European Site Conservation Objectives: Supplementary advice on conserving and restoring site features

Marazion Marsh
Special Protection Area (SPA)
Site code: UK9020289

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About this document

This document provides Natural England's supplementary advice for the European Site Conservation Objectives relating to Marazion Marsh SPA. This advice should therefore be read together with the SPA Conservation Objectives available here.

This advice is draft pending comments from the site's stakeholders. In the interim you should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England, when developing, proposing or assessing an activity, plan or project that may affect this site.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

This Supplementary Advice to the Conservation Objectives presents attributes which are ecological characteristics of the designated species and habitats within a site. The listed attributes are considered to be those that best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the Conservation Objectives. Each attribute has a target which is either quantified or qualitative depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email
HDIRConservationObjectivesNE@naturalengland.org.uk

About this site

European Site information

Name of European Site	Marazion Marsh Special Protection Area (SPA)
Location	Cornwall
Site Maps	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	August 2001
Qualifying Features	See section below
Designation Area	53.73 hectares
Designation Changes	*n/a*
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	Marazion Marsh SSSI
Relationship with other European or International Site designations	n/a

Site background and geography

Marazion Marsh is located on the south coast of Cornwall to the east of Penzance at the head of Mounts Bay. The marsh lies within the West Penwith National Character Area, which is a sparsely populated peninsula, ringed by high cliffs and rising to high, rocky moorland at its centre. Also known as the Land's End Peninsula, it is at the south-west extremity of England, surrounded on three sides by the pounding waters of the Atlantic Ocean and separated from the rest of Cornwall by a low-lying isthmus (land adjacent to the A30 between Hayle and Penzance). The marsh is at the mouth of a wide coastal valley, separated from the sea by a shingle bar with fringing sand dunes. The marsh has developed over Mylor Beds of Lower Devonian age, now overlain by alluvial deposits and peat. Streams, pools and dense reedbed grade into dense willow carr, with some unimproved grassland and scrub on drier margins. Plants include wavy-leaved St John's wort, yellow centaury and pillwort, while there is a strong assemblage of breeding dragonflies. The marsh is important for breeding, passage and wintering birds associated, in particular, with the extensive reedbed.

About the qualifying features of the SPA

The following section gives you additional, site-specific information about this SPA's qualifying features. These are the individual species of wild birds listed on Annex I of the European Wild Birds Directive, and/or the individual regularly-occurring migratory species, and/or the assemblages (groups of different species occurring together) of wild birds for which the SPA was classified for.

- **Qualifying individual species listed in Annex I of the Wild Birds Directive (Article 4.1)**

During the non-breeding season the SPA regularly supports:

- **A021 *Botaurus stellaris*; Great bittern (Non-breeding)**

At the time of its classification, over winter the SPA regularly supported an average of 2 individuals representing 2% of the GB population (5 year peak mean 1994/95 - 1998/99).

The population fluctuates from year to year depending on continental weather conditions.

- **A294 *Acrocephalus paludicola*; Aquatic warbler (Non-breeding)**

At the time of its classification on passage the SPA regularly supported an average of 6 individuals representing 9% of the GB population (5 year mean 1994-98).

Despite their eastern European breeding distribution, many Aquatic Warblers migrate west in autumn en route to their wintering areas in western Africa. Observations in Great Britain show that they are virtually restricted to reed-bed habitats during their migration through Europe. Accordingly, small numbers of birds occur in southern England every autumn on passage depending on weather conditions, although several sites have a long history of occurrence.

All regular passage sites are in England, such as Marazion Marsh SPA, concentrated on the south coast. On autumn passage, Aquatic Warblers occupy damp habitats with rushes (*Scirpus* and *Juncus* spp.).

Aquatic Warblers depend on the availability of large areas of reedbed habitat for feeding prior to autumn migration and at staging points along the course of the route to their wintering areas. They use these staging points to feed and rest in order to replenish their fat reserves, before commencing the long flight over the sea to France or Spain.

Site-specific seasonality of SPA features

The table below highlights in grey those months in which significant numbers of each mobile qualifying feature are most likely to be present at the SPA during a typical calendar year. This table is provided as a general guide only.

Unless otherwise indicated, the months shown below are primarily based on information relating to the general months of occurrence of the feature in the UK. Where site-based evidence is available and has been used to indicate below that significant numbers of the feature are typically present at this SPA outside of the general period, the site-specific references have been added to indicate this.

Applicants considering projects and plans scheduled in the periods highlighted in grey would benefit from early consultation with Natural England given the greater scope for there to be likely significant effects that require consideration of mitigation to minimise impacts to qualifying bird features during the principal periods of site usage by those features. The months which are *not* highlighted in grey are not ones in which the features are necessarily absent, rather that features may be present in less significant numbers in typical years. Furthermore, in any given year, features may occur in significant numbers in months in which typically they do not. Thus, applicants should not conclude that projects or plans scheduled in months not highlighted in grey cannot have a significant effect on the features. There may be a lower likelihood of significant effects in those months which nonetheless will also require prior consideration.

Any assessment of potential impacts on the features must be based on up-to-date count data and take account of population trends evident from these data and any other available information. Additional site-based surveys may be required. Non-breeding water bird monthly maxima data gathered for this site through the Wetland Bird Survey ('WeBS') may be available upon request from the British Trust for Ornithology.

Feature	Season	Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Site-specific references where available
Bittern	Non-breeding	Winter													
Aquatic warbler	Nonbreeding	Passage													

Guide to terms:
Breeding – present on a site during the normal breeding period for that species
Non-breeding - present on a site outside of the normal breeding period for that species (includes passage and winter periods).
Summer – the period generally from April to July inclusive
Passage - the periods during the autumn and spring when migratory birds are moving between breeding areas and wintering areas. These periods are not strictly defined but generally include the months of July – October inclusive (autumn passage) and March – April inclusive (spring passage).
Winter - the period generally from November to February inclusive.

Table 1: Supplementary Advice for Qualifying Features: A021. *Botaurus stellaris*; Great bittern (Non-breeding)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Non-breeding population	**Population abundance**	Maintain the size of the non-breeding Bittern population to a level which is above 2 individuals) or above 2.0% GB (whichever is the greater.	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Due to the mobility of birds and the dynamic nature of population change, the target-value given for the abundance of this feature is considered to be the minimum standard for conservation/restoration measures to achieve. This minimum-value may be revised where there is evidence to show that a population's abundance has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period. The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature. Given the likely fluctuations in numbers over time, any impact-assessments should focus on the current abundance of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is classified, and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration. Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account. Maintaining or restoring bird abundance depends on the suitability of the site. However, factors affecting suitability can also determine other demographic rates of birds using the site including survival (dependent on factors such as body condition which influences the ability to breed or make foraging and/or migration movements) and breeding productivity. Adverse anthropogenic impacts on either of these rates may precede changes in population abundance (e.g. by changing proportions of birds of different ages) but eventually may negatively affect abundance. These rates can be measured/	RSPB Reserve Annual Reports 1990 – current. CORNWALL BIRD WATCHING & PRESERVATION SOCIETY (CBWPS) County Bird Reports 1930 – current.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			estimated to inform judgements of likely impacts on abundance targets. Unless otherwise stated, the population size will be that measured using standard methods such as peak mean counts or breeding surveys. This value is also provided recognising there will be inherent variability as a result of natural fluctuations and margins of error during data collection. Whilst we will endeavour to keep these values as up to date as possible, local Natural England staff can advise on whether the figures stated are the best available.	
Supporting habitat (both within and outside the SPA): extent and distribution	**Extent and distribution of supporting non-breeding habitat**	Restore the extent and distribution of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non-breeding/wintering period (roosting, loafing, feeding) At least restore to the following extent: • Reedbed (Fen. Marsh swamp) - 20.6 ha • Open water – 8.8ha • Running water (rivers and dykes) – 4km across and adjacent to site.	Conserving and restoring the extent of supporting habitats and their range will be key to maintaining the site's ability and capacity to support the SPA population. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending to the nature, age and accuracy of data collection. The creation of additional reedbed (including fen, marsh and swamp) is key to the future resilience of the site. Opportunity for habitat creation in areas buffering the site should be supported.	Refer to the FCT for habitat extent objective RSPB management plans 1997 – 2001; 2002 – 2007; 2007 – 2011)
Supporting habitat (both within and outside the SPA): function /supporting process	**Connectivity with supporting habitats**	Restore the safe passage of Bitterns moving between roosting and feeding areas	The ability of the feature to safely and successfully move to and from nesting, feeding and roosting areas is critical to their breeding success and to the adult fitness and survival. This target will apply within the site boundary and where birds regularly move to and from off-site habitat where this is relevant.	RSPB monitoring data - RSPB management plans 1997 – 2002, 2002 – 2007, 2007 – 2011)
Supporting habitat (both within and outside the SPA):	**Food availability within supporting habitat**	Restore the distribution, abundance and availability of key prey items (e.g. eel, rudd, roach, frogs, toads) at preferred prey sizes (e.g. roach of 6-35	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey	EA (2018) currently working on improving fish passage as part of the Mounts Bay Stream priority area work.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
function/ supporting process		cm).	may adversely affect the population.	
Supporting habitat (both within and outside the SPA): function/ supporting process	**Salinity**	Restrict sea water ingress. Maintain water salinity at or to <0.5% (or <5ppt (parts per thousand)).	This feature is known to be particularly susceptible to changes in the salinity (concentration of salt) of its shallow brackish/fresh water habitat; Salinity is a major factor determining the distribution and composition of communities of fish, amphibians and aquatic invertebrates such as insects, crustaceans and worms on which this feature feeds. High levels of salinity may adversely affect fish and invertebrate food for adults and chicks. The principal factors governing the temporal and spatial nature of the salinity regime of coastal sites are the diurnal incursion of the tide, fresh water flow from the river(s) and control structures on the outflows. Any activity changing either of these factors can result in a change to the salinity regime.	RSPB monitoring data - RSPB management plans 1997 – 2002, 2002 – 2007, 2007 – 2011)
Supporting habitat (both within and outside the SPA): function/ supporting process	**Water quality**	Maintain water quality at the following standards to provide the necessary conditions to support the feature; Natural loading for sediment/ suspended solids entering the site; Ludgvan Stream - 29 t km-2 yr-1 Longrock Stream - 37 t km-2 yr-1 Tregadjack Stream - 32 t km-2 yr -1 Varfell Farm Stream - 32 t km-2 yr-1 Red River above confluence with Truthwall Stream - 10.9 t km-2 yr-1 Truthwall Stream - 4.3 t km-2 yr-1 Red River below confluence with Truthwall Stream - 8.1 t km-2 yr-1	For many SPA features which are dependent on wetland habitats supported by surface water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year during key stages of their life cycle. Poor water quality and inadequate quantities of water can adversely affect the availability and suitability of breeding, rearing, feeding and roosting habitats. Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the SPA Conservation Objectives but in some cases more stringent standards may be needed to support the SPA feature. Observations during the course of the APEM (2018) eastern sediment study during high flow events, witnessed evidence of the Red River overtopping its banks and flow entering the SSSI area. The current information is that under all flow conditions except for very high flows the Red River is detached from the Marsh but at high flows overtopping of banks, quite possibly at numerous locations and lengths, does occur. Large quantities of fine sediment are transferred under short (<24hrs) duration intense rainfall events. However, this process does not necessarily mean that large quantities of sediment are	RSPB management plans 1997 – 2002; 2002 – 2007; 2007 – 2011) APEM (2015) A drainage network characterisation and sediment loading study of the Marazion Marsh catchment' APEM Ref 413074, February 2015 APEM (2018). Marazion Marsh catchment study. APEM Scientific Report P00001011, Natural England June 2018

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		Phosphorus 0.1 mg/l should be considered an upper limit for this site. Ruth Hall (NE standing waters Specialist, March 2017) Nitrogen Total annual mean nitrogen concentrations should not exceed 1.5 mg/l. Dissolved oxygen target is 6.0 mg/l in line with CSMG and WFD standards. pH Should be between 5.5 and 9 to support fish health	transferred into the Marsh from the Red River via the overtopping of banks. The overall evidence is that relatively low totals of fine sediment (compared to the western catchment) are transferred to the Marsh via the Red River but that the majority of fine sediment is conveyed to the sea. For the eastern catchment study the Ludgvan Stream shows similar loading values as that estimated from the western catchment study, albeit slightly lower probably as a result of the average rainfall during 2017. Therefore it is reasonable to conclude again that the Ludgvan Stream is a good comparison for a semi-natural catchment However, for the eastern catchment study, in contrast to the western catchment study, the other streams in the study area (Truthwall Stream and Red River) show lower specific sediment yields (t km2/ yr) than the Ludgvan Stream. Therefore, based on the method used in the western catchment study, proposing sediment targets for the eastern catchment study watercourses is not required. There are no site specific targets set out in CSMG for Marazion Marsh. However the following is taken as the accepted targeted after reviewing evidence and consultation with Natural England specialists. “TP levels should be below 0.05 for standing water habitat, but the water body is not the feature and the water quality does not need to as good as this to support the features). Ruth Hall NE National Lake Specialist “For lake CSM we use 1.5mg/l for all lake types, but if a lake is nitrogen limited we would apply something more stringent”	
Supporting habitat (both within and outside the SPA): function/ supporting	**Air quality**	Maintain concentrations and deposition of air pollutants within the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	The structure and function of habitats which support this SPA feature may be sensitive to changes in air quality. Exceeding critical values for air pollutants may result in changes to the chemical status of its habitat substrate, accelerating or damaging plant growth, altering vegetation structure and composition and thereby affecting the quality and availability of nesting, feeding or roosting habitats.	More information about site-relevant Critical Loads and Levels for this SPA is available by using the ‘search by site’ tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
process		Feature: Botaurus stellaris (Europe - breeding) - Great bittern Critical Load Class: Rich fens Critical Loads (kg N/ha/yr): 15-30 Nitrogen Deposition (kg N/ha/yr): Maximum: 13.4 Minimum: 13.4 Average: 13.4	Critical Loads and Levels are thresholds below which such harmful effects on sensitive UK habitats will not occur to a noteworthy level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.	
Supporting habitat (both within and outside the SPA): function/ supporting process	**Conservation measures**	Restore management or other measures (whether within and/or outside the site boundary as appropriate) necessary to restore the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	Active and ongoing conservation management is often needed to protect, maintain or restore this feature at this site. Other measures may also be required, and in some cases, these measures may apply to areas outside of the designated site boundary in order to achieve this target. Further details about the necessary conservation measures for this site are found within, the Site Improvement Plan, diffuse water pollution plan, water level management plan, shoreline management plan	NATURAL ENGLAND, 2013. Site Improvement Plan – Marazion Marsh SPA (SIP131). Marazion Marsh Diffuse Water Pollution Plan 1 June 2016. Marazion Marsh Water Level Management Plan Draft Mott MacDonald/Environment Agency 6th October 2017. Cornwall and Isles of Scilly Shoreline Management Plan (SMP2) Cornwall Council 2011. STAGE 3 REPORT: MARAZION-FUTURE MANAGEMENT OPTIONS Cornwall Beach and Dune Management Plans

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				Prepared for Cornwall Council 7 August 2017 CH2M HILL RSPB monitoring data - RSPB management plans 1997 – 2002, 2002 – 2007, 2007 – 2011)
Supporting habitat (both within and outside the SPA): function/ supporting process	**Water quantity**	Maintain water quantity at the following standards to provide the necessary conditions to support the feature; Open water: Target Water depth (if applicable) Summer - Open water pools and channels should be 2-4m deep Winter: Open water pools and channels should be 2-4m deep Reedbed (Fen, marsh, Swamp) – includes 1-2ha of Scheoenoplectus tabernaemontani in Compartment C. Flooded all year. Summer levels should be at least 5cm above ground level and up to 30 cm. Winter - Flooded all year. During winter months set sluices so that the maximum depth though the reedbed does not exceed 75 cm to provide optimum feeding habitat for Bittern.	As above. This is important to provide deep water refuges for fish and aquatic species throughout the site. Also takes into account water regime requirements for S4 (Phragmites australis) Reedbed set out in EA (2004). Summer levels varied for habitat mosaic B.D. Wheeler, D.J.G. Gowing, S.C. Shaw, J.O. Mountford, and R.P. Money, 2004. Ecohydrological Guidelines for Lowland Wetland Plant Communities (Eds. A.W. Brooks, P.V. Jose, and M.I. Whiteman,). Environment Agency (Anglian Region) Species requirements noted in RSPB management plan.	RSPB management plans RSPB Dip Well readings 2000-2006 Species requirements noted in RSPB management plan.
Supporting habitat (both	**Minimising disturbance**	Restrict the frequency, duration and/or intensity of disturbance	The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may	NATURAL ENGLAND, 2013. Site Improvement Plan – Marazion

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
within and outside the SPA): minimising disturbance	**caused by human activity**	affecting roosting, foraging, feeding, moulting and/or loafing birds so that the Bittern feature is not significantly disturbed.	substantially affect their behaviour, and consequently affect the long-term viability of the population. Such disturbing effects can for example result in changes to feeding or roosting behaviour, increases in energy expenditure due to increased flight, abandonment of nest sites and desertion of supporting habitat (both within or outside the designated site boundary where appropriate). This may undermine successful nesting, rearing, feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their distribution within the site contracts. Disturbance associated with human activity may take a variety of forms including noise, light, sound, vibration, trampling, and presence of people, animals and structures. Concern has been raised regarding impact of kite surfing at high tide causing disturbance (ref Site Improvement Plans) and dog walkers on site flushing/ scaring birds.	Marsh SPA (SIP131).
Supporting habitat (both within and outside the SPA): structure	**Landform**	Restore the extent of wet ditches and/or pools with suitable profiles (typically, with a deep central channel of 1.5-2.5 m deep and one or more 1 m deep with 5 m wide shallow margins).	The physical topography and landform of a site will strongly influence the quality and extent of supporting habitats used by this feature for nesting/rearing, feeding and/or roosting as appropriate. This will also influence the interactions with underlying supporting processes on which the supporting habitat may rely. Any changes or modifications to site topography may adversely affect the ability of the supporting habitats to support and sustain this feature.	See site specific targets above and Water level management plan.
Supporting habitat (both within and outside the SPA): structure	**Landscape**	Restore an open and unobstructed terrain which provides safe passage for Bitterns moving between roosting and feeding areas across the site.	This feature is known to favour large areas of open terrain, largely free of obstructions, in and around its nesting, roosting and feeding areas. Often there is a need to maintain an unobstructed line of sight within nesting, feeding or roosting habitat to detect approaching predators, or to ensure visibility of displaying behaviour. An open landscape may also be required to facilitate successful movement of birds between the SPA and any off-site supporting habitat (also known as 'functionally-linked land'). Seek opportunities to clear buffering *Salix spp* woodland.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat (both within and outside the SPA): structure	**Vegetation characteristics**	Maintain the cover of pure, scrub-free reed-bed dominated by common reed *Phragmites australis* at or above 90% Maintain a diverse age structure of vigorous reed, with at least 30% reed-bed uncut and the remainder not more than 6 years old with no more than 20% cut in any year. Maintain proportions of sedge, reed, open water and muddy patches.	The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting this feature which enable successful feeding/ concealment/ roosting. Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear. Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature. Reference level RSPB management plan 2007 – 2011.	RSPB management plan 2007 – 2011.
Version Control Advice last updated: Not applicable				
Variations from national feature-framework of integrity-guidance: Not applicable				

Table 2: Supplementary Advice for Qualifying Features: A294. *Acrocephalus paludicola*; Aquatic warbler (Non-breeding)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Non-breeding population	**Population abundance**	Maintain the size of the non-breeding Aquatic warbler population to a level which is above 6 individuals (5 year mean 1994 – 1998. 9.0% GB population).	See notes for this attribute in Table 1 above.	RSPB Reserve Annual Reports 1990 - current, CBWPS County Bird Reports 1930 – current.
Supporting habitat (both within and outside the SPA): extent and distribution	**Extent and distribution of supporting non-breeding habitat**	Restore the extent and distribution of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non-breeding/wintering period (roosting, loafing, feeding) At least restore to the following extent: • Reedbed (Fen. Marsh swamp) - 20.6 ha includes 1-2ha of *Scheoenoplectus tabernaemontani* in Comp C. • Open water – 8.8ha	Conserving and restoring the extent of supporting habitats and their range will be key to maintaining the site's ability and capacity to support the SPA population. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending to the nature, age and accuracy of data collection. The creation of additional reed-bed (including fen, marsh and swamp) is key to the future resilience of the site. Opportunity for habitat creation in areas buffering the site should be supported.	RSPB management plans for maps illustrating extent of habitat over time.
Supporting habitat (both within and outside the SPA): function/ supporting process	**Food availability within supporting habitat**	Restore the distribution, abundance and availability of key prey items (e.g. Insects, caterpillars, grubs, spiders) preferred by Aquatic warbler	The availability of an abundant food supply is critically important for adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.	Ref: RSPB website for aquatic warbler.
Supporting habitat (both within	**Salinity**	Restrict sea water ingress. Maintain water salinity at or to <0.5% (or <5ppt (parts per	This feature is known to be particularly susceptible to changes in the salinity (concentration of salt) of its shallow brackish/fresh water habitat; Salinity is a major factor determining the	RSPB monitoring data - RSPB management plans 1997 – 2002, 2002 – 2007, 2007 – 2011)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
and outside the SPA): function/ supporting process		thousand)).	distribution and composition of communities of fish, amphibians and aquatic invertebrates such as insects, crustaceans and worms on which this feature feeds. High levels of salinity may adversely affect fish and invertebrate food for adults and chicks. The principal factors governing the temporal and spatial nature of the salinity regime of coastal sites are the diurnal incursion of the tide, fresh water flow from the river(s) and control structures on the outflows. Any activity changing either of these factors can result in a change to the salinity regime.	
Supporting habitat (both within and outside the SPA): function/ supporting process	**Water quality/ quantity**	See targets for this attribute in table 1 above.	See notes for this attribute in Table 1 above. Also takes into account water regime requirements for S4 (Phragmites australis) Reedbed set out in EA (2004). Summer levels varied for habitat mosaic B.D. Wheeler, D.J.G. Gowing, S.C. Shaw, J.O. Mountford, and R.P. Money, 2004. Ecohydrological Guidelines for Lowland Wetland Plant Communities (Eds. A.W. Brooks, P.V. Jose, and M.I. Whiteman,). Environment Agency (Anglian Region)	RSPB monitoring data - RSPB management plans 1997 – 2002, 2002 – 2007, 2007 – 2011) APEM (2015) A drainage network characterisation and sediment loading study of the Marazion Marsh catchment' APEM Ref 413074, February 2015 APEM (2018). Marazion Marsh catchment study. APEM Scientific Report P00001011, Natural England June 2018 RSPB management plans RSPB Dip Well readings 2000-2006
Supporting habitat (both within and outside the SPA): function/ supporting process	**Air quality**	Maintain concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk). Feature: *Acrocephalus paludicola* Critical Load Class: Rich fens	See notes for this attribute in Table 1 above.	More information about site-relevant Critical Loads and Levels for this SPA is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		Critical Loads (kg N/ha/yr): 15-30 Nitrogen Deposition (kg N/ha/yr): Maximum: 13.4 Minimum: 13.4 Average: 13.4		
Supporting habitat (both within and outside the SPA): function/ supporting process	**Connectivity with supporting habitats**	Restore the safe passage of birds moving between roosting and feeding areas	The ability of the feature to safely and successfully move to and from feeding and roosting areas is critical to their breeding success and to the adult fitness and survival. This target will apply within the site boundary and where birds regularly move to and from off-site habitat where this is relevant.	RSPB monitoring data - RSPB management plans 1997 – 2002, 2002 – 2007, 2007 – 2011)
Supporting habitat (both within and outside the SPA): function/ supporting process	**Conservation measures**	Restore management or other measures (whether within and/or outside the site boundary as appropriate) necessary to restore the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	Active and ongoing conservation management is often needed to protect, maintain or restore this feature at this site. Other measures may also be required, and in some cases, these measures may apply to areas outside of the designated site boundary in order to achieve this target. Further details about the necessary conservation measures for this site are found within, the Site Improvement Plan, diffuse water pollution plan, water level management plan, shoreline management plan	Site Improvement Plan, diffuse water pollution plan, water level management plan, shoreline management plan. NATURAL ENGLAND, 2013. Site Improvement Plan – Marazion Marsh SPA (SIP131). Marazion Marsh Diffuse Water Pollution Plan 1 June 2016. Marazion Marsh Water Level Management Plan Draft Mott MacDonald/Environment Agency 6th October 2017. Cornwall and Isles of Scilly Shoreline Management Plan (SMP2) Cornwall Council 2011. STAGE 3 REPORT: MARAZION-FUTURE MANAGEMENT OPTIONS Cornwall Beach and Dune Management Plans

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				Prepared for Cornwall Council 7 August 2017 CH2M HILL RSPB monitoring data - RSPB management plans 1997 – 2002, 2002 – 2007, 2007 – 2011)
Supporting habitat (both within and outside the SPA): minimising disturbance	**Minimising disturbance caused by human activity**	Restrict the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding birds so that the Aquatic warbler feature is not significantly disturbed.	The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population. Such disturbing effects can for example result in changes to feeding or roosting behaviour, increases in energy expenditure due to increased flight, abandonment of nest sites and desertion of supporting habitat (both within or outside the designated site boundary where appropriate). This may undermine successful rearing, feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their distribution within the site contracts. Disturbance associated with human activity may take a variety of forms including noise, light, sound, vibration, trampling, and presence of people, animals and structures. Concern has been raised regarding impact of kite surfing at high tide causing disturbance (ref Site Improvement Plans) and dog walkers on site flushing/ scaring birds.	
Supporting habitat (both within and outside the SPA): structure	**Landform**	Restore the extent of Reedbed (Fen, marsh, Swamp) to at least 20.6 ha – includes 1-2ha of *Scheoenoplectus tabernaemontani* in Comp C.	The physical topography and landform of a site will strongly influence the quality and extent of supporting habitats used by this feature for rearing, feeding and/or roosting as appropriate. This will also influence the interactions with underlying supporting processes on which the supporting habitat may rely. Any changes or modifications to site topography may adversely affect the ability of the supporting habitats to support and sustain this feature.	See site specific targets above and Water level management plan.
Supporting habitat (both within and outside the SPA): structure	**Landscape**	Restore an open and unobstructed terrain which provides safe passage for birds moving between roosting and feeding areas across the site.	This feature is known to favour large areas of open terrain, largely free of obstructions, in and around its roosting and feeding areas. Often there is a need to maintain an unobstructed line of sight within feeding or roosting habitat to detect approaching predators, or to ensure visibility of displaying behaviour. An open landscape may also be required	Refer to habitat extent objectives in Favourable condition tables.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			to facilitate movement of birds between the SPA and any off-site supporting habitat. Seek opportunities to clear buffering *Salix spp* woodland.	
Supporting habitat (both within and outside the SPA): structure	**Vegetation characteristics**	See targets for this attribute in Table 1 above.	The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting this feature which enable successful feeding/ concealment/ roosting. Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear. Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature.	Reference level RSPB management plan 2007 – 2011.
Version Control Advice last updated: Not applicable.				
Variations from national feature-framework of integrity-guidance: n/a				