

## CARMARTHEN BAY & ESTUARIES EUROPEAN MARINE SITE

#### comprising

Carmarthen Bay and Estuaries Special Area of Conservation
Burry Inlet Special Protection Area (and Ramsar Site)
Carmarthen Bay Special Protection Area

# MANAGEMENT SCHEME TECHNICAL ANNEX 2 ASSESSMENT OF ACTIVITES, PRESSURES AND THREATS

Produced by Blaise Bullimore, Carmarthen Bay & Estuaries European Marine Site Officer, on behalf of the Carmarthen Bay & Estuaries EMS Relevant Authorities Group

#### 2012

This is a working document and as such will be continually revised in light of any relevant new information and legislation.

www.cbeems.org.uk

#### CARMARTHEN BAY AND ESTUARIES EUROPEAN MARINE SITE

#### comprising Carmarthen Bay and Estuaries SAC,

#### **Burry Inlet SPA and Carmarthen Bay SPA**

#### **MANAGEMENT SCHEME TECHNICAL ANNEX 2:**

## ASSESSMENT OF PRESSURES AND THREATS WORKING DRAFT

#### This technical annex:

- contains systematic assessments of the pressures and threats on the features of the SAC and SPAs;
- identifies where there are or may be conservation issues;
- identifies generic management options and requirements to address the issues, or information shortfalls that prevented adequate assessment.

#### **CONTENTS**

A	SSE	SSMENT OF PRESSURES AND THREATS	3
C	CONT	TENTS	3
1	I	NTRODUCTION	1
2	P	ROCESS	2
	2.1	INTRODUCTION	2
	2.2	PRESSURE, THREAT AND IMPACT	2
	2.3	DAMAGE, DEGRADATION AND DISTURBANCE	3
	2.4	FORMAT	3
3	G	SENERIC PRESSURES AND THREATS	6
	3.1	CARMARTHEN BAY & ESTUARIES SAC HABITATS AND SPECIES FEATURES	6
	3.2	WETLAND BIRDS AND SEADUCK	8
4 F		ISKS AND VULNERABILITIES SPECIFICALLY IDENTIFIED IN NATURA 2000 DATA MS, RAMSAR INFORMATION SHEETS AND CCW REGULATION 33 ADVICE.	10
	4.1	NATURA 2000 DATA FORMS AND RAMSAR INFORMATION SHEET	10
	4.2	CCW REGULATION 35 ADVICE FEBRUARY 2009	11
5	A	SSESSMENT OF ACTIVITIES AND OPERATIONS, THREATS AND PRESSURES	13
	5.1	EXPLOITATION OF LIVING RESOURCES	14
	5.	1.1 Commercial vessel fishing & shellfishing	17
		Trawling: otter	17
		Dredging: bladed – mussel (adult)	20
		Dredging: bladed - mussel seed	22
		Dredging: deep hydraulic	26
		Netting: static gill	29
		Netting: bottom-set tangle / trammel (static)	32
		Netting: surface set gill (drift)	34
		Potting: lobster / crab	36
		Potting: prawn	38
		Potting: whelk	40

Line: lo	ng-line	43
Line: re	d & line / handline	45
Electro	fishing: molluscs	48
Trawlin	g: beam.	50
Dredgi	ng: toothed (scallop)	50
Dredgi	ng: cockle mechanical	51
Dredgi	ng: shallow hydraulic (eg suction)	51
Dredgi	ng: bladed – oyster	52
Netting	: demersal seine	53
5.1.2 Ha	nd gathering / beach netting: commercial & for personal consumption	54
Hand g	athering: cockles	54
Hand g	athering: mussels	62
Hand g	athering: mussel seed	67
Hand g	athering: other bivalves	73
Hand g	athering: winkles	75
Hand g	athering: crustacean shellfish	77
Netting	: beach seine	79
Netting	: beach-set gill	81
Hand g	athering: algae & plants for human consumption	83
5.1.3 Fis	neries support activities	86
Fisheri	es: predator control	86
Hand g	athering: access and vehicle use	88
5.1.4 Red	reational fishing	91
Recrea	ional Sea Angling	91
Spearfi	shing	94
5.1.5 Bai	collection	95
Bait co	lection: digging	95
Bait co	lection: worm-pump	98
Bait co	lection: boulder turning & collection targeted species	102
Bait co	lection: aggregation devices	104
5.1.6 Oth	er exploitation of living resources	106
Algal g	athering for chemical extraction / biomass	106
Collect	on for aquarium / curio trade	108
Grazin	g: salt-marsh	109
5.2 CUL	TVATION OF LIVING RESOURCES	112
Aquacı	lture: molluscan 'ranching'	112
Aquacı	lture: molluscan 'farming'	114
Aquacı	lture: land based semi-enclosed / recirculation	116
Aquacı	lture: predator control	117
Aquacı	lture: aggregation devices see bait collection: aggregation devices	118
Aquacı	lture: algae	118
Aquacı	lture: finfish - sea cages or impoundments	118
Aquacı	lture: crustaceans - sea cages or impoundments	118
5.3 EXP	OITATION OF NON-LIVING RESOURCES	119
Aggreg	ate extraction	119
Water	bstraction	121
Offsho	e wind energy generation	123
Oil & g	as exploration	126

	Renewable energy generation: tidal barrage	126
	Renewable energy generation: tidal impoundment	126
	Renewable energy generation: tidal current turbine	126
	Renewable energy generation: wave energy	127
5.4	CIVIL ENGINEERING	129
5	.4.1 Development	129
	Coastal development / construction	129
	Marine development / construction	132
	Maintenance & management of civil engineered coastal, foreshore and marine structures	134
5	.4.2 Coast protection	138
	Coast protection: general	139
	Coast protection: hard defence	143
	Coast protection: soft defence	145
	Coast protection: beach replenishment	146
5	.4.3 Other coastal engineering	148
	Foreshore deposit of hard materials	148
	Hard-engineered freshwater watercourses	150
	Pipelines & outfalls: maintenance & replacement	152
	Power / communication cables	154
	Coast protection: surge/tidal barrage	156
	Barrage: amenity	156
	Artificial reef	156
5.5	WASTE DISPOSAL & POLLUTION	157
5	.5.1 Waste disposal	162
	Effluent disposal: continuous treated waste water	162
	Effluent disposal: intermittent (partly) treated waste water	167
	Effluent disposal: industrial & commercial	171
	Direct discharges to the environment independent of UWWT infrastructure, including effluent	nt / direct
	waste disposal from shellfish processing	171
	Effluent disposal: unregulated	173
	Dredge spoil disposal	175
	Beach cleaning	177
5	.5.2 Pollution	179
	Diffuse urban / industrial pollution	179
	Diffuse agricultural pollution	180
	General wastes & debris	182
	Effluent disposal: thermal	184
5.6	HARBOURS, MARINAS & VESSELS	185
	Docks, harbours & marinas: construction / development	185
	Docks, harbours & marinas: maintenance	187
	Shipping: navigation	191
	Shipping: accidents & accidental discharges	194
	Vessel waste management	196
	Vessel maintenance	198
	Harbour / marina dredging: capital	200
	Shipping: moorings & anchoring	200
5.7	RECREATION, LEISURE & TOURISM	201
5	.7.1 Boat & water based activities	202

	Recreational boating: power craft	202
	Recreational boating: sail	206
	Recreational boating: canoeing	209
	Recreational wind powered shore and water sports	211
	Recreational boating: anchoring	214
	Recreational boating: moorings	216
5	5.7.2 Other recreation	218
	Wildfowling	218
	Marine wildlife watching/eco-tourism	221
	Motorised shore recreation & vehicles on foreshore	223
	Recreational aircraft	225
	Access and casual shore recreation & non-specific leisure	227
	Longboat rowing	230
	Snorkeling	230
	Scuba diving	231
	Beach recreation	231
	Swimming	231
	Body boarding	232
	Surfing	232
	Coasteering	232
	Cliff climbing	233
5.8	MILITARY	234
	Military activity: ordnance ranges	234
	Military activity: ordnance disposal	238
	Disposal of contemporary and historical ordnance through controlled explosions	238
	Military activity: aircraft	240
5.9		242
	Education	242
	Science research	244
	Animal welfare operations & sanctuaries	246
	Rescue / intervention injured or disabled wildlife; release of rehabilitated wildlife	246
	Marine pollution response	247
	Archaeology & salvage	248
6 T	UNATTRIBUTABLE / INDIRECT THREATS AND PRESSURES	249
	Climate change	249
	Modification of catchments	251
	Mass invertebrate mortalities	253
	Invasion of non-native ('alien') species	255
	Estuary evolution	257
7 I	LIMITATIONS OF RELEVANT AUTHORITIES MANAGEMENT CAPABILITY	259
ANNI	EX GLOSSARY OF ABBREVIATIONS	261

#### National Biodiversity Network (NBN) data copyright statement

Copyright for NBN data referred to in this document remains with the Data Providers, Original Recorders [where identified], and /or the NBN Trust as appropriate. Data Providers, Original Recorders [where identified], and the NBN Trust bear no responsibility for any further analysis or interpretation of material, data and/or information downloaded from the NBN website and reproduced in this document.

#### 1 INTRODUCTION

The CB&E EMS relevant authorities group's agreed strategy for the development of the site's management scheme is founded on the principles of, *inter alia*, sustainability, precaution, and appropriate and fit-for-purpose management. The relevant authorities committed themselves to the stepwise:

- identification of the processes for decision-making (eg on conservation issues; development of management solutions);
- objective assessment of pressures on and threats to features, identified as far as possible using the best available scientific survey, monitoring, surveillance and causal relationship information:
- basing management action on a full inventory of the necessary management requirements to secure and maintain favourable conservation status.

All specific activities known, based on current available information, to be currently occurring within or in the vicinity of the site, or are likely to occur or may be foreseen as possibly occurring in the future, and that may be considered to be potentially detrimental to the conservation interest of the site have been identified and assessed in this document.

In almost all cases the status of the activities, and the pressures and threats they pose to the features are dynamic to some extent. It is acknowledged that some of the information contained herein may be out of date and assessments in need of revision. Constant review and revision is an integral part of the management planning process.

#### 2 PROCESS

#### 2.1 INTRODUCTION

The relationship of each activity or operation, both within and outwith the site boundary, to the site's features is systematically assessed for its current status; the potential threats to the features; its current management; and known or likely impacts on the features. An initial identification of management action (response) to remove / reduce risk / impact is included.

For consistency, the assessments follow the DPSIR ( $\underline{D}$ riving forces,  $\underline{P}$ ressures,  $\underline{S}$ tates,  $\underline{I}$ mpacts,  $\underline{R}$ esponses) model, defined as "The causal framework for describing the interactions between society and the environment adopted by the European Environment Agency: driving forces, pressures, states, impacts, responses (extension of the PSR model developed by OECD)" <sup>1</sup>.

Many of the activities & operations also may be, at least in part, plans or projects subject to appropriate assessment; these are identified as appropriate.

In addition to all ongoing relevant activities, historical activities that may be revived and potential future relevant activities are also identified and assessed where appropriate <sup>2</sup>.

#### 2.2 PRESSURE, THREAT AND IMPACT

Generic pressures (factors affecting species in the past and currently) and threats (factors considered to be a future problem) were developed from the EC *Natura 2000* Standard Data Form, Appendix E list of "Impacts and activities influencing the conservation status of the site" <sup>3</sup>. This standard list is used for completion of the "Information on impacts and activities in and around the site" section of the Standard Data Form for *Natura 2000* sites and the basis for management. These generic pressures and threats were modified and amplified as necessary to reflect site specific requirements for this EMS.

Pressure on the site's features leading to either potential threat or actual impact, *ie* disturbance, or damage to or degradation of conservation status may arise, alone or in combination, from one or more of four broad causes:

- 1) activities and operations in or adjacent to the site which have a direct or indirect influence on one or more components of a feature, or its requirements (section 2);
- 2) direct, indirect or consequential effects of broad-scale, possibly global, anthropogenic influences (section 3);
- 3) developments and plans that may potentially influence features;
- 4) management initiatives unrelated to EMS requirements, by relevant and other authorities.

Whilst most pressures and threats are directly or indirectly attributable to human pressures on the features, the causes of some are unknown or difficult to attribute directly, or are the result of historical human activities.

Whilst most activities or operations exert one or more pressures or threats to features when they coincide in time and space, features are not always vulnerable to those pressures or threats at all times or locations. The paucity of spatial and temporal data for many activities and the frequent absence of any systematic data on the actual relationships between activities and features makes the objective assessment of impacts extremely difficult. Whilst this has undoubtedly resulted in precautionary judgements that are at risk of being challenged for being over-precautionary, it has also resulted in many of the recommended management responses being focussed on surveillance, monitoring and collection of objective data to better inform future assessment and judgement.

<sup>&</sup>lt;sup>1</sup> European Environment Agency: http://glossary.eea.europa.eu/terminology/sitesearch?term=dpsir

<sup>&</sup>lt;sup>2</sup> Clearly this list is site specific.

<sup>&</sup>lt;sup>3</sup> http://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/standarddataforms/notes\_en.pdf

It is stressed that many activities and pressures may act cumulatively, synergistically or antagonistically. Specifically, many will, or are likely to, combine with or be amplified by climate change to magnify impacts; such as coastal infrastructure development, fisheries and marine renewable energy development.

Action to reduce, remove or mitigate pressures or threats may be limited subject to the capability of relevant authorities to introduce or deliver the management necessary for securing and maintaining the features at favourable conservation status (section 5).

In addition, long-term ecosystem or habitat changes resulting from 'rebound' following previous (historical) anthropogenic influences or impacts may also, in some circumstances, exert pressures on current populations and features (section 5). These are not regarded as anthropogenic pressures or threats *per se*, but as natural ecosystem responses or realignment following the removal of anthropogenic influences or impacts; however, obviously, there is no way of knowing how natural a state the resulting realignment is, or will be. However such changes and dynamism must be taken into account when identifying current pressures and threats.

This annex focuses on the first and second of the above listed causes of pressure and / or threat, plus the clearest, and likely most significant, examples of the limitations on relevant authorities capabilities to deliver the management measures necessary to secure the site's features at favourable conservation status.

#### 2.3 DAMAGE, DEGRADATION AND DISTURBANCE

Operations and activities may damage, degrade <sup>4</sup> or disturb one or more conservation features through one or more effect mechanisms. Outcomes arising from human action that are likely to be considered detrimental include such effects as, for example:

- permanent change of distribution or reduction in extent of a feature or feature component, or temporary modification or reduction sufficiently significant to negatively impact on biota or ecological processes;
- reduction in ecological function caused by loss, reduction or modification of habitat structural integrity;
- interference in or restriction of the range, variety or dynamism of structural, functional or ecological processes, *eg*: alteration of habitat structure, obstruction of tidal streams, chronic or acute thermal, salinity or suspended sediment elevations or reductions;
- hypertrophication or eutrophication;
- contamination by biologically deleterious substances;
- reduction in structure, function and abundance of species populations;
- change in reproductive capacity, success or recruitment of species populations;
- reduction in feeding opportunities of species populations
- reduction of health to a sub-optimal level, or injury, rendering the population less fit for, *inter alia*, breeding, foraging, social behaviour, or more susceptible to disease;
- increase in abundance and range of opportunist species through the unnatural generation of preferential conditions (*eg* organic enrichment), at the expense of existing species and communities.

#### 2.4 FORMAT

The assessment of each relevant activity is documented in a standard format. Activities that are not known to occur in the site at present, but which may possibly be introduced to the site and which have the potential to cause degradation and require management, and activities that are judged unable to pose a threat to the site's features are identified at the end of each subsection.

<sup>&</sup>lt;sup>4</sup> Degrade is defined as "to lower in rank or grade, to lower in character, value or position or in complexity"; and degraded: "declined in quality or standard". In this document, the meaning of degrade(d) applies to damage or impairment resulting from such human action as have detrimental outcome for features. The significance of any degradation is dependent on the type of human action, its nature, location, timing, duration and intensity, the longevity and scale of the impact and the conservation value of the receptor and its intolerance and recoverability.

For each activity (or group of closely allied activities having the same or highly similar effects) the assessment includes a brief description of:

The activity (driving force): what it is;

**Current Status**: where it takes place and how much of it goes on - description of <u>known</u> current spatial distribution, frequency, timing and intensity;

#### **Key information sources;**

**Current management:** relevant legislation and legal instruments; relevant non-statutory measures; current statutory and non-statutory management measures and / or limits on activity; responsibilities for management;

**Pressures:** the mechanism(s) by which it affects, or may affect, the feature (*ie via* direct physical impact, *eg* dredging, or contamination, or removal of biota);

Features at potential risk - the features that may be affected;

**Known or likely threats & impacts (rationale for management):** coincidence of activity / threat factor(s) and features. A judgement of *no known impacts; insufficient information to judge likelihood or degree of impact* does <u>not</u> mean there is evidence to suggest an absence of impact, rather that there is, in most cases, no relevant information available, or that has been collected, that is capable of informing a judgment;

**Generic management option(s):** evaluation of whether existing management is sufficient, see 'F-list' definitions below;

**Management action(s) required:** general identification of any changes/actions required. NB: specific actions, responsibilities and priorities are identified in MS Action Plan

Against each of the above a statement of confidence and whether more information is required to improved confidence.

#### 'F LIST' DEFINITIONS

Code	Judgment	Management					
F1	The activity constitutes a <i>plan or project</i> as defined in the Habitats Directive.	Apply Habitats Regulations 59 to 83 ( <i>Habitats Regulation Assessment</i> )  Develop RAG view on significance as a relevant					
		conservation issue					
F2	There is no known mechanism for the activity to affect the feature, no known causal relationship, and no evidence that it is having a significant adverse effect.	Not considered further at present					
F3	There is no known mechanism for the activity to affect the feature, but there is evidence that there may be a causal relationship and/or it is having a significant adverse effect.	<ul> <li>Research</li> <li>Activity surveillance</li> <li>Experimental or trial management</li> <li>Identify and implement operational limits</li> </ul>					
F4	There is known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect.	<ul> <li>Activity surveillance</li> <li>Precautionary management including use of operational limits</li> <li>Research to determine whether there is an effect or not and inform operational limit setting</li> <li>Maintain current management</li> <li>Monitor compliance of current management implementation</li> </ul>					

Monitor compliance with management

		Monitor compliance with current management measures
F5	There is a known mechanism for the activity to have an effect, but evidence	F5a: ( absence of adverse effect is a result of current management)
	shows that it is not having a significant adverse effect at present.	<ul> <li>Maintain current management</li> <li>Monitor compliance of current management implementation</li> </ul>
		<ul> <li>Monitor compliance with current management measures</li> </ul>
		F5b: (absence of adverse effect is / appears independent of current management)
		Activity surveillance
		• Identify and implement operational limits
F6	There is evidence to suggest that an activity is having a significant effect on the feature, but it is outside management control ( <i>e.g.</i> it is an indirect effect from large scale human activity such as climate change), or there is no current mechanism for management.	<ul> <li>Activity/factor surveillance</li> <li>If necessary, seek appropriate management mechanism, then implement appropriate management</li> </ul>
F7	There is evidence to suggest that an activity is having a significant adverse effect and the mechanism is known.	<ul> <li>Identify and implement management measures</li> <li>Identify and implement operational limits</li> <li>Monitor compliance of management implementation</li> </ul>

References are cited throughout the text where appropriate, and are included as footnotes to avoid the need to cross refer to the bibliography. Common sources of information are cited in introductions to subsections where appropriate; these sources include CCW's Regulation 33 advice <sup>5</sup>.

measures

<sup>&</sup>lt;sup>5</sup> Both the 2005 draft and 2009 versions of the Regulation 33 advice were used; 2009 edition available at: <a href="http://www.ccw.gov.uk/idoc.ashx?docid=d3cc773f-53f7-48c6-a46f-aa1cb3eb1459&version=-1">http://www.ccw.gov.uk/idoc.ashx?docid=d3cc773f-53f7-48c6-a46f-aa1cb3eb1459&version=-1</a>

#### **3 GENERIC PRESSURES AND THREATS**

#### 3.1 CARMARTHEN BAY & ESTUARIES SAC HABITATS AND SPECIES FEATURES

The main, generic, pressures and threats in the UK to the features for which the Carmarthen Bay & Estuaries SAC is designated are identified in the *Second Report by the United Kingdom under Article 17* to the EC <sup>6</sup> and shown in the table overleaf.

**Pressures** - impacting on the species and/or its habitat(s) in the past or at the moment (past/present impacts) only are shown in yellow.

**Threats** - affecting long term viability of the species and/or its habitat(s) (future/foreseeable impacts) are shown in orange.

Activities exerting both **pressure and threat** are shown in red.

Activities not occurring and unlikely to occur within the site are greyed out.

Natura 2000 data form Appendix E Impacts and activities inflencing the conservation status of the site <sup>7</sup>	Sandbanks	Estuaries	Sediment flats	LSIBs	Salicornia	ASM	Lampreys	Shads	Otter
110 - use of pesticides									
120 - fertilisation									
140 - grazing									
141 - abandonment of pastoral systems									
200 - fish and shellfish aquaculture									
210 - professional fishing									
211 – fixed location fishing									
212 - trawling									
213 - drift-net fishing									
220 - leisure fishing									
221 - bait digging									
240 - taking / removal of fauna, general									
250 - taking / removal of flora, general									
290 - other hunting, fishing or collecting									
300 - sand and gravel extraction									
302 - removal of beach materials									
313 - exploration and extraction of oil or gas									

<sup>6</sup> Joint Nature Conservation Committee. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Accessed: www.jncc.gov.uk/article17

<sup>7</sup> http://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/standarddataforms/notes\_en.pdf

100 1 1 1 1 1 1 1					
400 - urbanised areas, human habitation					
410 – industrial or commercial areas					
420 - discharges					
502 - routes, autoroutes					
504 - port areas					
510 - energy transport					
512 - pipe-lines					
520 - shipping					
600 - sport and leisure structures					
621 - nautical sports					
623 - motorised vehicles					
700 - pollution					
701 - water pollution					
702 - air pollution					
703 - soil pollution					
730 - military manoeuvres					
720 - trampling, overuse					
800 - landfill, land reclamation/drying out, general					
801 - polderisation;					
802 - reclamation of land from sea, estuary or marsh					
803 - infilling ditches, dykes, ponds, pools, marshes					
810 - drainage					
811 – mgmt aquatic/bank vegetation for drainage					
820 - removal of sediments					
830 - canalisation					
840 - flooding					
850 – general modification hydrographic function	r				
851 - modification of marine currents					
852 – modification structure inland watercourses					
853 - management of water levels					
860 - dumping, depositing of dredged deposits					
870 - dykes, embankments, artificial beaches					
871 – sea defence or coast protection works					

900 – erosion					
910 - silting up					
920 - drying out					
930 - submersion					
950 - biocenotic evolution					
951 - drying out, accumulation of organic material					
952 - eutrophication					
953 - acidification					
954 - species invasion					
960 - interspecific faunal relations					
969 – other/mixed interspecific faunal competition					
970 - interspecific floral relations					
971 - competition					
973 - introduction of disease					
974 - genetic pollution					

#### 3.2 WETLAND BIRDS AND SEADUCK

The BTO specifically cite the following as main pressures and threats to water-birds 8:

- habitat change and loss, particularly in estuaries, with loss of intertidal mudflats and salt-marsh to land-claim for industry, housing and harbour developments <sup>9</sup>;
- disturbance for example, construction work, traffic and recreation) as a result of the high urbanization
- possibly, improvements to sewage treatment and discharge <sup>10</sup>
- sea-level rise;
- climate change

Pressures and threats to migrating and wintering populations scoter specifically cited by the BTO, UK BAP and WWT <sup>11</sup> include:

- modern commercial harvesting and over-harvesting of shellfish;
- eutrophication, affecting food availability, water clarity and algal growth;

\_

<sup>8</sup> http://www.bto.org/research/wetland

<sup>&</sup>lt;sup>9</sup> eg Burton, N.H.K. 2006. *The impact of the Cardiff Bay barrage on wintering waterbirds*. In *Waterbirds around the world*. Eds. G.C. Boere, C.A. Galbraith & D.A. Stroud. The Stationery Office, Edinburgh, UK. pp805

<sup>&</sup>lt;sup>10</sup> Burton, N.H.K., Jones, T.E., Austin, G.E., Watt, G.A., Rehfisch, M.M. & Hutchings, C.J. 2004. Effects of reductions in organic and nutrient loading on bird populations in estuaries and coastal waters of England and Wales. Phase 2 Report. EN Research Report 586. ISSN 0967-876X. English Nature, Peterborough, U.K.

<sup>&</sup>lt;sup>11</sup> BTO (http://www.bto.org/research/wetland/habitat.htm); UK BAP (http://www.ukbap.org.uk/ukplans.aspx?ID=444#2); WWT (http://www.wwt.org.uk/learn/fact-files/wetland-wildlife/species-fact-files/common-scoter)

• oil pollution.

BirdLife International (the official Red List Authority for birds for IUCN) provides a more detailed list <sup>12</sup>:

The large concentrations of this species that occur during the moulting period and in winter are highly vulnerable to oil spills, chronic oil pollution, human disturbance and the degradation of food resources as a result of oil exploration. The species also suffers disturbance from high-speed ferries and populations wintering off the coasts of western Europe are threatened by offshore wind farms. The effects of commercial exploitation of benthic shellfish also poses a threat (through competition for food resources), and the species's breeding habitats are threatened by eutrophication in some areas.

 $^{12}\ www.birdlife.org/datazone/species/index.html?action=SpcHTMDetails.asp\&sid=491$ 

Page | 9

## 4 RISKS AND VULNERABILITIES SPECIFICALLY IDENTIFIED IN NATURA 2000 DATA FORMS, RAMSAR INFORMATION SHEETS AND CCW REGULATION 33 ADVICE.

#### 4.1 NATURA 2000 DATA FORMS AND RAMSAR INFORMATION SHEET

Very little information and few pressures and threats are identified in the *Vulnerability* sections of the *Natura 2000* data forms for two of the three *Natura 2000* sites comprising the EMS; the Carmarthen Bay SPA form includes slightly more detail.

#### Carmarthen Bay & Estuaries SAC 13

- Developments in fishing practices and target species
- Most of the potential threats come from fisheries and related activities such as shellfish management and access issues related to mussel and cockle gathering
- Aggregate dredging may have an effect locally on the biology of Helwick Bank, and in conjunction with other coastal defence works may also affect sediment budgets and characteristics over a wider area

#### Burry Inlet SPA 14

- Shellfish activities such as management and access
- Eutrophication issues
- Salt-marsh grazing levels
- Tourism, amenity and recreation activities in relation to the Millennium Coastal Park
- Potential hydro-electric barrage scheme

#### Carmarthen Bay SPA 15

- The scoter population is vulnerable to risk factors outside the site, for example at breeding grounds, and broad-scale factors such as long-term climatic change
- Developments / changes in fishing practices, targeting new species and/or increases in fisheries effort could threaten sea-duck and the benthic communities on which the population depends for food
- Hydrocarbon pollution
- Sea-surface or aerial activity creating significant disturbance; *eg* recreational, commercial or military water-surface or aerial activities
- Major infrastructure developments, such as for offshore energy generation
- Significant changes to the sediment structures or sediment transport regime could indirectly threaten the
  integrity of the scoter population through impacts to benthic communities containing the birds' food
  source.
- Seabed aggregate exploitation
- Major changes to harbour infrastructure and consequential maintenance regimes

#### Burry Inlet Ramsar site

The most recent version of the Ramsar Information Sheet <sup>16</sup> lists only erosion under "factors (past, present or potential) adversely affecting the site's ecological character", with the following amplification:

-

 $<sup>{\</sup>color{blue}^{13}} \ \underline{\text{http://www.jncc.gov.uk/ProtectedSites/SACselection/SAC\_list.asp?Country=W}$ 

<sup>14 &</sup>lt;u>C:\Users\EMSO\Documents\CB&E Management Scheme\MS document version 1\_to Feb 2011\Availablehttp://www.jncc.gov.uk/page-1403</u>

<sup>&</sup>lt;sup>15</sup> Op cit

Ramsar Information Sheet: UK14001 Burry Inlet Version 3.0, 13/06/2008 http://www.jncc.gov.uk/page-1392

"Sea-level rise and/or changes in the frequency of storms, natural sediment transition as a result of the natural breach of the old 'training wall' and channel realignment causes changing patterns of sediment deposition and erosion.

Studies suggest that overall erosion rates are more or less matched by sediment accretion.

Erosion of /loss of *Salicornia* zone is occurring – loss of this early successional vegetation is changing the overall salt-marsh habitat distribution on the site."

Somewhat surprisingly, the response recorded against the question "Is the site subject to adverse ecological change?" is "No".

The Overview of the implementation of the Convention in the Western European region report to the 6th Meeting of the Conference of the Contracting Parties <sup>17</sup> notes unregulated digging for fishing bait as a negative factor for the site.

#### 4.2 CCW REGULATION 35 ADVICE FEBRUARY 2009

In addition, Section 3.6 *Modifications as a result of human activity* of the advice document cites the following:

Activities currently believed to be actual or potential threats, and either requiring better management or further investigation include (not in any particular order):

- Aggregate extraction;
- Levels of exploitation of ecologically important shellfish species (e.g. cockles, mussels and mussel seed, whelks);
- Molluscan shellfish culture ('ranching');
- Creation & maintenance of hard engineered coastal defence works;
- Land claim;
- Over-grazing;
- Bait collection, particularly digging;
- High speed power craft (including PWCs);
- Disposal of wastes & debris;
- Military activity.

... other potential threats to the long term sustainability of marine habitats and wildlife. These are both global and local, and may be indirectly caused or influenced by human activity and include:

- Sea level rise:
- Coastal 'squeeze';
- Inadequate fisheries management capability;
- Mass mollusc (cockle) mortality events;
- Water quality and nutrient enrichment;
- Urban water run-off;
- Waste & debris;
- Modifications to sediment transport;
- Short term planning policies and unsustainable development;
- Poor public awareness, understanding or interest.

More information is needed on the distribution, timing and intensity of all activities, but in particular on:

- All forms of commercial fishing;
- Angling;
- Bait collection of all kinds;
- Recreational high speed boating and water-sports;
- Off-road motor sports in intertidal areas;

Page | 11

http://www.ramsar.org/cop1/cop6\_overview\_westeurope.htm

- Unregulated wildfowling;
- Unregulated rubbish disposal (fly-tipping);
- Unregulated foreshore development;
- Unregulated coastal protection & land claim;
- Vessel maintenance (including cleaning and painting antifouling);
- Marine wildlife watching / 'eco-tourism';
- Scientific research;
- Marine wildlife welfare.

#### Section 3.5 Operations within the SAC highlight the following as pressures and/or threats:

- coastal settlements giving rise to localised pressures on the marine environment;
- extensive reclamation of saltmarshes;
- sea defences, including sea walls, rock armour, gabions and groynes;
- protected coastal railway tracks acting as coastal defences and preventing the inland migration of coastal habitats;
- extensively and, at times intensively grazed saltmarshes;
- high levels of bait collection, including of marine worms and soft shelled 'peeler' crab;
- hypertrophic estuaries;
- hypernutrification in the upper Loughor Estuary;
- residual legacy heavy metals from industry and redundant coalmines in estuary catchments;
- decline in *Salicornia* populations since 1982, possibly caused by changes in the main channel and vehicular erosion;
- extraction of sand from the Helwick Bank for aggregate, exacerbating losses caused by natural processes.

### 5 ASSESSMENT OF ACTIVITIES AND OPERATIONS, THREATS AND PRESSURES

#### **Abbreviations**

Confidence assessments:

Low

Moderate

High

More information needed:

✓ = more information needed

A = alert to applications, proposals, developments or unauthorised activity

#### **Summary symbols**

Operations marked with **②** are or may be plans or projects (PoPs) and subject to Habitats Regulations Assessment (HRA; screening for likely significant effect and appropriate assessment as required). Although all fisheries requiring consents or permits are also PoPs subject to appropriate assessment they are not marked with asterisks.

The potential effects of the construction phase of operations marked with a hash (#) are included in the general operation 'construction'; in such cases the factors and likely effects listed relate to the ongoing presence, processes or consequences of the specified operations.

- !! = Key risk activity / operation; activity to which the site features are highly vulnerable or which is causing / has caused an impact.
- ! = Possible risk activity / operation.
- ✓ = Likely nil or trivial risk activity / operation
- ? = Insufficient information on which to confidently base judgement / more information required on frequency, intensity, spatial and temporal distribution of activity.
- Monitor activity / effect of activity.
- (R) = Review management measures.
- = Some measures already in place to ensure that the activity / operation is managed in line with the Habitats Regulations.
- % = Additional management required to manage the activity to contribute to securing FCS.
- (i) = Awareness raising / information provision

#### 5.1 EXPLOITATION OF LIVING RESOURCES

All activities exploiting living resources exert, to varying degrees, both direct and indirect ecological pressures, through target species depletion, by-catch and incidental effects caused by the techniques and gears utilised. Threats are dependent on intensity, scale and efficiency of activities, the ecological function of target or by-caught organisms and habitats sensitivities.

Fishing activities not known, with moderate to high confidence, to occur within or in the vicinity of the site, but which have the potential to do so and to impact the site's features are listed at the end of this section.

#### Information sources

Common information sources for this section:

CCW, 2010. Sea Fishing Atlas of Wales. Countryside Council for Wales, Bangor.

Gubbay, S & Knapman, PA, 1999. A review of the effects of fishing within UK European marine sites. English Nature (UK Marine SACs Project), 134 pp.

Hall, K, Paramor, OAL, Robinson LA, Winrow-Giffin, A, Frid CLJ, Eno, NC, Dernie, KM, Sharp, RAM, Wyn, GC & Ramsay, K, 2008. *Mapping the sensitivity of benthic habitats to fishing in Welsh waters-development of a protocol*. CCW [Policy Research] Report No: [8/12], 85pp.

Sewell, J & Hiscock, K, 2005. *Effects of fishing within UK European Marine Sites: guidance for nature conservation agencies*. Report to the Countryside Council for Wales, English Nature and Scottish Natural Heritage from the Marine Biological Association. Plymouth: Marine Biological Association. CCW Contract FC 73-03-214A. 195 pp.

Sewell, J, Harris, R, Hinz, H, Votier, S & Hiscock, K, 2007. *An assessment of the impact of selected fishing activities on European marine sites and a review of mitigation measures.* Report to Seafish Technology from the Marine Biological Association and the University of Plymouth. 217pp.

Walmsley, S.A. & Pawson, M.G., 2007. *The coastal fisheries of England and Wales, Part V: a review of their status* 2005–6. Sci. Ser. Tech Rep., Cefas Lowestoft, 140: 83pp.

(Woolmer, A, 2008. *Using Fishermen's Knowledge Base to Map Fishing Activity in South Wales*. Report to South & West Wales Fishing Communities Ltd. 39pp <sup>18</sup>)

#### **Existing management measures**

Current European (*ie* CFP) and national (*eg* vessel licensing and license conditions) management measures are not listed in detail below, except where national measures are specifically relevant.

A government licence is required to fish commercially using a vessel. As a consequence, all fishing operations subject to renewable licences fall within the requirement for appropriate assessment and are therefore classified as F1 in the following tables, though most are also subject to other management measures.

The functions of the former South Wales Sea Fisheries Committee were transferred into the Welsh Assembly Government on 1 April 2010. The *Marine and Coastal Access Act 2009 (Commencement No.1, Consequential, Transitional and Savings Provisions) (England and Wales) Order 2010* (Article 13) transferred the provisions of the SWSFC byelaws in force at the time the measures in the Order came into force (with one minor exception) into *de facto* statutory instruments "as if made by the Welsh Ministers". These will be reviewed, and perhaps amended, in the future <sup>19</sup>; however, this process is reported as likely to

<sup>18</sup> Although initially made available, the owners of this document, the South & West Wales Fishing Communities Ltd, have subsequently withheld their agreement to cite or draw on the report. It was nevertheless used as a background source of information.

Ministerial decision report: A holistic review of sea fisheries legislation within the Welsh zone. 6 December 2010 <a href="http://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="http://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="http://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="http://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="http://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="http://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="http://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="http://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="http://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="https://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="https://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="https://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="https://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/;jsessionid="https://wales.gov.uk/publications/accessinfo/drnewhomepage/environmentdrs2/2010/seafisherieslawreview/environmentdrs2/2010/seafisherieslawreview/environmentdrs2/2010/seafisherieslawreview/environmentdrs2/2010/seafisherieslawreview/environmentdrs2/2010/seafisherieslawreview/environmentdrs2/2010/seafisherieslawreview/environmentdrs2/2010/seafisherieslawreview/environmentdrs2/2010/seafisherieslawreview/environmentdrs2/2010/seafisheries

take several years. Consequently, for the time being they are cited herein by their SWSFC former byelaw number.

Several SWSFC byelaws have wide application to the management of multiple fishing activities; inter alia:

- 24. Temporary closure of shellfish fisheries. Allows for temporary closure of any shellfish fishery, or part thereof in order to ensure recovery of depleted stocks; or the protection and development of mainly immature or undersized or transplanted shellfish; or protection of a fishery, fishery management or control of exploitation.
- 38. Maximum vessel size. Prescribes the maximum vessel size in vessel capacity units (VCU, a combination of overall length, breadth and engine power); and includes vessels greater than 15.90 metres overall length.
- 41. Boat fishing (catch returns) permit. Requires an annual, non-transferable, permit to operate a (mechanically powered) boat in fishing, and the annual submission of a statistical return.
- 44. Marking of fishing gear and keep pots. Prescribes the requirements for marking all static gears

#### **Future management**

#### a) EU biodiversity strategy

The European biodiversity strategy dated May 2011 <sup>20</sup> postdates the analyses and identification of additional future management measures for the EMS. However, headline target 4 of the strategy

"Fisheries: Achieve Maximum Sustainable Yield (MSY) by 2015. Achieve a population age and size distribution indicative of a healthy stock, through fisheries management with <u>no significant adverse impacts on other stocks</u>, species and ecosystems, in support of achieving Good Environmental Status by 2020, <u>as required under the Marine Strategy Framework Directive</u>." (emphasis added)

endorses recommended generic measures identified in this section.

### b) New generic actions to cross-cut all fisheries activities and management additional to actions identified under each fishing metier.

Maintain Welsh Fisheries Strategy and implementation plans under review to ensure they meet the conservation requirements of EMS.

Ensure fisheries development plans and other plans that support fisheries developments recognise and fully accommodate site conservation requirements.

Support the WAG process to identify highly protected Marine Conservation Zones.

Adopt Marine Stewardship Council Principles and Criteria <sup>21</sup> as a minimum requirement for all fisheries undertaken within a habitat feature, or that may affect one or more habitat or species features, subject to specific further actions for individual fishing techniques. This recommendation does *not* require application for MSC accreditation or for fisheries to be subject to pre-accreditation assessment, but simply the adoption of the principles and criteria, specifically those that apply to wider environmental effects of the fisheries, as an internationally accepted set of standards to which environmentally responsible management should aspire.

Ensure monitoring / information gathering of fisheries undertaken within designated habitat features, or that may affect one or more habitat or species features, meets the information / data standards of the Marine Stewardship Council Fisheries Assessment Methodology *Information and Monitoring* Performance Indicator

#### VxdcNBfS0g9Rlj01vgswyCHK1JrXykq2d74l0SLLKvnLH9zcxb7b!-1573769667?lang=en

Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions. *Our life insurance, our natural capital: an EU biodiversity strategy to 2020.* com(2011) 244 final http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm

Available as download from MSC website at: http://www.msc.org/documents/msc-standards/MSC\_environmental\_standard\_for\_sustainable\_fishing.pdf

(PI 1.2.3) (para 6.3.15 a - f) <sup>22</sup> as a minimum, subject to specific further monitoring / information gathering for individual fishing techniques.

Where a fishery targets a species that is an ecologically important component of a habitat feature (*eg* a 'keystone' species, major prey species), ensure management of the fishery meets Principle 1 Performance Indicators Scoring Guidepost *SG100* descriptors <sup>23</sup>.

#### c) Additional management measures for consideration

Additional management measures used in other developed nation fisheries (*eg* US, Canada, Australia, New Zealand) include:

- gear restrictions;
- non-transferable boat licences;
- restricted boat licences to specific fishery(ies)
- restrictions on the size of the vessel to reduce effort;
- closed or restricted areas to protect the habitat;
- designated areas where fishing activity is permitted;
- limited operating times;
- limited number of licences:
- daily / weekly / seasonal restrictions / closures.

Fisheries Assessment Methodology and Guidance to Certification Bodies. Version 2.1, 1 May 2010. Available as download from MSC website at: <a href="http://www.msc.org/about-us/standards/methodologies/fam">http://www.msc.org/about-us/standards/methodologies/fam</a> PI 1.2.3, para 6.3.15: a) Stock structure: distribution and geographical range of target stock; relationship of geographical range to harvest control; age, size, sex and genetic structure of the stock; b) Stock productivity: maturity, growth, natural mortality, density dependent processes, stock-recruit relationship and fecundity; c) Fleet composition effort by gear type/method of capture, fleet characteristics in targeted and non-targeted fisheries taking the species; d) Stock abundance: absolute or relative abundance indices including recruitment, age size sex and genetic structure of stock; may be met by use of surrogate indicators that provide an adequate proxy for stock abundance; e) Fishery removals: level, size, age, sex and genetic structure of landings; discards, illegal, unreported, unregulated, recreational, customary and incidental mortality of target stock.

Page | 16

<sup>&</sup>lt;sup>23</sup> Fisheries Assessment Methodology *qv*, Section 6.4: Principle 1 Performance Indicators and Scoring Guideposts.

#### 5.1.1 COMMERCIAL VESSEL FISHING & SHELLFISHING

Trawling: otter ? ® (i)







L

Confidence More info

#### **Current status**

No quantitative and only indicative spatial information.

Reportedly carried out throughout the bay, mainly by local (Burry Port, Saundersfoot, Tenby; and Swansea / Milford Haven) relatively small (mostly <10m, but up to 12m) vessels. Regular visits by a small number of larger (c.15m) North Devon vessels, one of which has historical rights to fish close to shore. Reputedly occasional incursions by larger, foreign flagged vessels and / or vessels exceeding SWSFC VCU restriction (byelaw ) though such reports are considered suspect by WAG Fisheries officers.

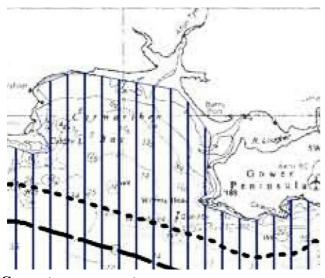
Primary targeting ray and flatfish species (mainly plaice), occasionally bass, with turbot, rays, and dogfish further offshore during summer months, and cod and whiting in winter.

Occasional inshore targeting of bass resulting in heavy discarding of undersized fish.

Frequency and intensity of effort unknown.

#### **Key information sources**

SWSFC; CCW 2010; MFA / WAG FOs; Walmsley & Pawson 2007; (Woolmer 2008)



CCW 2010 ('Light demersal trawl' used by smaller inshore vessels that do not have great engine power. Light otter trawls have doors and sweeps but the small vessels that work this gear will use small doors and shorter sweeps that cover less ground than the larger, heavier gear. Used to target a range species, such as rays, plaice and shrimps, differing with area and time of year)

#### **Current management**

SWSFC byelaws:

- 10. Skate and ray minimum size
- 38. Maximum vessel size (VCU limit)
- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.

Η **Pressures** 

Η

Sediment habitat modification: surface 10 - 60 mm disturbed; sediment resuspended; tendency to change structure from coarser to finer grained fractions and to reduce topographic heterogeneity.

Changes in benthic community structure: significant reduction in biomass of target and non target species (significant by-catch including crustaceans, molluscs, echinoderms); species reduction in diverse communities, depletion of stable communities and long lived, slow moving or sedentary species; (repeated trawling) increases in mobile species, rapid colonizers (opportunists) and juvenile stages; influx / increase of scavenging species; changes in trophic structure (eg increase in jellyfish populations as top predators).

Depletion of species that stabilise sediments, potentially resulting in further sediment habitat instability, erosion, resuspension.

By-catch non target species.

#### Features at potential risk



#### **Known or likely pressures & impacts (rationale for management)**

No known impacts; insufficient information to judge likelihood or degree of impact.

Known causal relationships (see above) and continued pressure give potential for impacts.

The effects of the long history of fishing in the site likely to be well established and modifications to seabed habitats and species populations to have occurred. However, there clearly remain current pressure and, therefore, possibly continued threat to benthic habitat structure and function, and to benthic species populations in the Bay and on / in vicinity of sandbanks. Nevertheless, because of the sparsity of information on effort, catch and degree of benthic disturbance and because in the greatest species mortality from trawling remains on the seabed rather than occurring as by-catch, there is insufficient information for judgement whether, or how significant, otter trawling is a conservation issue.

#### **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

#### Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Ensure that species subject to existing commercial fisheries are exploited only when population levels are at or greater than those required to achieve maximum sustainable yield

Rigorously implement existing management measures

Prohibit bass trawling in favour of low environmental impact bass capture techniques

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas.

Dredging: bladed – mussel (adult) ?







More info

L

#### **Current status**

Local, minor. Intermittently in few localised areas, eg Burry Port channel

#### **Key information sources**

SWSFC, CCW effort distribution maps

Activity map needed

#### **Current management**

SWSFC byelaws:

- 23. Shellfish re-deposit
- 24. Temporary closure of shellfish fisheries
- 38: Maximum vessel size (VCU limit)
- 40. Bivalve molluscan shellfish methods of fishing
- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.

Mussel dredging permitted under SWSFC byelaw after assessment and consultation with CCW.

**Pressures** M

Disturbance of substrate surface and generation of sediment plumes.

Localised reduction in water quality; increased nutrient loads, oxygen consumption and phytoplankton production; release of suspended particles; level of threat dependent on water exchange and benthic habitat stability, and may be relatively trivial.

Depletion of benthic flora and fauna / modification benthic communities. Repeated dredging results in continued disturbance preventing recovery of communities characteristic of stable habitats.

Reduction of overall size of mussel beds potentially depleting bird food resources causing increasing disturbance via interference competition among foragers.

#### Features at potential risk

Subtidal sandbank Salicornia Shads & lampreys

#### **Known or likely threats & impacts (rationale for management)**

Known causal relationships. Potential exists. Some local and intermittent pressure; likely local impact to benthic species populations in Bay and possible local impacts on benthic habitat structure and function.

No known impacts; insufficient information to judge likelihood or degree of impact

#### **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

#### Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Rigorously implement existing management measures

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas.

Dredging: bladed - mussel seed! ?





## Confidence More info

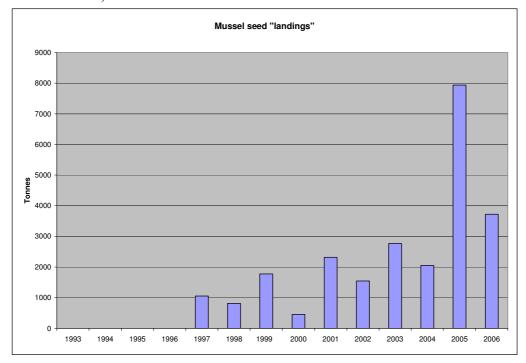
A

#### **Current status**

Intermittent at a few localised areas (mostly Caldey Roads and Yowan Rocks areas). Regular industry pressure for consent to dredge to intertidal stocks in vicinity of Whiteford lighthouse; Experimental dredge of c.9000 tonnes (mainly seed) in 2005.

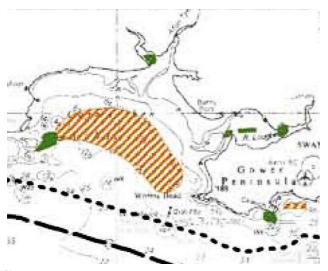
Prospecting widely throughout the bay and outer estuaries, including very shallow nearshore.

SWSFC catch statistics indicate considerable annual variation but trend toward substantially greater seed collection (landing statistics combine dredging and hand-gathering; no individual data for each method).



#### **Key information sources**

SWSFC / SFOs; consultations; MFA / WAG FOs; CCW 2010; (Woolmer 2008)



CCW 2010: mussel seed dredging shown in green shading

#### **Current management**

SWSFC byelaws:

- 13. Shellfish minimum sizes
- 20. Protection of shellfish beds burry inlet
- 23. Shellfish re-deposit of
- 24. Temporary closure of shellfish fisheries
- 38: Maximum vessel size (VCU limit)
- 40. Bivalve molluscan shellfish methods of fishing
- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.

Wildlife & Countryside Act 1981 (As Amended) Section 28 SSSI consenting regime Mussel seed dredging permitted under SWSFC byelaw after assessment and consultation with CCW.

Applications for dredging in the intertidal are considered on a case by case basis and in discussion with others, specifically CCW in the case of dredging within or immediately adjacent to SSSI.

Pressures <sup>24</sup>

Potential depletion of bird prey resources (mussel seed provides food source for specialist feeders, such as knot and common scoter, and oystercatcher, in intertidal and shallow subtidal areas) and generation of increased disturbance via interference competition among foragers. (However, from perspective of direct bird disturbance, dredging is considered a lesser threat than mussel seed collection by hand-gathering qv);

Modification of associated invertebrate communities, and reduction of food for dependent (predator) faunas (other than birds);

Reduction / prevention of mussel recruitment in other areas following seed displacement by

\_

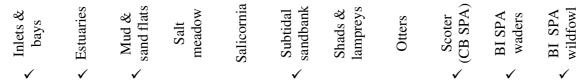
<sup>&</sup>lt;sup>24</sup> Saurel, C, Gascoigne, J. & Kaiser, MJ, 2004. *The Ecology of Seed Mussel Beds: Literature Review*. Report to SeaFish from School of Ocean Sciences, University of Wales Bangor; Rees, EIS, Dare, P, Dolmer, P & Smaal AC, 2004. *Peer review of a CCW commissioned report: Beadman, H. (2003) Impacts of mussel seabed-lay bottom cultivation, with special reference to the Menai Strait and Conwy Bay Candidate Special Area of Conservation. A report to the Countryside Council for Wales* 

L

storm / wave action ("mussel patch dislodgment may represent the major mode of patch dispersal and new patch formation in soft-bottom environments" <sup>25</sup>)

Localised reduction in water quality; increased nutrient loads, oxygen consumption; release of suspended particles: level of threat dependent on water exchange and benthic habitat stability, and may be relatively trivial.

#### Features at potential risk



#### **Known or likely threats & impacts (rationale for management)**

Habitat effect of technique reportedly trivial (but possibly not objectively determined).

Ecosystem effect of mussel seed exploitation unknown.

Scale of effect on bird populations varies between years, dependant on, *inter alia*, cockle prey availability. Pressures from removal of mussel seed overall may create a prey resource impact in some years rather than the technique of dredging *per se* <sup>26</sup>.

Insufficient information to judge likelihood or degree of impact.

Collection of seed is unlikely to be a severe threat to benthic habitat structure or communities when it takes place on very unstable beds.

#### **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

#### Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers Further assess pressures from activity on designated EMS features

Ensure that all developments, permissions etc are subject to appropriate and legally compliant

Statutory consultees respond fully to consultations on permission applications, focussing on the site's conservation objectives

<sup>25</sup> Reusch, TBH &. Chapman, ARO (1997) *Persistence and space occupancy by subtidalblue mussel patches*. Ecological Monographs: Vol. 67, No. 1, pp. 65-87

<sup>26</sup> West, A.D., McGrorty, S., Goss-Custard, J.D., Sanderson, W.G., & Gray. C. 2005. Modelling shorebirds and their food on the Dee Estuary, Traeth Lafan and Burry Inlet SPAs to inform target setting and site management – phase 2. A report to the Countryside Council for Wales from the Centre for Ecology and Hydrology. CCW Marine Monitoring Report No:19, 151pp.

Ensure compliance with s28 of 1981 WCA, as amended by the CRoW Act, in SSSIs

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management; specifically, require spatial and temporal reporting of effort and catch as conditions of permissions

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Rigorously implement existing management measures

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas

Ensure integrated management of all mussel seed collection techniques

Develop & introduce mussel cultivation management policy (to include mussel seed exploitation protocol), including zonation plans where appropriate, to:

- secure the EMS features at favourable conservation status;
- ensure, proactive, management measures are consistently applied in a timely manner;
- limit effort and catch such that the environmental carrying capacity of the estuaries and bay are not exceeded

**Dredging: deep hydraulic** (including, for example, water-jet injection dredging) !! ?











**Current status** 

Unclear. One vessel fished under scientific authorisation during 2003. Conflicting evidence as to whether technique is being used (SWSFC report nil cf CCW 2010 - map below (and Woolmer 2008)). Interest remains; potential for legal or illegal development.

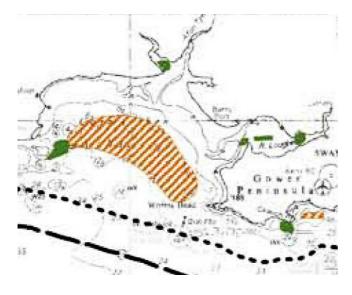
Confidence More info

M

A

#### **Key information sources**

SWSFC; SWWFC; CCW 2010; (Woolmer 2008)



CCW 2010: hydraulic dredging shown as red hatching

**Current management** 

SWSFC byelaw: 40. Bivalve molluscan shellfish - methods of fishing. Specified forms of hydraulic gear are conditionally permitted under SWSFC byelaw outwith the 10 m isobath.

41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.

NAW Statutory Instrument 2003 No. 607 (W.81) The Shellfish (Specified Sea Area) (Prohibition of Fishing Methods) (Wales) Order 2003. Prohibits the use of (specified types of) hydraulic dredging for bivalve molluscs in Carmarthen Bay. However, the prohibited types of gear are those which are already not permitted under SWSFC byelaw, rather than those which are.

Η **Pressures** 

Substantial physical disturbance of substrate / habitat.

Significant reduction in abundance of non-target species: short – medium term reduction of mobile, rapidly recruiting or short -lived species; long term reduction of long-lived and slow moving or sedentary species, including the target species.

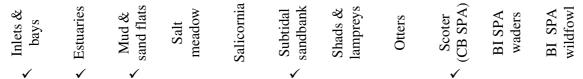
Modification of age / size-class structure of long-lived species populations.

Damage to long-lived species; increased vulnerability to predation.

Depletion of or damage to sea-duck prey; potential disturbance to sea-duck.

Ecosystem effects of depletion of target species; community change to alternative stable state <sup>27</sup>

#### Features at potential risk



#### **Known or likely threats & impacts (rationale for management)**

M ✓

Potential exists for substantial localised, or wider, acute and chronic impacts if undertaken either legally or illegally

Not known to be currently pursued, but, In the event that use of this technique commences (or current use is confirmed), any fishery is a potentially significant conservation issue, with significance depending on scale, frequency and location

#### **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

#### Management action(s) required

Monitor and report spatial and temporal intensity of any activity

Maintain activity trend under review

Ensure that all developments, permissions etc are subject to appropriate and legally compliant HRA

Secure research to determine likely spatial extent and magnitude of effects of activity on EMS features

Statutory consultees respond fully to consultations on permission applications, focussing on the site's conservation objectives

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management; specifically: require spatial and temporal reporting of effort and catch as conditions of permissions

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate. Specifically, review and revise Statutory Instrument 2003 No. 607 (W.81) to better define permitted, proscribed and managed gear types

Rigorously implement existing management measures

Operator education: raise awareness of EMS and features at risk and threats from activities

\_

<sup>&</sup>lt;sup>27</sup> Fahy, E & Carroll, J. 2007. Consequences of hydraulic dredging for a razor clam Ensis siliqua (l.) bed in the northwest Irish Sea. Biology and Environment: Proceedings of the Royal Irish Academy, 107B(3), 115 -128







# Confidence

#### **Current status**

Extensive throughout Bay. Information as to distribution; frequency and intensity gear type unknown, but effort reportedly to be seasonally substantial.

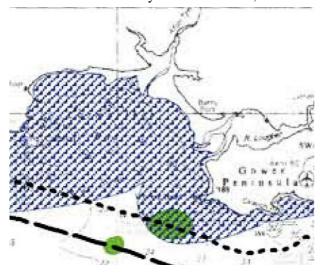
Vessels from Burry Port (c 25 marina-based vessels of 6–10m and up to 50 smaller, trailerlaunched boats); Three Rivers (Ferryside, Laugharne; small numbers of trailer-launched small boats during spring to autumn); Saundersfoot (roughly a dozen, plus several part-timers during the summer); Tenby (c 3 full-time and c 6 part-time < 10 m) and likely further afield.

Most vessels fish multiple gear types including static gill nets, but vary effort with bottom set tangle netting, potting, rod and line and draft netting.

Static gill nets are primarily used to target flatfish (plaice, turbot and rays) and bass, spurdog and mullet.

#### **Key information sources**

SWSFC SFOs Walmsley & Pawson 2007; MFA / WAG FOs; CCW 2010; (Woolmer 2008)



CCW 2010: boat-set nets, including drift nets, shown in blue diagonal shading. Does not distinguish surface and seabed set nets.

#### **Current management**

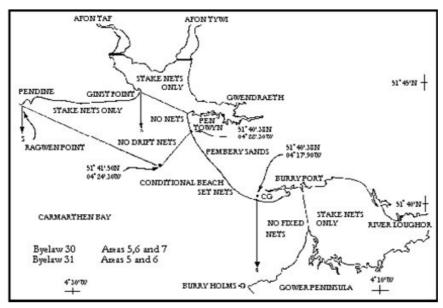
SWSFC byelaws:

8. Bass - minimum size

29. Bass nursery area-restrictions on fishing

30. Fixed nets

M



- 32. Mesh sizes-nets other than trawl and purse seine nets
- 33. Set, stake and stop nets
- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.

Statutory Instrument 1990 No.1156. The Bass (Specified Areas) (Prohibition of Fishing) Order 1990 (prohibits fishing for bass by boat in the Taf, Tywi and Gwendraeth Estuaries and Burry Inlet between 30 April and 1 November)

Pressures H \(\sqrt{}\)

Incidental by-catch, particularly vertebrates:

- Accidental capture of diving birds foraging for food in and around nets. Threat dependent on netting effort, bird concentrations and timing (seasonality) of fishing.
- Lampreys & shad in estuaries and coastal areas.
- Marine turtles

Increase in scavenging seabird species due to discarding of unwanted catch and offal.

'Ghost fishing': threat and duration dependent on exposure and seabed habitat.

## Features at potential risk

## **Known or likely threats & impacts (rationale for management)**

Potential exists – particularly for species features.

Degree of risk or actual entanglement of bird species features unknown.

No known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Develop & introduce management measures, including zonation plans where appropriate, to secure the EMS features at favourable conservation status

Ensure that species subject to existing commercial fisheries are exploited only when population levels are at or greater than those required to achieve maximum sustainable yield

Rigorously implement existing management measures

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas

# Netting: bottom-set tangle / trammel (static) ?









More info

# **Current status**

Extensive throughout Bay. Information as to distribution; frequency and intensity gear type unknown, but effort reportedly to be seasonally substantial.

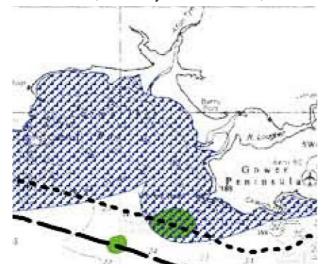
Vessels from Burry Port (c 25 marina-based vessels of 6–10m and up to 50 smaller, trailerlaunched boats); Three Rivers (Ferryside, Laugharne; small numbers of trailer-launched small boats during spring to autumn); Saundersfoot (roughly a dozen, plus several part-timers during the summer); Tenby (c 3 full-time and c 6 part-time <10 m) and likely further afield.

Most vessels fish multiple gear types including tangle nets, but vary effort with potting, rod and line and static and drift gill netting.

Tangle nets primarily used to target plaice, turbot and rays.

## **Key information sources**

SWSFC SFOs; Walmsley & Pawson 2007; CCW 2010; (Woolmer 2008)



CCW 2010: boat-set nets, including drift nets, shown in blue diagonal shading. Does not distinguish surface and seabed set nets.

## **Current management**

SWSFC byelaws:

- 10. Skate and ray minimum size
- 30. Fixed nets (contributes to reduction in risk to otters)
- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.

# Features at potential risk

Inlets & bays	Estuaries	Mud & sand flats	Salt meadow	Salicornia	Subtidal sandbank	Shads & lampreys	Otters	Scoter (CB SPA)	BI SPA waders	BI SPA wildfowl
/	/	/			/	/	/	/		

# **Known or likely threats & impacts (rationale for management)**

M ✓

Potential exists.

Degree of risk or actual entanglement of bird species features unknown.

Fisheries sustainability unknown?

No known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Develop & introduce management measures, including zonation plans where appropriate, to secure the EMS features at favourable conservation status

Ensure that species subject to existing commercial fisheries are exploited only when population levels are at or greater than those required to achieve maximum sustainable yield

Rigorously implement existing management measures

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas







# **Current status**

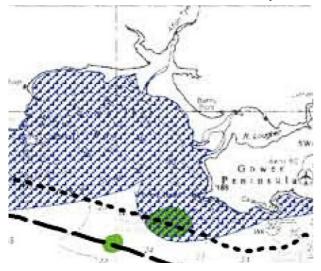
Extensive throughout Bay. Information as to distribution; frequency and intensity of gear type use, and specific information as to gear detail (net length, height etc) are unknown, but effort reportedly to be seasonally substantial.

Vessels from Burry Port (c 25 marina-based vessels of 6-10m and up to 50 smaller, trailerlaunched boats); Three Rivers (Ferryside, Laugharne; small numbers of trailer-launched small boats during spring to autumn); Saundersfoot (roughly a dozen, plus several part-timers during the summer); Tenby (c 3 full-time and c 6 part-time <10 m) and likely further afield.

Effort focussed effort Caldey – Tenby and offshore; Three Rivers and Burry Inlet entrances for bass: Helwick Bank

## **Key information sources**

SWSFC SFOs; MFA / WAG FOs; Walmsley & Pawson 2007, (Woolmer 2008)



CCW 2010: boat-set nets, including drift nets, shown in blue diagonal shading. Does not distinguish surface and seabed set nets.

# **Current management**

M

SWSFC byelaws:

8: Bass minimum size

31: Drift net prohibitions

41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.

Statutory Instrument 1990 No.1156. The Bass (Specified Areas) (Prohibition of Fishing) Order 1990. Prohibits fishing for bass by boat in the Taf, Tywi and Gwendraeth Estuaries and Burry Inlet between 30 April and 1 November.

**Pressures** M

Incidental catches of diving birds (notably scoter). Threat dependant on the netting timing, effort and distribution, and concentrations of birds.

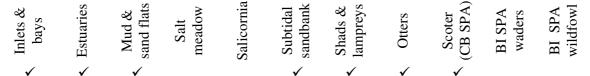
By-catch of non-target fish species including both species of shads and lampreys (species

L

features); lesser degree of risk to these species than from other threats.

Accidental entanglement and capture of other vertebrates species including marine mammals (most likely porpoise in Carmarthen Bay) and marine turtles.

# Features at potential risk



## **Known or likely threats & impacts (rationale for management)**

No known impacts; insufficient information to judge likelihood or degree of impact Degree of risk or actual entanglement of bird species features unknown

## **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Develop & introduce management measures, including zonation plans where appropriate, to secure the EMS features at favourable conservation status

Ensure that species subject to existing commercial fisheries are exploited only when population levels are at or greater than those required to achieve maximum sustainable yield

Rigorously implement existing management measures

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas

Potting: lobster / crab ?









#### **Current status**

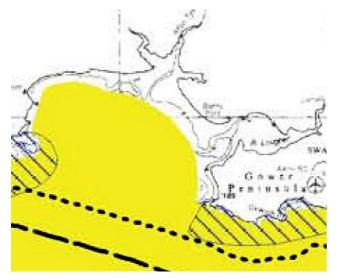
Mainly confined to SW Gower coast and deep rocky areas in Bay. Nil quantified information. South Gower "more or less constant effort"

Vessels mainly from Swansea / Gower (south Gower) and Saundersfoot / Tenby (western – central Bay) Saundersfoot c 10 – 12 vessels plus several part-time in summer; Tenby c 3 fulltime and c 6 part-time <10 m vessels.

Most vessels fish multiple gear types including pots (crustacean and whelk).

## **Key information sources**

SWSFC SFOs; PCNPA; NT; CCW 2010; anecdotal; (Woolmer 2008)



CCW 2010: lobster / crab potting shown as black diagonal shading

L

# **Current management**

SWSFC byelaws:

- 3 7. Crustacean minimum and maximum size limits, landing V-notched lobsters
- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.
- 44. Marking of fishing gear and keep pots
- 46. Parts of crustacean shellfish prohibits removing parts of crustacean shellfish

Welsh Statutory Instrument 2002 No. 676 (W.73) The Lobsters and Crawfish (Prohibition of Fishing and Landing) (Wales) Order 2002. Prohibits fishing for or landing mutilated or Vnotched lobsters.

Welsh Statutory Instrument 2002 No. 1897 (W.198) The Undersized Spider Crabs (Wales) Order 2002. Prescribes minimum size for landing spider crabs.

**Pressures** M ✓

L

Impact and abrasion damage to fragile / brittle species on rocky reef. Reefs surrounded by areas of soft sediment particularly threatened as reduced recolonisation from nearby rocky areas difficult. Very limited effect on in sediment habitats.

Entanglement of certain vertebrate species (seals, turtles) with marker buoy ropes.

Incidental capture of otters.

'Ghost fishing' by lost gear.

# Features at potential risk

## **Known or likely threats & impacts (rationale for management)**

No known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Rigorously implement existing management measures

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas

Potting: prawn ? ® (i)







L

**Current status** Reportedly hobby / casual recreational interest only

# **Key information sources**

SWSFC, CCW 2010 (not shown in this site)

## **Current management**

SWSFC byelaws:

- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.
- 44. Marking of fishing gear and keep pots

**Pressures** L

Entanglement of certain vertebrate species (seals, turtles) with marker buoy ropes.

Incidental capture of otters.

'Ghost fishing' by lost gear.

# Features at potential risk

Shads & lampreys Subtidal sandbank BI SPA waders

## **Known or likely threats & impacts (rationale for management)**

Possible potential for otter entrapment

No known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

Possibly F2 (no known mechanism for activity to affect the feature(s), no known causal relationship, no evidence that it is having a significant adverse effect), otherwise

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Develop & introduce management measures, including zonation plans where appropriate, to secure the EMS features at favourable conservation status

Rigorously implement existing management measures

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas













# **Current status**

A whelk fishery developed in Carmarthen Bay and offshore during the early – mid 1990s, probably driven by a rapid development in Far Eastern market for whelk in the mid 1990s. Effort substantial and widely distributed, but little information on actual distribution. Effort has shifted and continues to shift further offshore into deeper water and westwards.

No site specific catch statistics for Carmarthen Bay except for Nov 1996 - April 1997 reported as >900T (Ellis 1998 <sup>28</sup>).

Reportedly 10 (Saundersfoot based) vessels fishing in 2007; 2 – 4 fishing within Bay 2008; additional vessels fishing at entrance to Bay / Caldey area; numbers considerably reduced from 1996 (Saundersfoot 18, Tenby 3-5, Burry Port 2-4, Swansea c 6; Ellis 1998). Smaller vessels land 1-1.5 tonnes / fishing day; larger vessels 2 – 3 tonnes / day. Larger vessels reportedly set 1 - 2000 pots, smaller vessels set up to 300 - 1000 pots per boat on inshore grounds.

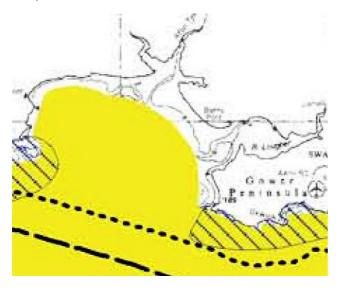
Landing data for SWSFC district indicates substantial fluctuations since commencement of records in mid 1990s, but an overall downward trend; however, catches from outwith the SWSFC District may be unreported . under-reported.

Size of maturity determined as approx 75 mm shell height for males and 75-78 mm for females. "Substantial" quantities of fish (preferentially dogfish) and (brown) crabs are used as bait (Ellis 1998); the sustainability of bait supplies are unknown. Shortage of crab bait creates the risk of using locally taken undersized edible crab (SWSFC Directors Report June 2009).

Perception that widely distributed whelk gear discourages or reduces use of towed gears.

# **Key information sources**

SWSFC; SFOs; MFA/WAG FOs; CCW 2010; Elllis 1998, Walmsley & Pawson 2007; (Woolmer 2008)



CCW 2010: whelk potting shown as solid yellow shading

L

## **Current management**

<sup>&</sup>lt;sup>28</sup> Ellis, JR 1998. An assessment of two commercial fisheries operating at Milford Haven and Carmarthen Bay subsequent to the Sea Empress oil spill: final report. SEEEC report M13.

L

## SWSFC byelaws:

- 11. Whelk minimum size. (The minimum landing size of 55mm is well below size of maturity, *ie* size at first spawning).
- 24. Temporary closure of shellfish fisheries (Annual closed season during period of peak spawning 1 January 14th February 2008 (byelaw 24)
- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.
- 44. Marking of fishing gear and keep pots

Pressures L ✓

Ecosystem effects of depletion of target species, a relatively low mobility scavenger with a potentially slow recovery rate <sup>29</sup>

Entanglement of certain vertebrate species (seals, turtles) with marker buoy ropes. A "conspicuous clustering of (leatherback turtle) strandings and bycatch" was identified in Carmarthen Bay coinciding with a peak in whelk potting in the 1990s <sup>30</sup>.

## Features at potential risk

Inlets & bays
bays
Mud & Mud & sand flats
Salt
meadow
Salicornia
Subtidal
Sandbank
Shads & lampreys
Otters
CCB SPA
waders
BI SPA
wildfowl

## **Known or likely threats & impacts (rationale for management)**

Direct benthic impacts inferred to be mimimal. Removal of substantial quantity of scavenger species assumed to have measurable, potentially significant, ecological effects. Occasional but significant entanglement of turtles, and potentially other mega-faunal species, in pot buoy ropes.

#### **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

#### Management action(s) required

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers Ensure that all developments, permissions etc are subject to appropriate and legally compliant HRA

Statutory consultees respond fully to consultations on permission applications, focusing on the

<sup>29</sup> Fahy, E., E. Masterson, D. Swords and N. Forrest (2000) *A second assessment of the whelk (Buccinum undatum) fishery in the southwest Irish Sea, with particular reference to its history of management by size limit.* Irish Fisheries Investigations No 6: 67 pp.

\_

<sup>&</sup>lt;sup>30</sup> Pierpoint, C. 2000. Bycatch of marine turtles in UK and Irish waters. JNCC Report No 310

site's conservation objectives

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management; specifically: require spatial and temporal reporting of effort and catch as conditions of permissions

Secure research to determine likely spatial extent and magnitude of effects of activity on EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Develop & introduce management measures, including zonation and / or rotation plans where appropriate, to secure the EMS features at favourable conservation status

Ensure stocks are at or greater than the abundance required to achieve maximum sustainable yield

Rigorously implement existing management measures

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas.

Require sinking or counterweighted buoy lines, particularly during summer months (to September)





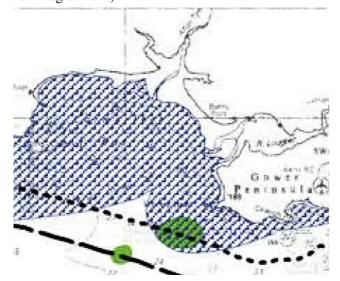
**Current status** 

Historically small scale; relatively recent increases; substantial but unquantified. Mainly NE quadrant of Bay / off estuary entrances; mainly seasonal (targeting bass). Also deployed for ray species by the <10 m fleet with up to 400 hooks per line for ray.

About six, <10m Saundersfoot based vessels reported to focus on bass using multiple long lines of 20-25 hooks.

# **Key information sources**

SWSFC SFOs; Walmsley & Pawson 2007; WAG FOs; CCW 2010; (Woolmer 2008) (note: sources not in agreement)



**CCW 2010:** Long-lining shown in solid green shading

# **Current management**

SWSFC byelaws:

- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.
- 42. Set or night lines. Limits length of lines set on the shore above MLWS
- 44. Marking of fishing gear and keep pots

Statutory Instrument 1990 No.1156. The Bass (Specified Areas) (Prohibition of Fishing) Order 1990 (prohibits fishing for bass by boat in the Taf, Tywi and Gwendraeth Estuaries and Burry Inlet between 30 April and 1 November)

**Pressures** M ✓

No specific pressures identified further to ecosystem effects of target species depletion

## Features at potential risk

L ✓

Inlets & bays	Estuaries	Mud & sand flats	Salt	Salicornia	Subtidal sandbank Shads & lampreys	Otters	Scoter (CB SPA)	BI SPA waders	BI SPA wildfowl
./	./	./			./ ./	./			

# **Known or likely threats & impacts (rationale for management)**

No known impacts; insufficient information to judge likelihood or degree of impact

# **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers Maintain surveillance of interaction between operations and designated features for adverse impacts Operator education: raise awareness of EMS and features; encourage best operating practices and avoidance of sensitive areas Line: rod & line / handline ✓?







Confidence

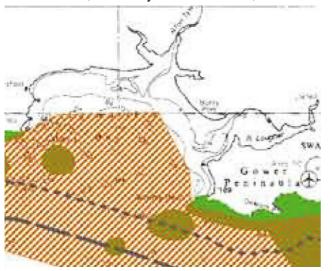
## **Current status**

Rod and line / hand-lines are used primarily to target bass, but also grey mullet and pollack; the bass rod and line fishery expanded from the late-1980s.

Up to 25 vessels of 6-10m vessels based Burry Port marina and up to 50 smaller, trailer-launched boats target Burry Inlet / Three Rivers entrance / offshore; vessels / boats based / launched from Saundersfoot, Tenby. Focus on Drift Rock, Offing Patches and Caldey area.

# **Key information sources**

SWSFC SFOs; Walmsley & Pawson 2007; WAG Fisheries Officers; Anecdotal



## **CCW 2010:**

Commercial rod & line fishing shown in diagonal red shading.

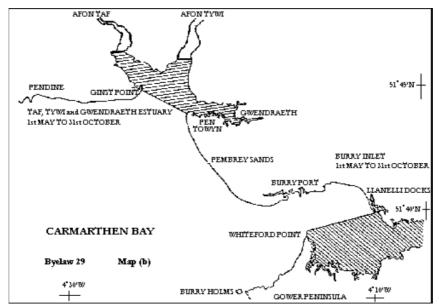
Hand-lining shown in solid green shading

## **Current management**

SWSFC byelaws:

- 8 10. Bass, mullet, skate and ray minimum sizes.
  - 29. Bass nursery area-restrictions on fishing. Fishing for bass from a boat or with sandeels as bait is prohibited during May to October inclusive in areas shown in map below.

L



41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified.

Bass (Specified Areas) (Prohibition of Fishing) Order1990. Prohibits fishing for bass by any boat Taf, Tywi and Gwendraeth Estuary Burry Inlet Between 30 April and 1 November

Pressures M ✓

By-catch shad species

Increased demand for sandeels as bait and pressure on local sandeel stocks

## Features at potential risk

# **Known or likely threats & impacts (rationale for management)**

No known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

#### Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers Rigorously implement existing management measures

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features; encourage best operating practices and avoidance of sensitive areas

Electro-fishing: molluscs (P) ? (R) (L) (1)









Confidence

## **Current status**

Interest exists.

Field developmental investigation 2007-08

## **Key information sources**

SWSFC, SWWFC

## **Current management**

SWSFC byelaws:

- 40. Bivalve molluscan shellfish methods of fishing
- 41. Boat fishing (catch returns) permit. Requires submission of statistical return "accurately" showing the weight of each species taken daily, the types and quantities of fishing gear employed, the area fished and details as specified

EC Regulation (EC) No 850/98 (conservation of fishery resources through technical measures for the protection of juveniles of marine organisms); Article 31. Prohibits catching marine organisms using specified methods including use of electric currents (subject to exemptions)

**Pressures** M ✓

Direct and indirect sublethal and behavioural effects on fish and benthic organisms. Highly variable according to electric current, species, morphology, behaviour and sensory systems; eg reported effects range from spinal damage of round fish to disturbance of electrically sensitive fish such as skates and rays

Behavioural modification of crustaceans, crustacean limb autotomy; increased vulnerability to predations 31

Chemical composition of gaseous discharges at electrodes

Ecosystem effects of depletion of target species; community change to alternative stable state <sup>32</sup>

#### Features at potential risk

Polet, H, Delanghe, F & Verschoore, R. 2005. On electrical fishing for brown shrimp (Crangon crangon) I. Laboratory experiments. Fisheries Research 72 (2005) 1–12; Polet, H, Delanghe, F & Verschoore, R. 2005. On electrical fishing for brown shrimp (Crangon crangon) II. Sea trials Fisheries. Fisheries Research 72 (2005) 13–27; Phillips, BF & Scolaro, AR. 1980. An electrofishing apparatus for sampling sublittoral benthic marine habitats. J. exp. mar. Biol. Ecol. 47 69-75

Fahy, E & Carroll, J. 2007. Consequences of hydraulic dredging for a razor clam Ensis siliqua (1.) bed in the northwest Irish Sea. Biology and Environment: Proceedings of the Royal Irish Academy, 107B(3), 115-128

I.

Inlets & bays	Estuaries	Mud & sand flats	Salt meadow	Salicornia	Subtidal sandbank	Shads & lampreys	Otters	Scoter (CB SPA)	BI SPA waders	BI SPA wildfowl
./	./	./			./	./		./		

# **Known or likely threats & impacts (rationale for management)**

Actual ecological and ecosystem effects little understood or assessed. Limited information available not derived from robust science but suggests effects of low currents employed in razor clam fishing <u>may</u> be slight and limited in scale; however, further, scientifically rigorous information required

## **Generic management option(s)**

F1 (activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

# Management action(s) required

Maintain surveillance for commencement of activity

If activity commences, monitor and report spatial and temporal intensity of activity and maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers Ensure that all developments, permissions etc are subject to appropriate and legally compliant HRA

Statutory consultees respond fully to consultations on permission applications, focusing on the site's conservation objectives

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management; specifically: require spatial and temporal reporting of effort and catch as conditions of permissions

Further assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention if activity commences and identify new measures as appropriate.

If activity commences:

- develop & introduce management measures, including zonation plans where appropriate, to secure the EMS features at favourable conservation status
- rigorously implement new and existing management measures
- monitor operations for compliance with permission conditions and / or mitigation measures as appropriate
- maintain surveillance of interaction between operations and designated features for adverse impacts
- raise awareness with operators of EMS and features at risk, threats from activities; encourage best operating practices and avoidance of sensitive areas

Ensure best possible awareness of EMS, features at risk and threats from activities

The fishing activities listed in the table below are not known, with moderate to high confidence, to occur within or in the vicinity of the site. However, since:

- causal relationships by which these activities could potentially create threats to or pressures on one or more components of EMS features are known;
- the potential exists for their development or proposed development;
- there are suitably equipped vessels with home ports in the area and that work within a few hours transit time;

they are included in this assessment, and the need to maintain an **active alert** for their development or proposed development is identified.

Activity / operation	Features at potential risk												
	Inlets & bays	Estuaries	Mud & sand flats	Salt meadow	Salicornia	Subtidal sandbanks	Shads & lampreys	Otters	Scoter (CB SPA)	BI SPA waders	BI SPA wildfowl		
Trawling: beam.	✓	✓	✓			✓	✓	✓	✓				
? • 🚇 🛈													
F1 (activity constitutes a plan or project, apply Habitats Regulations 59-83);													
F5a (known mechanism for activity to have effect, but evidence shows no significant adverse effect at present as a result of current management) Management measures prevent large beam trawlers entering SWSFC District; byelaws 38 (vessel size) and 39. Beam trawl restriction (prevents use of any beam trawl with beam length of beam over 4 metres; limits vessels to single beam unless aggregate effective beam length not over 4 metres); If beam trawling were to be carried out within the site it would be classified as F7													
Dredging: toothed (scallop).	✓	✓	✓			✓			✓				
<b>③ ①</b>													
F1 (activity constitutes a plan or project, apply Habitats Regulations 59-83);													
F2 (no known mechanism for activity to affect the feature(s), no known causal relationship, no evidence that it is having a significant adverse effect) No known great scallop ( <i>Pecten</i> ) populations within site, though records of shells from east Caldey <sup>33</sup> ) therefore minimal risk of toothed dredges being employed, <i>though use of</i>													

 $<sup>^{\</sup>rm 33}\,$  NBN records © Conchological Society, 1997

Page | 50

Activity / operation	Features at potential risk										
	Inlets & bays	Estuaries	Mud & sand flats	Salt meadow	Salicornia	Subtidal sandbanks	Shads & lampreys	Otters	Scoter (CB SPA)	BI SPA waders	BI SPA wildfowl
other dredge gears for queens is possible); F5a (known mechanism for activity to have effect, but evidence shows no significant adverse effect at present as a result of current management: management measures prevent large scallop dredgers entering SWSFC District; SI 2010 No. 203 (W.30) The Scallop Fishing (Wales) Order 2010 prohibits all dredging for <i>Pecten</i> within the EMS, however it is subject to review If toothed or other scallop dredging (live queen scallops ( <i>Aquipecten</i> ) recorded in east and west of bay in 1978 and 1998 34) were to be carried out within the site it would be classified as F7.											
Dredging: cockle mechanical	✓	✓	✓							✓	✓
Not a "fishing instrument of an approved pattern" under SWSFC byelaw 40  Potential exists. Experimental trials undertaken in the early 1990s demonstrated adverse effects on SPA bird species <sup>35</sup> and benthic infauna <sup>36</sup> . Trials also showed undesirable effects with respect to management of a locally high employment fishery. F1 (activity constitutes a plan or project, apply Habitats Regulations 59-83)  F5a (known mechanism for activity to have effect, but evidence shows no significant adverse effect at present as a result of current management - management measures prevent use of mechanical cockle dredges in SWSFC District); if cockle dredging were to be carried out within the site it would be classified as F4 / F7 depending on location											
Dredging: shallow hydraulic (eg suction)	✓	✓	✓			✓			✓		

<sup>34</sup> NBN records © Conchological Society, 1978, Rhossili; © CEFAS, 1998, 8 km WNW of Tenby

<sup>&</sup>lt;sup>35</sup> Ferns, PN. 1995. The effects of mechanised cockle harvesting on bird feeding in the Burry Inlet. Burry Inlet & Lougher Estuary Symposium report Vol 1, pp 3-10. ISBN 0907599133

Rostron, DM. 1995. The effects of mechanised cockle harvesting on the invetebrate fauna of the Llanrhidian Sands. Burry Inlet & Lougher Estuary Symposium report Vol 2, pp 111-117. ISBN 0907599141

Activity / operation	Features at potential risk										
	Inlets & bays	Estuaries	Mud & sand flats	Salt meadow	Salicornia	Subtidal sandbanks	Shads & lampreys	Otters	Scoter (CB SPA)	BI SPA waders	BI SPA wildfowl
F1 (activity constitutes a plan or project, apply Habitats Regulations 59-83) F5a (known mechanism for activity to have effect, but evidence shows no significant adverse effect at present as a result of current management - management measures prevent use of (cockle) suction dredges in SWSFC District); if suction dredging were to be carried out within the site it would be classified as F4											
Dredging: bladed – oyster	✓	✓	✓			✓			✓		
F1 (activity constitutes a plan or project, apply Habitats Regulations 59-83) F2 (no known current oyster populations within site (though recent historical records from Helwick Bank and older historical records from Tenby area <sup>37)</sup> , therefore minimal risk of technique being employed); if cockle dredging were to be carried out within the site it would be classified as F4 / F7 depending on location  Oyster dredging reported in Woolmer 2008 to occur in a limited number of areas where the native oyster occurs. These are mainly Swansea Bay and Milford Haven but some effort has traditionally occurred south of the Helwick Bank off the Gower coast.											

Harrison, W. 1955 Tenby Harbour. Tenby Sailing Club Guide of 1955 accessed at <a href="www.tenbysailingclub.org.uk">www.tenbysailingclub.org.uk</a>

Netting: demersal seine	✓	✓	✓		✓	✓	✓	✓	
<b>③ ①</b>									
F2 (no known use of technique within site); if demersal seine were to be carried out within the site it would be classified as F4									

#### 5.1.2 HAND GATHERING / BEACH NETTING: COMMERCIAL & FOR PERSONAL CONSUMPTION

#### **Current status**

Major commercial fisheries. Casual private collection.

#### **Burry Inlet**

There has been a cockle fishery in the Burry Inlet for well over a century. It has been managed by the SWSFC since 1965 under a Regulating Order (Sea Fisheries (Shellfish) Act 1967), which allows for the issue of a restricted number of licences. Only collection by hand raking has been allowed throughout the history of the fishery. Originally access was restricted to traditional horse and cart or donkey, but motorised vehicles had been introduced by 1987. Effort is controlled though the issue of cockle licences and daily quota. The fishery is Marine Stewardship Council (MSC) accredited for management which supports a sustainable fishery in both fishery and ecological terms.

Atypically heavy annual cockle mortalities began in 2002; the population size dramatically fell in 2004 and the populations have since collapsed significantly with mass mortalities following spawning each year, leaving increasingly few cockles older than one year alive. See also Mass invertebrate mortalities below.

Although catches have varied widely since reliable recording began in 1960 38, catches since 2004 have declined very significantly. A review of the industry in 1973 concluded that stocks would be unlikely to sustain the then current level of exploitation – a level actually

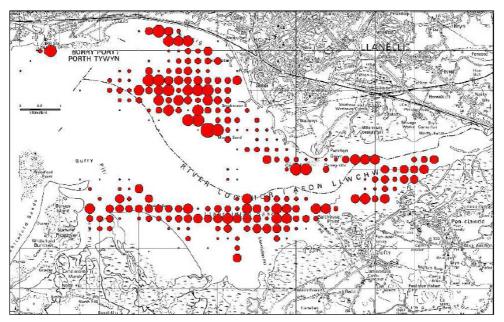
## Three Rivers Estuary

The Three Rivers cockle fishery has traditionally been of secondary importance to the Burry Inlet and the beds considered more unstable and temporary, and cockle stocks therefore naturally more variable; the beds in the Taf and Gwendraeth estuaries being more persistent than those in the Twfi. However, significant catches have been taken in some recent years; on several occasions considerably greater than those from the Burry Inlet.

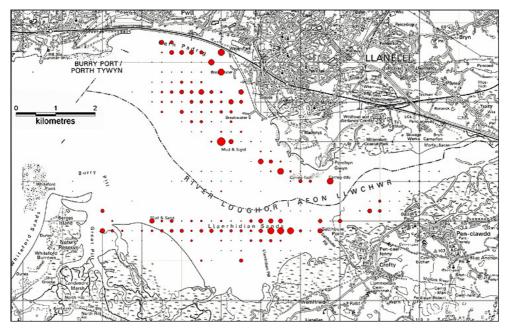
Following an unprecedented cockle settlement in 2004, up to 2,000 cockle gatherers fished the Three Rivers Estuary in August 2005 with 8200 tonnes of cockles removed under SWSFC permit.

Cockle stocks began to suffer annual mass mortalities in 2005 though the mortalities have been irregularly distributed within the estuary system.

<sup>&</sup>lt;sup>38</sup> Franklin, A. 1972. *The cockle and its fisheries*. MAFF Laboratory Leaflet (New Ser) 26

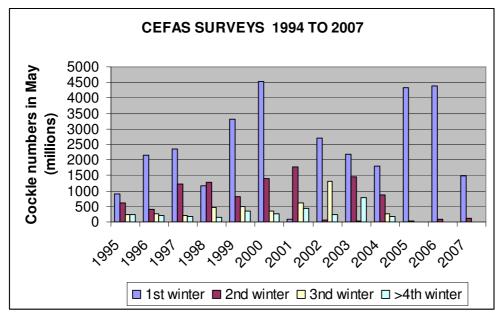


Distribution and density of cockles (>2mm) in the Burry Inlet; maximum density (largest dot) 2501 cockles/0.1m<sup>2</sup>

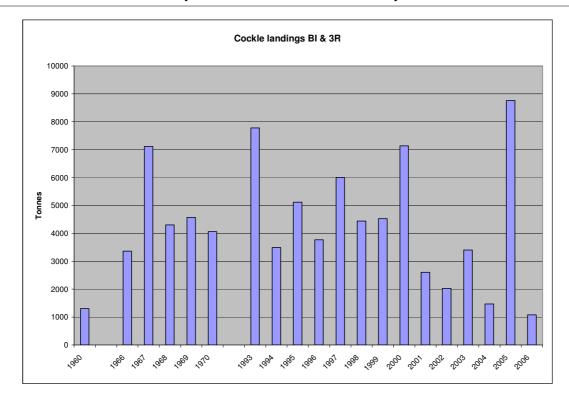


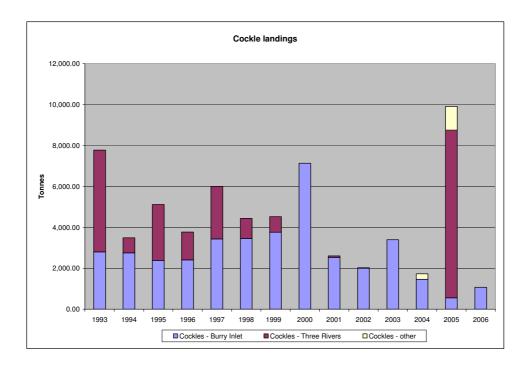
Distribution of September 2007 cockle densities in the Burry Inlet, with a square root transformation. Maximum density (the largest dot) was 834 cockles/0.1m<sup>2</sup>.

From Moore 2009 (draft) OS map used as background.© Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 (2006)



Note: CEFAS surveys do not cover the full area of likely cockle settlement





## **Key information sources**

SWSFC; CCW effort distribution maps and survey reports

## **Current management**

SWSFC byelaws:

13. Shellfish - minimum sizes

Burry Inlet byelaws

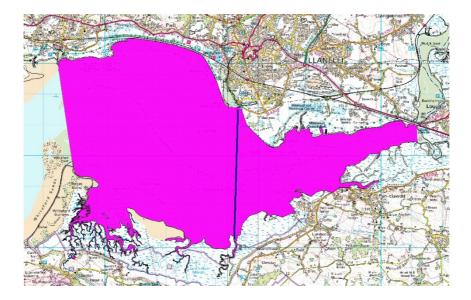
- 15. Vehicle usage in the burry inlet cockle fishery
- 16. No Sunday gathering
- 17. The licensing of cockle gathering in the burry inlet
- 18. Daily cockle quota (Burry Inlet)
- 19. Personal cockle gathering Burry Inlet
- 20. Protection of shellfish beds Burry Inlet
- 21. Prohibition of night gathering of cockles
- 23. Shellfish re-deposit of
- 24. Temporary closure of shellfish fisheries
- 40. Bivalve molluscan shellfish methods of fishing
- 47. Permit to take cockles within the Three Rivers estuary

Low levels of gathering for personal use do not require a license

## **Burry Inlet Regulating Order**

The Burry Inlet fishery has been managed by the SWSFC since 1965 under a Regulating Order (Sea Fisheries (Shellfish) Act 1967). The Order allows the SWSFC Committee to restrict access by means of a chargeable licence and to recover, in full, the costs of management.

Management of the BICRO transferred from SWSFC to the Environment Agency Wales on 1 April 2010



Management of the fishery is though the issue of cockle licences (currently c50), permit conditions, daily quota (300 kg - 600 kg (0.3 - 0.6 tonnes) per person per day) and byelaws 15 – 20 and 40 (above) . Gathering without a licence for personal consumption is permitted east of the line between Llanelli Dock entrance and Llanrhidian Pill, subject to byelaws.

Only collection by hand raking is allowed. Gathering takes place all week except on Sundays. Minimum cockle sizes (17.5mm or 19mm square gauge) are determined via hand riddle size to allow the survival of sufficient spawning stock.

The SWSFC operate a system whereby licences are withdrawn or suspended following two convictions or permit contraventions.

Scientific assessment of the cockle biomass takes place at least once per year by scientists from SWSFC and/or CEFAS (Centre for Environment, Fisheries and Aquaculture Science). From these surveys the level of fishable stock is set at around 33 % of the total fishable biomass. The number of cockle licences (full time or temporary) and daily cockle quota is then broadly set to give rise to the desired fishing effort.

The SWSFC consider that taking a third of the biomass of adult standing stock each year has proved successful as a stock conservation measure and apportions the resource 33 % to fishermen, 33 % for bird prey, and the remaining 33 % to act as brood stock. As cockle stocks are dynamic, with numbers and biomass continually changing, *eg* through growth (especially in the summer) and losses (storms, excessive heat), selection of the most appropriate time to assess the resource is problematic. However, as a best middle ground, estimates of biomass are made in the late spring before fishing starts.

## Three Rivers

Management is via the minimum size, gathering by hand only, no night fishing and seasonal opening and closure of specified beds. A permit scheme introduced in 1998 requires catch returns to be submitted but permits are available to all applicants upon request, free of charge.

Other current Three River permit conditions include:

- limiting fishing for cockle to areas specifically opened to fishing; areas may be closed at any time
- minimum size of 19 millimetres (Byelaw 13c)
- gathering by rake and fixed mesh sieve only with illegal instruments subject to seizure
- prohibition of any instrument used to fluidise the sand in a gathering operation
- vehicles only permitted on the intertidal sands or adjacent land with landowner's permission

## • adherence to all other SWSFC byelaws

In recognition of the management value of the Burry Inlet Regulating Order, the SWSFC submitted an application to the Welsh Assembly Government for a similar Order for the Three Rivers in December 1999, though the application fell into abeyance. The recent mass mortalities, pressures on stocks and need for reactive fisheries openings and closures has reemphasised the need to a Regulating Order and the application has been revived

Sea Fisheries (Shellfish) Act 1967 (regulating orders)
Wildlife & Countryside Act 1981 (as amended), Section 28, SSSI consenting regime

Pressures M 

Reduction of prey resources of wading bird (SPA feature) species resulting in displacement from preferred/optimal feeding grounds and/or reduced foraging time/opportunities and/or insufficient prey resources <sup>39.</sup>

Disturbance of feeding and/or roosting wading bird (SPA feature) species resulting in displacement from preferred/optimal feeding grounds and/or reduced foraging time/opportunities and/or increased energy expenditure. Displacement potentially results in feeding in undisturbed areas at higher (bird) density, with increased competition and lower efficiency

Habitat modification / degradation: physical habitat impacts from trampling, acceleration of erosion or promotion of selective erosion of finer sediment sizes; smothering caused by siltation / deposit of materials; increased turbidity; alteration of substrate structure

Direct / indirect losses / modification to species populations

Reduction in biomass of target species; potential population effects from sustained exploitation (eg "juvenescence") 40

Habitat damage, eg to eelgrass beds

Damage to undersize target species and non-target species, or increased exposure to predation, desiccation or freezing <sup>41</sup>

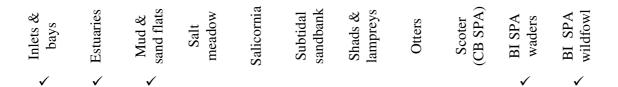
# Features at potential risk

. .

<sup>&</sup>lt;sup>39</sup> Stillman, RA. 2009. *Predicting the effect of shellfish stocks on the oystercatcher and knot populations of the Burry Inlet and Three Rivers*. Bournemouth University for the Countryside Council for Wales. CCW Marine Monitoring Report No. 65. 45pp

<sup>&</sup>lt;sup>40</sup> eg Darimonta, CT, Carlson, SM, Kinnison, MT, Paquet, PC, Reimchen, TE & Wilmers CC. 2009. *Human predators outpace other agents of trait change in the wild.* PNAS <u>106(3)</u>: 952–954; Kenchington. E. 2001. *The effects of fishing on species and genetic diversity.* Report of the Reykjavik conference on responsible fisheries in the marine ecosystem. Reykjavik, Iceland, FAO Fisheries Report No. 658; Law, R. 2000. *Fishing, selection, and phenotypic evolution.* ICES Journal of Marine Science, 57: 659–668.

Kaiser, MJ, G. Broad, G & Hall, SJ. 2001. *Disturbance of intertidal soft-sediment benthic communities by cockle hand raking.* Journal of Sea Research 45(2); 119-130



## **Known or likely threats & impacts (rationale for management)**

M 🗸

Depletion of bird prey resources. Prior to 2004 cockle resources are assessed to have typically provided enough food to support cockle-eating bird populations, notwithstanding additional available food resources, such as mussels. From 2004 Burry Inlet cockle stocks have declined to levels insufficient to support the oystercatcher population at SPA threshold size. The combined Burry Inlet and Three Rivers oystercatcher population could not be supported by the cockle resources in both sites by 2007. The combined cockle and mussel food resource in Burry Inlet were below or very close to the minimum ecological requirements of the oystercatcher population from 2005 <sup>42</sup>. Stillman (2009) concluded that "The Burry Inlet can no longer support the population size of oystercatcher for which it was designated."

Disturbance of bird species; Stewart 2001; Banks et al 2007 <sup>43</sup> and anecdotal reports. Unknown significance. Although quasi-resident birds likely become habituated to a degree, larger numbers of gatherers or fast moving vehicles etc likely to cause non-trivial disturbance ("human presence was generally tolerated to 200m, or even closer on occasions, particularly in areas that are regularly visited by cockle gatherers, bait diggers or fishermen. These activities are of a static nature and appear to cause only minimal disturbance. However, it is considered that a high number of workers occasionally excluded birds from potentially good feeding areas" Stewart 2001)

Ecological effects of target population depletion are plausible but unknown

Any contribution of fishing activity to modification or change of habitat structure and function unknown

Conservation issues include limitations of management capability and difficulties of enforcement; see Section 7.

See also target species mass mortalities and foreshore vehicle use for access

## **Generic management option(s)**

F1 (activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect): impacts on habitats, target & non-target species; bird disturbance

F7 (evidence to suggest that an activity is having a significant adverse effect and the mechanism is known): impact on bird prey resources

#### Management action(s) required

Maintain monitoring and reporting spatial and temporal intensity of activity Maintain activity trends under review

\_

<sup>42</sup> Stillman, RA, 2009, ibid

<sup>&</sup>lt;sup>43</sup> Stewart B (2001) Relationship between mussel and oystercatcher populations in the Burry Inlet. Part 1B, Section 2, Rep. No. FC 73-02-188 A. Countryside Council for Wales; Banks et al 2007. Monitoring Bird Distribution and Behaviour on the Carmarthen Bay & Estuaries SAC at Low Tide. CCW Contract Science Report No: 790

Maintain stock population monitoring

Ensure that all developments, permissions etc are subject to appropriate and legally compliant HRA

Statutory consultees respond fully to consultations on permission applications, focussing on the site's conservation objectives

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management; specifically: require spatial and temporal reporting of effort and catch as conditions of permissions

Maintain assessment of pressures from activity on designated EMS features under review

Maintain research to determine likely spatial extent and magnitude of effects of activity on EMS features

Maintain management of Burry Inlet cockle Regulating Order

Integrate management of Burry Inlet cockle Regulating Order with management of cockle fishing in adjacent areas, particularly the Three Rivers estuary complex

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Develop & introduce management measures, including zonation plans where appropriate, to:

- secure the EMS features at favourable conservation status;
- ensure, proactive, management measures to prevent difficult to control exploitation are consistently applied in a timely manner;
- secure introduction of Regulating Order for the Three Rivers estuary complex;
- limit effort and catch such that the environmental carrying capacity of the estuaries and bay are not exceeded.

Develop & introduce measures to manage <u>access</u> to fisheries to secure the EMS features at favourable conservation status

Rigorously implement existing management measures

Ensure that stocks are exploited only when population levels are at or greater than those required to achieve maximum sustainable yield and to meet prey requirements of designated SPA features (including appropriate safety factor);

Monitor operations for compliance with permission / licence conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS, features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas

(Malham et el 2008): Development of appropriate management options such as establishing trigger points for interventions and experimental un-fished areas

(Banks et al 2007): Time zoning (greater numbers of birds feed earlier in the tidal cycle - potential for temporal avoidance by shellfishers of feeding areas at times when bird densities are highest, thus reducing conflicts between birds and people)

(Stillman 2009): Review and revise the 'allocation by thirds' management policy The proportion of shellfish stock allocated to fishing should depend on the size of the shellfish stock, but reserve enough stock for at least two times the birds physiological requirements, in addition to the stock reserved for subsequent years. The conservation objectives and management of BI & 3R should not be considered in isolation.

Hand gathering: mussels (excluding access issues)









Η

## **Current status**

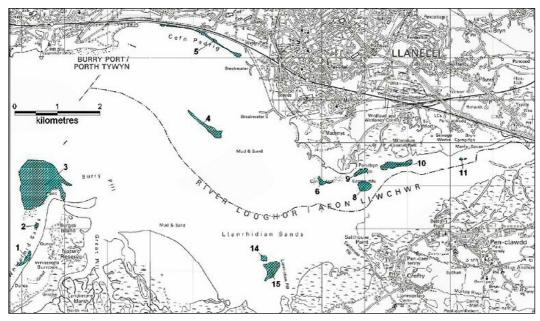
Major commercial fisheries. Casual private collection.

Fishing effort reflects current distribution of mussels above minimum legal limit. Interannual winter catch varies considerably (eg Burry Inlet North 2004 – 2006:, 30 – 45 tonnes per annum; 2007: 118 tonnes. Salmon Point Scar, Three Rivers: 2004: 10 tonnes; 2005: 40 tonnes, 2006 64 tonnes; 2007: zero (Stillman, 2009))

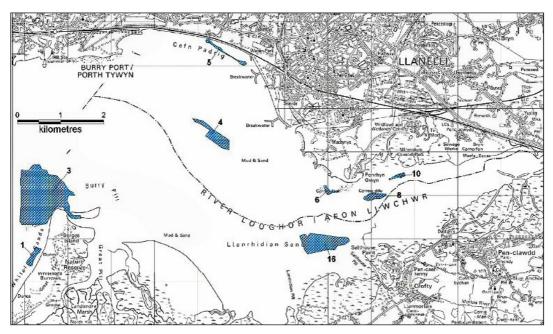
Several Order applications under consideration (2008)

## **Key information sources**

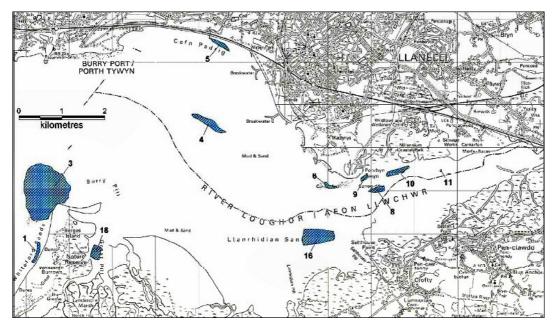
SWSFC; CCW effort distribution maps; PCNPA



Locations and extents of surveyed mussel beds in the Burry Inlet, September 2004



Locations and extents of surveyed mussel beds in the Burry Inlet, September 2006



Locations and extents of surveyed mussel beds in the Burry Inlet, September 2008 From Moore 2008 (draft) Fig 13 OS map used as background.© Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 (2006)

## **Current management**

## SWSFC byelaws:

- 13. Shellfish minimum sizes (51mm, reduced to 45mm from 28 November 2008).
- 20. Protection of shellfish beds burry inlet
- 23. Shellfish re-deposit of
- 24. Temporary closure of shellfish fisheries
- 40. Bivalve molluscan shellfish methods of fishing

M

Wildlife & Countryside Act 1981 (as amended), section 28 SSSI; consenting regime Sea Fisheries (Shellfish) Act 1967 (Several order) (applications ongoing)
South Wales Sea Fisheries Committee / Countryside Council for Wales Code of Conduct for Mussel gathering generally at Whiteford Point (more guidance than a robust C of C)

Pressures M ✓

Disturbance of feeding and/or roosting wading bird (SPA feature) species resulting in displacement from preferred/optimal feeding grounds and/or reduced foraging time/opportunities and/or increased energy expenditure. Displacement potentially results in feeding in undisturbed areas at higher (bird) density, with increased competition and lower efficiency.

Reduction of, or increased competition for prey resources of wading bird (SPA feature) species resulting in displacement from preferred/optimal feeding grounds and/or reduced foraging time/opportunities and/or insufficient prey resources <sup>44.</sup>

Depletion in biomass of target species / reduction in structural integrity of mussel beds. Acceleration of erosion or promotion of selective erosion of finer sediment sizes.

# Features at potential risk

## **Known or likely threats & impacts (rationale for management)**

Depletion of bird prey resources. Prior to 2004 cockle resources are assessed to have typically provided enough food to support cockle-eating bird populations, notwithstanding additional available food resources, such as mussels. By 2004 Burry Inlet cockle stocks declined to levels insufficient to support the oystercatcher population at SPA threshold size and the combined cockle and mussel food resource in Burry Inlet was below or very close to the minimum ecological requirements of the oystercatcher population from 2005 <sup>45</sup>. Stillman (2009) concluded that "The Burry Inlet can no longer support the population size of oystercatcher for which it was designated."

Disturbance of bird species; Stewart 2001; Banks et al 2007 <sup>46</sup> and anecdotal reports, unknown significance. Although quasi-resident birds likely become habituated to a degree, larger numbers of gatherers or fast moving vehicles etc likely to cause non-trivial disturbance ("human presence was generally tolerated to 200m, or even closer on occasions, particularly in areas that are regularly visited by cockler gatherers, bait diggers or fishermen. These activities are of a static nature and appear to cause only minimal disturbance. However, it is considered that a high

\_

<sup>&</sup>lt;sup>44</sup> Stillman, RA. 2009. *Predicting the effect of shellfish stocks on the oystercatcher and knot populations of the Burry Inlet and Three Rivers*. Bournemouth University report for the Countryside Council for Wales. CCW Marine Monitoring Report No. 65. 45pp

<sup>45</sup> Stillman, RA. 2009. ibid

<sup>&</sup>lt;sup>46</sup> Stewart B (2001) Relationship between mussel and oystercatcher populations in the Burry Inlet. Part 1B, Section 2, Rep. No. FC 73-02-188 A. Countryside Council for Wales; Banks et al 2007. Monitoring Bird Distribution and Behaviour on the Carmarthen Bay & Estuaries SAC at Low Tide. CCW Contract Science Report No: 790

number of workers occasionally excluded birds from potentially good feeding areas" Stewart 2001)

Consequence of mussel gathering on sediment erosion / habitat modification unknown.

Ecological effects of target population depletion unknown.

Conservation issues include limitations of management capability and difficulties of enforcement; see Section 7.

See also foreshore vehicle use for access

## **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83): Several Orders

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect): impacts on habitats; bird disturbance)

F7 (evidence to suggest activity having significant adverse effect and mechanism known): impact on bird prey resources

## Management action(s) required

Maintain monitoring and reporting spatial and temporal intensity of activity

Maintain activity trends under review

Maintain stock population monitoring

Ensure that all developments, permissions etc are subject to appropriate and legally compliant HRA

Statutory consultees respond fully to consultations on permission applications, focussing on the site's conservation objectives

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management; specifically: require spatial and temporal reporting of effort and catch as conditions of permissions

Ensure that any Several Orders granted are subject to enforceable management plans with appropriate provisions for securing EMS features at favourable conservation status

Maintain assessment of pressures from activity on designated EMS features under review

Maintain research to determine likely spatial extent and magnitude of effects of activity on EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Develop & introduce mussel management policy and measures (to include mussel seed exploitation protocol), including zonation plans where appropriate, to:

- secure the EMS features at favourable conservation status;
- ensure, proactive, management measures are consistently applied in a timely manner;
- limit effort and catch such that the environmental carrying capacity of the estuaries and bay are not exceeded

Introduce (or extend existing) Regulating Order(s) to include mussels

Develop & introduce measures to manage <u>access</u> to fisheries to secure the EMS features at favourable conservation status

Rigorously implement existing management measures

Ensure that stocks are exploited only when population levels are at or greater than those required

to achieve maximum sustainable yield and to meet prey requirements of designated SPA features (including appropriate safety factor)

Monitor operations for compliance with permission / licence conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas.

Hand gathering: mussel seed (excluding access issues) !!







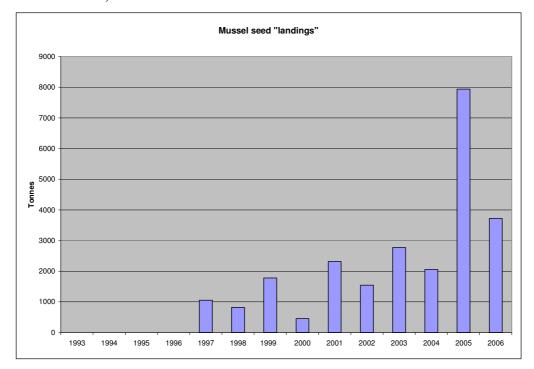


Confidence More info

## **Current status**

Major commercial fishery. Several locations. Notably Whiteford Point. Up to 75 collectors with multiple vehicles observed. Actual collection effort reportedly exceeds agreed (permitted) effort on occasion.

SWSFC catch statistics indicate considerable annual variation but trend toward substantially greater seed collection (landing statistics combine dredging and hand-gathering; no individual data for each method).



# **Key information sources**

SWSFC; CCW (DP)

## **Current management**

SWSFC byelaws:

- 13. Shellfish minimum sizes
- 20. Protection of shellfish beds Burry Inlet
- 23. Shellfish re-deposit of
- 24. Temporary closure of shellfish fisheries
- 40. Bivalve molluscan shellfish methods of fishing

Wildlife & Countryside Act 1981 (as amended) section 28 SSSI consenting regime

**Pressures** M

Potential depletion of bird prey resources (mussel seed provides food source for specialist

M

feeders, such as knot and common scoter, and oystercatcher, in intertidal and shallow subtidal areas) and generation of increased disturbance *via* interference competition among foragers.

Disturbance of feeding and/or roosting wading bird (SPA feature) species resulting in displacement from preferred/optimal feeding grounds and/or reduced foraging time/opportunities and/or increased energy expenditure. Displacement potentially results in feeding in undisturbed areas at higher (bird) density, with increased competition and lower efficiency.

Habitat destablisation.

Reduction / prevention of mussel recruitment in other areas following seed displacement by storm / wave action.

Prevention of establishment of mature, stable beds.

## Features at potential risk

# **Known or likely threats & impacts (rationale for management)**

Depletion of bird prey resources. Prior to 2004 cockle resources are assessed to have typically provided enough food to support cockle-eating bird populations, notwithstanding additional available food resources, such as mussels. By 2004 Burry Inlet cockle stocks declined to levels insufficient to support the oystercatcher population at SPA threshold size and the combined cockle and mussel food resource in Burry Inlet was below or very close to the minimum ecological requirements of the oystercatcher population from 2005 <sup>47</sup>. Fortnightly LW oystercatcher counts indicate decline in use of area (max 2500 in 2006 – 1200 in 2007). Stillman (2009) concluded that "The Burry Inlet can no longer support the population size of oystercatcher for which it was designated."

Disturbance of bird species; Stewart 2001; Banks et al 2007 <sup>48</sup> and anecdotal reports Unknown significance. Although quasi-resident birds likely become habituated to a degree, larger numbers of gatherers or moving vehicles are likely to cause non-trivial disturbance, particularly in otherwise relatively undisturbed locations ("human presence was generally tolerated to 200m, or even closer on occasions, particularly in areas that are regularly visited by cockle gatherers, bait diggers or fishermen. These activities are of a static nature and appear to cause only minimal disturbance. However, it is considered that a high number of workers occasionally excluded birds from potentially good feeding areas" Stewart 2001; based on studies in The Wash, Stillman (2005 <sup>49</sup>) assumes that hand gatherers on average exclude knot from a radius of over 70m and oystercatchers over 100m from their location, though higher ranges have been recorded at normally undisturbed locations.)

Habitat modification / damage; consequence of mussel seed gathering on sediment erosion unknown (but dependent on amount and type of mechanical assistance employed (*eg* mechanical sorting), age structure of targeted stock, degree of catch sorting).

Ecological effects of removal of large volumes of juvenile mussel (eg for recruitment to adult

\_

<sup>47</sup> Stillman, RA. 2009. ibid

<sup>&</sup>lt;sup>48</sup> Stewart B (2001) *Relationship between mussel and oystercatcher populations in the Burry Inlet. Part 1B, Section 2*, Rep. No. FC 73-02-188 A. Countryside Council for Wales; Banks et al 2007. Monitoring Bird Distribution and Behaviour on the Carmarthen Bay & Estuaries SAC at Low Tide. CCW Contract Science Report No: 79

<sup>&</sup>lt;sup>49</sup> Stillman, RA *et al* 2005. *Estuary special protection areas - establishing baseline targets for shorebirds*. Final report. In, p 157. English Nature.

May 2012

population or as decrease in an energy resource) unknown.

Conservation issues include limitations of management capability and difficulties of enforcement; see Section7.

Links with foreshore vehicle use for access

## **Generic management option(s)**

F1 (the activity constitutes a plan or project, apply Habitats Regulations 59-83)

F4 (a known mechanism for the activity to have an effect, but there is insufficient evidence at present to determine whether or not it is having a significant adverse effect): impacts on habitats

#### Management action(s) required

Maintain monitoring and reporting spatial and temporal intensity of activity

Maintain activity trends under review

Maintain stock population monitoring

Ensure that all developments, permissions etc are subject to appropriate and legally compliant

Statutory consultees respond fully to consultations on permission applications, focusing on the site's conservation objectives

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management; specifically: require spatial and temporal reporting of effort and catch as conditions of permissions

Maintain assessment of pressures from activity on designated EMS features under review Undertake research as required to determine likely / spatial and severity of effects of activity on

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Develop & introduce management measures, including zonation plans where appropriate, to:

- secure the EMS features at favourable conservation status;
- ensure, proactive, management measures to prevent difficult to control exploitation are consistently applied in a timely manner;
- limit effort and catch such that the environmental carrying capacity of the estuaries and bay are not exceeded

Develop & introduce measures to manage access to fisheries to secure the EMS features at favourable conservation status

Rigorously implement existing management measures

Ensure stocks exploited only when population levels are at or greater than those required to meet prey requirements of designated SPA features (including appropriate safety factor) and recruitment to adult stocks

Monitor operations for compliance with permission / licence conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas

Ensure integrated management of all mussel seed collection techniques

Develop and implement a mussel seed exploitation protocol

**Hand gathering: razor clam** (including salting, spearing; excluding access issues)





fidence

## **Current status**

Mainly known from Tenby/ Saundersfoot & Rhossili. Frequency and intensity unknown, though anecdotal reports suggests possibly increasing.

## **Key information sources**

SWSFC SFOs; MFA/WAG FOs; Anecdotal

## **Current management**

SWSFC byelaws:

- 23. Shellfish re-deposit of
- 24. Temporary closure of shellfish fisheries
- 40. Bivalve molluscan shellfish methods of fishing

Wildlife & Countryside Act 1981 (as amended) section 28 SSSI consenting regime

Pressures M ✓

Toxic effects of excessive or indiscriminate application of salt generating localised hypersalinity. Benthic marine organisms vulnerable to dehydration, osmotic imbalance and death. Long abdomen invertebrates and echinoderms particularly vulnerable <sup>50</sup>

Target stock depletion

Wading bird disturbance

"Such is the popularity of razorfish with the Chinese that in the UK, proprietors of Chinese restaurants have decimated many razorfish beds by over collection. This has happened especially in southwest and west Wales, and also along some of the Cornish beaches" www.worldseafishing.com/baits/razorfish.html

# Features at potential risk

Inlets &
bays

Estuarie

Mud & sand flats

Salt meadow Subtidal sandbank

Salicornia

Shads & lampreys

Scoter

BI SPA waders

BI SI wildfe

L

## **Known or likely threats & impacts (rationale for management)**

Potential for local impact exists depending on techniques (salting / spearing). Indiscriminate use

Environmental Issues of Desalination. Journal of Contemporary Water Research & Education 132: 11-18

-

<sup>50</sup> eg Benkendorff, K 2008. Submission for the Inquiry into the Environmental Impacts of Proposed Desalination Plants in S.A. Environment, Resources and Development Committee Desalination Submission No 7 (accessed at <a href="http://www.parliament.sa.gov.au/NR/rdonlyres/E2C2E810-D341-4FEB-A54C-FAE06B74EC1D/12945/07MolluscanResearch.pdf">http://www.parliament.sa.gov.au/NR/rdonlyres/E2C2E810-D341-4FEB-A54C-FAE06B74EC1D/12945/07MolluscanResearch.pdf</a>); Einava, R, Harussib, K & Perryb, D. 2002. The footprint of the desalination processes on the environment. Desalination <a href="https://www.parliament.sa.gov.au/NR/rdonlyres/E2C2E810-D341-4FEB-A54C-FAE06B74EC1D/12945/07MolluscanResearch.pdf">https://www.parliament.sa.gov.au/NR/rdonlyres/E2C2E810-D341-4FEB-A54C-FAE06B74EC1D/12945/07MolluscanResearch.pdf</a>); Einava, R, Harussib, K & Perryb, D. 2002. The footprint of the desalination processes on the environment. Desalination <a href="https://www.parliament.sa.gov.au/NR/rdonlyres/E2C2E810-D341-4FEB-A54C-FAE06B74EC1D/12945/07MolluscanResearch.pdf">https://www.parliament.sa.gov.au/NR/rdonlyres/E2C2E810-D341-4FEB-A54C-FAE06B74EC1D/12945/07MolluscanResearch.pdf</a>); Einava, R, Harussib, K & Perryb, D. 2002. The footprint of the desalination processes on the environment. Desalination <a href="https://www.parliament.sa.gov.au/NR/rdonlyres/E2C2E810-D341-4FEB-A54C-FAE06B74EC1D/12945/07MolluscanResearch.pdf">https://www.parliament.sa.gov.au/NR/rdonlyres/E2C2E810-D341-4FEB-A54C-FAE06B74EC1D/12945/07MolluscanResearch.pdf</a>); Einava, R, Harussib, K & Perryb, D. 2002. The footprint of the desalination processes on the environmental impact of seawater desalination. Desalination 185: 1–8; Younos, T. 2005.

of excessive quantities of road rock-salt has been reported though this appears to be highly infrequent. Impacts on stocks assumed likely to be minimal as main stock lies below MLWS. However, no known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Ensure that stocks are exploited only when population levels are at or greater than those required to achieve maximum sustainable yield

Rigorously implement existing management measures

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas.

Hand gathering: other bivalves (excluding access issues)







Contidence More info

L

## **Current status**

Gathering various long-live, slow growing bivalve species (*eg* Mya , Lutraria) reported from Tenby/ Saundersfoot & Rhossili; frequency and intensity unknown.

## **Key information sources**

SWSFC; anecdotal public reports

## **Current management**

SWSFC byelaws:

23. Shellfish - re-deposit of

24. Temporary closure of shellfish fisheries

Wildlife & Countryside Act 1981 (as amended), section 28 SSSI consenting regime

Pressures M ✓

Target stock depletion

Habitat modification

Wading bird disturbance

## Features at potential risk

# Pressures,& impacts (rationale for management)

Potential for local impact exists depending on techniques; more likely to be ecosystem effects than threat to species with large population reservoirs below LW. However, no known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Review current management measures to assess their suitability for securing EMS features at

favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Develop & introduce measures to manage <u>access</u> to secure the EMS features at favourable conservation status

Rigorously implement existing management measures

Maintain assessment of pressures from activity on designated EMS features under review Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas.

**Hand gathering: winkles** (excluding access issues) ?







L

## **Current status**

Gower, Tenby/Saundersfoot. Observations only, no systematic or quantitative information.

# **Key information sources**

SWSFC SFOs; PCNPA

## **Current management**

SWSFC byelaws:

- 11 & 12. Winkles (size and hand gathering only)
- 23. Shellfish re-deposit of
- 24. Temporary closure of shellfish fisheries

Wildlife & Countryside Act 1981 (as amended), section 28 SSSI consenting regime

M ✓ **Pressures** 

Disturbance of feeding and/or roosting wading birds (SPA feature).

Displacement of algal cover, increased exposure of shore fauna to desiccation

Reduction in biomass of target species; potential population effects from sustained exploitation (eg reduced average size); significant collection may result in habitat effects from reduced grazing, though no recorded instance of such habitat effects have been reported.

## Features at potential risk

## **Known or likely threats & impacts (rationale for management)**

Potential for local impacts. However, no known impacts; insufficient information to judge likelihood or degree of impact

#### **Generic management option(s)**

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Develop & introduce measures to manage  $\underline{access}$  to secure the EMS features at favourable conservation status

Rigorously implement existing management measures

Maintain assessment of pressures from activity on designated EMS features under review Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas.

Hand gathering: crustacean shellfish (for consumption; for bait purposes see Bait collection:

boulder turning & collection targeted species) ✓ ? ◎







- Confidence ✓ More info

L

# **Current status**

Known from South Gower: Worm's Head – Port Eynon. Observations only, no systematic or quantitative information.

## **Key information sources**

NT; Anecdotal

# **Current management**

SWSFC byelaws:

- 3. Lobster minimum size
- 5. Protection of V-notched lobsters
- 6. Crabs minimum size
- 23. Shellfish re-deposit of
- 24. Temporary closure of shellfish fisheries
- 46. Parts of crustacean shellfish prohibits removing parts of crustacean shellfish

Wildlife & Countryside Act 1981 (as amended) section 28 SSSI consenting regime

**Pressures** M

Pressures to SAC / SPA features appear minimal

## Features at potential risk

## **Pressures impacts (rationale for management)**

No known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

F2 (no known mechanism for activity to affect the feature(s), no known causal relationship, no evidence that it is having a significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Maintain surveillance for spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Netting: beach seine ?









More info

## **Current status**

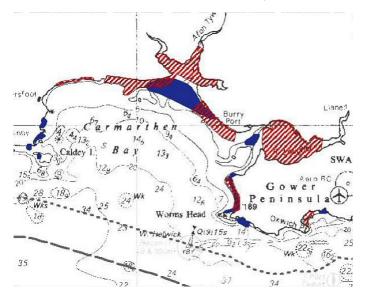
Sandeels are taken in beach seines from exposed beaches and sold for angling bait (especially for bass), in parts of Pembrokeshire (Tenby – Saundersfoot); open Carmarthenshire beaches; Three Rivers confluence / Burry Inlet entrance.

Details of gear used, frequency, intensity and any by-catch is unknown.

As the nets used are below the legal minimum sized mesh, the fishery is conducted under authorization from the South Wales SFC, and is subject to catch return reporting.

## **Key information sources**

SWSFC SFOs; MFA/WAG FOs; Walmsley & Pawson 2007; CCW 2010



CCW 2010: beach seine netting shown in solid blue shading

# **Current management**

SWSFC byelaws:

8. Bass - minimum size

Statutory Instrument 1990 No.1156. The Bass (Specified Areas) (Prohibition of Fishing) Order 1990 (prohibits fishing for bass by boat in the Taf, Tywi and Gwendraeth Estuaries and Burry Inlet between 30 April and 1 November)

Wildlife & Countryside Act 1981 (As Amended) Section 28 SSSI consenting regime

**Pressures** M ✓

Intense effort may impact on local sandeel populations. Otherwise likely minimal.

## Features at potential risk

Inlets & bays	Estuaries	Mud & sand flats	Salt meadow	Salicornia	Subtidal sandbank	Shads & lampreys	Otters	Scoter (CB SPA)	BI SPA waders	BI SPA wildfowl
✓	✓	✓				✓	✓			

# **Known or likely threats & impacts (rationale for management)**



Gear deployed near-shore in shallow water so unlikely to interact with bird features; gear constantly tended so any by-catch should be immediately detected and released. Current level of sandeel catch unlikely to put significant pressure on stocks.

No obvious pressures on SAC or SPA features and no recorded or perceived threats.

## **Generic management option(s)**

F5b (known mechanism for activity to have effect, but evidence shows no significant adverse effect at present as independent of current management) / ? F2 (no known mechanism for the activity to affect the feature, no known causal relationship, and no evidence that it is having a significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Develop & introduce management measures, including zonation plans where appropriate, to secure the EMS features at favourable conservation status

Ensure that species subject to existing commercial fisheries are exploited only when population levels are at or greater than those required to achieve maximum sustainable yield

Rigorously implement existing management measures

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas

Netting: beach-set gill ?









Confidence

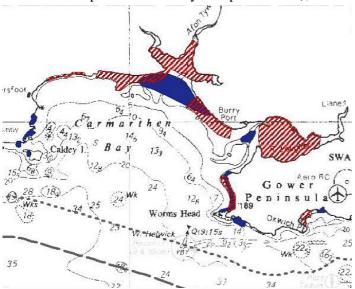
## **Current status**

Carmarthenshire open beaches, Three Rivers confluence, Burry Inlet; variable & seasonal; gear detail, frequency and intensity unknown. Casual recreational effort ("holiday activity") SE Pembrokeshire beaches (eg Amroth)

Seasonal beach netting for cod, bass and flounders

#### **Key information sources:**

CCW effort distribution maps; SWSFC SFOs (not in agreement - major overlap CCW effort distribution maps and SWSFC byelaw prohibitions); MFA/WAG FOs



CCW 2010: beach-set gill netting shown in red diagonal shading

## **Current management**

SWSFC byelaws:

- 8. Bass minimum size
- 30. Fixed nets (contributes to reduction in risk to otters)
- 33. Set, stake and stop nets (Inter alia limits maximum length to 200 metres and height to 1.25 metres; proscribes use of metal supports; requires that nets not be deployed below the edges of streams or channels, be no closer than 200 metres to any other net; limits individuals to use of one net at any one time; and sets requirements for servicing the nets.,

Statutory Instrument 1990 No.1156. The Bass (Specified Areas) (Prohibition of Fishing) Order 1990 (prohibits fishing for bass by boat in the Taf, Tywi and Gwendraeth Estuaries and Burry Inlet between 30 April and 1 November)

Wildlife & Countryside Act 1981 (as amended) Section 28 SSSI consenting regime

**Pressures** M

Entanglement non-target species (shads, lampreys otters, birds)

## Features at potential risk

## **Known or likely threats & impacts (rationale for management)**

L 🗸

Potential exists.

Degree of risk or actual entanglement of bird or other species features is unknown.

Inferred that well serviced nets should pose minimal threat; no known impacts; insufficient information to judge likelihood or degree of impact

# **Generic management option(s)**

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Develop & introduce management measures, including zonation plans where appropriate, to secure the EMS features at favourable conservation status

Ensure that species subject to existing commercial fisheries are exploited only when population levels are at or greater than those required to achieve maximum sustainable yield

Rigorously implement existing management measures

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas

Hand gathering: algae & plants for human consumption (excluding access issues)?





(R) (L)

eg Porphyra (laver), Salicornia (glasswort); cf Algal gathering for chemical extraction / biomass

#### **Current status**

Known from Burry Inlet. Exact locations, frequency and intensity unknown Little info; no recent quantitative.

Commercial collection of *Porphyra* (laver) for processing. Over 200 tons reportedly collected in 1962

## **Key information sources**

**SWSFC** 

#### **Current management**

Seaweed harvesting is not currently regulated through a specific licensing or permit system, though it may be controlled within SSSI by the Wildlife & Countryside Act 1981 (as amended) (section 28 SSSI consenting regime) and within EMS by the Habitats Regulations <sup>51</sup>

Fresh seaweed floating in the sea may be collected as an extension of the public right to fish in and gather items from the sea. Floating seaweed over the foreshore (occurring either as fresh vegetation or drift) can be taken as part of this public right when the tide is in, but not when remaining as fresh or drift vegetation when the tide is out, unless under some other legal right such as "wrack right" applies; the application of "wrack rights" in Wales is undetermined. Seaweed above the high water-mark belongs to the owner of the land and there is no public right to take seaweed in these circumstances.

'Natural products' found on the seashore belong to the owner of the shore; the public common law right to fish or "wrack rights" do not extend to collection of 'natural products'

Possible management by Section 15 (Countryside Act 1968) management agreements and Tir Gofal agri-environment scheme agreements though specific examples not known.

**Pressures** M

Disturbance of feeding and/or roosting wading birds (SPA feature).

Reduction in biomass of target species.

Habitat disturbance / modification; disruption (sediment destabilisation or erosion; biological

<sup>&</sup>lt;sup>51</sup> "CCW does not have any specific policies/position statements on seaweed harvesting and the impacts of these activities on the marine environment. If harvesting is carried out within a designated site then we would use the current legislative processes to deal with it: If carried out in an SSSI/SAC by an Owner Occupier (or third party with the permission specific or implied by the O/O) then CCW would (under the Countryside and Right of Way act and Habitats Directive regulations) assess the extent of the operation and issue consent or not depending on the impact on the features. If carried out in an SSSI by a third party without the permission of the Owner Occupier CCW would seek to liaise with the collectors to look for the best way to minimise any impact on the SSSI/SAC features. If carried out within a SAC by a third party in Wales there is currently no control mechanism, although the Assembly as the body responsible for the implementation of the Habitats Directive in Wales could (if the harvesting was damaging the nature conservation value of the site) introduce the required controls e.g. authorising a CCW bylaw under regulation 36 {of the Habitats Regulations}, or by making a special nature conservation order to protect the features of the site. (Gabrielle Wyn, pers. Comm.)" Quercus, 2005 Assessment of the Effects of Commercial Seaweed Harvesting on Intertidal and Subtidal Ecology in Northern Ireland. Report to Environment and Heritage Service No. 06/26. EHS contract number: CP1149/320

L

disturbance either by selective extraction of species, physical loss through removal; or physical damage leading to the loss of species)

Food web disruption

Algal harvesting

Depletion of target species. Removal of whole plants significantly increases recovery time compared to cutting and leaving holdfast

Displacement of algal cover, increased exposure of shore fauna to desiccation <sup>52</sup>

Salicornia Depletion of populations of key component of SAC features

## Features at potential risk

# **Known or likely threats & impacts (rationale for management)**

Potential for impacts on *Salicornia* populations and depletion of *Porphyra* exist. However, no known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Ensure that all developments, permissions etc are subject to appropriate and legally compliant HRA

Statutory consultees respond fully to consultations on permission applications, focussing on the site's conservation objectives

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management; specifically: require spatial and temporal reporting of effort and harvesting as conditions of permissions

Assess pressures from activity on designated EMS features

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Develop & introduce management measures, including zonation plans and SSSI management agreements where appropriate, to secure the EMS features at favourable conservation status

Develop & introduce measures to manage access to secure the EMS features at favourable

-

<sup>&</sup>lt;sup>52</sup> Minch Project. 1995. *Littoral seaweed resource assessment & management in the Western Isles*. Report from Environment & Resource Technology Ltd (accessed at <a href="http://www.w-isles.gov.uk/minch/seaweed/seaweed.htm#TopOfPage">http://www.w-isles.gov.uk/minch/seaweed/seaweed.htm#TopOfPage</a>); Quercus, 2005 *op cit* 

conservation status

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Review existing SSSI management agreements and amend as appropriate

Rigorously implement existing management measures

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities; encourage best operating practices and avoidance of sensitive areas.

"Artisanal scale harvesting of a species should be based on a minimal impact cropping method and harvesting cycle appropriate to each species. Restricting the cropping to a maximum of 25% of the coverage of the target species, by hand, with the cutters accessing the site on foot and with an interval between visits of several years would have negligible effect on the habitat" <sup>53</sup>

<sup>53</sup> Environment & Heritage Service Northern Ireland, 2007. *Environmentally Sustainable Seaweed Harvesting in Northern Ireland*. Environment and Heritage Service Position Statement March 2007

Page | 85

#### 5.1.3 FISHERIES SUPPORT ACTIVITIES

# Fisheries: predator control (P) ? (P) (R) (L)

Culling or disturbance of vertebrate predators; removal invertebrate competitors for shellfish or other exploited resources

Confidence More info

L

#### **Current status**

Oystercatchers, as competitors for molluscan shellfish, were formerly (1972-73) culled <sup>54</sup> Anecdotal & unattributable reports of commercial net-fishermen shooting seals in NE quadrant of Bay

## **Key information sources**

**SWSFC SFOs** 

## **Current management**

Conservation of Seals Act 1970 (as amended)

Conservation (Natural Habitats, &c.) Regulations 2010

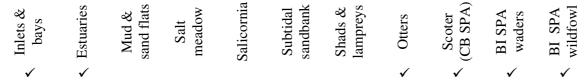
Pressures M ✓

Depletion of designated and other species population

Noise and visual disturbance

Disruption of food webs

## Features at potential risk



## **Known or likely threats & impacts (rationale for management)**

Seals are not a specified CB&E SAC feature, but unjustified shooting arguably a potential conservation issue if seals are considered a normal and regular component of the Bay's fauna, and is, at least, against spirit of Directive, and the objective to conserve Annex II species outwith as well as within EMS of which they are a feature

Otherwise no known impacts; insufficient information to judge likelihood or degree of impact

## **Generic management option(s)**

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

## Management action(s) required

\_

<sup>&</sup>lt;sup>54</sup> Howells, R. 1995. *Birds in the Burry Inlet 1976 – 1994*. In the Burry Inlet Symposium: Sate of the Estuary Report (Part 1). Ed J Atkins. Burry Inlet and Lougher Estuary Liaison Group.

Maintain active surveillance to detect activity; report as appropriate

Maintain trends under review

Develop / improve and implement routine effort data recording protocols by fisheries officers

Ensure that all proposals / applications for permissions to cull or otherwise manage predators are subject to appropriate and legally compliant HRA

Statutory consultees respond fully to consultations on permission applications, focussing on the site's conservation objectives

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Rigorously implement existing management measures

Ensure best possible awareness of EMS, features at risk and threats from activities

# Hand gathering: access and vehicle use (P) ! ? (Q) (R) (L) 🛠 (1)









Confidence More info

## **Current status**

Integral to cockle fisheries and mussel seed collection (and intertidal mussel several orders)

Limited number of access points; some access points require landowner / occupier permission

Broughton Burrows (for Whitford)

Burry Port harbour (Cefn Sidan)

Shore access for approved users only at:

Pendine (restricted)

Whiteford, Llangennith, (partly restricted); Pembrey (Country Park) (restricted)

## **Key information sources**

SWSFC, CCW; industry, NT, MoD

## **Current management**

SWSFC byelaws:

15. Vehicle usage in the Burry Inlet cockle fishery

48. Vehicle usage within the Three Rivers estuary

Road traffic Act 1988, s 34 (off road use of vehicles on foreshore is not legal)

PCNPA byelaws

Wildlife & Countryside Act 1981 (as amended) section 28 SSSI consenting regime

Η **Pressures** 

Habitat modification / damage (including rutting, compaction, alteration drainage regine and sediment erosion)

Direct and indirect mortality of biota, inter alia from crushing, burial (asphyxia), damage to respiratory or feeding mechanisms. Increase in opportunistic species populations at expense of longer lived species

Disturbance of feeding and/or roosting wading bird (SPA feature) species. Regular disturbance may result in long-term exclusion from feeding / roosting areas

Severity of threats dependant on method of access: vehicles generally liable to cause more damage than walking (c. 5-30 fold) due their greater weight, power and wheel torque; also with how vehicles used (ie how they are driven) and the nature of the receiving habitat

Eel grass beds and salt-marsh particularly vulnerable to damage. Long lasting wheels ruts result in abrupt changes in vegetation, as ruts favour more damp tolerant plants 55

#### Features at potential risk

<sup>&</sup>lt;sup>55</sup> Tyler Walters, H & Arnold, C, 2008. Sensitivity of intertidal benthic habitats to impacts caused by access to fishing grounds. Report to Countryside Council for Wales from the Marine Life Information Network (MarLIN). Marine Biological Association of the UK, Plymouth (Contract no FC 73-03-327)

Inlets & bays	Estuaries	Mud & sand flats	Salt meadow	Salicornia	Subtidal sandbank	Shads & lampreys	Otters	Scoter (CB SPA)	BI SPA waders	BI SPA wildfowl
./	./	./	./	./					./	./

# **Known or likely threats & impacts (rationale for management)**

M ✓

Disturbance of bird species <sup>56</sup>

Although routine use by established operators reportedly is well self-managed and perceived to have minimal impact there remains potential for habitat damage in targeted habitats and habitats crossed for access. However, no known systematic evaluation

Reported perception of accelerated erosion in vicinity of Loughor Estuary training wall (cause unknown)

Insufficient information to judge likelihood or degree of habitat impacts

## **Generic management option(s)**

F4 (known mechanism for activity to have effect, but insufficient evidence at present to determine whether or not it is having significant adverse effect)

locally F7 (evidence to suggest that the activity is having a significant adverse effect and the mechanism is known)

## Management action(s) required

Further quantify and report spatial and temporal activity; collate existing information / collect data as appropriate

Monitor and report spatial and temporal intensity of activity

Maintain activity trends under review

Ensure responsibilities for management are clearly identified (see section 5)

Ensure that all developments, permissions etc are subject to appropriate and legally compliant HRA

Statutory consultees respond fully to consultations on permission applications, focusing on the site's conservation objectives

Ensure conditions on permissions include appropriate provisions for feedback to inform adaptive management

Review current management measures to assess their suitability for securing EMS features at favourable conservation status and revise as appropriate; determine requirement for additional management intervention and identify new measures as appropriate

Ensure compliance with s28 of 1981 WCA, as amended by the CROW Act, in SSSIs

Rigorously implement existing management measures

Ensure no motorised transport permitted on sensitive shore features

Monitor operations for compliance with permission conditions and / or mitigation measures as appropriate

Maintain surveillance of interaction between operations and designated features for adverse impacts

Operator education: raise awareness of EMS and features at risk and threats from activities;

\_

<sup>&</sup>lt;sup>56</sup> Stewart B (2001) *Relationship between mussel and oystercatcher populations in the Burry Inlet*. Part 1B, Section 2, Rep. No. FC 73-02-188A. Countryside Council for Wales; Banks et al 2007. Monitoring Bird Distribution and Behaviour on the Carmarthen Bay & Estuaries SAC at Low Tide. CCW Contract Science Report No: 790

encourage best operating practices and avoidance of sensitive areas.

#### 5.1.4 RECREATIONAL FISHING

# 

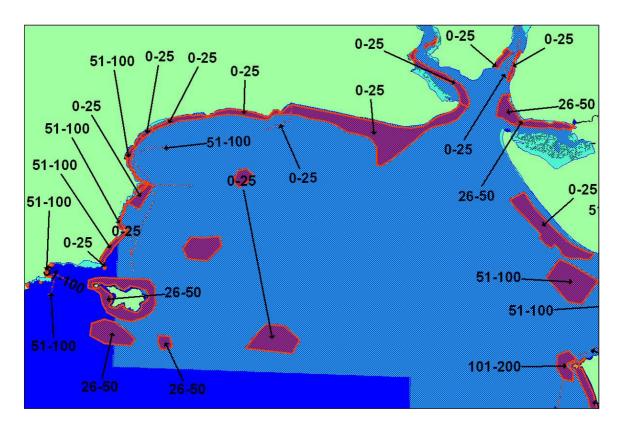
All recreational sea angling activities including informal shore and vessel angling, angling charters and organised shore or boat based competitions.

## **Current status**

Widespread and regular shore angling around Bay and within Burry Inlet / Loughor Estuary and boat angling throughout bay. Reportedly favoured and concentrated effort 'hotspots'. In the absence of systematically quantified data on distribution, frequency or intensity <sup>57</sup> the numbers of anglers shown in the maps below were collated by the SW Wales Recreation Audit Working Group (RAWG) from information held by a wide range of coastal workers (figures indicate numbers on average moderately busy day in season)

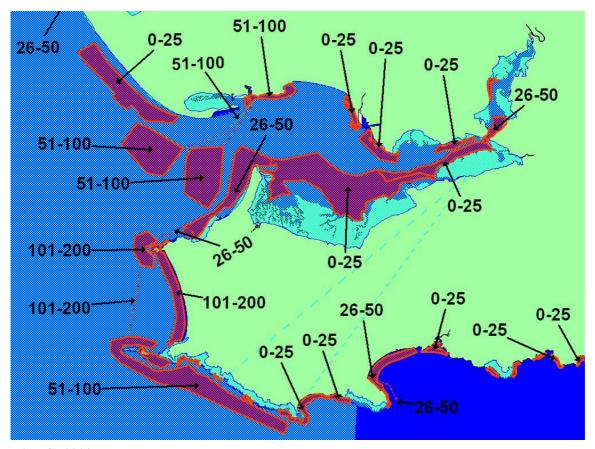
Anecdotal observations of occasional intense, though localised pressure related to competitions and associated bait collection (notably beach fishing competitions Pembrokeshire – west Carmarthenshire coast and Burry Inlet).

Two charter fishing vessels (authorised to carry less than 13 passengers) Burry Port.



\_

<sup>&</sup>lt;sup>57</sup> A lack of quantified information on recreational sea angling is common to the whole of the Welsh coast. Goudge, H., Morris, E.S. & Sharp, R. 2009. *North Wales Recreational Sea Angler (RSA) pilot surveys: Winter results December 2007 to March 2008.* CCW Policy Research Report No. 08/14.



**RAWG, 2009** 

## **Key information sources**

SW Wales Recreation Audit Working Group (RAWG); SWSFC SFOs; PCNPA; angling websites

## **Current management**

Broadly unregulated except minimum sizes and salmonids

National species size limits

SWSFC byelaw 29: bass nursery area-restrictions on fishing (1 May – 1 October)

Voluntary codes of Conduct from recreational sector (eg WFSA) and statutory agencies (Environment Agency) with respect to, eg, regulation of catch in competitions, selective competitions for specific fish

Threats M ✓

Habitat modification / degradation: trampling, impacts of lost / discarded fishing tackle of fish & birds

Visual, noise and physical presence disturbance of bird and mammal features

Possible stock effects from target species depletion, particularly in estuaries and on elasmobranchs; possible incidental catch of shad spp

See also bait collection

## Features at potential risk

ERROR: stackunderflow OFFENDING COMMAND: ~

STACK: