



Sue Burton



Kate Lock

# Milford Haven Waterway Seasearch 2007 Biodiversity Action Plan Species and Habitat surveys



Leon Hopkins



Kate Lock



Sue Burton



**The Milford Haven waterway** is a ria-estuary, an uncommon estuary type restricted in the UK to SW England & Wales. The Milford Haven waterway is the only example of its kind in Wales and the largest ria-estuary complex in the UK. The waterway is encompassed within the Pembrokeshire Marine SAC - a designation that recognises its unique and diverse marine species and habitats as being of European importance.

This is historically one of the best studied areas of sea around the UK; marine biological research work has been focused throughout the area since the production of the Dale Fort *Marine Flora and Fauna* in 1966. The presence of the Field Studies Council's Oil Pollution Research Council through 1967-1999 helped ensure that Pembrokeshire firmly remained one of the prime sites for marine scientific research. Today the Milford Haven Waterway Environmental Surveillance Group and various visiting universities, colleges and others including Seasearch continue to study the waterway's marine environment.

The natural deep water harbour of the Milford Haven ria also provides opportunities for many diverse human activities; it is the reason why the port and its maritime industries can exist here. Milford Haven is the biggest port in Wales and the fifth busiest port in the UK. The presence of 2 oil refineries, 1 oil storage unit, and the Port of Pembroke Dock with its ro-ro Irish Ferry and MoD activity all result in a considerable amount of shipping; 9981 movements were recorded in 2004. The current development of 2 LNG (liquid natural gas) terminals and potentially 2 power stations and a bio-diesel facility will increase shipping movements and usage of the port considerably. The waterway is also an important resource for the fishing industry and popular with recreational users. With its plethora of moorings and two existing marinas at Neyland and Milford (and proposed new marina development at Pembroke Dock), it acts as a gateway for many boat users to the rest of the Pembrokeshire coast. Although the waterway has been well studied relative to other marine areas, the co-existence of its extremely varied species and habitats, combined with the diversity and intensity of human activity provide an important arena for monitoring potential impacts and change.



Milford  
Haven Pot  
Authority

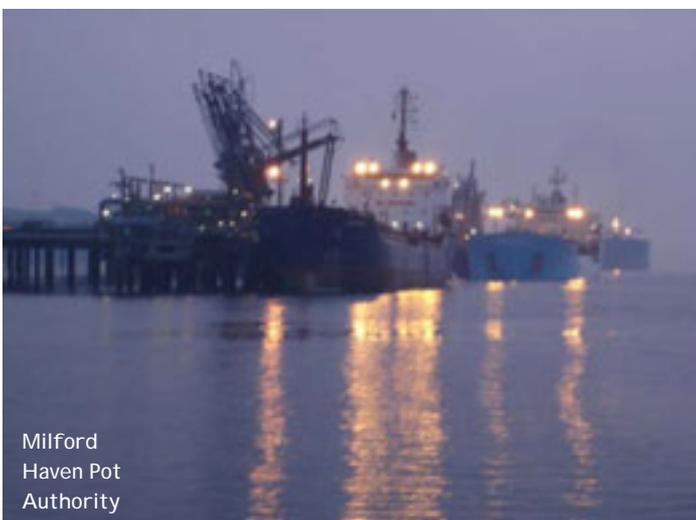
### UK Biodiversity Action Plan (BAP)

Recognising the decline in species and habitats, the UK Government has established a list of habitats and species in need of priority conservation action through its Biodiversity Action Plan (BAP). Through the BAP process, there is a UK-wide drive to conserve and enhance threatened species and habitats. The UK BAP

list of habitats and species has contributed to a Welsh BAP list, which contains additional marine listings to better reflect the marine conservation needs of Wales -

<http://www.biodiversitywales.org.uk>.

Basic information such as 'what is where?' and 'how much?' is lacking for marine BAP habitats and species. Seasearch surveys undertaken in the Milford Haven waterway, which hosts many marine BAP habitats and species, provides valuable data on distribution, and possible early indications of change.



Milford  
Haven Pot  
Authority

## Seasearch 2007

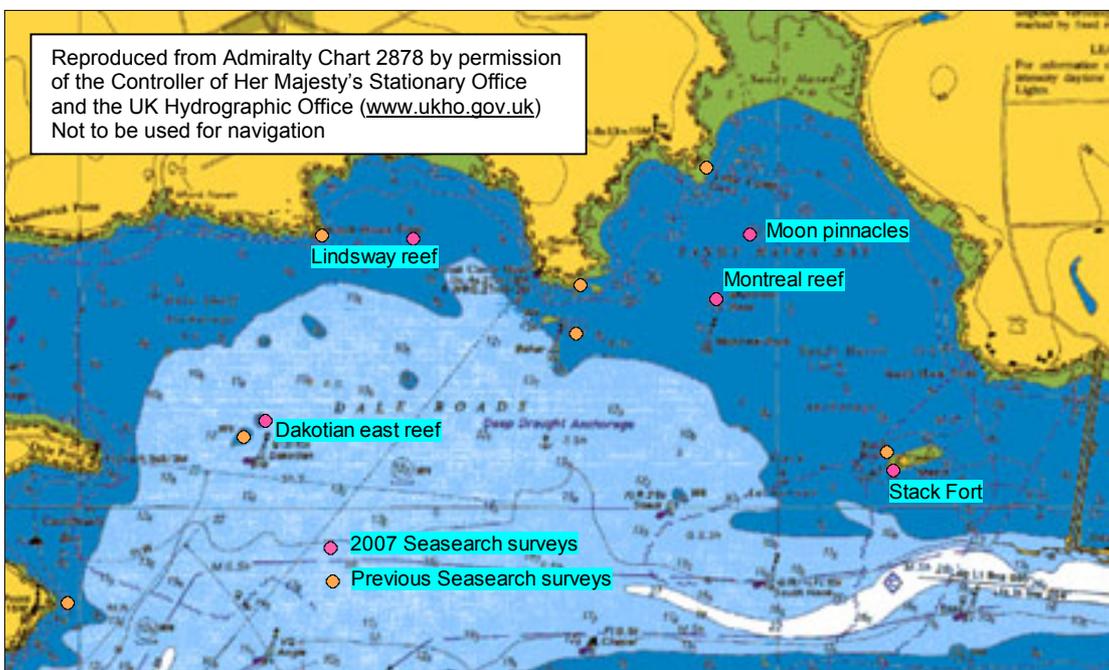
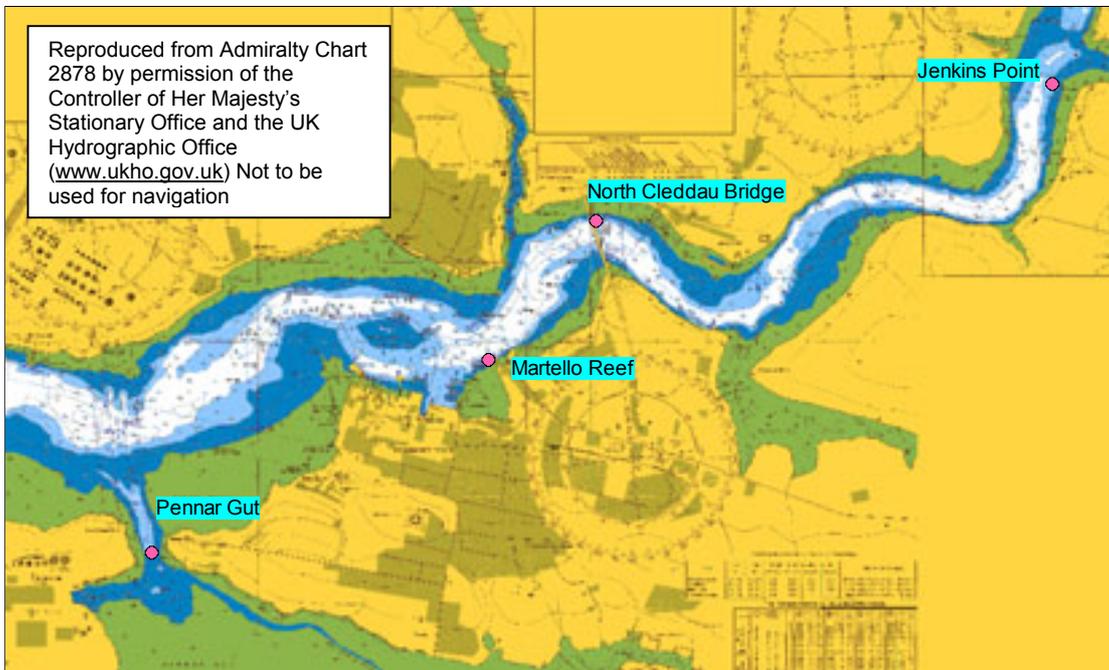
Seasearch dives were organised during 2007 by Kate Lock. Sites were targeted to gain information on UK Biodiversity Action Plan (BAP) species and habitats:

1. Native oyster, *Ostrea edulis* : Pennar Gut and Jenkins Point;
2. Fan shell *Atrina fragilis* : Stack Fort and Dakotian east reef;
3. Tidal rapids: Sandy Haven reefs, Lindsay reef, North Cleddau Bridge and Martello reef.

Advice was provided by Aethne Cooke, Countryside Council for Wales (CCW) Marine BAP Officer and Mike Camplin CCW West Wales Senior Marine Conservation Officer.



Dive sites are shown below:



## Native Oyster *Ostrea edulis*

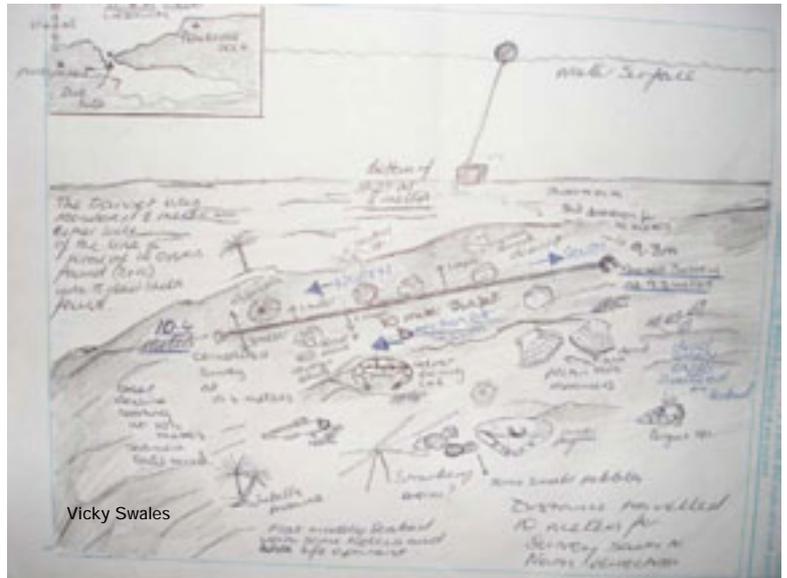
Up until the end of the 19th century, there was a thriving native oyster fishery in Pembrokeshire - in the Milford Haven estuary and also around Caldey Island, Tenby and Stackpole. But with the railways came increased demand, which led to a steep decline in oyster numbers and distribution. Today, the Milford Haven estuary is the only known location for native oyster beds in Pembrokeshire. There are many relict beds of dead shells in the estuary, and elsewhere around Pembrokeshire, as a reminder of the native oyster's heyday. What remains of the native oyster in the Milford Haven estuary is much reduced from historical levels.



In 2002 a survey to access the distribution and abundance of the native oyster in Milford Haven was completed for CCW by Emu Ltd. Two sites from this survey were revisited in 2007 to record the current condition. Numbers of native oyster were recorded in a two metre band along ten metres transect tapes. At Pennar Gut six transects were completed and four at Jenkins Point. The data has not been included in this report as the native oyster is identified by the Countryside Council for Wales as a sensitive species.

### Pennar Gut

Flat seabed at 8m below chart datum (bcd) covered in a super-abundance of the slipper limpet *Crepidula fornicata*. The harbour crab *Liocarcinus depurator* and the common hermit crab *Pagurus bernhardus* were frequently found and the native oyster *O. edulis* recorded in low numbers along the transects. A small outcrop of rock provided the substrate for a more diverse range of species including foliose red algae, sponge species including the shredded carrot sponge *Amphilectus fucorum* and the chocolate finger sponge *Raspalia ramosa*, the antenna and branched antenna hydroids *Nemertesia antennina* and *N. ramosa* and the nudibranch *Eubrancus tricolor*.



### Jenkins Point



A cobble and gravel substrate with broken shell and a mud/silt mix sloping from 6m close to shore to 9m bcd (running east-west). The slipper limpet *C. fornicata* was common with some very dense patches and only occasional native oysters *O. edulis* were recorded. Anemones were frequent including the horse dahlia anemone *Urticina eques*, daisy anemone *Cereus pedunculatus* and the elegant anemone *Sagartia elegans*. Also frequently recorded were common hermit crab *P. bernhardus*, shore crab *Carcinus maenas* and the sand mason *Lanice conchilega*. Only three species of fish were observed including a single record of the greater pipefish *Syngnathus acus*.

## Fan shell *Atrina fragilis*



*Atrina fragilis* at Scottish site Rohan Holt

This large mollusc is a nationally scarce species in the UK, is listed for protection in the Wildlife and Countryside Act 1981 and is a UK BAP species. Current records of the fan shell show that it is now only found at sites on the west of Scotland and two sites on the south coast of England - Plymouth Sound and Salcombe Bay. Historical records in Wales identify fan shell records in Camarthen Bay and Stack Rock in Milford Haven. A Seasearch survey in 2003 organised by Chris Wood targeted these Welsh sites and although suitable sediment habitats were found at all sites no living specimens were recorded. The only record of the species was of a single shell found amongst shell debris at

the Stack Rock site in Milford Haven. In 2007 further Seasearch dives were targeted around Stack Rock and also at Dakotian East Reef located in the entrance of Milford Haven. The fan shell was not found during these dives despite suitable habitat being recorded at both sites.

## Stack Fort

A series of low broken and irregular bedrock ridges extended out from Stack Rock Fort, these were interspersed with sandy gravel sediments and petered out to sediment plain at 6m bcd. Upward facing rock surfaces were totally covered in red algae. Ascidians and sponges dominated the vertical faces, the most common being colonial gooseberry sea squirt *Dendrodoa grossularia* and the boring sponge *Cliona celata*. Erect sponges present were the chocolate finger sponge *R. ramosa* and yellow staghorn sponge *Axinella dissimilis*, and the chimney sponge *Polymastia penicillus* was found in the sediment areas between the rocks. Non-native species recorded were the leathery sea squirt *Styela clava* and the slipper limpet *C. fornicata*.

The sediments areas were made up of pebbles, shell fragments and cobbles mixed with fine sand. These areas were rich in life. Burrowing anemone *Cerianthus lloydii* and daisy anemones *C. pedunculatus* were both found along with the eyelash worm *Myxicola infundibulum* and the feather duster worm *Sabella pavonina*. The king scallop *Pecten maximus* was recorded and evidence of fishing dredge tracks were observed on the sediment plain.



Blaise Bullimore



Blaise Bullimore

## Dakotian east reef

A flat seabed of angular cobbles with occasional small boulders and areas of low bedrock rising 0.5m above the surrounding area giving way to sediment plain of pebbles, gravel and coarse sand. The rocks were lightly silted and sparsely covered in red algae and encrusting bryozoans. The potato crisp bryozoan

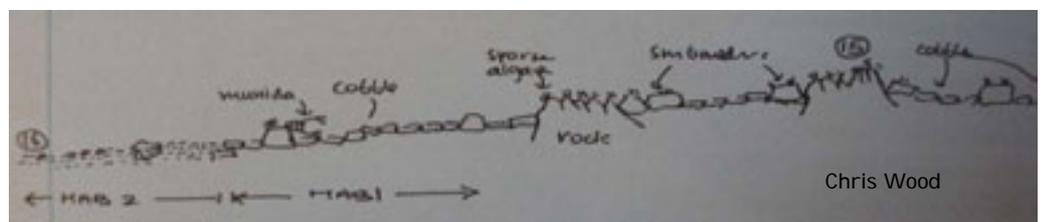


Blaise Bullimore



Blaise Bullimore

*Pentapora foliacea* was occasionally found along with frequent records of the orange pumice bryozoan *Cellepora pumicosa*. A diverse range of territorial fish were observed including rock and black gobies *Gobius paganellus* and *G. niger*, the scorpion fish *Talurus bubalis* and the common reef species goldsinny wrasse *Ctenolabrus rupestris* and corkwing wrasse *Crenilabrus melops*. The most notable feature of the reef area was the presence of large numbers of the long clawed squat lobsters *Munida rugosa*, a northern species not often seen in England and Wales. The king scallop *P. maximus* was found on the surrounding sediment plain.



Chris Wood

## Tidal rapids

Tidal rapids are a UK BAP habitat. The term 'tidal rapids' is used to cover a broad range of high-energy environments including deep tidal streams and tide-swept habitats. Wherever they occur, strong tidal streams result in characteristic marine communities rich in diversity, nourished by a constantly renewed food source brought in on each tide.

The rocky tide-swept habitats present in Milford Haven and the Dau Cleddau estuary are given as one of the key features of the reefs present in the Pembrokeshire Marine SAC and are considered of notable importance.

High-resolution multi-beam bathymetric survey results of the Haven showed a number of apparently rocky features that had not been previously identified. The following four sites were surveyed using multibeam maps provided by Mike Camplin, CCW.

## North Cleddau bridge

This site was located a few metres west of the north end of the bridge close to boat moorings. A steep 45 degree gradient wall was found rising from 15 bcd to 8m. The rock face was thickly covered in a layer of silt and was interspersed with pockets of cobbles and mud. At 8m the seabed levelled off with a mix of angular pebbles and muddy shell gravel, here the slipper limpet *C. fornicata* was common with occasional native oysters *O.edulis* recorded. Sponges and anemones dominated the rock faces, the goose bump sponge *Dysidea fragilis* was the most common and the mermaids glove *Haliclona oculata*, breadcrumb sponge *Halichondria panicea*, shredded carrot sponge *A.fucorum* and sea orange *Suberites fiscus* all frequently recorded. The elegant anemone *S.elegans* and the white striped anemone *A. sphyrodeta* were the most frequent anemones, hidden in the sponge turf the anemone *Diadumene cincta* was also found. Six species of nudibranch were found the most unusual being *Rostanga rubra*.



Kate Lock

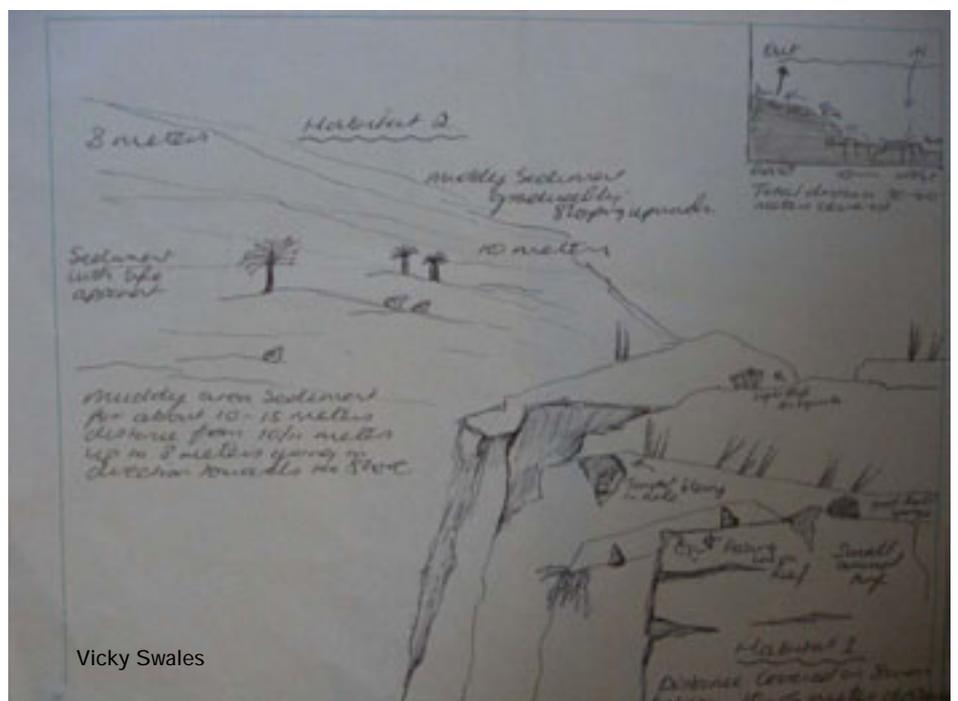
## Martello reef

A steep vertical wall four metres in height from 14m to 10m abundant in anemones and rich in sponges, hydroids and ascidian turf. The bedrock was pitted and had large numbers of holes or cracks filled with fine soft sediment and silt. The abundance of anemones was dominated by plumose anemones *M. senile* and the elegant anemone *S. elegans*. Ascidian turf was abundant with *Ascideilla aspera*, and *Ciona intestinalis* and the sponges breadcrumb sponge *H. panicea* and the shredded carrot sponge *A. fucorum*.

At the top of the wall the seabed levels off to a gently sloping muddy sediment plain up to 8m. The mud layer was thick and soft with the eyelash worm *M. infundibulum*, the burrowing anemone *C. lloydi*, sand mason *L. cochilega* and lug worm *Arenicola marina* casts all being recorded.



Kate Lock



Vicky Swales

## Sandy Haven reefs

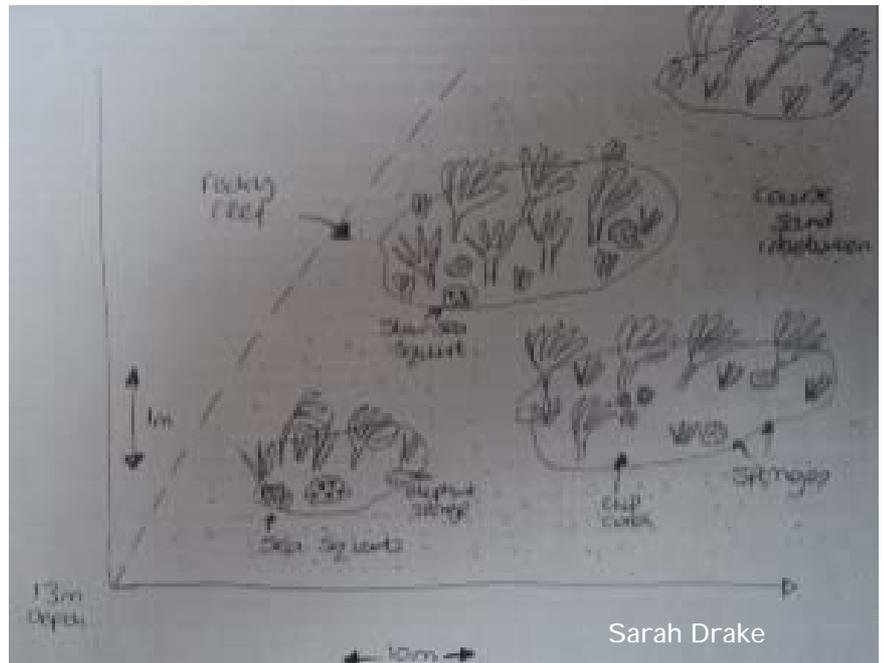
Two sites were dived close together and these were called Montreal reef and Moon Pinnacles, both sites were isolated rock outcrops rising 2 to 3m from the surrounding sediment area of sand and gravel at 8m bcd. The tops of the reef were covered in silted red algae and kelp forest made up of both forest kelp *Laminaria hyperborea* and furbelows *Saccorhiza polyschides*. The rock faces were densely covered in colonial ascidians, orange sea grapes *Stolonica socialis* and the sponge seasquirt *Diplosoma spongiforme* being the most common. Sponge and bryozoan turf also dominated with a diverse range of sponges present and sea chervil *Alcyonidium diaphanum* common. The blue striped squat lobster *Galathea strigosa* and the common prawn *Palaemon serratus* were both found hiding in rock crevices. Wrasse species swam around the reef whilst the tompot blenny *Parablennius gattorugine* and conger eel *Conger conger* were found lurking in holes between boulders.



Chris Wood

## Lindsway reef

Rocky reef patches 13m bsl standing like islands 1m above a coarse sand seabed. The rocks were covered in a mix of red seaweed and animal turf especially sponges and seasquirts. Common sponges included the elephants ear sponge *Pachymatisma johnstonia*, the yellow staghorn sponge *Axinella dissimilis* and the sea orange sponge *S. ficus*. Sea squirts were dominated by the orange sea grapes *S. socialis* on the rocks and the star sea squirt *Botryllus schlosseri* attached to seaweeds. Lobsters *Homarus gammarus* and both velvet swimming crabs *N. puber* and edible crabs *C. pagurus* were all found around the reefs along with and abundance of the double spiral tube worm *Bispira voluticornis*. Fish species were also frequently recorded on the reef.



Sarah Drake



Divers taking part in the surveys were: Glyn Powell, Sarah and David Bowen, Stephen Bound, Kerry Lewis, Blaise Bullimore, Kate Lock, Sheena Davies, Leon Hopkins, Rob Gibbs, Scott Tompsett, Rebecca Gaille, Ian Williams, Erin Smyth, Vicky Swales, Paul Holmes, Sarah Drake, Paul Holland, Chris Wood. Boatmen: Steve Lewis and Alun Lewis.

Report prepared by Kate Lock with contributions from Sue Burton and Aethne Cooke. Survey guidance provided by Aethne Cooke and Mike Camplin. Photos by Kate Lock, Leon Hopkins, Blaise Bullimore, Mike Camplin, Bill Sanderson, Rohan Holt, Sue Burton, Chris Wood and Milford Haven Port Authority. Sketches by Vicky Swales and Chris Wood. Where appropriate, full survey results and species list available on the NBN Gateway.

Seasearch is a volunteer underwater survey project for recreational divers who wish to contribute to conserving the marine environment.

Financial support for the project during 2007 has been given by:

