

**OTTER (*Lutra lutra*) ACTIVITY ON THE OPEN COAST & ISLANDS  
WITHIN THE PEMBROKESHIRE MARINE SPECIAL AREA OF  
CONSERVATION.**



© Laurie Campbell Photography

**Geoff Liles**

**May 2009**

**A report to the Pembrokeshire Marine SAC Relevant Authorities Group**

**Project Manager Sue Burton  
Pembrokeshire Marine SAC Officer,  
Milford Haven Port Authority, Gorsewood Drive, Milford Haven  
Pembrokeshire, SA73 3ER**

**The Otter Consultancy  
Llwyneion Isaf, Capel Iwan, Newcastle Emlyn  
Carmarthenshire, SA38 9LY**



**Report:** Otter (*lutra lutra*) activity on the open coast & islands within the Pembrokeshire Marine Special Area of Conservation.

**Author:** Geoff Liles

**Publication date:** May 2009

**Commissioned by:** Pembrokeshire Marine Special Area of Conservation Relevant Authorities Group

**Distribution List:**

*Pembrokeshire Marine SAC RAG*

Mark Andrews, Milford Haven Port Authority  
Mike Camplin, Countryside Council for Wales, Pembroke Dock  
Phil Coates, South Wales Sea Fisheries Committee  
Kate Collins, Environment Agency Wales, Haverfordwest  
Jane Hodges, Pembrokeshire Coast National Park Authority  
Stephen Hurr, Pembrokeshire County Council  
Andrea McConnell, Countryside Council for Wales, Pembroke Dock  
Trevor Theobald, Pembrokeshire County Council  
Dusi Thomas, Dwr Cymru Welsh Water

Sue Burton, Pembrokeshire Marine SAC Officer  
Blaise Bullimore, Acting Pembrokeshire Marine SAC Officer (Sept 2008 – Sept 2009)

*Others*

Bethan Cox, Pembrokeshire Biodiversity Partnership Implementation Officer  
Annie Haycock, Pembrokeshire County Mammal Recorder  
Wildlife Trust of South and West Wales Conservation Officer  
Wildlife Trust of South and West Wales Skomer NNR Warden

**Libraries**

National Library of Wales  
National Assembly for Wales Library  
Welsh Assembly Government Library  
Pembrokeshire County Reference Library



## CONTENTS

1.	INTRODUCTION	1
2.	AIMS & OBJECTIVES	2
3.	SCOPE OF PROJECT	3
4.	A REVIEW OF THE ECOLOGY OF EURASIAN OTTERS UTILIZING MARINE AND ESTUARINE HABITATS.	4
5.	METHODOLOGY	6
	5.1 Survey sites	
	5.2 Locating survey sites	
	5.3 Site surveys	
	5.4 Identifying potential / actual threats to otters	
	5.5 Otter sightings	
	5.6 Spraint analyses	
6.	RESULTS	9
	6.1 Sites searched	
	6.2 Otter signs	
	6.3 Otter diet	
	6.4 Features of importance to otters	
	6.5 Threats & issues.	
7.	DISCUSSION	26
	7.1 Availability of sites suitable for otters	
	7.2 Otter activity	
	7.3 Threats & issues	
8.	CONCLUSIONS	31
	8.1 Further research	
	8.2 Monitoring threats	
	8.3 A conservation management plan	
9.	CONSERVATION RECOMMENDATIONS	32
	9.1 Further research	
	9.2 Monitoring	
	9.3 A Conservation Management Plan	
10.	ACKNOWLEDGEMENTS	33
11.	REFERENCES	34
	APPENDIX	36



## 1. INTRODUCTION

The first investigations into otter use of the coast within the Pembrokeshire Marine SAC (Liles, 2003a) focussed on otter activity and habitat availability on freshwater coastal streams and estuaries and on the diet of otters utilizing these areas (Parry, 2008). Results showed that otters make regular use of these habitats. Signs of otters (mainly spraints) were found at 13 of the 29 coastal streams that lie within the marine SAC. At most of these sites otter signs were found at, or within a few metres of, the point at which the coastal stream or river meets the shore. At 5 sites, otter prints or spraints were found on the beach within the bay. These land-based otter surveys focussed on the short stretches of coastline immediately adjacent to the outflow of coastal streams because, after foraging in the sea otters must return to fresh water in order to wash their fur and to drink (Kruuk, 2006).

Pembrokeshire's coastal streams are relatively short (less than 2 km to several kilometres in length) yet many provide otters with secure cover. For example, 14 of the 29 streams flow through extensive areas of dense fen, scrub or woodland, habitats that are known to be used as resting sites by otters, and for breeding and rearing cubs (Liles, 2003b). For otters to make full use of these habitats, access to an abundant and accessible food supply is essential. However, these small coastal streams are unlikely to support significant populations of fish (D. Mee, pers com) and otters may be foraging in the wider marine environment, well away from coastal streams.

Otter use of the Pembrokeshire coastline and marine environment generally may be far more extensive than previously thought. Reliable sightings of otters in the sea have been reported on two occasions by sailors in South Haven on Skomer Island, and by a sea canoeist approximately 300m offshore near Abereddy (Liles, 2003a). In the first project, spraint was found on a stretch of open coastline near St. Anne's Head by Geoff Liles & Sue Burton during a brief boat survey of this part of the coast. Analyses of spraints collected during the 2003 otter project, and during a follow-up survey of coastal stream sites by a team of volunteers over a 12 month period, demonstrated that the diet of otters using the coastal streams includes a wide range of marine prey. In the follow-up study, during which a team of volunteer surveyors collected spraints over a period of 12 months from coastal streams, results showed that marine fish (at 56%) made up the largest dietary component (Parry, 2008).

The utilization of marine environments by the Eurasian otter has been studied in several European countries, including Portugal, Norway and Scotland. A review of the ecology of Eurasian otters using marine and estuarine habitats is given below in section 4. In western Scotland and the Scottish islands otters inhabit the coast and rarely, if ever, venture inland along watercourses (freshwater for drinking and washing coats is found typically in small pools close to the shoreline). In Wales, although it has now been established that otters make regular use of the coast close to fresh water streams, and are feeding in the marine environment (for example, Liles, 2003a; Strachan *et al*, 2005) the extent to which they use the open coast away from fresh water streams is unknown.

The coastline within the Pembrokeshire Marine SAC is approximately 107km long and formed mainly by high cliffs, with 29 rivers and small streams flowing into the sea and with numerous small bays and coves. The open-sea distance between nearest neighbour coastal streams ranges from a few hundred metres up to 13 km. However, for most streams, the nearest neighbour distance is between 1km and 3km.

This report describes the results of a survey of the open coast and islands of the Pembrokeshire Marine SAC using a unique methodology in which surveyors in dry suits swim in to coves and bays from a small boat to search for evidence of otter activity.

## 2. AIMS & OBJECTIVES

The aims of the project were to:

- 2.1 Assess otter activity on the open coast and islands;
- 2.2 Identify likely threats and issues to otter survival on the coast;
- 2.3 Establish otter conservation guidelines.

The objectives of the project were to:

- Determine whether (and how frequently) otters use the open coastline of the mainland within the Pembrokeshire Marine SAC area;
- Determine whether (and how frequently) otters visit the Pembrokeshire Islands (Skomer, Skokholm, Ramsey, and small islands such as Stack Rocks and Green Scar Island);
- Identify potential / actual threats to otters using the Pembrokeshire Marine SAC;
- Identify likely solutions to threats & issues relating to otters within the Pembrokeshire Marine SAC;
- Assess the efficacy & cost effectiveness of a unique methodology that involves boat + surveyors in dry suits to survey for otters in the marine environment.



### 3. SCOPE OF PROJECT

Nine key stretches of coast were selected for surveys to cover the mainland and islands, and to include stretches that were near to as well as distant from fresh water streams. They are:

- The coast between Bosherton Lakes and Frains Lake;
- Dale and Marloes Peninsulas (from West Blockhouse Point round to Musselwick Sands);
- Skomer and Skokholm Islands – eastern coastlines only;
- Musselwick north to (and including) Stack Rocks;
- Broad Haven north to Newgale;
- Solva (including Green Scar island) west to Carreg yr Esgob (and including the stretches used for Coasteering);
- Ramsey Island (east coast);
- Mainland of Ramsey Sound from Penmaen melyn to Point St John;
- St David's Head to Aberiddy.

Restricted areas identified in the “Pembrokeshire Marine Code” were not included in the survey to avoid disturbance to breeding birds. Outside restricted areas care was taken to reduce disturbance to seals and other species when approaching by boat.

**Fig 1 Pembrokeshire Marine SAC showing limit of coastal otter survey.**



Coastal Outline © Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 [2009].

#### 4. A REVIEW OF THE ECOLOGY OF EURASIAN OTTERS UTILISING MARINE AND ESTUARINE HABITATS.

##### ***Home range and habitat utilisation.***

Eurasian otters inhabit freshwater, brackish and marine environments. Whilst some animals live entirely in one type of environment, many occupy home ranges that include freshwater streams, estuaries and the coast. Otters living on the coast however must have access to fresh water streams and pools for drinking and washing (Kruuk & Balhary, 1990; and Moorehouse, 1988). Most studies on otter ecology have been based on marine-living populations.

Radio telemetry and spraint survey studies of otters in Scotland (Kruuk, 1995; & Macdonald & Mason, 1980) show that otters living exclusively on the coast have smaller home ranges than those in river environments. On Shetland, for example, the average distribution of animals is one adult otter for each kilometre of the coast, with each otter using several kilometres of shore (Kruuk, 1995). On river systems, typical home ranges are 20 to 40 Km (Green *et al*, 1984).

Coastal living otters use only a fairly narrow strip of both land and water along the coast, with males making more use of exposed rocky shores rather than sheltered areas. In Shetland, otters show a strong preference for gently sloping peaty coastlines without agriculture and cliffs.

The types of resting sites used by otters in marine and estuarine habitats are similar to those found in freshwater systems, although coastal otters generally have fewer dens than those living in freshwater. On the west coast of Scotland and Shetland, resting sites are found in cavities amongst rocks, holes in peat, and rabbit burrows in sand dunes (Watson, 1978; & Moorehouse, 1988). In Wales, potential resting sites on the coast and in estuaries include reed beds (for example, Oxwich Bay on the Gower, and the River Teifi estuary), tree root systems, and scrub (Liles, 2000 & 2003c).

##### ***Prey and feeding.***

Coastal otters can hunt as far as 100m offshore in water over 10m deep, but most feeding is done much closer to shore and in water less than 3m deep (Nolet *et al* 1993). In Shetland, 62% of observed dives occurred within 20m of the shore.

The prey species taken by coastal otters has been studied in Shetland (e.g. Nolet & Kruuk, 1994), Norway (Heggberget, 1993 and 1995; Heggberget & Moseid, 1994), and Portugal (Beja, 1991 & 1996). Results indicate a preference for slower swimming flatfish and other bottom dwelling species, such as eelpout (*Zoarces viviparous*), rockling (*Ciliata mustela*), sea scorpion (*Taurulus bubalis*), and butterfish (*Pholis gunnalus*). In Norway, cod (*Gadus morhua*) is probably the most important species for coastal otters (Heggberget, 1995). Other large species taken by otters include saithe (*Pollachius virens*) and Pollack (*P. pollachius*), lumpsuckers (*Cyclopterus lumpus*), and dogfish (*Scyliorhinus canicula*). Smaller species, such as the 15 spined stickleback (*Spinachia spinachia*) and gobies (Gobiidae) are also taken.

The main hunting areas for otters on the coast are largely determined by the habitat preferences of prey species. Rockling and sea scorpion are closely associated with exposed, boulder shores supporting the algae *Gigartina* sp, and thong-weed (*Himanthalia* sp). Eelpout is common on sheltered shores, amongst knotted wrack (*Ascophyllum* sp) and bladder wrack (*Fucus vesiculosus*). Butterfish are found in both rocky and sheltered shores. Prey species that are numerous in the shallow subtidal zone include the 15 spined stickleback and gobies.

The diet of otters in brackish water in large estuaries is less well known. In south west Portugal, eels (*Anguilla anguilla*) and grey mullet (*Chelon labrosus* and *Liza* spp.) form a major part of the diet of otters (Beja, 1991).

Marine fishes are highly mobile, and many species have habitat requirements that change seasonally and daily (Potts & Swaby, 1993). Consequently, the availability to otters of marine prey species varies throughout the year in both coastal and estuarine environments, and may also vary in different parts of the otter's range. In Norway, where Gadidae, flatfish, Cottidae, lumpsuckers, Salmonidae and Labridae form 95% of fish weight in otter diets, the amount of each species taken remains relatively constant in each season. In Shetland however, potential prey is very abundant in mid summer (especially eelpout in august), but scarce in late winter and spring (Kruuk 1995). In Portugal, Beja (1991) found seasonal variations in otter diet on the coast with wrasses (mostly *Symphodus melops*, *Coris julis*, *Labrus bergylta* and *Ctenolabrus rupestris*) taken less frequently in the summer, but blennies (mostly *Coryphoblennius galerita*, *Blennius gattorugine* and *B. pholis*) more frequently, and rocklings more frequent in the autumn. Otter diet in brackish/freshwater estuary sites in the same study displayed a much larger seasonal variation than in the marine sites. Fresh water species dominated the diet in spring and summer, and marine prey was most important in the autumn and winter. Grey mullet (thought to be the typical prey for otters inhabiting Portuguese estuaries) is most frequent in the diet in the winter and spring.

### **Threats**

Direct threats to individual otters, such as oil spills (Heggberget & Moseid, 1995, and Conroy, unpub. data); fish traps (Jeffries et al, 1984); and road mortalities (Philcox et al, 1999), can have a serious impact on otters, especially where populations are scarce. In Wales, several otter road mortalities have been recorded within a few hundred metres of the coast, suggesting that otters are travelling between the coast and inland watercourses (Bradshaw & Slater, 1999; Liles & Colley, 2000).

Indirect factors, such as habitat loss on estuaries and coastal watercourses, and declines in fish populations, may pose a major potential threat to otters and their use of coasts and estuaries.

## 5. METHODOLOGY

The survey team included experienced boat handlers; two surveyors (Geoff Liles and Sue Burton); and a small number of volunteers to help with data recording and photography. Surveys were conducted over a period of 6 days between April 8<sup>th</sup> and May 11<sup>th</sup> 2008. The days on which surveys were carried out were determined by tide times, sea and weather conditions so that risks associated with a boat approaching cliffs, and surveyors swimming in to coves, were minimized.

### 5.1 Survey sites

Sites to be surveyed included any feature within the cliff face that could be accessed by otters only from the sea (for example, a cove with high, vertical cliff walls), or where the approach for otters was most likely from the sea (for example, a cove or bay with steeply sloping land up to the cliff top, but no stream or other obvious watercourse route for otters). Examples are shown in Plates 1a & 1b below.

#### Plate 1a Cove accessible to otters only from sea



#### Plate 1b Cove with sloping land to cliff top but no watercourse route for otters.



### 5.2 Locating survey sites

Stretches of coast where there are cliffs, bays and coves were identified from Ordnance Survey Maps (1:25000 scale) but specific sites for survey could only be identified during the boat survey. Potential survey sites were found by scanning cliffs through binoculars from the boat. Sites likely to be accessible to otters (and which would provide them with a

haul out and dry platform at most states of the tide) were approached by boat so that they could be investigated more closely. Sites were not selected for survey if there was a high sea swell and large breaking waves; if access for surveyors was difficult or dangerous; or if submerged rocks in the approach to the feature made boat access dangerous.

### 5.3 Site surveys

Once suitable sites were located, the boat was manoeuvred as close as possible to the base of the cliff so that surveyors, wearing dry suits, safety helmets and gloves could swim in to the feature (Plate 2) and climb out.

#### Plate 2 Surveyors swimming in to a survey site



At each site a detailed search was carried out from the normal high water mark to the cliffs at the back and sides of the cove. Typical features that were investigated particularly for otter signs and sites included the tops of large rocks and bedrock ridges; bedrock and earth ledges; and cavities beneath boulder piles (Plate 3).

#### Plate 3 Features investigated for otter signs & sites





A search was made for:

- otter signs (mainly spraints),
- food remains,
- resting sites,
- otter paths,
- evidence of fresh water (e.g. waterfall, pool or spring)

Spraints were assigned to an 'age' category and counted. Three 'age' categories were used:

"Fresh" – The spraint is oily and wet with a strong characteristic smell.

"Recent" – Spraint dry and usually hard, or becoming hard, and very compact. Retains the strong, characteristic smell.

"Old" - Spraint no longer compact, or if it appears so, crumbles very easily. Characteristic smell now faint.

All spraints (regardless of relative age) were collected so that prey remains could be identified using spraint analyses techniques (see 5.6 below). Each individual spraint was placed in a self-seal plastic bag which was labelled with name of site (i.e. bay or cove) and date of collection. Spraints were stored frozen to avoid deterioration.

Digital photographs of each site surveyed, and key features associated with the site, were taken from the boat.

#### **5.4 Identification of potential / actual threats to otters.**

Potential threats to otters (and other issues) were recorded during the surveys. Potential threats and issues include lobster / crab pots close to the coast; disturbance to potential resting sites from sea anglers and walkers; disturbance from activities such as Coasteering; and rubbish on beaches.

#### **5.5 Otter sighting records**

Reports of otters seen swimming in the sea, or using the open coast, provide valuable additional information. A few records have already been collected by the surveyors, and further records were sought from relevant staff of the Countryside Council for Wales and Pembrokeshire National Park. Articles about the project with a request for information on otter sightings within the marine environment were published in the local press. Two examples (from Pembrokeshire Life Magazine and the Western Telegraph) are shown in Appendix 1 & 2.

#### **5.6 Spraint analyses**

Spraint analysis was carried out by Gareth Parry, and experienced member of the Conservation Ecology Research Team in the Institute of Environmental Sustainability at Swansea University. Spraints (frozen) were placed in a 500ml glass beaker with 10-50ml of biological detergent to break down mucus bonds etc. The beaker was filled with warm water (room temp) and left to stand for approximately 24 hrs. After this time, the contents were strained through a 0.5mm sieve and washed with cold water to remove dirt etc. The

contents were placed on a filter paper and left to air dry for about 1 hour. Any identifiable remains were removed and the remainder discarded. Fish vertebrae (caudal, thoracic and ventral), and fur, feathers and bones of mammals were identified using standard keys. The total number of vertebrae of specific species was counted for each spraint.

## 6. RESULTS

Tables 1 and 2 below show numbered and named sites with grid references and survey data.

### 6.1 Sites searched.

#### 6.1.1 Number of sites

The total number of sites searched was: 48 sites along the mainland coast; 2 sites on Skokholm island; 1 site on Skomer island, and 4 sites on Ramsey island.

#### 6.1.2 Location of sites

Although the entire length of coast was searched, sites suitable for survey were found along three discrete stretches of coast: Bosherton to Hobbyhorse Bay; St Ann's Head to Little Haven; and Newgale to Porth Egr (Fig 2 below).

**Fig 2 Locations of otter survey sites along the coast of the Pembrokeshire mainland and islands**



Coastal Outline © Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 [2009].



Table 1 Mainland coast sites – yellow background highlights sites with otter signs

Site	Location	Grid Ref	Fresh	Recent	Old	Fresh Water	Resting Site	Rock-pools	Notes
	<b>Bosherston to Hobbyhorse Bay</b>								
1	West of Broad Haven	SR975932	3	2	2	No	Rock cavities	No	Sheltered cove
2	East of St Govan's chapel	SR969929	0	0	0	No	Rock cavities	Yes	Rock platform at base of cliff + boulders
3	Stennis Ford	SR963930	0	0	0	No	Cavity	No	Boulder beach. Secure site for otters
4	Bullslaughter Bay	SR941942	0	0	0	No	Cave	No	Boulder beach. Cave deep and cannot see into end.
5	Filmstone Bay	SR931945	0	0	0	No	Caves	No	Large bay with boulders. Good caves & easy access for otters.
6	The Wash	SR919944	0	0	0	No	No	No	Rock strewn cove behind massive bedrock slab. V. sheltered site.
7	Below Bulliber Down	SR903952	0	0	0	No	No	No	Key Hole Bay – boulder site but possible too exposed with rough seas at high tide.
8	Pen y holt Bay	SR896953	0	0	0	Yes	Cave & cavities	Yes	Few freshwater trickles. Rock-pools on rock platform.
9	Hobbyhorse Bay	SR886957	0	0	0	No	Rock cavities	No	Caves and rock cavities.
	<b>St. Ann's Head to Little Haven</b>								
10	St Ann's Head-Cobblers	SM805026	0	0	0	No	No	No	
11	St Ann's Head-The Vornit	SM804031	0	4	2	Yes	Rock cavities	No	Sprints in rock cavities and at back of boulder slope near trickle of fresh water.
12	Frenchman's Bay	SM801037	0	0	0	No	No	No	
13	By Short Point	SM798043	0	0	0	No	No	No	Not suitable for surveying – very large boulders.
14	Long Point	SM795048	1	0	0	Yes	No	No	1 oily secretion spraint near fresh water pool
15	By Great Castle Head	SM799055	0	0	0	No	No	Yes	Excellent deep rock pools.
16	Marloes sands, south end	SM789068	0	0	0	Yes	Rock cavities	No	Gently sloping bay with rocks and boulders, with fresh water.
17	Gateholm west side	SM769072	2	0	2	No	No	No	Sprints found on large boulders 1m from cliff face.
18	Watery Bay	SM768077	0	0	0	No	No	No	
19	Little Castle Bay	SM765079	0	0	0	No	No	No	
20	Rainy Rock	SM763081	0	0	0	No	No	No	
21	Renny Slip	SM759089	0	0	0	Yes	Rock cavities	No	Gently shelving beach with large angular boulders. Many rock cavities. Fresh water wells up on beach. Little wrack seen.
22	West Hook	SM763092	0	0	0	Yes	Rock cavities	No	Possible access for otters up to top of cliffs. Much wrack seen in bay.
23	West Hook, east beach	SM764092	0	0	0	Yes	Rock cavities	No	
24	Hopgang	SM778088	0	2	4	No	Scrub	No	Spraint sites are grassy ridges. Much wrack & kelp.
25	Musselwick, west end	SM781087	0	0	0	No	No	No	

Table 1 Mainland coast sites (continued)

Site	Location	Grid Ref	Fresh	Recent	Old	Fresh Water	Resting Site	Rockpools	Notes
26	Nr Nab Head – west side	SM790108	1	0	0	No	No	Yes	Easy access for otters up to top of cliff. Rock-pools are deep on bedrock ledges
27	Nab Head – east side	SM791111	0	0	0	No	No	No	Difficult access for surveying due to submerged rocks.
28	East of Nab head	SM793110	0	3	2	Yes	Cave	No	Sheltered gully leading to large dry cave with soil floor, good rest site.
29	Warey Haven	SM805115	0	0	0	No	No	No	Not suitable for survey due to rocks, but accessible to otters. Much wrack
30	West of Mill Haven	SM812122	0	0	0	No	No	No	Uniform bouldery cove.
31	Stack Rocks	SM812133	0	0	0	No	No	No	Not easy access for otters, but plenty of wrack around rocks.
32	Brandy Bay	SM819126	0	1	0	Yes	No	No	Boulder cove with small stream. Wrack seen.
33	By Howney Stone	SM821128	0	0	1	No	No	No	Difficult access for otters but good wrack & kelp. Sprint on grass high up on a ridge.
34	Goultop Roads	SM845124	0	0	6	No	Dense Scrub	Yes	Easy access for otters. Excellent scrub cover for resting site.
	<b>Newgale to Porth Egr</b>								
35	Ogof y Cae	SM824230	0	2	3	No	Rock cavity	No	Very well used sprint sites on huge rock slab & inside cavity.
36	Green Scar	SM796226	0	0	0	No	No	No	Large boulder tumble above MHW but exposed to south west.
37	Ogof Mwn	SM780244	0	0	0	Yes	No	Yes	Suitable site but no signs.
38	Betw Caer Bwdy & Caerfai	SM763238	0	0	0	No	No	Yes	Little above MHW. Small rocky beach but excellent rock pools and this is a sheltered basin with possible access for otter to grass covered rock outcrops.
39	St Non's	SM751241	0	0	0	Yes	No	No	Good sprint sites available but no signs.
40	Porth Coch Mawr	SM749241	0	1	9	Yes	Rock cavity	No	Well used site with 2 sprint sites and otter access up grassy slope. Good sheltered nook/cave under boulder tumble for resting site.
41	Porth Henllys	SM724235	0	0	0	Yes	Rock cavities	No	Excellent waterfall with fresh water pools. Good access for otters and side cove is very sheltered. Many good resting site cavities.
42	Carn ar Wig	SM718238	0	0	0	No	No	No	Small cove with pebble beach. Wrack on adjacent cliff rocks.
43	By Carn ar Wig	SM718239	0	0	2	No	Gorse scrub	No	Easy access for otters to site and up slope to cliff top. Good resting sites in dense scrub up slope. Sprint sites are on grass tussocks top of rocks.
44	Porth Brag	SM721251	0	0	0	No	No	No	Small cover with pebble beach. Wrack on boulders approaching beach.
45	Gesail fawr	SM741287	0	0	0	No	No	No	Very small cover with near vertical cliffs. Pebble beach.
46	Carreg yr Afr	SM759290	0	0	2	Yes	Rock piles	No	Waterfall. Otters can get access up cliff to cliff top. Sheltered site.
47	Porth y Rhaw	SM770297	0	0	3	Yes	Rock cavities	No	Bay steep sloping cliffs, pebble beach. Sprints in boulder cavities.
48	Porth Egr	SM803325	0	0	0	No	Rock cavities	No	Pebble beach with boulders on one side. Wrack on adjacent cliff bases.

Table 2 Island Sites – yellow highlights sites with otter signs.

**Ramsey**

Site	Location	Grid Ref	Fresh	Recent	Old	Fresh Water	Resting Site	Rockpools	Notes
1	Waterings (east side)	SM705238	0	1	9	No	Rock cavities	No	Extensive tumble of rocks provides many cavities and good shelter for resting sites.
2	Aber Mawr	SM699242	0	0	0	No	No	No	Wide bay with pebble beach and steep cliffs. Trickle of water but not useful.
3	Porth Lleuog	SM699230	0	0	0	Yes	Boulder cavities	No	Sheltered bay with pebble beach and steep cliffs. Boulder cavities provide good resting shelter.
4	Ynys Gwelltog	SM704225	0	1	7	No	Boulder cavity high up from water	No	Otters can get access up to top of cliff. This is close to where Fion saw an otter.
5	Aber Byharan	SM704229	0	0	0	yes	No	No	Steep high cliffs with pebble beach and boulders to one side.

**Skomer**

Site	Location	Grid Ref	Fresh	Recent	Old	Fresh Water	Resting Site	Rockpools	Notes
1	South Haven: South Stream Cliff	SM731090	0	0	1	Yes	No	No	Otters can get access onto the island here by climbing up the grassy slope to the cliff top.

**Skokholm**

Site	Location	Grid Ref	Fresh	Recent	Old	Fresh Water	Resting Site	Rockpools	Notes
1	North Haven	SM742054	0	0	0	No	No	No	Exposed to north – but good access for otters to cliff top up the grassy slope.
2	South Haven	SM741051	0	0	0	No	Rock cavities	No	Sheltered on south side of island. Easy access for otters and with good caves and rock cavities. Bay has plenty of wrack.

### 6.1.3 Types of site

The types of site that were surveyed (selected because they appeared to provide otters with access from the sea to surfaces or structures that will be above most high tide marks) fell into four main categories:

- **Bay** – a roughly semi-circular curved sweep of high cliffs around a boulder, rock and/or pebble beach, ranging in size from about 20m to 50+m wide.
- **Cove** – a sheltered recess or inlet in the cliff face, often with the floor strewn with massive rocks and sometimes many tens of meters deep.
- **Open coast with bedrock ledges** – a stretch of coast not contained within a wall of cliff but where there is a ledge of bedrock at the base of the cliff.
- **Open coast with rock ledges** – a stretch of coast not contained within a wall of cliff but where a pile of rocks or boulders form a high platform at the base of the cliff.

Examples of the four types of site are shown in Plates 4a, b, c & d below.

Plate 4a Bay



Plate 4b Cove



**Plate 4c Open coast with bedrock ledges****Plate 4d Open coast with rock ledges**

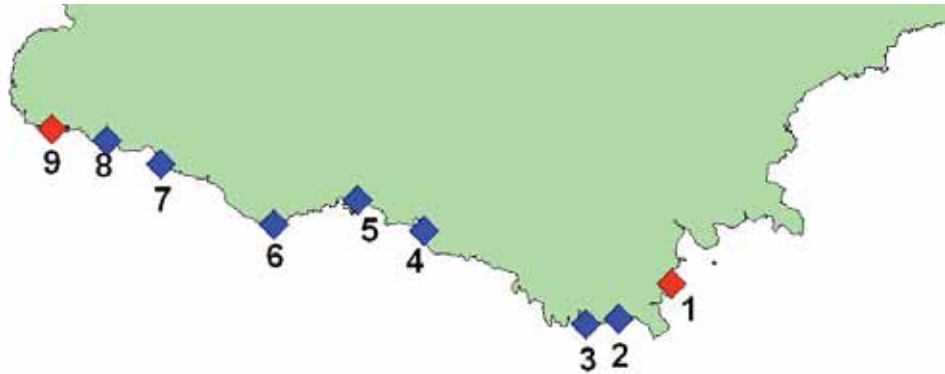
Of the four types of sites available to otters, bays accounted for 22 sites; coves accounted for 16 sites; and of the open coast sites, 6 ledges were formed by bedrock and 4 by rocks or boulders.

**6.2 Otter signs****6.2.1 Positive sites**

Otter signs (spraints) were found at 15 of the 48 sites searched on the mainland coast, and on the islands of Ramsey and Skomer. The location of negative and positive sites for each stretch is shown below in Figs 3a, b, & c.

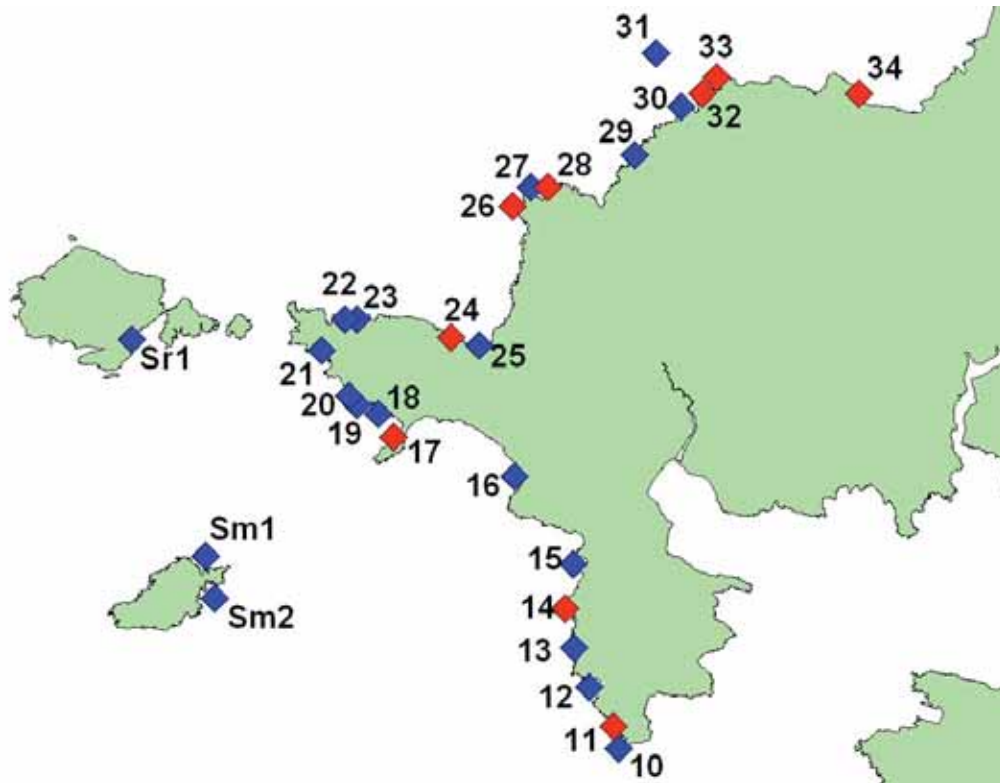
Positive sites were found in each of the three coastal stretches, although of the 10 sites searched from Bosherton to Hobbyhorse Bay, only one (close to Bosherton Lakes) was positive (Fig 3a). Names of sites and six figure OS Grid References are given in Table 1 with positive sites highlighted by a yellow background.

**Fig 3a** Locations of negative (blue) & positive (red) sites Bosherton to Hobbyhorse Bay

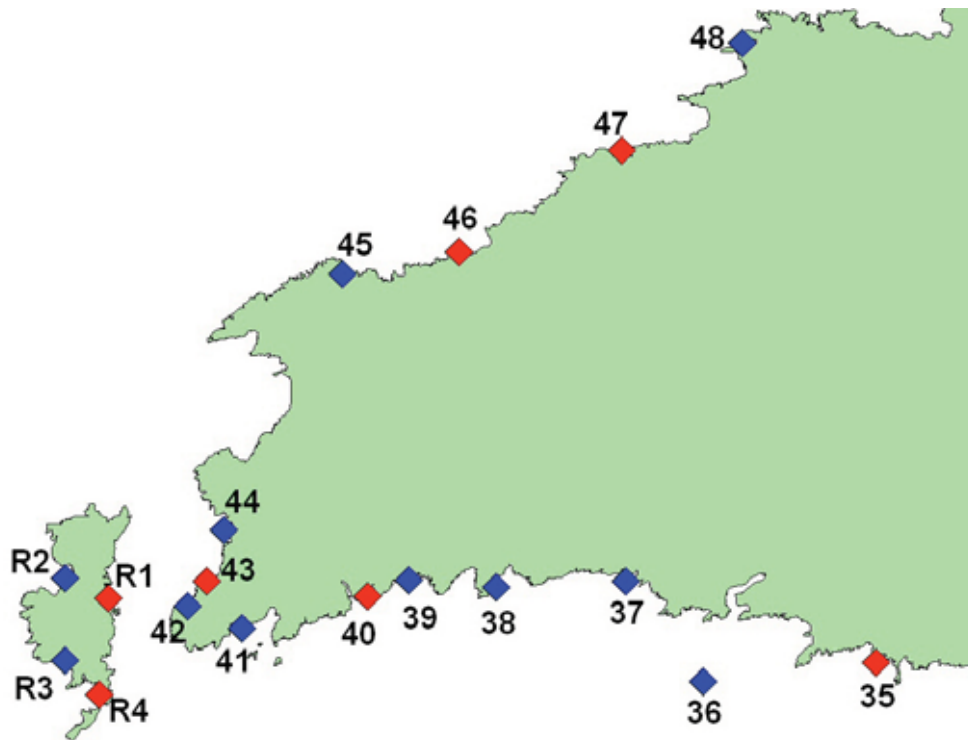


Coastal Outline © Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 [2009].

**Fig 3b** Locations of negative (blue) & positive (red) sites St Ann’s Head to Little Haven



Coastal Outline © Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 [2009].

**Fig 3c Locations of negative (blue) & positive (red) sites Newgale to Porth Egr**

Coastal Outline © Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 [2009].

### 6.2.2 Numbers & 'ages' of spraints

The total numbers of spraints found in each "age" category were: 7 fresh; 15 recent; and 38 old. Fresh, recent and old spraints were found together at one site (Site 1 west of Broad Haven) and at a further six sites two age categories were represented.

### 6.2.3 Sprainting sites

Most sprainting sites were either enclosed cavities within a jumble of rocks/boulders or prominent structures such as bedrock ledges. The tops of large boulders acted as sprainting sites at two of the sites visited. Potential sprainting sites (including cavities and ledges) were recorded at many of the sites where signs were not found.

Sprainting sites were usually some distance back from the apparent high water mark within the bay or cove, and several were either right at the back of the bay very close to the cliff face, or in an elevated position on a high ledge (see Plates 5a & b below).

**Plate 5a** Sprainting site at back of bay. Arrow show location of sprainting site.



**Plate 5b** Sprainting site at elevated position at back of bay. Arrow shows location of sprainting site





#### 6.2.4 Otter Sightings

Sightings of otters using the open coast and marine environment within the Pembrokeshire Marine SAC have been recorded at 23 sites (detailed in Table 3 below). Except for the northern section (from Ramsey Sound to Abereidddy) where no records of sightings have been recorded, otter sightings along the marine SAC coast are well distributed, as shown in Fig 4 below. As well as mainland coastal sightings, reliable sightings of otters have been recorded for the islands of Ramsey and Skomer.

The earliest otter sightings for the Marine SAC coast for which we have records are at Newgale sands in 1975. Three sightings reports come from the 1990s with the majority of sightings (n=14) recorded between 2000 and 2008.

Where descriptions of animals and/or behaviour are available (n=16), 3 sightings describe the presence of cubs; 7 sightings were of otters feeding (for example, on crabs and salmon); 4 reports were of otters travelling (swimming or running along rocks at sea level); and for 2 sightings otters entered scrub.

**Fig 4 Locations of otter sightings along the coast. Information on each of the numbered sites is given in Table 3 below.** (Records of sightings within the Milford Haven Waterway / Daugleddau estuary are not part of this project and are not shown)



Coastal Outline © Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 [2009].

**Table 3 Sightings of otters on the open coast.**

No.	Location	Sighting date (when known)	Seen by:	Details of sighting
1	Pen Pedol	20/04/2008	Allison Ross	Female with cub in her mouth swimming along rocks and came out onto rocks. Cub squeaking.
2	Ramsey Island	24/03/2008	Ffion Rees	Otter seen at 10.11 in Twll y Dillyn, the gap between Ynys Cantwr & the Midland at south end of Ramsey. Otter on its back coasting through with tide which was running strongly.
3	Porth Clais	01/03/2000	J. Edwards	Seen at 11.00. Otter spent most of day at harbour mouth & coast. Feeding
4	Penpleidiâu	03/05/2000	S. Dove	Seen at 15.00 from Penpleidiâu, fishing on rising tide
5	Porth y Rhaw	u/k	E. Daniels	Seen hunting in bay, reported on behalf of late husband
6	Solva Harbour	05/01/2000	Mrs Sendel	Large otter seen at night hunting salmon at top of harbour.
7	Newgale	23/05/1975	Frank Rumming	Seen in 1970s on Newgale sands.
8	Newgale	28/05/1975	Peter Gale	Otter seen running through petrol station forecourt towards the sand dunes
9	Rickett's Head	u/k	Ivor Jones	
10	Broad Haven	20/03/1991	C. Mathieson	Female (assumed) + 2 cubs seen near beach.
11	Skomer Island – South Haven	14/06/1992	Leslie Cook	Sighting from sailing boat.
12	Skomer Island – South Haven	20/09/2002	John & Jayne Kebey	Sighting from sailing boat in South Haven when otter seen running along rocks and swimming.
13	Gateholm	06/09/2004	Andy Davies	Whilst snorkelling (and submerged) he came across a young otter who stared at him for a bit from amongst the kelp!
14	Welshman's Bay	19/04/2008	Colin Scourfield	Walking coast path & saw otter in Welshman's Bay between Long Point & Little Castle Point at 2.30pm about 1.5hrs after low tide. Watched otter for 5 mins.
15	Freshwater West	31/05/2008	Athena Williams	Otter seen at 8.30pm to the left of rabbit island when tide was coming in. Otter ran along the shore then went into the sea in the middle of the bay.
16	Frainslake Beach	Winter 2007/08	Lynne Ferrand	Otter seen eating fish on Frainslake beach.
17	Stack Rocks	10/09/2004	Lynne Ferrand	"Before it entered the scrub the otter 'romped' (it didn't run!!) to the edge of the cliff, from the direction of the Range, where it stopped. On seeing my colleague it 'romped' about 10 yards into the grass and lay down. Just its head was showing. It then wandered into the scrub and curled up".
18	Bullslaughter Bay	07/05/2007	Lynne Ferrand	"Otter was searching around and under rocks at the top of the cliff just south of Bullslaughter Bay on Castlemartin Range. I'd guess by the size of it it was a female and she was running around quite happily upsetting the nesting birds".
19	Broadhaven	u/k	Lynne Ferrand	otter seen but no other details
20	Broadhaven	1996	Robert Foster	Otter watched eating crabs. Long description of sighting available
21	Freshwater East	04/05/2002	Meg Stark	Seen on coast path near Freshwater East.
22	Manorbier Bay	29/09/2008	Howard Fox	Otter seen on beach in Manorbier Bay then ran up sand towards back of beach and into scrub. HF has seen signs of otters regularly (and through summer) on small stream that flows down to Manorbier Bay. Otters appear to come down about every 2 -3 weeks.
23	Manorbier Bay	u/k	Surfer unknown	No information on sighting.

### 6.3 Otter diet

A total of 102 spraints were collected for analysis to identify prey remains. Several other spraints were recorded but not collected because they contained no hard remains. Details of spraint analyses results are shown in Table 4.

**Table 4 Prey in otter diet based on spraints taken from five stretches of open coast (RFO = relative frequency of occurrence)**

<b>3a St Ann's Head to Great Castle Head</b>			
<b>Diet 08/04/2008 (n = 6)</b>	<b>Scientific name</b>	<b>Occurrences</b>	<b>RFO %</b>
<b>Blenny</b>	<i>Blennidae sp</i>	1	9.1
<b>Four-Bearded Rockling</b>	<i>Enchelyopus cimbrius</i>	2	18.2
<b>Plaice</b>	<i>Pleuronectes platessa</i>	1	9.1
<b>Wrasse</b>	<i>Labridae sp</i>	5	45.5
<b>3b Marloes Sands to Musselwick</b>			
<b>Diet 09/04/2008 (n = 6)</b>	<b>Scientific name</b>	<b>Occurrences</b>	<b>RFO %</b>
<b>Fifteen-Spined Stickleback</b>	<i>Spinachia spinachia</i>	1	9.1
<b>Blenny</b>	<i>Blennidae sp</i>	1	9.1
<b>Four-Bearded Rockling</b>	<i>Enchelyopus cimbrius</i>	2	18.2
<b>Flounder</b>	<i>Platichthys flesus</i>	1	9.1
<b>Other Flatfish</b>	<i>Hetrosomata sp</i>	2	18.2
<b>Wrasse</b>	<i>Labridae sp</i>	2	18.2
<b>Newt</b>	<i>Tristurus sp</i>	1	9.1
<b>Avian</b>	<i>Aves sp</i>	1	9.1

### **3c Musselwick to Goulthrop**

<b>Diet 23/04/2008 (n = 13)</b>	<b>Scientific name</b>	<b>Occurrences</b>	<b>RFO %</b>
<b>Eel</b>	<i>Anguilla anguilla</i>	1	3.8
<b>Three-spined Stickleback</b>	<i>Gasterosteus aculeatus</i>	1	3.8
<b>Goby</b>	<i>Gobiidae sp</i>	1	3.8
<b>Blenny</b>	<i>Blennidae sp</i>	9	34.6
<b>Three-Bearded Rockling</b>	<i>Gaidropsarus vulgaris</i>	1	3.8
<b>Four-Bearded Rockling</b>	<i>Enchelyopus cimbrius</i>	6	23.4
<b>Flounder</b>	<i>Platichthys flesus</i>	2	7.7
<b>Plaice</b>	<i>Pleuronectes platessa</i>	3	11.5
<b>Wrasse</b>	<i>Labridae sp</i>	2	7.7

### **3d Newgale to Porth Henllys**

<b>Diet 07/05/2008 (n = 15)</b>	<b>Scientific name</b>	<b>Occurrences</b>	<b>RFO %</b>
<b>Eel</b>	<i>Anguilla anguilla</i>	2	4.3
<b>Fifteen-Spined Stickleback</b>	<i>Spinachia spinachia</i>	1	2.1
<b>Goby</b>	<i>Gobiidae sp</i>	3	6.4
<b>Blenny</b>	<i>Blennidae sp</i>	9	19.1
<b>Brown Trout</b>	<i>Salmo trutta</i>	3	6.4
<b>Three-Bearded Rockling</b>	<i>Gaidropsarus vulgaris</i>	1	2.1
<b>Four-Bearded Rockling</b>	<i>Enchelyopus cimbrius</i>	8	17.0
<b>Plaice</b>	<i>Pleuronectes platessa</i>	1	2.1
<b>Other Flatfish</b>	<i>Hetrosomata sp</i>	3	6.4
<b>Cottidae</b>	<i>Cottidae sp</i>	2	4.3

<b>Wrasse</b>	<i>Labridae sp</i>	6	12.8
<b>stone loach</b>	<i>Nemacheilus barbatus</i>	1	2.1
<b>Crustacean</b>	<i>Carcinus sp</i>	6	12.8
<b>Unidentified fish</b>		1	2.1

**3e Broad Haven to  
Hobbyhorse Bay**

Diet 11/05/2008 (n = 4)	Scientific name	Occurrences	RFO %
<b>Eel</b>	<i>Anguilla anguilla</i>	1	12.5
<b>Blenny</b>	Blennidae sp	2	25
<b>Cottidae</b>	Cottidae sp	2	25
<b>Wrasse</b>	<i>Labridae sp</i>	1	12.5
<b>Unidentified fish</b>		1	12.5
<b>Newt</b>	<i>Tristurus sp</i>	2	25

$\text{RFO \%} = \frac{\text{Number of occurrences of a prey group}}{\text{Total occurrences for all prey groups}} \times 100$
--

Total spraints analysed =  
102

## 6.4 Features of importance to otters

### 6.4.1 Fresh water

The presence of significant amounts of fresh water that could be used by otters for washing and drinking - usually a water fall (see Plate 6 below) or relatively large pool of water - was recorded at 15 sites.

**Plate 6** Fresh water available to otters.



Otter signs were found at 7 of the 15 sites with useable fresh water.

### **6.4.2 Rockpools**

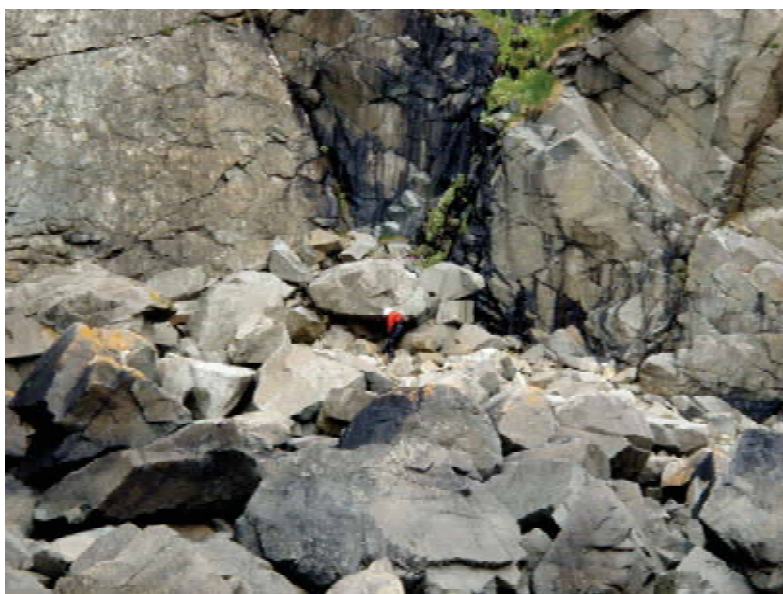
Rock pools were recorded at 8 sites, but otter signs were found at only two of these.

### **6.4.3 Resting sites**

Specific features likely to be used by otters for lying up during the day were found at 22 of the 48 sites searched. Of the 22 sites with potential resting sites, 11 also had useable fresh water.

Most potential resting sites (19 of the 22 sites) are provided by cavities within rocks, formed typically from a rock fall from the cliff (Plate 7). Where rock falls have left an extensive jumble of rocks or boulders, many cavities are available to otters. Some cavities are deep with relatively small entrances so that otters would be well hidden.

#### **Plate 7 Potential resting sites in rock cavities.**



At the remaining three sites the potential resting sites were in dense scrub on the lower scree-like slope beneath the cliff (Plate 8).

#### **Plate 8 Potential resting site in dense scrub**



## 6.5 Threats & issues

### 6.4.1 Disturbance at potential resting sites

Three examples of human activities that could potentially disturb otters using potential resting sites along the coast for lying up during the day were noted during the survey period. At one site a group of three people in dry suits were engaged in coasteering (swimming and scrambling along the base of cliffs and into bays and coves). At a second site a group of rock climbers used a cliff face (see Plate 9) between sites 37 and 38 (west of Solva). At a third site sea anglers had climbed down the cliff to reach rock platforms from which they could cast.

Although only one group of people were seen coasteering during the survey, CCW report that it is becoming more popular, and can take place anywhere along the coast (Bob Haycock, pers com.). If the popularity of coasteering continues to increase it may become a significant threat to otters if they are lying up in coves and bays.

Sea angling takes place from beaches or where there is cliff access down to a rock promontory or ledge as in Plate 10 below. Sea angling takes place during both the day (for species such as mackerel) and night. At Frainslake beach, for example, night fishing takes place mainly for sea bass and several anglers have reported otter sightings (Lynne Ferrand, pers com). Sea angling also takes place from small boats and sit-on kayaks.

As well as the potential indirect threat of disturbance to otters from sea fishing there is also the direct threat to individual animals from debris left by anglers. Lynne Ferrand (Ranger, Defence Training Estate Pembrokeshire) reports cases of bird entanglement in discarded fishing line and hooks on the Pembrokeshire coast. As sea angling is a popular activity and carried out by large numbers of anglers, the potential for otters to become entangled is probably high.

The use of sea canoes and kayaks appears to be increasing along the Pembrokeshire coast (G. Liles, pers obs) with relatively inexpensive plastic sit-on kayaks that are ideal for sea conditions now easily available. Bays and coves that were previously difficult for people to reach can now be accessed and explored. If otters lie up in bays and coves this activity could introduce significant disturbance to otters, and particularly if bays and covers are used for over-night camping.

#### Plate 9 Rock climbers on cliff face close to sites 37 & 38



### 6.5.2 Crustacean traps

Buoys marking the position of crustacean traps were recorded along the entire length of the coastline surveyed, but with most gear recorded in St Brides Bay and less to the north of Ramsey Sound and along the southern coastline. Along the open coast the number of buoys at any one location was usually small (between 1 and 10), but close to small harbours (where access for casual rather than commercial fishermen is easier) much larger groups of buoys were found (for example at Site 34 in Plate 11 below).

Most of the crustacean traps were set within 100m of the cliffs, with many set less than 50m from the cliffs (an example is shown in Plate 12 below).

**Plate 10** Group of sea anglers on rock ledge



**Plate 11** Group of buoys with fishing vessel



**Plate 12** Two white buoys marking the position of crustacean traps set less than 50m from the base of the cliff (at a site used by otters).





## 7. DISCUSSION

### 7.1 Availability of sites suitable for otters.

Although the entire marine SAC coast was scanned from the boat, sites thought to be suitable for otters where access for the animals is likely to be from the sea rather than from land, were found in 3 stretches of mainland coast and the islands where there are high cliffs with bays, coves or rock platforms.

Two long stretches of coast - the west facing coast of St Brides Bay from the village of Broad Haven to Newgale, and Freshwater West / Frainslake - were not surveyed because the coastline is mainly low-lying and provides otters with easy access from the land. On several shorter stretches the cliffs were sheer down to the sea and so are unlikely to provide otters with opportunities to leave the water.

On the islands the number of sites that could be searched was limited by the need to avoid bird nesting sites, and by the exposed nature of parts of the islands that meant that tidal swells made boat and swimming access dangerous.

Results of the survey indicate that there are many suitable sites along the open coast and on the islands where otters can hunt in relatively shallow water (2 – 3m deep) in kelp and wrack beds, and where they can get land access from the sea to sheltered coves and bays for feeding on large prey; territorial spraint marking; and for lying up during the day.

### 7.2 Otter activity

The results of these surveys, together with otter sightings records and spraint analyses results indicate that otters are using much of the Pembrokeshire Marine SAC coast and islands for travelling, foraging and territory marking.

Table 5 shows the straight-line distances between the numbered survey sites on the open mainland coast with signs of otters and the nearest coastal stream. Although some sites are within several hundred metres of a watercourse, most are between 1000 and 6000m distant, with one site 12000m away.

**Table 5 Distances in metres from open mainland coast sites with otter signs to the nearest coastal stream.**

Site No.	Distance to stream (m)	Stream Name
1	1100	Bosherston Lake
11	6000	Dale/Mulloch estuary
11	5100	Marloes Stream
14	3100	Marloes Stream
17	12000	Marloes Stream
24	4000	St Brides
26	1800	St Brides
28	1000	St Brides
32	450	Mill Haven Stream
33	800	Mill Haven Stream
34	1200	Little Haven stream
35	950	Porth mynawyd stream
40	700	River Alun
43	2600	Porthlysgi Bay stream
46	0	Porth y Dwlfr stream
47	1300	Porth y Dylfr stream
Ramsey 1	4300	River Alun
Ramsey 4	3000	Porthlysgi

Skomer 1	5000	Marloes stream
----------	------	----------------

Straight line distances to the islands from the nearest coastal streams are:

- Ramsey – to Porthlysgi = 3000m
  - to Afon Alun = 4300m
  - to Whitesands stream = 3300m
- Skomer – to Marloes Stream = 5000m
- Skokholm – to Marloes Stream = 4200m.

The numbers and relative ages of spraints found at individual sites (for example, 2 fresh and 2 old at Gateholm; 2 recent and 4 old at Hopgang; 1 recent and 9 old at Porth Coch Mawr; and 1 recent and 9 old at one of the sites on Ramsey island), suggest that otters make regular use of the coast, at least during Winter and Spring (as indicated by the presence of recent and/or old spraints at most sites). In Portugal, where individual otters also occupy home ranges that include marine and freshwater habitats, marine prey was most important during the Autumn and Winter, with freshwater species more important during the Spring and Summer (Beja, 1991). However, during this Spring survey fresh spraint was found at Sites 1, 17 and 26. Sites 1 and 26 are relatively close to a coastal stream (within 1100m and 1800m respectively), but the distance from the nearest coastal stream to Site 17 is 12000m. It is possible that, unlike Portugal, marine species may form an important part of the otter's diet into the Spring and Summer.

Although the surveys provide a good indication of otter activity along the coast, it should be noted that the distribution of spraints does not necessarily reflect usage of different parts of the coastline because some spraints are deposited below the tide line and will be washed away (Kruuk, 2006).

As well as travelling from site to site through the sea there is evidence that otters are also travelling along land at the top of the cliffs, often using the existing coastal footpath. Lynne Ferrand reports sightings of otters on the cliff top at Stack Rocks in September 2004 (the otter was first seen in the grass and curled up in scrub), and at Bullslaughter Bay on Castlemartin Range in May 2007 (the otter was searching around and under rocks at the top of the cliff). Otter spraint was found on a coastal footpath stile on the north side of Marloes Peninsula (close to Site 24 Hopgang where spraints were found during the boat survey) in August 2008 and (twice, three years apart) on a small, concrete, coast path footbridge over a small stream draining irrigation ponds northwest of St Brides Haven (Blaise Bullimore, pers com) between sites 29 and 30 which were both negative during the current field survey. Spraint has also been found on other parts of the Pembrokeshire coastal path (G. Liles, pers obs; M. Baines, per com).

Of particular significance are the two reported sightings of female otters with young cubs – a female with a cub in her mouth at Pen Pedol opposite Ramsey Island in April 2008, and a female with two cubs near the beach at Broad Haven in March 1991. The presence of young cubs suggests that the breeding sites for the females were very close to the coast.

Although potential resting sites were found along the mainland coast at 22 of the 48 sites searched, only 10 sites with resting sites also had signs of otters. Of the 10 positive sites with resting sites, only 5 also had fresh water.

Evidence that would indicate that otters lie up within bays and coves would be difficult to find in most of the sites that were searched. The majority of potential resting sites are in rock cavities where the floor of the cavity (and therefore the bed for the otter) is formed by stones or rock that leave no evidence of use. Resting sites in freshwater

habitats can be identified from a variety of features, such as dish-shaped, usually 400mm diameter scrapes in earth where otters have curled up to sleep, often with a path from the water to the resting site; couches formed by vegetation and sticks; and well-trodden paths from water into enclosed cavities such as tree root systems (G. Liles, unpub data). Potential resting sites in dense scrub were found only on the mainland, at three sites: Hoptang (Site 24); Goultop Road (Site 34) and by Carn y wig (Site 43). A very obvious mammal path leading from the rocks into the scrub was found at Sites 24 and 43, but there was no fresh water present at either of these sites.

All three islands provide otters with potential resting sites and access to fresh water, and/or access up to the cliff tops. On Ramsey there is easy access for otters to the cliff top at Ynys Gwelltog where otter signs were found, and close to a recorded otter sighting (reported by Ffion Rees – see Table 3). On Skomer Island otters can reach the cliff top via South Stream in South Haven. There is also access for otters onto Skokholm Island, at North Haven.

The presence of potential resting sites with fresh water in bays and coves along the mainland coast and islands suggests that otters may lie up here during the day. If this is not the case, otters will be travelling to coves and bays from coastal streams. In a radio-telemetry study of otters on the Atlantic coast of Portugal (a coastline with tall, exposed cliffs, few shingle or sandy beaches, and several small permanent fresh water streams) otters were found to lie up in the coastal streams but travelled out to hunt almost exclusively in the sea (Beja, 1995a and 1996b).

Another possibility, that might enable otters to lie up close to the open coast whilst having access to both fresh water and the sea, should be considered. Although five of the coves and bays where otter signs were found are completely inaccessible from the land due to sheer, high cliffs (e.g. Site 32, Plate 13), 10 of the positive sites have scree or rock slopes that could be climbed by otters (e.g. Site 35, Plate 14). It is interesting to note that obvious and well-used mammal (possibly otter) paths were recorded at two of the sites (Sites 24 and 43) where there is an easy route for otters between cliff top and the sea. Once on the cliff top otters will have access, at some sites at least, to fresh water pools or small watercourses and to potential resting sites in cliff-top scrub.

**Plate 13      Cove with sheer cliffs inaccessible to otters**



**Plate 14** Cove with slope to cliff top accessible to otters



Although a relatively low number of spraints were found and analysed for prey remains, it is very noticeable that all spraints found were dominated by marine fish species. Of the 5 sites for which data is available, blenny and wrasse occurred at all sites, and four bearded rockling and flatfish (mainly plaice and flounder) occurred at 4 sites. Other marine species included goby, three bearded rockling and fifteen spine stickleback. Eel, newt and bird were also recorded.

Of the marine species taken by otters it appears that the most important are the four bearded rockling, blenny and wrasse, suggesting that otters are targeting their foraging in areas of rocky coast with beds of wrack and kelp. Otters also feed in rock-pools, taking species such as the fifteen spine stickleback. However, rock-pools were

recorded at only 5 of the 48 sites searched, and the fifteen spined stickleback occurred at only 2 sites. No rock-pools were found on the islands.

### **7.3 Threats & Issues**

The threat of disturbance to otters using the open coast is probably low at present, and particularly from rock climbing and sea angling, activities that are carried out at only a small number of specific sites.

The major potential threat of disturbance is likely to come from the increasingly popular sports of coastering and sea canoeing, both of which enable people to reach coves and bays that are normally inaccessible and undisturbed. However, this will only be a problem if otters are using these sites for lying up during the day.

The threat to otters from the many crustacean traps set close in to the coast is likely to be very significant. Otter deaths in lobster and crab traps have been recorded from many parts of Europe, with records in the UK dating from the 1800s to the present day (Jefferies, Green & Green, 1984). Information on otter deaths in crustacean traps is sparse because cases are rarely reported. However, an indication of the potential level of threat that this poses is seen from the results of a survey of otter mortality in lobster creels off the east coast of South Uist (Twelves, 1983). Over a period of three seasons a total of 22 otters were recorded drowned.

Crustacean traps are set in all areas used by otters for foraging, and are likely to pose a threat at any of these locations. However, it was noticeable that larger numbers of traps were set close to small harbours. As many of these small harbours (e.g. Solva) are located on the outflow of coastal streams that support otters it is likely that there will be a higher risk of accidental drowning in these areas.

Two types of crustacean traps, the inkpot trap and the Parlour pot are in use on the Pembrokeshire coast, although the latter is thought to be in much greater use (P. Coates, Sea Fisheries Committee for south & west Wales).

The threat to otters of oil contamination as a result of an oil spill is relatively high on the Pembrokeshire coast because of the tanker traffic to the refinery at Milford Haven. The grounding of the Sea Empress close to Milford Haven in 1996 resulted in the loss of 72000 tonnes of crude oil (Conroy unpub data). Although no oiled otters were found after the oil spill, there was evidence that otters were visiting the shore from coastal streams during that time (G. Liles, pers obs).

Oil contamination threatens otters in two ways. First, oil on the fur (and even small amounts) reduce or destroy the animal's insulation, leading to hypothermia. Second, ingestion of oil introduces toxic chemicals, particularly hydrocarbons that accumulate in blood and tissues.

## **8. CONCLUSIONS**

This project has demonstrated that otters are now using the open coast and islands of the Pembrokeshire Marine SAC, and are travelling in the sea away from coastal streams (often for distances of several kilometres) to forage in the marine environment, at least during the Autumn and Winter, and into Spring. A study of prey remains from spraints collected from coastal stream sites over a 12 month period (Parry 2008) has demonstrated that otters are feeding in marine environments throughout the year. Otter use of coves and bays on the open coast away from coastal streams during the Spring and Summer is unknown. Additional information (otter sightings and spraint) suggests that otters are also using cliff tops, often travelling along coastal footpaths.

The marine environment, coastline and coastal streams may be an important component of the habitats that sustain otter populations in Pembrokeshire, given the length of coastline, relative diversity and abundance of prey in the marine environment, the quality of habitats in coastal streams for lying up and breeding, and the relatively small size (and limited food availability) of most coastal streams.

One of the objectives of this project was to assess the efficacy & cost effectiveness of using boat and surveyors in dry suits to survey for otters in the marine environment. The overall conclusion is that the methodology is an efficient and cost effective way of covering large stretches of coastline and for reaching otherwise inaccessible areas and sites. Over a period of only six days the entire Pembrokeshire coastal SAC was surveyed from the boat, and detailed investigations carried out at 48 mainland and 8 island sites.

## 9. CONSERVATION RECOMMENDATIONS

In view of the continuing threats to otters on many freshwater systems (e.g. the decline in eel numbers entering UK rivers, pollution from sheep dips, and land-use pressures on river & wetland habitats), it is recommended that:

- 9.1 Further research** on otter use of the coast is undertaken to determine:
- seasonal patterns of otter use of the open coast and islands within the Pembrokeshire SAC;
  - whether otters are lying up along the open coast and islands;
  - the location of major feeding sites along the coast.
- 9.2 Monitoring** is undertaken of activities such as coasteering and sea canoeing that are likely to cause disturbance to otters.
- 9.3 A Conservation Management Plan** is established to further increase information on otters using the coast; tackle threats; safeguard areas and habitats important to otters; and raise awareness about otter activity and use of the Pembrokeshire Marine SAC. Specific tasks could include:
- To continue the recording of otter activity along the coast, including otter surveys and sightings;
  - Work with crab & lobster fishermen to research and tackle the threat to otters from crustacean traps (and other fishing methods);
  - To work with the Planning Authorities to ensure that coastal developments and maintenance of coastal structures do not introduce physical barriers to otters;
  - Setting up a simple mechanism for responding quickly to oil spill events on or near the Pembrokeshire coast so that otters can be found and dealt with;
  - Establishing “Otter Haven” areas along the coast which are protected from disturbance (by, for example, coasteering and sea canoeing activities);
  - Promoting “Have you seen an otter” campaigns for the coast amongst locals and visitors.

## **10. ACKNOWLEDGEMENTS**

This project was funded by the Pembrokeshire Marine SAC Relevant Authorities Group and managed by Sue Burton, the Pembrokeshire Marine SAC Officer.

I'm particularly grateful to Sue for ensuring that the research could be undertaken, and for organising the logistics. Sue was also the co-surveyor on each of the surveys, and it was a great pleasure working with her.

Both Blaise Bullimore (Carmarthenshire Bay Marine SAC Officer & acting SAC officer whilst Sue was on maternity leave) and Sue provided a great deal of help with the production of maps for the report; additional information; and comments and amendments for the report text.

In order to carry out the field work we relied very heavily on the skill, resources and time of the Skomer Marine Nature Reserve staff (Phil, Kate, Mark and Rob), Voyages of Discovery (and especially Ffion Rees), Pembrokeshire Dive Charters, Bob Haycock (CCW), Lynne Ferrand (PCNPA), and the volunteers Andy Davies, Chris Williams, Maggie Humble. Thanks too to all the 2007-8 coastal otter volunteers whose information helped to inform the survey and determine the sites selected, and to everyone who took the time to report their otter sightings.

I'm also extremely grateful to Gareth Parry at Swansea University who undertook the painstaking work of analysing spraints, and providing statistical analyses of the results.



## 11. REFERENCES

- Beja, P.R. (1991). Diet of otters (*Lutra lutra*) in closely associated freshwater, brackish and marine habitats in south-west Portugal. *J.Zool., Lond.* 225, 141 – 152.
- Bradshaw, A.V. & Slater, F.M. (1999) R&D Project W1-019, Dead otters: Postmortems and Tissue Analysis. R&D Technical Interim Report. Llysdyman Field Centre, Cardiff School of Biosciences.
- Erlinge, S. (1967) Home range of the otter *Lutra lutra* in Southern Sweden. *Oikos*, 18, 186-209.
- Green, J., Green, R., and Jefferies, D.J. (1984). A radio-tracking survey of otters *Lutra lutra* on a Perthshire river system. *Lutra*, 27, 85-145.
- Hall, C. (2002). A pilot study of the coastal ecology of the otter (*Lutra lutra*) in North Wales. Unpublished report.
- Heggberget, T.M. (1993). Marine-feeding otters (*Lutra lutra*) in Norway: Seasonal variation in prey and reproductive timing. *J. Mar.Biol. Ass. U.K.* 73, 297-312
- Heggberget, T.M. (1995). Food resources and feeding ecology of marine feeding Otters (*Lutra lutra*). In *Ecology of Fjords and Coastal Waters*. Elsevier Science B.V.
- Heggberget, T.M. and Moseid, K.-E. (1994). Prey selection in coastal Eurasian otters *Lutra lutra*. *Ecography* 17: 331-338.
- Heggberget, T.M. and Moseid, K.-E. (1995). Coastal otter habitats and exposure of otters to offshore oil spills. *Proceedings VI International Otter Colloquium Pietermaritzburg 1993* (eds. C. Reuther & D. Rowe-Rowe).
- Jeffries, D., Green, J., and Green, R. (1984). Commercial fish and crustacean traps: a serious cause of otter (*Lutra lutra*) mortality in Britain and Europe. Vincent Wildlife Trust, London.
- Jenkins, A.L. (1982) Otter distribution on the Western Cleddau. Vincent Wildlife Trust/ Nature Conservancy Council, Aberystwyth. 91pp.
- Kruuk, H. (1995) *Wild Otters. Predation and Populations*. Oxford University Press, Oxford.
- Kruuk, H. (2006) *Otters, Ecology, behaviour and conservation*. Oxford University Press, Oxford.
- Kruuk, H., Nolet, B. & French, D. (1988). Fluctuations in numbers and activity of inshore demersal fishes in Shetland. *Journal of the Marine Biological Association*. UK. 68, 601-617
- Kruuk, H. & Balhary, D. (1990). Effects of water on thermal insulation of the otter *Lutra lutra*. *J. Zool. London* 220: 405-415
- Kruuk, H., Conroy, J.W.H. & Moorhouse, A. (1991). Recruitment to a population of otters (*Lutra lutra*) in Shetland, in relation to fish abundance. *J. Applied Ecol.* 28: 95 - 101
- Kruuk, H., Wansink, D. & Moorhouse, A. (1990). Feeding patches and diving success of otters, *Lutra lutra*, in Shetland. *Oikos* 57: 68 – 72
- Liles, G. (2000) An audit of the otter (*Lutra lutra*) on the Gower Peninsula. A report for the Environment Agency Wales.
- Liles, G. (2003a). Otter (*Lutra lutra*) activity and habitat availability on the Pembrokeshire coast and Milford Haven estuary, within the Pembrokeshire Marine SAC. A report for the Pembrokeshire Marine SAC Relevant Authorities Group. Milford Haven.
- Liles, G. (2003b). Enhancing the status of the otter. *Conserving Natura 2000 Rivers Conservation Techniques Series 5*. English Nature, Peterborough.
- Liles G. (2003c). Current and Potential Distribution, Condition and Breeding Success of the Otter in the Afon Teifi catchment area. Countryside Council for Wales (Bangor).
- Liles G. & Colley R, (2000) Otter *Lutra lutra* road deaths in Wales: Identification of

- Accident blackspots and establishment of mitigation measures. A report for the Environment Agency Wales.
- Macdonald, S.M. & Mason, C.F. (1980). Observations on the Marking Behaviour of a Coastal Population of Otters. *Acta Theriol.* 25, 19: 245-253
- Moorehouse, A. (1988). Distribution of holts and their utilisation by the European Otter (*Lutra lutra* L.) in a marine environment. MSc. Thesis, University of Aberdeen.
- Nolet, B.A & Kruuk, H. (1994) Hunting yield and daily food intake of a lactating otter *Lutra lutra* in Shetland. *J. Zool.* 233 no.2 pp326-331
- Nolet, B.A., Dennis, E.H., Wansink, & Kruuk, H. (1993). Diving of otters (*Lutra lutra*) in a marine habitat: use of depths by a single-prey loader. *Journal of Animal Ecology* 62, 22-32.
- Parry, G.S. (2008). Diet of the Eurasian otter (*Lutra lutra*) with the Pembrokeshire marine SAC region. Swansea University. Swansea.
- Philcox, C.K., Grogan, A.L. & Macdonald, D.W. (1999). Patterns of otter (*Lutra lutra*) road mortality in Britain. *Journal of Applied Ecology*, 36, 748-762.
- Potts, G.W. & Swaby, S.E. (1993). Marine & estuarine fishes of Wales: The development of the British marine fishes database and monitoring programme for Wales. The Countryside Council for Wales/Marine Biological Association. Contract No. FC 73-01-53.
- Potts, G.W. & Swaby, S.E. (1993). Marine & estuarine fishes of Wales. The Countryside Council for Wales/Marine Biological Association. Contract No. FC 73-01-53.
- Strachan, R. Williamson K, Hall C & Baylis J. (2005). Dietary Study of Otters using the coast of North West Wales. Species Challenge Project Report. CCW
- Watson, H.C. (1978) Coastal otters in Shetland. The Vincent Wildlife Trust, London.

Appendix Articles on the coastal otter project. Pembrokeshire Life magazine, June 2008

# Otters are making a comeback to Pembrokeshire's rivers and coastline and a new survey is charting their progress

## Otter patrol



After a massive decline in numbers in the 1960s, otters are re-establishing themselves in the Pembrokeshire countryside.

HOW many of you are on the coast or in the sea around Pembrokeshire? If so, your information could help complete a survey currently being conducted for the Pembrokeshire Marine Special Interest Area. Pembrokeshire is an ideal and important county for our native otter. After the massive decline in numbers during the 1960s when this beautiful but elusive animal disappeared from most Welsh rivers, otters have made a remarkable recovery.

They now inhabit most of Pembrokeshire's rivers, and have even been spotted swimming along the river in Havenhead!

But otters are not restricted to fresh water habitats. They are known to swim in salt water, in estuaries, bays, harbours, and even divers, where they are venturing into the sea, swimming and from our estuaries and freshwater rivers and streams to hunt for crabs and marine fish along the coast.

A pioneering project set up by Geoff Liles of The Otter Consultancy and Sue Burton, officer for the Pembrokeshire Marine Special Area for Conservation, is surveying otters in the county. A team of the coast is used by others. Their aim of the coast is to map the otter's range and are searching for other signs in rocky areas that cannot be reached from land along the coast and islands.

"This is really exciting research," said Sue, who is working with the support of the hill-ford Havenport Authority. "The otter is one of the special animals of this area. Specialised by the coast and islands. It is a species that we do not have elsewhere in the county and what we're looking for is the coast and islands."

As well as the best surveys, land-based otter surveys of the coast have been carried out during the past year by trained volunteers, and the information they provide is helping to shed light on seasonal differences in the use of the coast by otters.

Both the best survey and volunteer

count surveys rely on finding – and marking – droppings. "We leave their droppings at prominent sites as territory markers, so once you know what to look for they're easy to find."

"A lot of canoe, droppings contain bits of bones and fish scales, so by collecting and analysing these we can find out what others are eating."

"I thank goodness their droppings smell sooty!"

Findings from the initial survey have been analysed and the results were revealed last month.

Sue said, "In our first completed survey, spruce has been found all around the Pembrokeshire coastline, including Stennis, Skokholm and Ramsey, the only exception being some southern parts of the county."

The diet of other otters depends on the location, but about 10% of food is eaten daily – mostly fish, amphibians, and crustaceans.

Otters are territorial animals and use deposits of faeces called sprouts, as well as other signs, to mark their territories. They also frequently used pathways or 'runs'.

IN Wales, otters are generally nocturnal (generally those living on Scotland's coast tend to be active throughout the day).

There is a variety of freshwater habitats or coastal areas where freshwater pools are available for drinking and bathing close to shore.

Female otters give birth to two or three young in a burrow or 'hull' dug with mud and lined with dry grass. Young animals remain with their mother for up to a year.

As the young animals grow the feeding range of family groups increases, with adult males travelling as much as 100 miles from their home.

The diet of other otters depends on the location, but about 10% of food is eaten daily – mostly fish, amphibians, and crustaceans.

Otters are territorial animals and use deposits of faeces called sprouts, as well as other signs, to mark their territories. They also frequently used pathways or 'runs'.

### Celtic Vision

PROFESSIONAL VIDEO AND PHOTOGRAPHY

Range of high quality equipment from the world's best brands

**MANFROTTO** Complete range of video and tripods from the world's best

**NIKON** Complete range of video and tripods from the world's best

We stock the largest selection of professional and wedding equipment in West Wales

Also visit us to see our full range of equipment

Maximum savings of over 15% on our prices 0900 55 55 55

Call and visit us for knowledge, advice and competitive prices

66 St. James Street  
Narberth Pembrokeshire  
01854 869125

Monday - Friday 9am - 5pm, Saturday 9am - 4pm  
Buy online at [www.westwalesbusiness.co.uk](http://www.westwalesbusiness.co.uk)

### CAPE Collections

Cape Country Pine Furniture for Life

- Visit our showrooms on the main road through Jervisville, Havenhead
- Most furniture in stock with free delivery throughout Pembrokeshire
- Greater service
- Free hand-painting service using a water based paint
- Furniture, tables and chairs
- Seals and Benches
- Lounge and Dining room furniture
- Gifts
- Cushions
- Mirrors
- Bedspreads
- Airpot umbrellas

An outstanding range of high quality furniture, in the heart of the Pembrokeshire coast

CAPE Collections, The Showroom, 20 St James Road, Narberth, Pembrokeshire SA67 2PE  
Email: [info@capecollections.co.uk](mailto:info@capecollections.co.uk)

Tel: 01547 890000 [www.apecollections.co.uk](http://www.apecollections.co.uk)

### QUALITY COOKWARE AND KITCHEN ACCESSORIES

Wedding gift list available  
Open Mon-Sat, 9am to 5.30pm

**DYMENTS**  
Quality Cookware

Simply the best!

60 St James Street, Narberth, Pembrokeshire  
SA67 2DA Tel: 01854 861105  
[www.dymentsofnarberth.co.uk](http://www.dymentsofnarberth.co.uk)

Western Telegraph, May 2008

westerntelegraph.co.uk/news

County news • Wednesday, May 14th, 2008 | 21

the message is  
**TENBY**



# Take note if you spot an otter

**OTTER** spotters are being asked to report sightings from around the coast.

Information is being gathered for a survey conducted for the Pembrokeshire Marine Special Area of Conservation (SAC).

Otters live in the county's rivers, streams and lakes and have even been seen swimming through Haverfordwest.

Recent surveys, and sightings by sailors, walkers, fishermen, and divers, show that otters

are venturing into the sea, swimming from estuaries and freshwater rivers. A project set up by Geoff Liles, of Otter Consultancy and Sue Burton, officer for the Pembrokeshire Marine SAC, is now underway to discover how much of the coast is used by otters.

Sue said: "This is really exciting research. The otter is one of the special features of this Marine SAC, and it's important that we find out how

they're using the coast and what they're feeding on."

A boat survey and volunteer coast surveys rely on collecting otter droppings, and analysing them to find out what the otters are eating. Sue and Geoff are keen to receive records of otter sightings on or near the coast.

Send information to Geoff Liles on 01239 682861 or e-mail: [geoff@otterconsultancy.plus.com](mailto:geoff@otterconsultancy.plus.com).



PICTURE: Sue Burton.