

## Abstract

Contributing to LiCCo Work Package 3.2 'Influencing policy at a local, national and International level' the following paper describes the 'Good, The Bad and the Ugly impacts of the Habitats Regulation Assessment (HRA) at Dawlish Warren' as applied as part of the proposed works for the Dawlish Warren Beach Management Scheme. The views expressed are personal and based on practitioner experience and reflect upon the principles of the HRA process rather than specific technical detail. They are written with the intent to further debate and learning through shared experience and do not reflect the views or responsibilities of any organisation.

### The Good

By accelerating the removal of the gabion basket defences along Dawlish Warren, the HRA process is widely considered to have benefitted the management of the spit from an environmental, engineering and economic perspective. By allowing the site to evolve more naturally, this has promoted sustainable flood risk management at the site and this approach should be promoted and incentivised through the Flood & Coastal Risk Management (FCRM) scheme justification and appraisal process.

### The Bad

Only after a sustained challenge to the HRA process has the option to construct a new structure along the vulnerable Neck section of the spit been permitted and only then with the expectation the structure will remain buried and be removed in the future. It can be debated this is not consistent with a sustainable FCRM approach. It is recommended there needs to be a greater recognition of the economic benefit of FCRM options as part of the HRA process when these measures in themselves reduce the 'likely significant effect' of the proposed development.

### The Ugly

A new flood wall at the site was originally designed to have minimal visual impact on the existing natural landscape and have lower future maintenance costs. The mitigation works required to satisfy HRA process concluded that the primary consideration for the new defence was not to affect the integrity of the site. This has resulted in the construction of a man-made structure which, although has a smaller footprint, guarantees habitat loss, has more visual impact in a natural environment than is necessary and will have higher future maintenance costs. It can be debated this is not consistent with a sustainable FCRM approach. A recommendation is that when considering mitigation measures, greater consideration and emphasis is given to the scale, visual impact and sustainability of the works when determining likely significant effect.

## Background

Dawlish Warren sand spit (see Figure 1 below) is an internationally important site for nature conservation. It has designated Special Area of Conservation (SAC) features, is a site of Special Scientific Interest (SSSI) and is within the Exe Estuary SSSI, Special Protected Area (SPA) and Ramsar. The sand spit also includes a National Nature Reserve, Local Nature Reserve and County Wildlife Site.

The UK Government has set a target for Natural England to bring 50% of all SSSI area across England into Favourable Condition by 2020. The SAC dunes and SSSI at Dawlish Warren are currently in an unfavourable and declining condition. There is a legal case to enable natural processes to improve the condition of the SAC.

The Warren also serves many other purposes. It is a coastal defence that provides protection from flooding to more than 2800 properties and 5km of main rail line providing an economic benefit of over £100 million. Its beaches and beauty attract more than 500,000 visitors a year making it one of the most important destinations for the region's economy. On its leeward side large bird populations, shell fisheries and valuable moorings depend upon the shelter it affords. The study of the changing coastal environment at Dawlish Warren appears on the syllabus of schools and universities across the country and draws hundreds of site visits and thousands of visitors each year.

### Dawlish Warren coastal defences

The defences along Dawlish Warren spit consist of 200m of concrete revetment, 1.8km of gabion (rock filled wire basket) revetment and timber groyne field along the whole 2km frontage. Over the last 20 years concern has grown that measures urgently need to be taken to manage the effects of coastal change. Erosion of beaches and dunes has left the Warren susceptible to breaching leading to exposure of the local and inner estuary communities and assets to an increased risk of flooding, wave damage and disruption. Recent storms in 2004, 2008 and 2014 caused extensive damage. In places up to 10m of dunes have been lost and emergency repairs to the gabion revetment and groynes were required to guard against the immediate risk of a breach of the Warren spit. The existing gabion revetment along the dunes' seaward face has reached the end of its serviceable life, has become an eyesore and hinders the natural development of the dunes. The amenity beach at the western end is depleted of sand. The toe of the existing concrete revetment at the western end is exposed and visitors, in search of a sandy spot to lie, trample the dunes and damage the delicate vegetation.

### Exe Estuary Strategy and Dawlish Warren Beach Management Scheme

The Exe Estuary Flood and Coastal Erosion Risk Management (FCERM) Strategy, 'The Strategy', identified that a range of works are needed as part of the subsequent Dawlish Warren Beach Management Scheme to allow the sand spit to continue to act as a flood defence and to improve the condition of the SSSI and SAC dune features.

To deliver these requirements, the Environment Agency (EA) Dawlish Warren Beach Management Scheme (The Scheme) will:

- add extra sand to the beach at Dawlish Warren; a process known as beach nourishment

- maintain the concrete revetment seawall near to the tourist facilities and village
- repair, replace and extend the wooden groynes along the beach
- build a flood defence near the visitor centre to reduce the risk of tidal flooding to Dawlish Warren village
- start gradual removal of the gabions (rock filled wire baskets) between the end of the concrete revetment promenade and the neck section of the spit

See Fig 1. The Solution, below

These works will reduce flood risk to nearly 3000 properties and key infrastructure whilst achieving significant environmental improvement and a reduction in long term maintenance costs. The agreed solution involves works in the short term to safeguard the sheltering function of the Warren through to the 2040s.



Fig 1. The Solution.

Note position of 'Rock armouring at the Neck' in red; 'Gabion removal' in orange and 'Embankment' (new flood defence wall) in green.

#### Environmental Impact Legislation relevant to Dawlish Warren

##### Background and legal context

The UK is bound by the terms of the EC Habitats Directive (and EC Birds Directive and the Ramsar Convention). The aim of the Habitats Directive is to conserve natural habitats and wild species across Europe by establishing a network of sites known as

Natura 2000 (European) sites. Under Article 6(3) of the Habitats Directive, an appropriate assessment is required where a plan or project is likely to have a significant effect upon a European site, either individually or in combination with other projects. To determine 'likely significant effect', a Habitat Regulation Assessment (HRA) is required.

The meaning of the Article has been interpreted that any project is to be subject to an appropriate assessment if it cannot be proven, beyond reasonable scientific doubt, that there is no significant effect on that site (a precautionary approach), either alone or in combination with other plans or projects. Further to this, Article 6(4) states that where an appropriate assessment has been carried out and results in a negative assessment (in other words, any proposed avoidance or mitigation measures anticipated are unable to reduce the potential impact so it is no longer significant) or if uncertainty remains over the significant effect, consent will only be granted if there are no alternative solutions, and there are imperative reasons of over-riding public interest (IROPI) for the development and compensatory measures. Natural England is the UK Government's Regulator that determines if proposed schemes have a significant effect and whether to issue consent for the works.

Any Appropriate Assessment would likely be done alongside an Environmental Impact Assessment (EIA) which may also be required to identify the environmental impacts (both positive and negative) on 'receptors' of the proposed development.

As the Dawlish Warren scheme is in and near to EU and internationally designated sites, a Habitats Regulation Assessment is required. For the Environment Agency, this assessment takes the form of an 'Appendix 11' to identify if there is 'likely' significant effect 'alone and/or in combination' on a European site and if so an 'Appendix 12' is required. To obtain consent the EA must identify what mitigation works will be done to conclude that scheme 'will not adversely affect the integrity of the European site and provide summary and explanation for answer given'.

The Good ...

## Removal of 'gabion' defences

### Background

Built during 1960s/70s by predecessor organisation to the EA, the majority of Dawlish Warren gabion defences are now exposed with little or no covering of sand and are easily damaged during storms and cost in excess of £100k per year to maintain. The defences effectively fix the location of the sand spit in an unnatural and unsustainable alignment. This is contributing to the erosion of the beach and front face of the dune system thus damaging the gabion baskets and therefore putting Dawlish Warren village, other towns within the estuary and the railway line at increased tidal flood risk. They are also considered unsightly and pose a risk to public safety who regularly walk over the defences.

In addition, the presence of the gabion baskets along the 'Central and Neck' section of the SAC dunes prevent the spit from functioning naturally. This causes the site to be in an 'Unfavourable Condition' and means there is a legal case to enable processes to improve the condition of the SAC.

Due to the requirements of the HRA and the target to bring 50% of all SSSI area across England into 'Favourable Condition' by 2020, this has accelerated the option to remove the gabions baskets (managed realignment) over other possible management options such as maintaining or improving defences. Although considered a major change at the site, this option now naturalises the site for environmental and amenity value and provides a more sustainable coastal defence alignment which will save a significant amount of cost over trying to maintain the existing defences.

#### Discussion & Recommendation

In this case here is an example of using a 'Managed Realignment' over a 'Hold The Line' policy option and, by accelerating the removal of the gabion baskets, the Habitat Regulations Assessment process is widely considered to have benefitted the site from an environmental, engineering and economic perspective. Where possible, this approach to sustainable flood and coastal risk management should be promoted widely and incentivised through the FCRM scheme justification and appraisal process.

## The Bad ...

### Uncertain future for the defences at 'the Neck'

#### Background

The works being delivered as part of the Dawlish Warren Beach Management Scheme will reduce flood risk to over 600 properties locally and to over 2100 properties and the main rail line within in the wider Exe estuary. In addition it will deliver significant environmental improvements and reduce long term asset maintenance costs. The economic benefits of the works have been identified as nearly £160 million over 35 years. The cost of the scheme over this period is expected to be over £14 million.

The existing gabion defences along the 'Neck and Distal end' section of Dawlish Warren spit provide the majority benefit of the man-made structures that reduce flood risk to the wider estuary, with an economic benefit of over £100 million. Acting as a wave barrier during storms, these structures are vulnerable and easily damaged and at risk of breaching. Due to the impacts of climate change, the Strategy has identified it is likely that in the longer term beyond the 2040s it will be unsustainable to maintain the vulnerable Neck and Distal end section of the spit and as such defences in the estuary will need to be improved.

The preferred option identified as part of the scheme shows that a new buried structure at the Neck is needed to reduce the risk of a breach here. With this strengthening, there is a greater level of certainty that wave sheltering to the wider estuary will continue through to the late 2040s. This is described as a 'no regrets' option.

However, as the HRA process has identified that the new structure has 'likely significant effect' on the European site then, as a condition prior to permission being granted, mitigation works are required to conclude that the scheme will not adversely

affect the integrity of the European site. Therefore, prior to starting works the principle at the outset has had to be agreed that at no point in the future would the structure be allowed to become continually exposed, isolated from the adjacent dune field (i.e. a breakwater) or of it being extended in the future should it become 'outflanked'.

#### Discussion & Recommendation

Only after a sustained challenge to the Habitat Regulation Assessment process has the engineering option to construct a new structure along the vulnerable Neck section of the spit been permitted. This structure, which is integral to maintaining a wave barrier defence to the wider estuary, is estimated to have an economic benefit of over £100 million. Implicit within the permission to do these works however is the condition that the structure will remain buried and have to be removed in the future.

It can be debated this is not consistent with a sustainable FCRM approach. In this case it is a personal opinion and recommendation that there needs to be a greater emphasis on the economic benefit of FCRM options, particularly when as part of the mitigation measures they also reduce the 'likely significant effect' of the proposed development. If, following mitigation and environmental monitoring the scheme is operating sustainably, there should not have to be a condition imposed to satisfy the HRA process that may lead to the removal of a sustainable FCRM structure in the future. It is recommended therefore that the HRA process that has led to these conclusions being drawn are reviewed.

... and The Ugly.

## New flood defence 'embankment' wall

As part of the Dawlish Warren Beach Management Scheme a new 200m long defence wall has been constructed within the Dawlish Warren SAC, near to the Visitor Centre. The aim of the structure is to cut off the route of flooding from the sea following a potential breach or overtopping event of the dunes along the coastal frontage. At present there is a risk of flooding to the community through the low lying Nature Reserve and car park.

The initial design for the defence was an embankment to tie in to higher ground at either end consisted of :

- 1m crest width
- 1:4 slope
- 10m – 11m wide footprint at the base
- 4m wide access track and 1:20 slope at the current access point
- Height above existing bank feature would generally be between 0.5m - 1m

This design was initially proposed to minimise the visual impact of the structure and allow it to 'blend in' with the existing landscape. The alignment of the defence was chosen to follow existing high ground in the area, to minimise the height of the finished structure. This original design would have an embankment footprint of over 1,000m<sup>2</sup>.

Through the HRA process it was identified that mitigation works would be needed before it be concluded that the scheme will not adversely affect the integrity of the European site. The initial design therefore had to be amended to reduce the footprint of the defence along the existing high ground as this area contains SAC dune grassland habitat.

The amended design incorporated a sheet piled wall that, where exposed, would be clad with wood to 'soften' its appearance along the area of existing high ground by the Visitor Centre (see photos 1 below). This has a footprint of approximately 140 m<sup>2</sup>. The height of this section will be approximately 0.75m above existing ground level. Although it was recognised that the timber clad section of the defence will have a greater visual impact than a landscaped embankment, it will have a much smaller physical footprint and will result in much reduced loss of SAC habitat beach.

It was concluded that it was preferable to minimise loss of SAC habitat rather than attempt to recreate it, as successful recreation with transplanted vegetation could not be guaranteed as there was no awareness of examples of successful recreation of this type of habitat on this large a scale anywhere else. In other areas of the site, where landscaped embankment is proposed, although this is within the SAC the habitat is considered not of the same quality as that in the area of the existing high ground.



Photo 1. New timber clad flood defence wall

## Discussion & Recommendation

The mitigation works required to satisfy the HRA conclusion, that the new defence would not affect the integrity of the site, has resulted in the construction of a man-made structure which has more visual impact in a natural environment than is necessary. It is also likely the structure will have higher maintenance cost than alternative options. In addition, although there was no guarantee that similar grassland could be recreated or transplanted successfully, by introducing an artificial structure, this guarantees there will be a permanent, albeit smaller loss, of SAC habitat.

It can be debated this is not consistent with a sustainable FCRM approach. In this case it is a personal opinion and conclusion that the mitigation measures are disproportionate to the scale of the development and more consideration should have been given to the impact of these measures on 'likely significant effect'. An opportunity has also been missed to attempt to recreate this type of grassland habitat over a flood defence structure and hence implement a more sustainable FCRM solution. A recommendation therefore is that when considering mitigation measures, greater consideration and emphasis is given to the scale, visual impact and sustainability of the works when determining likely significant effect.

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