2010

Expedition Plan
West Wales Wreck Exploration

Application for BEGS Grant

Cardiff BSAC Branch 0590

Rhian Lewis-James

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Contents

Purpose

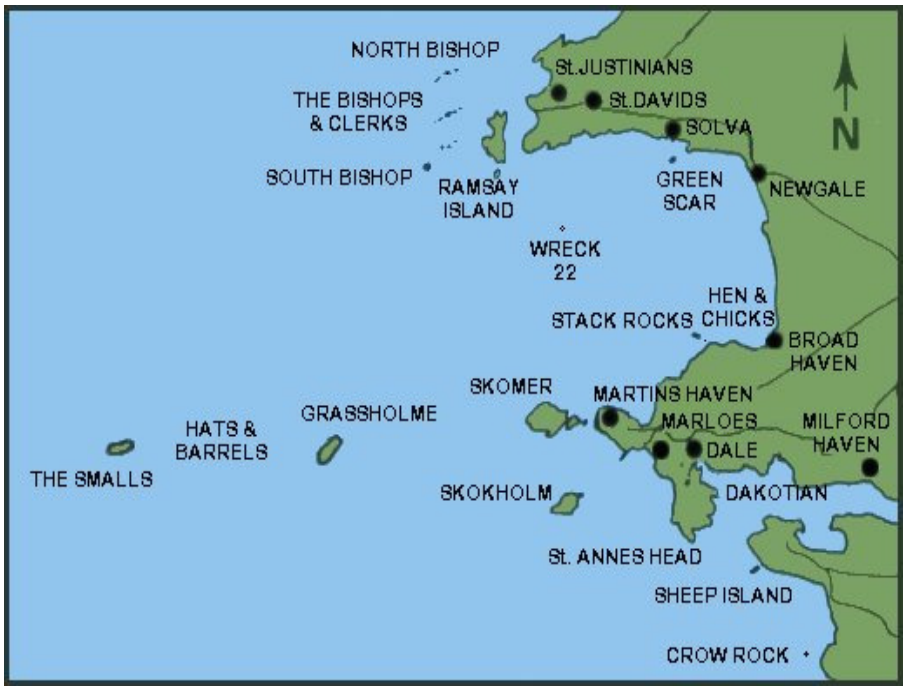
To search for new wreck sites around the West Wales coast.

Background

The Cardiff BSAC frequently dives around West Wales. Milford Haven is two hour's drive from the club's base in Cardiff and the club regularly organizes weekend diving for a variety of level of divers.

However, the club, and many other divers visiting Wales, tend to dive the same sites, such as The Lucy (40m), The Dakotian (20m) and the Behar (20m).

There are numerous wreck sites in West Wales but the exact locations are not widely known. There are no diving guide books for South Wales and the old wreck history books are out of print. The internet has much information about the wrecks but minimal information about the actual coordinates to dive.



The area of coast around Milford can also be extremely tidal and the information regarding slack times is often inaccurate.

This means the general information available to divers about South and West Wales dives sites is limited even though it is a popular destination for divers.

The advantage of popular dives sites such as the Dakotian and the Behar is that they are easy to find with a depth sounder as they are on a flat sandy bottom. They are in relatively sheltered locations (in the Haven) and are also generally non tidal during neap tides. This means that minimal planning is needed to dive these sites, another reason why they are so popular.

Aim

The aim of this project is to locate the exact positions of wreck sites and dive sites in West Wales and make the locations and tidal information available to all on the internet. The locations will be publicised on the Cardiff BSAC Web site, on WASAC's Web Site (Welsh Association of Sub Aqua Clubs – BSAC's governing body in Wales) and on Google Groups.

Initial dry research of sites

Research for locations of potential wreck sites can be gained from a number of sources.

Dive Pembroke – Len Bateman runs a dive operation in West Wales and has put together a list of dive sites some with GPS coordinates. The coordinates are often rounded to the nearest minute to protect his operation's dive locations, but they are a good starting point as they include history and descriptions of the ships.

Wrecksite.eu – this web site lists a huge number of potential wreck sites around the world. Much of the information is from hydrographical survey so the data around West Wales, which is mostly for shipping use rather than dive use, is not as accurate as we would require.

WASAC site- there is a small list of sites which are frequently dived. However some of the information, especially regarding slack times is incorrect and needs to be researched and revised.

Local knowledge – Local divers and instructors have old coordinates of some rarely dived sites. However, some locations are also regarded to be myths! The problem can be that some divers can be protective about site locations. Once new locations are found during this project, local divers may be more prepared to exchange site information.

Each estimated position from the above research is plotted on a chart to estimate which are more reliable positions. Some coordinates can be discounted immediately, if they are nowhere near the expected position (eg on land!) or if they have been rounded to the nearest degree. Some coordinates need to be converted from seconds to decimal, but this is not always obvious. Some positions will cluster closely in a small area which could mean an accurate position, or that the position has been taken directly from the chart by a number of different users.

An assessment of the most reliable coordinates will be made and transferred into the GPS.

The boat

The boat is a 5.8m Humber fitted with a main 140hp Suzuki engine and a spare donkey engine. A single 'A' frame at the back mounts the antennas plus the flares and first aid kits in yellow tubs. There is a cylinder rack behind the driver's seat with room for 6 sets of dive gear.

The boat's name is Rhoberi and is registered with the coastguard under the Voluntary Safety Identification Scheme CG66.

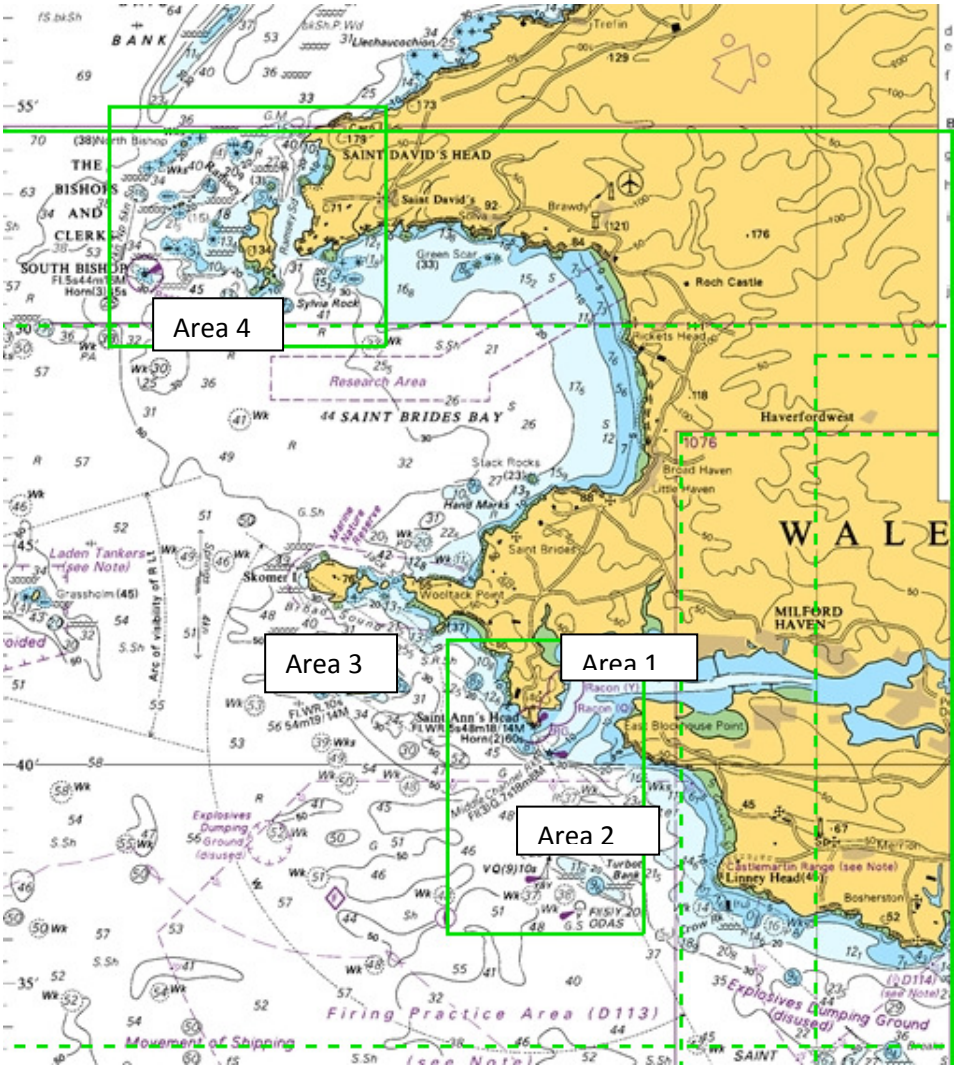
Boat Equipment

Engines	Suzuki 140hp 4 stroke , Suzuki 3.5hp 4 stroke.
Electronics	Radio, Side Scan Sonar/ GPS/ Depth sounder unit, compass
Safety gear	Flares, O2 kit, first aid kit, lifejackets, fire extinguisher, oars, spare fuel.
Dive kit	Shot weight, lines (12m/20m/30m), shot buoy, lifting bag
Other	Anchor, Log sheets, laminated charts, laminated tide tables, spare BSAC 88 tables, engine tools/spares, save a dive kit, A flag

Equipment for locating sites

The club has bought a side scan sonar unit specifically for the project to be fitted to the club RIB. After researching available units the one identified as most suitable was a Hummingbird 997 which is a multi unit consisting of Side Scan, GPS with charts and Depth sounder. Total cost with additional software £2,220.

Search Area

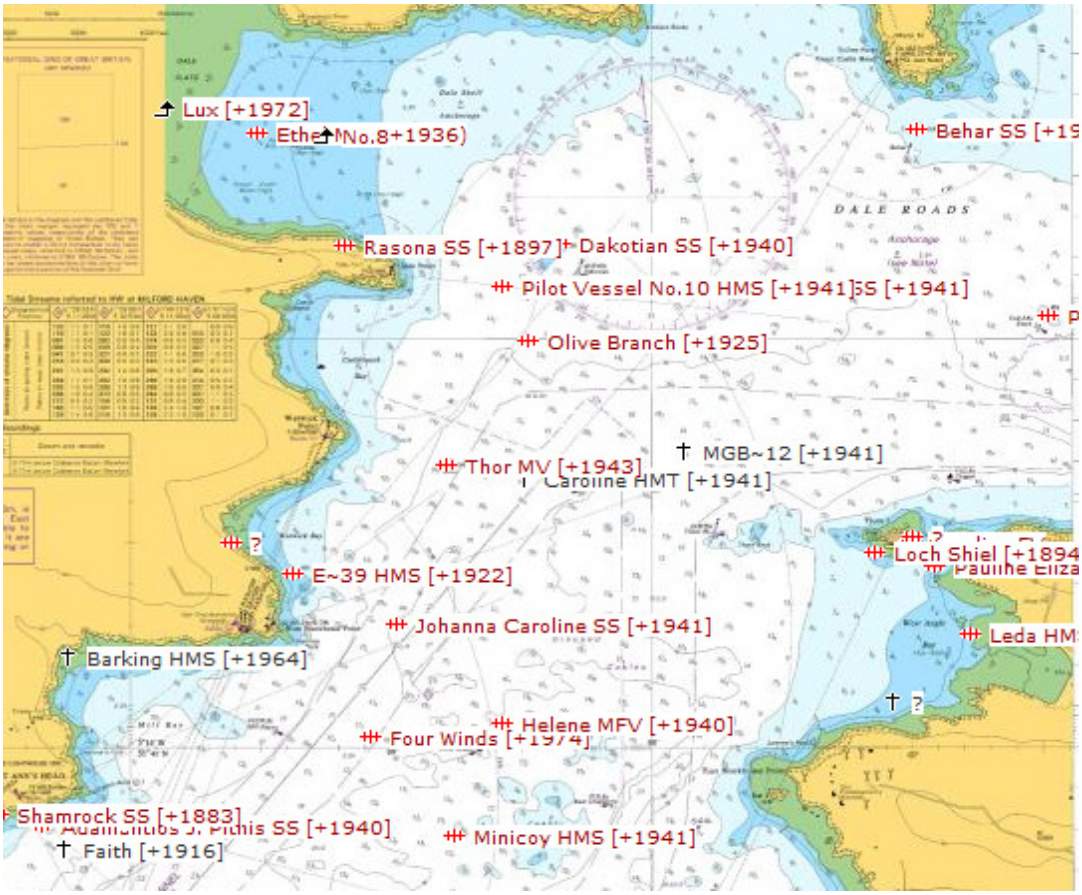


The area of the expedition will start in Milford Haven (Area 1) then south to Linney Head (Area 2) and North to Skomer Island (Area 3).

Area 4, to be planned for the future, further North includes St Brides bay and the Bishops & Clerks.

Area 1 Milford Haven

The initial search area is within Milford Haven in order to practice locating sites and interpreting the information from the side scan unit. The area has a generally sandy/silty bottom where wrecks stand up from the bottom and so can be more easily distinguished from the surrounding sea bed. There are numerous wreck sites in this area mostly as a result of the second world war.



NOTE - This portion of the expedition was completed in April.

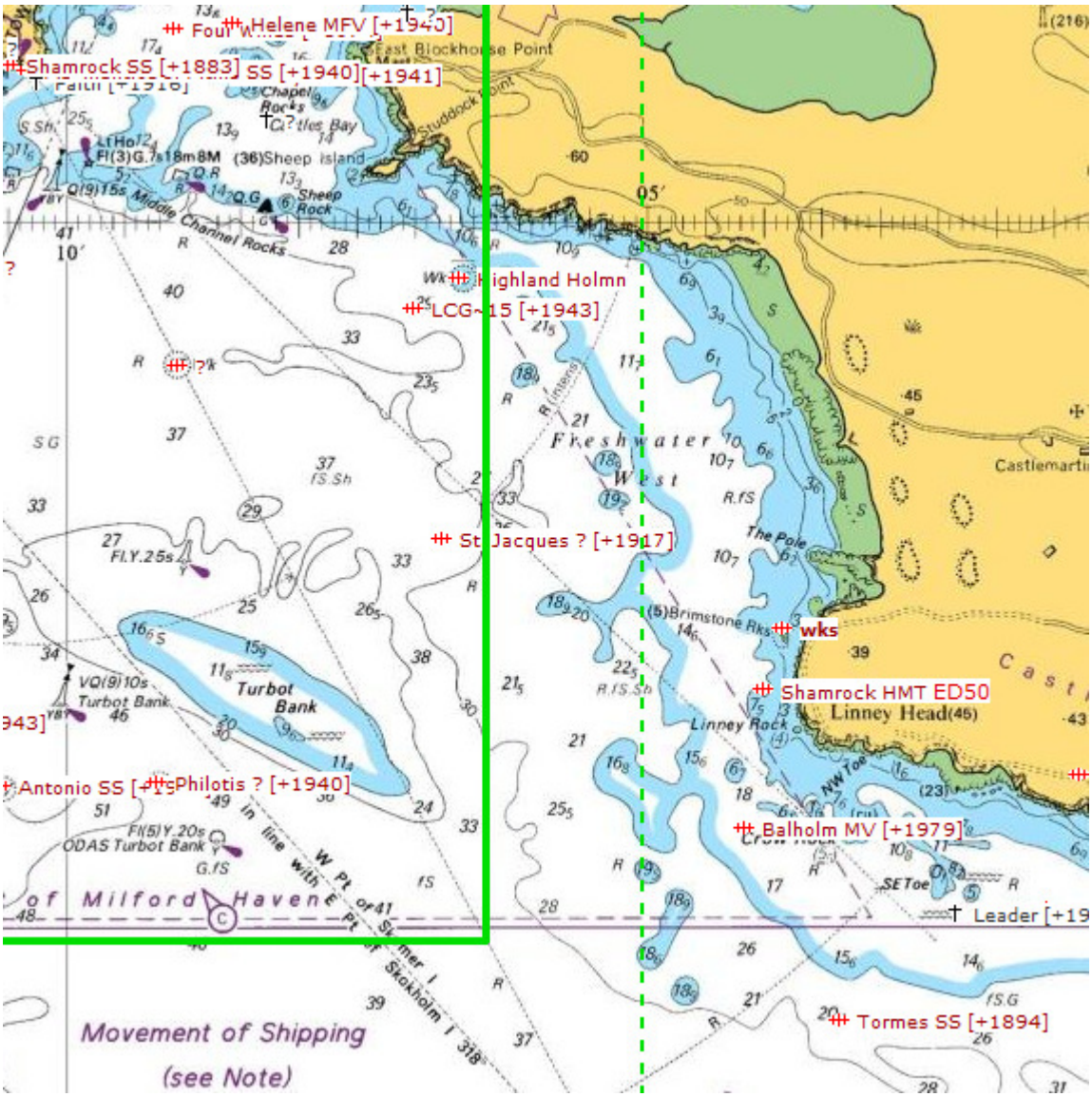
We used the Dakotian, Thor and Behar as practice sites to learn how to read and interpret the side scan sonar images. This practice also enabled us to learn how to refine the images using functions such as the range and beam definition.

Using internet & book research for site coordinates, these were then plotted on to a chart of the area. Using these hand plotted locations we estimated the most reliable coordinates which were then entered into the GPS using computer interface software. This allowed us to search the given areas easily with the GPS and in this way we found and dived the Collier, the Caroline, the pilot Vessel No 10 and a Landing Craft all in a single weekend. A very successful first expedition.

The preliminary results, pictures of the side scan images and brief descriptions of the dive sites can be found in the Appendix 1.

Area 2 Milford Haven South to Crow Rock at Linney Head

This area is deeper, at around 30m with a more rocky bottom which makes the searching and interpreting more complex. However initial research shows a large number of potential wreck sites especially around the 30m contour.



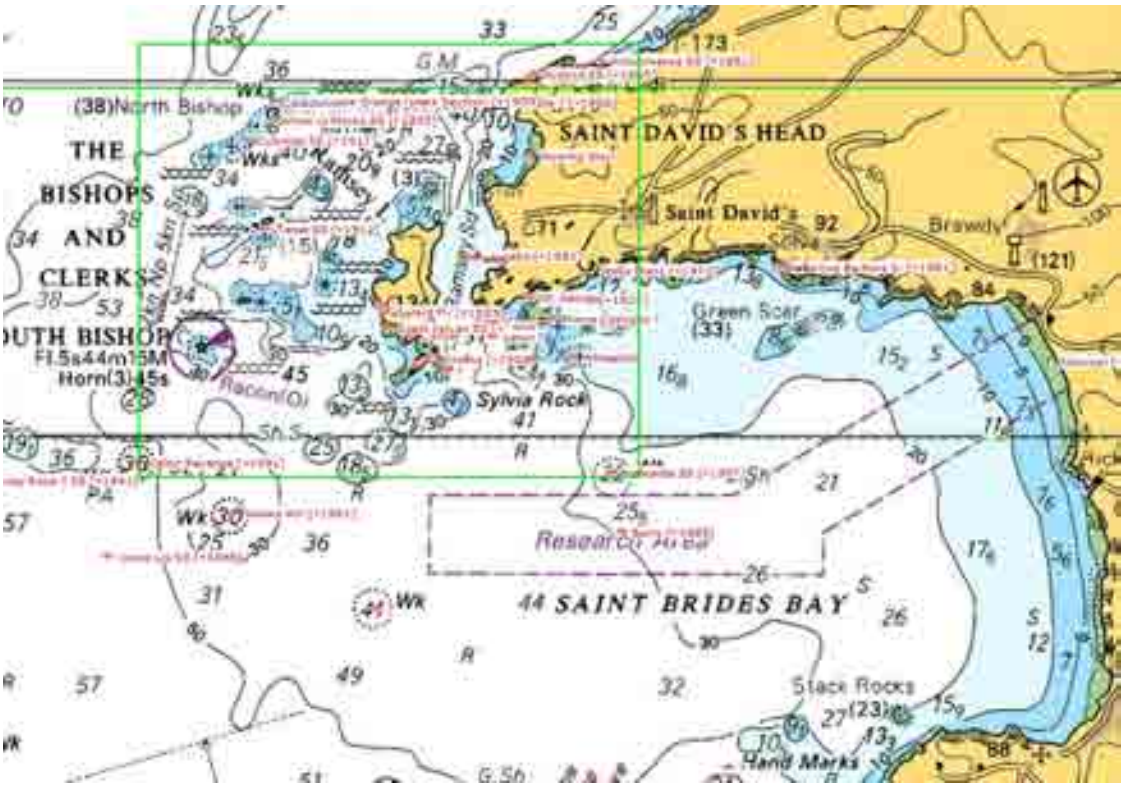
This will be the area of the second part of the expedition with an emphasis on finding the Balholm.

Area 3 Milford Haven North to Skomer Island

This will be a difficult area to scan as the bottom is very rocky. It includes the islands of Skokholm, Skomer and Gateholm and can be very tidal.

Future plans would be St Brides Bay and the Bishops & Clerks

A large area, which will be subdivided into north and south. This area is a mix of rock and sandy bottom. The southern side is generally sheltered from the prevailing SW winds.



Search methodology

Locate the area from GPS site coordinates identified during the dry research for each area. Generally a number of site coordinates will be identified for a single site.

In the RIB perform an initial sweep and general review of the location with the side scan unit and depth sounder. The side scan has a range of up to 100m although the quality reduces with the increase in range and the increase in depth. However it does mean a large area can be scanned relatively easily and quickly in shallower locations.

If the wreck is not found from this initial sweep, a wider search area will need to be covered. Drop a shot line in the location of the GPS position and perform a grid search using the shot as a datum. It is important to cover the same area from different directions because the beam of the side scan will show different views from different angles.

Once the wreck site has been located, save the site in the GPS and take transits if possible. Calculate estimated slack times and revisit with divers to dive the site and investigate the actual state of the wreck.

Schedule planning

The side scan searching of an area will be carried out by a small group of divers on the boat who will spend all day logging potential sites. Very calm weather is needed for using the side scan sonar as excessive movement of the boat gives false readings.

Ideally weekends will be scheduled in advance, with a small group taking the boat to Milford Haven on Friday to find sites and the remaining divers joining them to dive the potential new sites on Saturday and Sunday.

However, given the need for very calm weather, it is expected that the majority of trips will be scheduled at short notice once the wind forecast is known to be good. All the planning for the trip will be completed well in advance such as identifying dive sites, divers and B&B options. Then when the weather forecast is good for the weekend, the final booking of accommodation, availability of divers etc will be finalized on Wednesday, the club meeting night, for the coming weekend.

It is estimated that one or two weekends will be needed to survey each area, so depending on the weather it could be a long term expedition.

Costs outline

Initial outlay on instruments for the expedition

Equipment	**Cost £**
Side Scan unit	2000
UK detailed chart update	200
Memory card	20
Total cost of Equipment	**£2220**

Dive trip cost per trip

Item	Based on 6 divers for weekend	Total cost
Boat petrol	For 3 days including research day	200
Towing fee	For towing car	40
Car fuel	For two cars, one towing the boat	100
Diving fees	£7.50 per diver per dive x 4 dives x 6 divers	180
Accommodation	£25 per diver per night	300
Food	£10 evening £5 lunch &snacks	180
Air/Nitrox	£5 per fill x 24 dives	120
Total per weekend		**£1120**

Diving qualification

Divers are to be full BSAC diving members and should hold a minimum of BSAC Dive Leader qualification. Divers should have a minimum of 100 cold water divers and should have dived within 6 weeks of the trip to ensure all kit is in working order.

Due to the frequency and unpredictability of currents in the region, divers should be competent with a DSMB and deploy it at the first signs of any current and also carry flags, whistles and strobes or torches for attracting attention.

The Diving team

Name	Diving Qualification	Instructor Qualification	Responsibility
Rhian Lewis-James	First Class	Advanced	Expedition leader
Mark Gosling	Advanced	Advanced	Boat
Teresa Darbyshire	Advanced	Advanced	Dive manager
Anne Hudson	Advanced	Open Water	Accommodation & food
Andy James	Advanced		Dive manager
Brian Pentland	Advanced	Open Water	Dive manager
Steve Turnbull	Advanced	Practical Instructor	Boat

Personal Equipment

Full diving kit for 2 dives per day

- Twin cylinders, or two single cylinder set up with bail out
- Nitrox preferable or alternatively Air
- Safety gear – DSMB, flag, Strobe or torch, whistle, knife or shearers,
- Alternative weather gear - hat, gloves, thermals, sunglasses, sun block

Training needs

To ensure all the group participate in the planning and operation of the expedition it is useful for the team to have the following skills;

Course	Reason	Result
Chartwork & Position fixing	To plot estimated sites to identify probable locations	Course was run in March and all members either participated as students or instructed on the course.
Diver Cox'n	A diver cox'n qualification is required to drive and be responsible for the club RIB. All boat handlers are to be supervised by a cox'n at all times	Most of the team are already diver Cox'n. A boat handling course was run in February for the members working towards the cox'n qualification.
Marine VHF DSC operation	To ensure familiarity with the VHF in case of emergency and also general usage	As BSAC no longer offer this course an in house course was designed and run by the branch in April to familiarise and refresh team member skills
Wreck Appreciation	To identify and orientate divers on the wreck sites as well as recognition of parts of wrecks	The course is being run in May
First aid & O2 Administration	In cast of emergency incident	All divers have this qualification and refreshers where run in January

Accommodation

West Wales has numerous B&B, camping & self catering accommodations and costs can vary from £5pp/night to £40pp/per night. They can book up during bank holidays but generally there is always availability somewhere in the area.

Name	Location	Type	Cost
Welcome Travellers	Tiers Cross	Pub B&B	£25pp
Foxdale	Marloes	B&B and camping	£35pp
Albion House	Marloes	B&B	£35pp
Firstone	Walwyns Castle	Self Catering	£20pp

Food

Meal	Location	Food
Breakfast	B&B	As provided
Lunch	Boat	Sandwiches etc bought from local supermarkets
Evening meal	Pub	As provided

Air & Fuel

Air Milford Haven, new operation run by Dave Kennard has recently opened. Phone 07525687676

Fuel Tesco just around the corner from the air station at Milford Haven is convenient.

Launch sites

Area	Launch site	Notes
Milford Haven, to Linney Head and Skomer	Gelliswick	Slipway long wide and in good condition Tidal, launching onto sand and stones at low water, Usually quiet, with reasonable parking Can wash off boat in local yacht club opposite No permission needed to launch
Milford Haven, to Linney head and Skomer	Dale	Slipway long in good condition and pontoons in summer Tidal, launching onto sand and stones at low water Can be very busy with sailing boats and dive boats Slip owned by local yacht club but no fees to launch Lots of parking in pay & display
Skomer & St Brides Bay	Little Haven	Short steep slipway Limited parking and no waiting allowed (boats generally discouraged) Tidal launching onto soft sand from mid tide to low water Annual fees to launch
Skomer & St Brides Bay	Broad Haven	Long sandy beach, exposed to prevailing Westerly winds Good parking Soft sand at low water so use rope to avoid getting stuck
Skomer	Martins Haven	Shingle beach not possible to launch but good for picking up and dropping off divers if winds prevent launching of a full boat of divers.

Tides

Area	Tidal information
Milford Haven	Neaps – most stages of the tide Springs – high & low water
Linney Head	Two hours after High water (however this information from the websites appears to be wrong so more research into slack time is needed)
Skomer	Very complex current pattern around the islands
St Brides Bay	Variable depending on where you are in the Bay - more research needed.

Conclusion

It is an ambitious plan to cover in one season and quite weather dependant. We have already made a start and completed Area 1, the test area. Next are the more difficult, deeper areas to explore.

Appendix 1 - Preliminary results for Milford Haven search

Area 1, Milford Haven has been completed as mentioned in the report. A number of new sites were found and dived. The following shows the initial findings of scan images and brief dive description.

The Caroline

New site for Cardiff BSAC, previously dived by other divers from whom we obtained estimated coordinates.

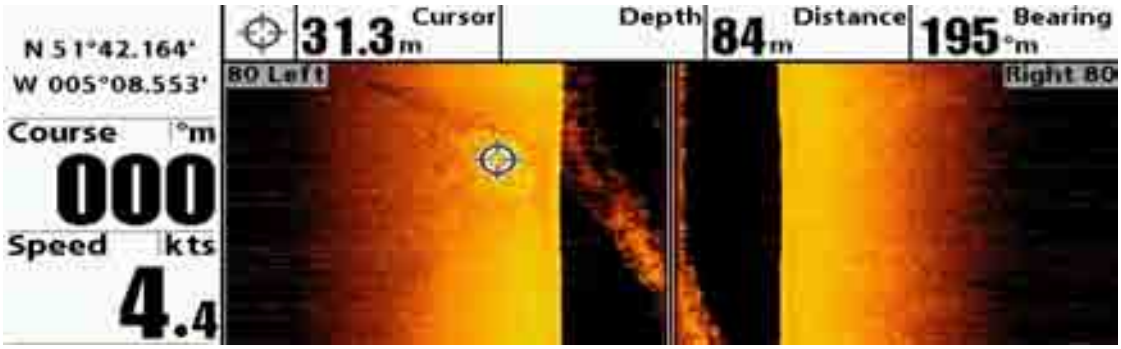
Caroline Estimate	N51°41.300'	W005°07.000'
Caroline Final	N51°42.271'	W005°08.282'

The Dive – in about 16m, it is the bow of a converted fishing trawler. It has been severed in two amidships and you can swim directly into the holds and much of the internal ship from the broken section. A very small site, good for 4-6 divers only!

The Pilot Boat

New Site – appears relatively undived due to the old bottles & china remaining on the site.

Pilot Final	N51°42.164'	W005°08.553'
Pilot Estimate	N51°42.119'	W005°08.568'
Pilot Estimate	N51°42.125'	W005°08.563'



The Dive – In about 22m a small area of wreckage which is very broken and mangled, lots of old bottles and china, which implies it is not dived much. An old Admiralty anchor lies just to the West of the site.

The Barge

New to Cardiff BSAC – known to other divers (once we said we found it!)

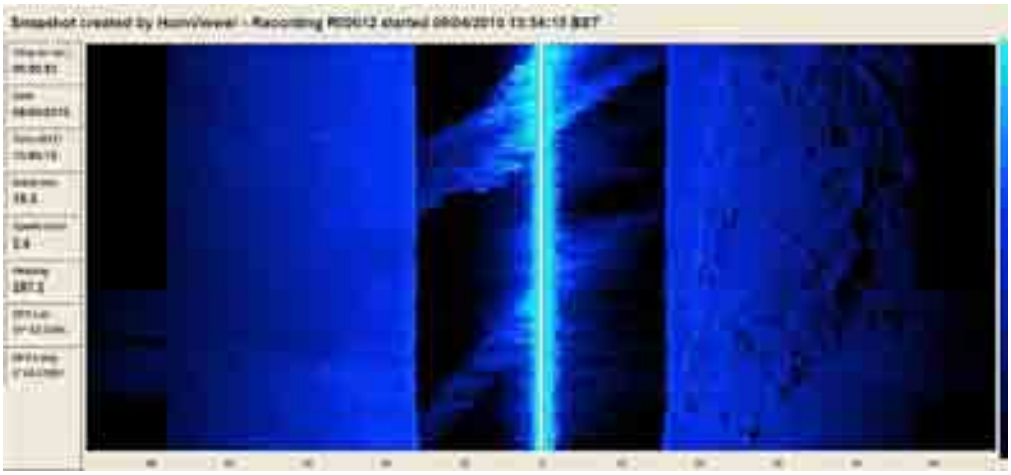
Barge Estimate	N51°41.642'	W005°05.223'
Barge Estimate	N51°41.630'	W005°05.270'
Barge final	N51°41.647'	W005°05.266'

The Dive – in about 12m right on the edge of the shipping channel, we requested permission from port ops CHL14 to dive. Upside down hull, with the landing doors bent up over the hull.

The Collier

Cardiff BSAC found this site last year and the extent of the large site has now been defined

Collier -Estimate	N51°42.056'	W005°06.849'
Collier- Estimate	N51°42.056'	W051°04.890'
Collier - Final	N51°41.640'	W005°05.281'



The Dive – in about 15m the site is very flattened and well spread out near the shipping channel. Ship was 6000 tones, although there are no large sections left intact, this site covers a very large area.

The Behar

Known site – scan only – not dived on this expedition.

Behar	N51°42.493'	W005°07.039'
Behar final	N51°42.505'	W005°07.052'

The Dive – in about 18m one side is on the reef which then goes down to the silty sea bed. Large reels of cables are still identifiable from this cable laying ship.

The Dakotian

Known site – scan only – not dived on this expedition.

Dakotian	N51°42.231'	W005°08.358'

The Dive – in about 18m this merchant vessel of 6000 ton is a popular dive site much of the structure remains to swim around.

Appendix 2 - Risk Assessment

1. Travel to and from Dive Site (and assessment of site) – Risk Medium

- Allow plenty of time for travel to site.
- Towing of rib – ensure that driver has experience of towing and hazards and regulations pertaining to towing
- Ensure that site being used to prepare boat is free from any obstructions or point out any obvious trip/slip hazards.
- Ensure that those preparing the boat and equipment do so in a safe manner, as some items (eg kit) will need lifting into the rib
- Ensure that those helping launch boat are aware of any hazards, such as the slip being slippery and that they are aware of trailer's position when boat being launched/retrieved
- Plan to be radioed the coast guard on departure and if there are any changes in plan during the day and final check in at the end of the day
- Ensure that all drivers take care particularly on way home after diving during the day. Suggest that in the event of being tired they stop for a rest/break.

2. Divers: Medical History/Injury – Risk high

- All divers should be fit and healthy to dive – and have either completed self declaration form or have received and passed medical from Medical referee
- Injuries sustained during diving: Such as Ear Damage, Mask Squeeze, Injury from kit (such as falling cylinders) – these should be low risk given level of divers for this expedition. All of the expedition members have had some formal training in First Aid. Any divers with problems should in the first instance be assisted by buddies.
- Running out of air: All SCUBA sets should be fitted with accurate cylinder pressure gauges. Given nature of the expedition, all divers should be asked to check their air regularly – as they may become distracted by tasks in hand. All divers should be diving in buddy pairs and in the event of an out of air situation use the buddy's alternative supply to make a safe ascent to surface
- Decompression Illness. All dives should be planned and conducted in accordance with BSAC '88 tables or decompression computer. In the event of diver(s) exhibiting symptoms, or having had a fast ascent, the diver(s) should be administered Oxygen, or failing that, Nitrox if available (strongest mix first)
- Contact with dive boat/propeller. Only trained Cox'ns should be allowed to operate the rib. All divers should be made aware of any entry/exit techniques and all such exits/entries should be controlled by Cox'n
- Injury from other boats. The Alpha Flag should be flown whilst divers are underwater. Surface traffic should be monitored by boat cover. Divers should be marked by DSMB's whilst surfacing if not ascending using the shot
- Diver distress - The boat carries a VHF radio to contact the emergency services and an O2 kit. All core members of the project are qualified boat handlers/coxswains , O2 qualified, and have a level of first aid training and VHF certificates. Diver recall mechanism available (eg signals via SMB line, Thunderflashes)

3. Diving incidents – Risk High

- Entanglement in nets/line/underwater obstruction. High possibility on new undived sites. All divers must carry appropriate cutting implements such as filament line cutters, wire snips, diving knife, etc. Assistance should be given by buddies where possible
- Reduced underwater visibility . Strobes and buddy lines items to be used in the event of the onset of reduced visibility. Dive to be abandoned in the event of adverse reduced visibility. Divers to surface and exit. Dive Manager to abort diving.
- Separation from boat (ie drifting) All dive pairs to carry DSMB's to be deployed on first sign of current.

4 Diver separation – Risk High

- All divers will be required to carry DSMBs and a torch. Look for buddy for 1 minute then surface to locate the missing diver.

5 Deteriorating weather conditions – Risk High

- Planning to include latest weather information and continuously monitored by Dive manager and coxn.
- Diving cancelled by Dive Manager. Diving in progress terminated using diver recall mechanism. Boat intentions and appropriate times notified to Coast guard prior to departure. Updated if plans are changed.

6 Boat breakdown – Risk High (if divers are in the water)

- The boat will always have a dedicated cox'n onboard. The Cardiff BSAC RIB carries an anchor, a spare engine, spare fuel tank and a VHF radio. In the event of the main engine breaking down the spare engine can be started and the fuel line can be detached from the main fuel tank and attached to the spare fuel tank quickly and easily.
- If the boat is drifting while the spare engine is being started the cox'n can immediately deploy the anchor to maintain the position on site.
- If there are any problems with then spare engine or if the boat is at a remote site the coastguard can be contacted via radio for assistance.

7 Non diving search days –Medium risk

- Fewer members of the team will be available to help with the boat so planning for launch and retrieval times in relation to tidal height is more important.
- Minimum of two members on board at all time during search days and plan to be logged with coastguard and other team members
- Life jackets are to be worn at all times by the coxn and crew during search days.