within a GIS into 25m x 25m cells (see Figure 1). This resolution of study was chosen as being sufficiently fine to illustrate major patterns whilst still being feasible within the space of the project. It also aligns with the earlier study undertaken by Footprint Ecology to identify areas at risk of erosion from trampling (Lake 2010).

A qualitative 5-point scale was defined in order to estimate trampling intensity and erosion risk (as a simple artificial composite score) in each square. This was based primarily on observations of the standard indices of trampling effects on vegetation (Cole & Bayfield 1993): loss of plant cover, reduced vigour or stature and damage (e.g. breakage and bruising of stems). Observations on substrate condition (erosion and compaction) were also used to qualify these, particularly in later ground-truthing of desk-based assessments.

Grid cells were assigned to the 5 categories using the following guidelines:

1. Slight risk/impact areas. <5% bare substrate overall and not obvious generally in air photos, areas usually with continuous cover of semi-natural vegetation. Typically, areas on level ground or gentle slopes (≤3˚). Where no recent grazing, mowing or strimming management, vegetation usually includes elements of tall sward, underscrub or woody features at least locally. Where shorter vegetation-maintained trampling-sensitive plants such as *Sedum* spp., Orchidaceae and fruticose lichens such as *Cladonia* spp. may form vigorous stands. Transition zones between disturbed and undisturbed either not visible or of minimal extent.

2. Lower risk/impact areas. Typically 5%-10% exposed sand or soil area with low density of desire paths of low width (<50cm). Transition zones between disturbed and undisturbed may be evident but not a conspicuous feature, with areas of reduced height vegetation localised around lines of access.

3. Moderate risk/impact areas. Typically <10% exposed sand or soil area due to trampling but diffuse effects more marked. Trampling impacts evident as reduced height sward at least locally. Sward generally not abraded so far as to cause erosion except localised at pinch points, path junctions etc. Areas usually traversed by significant (≥1m wide) formal tracks or paths or well-established desire paths. Transition zones obvious and occupying significant areas, with secondary effects of larger formal paths and trackways evident on adjacent vegetation. Paths in areas of fixed dunes with broad trample zones characterised by very short vegetation but not extensively re-mobilising sand. Tall herbs scrub and underscrub may be present but if so scattered and localised, with average distance between woody vegetation patches ≥10m. Increased abundance of trampling resistant genera in sward (e.g. *Poa* and *Plantago coronopus* and *Carex arenaria*) relative to 1 and 2.

4. High risk/impact areas. Intermediate to 3 and 5. May be some incipient braiding of desire paths in transition zones. Trampling resistant species usually abundant.

5. Very high risk/impact areas. Usually >15% exposed sand or soil. Typically, but not exclusively, areas on steeper slopes (>7˚). Typically high density of desire paths through semi-natural vegetation some of which broad (≥50cm) with obvious secondary erosion including heavily compacted transition zones and braiding effects where path users avoid mobile sand of main line to walk on fixed or semi fixed turf adjacent. Marked erosion hotspots at path junctions. Vegetation height clearly reduced in significant (>10%) proportions of the area. Reduced vegetation cover and vigour effects extend to trample-resistant species (e.g. *Poa* and *Plantago coronopus* and *Carex arenaria*).

Initially cells within the grid were assessed with reference to high resolution aerial imagery (GetMapping, Google Earth and Bing Maps) from the years 2019 to 2022. In total 573 cells covering the entire site were assessed.

A sample of 183 cells were then 'ground-truthed' between July and September 2023, with each cell being re-assessed using the same criteria in the field. The cells ground-truthed were selected to include a representative range of the values determined by aerial photo interpretation. It was found that the seasonal variation in aerial imagery and impacts of drought in the summer of 2022 meant that certain cells were considered ambiguous or determined with low levels of certainty. These areas were therefore included in the list of squares to be assessed in the field. The Locus GIS app was used in the field to collect photos and data whilst displaying the 25m x 25m grid and surveyor's GPS position.

Of the ground-truthed squares 39 were changed from the initial API scoring, giving it an accuracy of around 79%. Since the necessary adjustments were all minor in scale this was considered an acceptable degree of accuracy for the purposes of the survey, particularly as all squares that were flagged as being of low certainty at the desk-based stage were checked on the ground.

Photographs of each ground-truthed cell were taken within the Locus GIS App. The intention was to provide ground level photographic evidence of trampling which could be used for future reference and comparison. These data are provided as an appendix to the report.

Sand dunes are dynamic systems, which are influenced by both human and natural processes. As a result, some areas of naturally mobile sand may have been incorrectly assigned a higher trampling value. However, the ground truthing of the site by a surveyor aimed to reduce the likelihood of this effect. For example, in transition zones between beach and dune, only the dune area was considered during the assessment.

The area overlying the Geotube located at 'The Neck' of the warren was not assessed due to the limited presence of vegetation and access for walkers and other users of the warren.

The dataset from this assessment was processed in QGIS (QGIS Development Team 2019) using Inverse Distance Weighting (IDW) Interpolation on the revised (ground-truthed) trampling scores and a distance coefficient of 2. The interpolated dataset was then rendered as a 'Heatmap' covering the survey area and a 30 metre buffer to provide a continuous graphical surface for visualisation of trampling impacts. The source GIS data are retained.

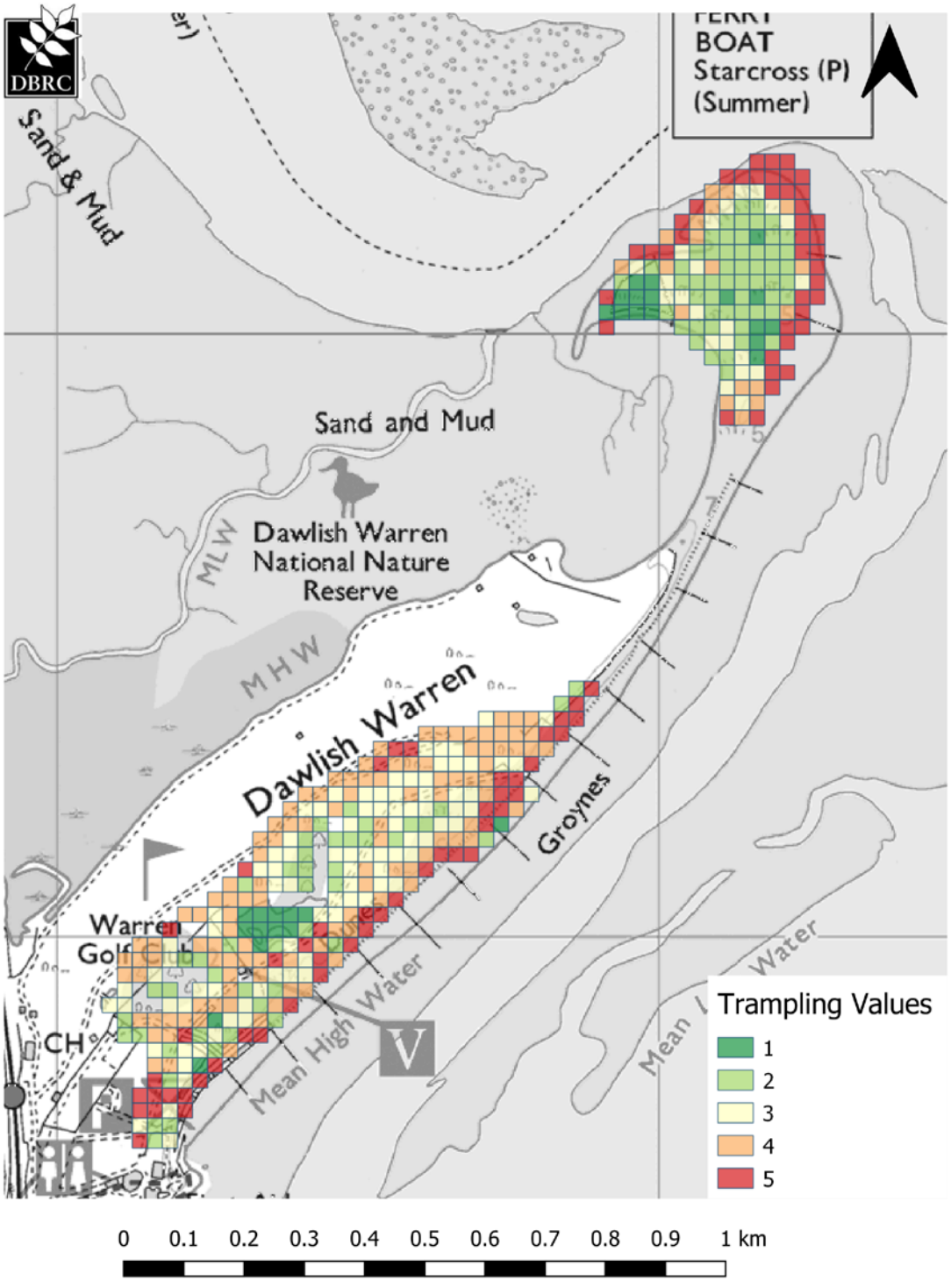




**Figure 1. Grid used to determine levels of trampling and for recording vegetation composition (sampled squares only). Trampling values shown for illustrative purposes only.**

## 2.3 NUTRIENT ENRICHMENT ASSESSMENT

In order to standardise collection of data on eutrophication risk on the site, the methodology from the 2019 survey (which drew on vegetation quadrat data from NVC surveys in 2012 and 2019) was adapted. An approach that was relatively simple, did not necessitate the labour-intensive collection of large volumes of vegetation data and could be integrated with the grid-based trampling assessment was needed.

Initially squares from the 25m x 25m grid were selected for vegetation assessment based on the location of quadrats used in previous assessments. This selection was then expanded to provide a wider and representative coverage of the site.

As in the trampling assessment, the surveyor utilised Locus GIS to determine the location of squares, and their own GPS position. The surveyor would then compile a species list from the centre of the square, and take photographs of the vegetation present. Species abundance was estimated and noted using the DAFOR scale.

### 2.3.1 INDICATIVE MAPPING OF SOIL FERTILITY

An indicative measure of fertility was derived using an adapted Ellenberg score for nitrogen, which provides a general indicator of soil fertility (Hill *et al*. 1999). The Ellenberg score for each species within a square was weighted using the DAFOR value it had been assigned with:

D = 5

A = 4

F = 3

O = 2

R = 1

Weighted score for each square= Sum (E*c) / No. species

E = Ellenberg score for each species

c= DAFOR value

IDW interpolation was then used to generate a heat map visualisation which would indicate areas of nutrient enrichment throughout the site.

In addition to this, anecdotal records of dog fouling were recorded spatially to provide supplementary information to be used alongside the heatmap. This was superimposed on the heat map to provide additional context and aid interpretation of the vegetation data.

Previous surveys included specific locations of nutrient-tolerant grass species for similar purposes. These have not been mapped spatially in the present work, as they were already included within the species data.

### 2.3.2 MAPPING OF ANTHROPOGENIC NUTRIENT ENRICHMENT INDICATORS AND RISK ZONES

Analysis of composite Ellenberg scores does not in itself distinguish between nutrient enrichment caused by recreational use of the site and pockets of soil and habitat which have naturally developed fertility through autogenic processes (accumulation of soil organic matter, N fixation etc).

To further develop the proxy information on fertility available for interpretation a second stage of analysis using indicator species was taken. A subset of the species recorded in the survey samples (above) were identified as generalists known to be indicative of soil 'improvement', and enrichment from anthropogenic nutrient inputs in the context of the low nutrient habitats historically characterising the dune grassland of the site. These were either species of intermediate to high Ellenberg N values or generalist species known to invade and out-compete low nutrient adapted specialists under conditions of nutrient enrichment. The list excluded native woody species and tall herbs characteristic of specialist semi-natural habitats.

| | |
|---|---|
| *Anisantha sterilis* | Barren Brome |
| *Anthriscus sylvestris* | Cow Parsley |
| *Arrhenatherum elatius* | False Oat-grass |
| *Cirsium arvense* | Creeping Thistle |
| *Galium aparine* | Cleavers |
| *Heracleum sphondylium* | Hogweed |
| *Hordeum murinum* | Wall Barley |
| *Lolium perenne* | Perennial Rye-grass |
| *Plantago lanceolata* | Ribwort Plantain |
| *Plantago major* | Greater Plantain |
| *Ranunculus repens* | Creeping Buttercup |
| *Rumex obtusifolius* | Broad-leaved Dock |
| *Trifolium repens* | White Clover |
| *Urtica dioica* | Common Nettle |

For each grid square a composite indicator score based on the relative abundances of any indicator species present was calculated by summing their DAFOR values (D = 5, A = 4, F = 3, O = 2, R = 1).

A second heatmap showing the relative concentrations of indicators of anthropogenic enrichment was generated from this dataset in the same way as above (2.3.1) and annotated with localised records of recent dog fouling which could be used to aid interpretation of the indicative soil fertility map.

# 3 RESULTS

The results of the surveys and investigation into trampling and eutrophication rates are shown in graphical form as grid maps and heat maps. These outputs are discussed in section 4.

## 3.1 TRAMPLING

The pattern of trampling and erosion risk throughout the site remains complex (Figure 2). The majority of hotspots are centred around access points to the reserve, path nodes and corridors between the amenity beach and the interior of the site. The broad spatial distribution of these risk areas is the same as in 2019. Changes are discussed in section 4.3. There has been significant erosion around the edge of Warren Point. A large number of squares assessed in the previous survey no longer contain vegetation and the 2019 pattern of linear pressure from walkers that follow the edge of the beach and dunes around the point has simply been replicated along the newly eroded edges of established SD6 and SD7 vegetation (mobile and semi-fixed Marram grass habitats).

## 3.2 NUTRIENT ENRICHMENT

The results of the indicative soil fertility mapping (Figure 4, 2.3.1) show higher levels of fertility:

1. in and around the southern end of the site near the entrance gates and in a corridor between the entrance and the visitor centre
2. in the dune slack to the west of the main trackway
3. At the narrowing west of groynes 8 to 10.
4. in some diffuse areas within the Marram grassland on Warren Point

Examination of the information on species considered indicative of dog fouling (Figure 5, 2.3.2) indicates that 1 (above) is the key area of risk with some more moderate effects scattered along the back path and in the area of grassland between the main trackway/Greenland Lake and the dune ridge level with groynes 5 to 8.

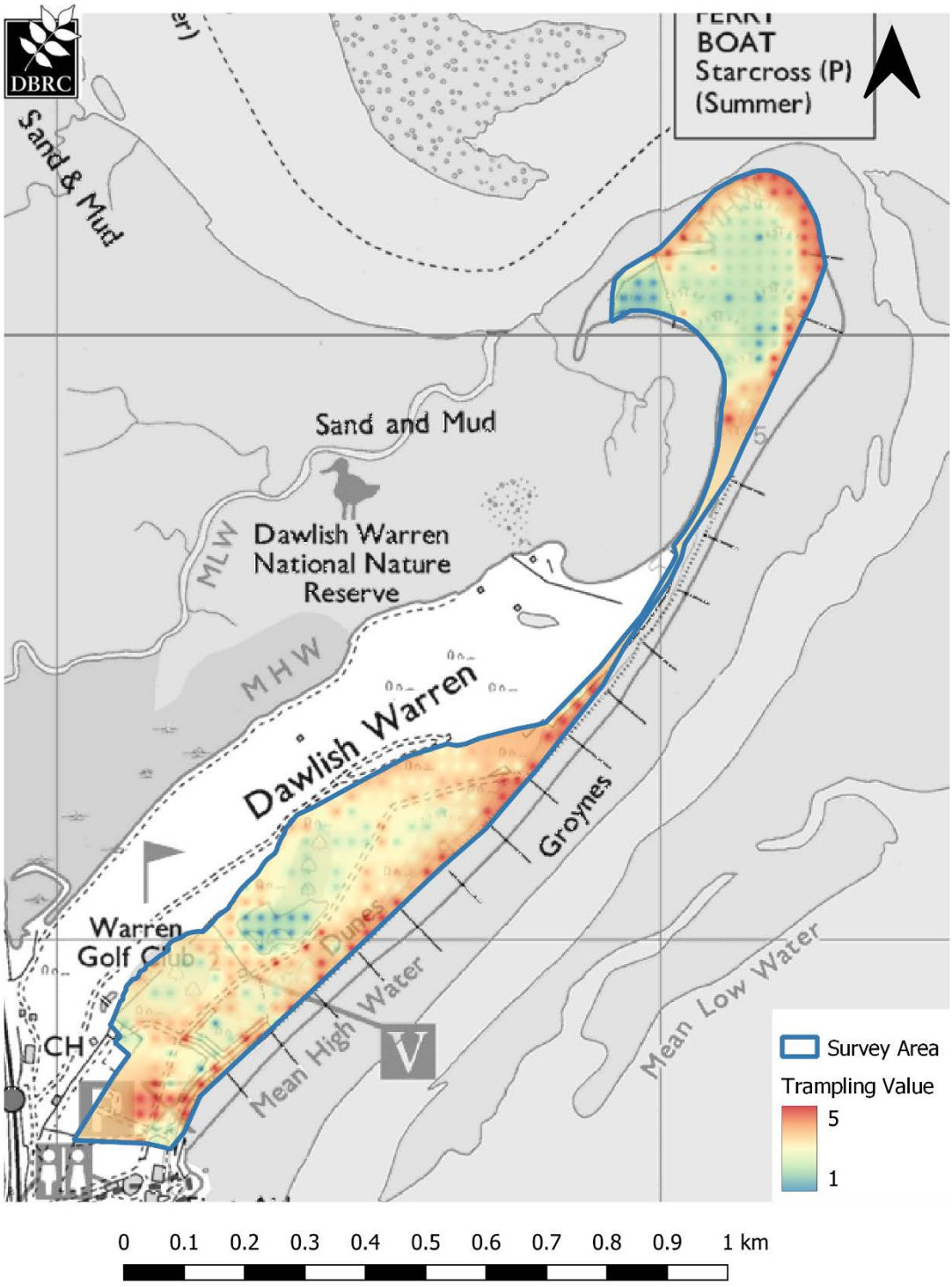




**Figure 2. Heatmap showing estimated trampling levels throughout Dawlish Warren based off of the 5 point scoring, with reds representing higher levels of trampling.**

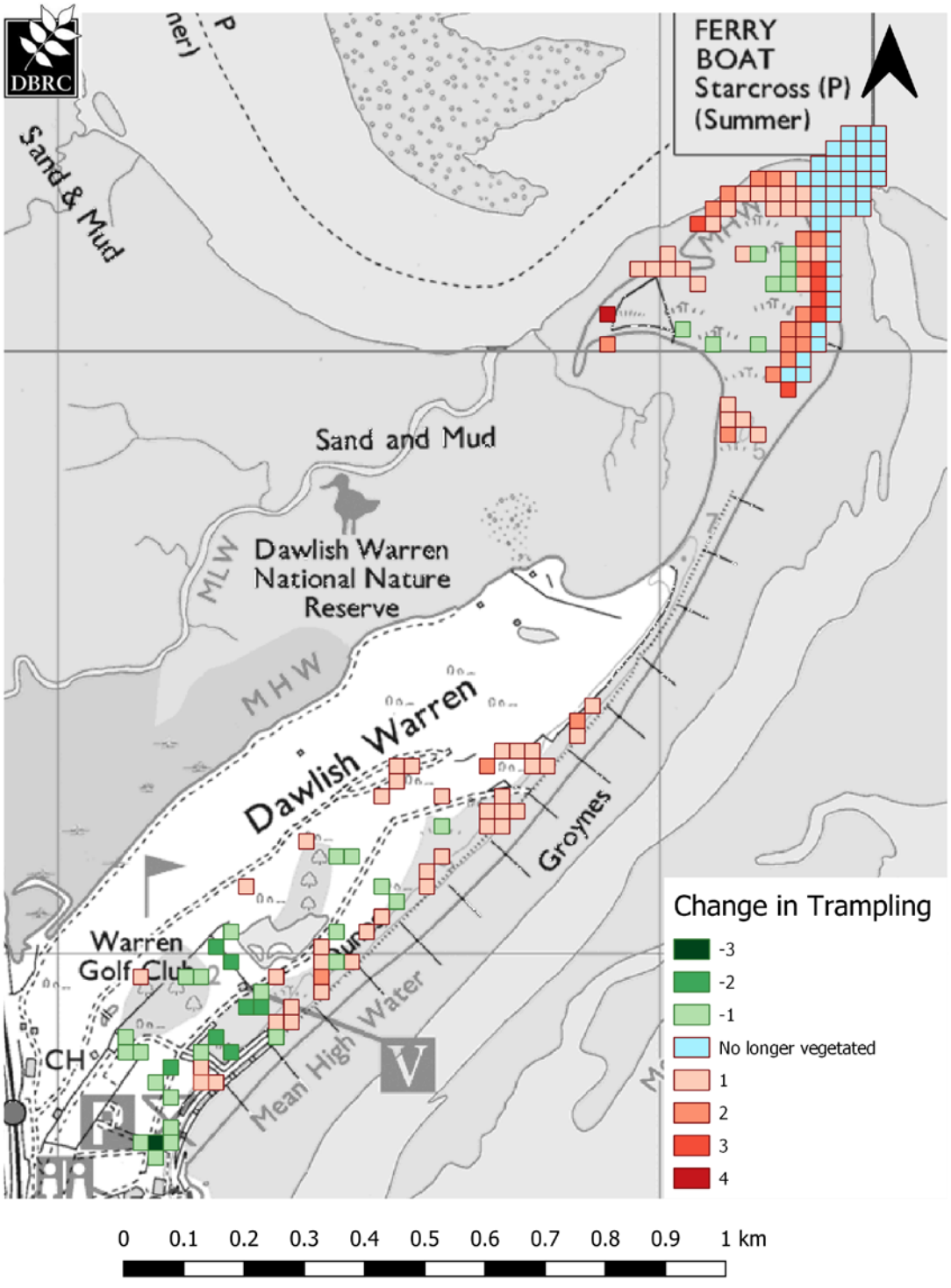




**Figure 3. Grid squares that have either shown a reduction or increase in trampling and erosion since 2019. Note that reduction need not imply removal of risk.**

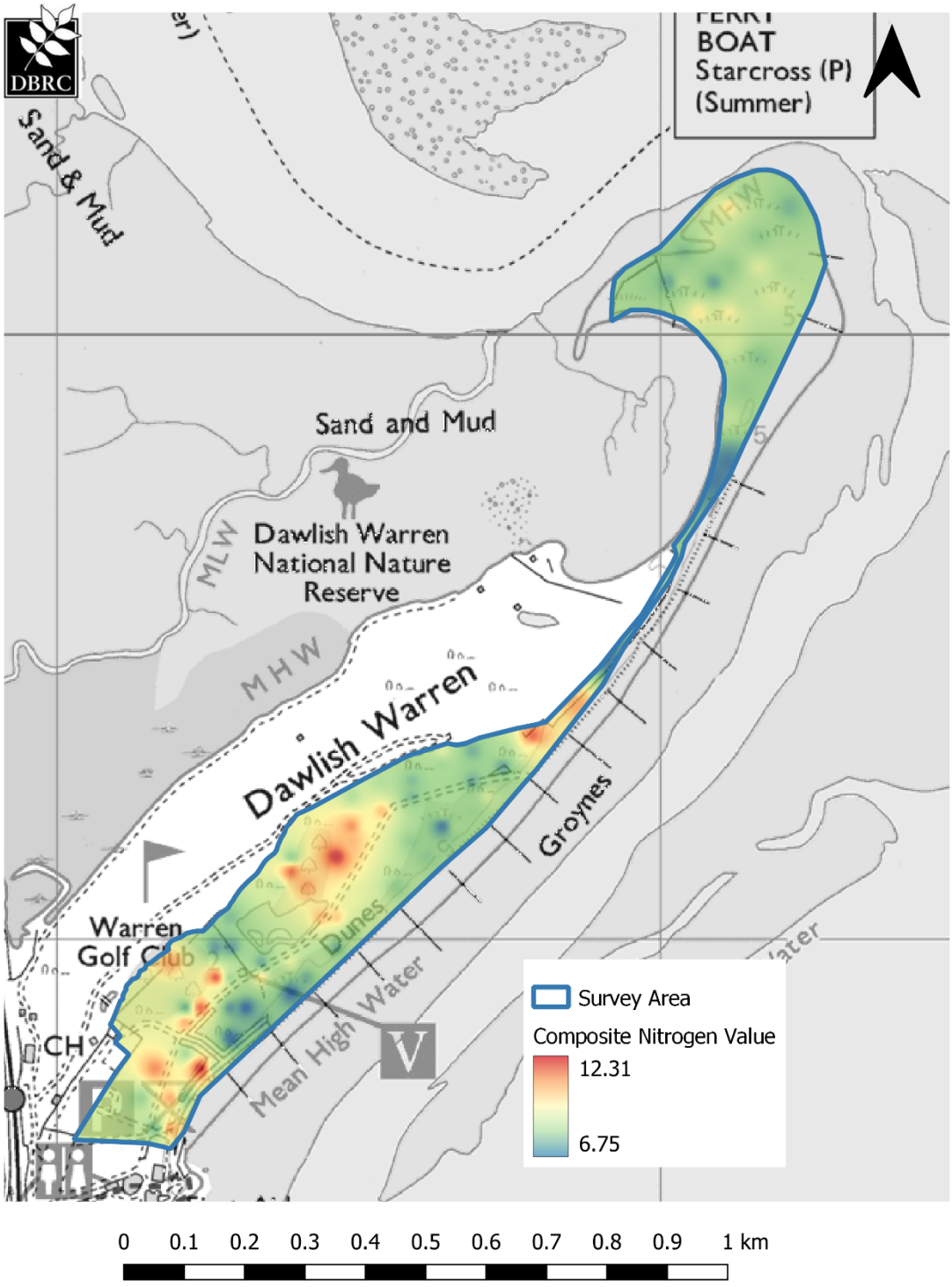




**Figure 4. Heatmap showing estimated fertility levels as expressed in vegetation composition across the site. Reds correspond to higher N values. Graphic is based on interpolation of abundance-weighted N values derived from species composition of 91 25m square sample plots. Note that high N values may have multiple causes. The weighted N values ranged from 6.75 to 12.31 (mean 8.65) – this scale is arbitrary and for comparative purposes only.**

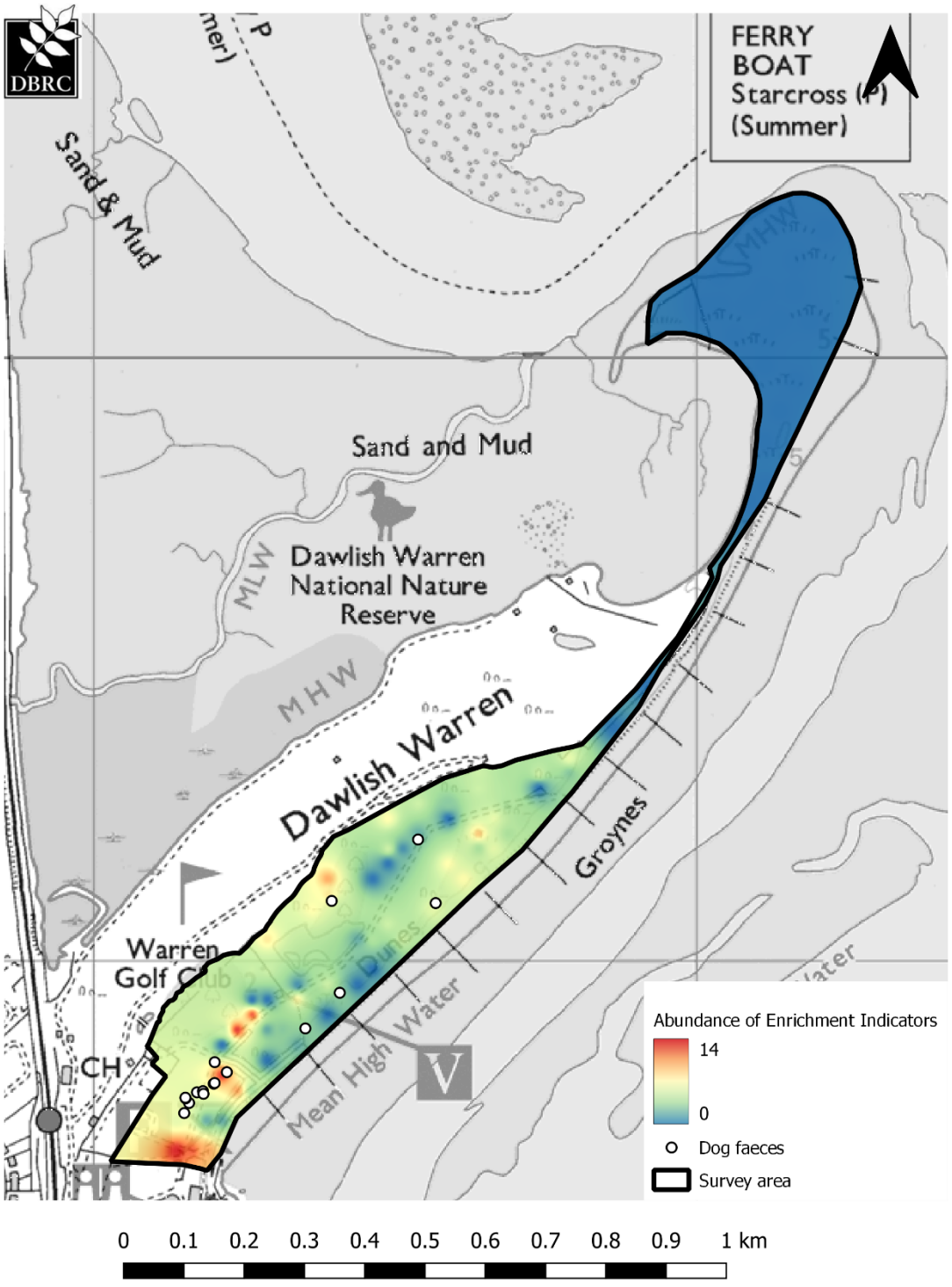




**Figure 5. Heatmap showing indicative abundance and distribution of vascular plant species indicative of anthropogenic nutrient enrichment in the context of dune grassland and dune slack habitats at Dawlish Warren. The location of recent dog faeces recorded during the fieldwork are shown for added context. Note this map is interpolated from samples (see text) not based on a full vegetation survey.**

# 4 CONCLUSIONS AND DISCUSSION

## 4.1 AREAS AT RISK OF SIGNIFICANT EROSION FROM TRAMPLING PRESSURE

The significant areas of risk from erosion from recreational trampling pressure are mostly associated with the frontal dune ridge. These are often in areas which technically belong to mobile dune vegetation types but are partially stabilised. Specifically for fixed dune and dune slack habitats the risk areas in order of decreasing severity are:

1) A small area of dune grassland at the extreme south end of the reserve next to the pedestrian entrance and adjacent to the buffer zone.

2) A particularly high density of path nodes and desire lines concentrates pressure on a relatively small area where the site narrows to the dune ridge level with groyne 8. Here there are a mixture of grassland types including dry and damp communities with the dune slack habitat reaching its northern limit flanked by areas of both fixed and semi-fixed turf.

3) The SD12 turf in a corridor on both sides of the main access track and footpath from the south end of the reserve to the visitor centre. Abrasion is frequent in these areas and is necessary to maintain the habitat suitable for some notable species present but risk of abrasion turning to net erosion and habitat loss is still significant.

4) The SD12 turf along the back path and in a corridor linking the back path and main trackway between the visitor center and pond (i.e. along south edge of flood bank). Impacts are more diffuse in these areas but moderately high locally.

Reference to Figure 1 and Figure 2 will provide further spatial detail on specific pressure spots.

## 4.2 AREAS SUBJECT TO NUTRIENT ENRICHMENT FROM DOG FOULING

The impact of dog waste (including urine and faeces) deposited on the low nutrient soils of sand dune habitats is not well understood. There is little empirical evidence or research from which to draw on for mitigation or management strategies. Jones et al. (2004) found that the varying habitats and soils within a sand dune system responded to atmospheric N deposition in complex and non-linear ways. An assumption that dog fouling causes increasing levels of plant-available Nitrogen (and Phosphorous) has been anecdotally correlated with observations of the spread of generalist or nutrient demanding forbs, grasses and shrubs (at the expense of specialist less competitive species of more open habitats).

There is an expectation in the succession of duneland habitats that nutrient status will naturally accrue - with relatively low levels in mobile sand communities gradually increasing inland. Ultimately old fixed dune grassland (as on the acid fairways of the golf course adjacent) may become very nutrient depleted due to leaching. Areas of fen or tall herb vegetation including some of the habitats found within maturing dune slacks (such as around Greenland Lake) may naturally have higher fertility values due to the significant accumulation of organic matter into the soil system in comparison to the intrinsically low-nutrient sand-derived substrates of the grassland habitats lying seaward in the zonation.

It should be noted that species 'Ellenberg N values', as published, were primarily derived from descriptive relationships between species distribution and soil fertility, not upon experimental data. A high N value can be seen as a general indicator of soil fertility rather than as a nitrogen index (Hill and Carey 1997). Whilst N values have been used in this study as a proxy for mapping fertility it should be noted that it is an untested assumption that a causal relationship between dog fouling and increased N values exists in dune vegetation.

The map at Figure 4 therefore gives context on the distribution of species and vegetation associated with higher fertility soils but does not necessarily indicate anthropogenic nutrient enrichment (from recreational use and dog fouling). A further layer of interpretation drawing on the incidence of indicator species (Figure 5) has been applied to interpret the areas listed at 3.2.

1. the southern end of the site near the entrance gates and in a corridor between the entrance and the visitor centre

Although no systematic survey of dog use was undertaken, the occurrence of visible dog fouling was recorded during the survey and this broadly coincided with the areas where dog faeces were most encountered and the highest recorded abundance of indicator species (Figure 5). It is also a high-pressure area for trampling.

2. the dune slack to the west of the main trackway

Contrary to Figure 4 indicator species were not abundant in this area. The vegetation data indicate that the apparent fertility here is more likely to be driven by autogenic than anthropogenic processes with the development of tall herb communities and willow regeneration. However, it is possible that dog fouling does contribute and that nutrients deposited in adjacent areas of higher usage may collect here.

3. the narrowing west of groynes 8 to 10.

Although this is an area of elevated trampling pressure (with the potential for dog fouling effects to be concentrated) the apparent fertility is thought to be related more to vegetation and disturbance history in this area than direct effects of dog fouling. This area has supported rank *Arrhenatherum* grassland and scrub in the past (Wheeler and Wilson 2013, DBRC 2020) and subsequent management or the persistence of woody vegetation may influence nutrient levels.

4. some diffuse areas within the Marram grassland on Warren Point

It is unlikely that this is directly influenced by recreation, due to the limited footfall (and dog ban) within the area. When reviewing the species data of high scoring quadrats within Warren Point, the majority of them supported frequent populations of bramble and evening primrose (*Oenothera* spp.), which both score 5 on the Ellenberg scale. The abundance of these species has weighted the scores towards the upper end of the scale and could suggest that the lack of disturbance or over stabilization of dune grassland in these areas is resulting in succession and attendant accumulation of organic matter and nutrients – i.e. autogenic rather than anthropogenic enrichment (although atmospheric nitrogen deposition may also be a factor in this vegetation).

Figure 6, below, is based on interpretation of the data presented in Figure 4 and Figure 5 alongside knowledge of vegetation community sensitivity and patterns of trampling risk and pressure.

### 4.2.1 AREAS SUBJECT TO HIGH AND MODERATE RISK FROM DOG FOULING

**High**

1) In conclusion an area of dune grassland (comprising a mixture of NVC communities SD7 and SD12) approximately 0.25 ha in size at the SE corner of the reserve (immediately east of the main access path) is the part of the site most prone to nutrient enrichment. It is also significantly more affected than the rest of the site. Floristically, this area was observed to be in a process of shifting from dune grassland towards mesotrophic grassland in the 2019 vegetation survey (DBRC 2020). It supports the Nationally Scarce species, *Trifolium glomeratum* (Clustered Clover), which is also scarce on the reserve. The level of nutrient enrichment here is comparable with that in the buffer zone immediately to the SE of this area (included on the maps for comparison). The relative limitation of this area within the reserve does demonstrate the function of a buffer zone in mitigating inputs.

**Moderate (in order of decreasing severity)**

2) The area of SD12 fixed dune grassland adjacent to the above (west of the main access path) and extending in a wedge shape northeast towards the visitor centre is not as severely affected but considered high-moderate risk and this also supports notable species.

3) The strip of dry SD12 which runs along the ridge between Greenland Lake and the golf course shows discontinuous but moderate nutrient impacts.

4) The area of mostly SD7 grassland between the main trackway/Greenland Lake and the frontal dune ridge level with groynes 5 to 8 and extending in a narrow strip on the landward face of the dune ridge towards the visitor centre also exhibits scattered evidence of nutrient enrichment potentially linked to long term effects of dog fouling.

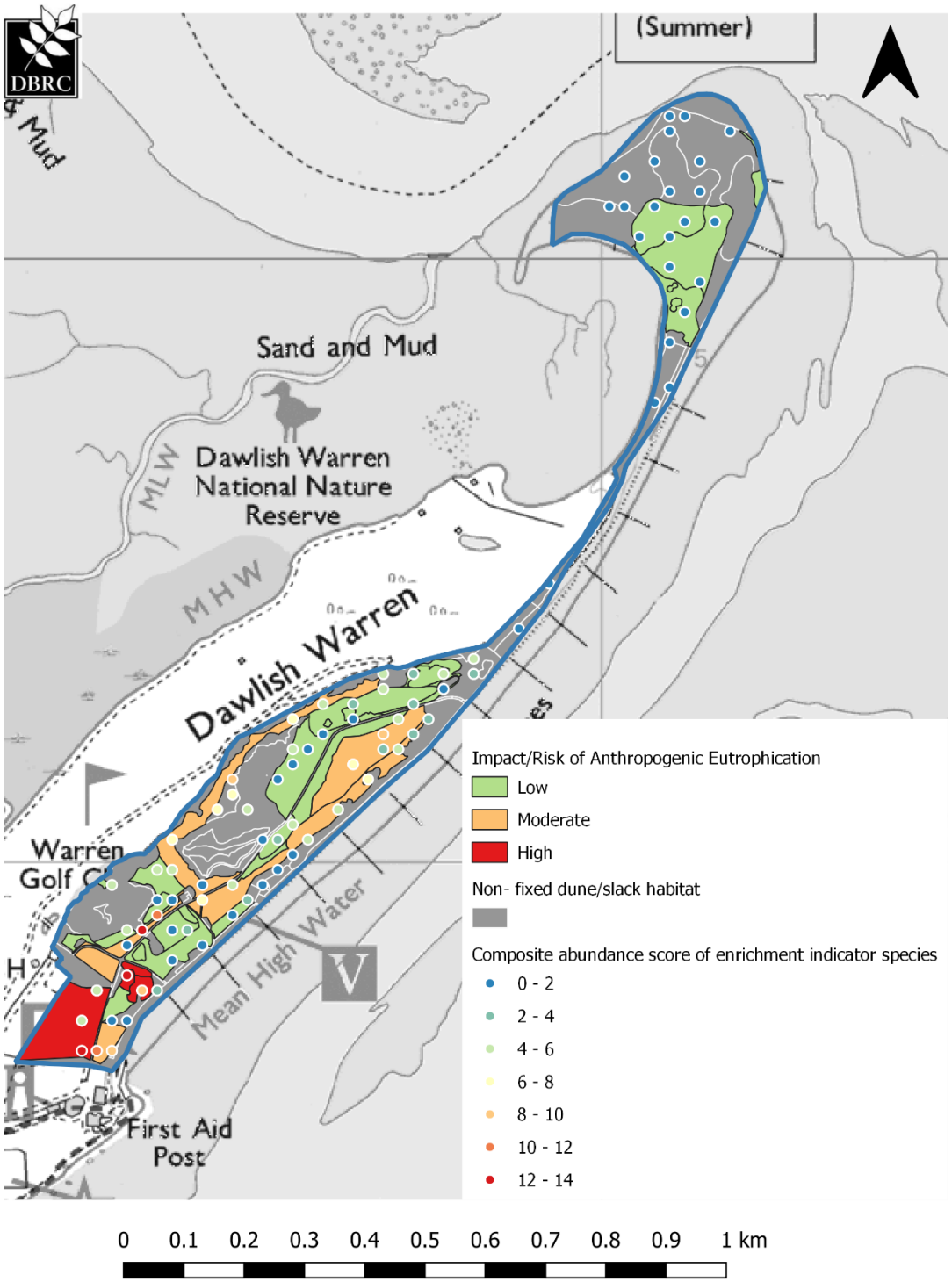




**Figure 6. Areas of fixed dune and/or dune slack subject to nutrient enrichment from dog fouling. Derived from interpretation of heatmaps produced from grid-based recording of vegetation in 2023, other observations and pre-existing NVC mapping.**

## 4.3 CHANGE SINCE THE 2019 ASSESSMENT

The survey has attempted to provide a comparable dataset to the previous assessments of trampling and eutrophication, to help managers and decision makers visualise and understand the possible impacts that they have had over time. Additionally, the survey sought to develop a means of data collection that can be relatively easily repeated. Monitoring the effects of nutrient enrichment does however pose significant challenges which are discussed below.

### 4.3.1 TRAMPLING

For trampling risk and impact a direct comparison between data collected in 2019 and 2023 is possible as the methodology was repeated without adaptation. Figure 3 summarises the detection of change in trampling pressure and risk as defined in the methodology. A number of squares which were assessed in 2019 were not assessed in 2023, for example where land has been lost to coastal erosion at Warren Point in the interim. These have been excluded from consideration in making the following comments which refer to squares with an available trampling assessment score in both years.

71% of the area has not changed in terms of its trampling assessment (319 of 447 squares). Approximately 20% of the area is assessed as experiencing higher trampling pressure and risk than in 2019 and 9% with some relaxation of trampling.

93 squares (21% of the area) changed to a minor degree of one scale increment (for example the assessment score altered from 2 to 3 or 5 to 4 between 2019 and 2023). Only 8% of the area (35 squares) changed by 2 or more increments. Changes detected at the lower end of the scale are likely to include some natural fluctuations and can be ascribed to recreational pressure with somewhat less confidence.

The net increase in trampling risk and pressure over the whole site (the sum of all changes to individually assessed squares) equates to a mean increase in the trampling index of 16%. This figure is derived from the qualitative 5 point scale used in the assessment and it is not suggested to demonstrate an absolute index of recreational pressure. Nevertheless, it suggests a small but significant increase since the previous assessment. It would be interesting to explore whether this correlates with visitor number estimates or records.

The overall spatial pattern of trampling risk has, unsurprisingly, not changed since 2019 (see 3.1) and the heatmaps produced for 2019 (DBRC 2020) and 2023 are very similar. However, there is evidence that some pressures have been slightly redistributed within the site. The principal areas of change (Figure 3) are:

1. the southern end of the site between the beach, pedestrian entrance and visitor centre. A new path and fencing has been installed. This may have encouraged greater use of the path for visitors wishing to access the amenity beach via the nature reserve but it has also provided an obstacle to using some of the adjacent parts of the site for recreation. Thus

some mitigation of trampling pressure in this area seems to have been achieved although it remains the highest risk part of the reserve for fixed dune habitats.

2. The vegetated margins of Warren Point. The mapped increase in pressure here is caused by a reduction in the extent of habitat so that the route navigated by walkers to circuit the point passes through squares which were formerly in the interior of the dunes and less accessible.
3. The beach front and dune ridge between groynes 4 and 8 appears to have experienced a slight increase in pressure with an increasing number of squares assessed in the 4 and 5 classes. However, the pattern of severity is identical to that shown by the 2019 assessment.

Additionally, there are a few squares within the warren point that have seen a reduction in trampling and erosion, this is likely through lack of use, with people sticking to the more worn paths.

121 squares showed an apparent increase in trampling and erosion. However, 78 of those are located around the northern edge of warren point and are likely to be attributed, predominantly at least, to natural processes. The other 43 squares are predominantly located along the edge of the main path through the dunes, which is more susceptible to erosion from footfall and environmental conditions, with another cluster of squares also located within the centre of the site at a main pinch point between those accessing the beach and the central areas of the reserve.

Although the survey's objectives were focused on anthropogenic erosion, it has effectively 'logged' the scale of natural erosion occurring around the northern extent of Warren Point, with many of the previously surveyed squares no longer existing, or now being occupied by beach sand or bare mobile sand. The current beech-vegetation front around Warren Point is still mapped as high risk for trampling. Although this part of the system may have the appearance of being under control of natural processes, even relatively low levels of trampling around the upper beach-foredune transition have potential to impact the dune habitat succession profoundly. There is evidence that past trampling pressure on the Point has interfered with or prevented the initiation of embryo dunes around the strandline (de Lemos 1992, Lake 2010). Trampling of the circuit around Warren Point is still evident and to what extent historical trampling has affected the resilience of the habitats to storm damage or impacted the ability of the dune system to migrate is unknown. A neat disentanglement of coastal erosion processes and trampling impact on the embryo and foredune habitat is probably not possible.

### 4.3.2 NUTRIENT ENRICHMENT

Analysis of change in the effects of nutrient enrichment since 2019 is more limited as no absolute comparison is possible between the 2019 and 2023 datasets.

Detection of change is dependent on identifying significant differences in the spatial distribution of indicative nutrient enrichment derived from vegetation attributes and supplementary observations.

The broad scale pattern shown on indicative fertility maps produced in 2019 and 2023 is very similar. Small differences are as likely to stem from differences in the way the data were collected (derived from vegetation data collected for other purposes in 2019 and the result of a more limited but purposely collected dataset in 2023) as change. The only significant discrepancy between these maps is that in 2019 the reedbeds are shown as a fertility hotspot but show as a neutral area in 2023. This is because they were sampled for NVC work in 2012 and 2019 but not prioritised under the objectives of the present survey.

Another significant difference is the apparent loss of a hotspot on the inner ridge approximately in line with groyne 7. This is thought be a very localised effect that the approach adopted in 2023 – essentially using 25m square samples to produce a more generalised picture of the site was spatially too insensitive to detect.

The application of heatmapping to a complex mosaic of habitats such as occurs on Dawlish Warren where the source data are samples rather than complete will always tend to smooth away heterogeneity in conditions.

Our best judgement from the available data is that the spatial distribution of nutrient enrichment effects from dog fouling is substantially the same as in 2019. These data do not allow an assessment of whether there have been any significant changes in severity, either at individual locations or for the whole site.

The ecology of dog-fouling derived nutrient inputs in sand dunes is complex and not yet well studied (see Rhodes 2012). A future assessment employing the same approach as used in the present survey could be capable of detecting changes if they were sizeable. However, it is likely that a more labour-intensive design of study, possibly employing direct measurement of nutrient loads and probably entailing a more complete inventory of the vegetation, would be needed to meaningfully monitor these impacts.

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## 6 ACKNOWLEDGEMENTS

This work was commissioned by the South East Devon Habitat Regulations Partnership. We are grateful to Neil Harris (Habitat Regulations Delivery Manager) and Phil Chambers (Senior Ranger at Dawlish Warren National Nature Reserve) for their advice and feedback.

# 7 APPENDICES

## 7.1 EXAMPLE PHOTOS OF TRAMPLING CATEGORIES

### 7.1.1 CATEGORY 5

### 7.1.2 CATEGORY 4

### 7.1.3 CATEGORY 3

### 7.1.4 CATEGORY 2

### 7.1.5 CATEGORY 1

## 7.2 LIST OF SPECIES RECORDED AND USED IN THE ANALYSIS WITH ELLENBERG VALUES (AFTER HILL ET AL. 1999) FOR NITROGEN

| Species | Common Name | Ellenberg N Value |
|---|---|---|
| *Acer pseudoplatanus* | Sycamore | 6 |
| *Achillea millefolium* | Yarrow | 4 |
| *Agrimonia eupatoria* | Agrimony | 4 |
| *Agrostis canina sens. lat.* | Creeping bent | 3 |
| *Agrostis capillaris* | Common Bent | 4 |
| *Aira praecox* | Early Hair-grass | 2 |
| *Ajuga reptans* | Bugle | 5 |
| *Alnus glutinosa* | Alder | 6 |
| *Ammophila arenaria* | Marram | 3 |
| *Angelica sylvestris* | Wild Angelica | 5 |
| *Anisantha sterilis* | Barren Brome | 5 |
| *Anthoxanthum odoratum* | Sweet Vernal-grass | 3 |
| *Anthriscus sylvestris* | Cow Parsley | 7 |
| *Arrhenatherum elatius* | False Oat-grass | 7 |
| *Artemisia vulgaris* | Mugwort | 7 |

| | | |
|---|---|---|
| *Asparagus officinalis* | Asparagus | 3 (based on subsp. *prostratus*) |
| *Atriplex sp.* | Orache | 7 (based on *A. laciniata*) |
| *Beta vulgaris subsp. maritima* | Sea beet | 8 |
| *Betula pendula* | Silver Birch | 4 |
| *Betula pubescens* | Downy Birch | 4 |
| *Bolboschoenus maritimus* | Sea Club-rush | 7 |
| *Bromus hordeaceus* | Soft brome | 4 |
| *Buddleja davidii* | Butterfly-bush | 5 |
| *Calystegia sepium* | Hedge Bindweed | 7 |
| *Calystegia soldanella* | Sea bindweed | 4 |
| *Carex arenaria* | Sand Sedge | 2 |
| *Carex distans* | Distant sedge | 5 |
| *Carex echinata* | Star Sedge | 2 |
| *Carex flacca* | Glaucous Sedge | 2 |
| *Carex leporina* | Oval Sedge | 4 |
| *Carex nigra* | Common Sedge | 2 |
| *Carex otrubae* | False Fox-sedge | 7 |
| *Carex panicea* | Carnation sedge | 2 |
| *Carex remota* | Remote Sedge | 6 |
| *Carex sylvatica* | Wood-sedge | 5 |
| *Centaurium erythraea* | Common Centaury | 3 |
| *Cerastium diffusum* | Sea Mouse-ear | 3 |
| *Circaea lutetiana* | Enchanter's-nightshade | 6 |
| *Cirsium arvense* | Creeping Thistle | 6 |
| *Clematis vitalba* | Traveller's-joy | 5 |
| *Cotoneaster* agg. | Cotoneasters | 4 (most cotoneasters) |
| *Crataegus monogyna* | Hawthorn | 6 |
| *Cynoglossum officinale* | Hound's-tongue | 6 |
| *Cynosurus cristatus* | Crested Dog's-tail | 4 |
| *Dactylis glomerata* | Cock's-foot | 6 |
| *Daucus carota* | Wild carrot | 3 |
| *Deschampsia cespitosa* | Tufted Hair-grass | 4 |
| *Digitalis purpurea* | Foxglove | 5 |
| *Dryopteris dilatata* | Broad Buckler-fern | 5 |
| *Elytrigia repens* | Common Couch | 7 |
| *Epilobium spp.* | Willowherbs | 6 (based on an average) |
| *Epipactis palustris* | Marsh helleborine | 4 |
| *Equisetum palustre* | Marsh Horsetail | 3 |
| *Erigeron canadensis* | Canadian fleabane | No value |
| *Erodium maritimum* | Sea Stork's-bill | 6 |
| *Eryngium maritimum* | Sea holly | 5 |
| *Euphorbia portlandica* | Portland spurge | 3 |
| *Euphrasia* agg. | Eyebright | 3 |
| *Festuca rubra* agg. | Red Fescue | 5 |
| *Filipendula ulmaria* | Meadowsweet | 5 |
| *Fraxinus excelsior* | Ash | 6 |
| *Galium aparine* | Cleavers | 8 |

| | | |
|---|---|---|
| *Galium mollugo* | Hedge Bedstraw | 4 |
| *Galium palustre* | Marsh-bedstraw | 4 |
| *Galium uliginosum* | Fen Bedstraw | 4 |
| *Galium verum* | Lady's Bedstraw | 2 |
| *Geranium dissectum* | Cut-leaved Crane's-bill | 6 |
| *Geranium molle* | Dove's-foot Crane's-bill | 5 |
| *Geranium robertianum* | Herb-Robert | 6 |
| *Geum urbanum* | Wood Avens | 7 |
| *Hedera helix* | Common Ivy | 6 |
| *Heracleum sphondylium* | Hogweed | 7 |
| *Holcus lanatus* | Yorkshire-fog | 5 |
| *Honckenya peploides* | Sea Sandwort | 6 |
| *Hordeum murinum* | Wall Barley | 6 |
| *Hydrocotyle vulgaris* | Marsh Pennywort | 3 |
| *Hypericum perforatum* | Perforate St John's-wort | 5 |
| *Hypericum tetrapterum* | Square-stalked St John's-wort | 4 |
| *Hypochaeris radicata* | Cat's-ear | 3 |
| *Iris foetidissima* | Stinking Iris | 5 |
| *Iris pseudacorus* | Yellow Iris | 6 |
| *Juncus acutiflorus* | Sharp-flowered Rush | 2 |
| *Juncus articulatus* | Jointed Rush | 3 |
| *Juncus bufonius agg.* | Toad rush | 5 |
| *Juncus conglomeratus* | Compact Rush | 3 |
| *Juncus effusus* | Soft-rush | 4 |
| *Juncus maritimus* | Sea Rush | 5 |
| *Lagurus ovatus* | Hare'stail | No value |
| *Lapsana communis* | Nipplewort | 7 |
| *Leontodon hispidus* | Rough Hawkbit | 3 |
| Lichen undiff. | | No value |
| *Linaria vulgaris* | Common Toadflax | 6 |
| *Linum catharticum* | Fairy Flax | 2 |
| *Lolium perenne* | Perennial Rye-grass | 6 |
| *Lonicera periclymenum* | Honeysuckle | 5 |
| *Lotus corniculatus* | Common Bird's-foot-trefoil | 2 |
| *Lotus pedunculatus* | Greater Birds-foot trefoil | 4 |
| *Lupinus arboreus* | Tree Lupin | 3 |
| *Luzula campestris* | Field Wood-rush | 2 |
| *Lycopus europaeus* | Gypsywort | 6 |
| *Lythrum salicaria* | Purple-loosestrife | 5 |
| *Malus domestica* | Apple | 7 |
| *Medicago lupulina* | Black Medick | 4 |
| *Mentha aquatica* | Water Mint | 5 |
| *Molinia caerulea* | Purple Moor-grass | 2 |
| *Odontites vernus* | Red Bartsia | 5 |
| *Oenanthe crocata* | Hemlock Water-dropwort | 7 |
| *Oenanthe lachenalii* | Parsley Water-dropwort | 5 |
| *Oenothera* | Evening primrose | 4 (average) |
| *Ononis repens* | Common Restharrow | 3 |
| *Origanum vulgare* | Wild Marjoram | 4 |
| *Phleum arenarium* | Sand cat's-tail | 3 |
| *Phragmites australis* | Common Reed | 6 |
| *Plantago coronopus* | Buck's-horn Plantain | 4 |

| | | |
|---|---|---|
| *Plantago lanceolata* | Ribwort Plantain | 4 |
| *Plantago major* | Greater Plantain | 7 |
| *Poa annua* | Annual Meadow-grass | 7 |
| *Poa bulbosa* | Bulbous meadow grass | 2 |
| *Polypodium vulgare* | Polypody | 3 |
| *Populus alba* | White Poplar | 6 |
| *Potentilla erecta* | Tormentil | 2 |
| *Prunella vulgaris* | Self-heal | 4 |
| *Pulicaria dysenterica* | Common Fleabane | 4 |
| *Quercus cerris* | Turkey Oak | 6 |
| *Ranunculus acris* | Meadow Buttercup | 4 |
| *Ranunculus repens* | Creeping Buttercup | 7 |
| *Raphanus raphanistrum* | Sea radish | 5 |
| *Rhinanthus minor* | Yellow-rattle | 4 |
| *Rosa arvensis* | Field-rose | 5 |
| *Rosa canina agg.* | Dog Rose | 6 |
| *Rubia peregrina* | Wild Madder | 5 |
| *Rubus fruticosus agg.* | Bramble | 6 |
| *Rumex acetosa* | Common Sorrel | 4 |
| *Rumex acetosella* | Sheep's Sorrel | 3 |
| *Rumex obtusifolius* | Broad-leaved Dock | 9 |
| *Rumex sanguineus* | Wood Dock | 7 |
| *Salix caprea* | Goat Willow | 7 |
| *Salix cinerea* | Grey Willow | 5 |
| *Sambucus nigra* | Elder | 7 |
| *Scorzoneroides autumnalis* | Autumn Hawkbit | 4 |
| *Sedum acre* | Biting Stonecrop | 2 |
| *Sedum anglicum* | English Stonecrop | 2 |
| *Senecio jacobaea* | Common Ragwort | 4 |
| *Silene dioica* | Red Campion | 7 |
| *Silene flos-cuculi* | Ragged-Robin | 4 |
| *Sisymbrium officinale* | Hedge Mustard | 7 |
| *Sisyrinchium bermudiana* | Blue-eyed-grass | 3 |
| *Solanum dulcamara* | Bittersweet | 7 |
| *Solidago virgaurea* | Goldenrod | 3 |
| *Sonchus asper* | Sow-thistle | 6 |
| *Spergularia rubra* | Sand Spurrey | 2 |
| *Spiranthes spiralis* | Autumn Lady's-tresses | 3 |
| *Symphyotrichum* | Michaelmas daisy | 6 |
| *Tamus communis* | Black Bryony | 6 |
| *Tanacetum vulgare* | Tansy | 7 |
| *Taraxacum officinale agg.* | Dandelion | 6 |
| *Teucrium scorodonia* | Wood Sage | 3 |
| *Trifolium arvense* | Hare's-foot Clover | 2 |
| *Trifolium dubium* | Lesser Trefoil | 5 |
| *Trifolium pratense* | Red Clover | 5 |
| *Trifolium repens* | White Clover | 6 |
| *Trifolium subterraneum* | Subterranean Clover | 2 |
| *Ulex europaeus* | Gorse | 3 |
| *Umbilicus rupestris* | Navelwort | 4 |
| *Urtica dioica* | Common Nettle | 8 |
| *Veronica chamaedrys* | Germander Speedwell | 5 |

| | | |
|---|---|---|
| *Vicia cracca* | Tufted Vetch | 5 |
| *Vicia hirsuta* | Hairy Tare | 6 |
| *Vicia sativa* | Common vetch | 4 |
| *Viola riviniana* | Common Dog-violet | 4 |
| *Vulpia bromoides* | Squirreltail Fescue | 3 |
| *Vulpia ciliata* | Bearded Fescue | 2 |

# Report produced by:

**Devon Biodiversity Records Centre**

**Cricklepit Mill**

**Commercial Road**

**Exeter**

**EX2 4AB**

Devon Biodiversity Records Centre is the central repository for species, habitat and geological data within the county. It values and supports the recording community whilst working closely with stakeholders, clients and the wider public. DBRC is run on a not for profit basis with income from key partners, commercial projects and services. Our mission is to ensure biodiversity can be measured, recorded and therefore protected for everyone's future benefit.

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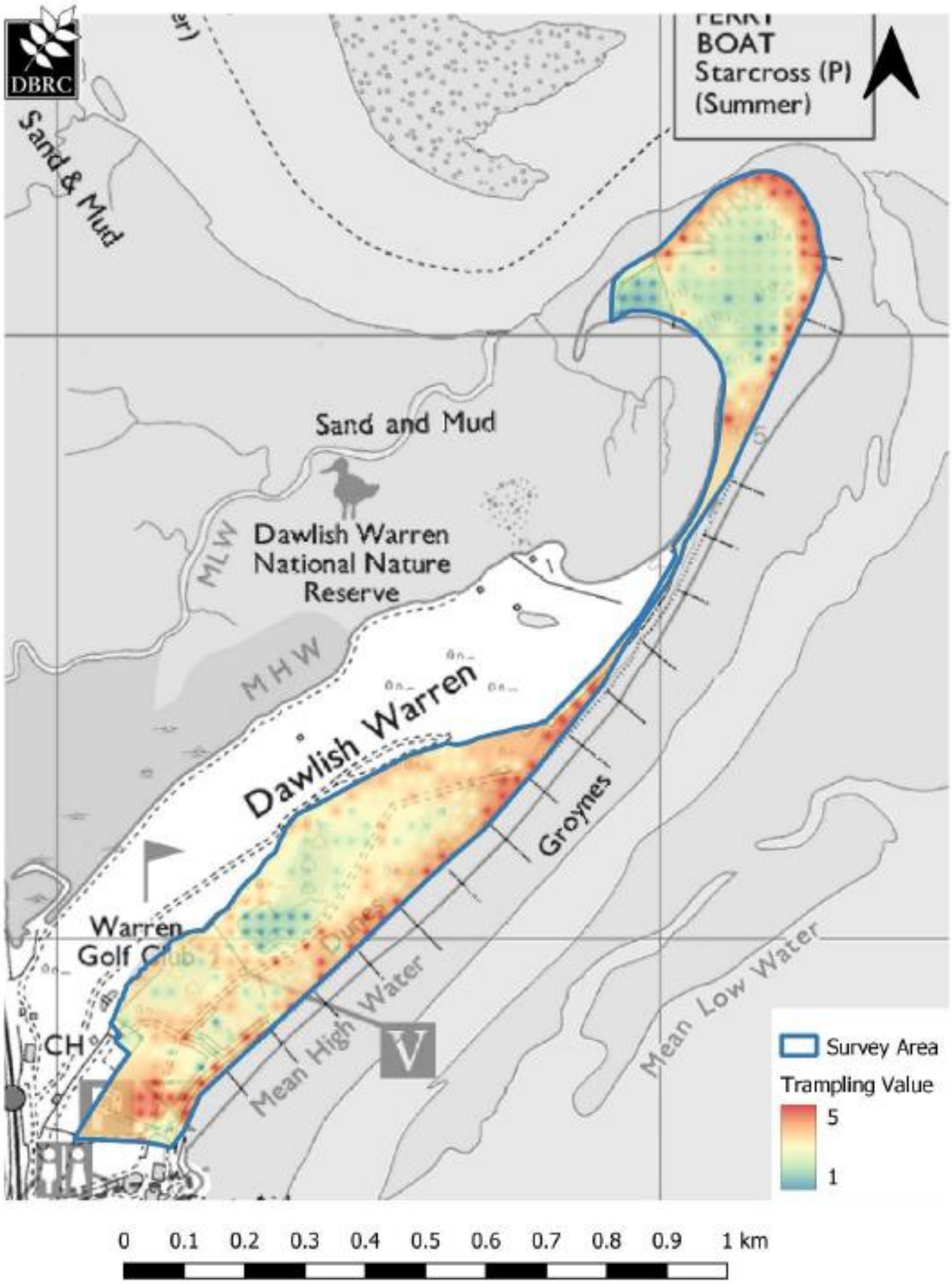
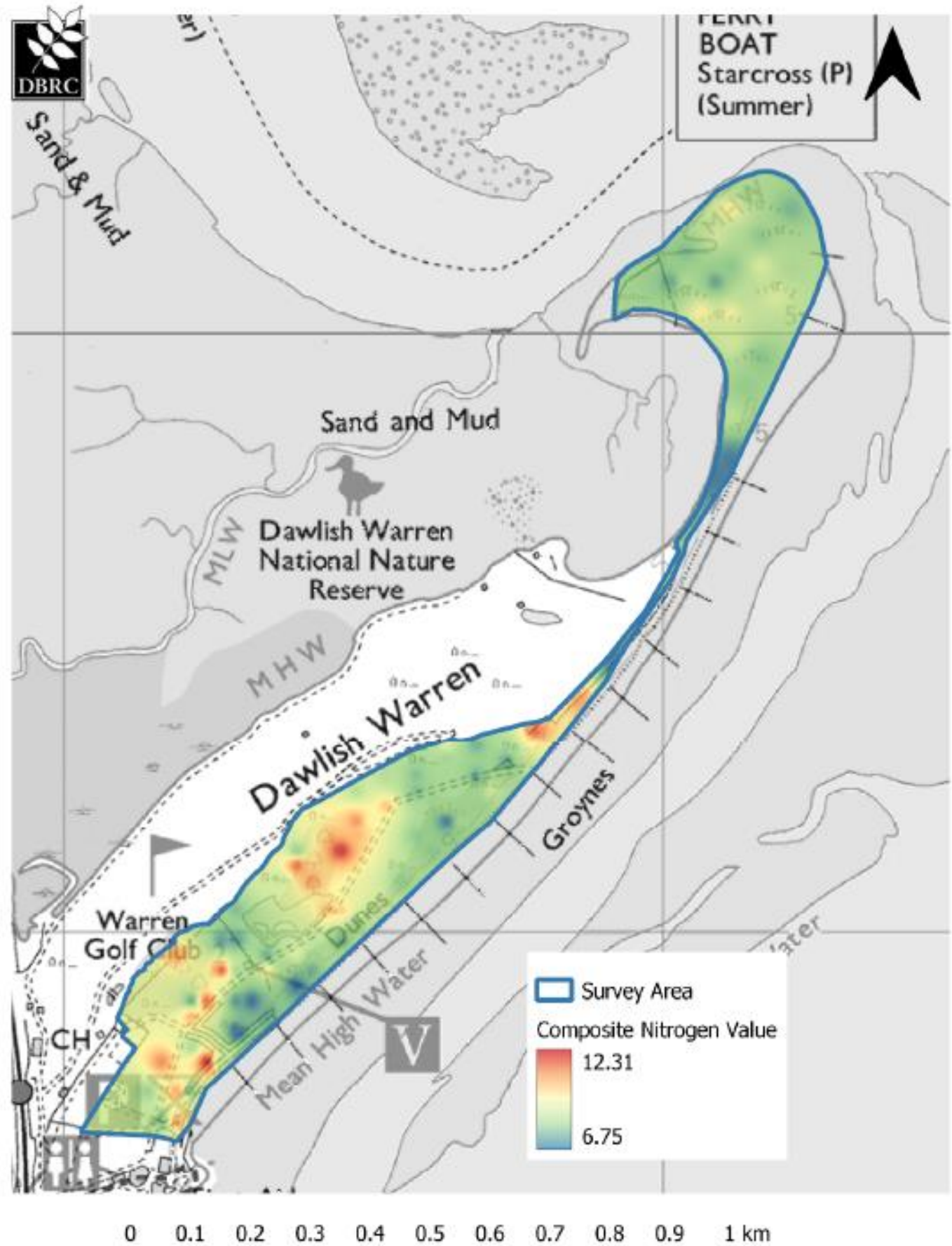
DBRC is hosted by Devon Wildlife Trust

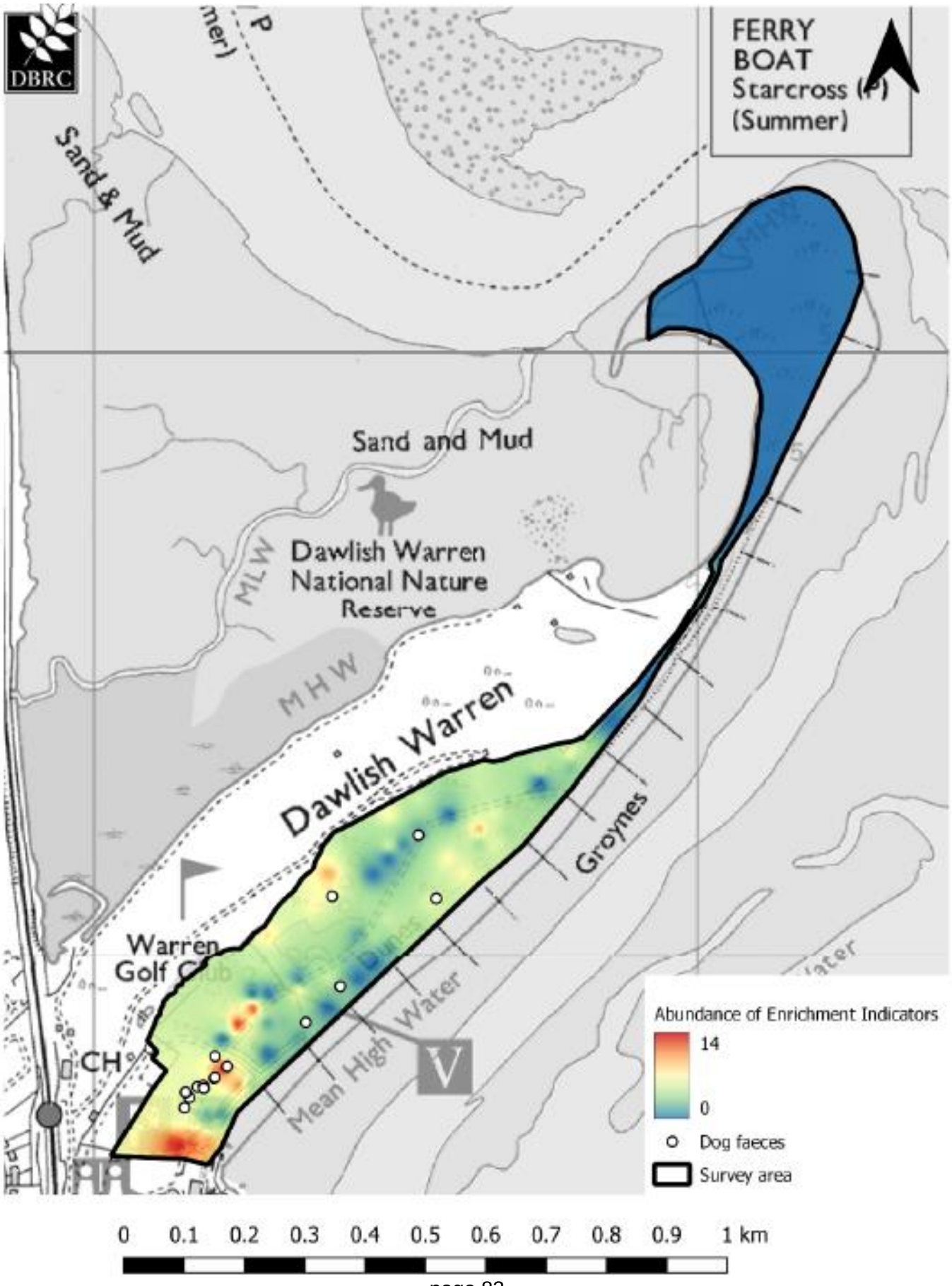
Appendix B: Trampling impact and risk heatmap.



Appendix C: Eutrophication (nutrient enrichment) heatmap.



Appendix D: Eutrophication (nutrient enrichment) heatmap – human-derived indicators.



SOUTH EAST DEVON
HABITAT REGULATIONS
PARTNERSHIP

# South East Devon Habitat Regulations Executive Committee

## South East Devon Wildlife branding update

Anne Mountjoy, Communications Officer
January 2024

Legal comment/advice:

There are no substantive legal issues to be added to this report.

Finance comment/advice:

No direct financial implications arise from the report.

| | |
|---|---|
| **Public Document:** | **Yes** |
| **Exemption:** | None |
| **Review date for release** | None |

## Recommendations

It is proposed that the Executive Committee:

1. Notes the branding update for South East Devon Wildlife, South East Devon Habitat Regulations Partnership and South East Devon Habitat Regulations Executive Committee.
2. Approve the revised communications protocol for the partnership and Committee.

**Equalities impact:** Low

Risk: Low. This report provides an update on branding for the work of South East Devon Wildlife.

### 1. Summary

1.1 South East Devon Wildlife (SEDW) is the public facing brand for the South East Devon Habitat Regulations Partnership and South East Devon Habitat Regulations Executive Committee.

1.2 A recent review of how the organisation, partnership, project work and committee are referenced has shown that standardisation of our name would reinforce and improve the awareness of the organisation and the work carried out.

### 2. Findings

2.1 An internal review of the South East Devon Wildlife (SEDW) brand has been carried out. The review found that the work of officers, the work of the partnership and the work of the committee are referred to in different ways.

2.2 Since its launch, SEDW officers have strived to increase engagement with the public by using plain English. For example, Habitat Mitigation Officers are now called Wildlife Wardens.

2.3 A standardisation exercise was carried out on digital communication channels to increase brand awareness and search engine optimisation. Where possible, digital communications channels are now named South East Devon Wildlife or derivatives of that.

2.4 To extend the standardisation work, it is recommended that the organisation and its work should be consistently referenced as South East Devon Wildlife. This change will mean that references to our work will consistently use South East

Devon Wildlife, across all comms, including when writing news stories for partners' communications.

2.5 For example, new website text for 'about us' would be:

*South East Devon Wildlife (SEDW) is a partnership of Exeter City, East Devon and Teignbridge District Councils (specifically referred to as the South East Devon Habitat Regulations Executive Committee (SEDHREC)) and officer working group, (specifically referred to as the South East Devon Habitat Regulations Partnership (SEDHRP)).*

*SEDHREC oversees the work of SEDW and is legally required to make decisions and recommendations across the three authority areas to protect three internationally important conservation sites.*

*The Committee operates through a delivery manager and the SEDHRP, to protect places such as the Exe Estuary, Dawlish Warren and the East Devon Pebblebed Heaths for future generations to enjoy.*

2.5 Where it is not possible to use South East Devon Wildlife, South East Devon Habitat Regulations Partnership or South East Devon Habitat Regulations Executive Committee will be used when the appropriate governance group is referred to.

2.6 The communications protocol should be updated in line with this. See Appendix 1.

**Anne Mountjoy**
**Communications Officer**
**South East Devon Habitat Regulations Executive Committee**

**January 2024**

| |
|---|
| Natural England comment:<br><br>Natural England have reviewed the report and have no further comment. |

SOUTH EAST DEVON
HABITAT REGULATIONS
PARTNERSHIP

# Habitat Regulations

# Communications Protocol – January 2024

**Memorandum of Understanding between the Communications teams at**:
Teignbridge District Council, Exeter City Council and East Devon District Council.

**The principal objective of Habitat Regulations mitigation communications is:**

To promote the work of the South East Devon Habitat Regulations Executive Committee (and Partnership) (SEDHREC/SEDHRP) in a consistent and coordinated manner.

Including:

- Agree main point of communications contact.
- To achieve agreement on key messages about the Mitigation Strategy and activities.
- To manage proactive and reactive media activity and relations to ensure appropriate recognition of partner authorities in funding joint initiatives (SANGS and other site-specific measures such as visitor access improvements, Exe Patrol Boat, Exe wildlife refuges, etc.).
- To manage content for social media and website.
- To manage the South East Devon Wildlife brand as the external face of SEDHREC and SEDHRP.
- To provide support for campaigns and events, where necessary.
- To keep key partner (National Trust, RSPB, DWT, Clinton Devon Estates, Exe Estuary Management Partnership) communications departments updated and informed of SEDW project communications.

**Requested communications protocol:**

Lead comms officer to remain as Anne Mountjoy, East Devon District Council (EDDC), due to experience of working in a split role across Exeter and East Devon Growth Point and Teignbridge District Council. Anne currently works for EDDC Growth, Development and Prosperity team and provides comms support for similar cross-boundary partnerships (eg Clyst Valley Regional Park).

East Devon
Exeter City Council
Teignbridge DISTRICT COUNCIL South Devon

SOUTH EAST DEVON
HABITAT REGULATIONS
PARTNERSHIP

**Communicating with Members**

Each Committee member will be supported by their appropriate council comms contact, with assistance from SEDHREC comms officer.

All councils' members to be informed of meeting agendas and minutes via internal communications routes.

Any Ward specific enquiries or issues to be returned to the relevant Council communications team for review/reply.

**Media releases**

All media releases to include a quote from the Chair of SEDHREC (who rotates between the three councils). If appropriate, each Council's Committee member can be asked to provide a quote. These must be approved by respective communications leads at each authority, to ensure compliance with local media relations/communications protocols. As and where appropriate, local comms leads to contact relevant Ward members to ensure they are informed about activities and issues, and to be provided with an opportunity to comment.

Any partners directly involved to be asked to provide a quote.

On despatch, releases to be circulated to key partners (Clinton Devon Estates, DWT, RSPB, etc).

Key comms contacts:

- Louise Raymond, Teignbridge District Council
  Louise.Raymond@Teignbridge.gov.uk **(01626 215164)**
- Andrew Hopkins, East Devon District Council
  ahopkins@eastdevon.gov.uk **(01395 517581)**
- Steve Upsher, Exeter City Council
  stephen.upsher@exeter.gov.uk **(01392 265103)**

Key technical/policy contacts:

- Neil Harris, EDDC/ECC/TDC
  nharris@eastdevon.gov.uk (07890 626 291)
- Jill Day, Exeter City Council

  Jill.day@exeter.gov.uk (01392 265615)
- Fergus Pate, Teignbridge District Council
  Fergus.pate@teignbridge.gov.uk (01626 215466)

East Devon Exeter City Council Teignbridge District Council South Devon

SOUTH EAST DEVON
HABITAT REGULATIONS
PARTNERSHIP

**Branding**

**Brand simplicity and consistency is key to raise awareness, understanding and reach of our work. All brand references use South East Devon Wildlife, including on the website, social media and our engagement team are 'Wildlife Wardens'. When referring to the organisation where appropriate, South East Devon Wildlife should be used. In circumstances where the Committee or Partnership are referred to specifically, then South East Devon Habitat Regulations Executive Committee and South East Devon Habitat Regulations Partnership can be used.**

**Website**

All news and updates relating to the project will be shared on www.southeastdevonwildlife.org.uk, as well as links to appropriate resources on respective Councils' websites as necessary. Documents can be duplicated on Councils' websites as required.

**Social media**

South East Devon Wildlife/Devon Loves Dogs officers manage their own social media channels, with training, advice and guidance from SEDHREC comms officer. Where appropriate social media messages to be shared by communications partners.

**Collateral**

All collateral to feature 3 Councils' logos and to be approved by all

Council logos to be used on a case by case basis, agreed with the respective Communications Lead and Delivery Officer

(Eg Dog Project collateral requires low local authority branding)

Specific Habitat Regulations Executive Committee logo to be used on all collateral.

SOUTH EAST DEVON
HABITAT REGULATIONS
PARTNERSHIP

# South East Devon Habitat Regulations Executive Committee

*Habitat mitigation team updates.*

*Wildlife Wardens and Devon Loves Dogs*
*Growth, Development & Prosperity,*
*East Devon District Council*
*January 2024*

The purpose of this report is to provide a regular update from the habitat mitigation delivery team. This enables the Executive Committee to maintain a good understanding of the initiatives, partnership working and day to day activities of public-facing staff. Continued and effective delivery of the Strategy and the development this enables remains of very high importance to all partners.

## 1 Wildlife Wardens

1.1 Between September and December, wardens focused a large part of their work on Exe Estuary Special Protection Area (SPA) overwintering waterbirds, with Exmouth Wildlife Refuge as peak pressure location.

1.2 As always, the team split their time between Dawlish Warren NNR, Exe estuary boat patrols, RSPB Exminster & Bowling Green Marsh, and the Pebblebed Heaths NNR, but were predominantly at Exmouth Wildlife Refuge during this quarter.

1.3 It is encouraging to report that we have thus far, had no negative engagements this refuge season – with almost all conversations positive and understanding.

1.4 The concept of the Wildlife Refuge as a voluntary 'no go' area is being championed by local watersports enthusiasts and both Exmouth Watersports and Edge Watersports (the predominant providers of watersports lessons in area) have both been seen on the water re-directing people who have entered the Refuge. Wardens have not seen any mass flight disturbance caused by watersports this season (and just one report of) and have had hundreds of positive engagements with this user group.

1.5 Dog walking on the foreshore remains a challenge, with dog walkers still entering the Wildlife Refuge from both the slipway and by hopping over the tidal defence at the other end of site. Lots of chats with dog walkers about the importance of giving overwintering species the space to rest and feed. Sadly, this group is difficult to engage with en-mass and more numerous than any other visitor to site. Warden presence has prevented disturbance from this group numerous times over the season and this still proves to be the most effective response.

1.6 Vantage point counts (to monitor disturbance) are undertaken weekly at all 3 estuary locations during the winter period: Cockwood steps (overlooking Dawlish Warren Wildlife Refuge), Lympstone (with views across river and down toward Exmouth Wildlife Refuge) & Exmouth Wildlife Refuge.


Figure 1. Vantage point count and social media post combined.

1.7 This year, there have been greater numbers of birds and species diversity in the Exmouth Refuge than any year previous. Initial Wetland Bird Survey (WeBS) counts of young Dark Bellied Brent Geese were concerning, at around 1.5% of flock size – nowhere near the 15% required to maintain a viable population. However, a second, more recent, WeBS survey resulted in a more reassuring count of approximately 19% young birds present.

## 2. Warden diary of operations.

### 2.1 September

Thurs 21st Sept: Exmouth Wildlife Refuge pop-up. Great to open the season with (Pale-bellied) Brent geese feeding in the Refuge.


Figure 2. “A” frame signage, Exmouth Imperial Recreation Ground slipway.

Fri 22nd Sept: Heaths patrol ~7 interactions inc. dog fouling to heathland habitat management and adder conservation.

Sat 23rd Sept: Water patrol by paddleboard at Exmouth Wildlife Refuge.

Prompted lots of interaction on site - and with it, the opportunity to promote our messaging. Viewing stats on this item +1.3k on Facebook, showing it's definitely worth taking the time to make targeted content.

This was a busy weekend at the Duck Pond with the temperatures still feeling summer warmth and lots of watersports enthusiasts launching from Imperial slip way – lots of interactions and spent the whole day at this site working from the gazebo.

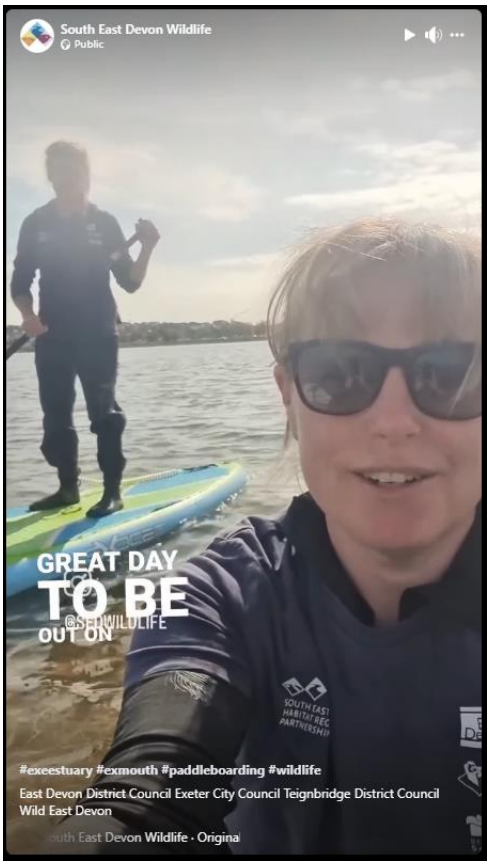



Figure 2. Social media post – paddleboard refuge patrol.

Sun 24th Sept: Dawlish Loves Dogs Festival – a really busy day, attended by predominantly local dog owners, so an ideal demographic for our messaging: Exmouth Wildlife Refuge, dog fouling, walks in locations alternative to SPA adjacent nature reserves, sharing the space without impacting wildlife or habitat.

Tues 26th Sept: Pop-up Exmouth Wildlife Refuge

Weds 27th Sept: Pop-up Exmouth Wildlife Refuge

Thurs 28th Sept: Dawlish Warren NNR and Vantage Point Count (VPC) at Cockwood

Fri 29th Sept: Pop-up Exmouth Wildlife Refuge, admin & meetings at Exmouth Town Hall.

### 2.2 October

At the start of October, Imo and Katie met with Stephen Farmer, Head of Campus at Cranbrook Education Campus to discuss the possibility of providing education sessions for the school.

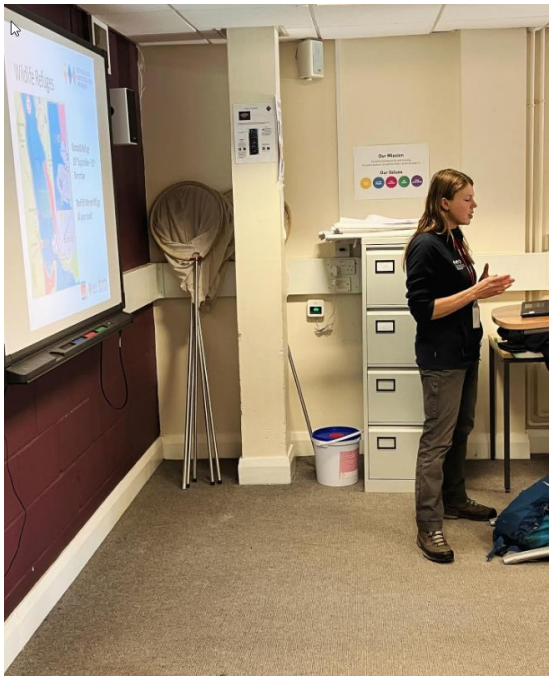


Figure 3. Warden Imo hosting a presentation to Bicton College.

Weds 4th Oct: Dawlish Warren NNR

Sama and Katie worked together at Exmouth Wildlife Refuge on the first weekend in Oct, joined by EDDC's Wild East Devon's, Fiona Coope. All three members of staff were needed as north-westerly wind direction is popular with kitesurfers for this location.

The Warden van has storage racking to ensure all engagement materials are stored without damage and easily accessible.

Weds 10th Oct: Dawlish Warren NNR

Katie and Imo attended RSPB training on performing bird counts at Bowling Green Marsh, while Sama spent the following day at the same nature reserve filming waterbirds through the scope to produce a series of clips for release on social media platforms.


Figure 4. Informative post about RSPB Bowling Green Marsh.

Sat 21st October was another busy weekend day at Exmouth Wildlife Refuge, with 40 interactions recorded. Sama and Katie also managed to squeeze in a heathland patrol in the morning, walking out of Warren car park.

Figure 5. Heathland cattle (social media post raising awareness of management techniques).

Thursday 26th October delivered a sunny half-term morning and Sama & Imo completed a Pebblebed Heaths Pop up at Model Air car park. There were still plenty of red admiral butterflies on the wing and a lot of families out for dog walks to engage with. We had the 'match the poo' game out and used this as a tool to instigate nutrient enrichment conversations.

### 2.3 November

At the beginning of the month Katie & Neil provided an onsite talk to TDC planners about the Exe wildlife refuges and our wider work at Cockwood Steps, overlooking Dawlish Warren Wildlife Refuge.

Friday 3rd Nov saw Sama and Imo working in partnership with the National Trust and Devon Harvest Mouse Project at Lower Halsdon Farm, Exmouth where they were providing a volunteer training session on harvest mouse surveying. This was a great opportunity for us to maintain important communication links between our project partners and introduce local volunteers to our messaging.


Figure 6. Harvest mouse survey, Exmouth.

Sunday 5th Nov: Weekend patrol at Dawlish warren NNR, with numerous interactions regarding the erosion caused by Storm Ciaran and damage to tidal defences on site.

Figure 7. Storm damage/erosion at Dawlish Warren NNR.

Tuesday 7th Nov: Katie gave a talk to Wonford Women's Institute, covering our work across the Exe and Pebblebed Heaths SPAs, funding for mitigation, threats to site and the mitigation measures that are currently caried out.

Weds 8th Nov: Imo and Katie accompanied Naomi and Neil on a site visit with EDDC planners to the new SANG at Broadclyst Station, nr Cranbrook.

Katie and Imo met up with David Price, WeBS (BTO Wetland Bird Survey) coordinator for the Exe, for help with bird identification and CPD.

Thurs 9th & Friday 10th: Imo & Sama attended the first inaugural Seagrass Symposium at the National Marine Aquarium in Plymouth.

Important contacts were made with delegates from the Environment Agency (EA) regarding Seagrass surveying on the Exe. Moving forward we'd like to know more about the condition of this priority habitat, how the Exe is mapped and monitored, and how we can support its protection. The seagrass bed that Exmouth Wildlife Refuge protects in part, is a critical food source for overwintering species such as Dark-bellied Brent Geese.

Weds 15th Nov: Dawlish Warren NNR patrols.

Thurs 16th Nov: Sama and Imo welcomed volunteer Bea for the day and spent the morning avoiding inclement weather at RSPB Bowling Green Marsh. The team filmed over overwintering birds roosting and feeding over the high tide to assist with ID clips for social media and use in presentations.

In the afternoon, a pop-up at Exmouth Wildlife Refuge included a beneficial chat with a bait digger who had entered the refuge (bait digging code distributed) and several dog walkers, with dogs causing minor flight disturbance.

Fri 17th: Sama and Imo took the patrol boat out on this cold and clear-skyed high-tide. Finger Point at Dawlish Warren Wildlife Refuge was full to bursting with Oystercatchers and a large flock of Dunlin in murmuration over the bight. Some filming done to share these views with the online community, perfectly demonstrating the requirement for the Wildlife Refuges as disturbance free areas.

We saw two seals during patrol, what appeared to be a juvenile, reclining on a moored boat near Dawlish Warren Wildlife Refuge and an adult fishing in the ski zone. Great to see larger marine animals thriving in the estuary.

We returned to Exmouth Wildlife Refuge over lunchtime as the tide receded, and again spoke to a number of dog walkers, whose dogs had entered the refuge causing disturbance to feeding ducks and geese.

Sat 18th Nov: Heath Patrol & Exmouth Wildlife Refuge

Sun 19th Nov: Dawlish Warren NNR patrols.

21st Nov: Imo and Katie met with Steph Harper-Cheung from the Exe Estuary Management Partnership to discuss partnership working over the coming year.

Tues 28th: Heath Patrol from Four Firs up to Warren car park. Several spaniels loose off the path, owners spoken to, and dog codes distributed.

Thursday 30th: Katie and Sama completed a vantage point count at Exmouth Duck pond in the snow! Large numbers of Brent geese (720) and wigeon (420) were recorded and the cold weather kept people off the refuge allowing the birds to feed in peace!

## 3. Devon Loves Dogs

3.1 I've had a busy autumn, dividing my time between a variety of different tasks both onsite and behind the scenes. The ongoing, successful programme of Waggy Walks has accounted for a large proportion of staff effort, especially as bookings are received by email until the new website (and booking system) is launched.

3.2 Since my last update in September, I've had walks at Four Firs, Mutters Moor and Wheathill with Kim Strawbridge (Site manager, Pebblebed Heaths Conservation Trust (PHCT)) and a walk with TDC Ranger Matt Gare at Ridgetop SANG at the beginning of November. All walks have been fully booked, which is great, but this does come with extra work managing waiting lists and people's expectations.

Photo1: Waggy Walk at Ridgetop 1st November.

3.3 Currently we have a large pool of regular walkers who join us intermittently. It's great to have these people walk with us, as it helps newer members settle in and learn good behaviours from the wider group, which is just what we're after. We're also doing our best to make sure that new people are always encouraged and welcomed along, so that we can continue to spread our messaging as far and wide as possible.

3.4 I'm in the process of putting together the engagement programme for winter/spring 2024 and I'm pleased to have a new contact at Forestry England which means we can once again offer woodland walks in a range of locations across the region.

3.5 I'm also excited that I've been able to offer a Waggy Walk around the Otter Estuary with PHCT Ranger Rick Lockwood in December. Many of our members and the dog walkers that we speak to, have been following the Lower Otter Restoration Project (LORP) since the beginning. I'm often asked questions about it, so it's great to be able to offer a Waggy Walk now that the project has been completed. We enjoyed our last walk before Christmas with mince pies for humans and presents for dogs.

Photo 2: Waggy Walk around the Otter Estuary 6th December.

3.5 As well as walks, I've also been out with the gazebo doing pop ups, at the Exmouth Wildlife Refuge, Dawlish Countryside Park and on the Otter Estuary. Although the Otter isn't currently part of our remit, it was a hugely successful pop up as we were able to meet a high number of dog walkers in a short space of time, many of whom are also regular visitors to the Pebblebed Heaths. We were also able to easily share information about the Exe Estuary as the species that the Exe is protected for are similar to those expected to share the Otter now and in the future.

Photo 3: Pop up at Dawlish Countryside Park Saturday 11th November.

3.6 Membership has continued to increase to 1257, with new member packs being sent out in November. Our newsletter sign-up figures have continued to rise gradually to 2414.

3.7 In addition to the onsite work, autumn has been a very busy time for work behind the scenes, admin and training. A large proportion of my time has been spent on the design and content of the new Devon Loves Dogs website which I have been working on with Anne (Communications Officer) and Neil (Delivery Manager). The home page has been designed and I'm now working on the individual page content that will be refreshed and added to the new design. An example of the new design for the home page is below:

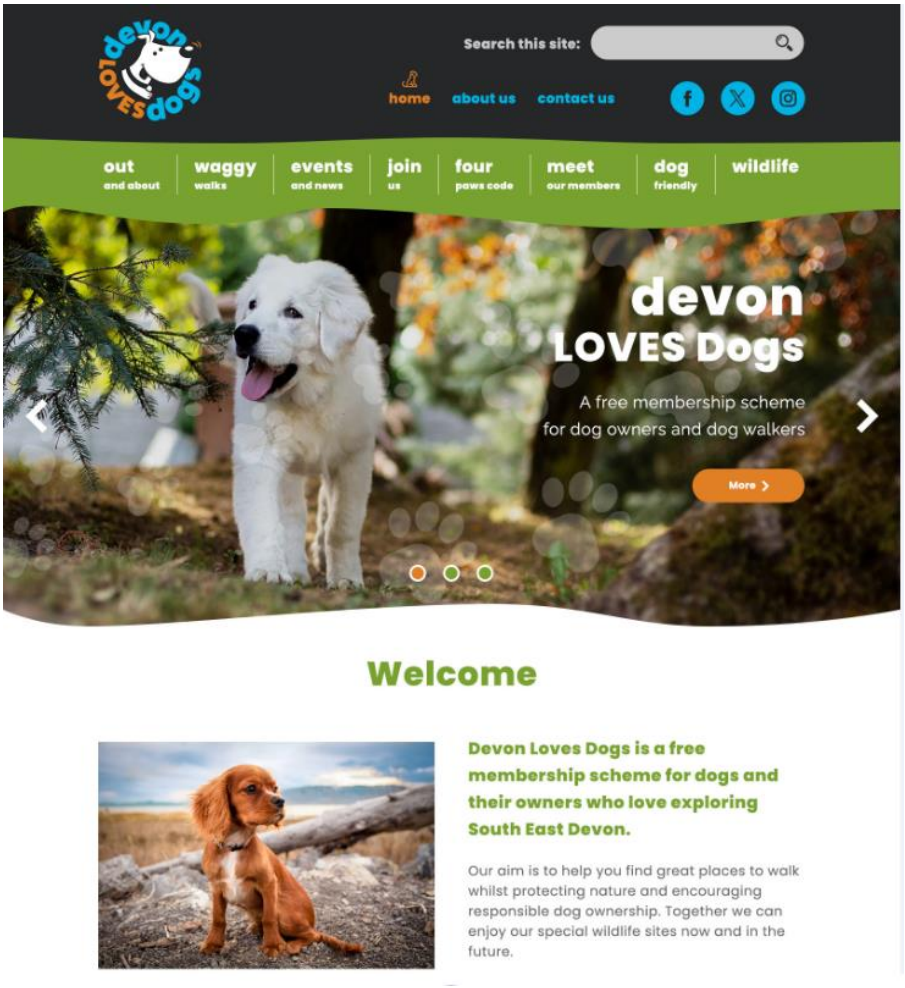



Figure 1: New website homepage design.

3.8 I've also attended the two mitigation strategy update workshops held by Footprint Ecology, a team session regarding EDDC's Service Plan and spent time refreshing my mandatory Health and Safety training.

3.9 I've taken part in a site visit with the East Devon Planning Team to Clyst Meadows SANG, which was very useful as we were able explain our roles. Additionally, our team have been providing input into the design of the new SANG based on our experiences of Dawlish Countryside Park and Ridgetop SANG.

3.10 Neil and I have also recently met with Anna Harrison, Nature Engagement Officer for the National Trust, Killerton. We discussed the mutual benefits of working in partnership together and have since arranged a Waggy Walk around Ashclyst Forest for February.

3.11 As we look forward to 2024, we have reviewed our 2023 operations and are considering future priorities and work programming for DLD. The project enters its 7th year and has grown and developed enormously since the beginning. Staff resource currently remains unchanged at 0.5 FTE and therefore it will be necessary to make some tough decisions as I am not able to attend all the events and opportunities that I am invited to.

3.12 Onsite measures continue to be both important and effective, whilst a whole range of back-office administration is required to maintain a professional, friendly brand for the project both onsite, online and via social media. I have no doubt that 2024 will be a busy, challenging time.

3.13 Finally, I'd like to thank my wider team and all of the partners who continue to give their support, time and expertise to grow and develop Devon Logs Dogs.

**South East Devon**
**Habitat Regulations**
**Executive Committee**