



SOUTH EAST DEVON
HABITAT REGULATIONS
PARTNERSHIP

South East Devon Habitat Regulations Executive Committee

*Dawlish Warren National Nature Reserve –
2019 Botanical Survey*

Neil Harris, Habitat Regulations Delivery Manager
November 2020



Exeter
City Council



Legal comment/advice:

There is no direct legal comment to be made at this time, each and any individual issue will need to be considered as it arises.

Finance comment/advice:

There are no specific financial implications within the report requiring separate comment, the cost of the commissioned report was £1,355 within the current financial year.

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

Recommendations

It is proposed that the Executive Committee:

1. Notes the results of the botanical survey relating to impacts associated with human activity at Dawlish Warren NNR.
2. Receives an updated botanical survey report as part of the ongoing monitoring programme in 2022.

Equalities impact: Low

Risk: Low

The attached report, included here as Appendix A, provides a detailed 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 Botanical (vegetative) monitoring of the Warren has been limited. It has included mapping exercises in 1990, 1994, 2003 and 2012, annual surveys of the Warren Crocus, *Romulea columnae* and the gathering of general records provided by local naturalists. There is a need to gain a better understanding about the changes in distribution of important species and habitats across the site.

1.3 In 2010, Teignbridge District Council (TDC) commissioned a report¹ 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 Lake, S. (2010) *Assessment of recreational impacts on Dawlish Warren Special Area of Conservation*. Teignbridge District Council/Footprint Ecology

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.

1.6 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). Looking forward, it will be used to compare the changes that have occurred since the 2010 and 2012 surveys, acting as a baseline following the DWBMS and for human impacts on habitats and key botanical species. The work will contribute to ongoing monitoring to ensure that the site is in favourable conservation status and that national and international obligations are being met.

2.0 The survey

2.1 Following a competitive tendering process, Devon Biodiversity Records Centre (DBRC) were 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:

- 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 section 2.4 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.

Trampling impact and risk:

2.4 Aligning with the Footprint study of 2010, 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.

2.5 The assessment of 573 cells was initially carried out by interpretation of high resolution, recent aerial photography. To "ground truth" this assessment, a sample of 100 cells were assessed onsite by the surveyors, with an independent re-assessment of the 5-point scale in the field.

2.6 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.

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

Eutrophication assessment:

2.8 To identify patterns of increased nutrient on the site's vegetation, two approaches were combined. The first involved compiling a Fertility indicator score for each vegetation sample collected in 2019 and 2012 as part of TDC's site management monitoring. This was based on an established scoring system for Nitrogen content, which is accepted as a general indicator of soil fertility.

2.9 Each species recorded in the sample (and according to its relative abundance) was given a value ranging from 1 to 9 with the lowest score relating to the lowest fertility. 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.

2.10 Additionally, direct observation of plant species associated with increased nutrient levels in the context of Dawlish Warren were made in the field. 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.

3. Results

3.1 Comparison of both the trampling and eutrophication maps, along with the maps of species of conservation concern², shows a clear pattern of areas of intermediate disturbance where notable species are found. Therefore, the study confirms that areas of low (and high) disturbance and areas of high fertility do not support these important species.

3.2 The report draws attention to the fact that the patterns of fertility shown on the map does not discriminate between that caused as a result of human activity and other causes of enrichment in the vegetation, which the report suggests, could be from the reedbeds and/or the open water ponds.

3.3 Other key fertility hotspots are near the access points to the reserve towards the south west of the site, the northern boundary of Greenland Lake and the golf course. The survey concludes that there is little doubt that fertility in these areas are at least partly as a direct result of recreational use and dogs in particular.

3.4 There is acknowledgement that some areas in the southern area of the site partly coincide with areas formerly covered by an invasive legume (nitrogen-fixing) plant which may have caused long term changes on soil chemistry and therefore the type of plants which tolerate those conditions.

4. Conclusion

4.1 The 2019 Dawlish Warren Botanical survey is the first empirical study to specifically assess impacts to vegetation and soil chemistry associated with recreational activity since the 2010 Footprint report.

4.2 The survey recorded data for site management purposes, recording broad habitat types, sampling 137 quadrats (2200 species records) and identifying a further 1100 species in field observations.

4.3 Additionally, it provides an important baseline monitoring assessment of the impact of human trampling and areas associated with increases in fertility. Both of these factors have more a complex relationship with the vegetation on the site than would first be apparent. The study identifies that plant species of conservation concern at the Warren are more likely to be associated to areas where there is a little trampling (interrupting the process of natural succession, allowing less dominant plants to persist) and are not too fertile.

4.3 The value of such studies lie in establishing a dataset over a number of years and ascertaining trends or patterns which emerge as a result. The budget set in the mitigation Strategy allows for standard 3 year intervals, intended to provide an early warning whereby negative impacts from trampling and eutrophication can be addressed through appropriate management. The next survey is therefore scheduled for 2022.

² See "Map 3 series" in the 2019 Botanical Survey report.

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Natural England comment:

Natural England have reviewed the report and have no further comment to make.