

NORTH DEVON UNESCO BIOSPHERE RESERVE

NATURE RECOVERY PLAN, 2021-25

OUR CONTRIBUTION TO TACKLING THE GLOBAL ECOLOGICAL EMERGENCY

ACTION PLAN FOR COAST

Produced jointly with, and endorsed by, the North Devon Coast AONB Partnership



VISION FOR NATURE ON OUR COAST BY 2030

By 2030, nature is recovering along the coast. Thriving habitats bursting with life are making space for nature to expand in distribution and abundance, including in well-managed Marine Protected Areas. Along the coast, farmers and landowners are restoring heathland and species-rich grassland, with woodland in the combes and wetlands in the valley bottoms. Carefully controlled grazing is encouraging plants and invertebrates to flourish and rare butterflies have rebounded. Choughs are breeding again on the cliffs and white-tailed eagles are back on Lundy acting as apex predators for the booming seabird colonies; more seabirds are nesting on mainland cliffs too. Dynamic coastal floodplains now feature more wetlands. Shorebirds roost free from disturbance at places such as Horsey Island, and lapwing and oystercatcher have safe places to nest, free from disturbance. New areas of saltmarsh are sequestering carbon and helping the Biosphere to adapt to climate change. RMB Chivenor is recognised as one of the UK's top bumblebee reserves, and a sanctuary for breeding skylarks. Exemplary management of coastal sand dune systems at Braunton, Northam, Instow, Croyde and Woolacombe is controlling invasive species and scrub growth and allowing rare plants and ground nesting birds to flourish. Local people and visitors enjoy witnessing nature's recovery in a world class coastal area.

Please read this plan in conjunction with the Introduction / Overview chapter

CONTENTS

Action Plan for Coast	1
PART I: SCOPE OF THE HABITATS COVERED BY THIS ACTION PLAN	2
PART II: PRIORITY ACTIONS FOR NATURE'S RECOVERY ON THE COAST	3
Indicators	7
PART III: SUPPORTING INFORMATION	8
Importance for nature	8
Coastal heath	8
Upland coastal heaths	8
Coastal and floodplain grazing marsh	8
Coastal sand dunes, including the strandline zone at extreme high-water mark.	9
Maritime cliffs and slopes	9
Coastal oak woodlands	9
Shingle ridge and beaches	9
Intertidal zones (outside the estuary)	9
Lundy	10
Estuaries	10
Protected areas and their levels of protection	11
Baseline and condition / trends (particularly since 2010)	12
Root causes to be addressed	15
Benefits / Ecosystem services	17
Main Achievements 2010-2020	17
Legislation, designations, policies and plans	17
Conservation action for habitats	18
Conservation action for species	18
Education and awareness	18
Research and monitoring	18
Cross-cutting issues with other action plans	19
Drafting group for this Action Plan	19

PART I: SCOPE OF THE HABITATS COVERED BY THIS ACTION PLAN

This Plan covers nature in the coastal habitats of the Biosphere Reserve which stretch some 312 km from the Cornwall boundary at Marsland Mouth in the west, through the North Devon Coast Areas of Outstanding Natural Beauty, to Exmoor National Park at Foreland Point (Countisbury) in the east, plus the island of Lundy.

These habitats include: Intertidal zones (outside the estuary); Shingle ridge and beaches, Coastal sand dunes; Maritime cliffs and slopes; Coastal heaths (and upland coastal heaths); Estuaries; Coastal and floodplain grazing marsh. Further description of these habitats is provided in Part III.

PART II: PRIORITY ACTIONS FOR NATURE'S RECOVERY ON THE COAST

The following actions have been identified as priorities for the period 2021-25 to progress towards the 2030 Vision and overall Goals of the Biosphere Nature Recovery Plan. The lead partner for each action (shown in bold) will actively engage with the other partners to drive implementation and report on progress. In general, resources for the actions are not yet secured and the partners will examine ways to integrate the action into their own programmes, as well as seeking new resources (and partners) where necessary. Therefore, being listed as a lead or partner organisation does not imply a commitment of new resources but does confirm support for collaborating to deliver the ambition and principles of the actions. Partners will work with and support farmers and major landowners to deliver this action plan, using the incentives of the existing Countryside Stewardship scheme, the new Environmental Land Management scheme, green finance and other project support.

These actions have been developed following a careful, fresh examination of the state of nature in the Biosphere and of the underlying reasons for decline and loss, focussing on the current, on-going, factors which are driving nature's decline. See Part III below for details.

Much good work has been done over the last decade and this is also outlined in Part III, along with issues that are shared between this and the other four plans.

For specific targeting opportunities, please refer to the Nature Recovery Network maps for Devon, expected to be published by the Devon Local Nature Partnership during 2021.

Habitat-related actions	Lead / Partners	Budget Source	By when
A1. Identify 10 suitable sites totalling 500ha for coastal rollback to restore clifftop grassland/scrub habitats, including coastal heath, and coastal woodland. Proof of concept projects with the aim to rollback coastal margin by an average 500m by 2030.	AONB and NT, Landowners	AONB, NT, CSS / ELMs	2023
A2. Identify potential/suitable areas using the NRN (e.g. Chivenor and near Bideford/Westleigh as well as up the rivers) and create or re-instate 300ha of wildlife-rich dynamic coastal grazing marsh according to the Shoreline Management Plan.	Biosphere team	Natural Capital Fund, Flood Defence, Innovative Resilience Fund (IRF)	2025
A3. Create reed beds along the estuary to offset loss due to encroaching saline waters, e.g. 15ha at Caen Wetlands. Restore/create at least 141ha of coastal land to inter-tidal and freshwater wetland habitats.	Biosphere team, DWT, EA, Defra, Triodos Bank	IRF as above	2025
A4. Improve water quality for the shellfish waters and recreational waters in the estuary, deliver SSSI measures, Water Framework	Biosphere team, EA, NE (CSF),	Green Infrastructure	2025

Directive objectives, Shoreline Management Plan objectives and address climate change impacts aiming to achieve good quality status by 2030. (CRITTER – Co-ordinated response for Intertidal Taw Torridge Estuary restoration.)	Plymouth & Swansea Universities, Plymouth Marine Aquarium.	Masterplan for investment linked to flood mitigation for Barnstaple/ Bideford	
A5. Improve dune habitat and increase populations of rare species like water germander and amber sandbowl snail, especially at Braunton Burrows & Northam Burrows, by promoting dynamic processes leading to more early successional substrates and wet slacks, and by controlling scrub and invasive sea buckthorn.	Plantlife , Christie Estate, NE, MOD, TDC (Northam Burrows CP), NT	NLHF, EU LIFE, Dynamic Dunescapes	2023
A6. Improve water quality and management of grazing marsh ditch systems and restore fields to a species-rich condition at Braunton and Chivenor Marshes.	NE , DWT, Marsh Inspectors	CSS / ELMs	2025
Species-related actions	Lead / Partners	Budget Source	By when
B1. Reduce disturbance at all high tide estuary wader roosts, including The Skern, Yelland, Instow, Ashford, Horsey) through education and engagement and best practices from S. Devon/Exe estuary, and consider employment of warden / estuary officer.	NDC, TDC , AONB/Biosphere teams and Estuary Forum, NE, BTO, RSPB, Gaia Trust	Developers, Estuary Forum partners	2025
B2. Identify and establish at least two disturbance free zones (during the nesting season) at suitable locations around the estuary for each of the following breeding birds: ringed plover, oystercatcher, curlew, lapwing, shelduck.	NDC, TDC , Estuary Forum, DWT, Landowners, FWAG	Private investment, CSS / ELMs, AONB	2025
B3. Ensure strict biosecurity continues on Lundy for ongoing seabird recovery, with restrictions on introduction of alien plant species. On the mainland coast, <i>Rhododendron ponticum</i> control must continue.	National Trust , Landmark Trust, RSPB, Landowners	Owners	Ongoing
B4. Work with stakeholders to establish feasibility of re-establishment of breeding ospreys and white storks around the estuary, and white-tailed eagles on Lundy, through research into provision of suitable nesting sites and/or re-introductions as needed.	Lead partner to be found. DWT, RSPB, NE, Gaia Trust, Landowners, NT, Landmark Trust, Forestry Commission.	Private investment, and listed partners	2025
B5. Support the natural re-colonisation by choughs through extensive grazing along selected clifftop zones. Establish and maintain 3-4 ha of optimal habitat within 500m of 6-10 potential nest sites along the coast and train a team of volunteers to monitor them.	Lead partner to be found , AONB, NT, RSPB, Landowners, Durrell Trust Jersey (for advice)	AONB, Private investment, CSS / ELMs	2025
B6. Support the recovery of farmland birds on the coast (yellowhammer, reed bunting, curl bunting, corn bunting) by providing minimum 10 ha of winter stubble or 2 ha of wild bird mix per 100 ha of cultivated land (RSPB advice) - aiming for 30ha winter stubble by 2025.	RSPB , AONB, Landowners	AONB, CSS / ELMs, Private investment	2025

B7. Reintroduce water vole following programme of mink control at Braunton marshes and potentially elsewhere.	Biosphere team, Landowners, NE	Private investment	2025
B8. Take specific conservation measures to improve sand dune habitats for brown-banded carder bee, moss carder bee, black mining bee and other pollinators in Woolacombe Warren (45ha), Croyde and Braunton Burrows (899ha) and other habitats at Instow, RMB Chivenor and Hartland Point.	BBCT, AONB, MOD, NT, Landowners	NT, Christie Estate, AONB, Private investment	2025
B9. Promote favourable management of SSSI/SAC maritime grassland through scrub control to help food plants such as the wood vetch <i>Vicia sylvatica</i> flourish to benefit invertebrates, in particular the scarce black-neck and Devonshire wainscot moths. Partners to target and signpost landowners to apply for CS in these areas, and promote favourable management of maritime grassland to farmers and landowners.	AONB, Devon Moth Group, Landowners	CSS / ELMs AONB	2022
B10. Remove smothering ivy from the rock faces at Berrynarbor which threaten the scribble lichen <i>Opegrapha subelevata</i> , and bramble and other undergrowth threatening the trees on which Fringed shield lichen <i>Parmelina carporhizans</i> grows.	AONB, local community	AONB, volunteers	2022
B11. Continue surveys to determine whether or not the beach comber beetle remains at Braunton Burrows and Woolacombe, its last sites in England. If not, then consider reintroduction from south Wales and review beach cleaning practices.	AONB, Coastwise, NT, Christie Estate, Parkin Estates.	Citizen Science, NE to be consulted	2025
B12. CRITTER project (see A4 above): Work with universities to test methods for establishing intertidal sea grass in Taw/Torridge estuary.	Biosphere team, EA, NE, Plymouth & Swansea Universities, Plymouth Marine Aquarium, Coastwise	Green Infrastructure investment	2025
Enabling actions	Lead / Partners	Budget /Source	By when
C1. Establish a pan-northern Devon dune management partnership to provide solidarity, harmonise approaches and communications, as well as joint commissioning of works etc.	Biosphere team, AONB, Plantlife, Christie Estate, NT, Ruda (Croyde), Torridge DC (Northam, Instow).	Minimal Requirement: Lottery, EU Life, CSS / ELMs	2023
C2. Promote public engagement in dunes through activities such as geocaching and park runs to change perception, encourage people to enter and make them dynamic (respecting the need to manage bird disturbance).	Dynamic Dunescapes project partners, Braunton Countryside Centre	Minimal requirement	2023
C3. Promote measures to reduce disposal of plastics into the environment, increase litter picking and education and awareness of the potential impact of plastic on wildlife.	Plastic Free Northern Devon Consortium	PFND, Councils	Ongoing

C4. Develop a network of local voluntary monitors for SSSIs to flag local issues that could impact on that site (e.g. grazing or new development).	Lead to be identified	Minimal, Volunteers	2024
C5. Share modelling of forthcoming major sediment/habitat shifts in estuary with the public in preparation for remedial & other measures.	EA; NE for protected habitats; LPA (SMP), Biosphere Team; TT Estuary Forum.	EA	2021
C6. Highlight the importance of good water quality for nature and our bathing beaches with, subject to funding, a public campaign about measures people can take to minimise their impact throughout catchment to the shoreline.	EA; South West Water; Biosphere team, AONB, Northam Burrows Country Park	EA, South West Water	2022
C7. Eutrophication: Reduce NOx impact on Braunton Burrows and its effect on wildlife (e.g. flora and lichen diversity, and the cover of scrub, brambles and nettles) through Shared Nitrogen Action Plans (SNAPs) as a mechanism for integrating action across multiple NOx sources and stakeholder engagement.	Dynamic Dunescapes project partners	Dynamic Dunescapes	2023
C8. Facilitate meeting/partnership of NGOs etc with local birding interests, to coordinate working together for habitat protection and creation around the estuary.	Lead to be identified, RSPB, DWT, Gaia Trust, WeBS, Devon Birds.	N/A	2021
C9. Support and strengthen the Estuary Forum to coordinate the aims and activities of estuary interest groups, with regular attendance of key players. Provide estuary forum community representation on Biosphere Partnership to invigorate local engagement and support.	TTEF, DWT, DBWPS, RSPB, BCC, Biosphere team / AONB with Coastwise support	N/A	2021
C10. Maintain a central website or forum for citizen science opportunities.	Lead to be identified	Minimal	2023
C11. Engage youth and students to assist with projects, initiatives and research in north Devon. (Lundy hosts visiting Universities eg. Middlesex, London Imperial College, Exeter and Cardiff).	Biosphere team, AONB, Colleges, Universities and project managers	N/A	Ongoing
C.12. Make the case for a Marine Officer for North Devon, properly equipped and resourced to establish appropriate level of marine science expertise currently missing, drawing links with Further Education sector and Plymouth & Exeter Universities to expand capacity.	Biosphere team, IFCA, DWT, Coastwise	tbc	2023
C13. Formalise the structure and operation of the Biosphere Reserve Marine Working Group to increase local engagement, ensure linkage with this plan and ensure accountability.	Biosphere team	N/A	2021
C14. Engage with RMB Chivenor to improve the management of the base for bumblebees and other wildlife and to make it one of the foremost bumblebee reserves in the country. Revitalise RMB Chivenor Conservation Group.	BBCT, DWT ND Group, MOD/DIO, Biosphere team	To be confirmed	2023

C15. Reduce and mitigate coastal recreational disturbance, a key wildlife impact for the entire Biosphere/AONB, including Lundy by establishing disturbance-free zones and/or codes of conduct for wildlife tour boats, kayakers and jet-skiers from Ilfracombe to Lynmouth, and addressing seal disturbance at Morte Point.	Biosphere team, AONB, NDC, TDC, DCC, NT, Estuary Forum, RSPB	Local authorities & private investment	2025
Monitoring priorities	Responsible	Budget source	Frequency
M1. Ensure all biodiversity SSSIs and MCZs are monitored for their site condition in the next 5 years, noting current pressures and activities in the area for future attention.	Biosphere team, NE, University research and monitoring groups, IFCA, Coastwise	NE, Research Council (subject to funding availability)	By 2025, then every 3-5 years
M2. Monitor representative MCZ rocky shores using DWT Shoresearch methodology for citizen scientists, under DWT guidance, to provide baseline data and develop for shore monitoring.	Coastwise & DWT	AONB SDFund	By 2023
M3. Use BTO WeBS data to monitor trends for designated bird species and consult with local birders about measures to sustain/improve position ahead of important imminent habitat changes.	Lead organisation to be confirmed. BTO via WeBS, Devon Birds	BTO, RSPB, volunteers	2021
M4. Continue NT bio-surveys of all their properties and annual monitoring on Lundy (summer and winter bird surveys, butterfly transects, bee transects, vegetation transect, and bat monitoring).	NT	NT	2021-25
Research priorities	Responsible	Budget source	By when
R1. Research and monitoring project on impact of invasives e.g. slipper limpets, pacific oysters, sea squirts, <i>Caulacanthus</i> algae.	Coastwise, Plymouth MBA	Volunteer support	2025

INDICATORS

These three outcome indicators will be monitored to track the overall impact of plan implementation.

Indicator	Baseline 2020	Targets	Means of verification	Responsible for monitoring
Improved condition of existing protected nature sites (including the estuary).	To be completed during 2021-2 WFD/SSSI/CWS	2025: 60% good or improving 2030: 85 -100% good or improving	Direct survey, CSS / ELMs monitoring.	EA, NE, DBRC

New biodiverse semi-natural coastal/estuarine habitat created (i.e. non-protected coastal sites improved from poor to good condition, or farmland managed for nature gain).	0 ha Priority habitats	2025: 1000ha of new semi-natural habitats under management 2030: 2500ha of new semi-natural habitats under management	Results of project work and agri-environmental returns (MAGIC) Net gain; ELMs monitoring	Biosphere team, AONB, Landowners, NT, DWT
Number of sites under improved protection from disturbance for roosting waders and breeding shorebirds	No current secure sites exist. To be established with assistance from stakeholders.	2025: Four sites for waders on estuary/beaches. 2030: Five to six sites in good condition	Regular monthly survey e.g. WeBS	TTEF, BTO, Devon Birds, volunteers

PART III: SUPPORTING INFORMATION

IMPORTANCE FOR NATURE

Geology and geography combine to provide the setting for northern Devon’s richly biodiverse coastal terrestrial, estuarine and intertidal habitats. The hog’s back landscape between Morte and Foreland Points culminates in some of the highest sea cliffs in England, whilst extensive rocky shores facing the Atlantic and Bristol Channel provide varying degrees of exposure to the elements. Headlands flank small coves and expansive sandy shores which, when subjected to Atlantic winds, feed important dune systems. 30 km offshore, the island of Lundy has become the focus of a world-renowned marine environmental protection and conservation effort, as the UK’s first Marine Nature Reserve and its first No Take Zone, with a successful programme of rodent eradication and ongoing monitoring to safeguard the seabird colonies.

Northern Devon’s unusual geomorphology, featuring east-west aligned Devonian rocks of the Taw valley, cut across by Carboniferous rocks of the Torridge, results in a short, young, dual estuary system with an under-developed delta. The unusual substrate structure and salinity combine with a huge tidal range to produce an estuary that is an important site for wildlife, designated as a Site of Special Scientific Interest (SSSI) for over-wintering and migratory populations of wading birds, and for the rare plants found on its shores.

The adjacent marshes, beaches, dune systems, rocky headlands and cliffs combine to offer an exceptional range of habitats within one regime, the whole within the Biosphere Reserve and most lying within the North Devon Coast AONB. In detail, the coastal habitats include:

COASTAL HEATH

Over 85% of UK coastal heaths have been lost since 1800 (source: Biosphere BAP 2010), but significant areas still exist in the Biosphere, mainly below the 300m contour, along the coast. Much of this habitat is owned and actively managed by the National Trust through agri-environment schemes. Dwarf shrubs such as heather and gorse predominate in these clifftop habitats, in a mosaic of semi-natural habitat which includes grassland, scrub and bracken. The best examples can be found on the Exmoor coast between Combe Martin and Foreland Point, and on Lundy, with smaller patches of good coastal heath remaining on the Morte Point headland, Woolacombe Down, Baggy Point, and between Marsland and Clovelly. Waved heath is an important feature, where exposure to strong, salt laden winds results in a distinctively sculptured sward and the nationally vulnerable Grey Waxcap *Cuphophyllus lacmus* is found in abundance.

UPLAND COASTAL HEATHS

Very small areas of heath lying above the 300m contour are found in the Biosphere, within Exmoor National Park. Most are National Trust owned, and managed through the Exmoor Environmentally Sensitive Area (ESA) Scheme.

COASTAL AND FLOODPLAIN GRAZING MARSH

The main areas of grazing marsh are closely associated with the Taw and Torridge estuaries (to the upper extent of tidal influence). One of the largest is Braunton Marsh, near the mouth of the main estuary system, reclaimed from the estuary in 1815. Characterised by their flat fields interspersed with a network of slow flowing drainage ditches, the grazed marshes are inhabited by abundant wildlife and grazing animals, with the best parts designated as SSSIs and County Wildlife Sites. There are plans to create new freshwater grazing marshes in the Taw and Torridge valleys to replace those areas being lost to rising sea levels and storms.

COASTAL SAND DUNES, INCLUDING THE STRANDLINE ZONE AT EXTREME HIGH-WATER MARK.

There are 1,130ha of sand dune in north Devon, by far the largest site being Braunton Burrows at 899ha, the core area of the UNESCO Biosphere and a Special Area of Conservation (SAC) and SSSI. Other dune habitats are found at Northam Burrows, Croyde Dunes, Woolacombe Warren and Instow Dunes. Sand dunes form a vital resource as a unique habitat for rich and diverse communities of highly specialised plant and animal species including petalwort, water germander, round-headed club-rush, sea stock, sand dune tiger beetle, beachcomber beetle, adder and sand lizard amongst many others.

MARITIME CLIFFS AND SLOPES

These habitats include areas of grassland, cliffs, scree and scrub. Maritime cliffs and slopes are characterised by hard and soft rocks influenced by the sea (i.e. the limit of salt spray deposition), which can be over 500m inland. Such habitats are found along large stretches on the north Devon coast including Marsland to Clovelly, Baggly Point, Morte Point to Ilfracombe, and Combe Martin to Foreland Point, as well as around Lundy. These zones also include maritime heath, scrub, maritime grassland with red fescue, thrift and sea plantain, wet seepages, and rock habitats with rock samphire, rock sea spurrey and sea beet and, on Lundy, the Lundy cabbage, found nowhere else in the world. The cliff habitat is important for breeding sea birds such as shags, guillemots, razorbills, kittiwake and fulmars, as well as peregrine and, historically, chough. On Lundy there are also important breeding colonies of storm petrel, Manx shearwater and puffin.

COASTAL OAK WOODLANDS

Oakwoods and other coastal woods are essential to understanding the North Devon coast as so much of it is wooded. Good examples include Beckland, Clovelly, Slee and Worthygate, Bucks Mills, Portledge, Twitchen, Lee, Broadstrand, Neck Wood, Woody Bay, Duty Point and Mill Combe, Lundy. These "temperate rainforests" are increasingly rare UK habitats, and are covered in the Trees, Woods & Hedges Action Plan.

SHINGLE RIDGE AND BEACHES

The shingle ridge to the north of Westward Ho! comprises a bank of large cobbles or 'pebbles' making it a unique geological formation, designated as a SSSI. This pebble ridge stretches along the seaward boundary of Northam Burrows and forms a coastal spit where it meets the Taw Torridge estuary; it curves back eastwards to create a sheltered muddy bay backed by saltmarsh, The Skern, to the east of the Burrows. The pebbles comprise of fine grain sandstone, originally from the cliffs between Westward Ho! and Hartland Point. Eroded by wave action, the loose rocks have formed rounded pebbles, transported along the coastline by longshore drift. Most of the other beaches in the Biosphere are formed of wave cut rock platforms (e.g. Welcombe and Marsland Mouth),

rock and shingle (Lee Bay), smooth pebbles (Greycliff and Bucks Mills), or sand (Woolacombe Bay). Sand and shingle beaches are dynamic places, constantly moving and reshaping as tides and storms shift the material about. Strand line species associated with this environment include sandhoppers, sea rocket, prickly saltwort, sea holly and sea sandwort. Wheatear nest on the Pebble Ridge.

INTERTIDAL ZONES (OUTSIDE THE ESTUARY)

The two mainland MCZ coastlines between Hartland and Welcombe, and Bideford to Foreland Point and, offshore, Lundy are among the most biodiverse in the UK, and support many interesting and scarce species. The Biosphere's coasts, including Lundy, are characterised by cliffs and rocky shores. On the mainland, there are numerous small sandy bays and inlets, with a huge expanse of sandy shoreline lining a great part of Barnstaple/Bideford Bay. North Devon is known to be rich in intertidal species because of the wide range of habitats present and, in part, because the north-facing nature of much of the coast means that many rocky shore habitats are shaded, and so subtidal species can survive on the lower shore. Hartland to Welcombe is part of the Hartland Point to Tintagel MCZ and largely comprises inaccessible wave-exposed rocky shores that deserve further study but are mostly un-documented. The MCZ designation for Bideford to Foreland Point includes all of the broadscale intertidal habitats (there are eight) that constitute the shores within the Biosphere Reserve. Among those features, specific habitats and species are designated: 'Honeycomb worm (*Sabellaria alveolata*) reefs' and 'Intertidal under-boulder communities'. 'Dark habitats' (overhanging rocks on shaded usually north facing reefs) are often colonised by rarely seen species such as cup corals and are a feature of the North Devon coast from at least Baggy Point to Foreland Point. There are caves at Baggy Point worth investigation. There are no intertidal species that are listed as 'designated features' in the Bideford to Foreland Point MCZ citation. However, notable intertidal species include: native oyster, Celtic sea slug, European eel, scarlet and gold star coral, Weymouth carpet coral, Devonshire cup coral and stalked jellyfish. Rocks on the 'surf beaches' of North Devon are often rich in sea anemone species including the nationally scarce glaucous pimplet *Anthopleura thallia* and are characterised by dense mussels, *Mytilus* species. Croyde Bay is the furthest east that the nationally scarce Celtic sea slug *Onchidella celtica* is recorded. The reefs at Croyde hold well-developed colonies of honeycomb worm *Sabellaria alveolata*: a reef-forming species. Saunton beach hosts the largest wintering population of sanderling in Devon, nationally important but subject to constant disturbance.

LUNDY

Lundy is a marine protected area (MPA) within which the MCZ designation includes only spiny lobster (*Palinurus elephas*) as a designated feature, but many other habitats and species that are rare, unusual or attractive occur there, protected by other designations (SSSI/SAC). Lundy reef habitats (intertidal and subtidal) have the highest recorded number of macro-algae species of any similar sized location in the British Isles, at over 314. Rockpools at wave sheltered locations hold particularly rich assemblages of algae. Significantly, *Corallina caespitosa* is an additional species of erect Corallinaceae found at Lundy that was new to science in 2009. The most northerly record of the lower shore and subtidal kelp *Laminaria ochroleuca* and the intertidal Celtic sea slug *Onchidella celtica* are at Lundy. The presence of colonies of the nationally scarce scarlet and gold star coral *Balanophyllia regia* are notable not least because the species was recorded from Lundy by Charles Kingsley a few years after it was described as new to science in 1853. One colony has been monitored since 1970. The unusual hydroid *Candelabreum cocksii* is now found in small numbers each year but was more abundant in the mid 20th century. Stalked jellyfish are present, also in smaller numbers since the late 1940s: *Depastrum cyathiforme*, *Calvadosia campanulata* and *Haliclystus auricula*. Some species found intertidally at Lundy are more characteristic of subtidal areas; for instance, *Munida rugosa* and *Luidea ciliaris*. There are many intertidal caves around Lundy that are important for seals as resting and pupping locations, but the great majority have an impoverished fauna. Exceptions occur at Rat Island and one location at Tibbets Point, where the anemone *Sagartia elegans* is common together with jewel anemones *Corynactis viridis*.

ESTUARIES

The Taw Torridge Estuary is fed mainly by the rivers Taw from the east and the Torridge from the south, joining at Instow. The Taw is tidal for 18km to New Bridge (4km upstream of Barnstaple) and the Torridge is tidal for approximately 13km to Weare Gifford. The estuary has a tidal range of 7.5m at its outfall into the Bristol Channel. It is designated as the Taw-Torridge Estuary Site of Special Scientific Interest (SSSI) and is also an Important Bird Area (IBA). The Taw is a broad sandy estuary, whereas the Torridge is a narrower, more meandering estuary constrained within a rocky valley. Torridge sediments are finer than the sandy Taw and there is some saltmarsh development within each estuary, with a large new area of emergent saltmarsh (c. 80ha) at Horsey Island near Braunton where the seawall has breached. Feasibility studies have been written for Chivenor Marshes and Penhill Marsh.

Because of the important interactions between marine and terrestrial ecosystems on the coast, there is inevitably (and logically) some overlap with the output of the Biosphere Marine Group and its Marine Natural Capital Plan. Close cooperation between the Nature Improvement Group and the Marine Working Group will be required to achieve maximum benefits for nature in the intertidal areas. In order to reduce overlap, this plan excludes all aspects of specific interest to fisheries e.g. shellfish, shore-crab traps, offshore-dwelling species, fish stocks and practices (including anadromous species while in the estuary e.g. salmon), and cetaceans. The Atlantic grey seal does often use the intertidal habitat to haul out, and is therefore included.

Much of the estuarine and intertidal habitats are accessible and enjoyed by North Devon residents and visitors on foot while the tide is out, so the plan addresses specific nature conservation issues, such as bird disturbance and trampling. Habitat creation linked to coastal squeeze from sea level rise is a further key issue, for example in the requirement for new areas of freshwater grazing marsh to replace those areas being lost, most recently at Horsey Island.

PROTECTED AREAS AND THEIR LEVELS OF PROTECTION

- The entire area of the northern Devon coast is contained within the Biosphere, and most of it is also fully protected through its designation as part of the North Devon Coast Areas of Outstanding Natural Beauty and Exmoor National Park. The AONB covers 171 km², including Braunton Burrows (but not Lundy) and since its designation in 1959, it has majored on protecting the landscapes within its area. Following the 2019 Glover Review, AONBs are expected to take a more active role in protecting and enhancing biodiversity in the future.
- Braunton Burrows, Lundy and Exmoor Coastal Heaths (partly in the Biosphere) are Special Areas of Conservation scheduled under the EU Habitats Directive and domestic legislation. The Marsland to Clovelly (and Hobby to Peppercombe) coastal stretches form part of the Tintagel-Marsland-Clovelly SAC, as internationally important examples of vegetated sea cliffs of the Atlantic and Baltic coasts. The North Devon Biosphere thus makes an important contribution to the diversity of habitats and species populations within Europe's Atlantic coast as a whole.
- The National Trust owns, manages and protects about half the coast covered by this Plan.
- There are 63 SSSI in the Biosphere Reserve, many in the suite of coastal and estuarine habitats considered here, including sites such as Braunton Burrows, Northam Burrows, Marsland to Clovelly Coast, Saunton to Baggy Point, and Morte Point, the Taw-Torridge Estuary, Braunton Swanpool, Greenaways and Freshmarsh within Braunton Marsh, Barricane Beach, Hele, Samson's & Combe Martin bays, Exmoor Coast and Woods, and Exmoor Coastal Heaths. Much of Lundy is also a terrestrial SSSI.
- Some 80ha of the grazing marsh at Horsey Island was subject to tidal inundation in November 2017 and is now a Devon Wildlife Trust nature reserve with a large area of emergent saltmarsh, tidal sand and mudflats ideal for wading birds and waterfowl.
- The Bideford to Foreland Point MCZ, designated in January 2016, lies entirely within the Biosphere. This 104km² site protects a wide range of habitats, from beaches of intertidal sand, to subtidal sediment and rock habitats

which are permanently submerged. Four further MCZs have been designated within the Biosphere, entirely in marine habitats: Hartland Point to Tintagel (part), Morte Platform, Lundy and North West of Lundy.

- Lundy became the UK's first statutory Marine Nature Reserve in 1986. Furthermore, an area of 30.7 km² of the waters surrounding Lundy formed the UK's first MCZ in 2010. In addition, a smaller area of 3.3km² off the island's eastern coast is England's first statutory No Take Zone, prohibiting the removal of any species.

BASELINE AND CONDITION / TRENDS (PARTICULARLY SINCE 2010)

Habitat	Baseline Area (ha)*	Trend** QUANT	Trend** QUALT	Comments (main reasons and sources of information)
Coastal heath	3,686 ha (See Intro. Annex 3 - Highly improbable there is so much lowland heathland in the Biosphere.	Severe decline post 1945, now largely arrested	Stable	Limited and reduced areas within mosaic of semi-natural habitats (bracken, scrub, etc) due to increase in sheep grazing putting pressure on heather and, in other cases, no grazing leading to scrub invasion. Best examples on NT land east of Combe Martin (Foreland Point), Morte & Baggy Points, Woolacombe Down, Marsland to Clovelly and Lundy. Special species: Green hairstreak butterfly, and in Heddon Valley area, high brown fritillary which requires warm, bracken-covered slopes with violets. Exmoor's heath fritillary is associated with bilberry dominated heathland coombes. In other parts of its very limited range uses unimproved grassland and coppiced woodland habitats. Other species include adder, Dartford warbler and merlin. Botanical interest includes dodder and rare lichens such as <i>Telochistes flavicans</i> and <i>Heterodermia leucomelos</i> .
Upland coastal heathland Exmoor	26,201 ha (See Intro. Annex 3)	?	?	89% of habitat notified as SSSI or recognised as CWS.
Coastal and floodplain grazing marsh	2,464 ha (See Intro. Annex 3)	Declining	Declining	Refers to land within tidal range even if not subject to tides. Coastal squeeze is threatening this habitat. Focus needed to find new sites in Taw-Torridge estuary to replace areas under threat of, or already lost to, saltwater inundation (e.g. Braunton Marsh/Horse Island (80ha+ lost 2017)).
Coastal sand dunes, including the strandline zone	1,526 ha (See Intro. Annex 3) (Dune systems only)	Declining	Declining	Steady decline over many years reflecting lack of dynamism and under-grazing, leading to scrub and rank grassland invading and smothering species-rich short turf. Invasive species include bramble, wild privet and sallow, and the non-native sea buckthorn and Japanese rose. Storminess causing some erosion of foredunes. Positive management of the Instow dunes has led to sand accretion and establishment of pioneer plant species. Change has occurred in many dune slack communities due to declines in water levels. The latest NE assessment of the Braunton Burrows SSSI is that the majority is in "Unfavourable recovering" condition
Maritime cliffs and slopes, including grassland, hard and soft rock cliffs, scree and scrub.	4,503 ha (See Intro. Annex 3)	Stable	Declining	Steady decline post WWII - due to reduction in rabbit population and loss of sheep & cattle grazing, scrub encroachment; uneconomical to manage. Efforts are underway (NT) to restore effective coastal grazing with cattle and reduction of sheep numbers, e.g. at Baggy Point, and scrub removal at Windbury and Welcombe. Similar programme on Lundy, with LT and LFS support, with successful rhododendron removal on Lundy's east coast.

				It will be important to maintain some sheep grazing for many species of low growing plants and lichens.
Pebble ridge	14 ha (approx. 4 km long)	Declining	Unfavourable recovering (NE, 2011)	The natural supply of pebbles is now restricted and further hampered due to man-made structures. Southern extent of the ridge has weakened and retreated over 150m since the 1860s. The ridge remains dynamic, with sections changing in size and profile constantly. The rate of retreat is slowest at its most northern point (supplied by pebbles from the south)
Beaches - Littoral sediments (sand, mud, gravel)	2,464 ha (See Intro. Annex 3)	Stable	Stable	Large expanses of bare sand, pebbles, rock, mud (at estuary mouth) exposed at low tide, in one of the largest tidal ranges in the UK. Sea level rise and storminess are starting to affect beach profiles (e.g. foredune erosion at Woolacombe, Croyde and Saunton; pebble advance at Greycliff).
Intertidal habitats - Littoral (intertidal) rocks, rockpools,	1,131 ha	Stable	Stable	Resilient habitats but flora and fauna changing – not systematically monitored in north Devon. Climate change, storminess, coastal erosion, water quality, aliens and invasives, litter including plastics, trampling, disturbance. Lundy MPA has been monitored regularly for many years by Hiscock, Irving etc, and by the Lundy Warden.
Intertidal habitats - Estuaries	Saltmarsh 1,324 ha (See Intro. Annex 3) Tidal prism 52.1 million m ³	Increasing (e.g. at Horsey Island)	Declining	Eutrophication, climate change (sea defences failing (Horsey Island), tidal squeeze / managed retreat. Losses due to inappropriate development. Disturbance from people and dogs, leisure craft. Disruption of mud/sand balance; vegetation changes; bird numbers under pressure, and declining. The latest NE assessment of the Taw-Torridge SSSI considers the majority of the area to be in Favourable condition.

*For baseline areas refer to Annex 3 in the Introduction regarding confidence assessments

** Trend estimates from expert opinion unless otherwise evidenced

Indicator Species	Trend QUANT	Comments (main reasons and sources of information)
<u>Mammals</u> Grey seal	Stable/increasing	Baseline: State of Biosphere Report (2015) See Marine Working Group.
<u>Birds</u> Wintering waders: Lapwing, golden plover, curlew, sanderling, purple sandpiper, turnstone Breeding waders: Oystercatcher	Declining Declining	WeBS; Climate change, Disturbance Devon Birds, RSPB, BTO surveys; Disturbance, WeBS

Chough	Regular annual sightings	Nest boxes installed on Hartland peninsula and Woolacombe area by NT; Devon Birds
Great white egret, spoonbill	Increasing frequency	NT, Devon Birds, BTO
Dartford warbler	Stable	NT, Devon Birds, BTO
Seabirds: cormorant, shag, manx shearwater, petrels, guillemot, razorbill, puffin	Stable [to be confirmed]	NT, Devon Birds, BTO
Herring gull, Lesser black-backed gull, kittiwake	Declining	These gull populations have seen significant declines on Lundy in recent years despite rodent control.
Peregrine	Stable	
Osprey	Regular estuary sightings on migration	Gaia Trust has installed a nest tower at Home Farm Marsh.
<u>Reptiles</u>		
Sand lizard (recently introduced)	Stable	Braunton Burrows
Adder	Declining	Habitat loss and other factors such as increase in predation of young by pheasants.
<u>Amphibians</u>		
Great crested newt	Increasing	Healthy population in Braunton Burrows
<u>Invertebrates – marine</u>		
Native oyster	To be researched by Coastwise	Indicator rarities selected as suitable for citizen science surveying by Coastwise. All relatively easy to identify, some may be extremely rare.
Stalked jellyfish		
Cup corals; scarlet & gold star coral (MCZ speciality)		
<i>Sabellaria</i> colonies		
Celtic sea slug		
Barnacle species (communities changing due to climate and invasives),		
Crab species <i>Xaiva biguttata</i>		
<u>Fish</u> (refer to Marine working Group):		
Common Eel, Short-snouted Seahorse		

<p><u>Invertebrates – terrestrial</u></p> <p>Insects: Beach comber beetle <i>Eurynebria complanata</i>;</p> <p>Spurge bug <i>Dicranocephalus agilis</i>;</p> <p>Brown-banded carder bee <i>Bombus humilis</i></p> <p>Lundy cabbage flea beetle,</p> <p>Molluscs: sand amber snail</p>	<p>Declining, possibly extinct</p> <p>Research required</p>	<p>Increased storminess – habitat now more unstable – beach cleaning removing micro habitat.</p> <p>DBRC, Bumblebee Conservation Trust, Devon Fly Group</p>
<p><u>Higher Plants</u></p> <p>Eelgrass,</p> <p>Water germander</p> <p>Sea stock</p> <p>Round-headed club-rush</p> <p>Lundy cabbage</p>	<p>Declining</p> <p>Declining</p> <p>Stable</p> <p>Stable</p> <p>Stable</p>	<p>MAGIC – Some information available for designated features within protected sites.</p> <p>DCC, DBRC, BSBI</p> <p>Lundy Field Society</p>
<p><u>Lower Plants</u></p> <p>Algae: <i>Lophosiphonia reptabunda</i></p> <p>Marine algae: <i>Caulacanthus okamurae</i> (pom-pom weed)</p>	<p>All not known</p>	<p>MAGIC – Some information available for designated features within protected sites. DCC, DBRC</p> <p><i>Caulacanthus</i> is an invasive rapidly colonising local shores) and requiring monitoring (Coastwise).</p>
<p><u>Fungi and lichens</u></p> <p>Scribble lichen <i>Opegrapha subelevata</i>,</p> <p>Scrambled-egg lichen,</p> <p>Fringed shield lichen <i>Parmelina carporhizans</i>,</p> <p>Golden hair lichen</p> <p>Ciliate strap lichen <i>Heterodermia leucomela</i></p>	<p>All declining</p>	<p>Range of causes for decline, including atmospheric pollution, changes to grazing regimes resulting in habitat loss</p>

ROOT CAUSES TO BE ADDRESSED

The following are the main causes of nature's declines on the coast, the majority of which are ongoing and need to be addressed by this plan:

Root Causes	Potential Solutions
<p><u>Conversion of natural habitats mainly for agriculture</u>: Many coastal heaths, grasslands and floodplain areas have been converted from semi-natural habitats to intensive agricultural land over centuries; in a few areas, pre-war abandonment of coastal grasslands led to scrubbing (ongoing in some areas e.g. coastal slopes to east of Hartland Point). Reduction in hay production and change to temporary species poor leys for silage.</p>	<ul style="list-style-type: none"> Identify priority areas and opportunities for restoration of semi-natural habitats e.g. hay meadows. Engagement with landowners through agri-environment projects. The Lundy Vision Workshop (LVW) (April 2019) envisaged less invasive and more ecologically sensitive farming practices on the island.

<p><u>Intensification and homogenization of farmland:</u> Coastal grassland has suffered from some under-grazing as well as over-grazing by sheep, degradation of soil condition, and drainage of wet areas/small wetlands. Grazing marshes have suffered from some intensification and unexplained lowering of the water table in some cases.</p>	<ul style="list-style-type: none"> ● Promote regenerative agriculture to build the economic case for landowners (e.g. NT Case study at Woolacombe Down) ● Holistic planned grazing including the need to restore cattle and pony grazing to coastal slopes. LVW envisaged reduced stock levels on Lundy. ● Use ELMs and third tranche of tests and trials to help address these issues. ● Note: in some coastal sites there is a need for a closer sward for many important species e.g. autumn squill, hairy bird's foot trefoil: some lichen species need sheep grazing at Baggy & Morte Points, rather than cattle.
<p><u>Lack of dynamism in habitat</u> – little change over many years, apart from increased gorse or other scrub (eg on Saunton Down). Early successional habitats are no longer being created (e.g. in Braunton Burrows) posing a major threat to biodiversity.</p>	<ul style="list-style-type: none"> ● Increase disturbance through mechanical devices, human access and grazing to lead to further bare sand. ● Education and experimentation regarding dynamism at larger scale and connective habitats.
<p><u>Eutrophication</u> due to atmospheric nitrogen deposition having negative impacts on heathlands/lichens and grassland, generally reducing species diversity. Dog fouling can also impact sensitive vegetation in heavily frequented areas (e.g. Braunton and Northam Burrows).</p>	<ul style="list-style-type: none"> ● Carbon/NOx reduction via changes to transportation (localised traffic). ● Encourage surrounding habitats eg woodland that are better at filtering nitrogen. ● Ensure removal of e.g. scrub and rank grass cuttings and take off site. ● Better management of dogs.
<p><u>Use of increasingly powerful biocides and pesticides</u> on farmland connected to semi-natural habitats on the coast affecting particularly invertebrates, with risk of wind-blow and entry into watercourses.</p>	<ul style="list-style-type: none"> ● Engagement with landowners and public to raise awareness and promote best practices ● Trialling alternatives and looking at effectiveness and cost implications.
<p><u>Climate Change</u> with heavier rainfall, storminess and sea level rise, causing coastal squeeze. Hard defences often cause more serious and unplanned damage to adjacent stretches of the coast or estuary bank.</p>	<ul style="list-style-type: none"> ● Engagement with landowners and public to raise awareness ● Work with natural processes to build resilience (nature-based solutions)
<p><u>Increased disturbance</u> arising from wider local access and from upsurge in recreational and tourism pressures in coastal areas (camping, dog-walking, paddle boarding, kayaking, drones, jet skis, coasteering, changes of use, coast path etc.). These pressures are likely to increase as a result of Covid-19 and more generally, the trend of increased population through new housing developments. Major problems are increased bird disturbance and seal disturbance on Biosphere coasts.</p>	<ul style="list-style-type: none"> ● Education and engagement with Countryside Code and better signage. ● Tackle site specific issues to manage disturbance ● Create disturbance free areas for roosting and breeding shorebirds. ● Controls and stricter guidance on housing development near wildlife rich sites. ● An estuary warden / team would ensure compliance and awareness as most people here, even locals, are ignorant to

	<p>the disturbance their activities cause, and to which species are sensitive to disturbance.</p>
<p><u>Habitat loss</u> due to built development. Fixing the coastline with structures and developments reduces the ability of coastal habitats to respond to sea-level rise. Infrastructure additions (e.g. jetties and quays) can also be problematic.</p>	<ul style="list-style-type: none"> • Greater awareness and more informed decision making required from planning authorities, alongside implementation of Net Gain policies • More scrutiny of planning (Glover Review/AONB, NGOs). • Address through Shoreline Management Plan and Coastal Change Management Area • Link with Towns & Villages action plan and Nature Recovery Network.
<p><u>Invasive species</u>: Major issues on many coastal habitats including: Hottentot fig, sea buckthorn, <i>Montbretia</i>, <i>Buddleia</i>, <i>Sargassum</i> (Japanese wireweed, a seaweed), <i>Caulacanthus ustulatus</i> seaweed, <i>Rhododendron</i>, brown and black rats (recently eradicated on Lundy), slipper limpets, Pacific oysters, Japanese knotweed.</p> <p>Lundy: Pacific Oyster present in Landing Bay. <i>Sargassum muticum</i> and <i>Asparagopsis</i>. Recent monitoring <i>ad hoc</i>; more in depth annual intertidal monitoring will commence 2021.</p>	<ul style="list-style-type: none"> • Biosecurity to stop further arrivals. • Prioritisation of species and sites for active control using best practices (e.g. Exmoor Non-Native Invasive Species Project). • Education on invasive garden escapees (to both the public and garden centres). • Monitoring and research of marine invasives to identify control measures. • Lundy: <i>Rhododendron</i>, Spanish bluebells removed from island. Biosecurity plan for invasive rodents, rats, mice, stoats and hedgehogs. Monthly checks on the island, and a dedicated incursion response team established. • Information presented to visiting watercraft available on the importance of biosecurity e.g Almanac, Lundy website, etc.
<p><u>Pollution</u>: a) Sewage, treatment and effluent, storm discharge and private septic tanks causing eutrophication in estuarine waters; b) Plastic and litter from marine and terrestrial sources impacting birds and other wildlife and entering the food chain; c) Waste disposal: e.g. Northam Burrows landfill tip. d) Agricultural impact on watercourses: run-off, nitrogen/phosphorus fertiliser leachates.</p>	<ul style="list-style-type: none"> • Work closely with water companies and enforcement (e.g. through Catchment Partnership) • Promotion of nature and tourism benefits and natural flood management - case study working well in Umber catchment with SW Water and landowners. • Monitoring and follow-up action (Monitoring on Lundy will record instances of plastic entanglement with seals and any plastic incorporation into nests.) • More rigorous enforcement by EA a solution as well as catchment management initiatives such as currently underway on the Umber.

Although not a root cause, reduced resourcing of statutory agencies has impacted the monitoring of nationally and internationally protected areas since 2010, investment in their management and enforcement measures - particularly for measures to address water quality.

BENEFITS / ECOSYSTEM SERVICES

Coastal habitats deliver a variety of ecosystem services of great economic and social importance.

Provisioning services: *Food production* from coastal and estuary fishing and shellfish. *Grazing* for livestock in marshes, coastal grassland.

Regulating services: *Carbon sequestration* in emerging estuarine habitats (eg saltmarsh can capture 1 - 4 tonnes CO₂e per ha per annum. Eelgrass and mud are also important providers of this service. *Coastal protection* by dune systems, saltmarsh, rocky cliffs, shingle and pebble banks, biogenic reefs such as *Sabellaria*. *Water purification* in coastal wetlands and the estuary.

Facilitating services: *Primary production* on coastal grasslands and intertidal zone fuelling food chains: fish nursery, mussel spat. *Carbon sequestration* in saltmarshes, muds, algae growth. *Nutrient cycling* role played by marine benthic species in de-nitrification of anthropogenic nitrogen inputs entering coastal ecosystems (eg from estuaries and coastal run-off). *Soil formation* in saltmarshes and coastal wetlands. *Photosynthesis* in algae.

Cultural services: *Recreation and leisure* including nature tourism; beach and coastal recreation, including surfing, coasteering, walking the Coast Path. *Education* – intertidal zone in some places is a very accessible classroom for learning about coastal marine life. *Public access* to a diverse natural environment and its appreciation provides benefits for physical and mental health. *Intellectual and aesthetic appreciation*: study, citizen science, research. *Spiritual and symbolic appreciation*; sense of place, the arts and folklore.

MAIN ACHIEVEMENTS 2010-2020

LEGISLATION, DESIGNATIONS, POLICIES AND PLANS

Since 2010, there have been extensive MCZ designations along large sections of the Biosphere coastline. Devon & Severn IFCA permit by-laws to control catch and e.g. diving activity. Marine and Landscape Pioneer schemes in North Devon have produced Natural Capital strategies and the Marine Natural Capital Plan

CONSERVATION ACTION FOR HABITATS

Braunton Burrows management: recent dune slack scraping, control of invasive sea buckthorn and other scrub removal, and ongoing military training use, are starting to restore habitat dynamism; the Dynamic Dunescapes project is developing a shared approach to restoration and management. Dune management at Instow. National Trust dune restoration: invisible electronic cattle fencing project on Woolacombe Warren. Rhododendron management, especially on Lundy. Other NT successes following 20 years of successful implementation of agri-environment schemes including conservation grazing at Baggy Point, Woolacombe Down and Morte Point, South Hole meadow restoration, and their purchase of common rights of Exmoor coastal heath. Multiple Countryside Stewardship HLS schemes along the coast have delivered a great deal for the money invested. Horsey Island on the Taw is now a DWT reserve - management and extension to wider Caen Wetlands will maximise biodiversity benefit of natural saltmarsh/mud habitat, with new grazing marsh created further upstream; innovative green finance is being explored to support management costs.

CONSERVATION ACTION FOR SPECIES

Lundy seabirds and ground nesting birds: numbers now increasing significantly (apart from gull species) due to brown and black rat eradication. NT management for Choughs at Hartland and Woolacombe. DWT Greater Horseshoe Bat project around Braunton, including downland and grazing marsh, produced good engagement between farmers and local community for conservation and management. Councils working with Biosphere and partners to address the major causes of disturbance at shorebird roosts on the estuary, following jointly funded research (NE, RSPB, TDC, NDC, AONB): Identification of Wintering Wildfowl High Tide Roosts and Recreational Disturbance Impacts on the Taw.

The Biosphere's INTERREG Biocultural Heritage Tourism project promoting visitor activity away from coastal honeypots.

EDUCATION AND AWARENESS

Braunton Countryside Centre: high quality habitat interpretation in an updated building, offering public walks and regular programmes of talks for over 20 years. Currently using virtual interpretation technology. New Northam Burrows Visitor Centre under construction. Morteheo and Combe Martin Museums house interactive displays. Exmoor NP Visitor Centre at Lynmouth interprets the Exmoor coast. DWT (local group) organises weekly Tuesday evening wildlife walks and other events during summer months, and monthly expert talks during winter months. BNA and Devon Birds also organise regular talks and field meetings. Coastwise North Devon has delivered expert talks and Summer programme of events, bioblitzes and surveys every year to members and public. AONB Coastal Creatures intertidal education and interpretation project fostered public engagement with marine habitats and beach cleans. Plastic Free North Devon Consortium established and active in tackling plastic pollution and waste. St Helen's Centre (Lundy): dedicated Education Officer arranging school visits, regular visitor walks, field workshops, with a stock of field equipment. Well supported by Lundy Field Society and members. The latter are Lundy Ambassadors, leading walks and talks. Posters and information on the island's code of conduct available online and on island. Skipper accreditation scheme trains local skippers on best practices to mitigate disturbance of Lundy's coastal flora and fauna – particularly seals and seabirds. Climbing restrictions in place around the island from March – August to prevent disturbance from climbers on nesting seabirds. No dogs are allowed on the island. Camping restricted to one field in Village and open campfires are not permitted. No drones are allowed unless specifically cleared with the Warden.

RESEARCH AND MONITORING

DWT Greater Horseshoe Bat Project (2015-2020); extensive recording of vascular plants for New Devon Flora 2016; Long Term Monitoring at Braunton Burrows by Natural England in 2015 and 2019, Survey monitoring of *Petalophyllum ralfsii* funded by Pondlife in 2017; Rare lichen surveys and monitoring by Bryan & Sandy Coppins at Braunton Burrows, Saunton & Baggy SSSI funded by NE; Water table monitoring continues at Braunton Burrows; Devon Fly Group discover new species; Bumblebee Conservation Trust (West Country Buzz): confirming importance of our dunes for rare species. DWT ShoreSearch citizen science project (ended 2016). Coastwise INNShore and ShoreSearch surveys; coastal communities carrying out marine litter and plastic pollution surveys for MCS and Tidy Britain annual monitoring.

CROSS-CUTTING ISSUES WITH OTHER ACTION PLANS

The following issues should be taken into account during implementation:

Towns and villages: Planning policy and decision-making process; pollution of watercourses; disturbance from people and dogs; engagement with local people and visitors; effective Net Biodiversity Gain projects implemented at all future housing developments.

Pasture and arable: Agricultural activity; pollution of watercourses and nitrogen eutrophication; wilding for e.g. coastal rollback, new estuarine grazing marsh

Wetlands and watercourses: Pollution of watercourses; invasive non-natives; consider role for beavers.

Marine Natural Capital Plan: Marine pollution and impact of plastics on maritime species: MCZ condition monitoring.

DRAFTING GROUP FOR THIS ACTION PLAN

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The Coast team would like to thank Dr. Keith Hiscock (Marine Biological Association), the Lundy Field Society, chaired by Alan Rowland, and the Lundy Warden, Dean Jones, for their assistance. John and Mary Breeds of North Devon Environmental Trust also supplied very useful advice and guidance on Braunton Burrows, in particular.

In view of their shared areas of interest along our coasts, and the simultaneous requirement of both organisations to develop nature recovery plans, the North Devon Biosphere and the North Devon Coast AONB decided to work jointly on this Action Plan for Coast habitats, with the full support of the Biosphere and AONB Partnerships. They will together support its implementation.