

Samson Flats Inter-tidal Field Survey



Project Design

Kevin Camidge & Luke Randall

With contributions by

Phil Rees
Charlie Johns



Title	Samson Flats , Isles of Scilly Inter-tidal Field Survey Project Design
Reference	5694
Authors	Kevin Camidge & Luke Randall
Derivation	Samson Flats Inter-tidal Field Survey Project Proposal
Origination date	27.I.2009
Revisers	Kevin Camidge Luke Randall
Date of last revision	12.VI.2009
Version	Rev 1.6
Status	Final
Summary of Changes	
Circulation	Kath Buxton Mark Dunkley Alison Hamer Charlie Johns Luke Randall Phil Rees Charlotte Winter
Required action	
File Name Location	D:/Samson Flats/Project Design SF Project Design 1_5
Approval	

Contents

Contents	4
Abbreviations	5
Project Name.....	6
Summary Description	6
Background.....	6
Summary of the Geology of Samson (by Phil Rees)	7
Sea Level Rise	8
Previous Work.....	9
Interpretation of the Features	10
Project Aims and Objectives.....	12
Increasing Public Awareness and Community Involvement	12
Improved Site Management	12
Understanding the Monuments	12
Business Case.....	13
Making the Past part of our Future	13
SHAPE	13
Taking to the Water	14
RCZAS	14
Project Scope	15
Interfaces	15
Communications	17
Project Review.....	17
Health and Safety	18
Open Day Safety Considerations	18
Risk Assessment Matrix	19
Project Team Structure	20
Methods Statement	21
Real Time Kinematic GPS Survey	22
Planning Frame Survey.....	22
Survey Personnel	22
Reports.....	23
Archiving.....	23
Community Involvement	23
Stages, Products and Tasks	24
Products.....	26
Ownership.....	27
Bibliography	28
Appendix I – Risk Log	30

Abbreviations

ADS	Archaeology Data Service
BP	Before Present
CAU	Cornwall Archaeological Unit
CEP	Coastal Erosion Project
CISMAS	Cornwall and Isles of Scilly Maritime Archaeology Society
EDM	Electronic Measuring Device
EH	English Heritage
GPS	Global Positioning System
HER	Historic Environment Record
HES	Historic Environment Service (Cornwall)
IoS	Isles of Scilly
ISSET	Isles of Scilly Environmental Trust (Isles of Scilly Wildlife Trust from 2001)
MSL	Mean Sea Level
PRN	Primary Record Number
RCZAS	Rapid Coastal Zone Assessment Survey
RTK	Real Time Kinematic

Project Name

Samson Flats Inter-tidal Field Survey

Summary Description

The 'Hedges and Ruins' on Samson Flats in the Isles of Scilly were first noted by Dr William Borlase in the mid-eighteenth century. The location of these features within the inter-tidal zone was taken as evidence that they were part of an inundated landscape and possibly prehistoric in date. However, this interpretation of their function and date has sometimes been questioned. This project aims to produce an accurate survey of the features and the topography in the inter-tidal zone on Samson Flats. The survey of these features should allow a better determination of their function and date. The project will also seek to engage the local community through site open days and local presentations.

Background

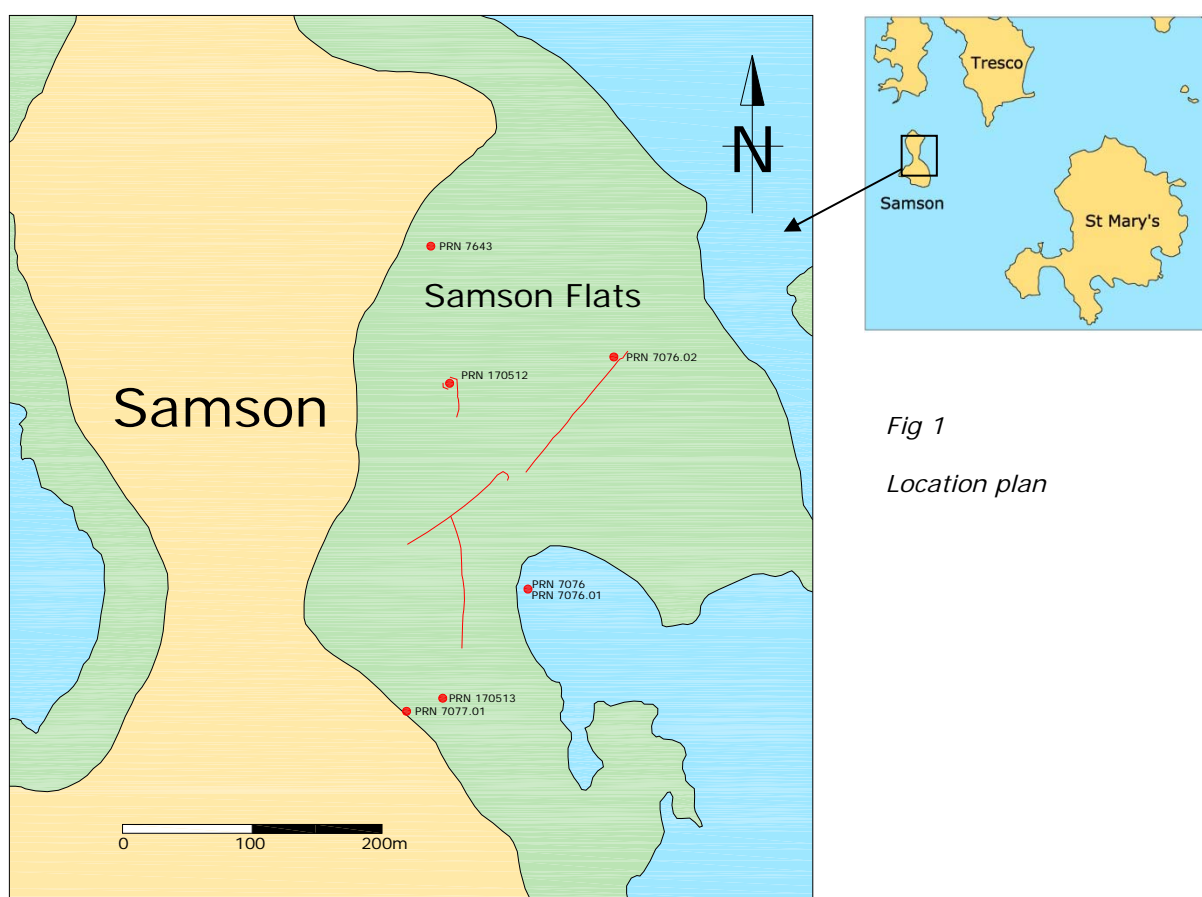


Fig 1

Location plan

Samson Flats is an expanse of littoral sand located to the east of Samson, Isles of Scilly. On a spring low tide, this area consists of about 0.15 km² of exposed ground. Within this area the Isles of Scilly Historic Environment Record (HER) lists seven features of archaeological importance (fig 2). These form part of Scheduled Monument 15526 'Prehistoric to post-medieval funerary, field system and settlement remains etc, on and adjacent to Samson'.

Fig 2

*HER records for
Samson Flats*

PRN	Description
7076	Hut Circle
7076.01	Field System
7076.02	Hut Circle/Settlement
7077.01	Field System
7643	Stone Working Site
170512	Hut Circle
170513	Hut Circle

Summary of the Geology of Samson (by Phil Rees)

The Isles of Scilly is an archipelago formed by the erosion and partial submergence of an oval shaped batholith of granite. The makeup of the granite is divided into two types (Barrow, 1906), coarse and fine, the latter occupying a roughly central position bounded by the most southern part of Tresco, all of Samson, the northern part of Annet and the most northerly parts of St. Mary's.

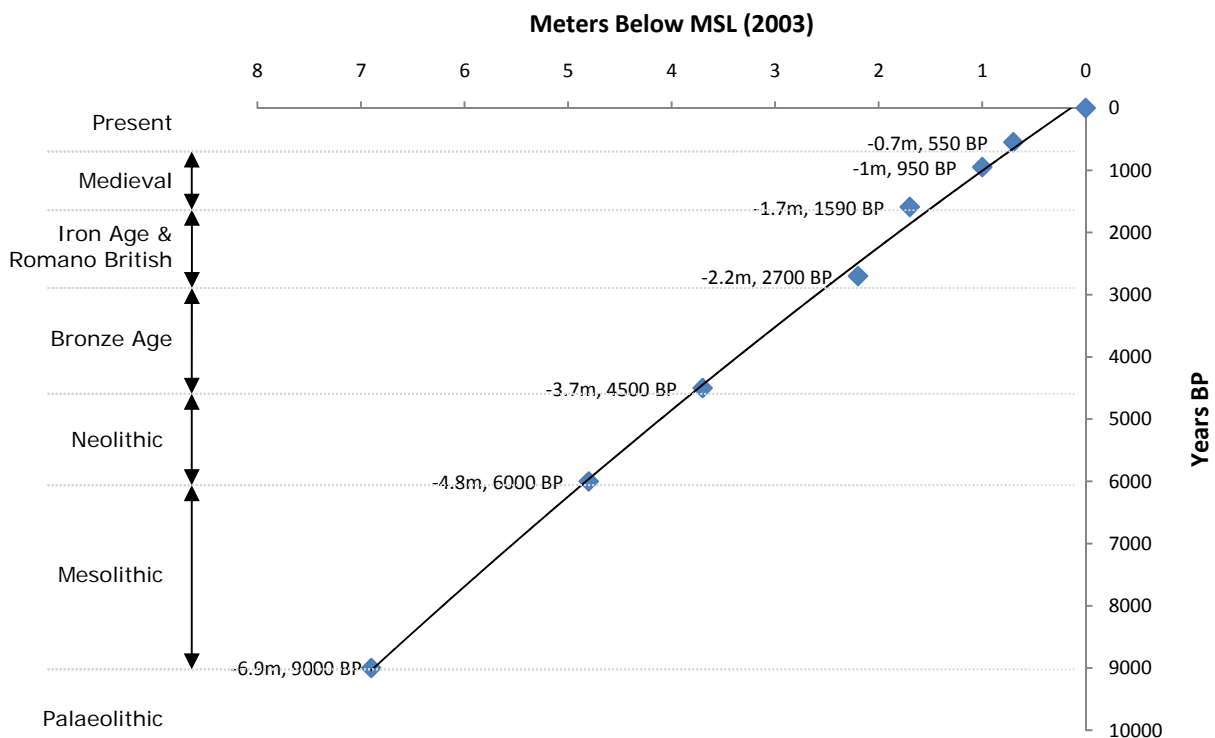
The weathering and denudation of the exposed granite has created a glacial deposit known as head material which can be seen in the cliffs on the exposed shorelines of the islands, together with large accumulations of sand which have been transported initially by the action of the sea and then sculpted by the wind into a variety of land forms including dunes, beaches, bars and most significantly tombolos (sandbars connecting an island with the mainland or another island).

The island of Samson is the largest of the uninhabited islands, and takes the form of two distinct hills connected by a sand bar isthmus. The twin hills effectively form the summits of two granitic "tors" with the lower sides cloaked in "head" material which can be seen in the exposed cliff faces on the west side of the island facing onto the "sand flats". There is also evidence from the excavation of a cist in 1970 which was exposed by the action of the sea (Thomas, 1985) to suggest that this sand bar connecting the two hills has been breached by an unreported tidal surge in the first millennium AD and that the bar has since been reformed by the movement of the sand.

The likely sequence of sediments within the vicinity of archaeological features on Samson Flats is a sand layer up to one metre thick overlying a glacial deposit of eroded brecciated material (head) formed from the weathering of the granite, which according to Scourse (1991), would have been formed during the very last phase of glaciation (Devensian) whose influence is now thought to have extended as far south as the northern margins of the islands.

Sea Level Rise

Since the Last Glacial Maximum, rising sea level has served to isolate the Isles of Scilly from the Cornish mainland and transform them into their present form (Johns *et al* 2004, 21). This process would have impacted significantly upon the islands' inhabitants. As areas once suitable for settlement gradually became inundated, the means by which islanders utilised a changing landscape would have altered accordingly (Johns *et al* 2004, 90-93). An early submergence model for the islands postulated by Thomas (1985) has more recently been questioned by Ratcliffe and Straker (1996) through the dating of inter-tidal peat deposits. The proposed Lyonesse project (Johns *et al* 2007) aims to build on previous work and resolve the question of sea level rise in Scilly.



Previous Work

The 'Hedges and Ruins' on Samson Flats were first noted by Dr William Borlase in the mid-eighteenth century (Borlase 1756) and later discussed by OGS Crawford (1927). The location of these features within the inter-tidal zone was taken as evidence that they were part of an inundated landscape and possibly Bronze Age in date (eg Thomas 1985). However, the interpretation of these linear stone features as field boundaries by Borlase, Crawford and Thomas has sometimes been questioned.

In 1988 the Cornwall Archaeological Unit (CAU – now HES) was commissioned by EH to undertake an assessment of the archaeological resource on Scilly, including submerged remains and those in the inter-tidal zone. The resulting report (Ratcliffe 1989a) formed the archaeological input into an Integrated Management Plan by ISET. The hut circle/settlement and field system on Samson Flats was one of the sites prioritised for archaeological recording (Ratcliffe 1989b, 19). Although this was not undertaken during the ensuing five year rolling project of coastal monitoring, small scale recording and palaeoenvironmental sampling was. The Coastal Erosion Project (CEP) resulted in the publication of *The Early Environment of Scilly*, which similarly recommended further survey of inter-tidal remains (Ratcliffe and Straker 1996, 52).

In 2003 English Heritage commissioned the Cornwall County Council HES to conduct a Rapid Coastal Zone Assessment Survey (RCZAS) for the Isles of Scilly (Johns *et al* 2004). In this report the function and antiquity of certain inter-tidal and subtidal features listed in Scilly was debated:

It has been suggested recently that at least some of those submerged and inter-tidal stone remains, which have been interpreted since Dr Borlase's time as old field walls, could in fact be fish traps, or possibly boundaries between kelp gathering territories. The kelp burning industry was introduced to Scilly in 1684; submerged 'Hedges' were noted by Dr Borlase 72 years later in 1756 and assumed to be prehistoric in date. Was Dr Borlase actually noting comparatively recent features associated with kelp burning? As a caveat to this hypothesis it is useful to note that Hooley (pers comm) has observed that the inter-tidal walls show a very poor correlation with areas of kelp growth and are not aligned in a suitable manner to function as fish-traps. (Johns et al 2004, 94).

The 'settlement and field system' in the inter-tidal zone on Samson Flats was one of the sites prioritised for survey by the RCZAS (Johns *et al* 2004, 199-200).

Interpretation of the Features

The principal archaeological features visible on Samson Flats are linear stone features set into the sand of the inter-tidal zone. Several interpretations of these features have been voiced (Johns *et al* 2007, 94). These features could be associated with prehistoric settlements, fish-trapping or the kelp burning industry.

Submerged Prehistoric Settlement

There are seven HER records for Samson Flats. Of these, two are classified as 'Field Systems' and four as 'Hut Circles'. Thomas (1985, 241) suggests that the linear structures on Samson Flats might form part of a field system that extends over much of the island. It has been suggested that these features are Bronze Age in date (Thomas 1985; Robinson 2007) and present models for sea level rise in Scilly suggest that such a date is feasible (Ratcliffe & Straker 1996 cited in Johns *et al* 2004).

Fish Traps

Although Crawford (1927) originally wrote in support of the submerged field boundary hypothesis he later suggests, in an editorial for *Antiquity* (Crawford 1946), that these features might instead be the remains of medieval fish traps (cf English Heritage 1996; Hooper 2001; Jones 1983). Bannerman and Jones (1999) state that seven types of fish trap can be identified, although variations upon these can be demonstrated (Dawson 2004; Hooper 2001). All types work on the same principle, acting to either isolate fish within a broad area or guide them towards a staked net during the ebbing tide.

Fig 4

Fish-trap types, after Bannerman and Jones (1999)

Type	Description
1	Natural feature adapted as a trap
2	Semi-permanent wattle and wood trap
3	Modified natural feature trap
4	Crescent – shaped trap
5	Rectilinear trap
6	The V or Double V – shaped trap
7	The S – shaped weir trap

The dating of stone-built fish-traps is often problematic. However, timber stakes found in association with stone-built traps at Strangford Lough, Co. Down, have been dated to the late medieval period (McErlean *et al* 2002 cited in Dawson 2004, 16). Historical sources have also been used to date a trap in Caernarfon, North Wales, to the 12th or 13th century (Momber 1991, 108) and fish-traps in Scotland are known to have been used well into the 19th century (Dawson 2004, 25).

Ashbee (1978, 55) and Hooley (cited in Johns *et al* 2004, 94) state that the alignment, position and construction of the linear features on Samson Flats all indicate they would function poorly as fish traps. High resolution survey of the features and surrounding topography should help resolve these issues.

Kelp Industry

The collection and burning of kelp for the extraction of sodium carbonate and iodine formed a seasonal industry in Scilly from the mid 17th to 19th century (Thomas 1985, 109). There are three types of archaeological feature associated with the kelp industry which are analogous with the inter-tidal remains on Samson Flats: drying walls, territorial boundaries and structures designed to encourage kelp growth.

Inter-tidal structures intended to increase yield – these are evidenced at Strangford Lough in Co. Down, Northern Ireland. They were shallow linear structures built within the inter-tidal zone in order to encourage the growth of kelp (McErlean *et al* 2002 cited in Forsythe 2006, 220).

Drying walls – structures intended to keep kelp off wet ground, thus allowing it to dry thoroughly in advance of burning. These are prevalent features in both Co. Donegal and Rathlin, Northern Ireland (Forsythe 2006, 221).

Territorial boundaries - Johns *et al* (2004, 94) suggests that the linear features on Samson Flats might represent boundaries between kelp territories. Thomas (1985, 110) cites historical accounts of disagreements in Scilly regarding kelp collection in certain areas.

Project Aims and Objectives

The project aims fall into three main categories:

Increasing Public Awareness and Community Involvement

- Involvement of the local community and schools in the project by means of guided site open days, school visits and presentations.
- Involvement of the community in the survey: CISMAS members will undertake the fieldwork and recording. All participants in the fieldwork will be volunteers.

Improved Site Management

- Determination as to the most efficient survey methods in the inter-tidal zone, yielding sufficient detail to facilitate the interpretation of function and monitoring the site deterioration processes.

Understanding the Monuments

There is a degree of uncertainty regarding the function of the archaeological features at Samson Flats. Early interpretations of these and other, similar features around Scilly are open to question and the lack of any detailed survey of these remains renders their reinterpretation difficult. The following methods will be used to address these issues:

- Completion of an accurate survey of feature positions and alignments using RTK GPS.
- Detailed recording of exposed features consisting of 1:20 planning frame drawings and 1:10 profiles. Such detailed recording may show any inter-relationships between features and lead to a relative dating sequence.
- Production of a high-resolution contour survey of site topography.



Fig 5 'Field walls' in the inter-tidal zone on Samson Flats. 17th September 2008

Business Case

Making the Past part of our Future

The EH corporate objective which forms the primary driver of the project is
5A: Increase public awareness of the historic environment.

Activity Type 3, Communication

Research A2: Spotting the gaps: Analysing poorly understood landscapes, areas and monuments

SHAPE

The corporate activity / activity type as defined in SHAPE is 5A-3-A1, which converts to 51-3-11.

Communication A1 – Getting people involved: Community participation projects in the historic environment.

<i>Sub-Programme Name</i>	Community involvement and awareness projects
<i>Sub-Programme Number</i>	51311.110
<i>Corporate Objective</i>	5A: Increase public awareness of the historic environment.
<i>Activity Type and Programme</i>	Communication A1 – Getting people involved: Community participation projects in the historic environment.
<i>Sub-Programme Description</i>	Projects raising community awareness of historic environment through direct communication, engagement and participation. Examples might include: <ul style="list-style-type: none">• Volunteer involvement in surveys• Community-led research programmes• Guided site or landscape visits
<i>Reason for EH Support</i>	Builds direct support and engages enthusiasm from which multiple benefits flow. Encourages knowledge transfer through enjoyment.
<i>Similar Sub-Programmes</i>	Separate from 52311.110 where emphasis is on particularly disadvantaged groups.

Taking to the Water

English Heritage's Initial Policy for The Management of Maritime Archaeology in England, *Taking to the Water* states:

Priorities

12.5 Subject to the provision of adequate resources, English Heritage will undertake a programme of research designed to provide a more robust basis for the understanding and management of the maritime historic environment. In doing so we will place greatest emphasis on work designed to strengthen the national record of maritime sites and landscapes, and work designed to enhance the practical and theoretical basis for site management. The following types of project are seen as a high priority:

- projects designed to enhance and validate the Maritime Record through field survey, often in partnership with voluntary groups;
- studies designed to improve understanding of drowned coastal landscapes and palaeo environments. Such landscapes have tremendous potential for the preservation of archaeological evidence of the exploitation of coastal and marine resources and for use in predicting the nature, scale and pace of coastal change; (Roberts & Trow 2002)

RCZAS

The Rapid Coastal Zone Assessment Survey for The Isles of Scilly makes a number of recommendations including:

Further work on inter-tidal sites

Future work in the inter-tidal zone should consist of an integrated study of the two types of evidence in the inter-tidal zone, that is stone remains (field walls, hut circles, cists) and the inter-tidal 'peat' deposits, and include detailed survey as well as palaeoenvironmental sampling and analysis.

Survey in the inter-tidal zone

Survey of inter-tidal remains in Scilly has so far been very piecemeal, carried out in several field projects by a variety of organisations and individuals using different types of equipment, some of it now regarded as antiquated, usually compass, dumpy level, alidade and plane table, which are on the whole unsuitable with the special factors affecting survey in the inter-tidal zone. The survey area is often distant from any fixed points, the ground is often unstable (wet or dry sand) and remains are only exposed above water for a short time. There is a pressing need for a comprehensive and accurate survey of Scilly's inter-tidal sites so that their geographical, topographical and chronological relationships can be better understood and so that sampling work can be carried forward against a background of good survey evidence representing the wider archaeological context of palaeoenvironmental results. Future survey should prioritise:

- EDM survey to produce accurate plans of all exposed inter-tidal remains;
- Using differential GPS to establish the accurate ordnance datum height of all exposed (and recorded buried) inter-tidal remains is particularly important;
- EDM contour surveys of beaches on which remains are exposed;
- Using EDM/GPS to establish fixed survey points from which inter-tidal remains can be monitored periodically

Sites prioritised for survey

- **PRN 7076.01/.02** Samson Flats, settlement and field system
- **PRN 7102.05-.07** Tean, settlement and field system
- **PRN 7247.01/.02** Nornour, settlement and field system
- **PRN 7345** Crab's Ledge, Tresco, field system
- **PRN 7346.01-03** Bathinghouse Porth, Tresco, settlement and field system
- **PRN 7305** The Brow, Bryher, field system

(Johns *et al* 2004)

Project Scope

The project will be confined to the exposed features in the inter-tidal zone to the east of the Island of Samson, the area known as Samson Flats. The project will consist of survey only and as such will be non-intrusive.

There are three main elements to the survey

1. Identification and survey of position and alignment of exposed features using RTK GPS.
2. Characterisation of these features by drawing short sections of them in plan and profile. At the same time photographic recording will be undertaken.
3. High-resolution contour survey of the site topography

Interfaces

The most obvious interface is with the Lyonesse Project which, if successful in obtaining funding, will look into the evolution of the coastal and marine environment in Scilly. It will be a three year project, starting in 2009. CISMAS members are part of the proposed Lyonesse project team, and will be undertaking the marine geophysical survey mapping the seabed peat deposits. A brief summary of the Lyonesse project is reproduced below.

The aim of the Lyonesse Project is to reconstruct the evolution of the physical environment of the Isles of Scilly during the Holocene, the progressive occupation of this changing coastal landscape by early peoples and their response to marine inundation and changing marine resource availability. Of particular importance nationally will be the collection and analysis of data that will increase knowledge of sea level change during the past 8,000 years. The project, which will extend over a 3-year period, includes geophysical survey to identify submerged sediments and archaeological remains and biostratigraphic analysis of coastal, inter-tidal and submerged sediments at selected locations around Scilly. The results of the first two years will be disseminated in annual interim reports, with a final project report being prepared at the end of year three. The project, which will be co-ordinated by Cornwall County Council's Historic Environment Service, will include experts from Cardiff and Plymouth Universities and the Cornwall and Isles of Scilly Maritime Archaeological Society (CISMAS) as well as seeking to involve the local diving community on Scilly. (Johns et al 2008)

The detailed survey of the inter-tidal cultural material on Samson Flats will be a valuable data set for the Lyonesse project, especially so if many of the so-called field walls on Samson Flats turn out to be features associated with fish trapping – as seems possible. In any case, these structures are highly dependent on sea level and tidal range and as such the sea level changes are important to their operation.

Another interface will be with the ongoing 'Islands in a Common Sea' project. This is a partnership between Cardiff University and Cornwall HES, which commenced in 2005. This project seeks to:

Reinvigorate archaeological research into the archaeology of Scilly; to further develop knowledge of the early environment, society and settlement on the islands; to explore the relationship between Scilly and the Southwest British mainland; to enhance understanding of the archaeology of the Atlantic facade; and to continue research into cultural and economic responses to physical and climatic marginality on islands.

Communications

The project team will communicate with each other by e-mail and telephone. We will communicate externally with EH through e-mails and highlight reports. Highlight reports will be prepared and circulated on completion of fieldwork each year.

The project will be signposted on OASIS.

The following bodies will need to be consulted before work starts on this project. Some have already been contacted, but all will need to be kept informed of the project's progress. This will be accomplished by email and telephone.

The Crown Estates (Charles Green)
Isles of Scilly Wildlife Trust (David Mawer)
Natural England (Judy Webber & Fiona McNie)
English Heritage (Phil McMahon)
The Duchy of Cornwall (Colin Sturmer)
The Council of the Isles of Scilly
Isles of Scilly Historic Environment Field Advisor (Eleanor Breen)
The Isles of Scilly Museum (Amanda Martin)
Community & local schools (Tresco and St Mary's)

Permission for the project may be required from the Duchy of Cornwall (land owners) and the Isles of Scilly Wildlife Trust (leaseholders). Initial approaches to these bodies suggest that no problems will be encountered.

Project Review

The project will be reviewed after each 'execution' stage – in this case the fieldwork undertaken in 2009 and 2010. This process will be performed by the project manager at the same time as the highlight reports are produced. The highlight reports will be submitted to the project officer, Alison Hamer, within one month of completion of the field work.

Health and Safety

Work will be conducted in accordance with the manual *Health and Safety in Field Archaeology* (2002) endorsed by the Standing Conference of Archaeological Unit Managers and also the Council for British Archaeology's Handbook No. 6 *Safety in Archaeological Field Work* (1989).

Prior to carrying out on-site work a Risk Assessment will be produced for the project.

CISMAS is covered by public liability insurance through the CBA group insurance scheme.

Open Day Safety Considerations

The following is a customised health and safety statement for visitors to the site during the site open days. In the case of the visiting school parties, these will at all times be under the supervision and control of their accompanying teachers. Schools operate a rigorous health and safety regime in respect of outside visits – they will have their own risk assessment in place beforehand. We will liaise with the teachers concerned with respect to health and safety and risk assessments prior to the visits.

The site has open public access; visitors will be made aware of the risks outlined in the risk assessment matrix below. One member of the team will have responsibility for visitors to the site.

Risk Assessment Matrix

Task	Potential Hazard	A Likelihood	B Severity Rating	Overall Risk Rating A x B	Control Measures	Action	Revised Risk Rating
1. Site Visit	1.1 Adverse Weather: Hyperthermia, hypothermia	3	3	9 Moderate	Wear protective clothing	Take foul weather clothing, sun cream, water, etc	1x1=1 Low
	1.2 Mud: Injury to participants, risk of getting stuck.	3	3	9 Moderate	Avoid hazardous areas.	Brief participants. Appropriate footwear. Carry first aid kit. Carry mobile phones.	1x2=2 Low
	1.3 Uneven ground. Injury to participants.	3	2	6 Medium	Brief participants and teachers to be vigilant of trip hazards	Brief participants. Carry first aid kit.	2x2=4 Low
	1.4 Currents/ tide. Participants caught by tide.	4	4	16 High	Refer to tide times Only enter intertidal zone at low tide	Brief participants of tide times. Working day to take account of tide times.	2x2=4 Low
	1.5 Hand tools. Tapes and planning frames Injury to participants.	2	2	4 Low	Brief participants on use. Brief visitors to beware of tapes		2x1=2 Low

Probability

- 1 Extremely improbable, an accident could only occur under freak conditions. This should be the normal status.
- 2 Improbable, an accident might occur if other factors were present but the risk is minimal
- 3 Possible, the accident may occur if an additional event takes place. This additional event is a specific action (failure to act)
- 4 Probable, the accident could be precipitated by wind, vessel movement or human carelessness, e.g unsecured ladder
- 5 Highly probable, if work continues there will almost certainly be an accident, e.g exposed electrical conductor

Seriousness

- 1 Trivial injury, the injury can be treated on site and does not prevent the casualty from working
- 2 Minor injury, injury or disease that keeps the casualty off work
- 3 Serious injury
- 4 Major injury, serious injuries to a number of personnel
- 5 Death to one or more people

S E R I O U S N E S S						
P R O B A B I L I T Y		1	2	3	4	5
	1	LOW	LOW	LOW	LOW	LOW
	2	LOW	LOW	MEDIUM	MEDIUM	MEDIUM
	3	LOW	MEDIUM	MEDIUM	MEDIUM	HIGH
	4	LOW	MEDIUM	MEDIUM	HIGH	HIGH
	5	LOW	MEDIUM	HIGH	HIGH	HIGH

Project Team Structure

Stage	Personnel	Details
Project Design	Kevin Camidge (KC) Luke Randall (LR) Charlie Johns (CJ)	Darkwright Archaeology CISMAS Cornwall HES
Survey	CISMAS Kevin Camidge (KC) Luke Randall (LR) Maureen Murphy (MM) Janet Witheridge (JW) Robin Witheridge (RW) Sharon Austin (SA) Phil Rees (PR) Innes McCartney (IM)	Project manager Archaeologist & survey Archaeologist Draughtsman Survey assistant Draughtsman & photographer Marine geologist Site assistant
Community liaison	Luke Randall (LR) Robin Witheridge (RW)	CISMAS CISMAS
Reporting	Kevin Camidge (KC) Luke Randall (LR) Charlie Johns (CJ)	Darkwright Archaeology CISMAS Cornwall HES

Methods Statement

The fieldwork will take place during spring tides to allow access to the inter-tidal features. The week chosen (20-27 June), although not the best spring tides of the year, offers the spring tides which, although not the best in year, are the most suitable where accommodation is still available for the team on Scilly.

Date (2009)	High Water		Low Water	
Sun 21 June	02:54	5.2m	09:19	1.2m
	15:18	5.4m	21:51	1.1m
Mon 22 June	03:46	5.5m	10:10	1.0m
	16:09	5.7m	22:43	0.9m
Tue 23 June	04:36	5.6m	11:01	0.9m
	16:58	5.8m	23:34	0.8m
Wed 24 June	05:26	5.7m	11:51	0.8m
	17:48	5.9m	-	-
Thu 25 June	06:16	5.6m	00:25	0.7m
	18:39	5.9m	12:40	0.9m
Fri 26 June	07:05	5.5m	01:15	0.8m
	19:29	5.6m	13:30	1.0m

Fig 6

Table of tidal heights above chart datum for St Mary's. Heights are in metres and times in GMT. The low tides when survey will take place are highlighted in blue.

Observations made in September 2008 suggest that, given the above tides, the inter-tidal features will be exposed for four to six hours each day. Thus the working day will be structured so that the team is on site and ready to survey as the falling tide exposes the features. Many of the features are covered in wrack algae (fig 7), and this will need to be trimmed in the areas which are to be drawn in detail (short sections of no more than 5m). Past experience with trimming suggests that the algae will regenerate rapidly.

Fig 7

Linear stone feature partly obscured by bladderrack. Samson Flats September 2008



The RTK GPS system will be used to fix the control point network employed in the survey of the visible features. It will also be used to gather data for the overall contour survey of the area. Once the general position and alignment of the features is established, they will be characterised by drawing representative sections of the features. This will be accomplished by a 1:20 planning frame survey and 1:10 profiles and cross-sections. These will be undertaken in the first year. In the second year further detail will be added, resulting in more of the features being drawn in detail.

Real Time Kinematic GPS Survey

It is intended that an RTK GPS be hired. This comprises a rover unit and a reference station, which will be positioned over the existing Ordnance Survey datum on Samson. The stated accuracy for such systems is approximately 20mm horizontally and 30mm vertically. The RTK GPS survey

- Will be used to fix the control point network used for the survey
- Will allow rapid collection of high density contour data for the area around the exposed features
- Will be used to establish precise position and alignment of the exposed features

The survey data collected using the RTK GPS will be stored as an ASCII text 'XYZ' file and will accompany the final report on CD ROM.

Planning Frame Survey

In addition to the GPS survey, 1:20 plans and 1:10 profiles will be drawn from baselines fixed by the control network. These plans and sections will allow for the interpretation of variations in construction and design, the analysis of areas of dispersion and the demonstration of physical relationships where observed.

Plans will be drawn using planning frames fixed by baseline, whilst sections and elevations will be completed by offsetting from a level line and the relevant section points collected using the RTK GPS. The survey will be digitised using AutoCAD, and the AutoCAD files will be placed on the CD ROM which will accompany the final report. Autocad files can be readily exported to GIS systems, such as the ESRI Archview system used by Cornwall HER.

Survey Personnel

This survey will be conducted by the Cornwall and Isles of Scilly Maritime Archaeology Society (CISMAS) under the direction of Kevin Camidge. CISMAS has already carried out work on *Colossus* including a two year survey of the debris field in 2004-5. In 2008, CISMAS undertook the recording phase of the stabilisation project commissioned by EH. CISMAS has also undertaken a survey of Mount's Bay in Cornwall, funded by the Heritage Lottery Fund, which involved detailed recording of exposed wreck material.

CISMAS members have also been involved for the last two years in detailed recording in Scilly of the wreck of *Firebrand* (1707). Although CISMAS is an organisation of volunteers, the survey achieved by its members is of a very high standard.

Reports

An interim survey report will be produced by September 2009. This will include a description of the fieldwork undertaken in 2009 and the survey results. It will also detail the survey to be complete in 2010 as well as any alterations required to the survey methodology.

The final survey report will be produced by October 2010. This will include a description of all the fieldwork, the survey results and a discussion of the interpretation of the features surveyed.

Archiving

Copies of the report and the digitised survey will be supplied to Cornwall HER, English Heritage and to the Archaeology Data Service (ADS). The cost of the digital archiving at the ADS will be borne by EH, but time has been allowed for its preparation and liaison with the ADS.

Community Involvement

The project provides an opportunity for CISMAS to engage local communities in their cultural and environmental heritage. This will be achieved through the organisation of site open-days and the presentation of findings to local organisations.

Liaison with the Isles of Scilly Museum, the Council of the Isles of Scilly Lifelong Learning Department and local media will allow for the advertisement of site open days. This will afford the project the opportunity to engage both members of the local community and visitors to the islands. During open days, the site and other prominent archaeological features on Samson can be highlighted and discussed. The project's relevance to past changes in the island landscape forms an ideal introduction to the topics of both past and present sea level rise and climate change. The open days will be advertised in the *Islander* (a local news magazine), on Radio Scilly (local radio station) and in the weekly *What's On* events diary run by the Tourist Information Service on Scilly.

There is only one school on the Isles of Scilly, located on five different sites. The Five Islands School has been contacted to encourage student and teacher involvement. Tresco Primary School & Carn Thomas Secondary School, St. Mary's have been consulted and the opportunity for site-visits in the 2009 season discussed. A presentation will be prepared about the project and a member of the team will be available to go into schools and discuss the project with pupils. This team member will also attend the Access and Learning Workshop for Educators held in May 2009 run by the Hampshire and Wight Trust for Maritime Archaeology.

Stages, Products and Tasks

2009					
Product	Task No	Date	Task	ID	Days
Logistics	1	Apr 09	Book accommodation Purchase survey supplies Book freight and team on IoS ferry	KC	0.5
	2	Apr 09	Book RTK GPS hire Set up school visits Advertise open days	LR	0.5
Community Involvement	3	May 09	Prepare schools outreach presentation	LR	2
	4	May 09	Access and Learning Workshop Southampton	LR	4**
	5	Jun 09	Site open days (schools and public)	LR RW	1**
	6	Jun 09	Schools outreach presentation	RW	1**
Survey	7	Jun 09	Set up control network	KC	1**
	8	Jun 09	Identify and survey intertidal features	KC LR	3** 3**
	9	Jun 09	Draw 1:20 plans	KC MM JW SA IM LR RW	1** 5** 5** 5** 6** 1** 4**
	10	Jun 09	Draw 1:10 profiles	MM JW SA	1** 1** 1**
	11	Jun 09	Contour survey	KC LR	1** 1**
	12	Jun 09	Project review 1	KC LR	0.5 0.5
	13	Jul 09	Highlight report 1	KC	0.5
Reporting	14	Sep 09	Interim survey report – including survey processing and any suggested refinements for the 2010 survey methodology	KC LR CJ	3 3 0.5

Days marked ** are a CISMAS contribution – at no cost to EH

2010					
Product	Task No	Date	Task	ID	Days
Logistics	15	Apr 10	Book accommodation Purchase survey supplies Book freight and team on IoS ferry	KC	0.5
	16	Apr 10	Book RTK GPS hire Set up school visits Advertise open days	LR	0.5
Community Involvement	17	May 10	Revise schools presentation	LR	2
	18	Jun 10	Site open days (schools and public)	LR RW	1** 1**
	19	Jun 10	Schools outreach presentation	RW	1**
Survey	20	Jun 10	Check and repair control network	KC	1**
	21	Jun 10	Continue survey intertidal features	KC LR	2** 2**
	22	Jun 10	Draw 1:20 plans	KC MM JW SA IM LR RW	1** 5** 5** 5** 6** 1** 4**
	23	Jun 10	Draw 1:10 profiles	MM JW SA	1** 1** 1**
	24	Jun 10	Contour survey	KC LR	1** 1**
	25	Jun 10	Project review 2	KC LR	0.5 0.5
	26	Jul 10	Highlight report 2	KC	0.5
Reporting	27	Sep 10	Final survey report – including survey processing	KC LR CJ	5 5 1
Archive	28	Sep 10	Prepare archive for HER and ADS	KC	1

Days marked ** are a CISMAS contribution – at no cost to EH

Actual dates for tasks 18 to 26 will only be fixed once tides and available accommodation in 2010 are known.

Products

One interim and one final report will be produced. These will describe the results of the fieldwork undertaken, the circumstances and conditions at the time of the survey and the results that were obtained.

Interim Report (Sept 2009)

Final Report (Oct 2010)

Archive (copies to EH, HER and ADS)

Each report will have the following contents:

Summary	
Introduction	Background aims and methods
Results	The survey results
Discussion	Discussion of the archaeological findings
Specialist Reports	Any specialist reports (eg geology)
Archive	A summary of the archive contents
Illustrations	Photographs and drawings All drawings and survey results will also be held as an AutoCAD file and raw GPS data (on CD with the report) including DXF files for easy migration to GIS

Ownership

Use of all material contained within the project reports and survey files is granted to the client.

Bibliography

- Ashbee, P, 1978. *Ancient Scilly: from the first farmers to the early Christians*. David and Charles: Newton Abbot
- Bannerman, N and Jones, C, 1999. 'Fish-trap types: a Component of the Maritime Cultural Landscape' in *The International Journal of Nautical Archaeology* Vol. 28.2 pp 70-84
- Barrow, G, 1906. *The Geology of the isles of Scilly*, *Memoirs of the Geological Society* HMSO, London.
- Borlase, W, 1756. *Observations on the Ancient and Present State of the Islands of Scilly*. Oxford
- Crawford, OGS, 1927. *Lyonese, Antiquity* I, 5-14
- Crawford, OGS, 1946. Editorial in *Antiquity* 20
- English Heritage, 1996, *The Wootton-Quarr, the Isle of Wight survey*. Available at http://www.eng-h.gov.uk/archrev/rev96_7/wquar.htm
- English Heritage, 2000. *Power of Place: The future of the historic environment*, English Heritage
- English Heritage, 2005a. *Making the Past Part of our Future*, English Heritage
- English Heritage, 2005b. *Research Agenda 2005-2-10: An Introduction to English Heritage's research themes and programmes*, English Heritage
- English Heritage, 2006. *Management of Research Projects in the Historic Environment: The MORPHE Project Managers' Guide*, English Heritage
- English Heritage, 2007. *SHAPE 2008: Strategic Framework for Historic Environment Activities and Programmes in English Heritage, Guidance for external grant applications*, English Heritage, SHAPE version 1.0 November 2007
- Forsythe, W, 2006. 'The Archaeology of the Kelp Industry in the Northern Isles of Ireland' in *The International Journal of Nautical Archaeology* Vol. 35.2 pp 218-229
- Hooper, J, 2001, *Ardersier – Excavations of a Possible Fish Trap*. Report for Historic Scotland/Highland Council Archaeology Unit. Available at <http://her.hIGHLAND.gov.uk/SingleResult.aspx?uid=EHG1132>
- Johns, C, Larn, R, Tapper BP, 2004. *Rapid Coastal Zone Assessment for the Isles of Scilly*. HES, Truro
- Johns, C, Camidge, K, Charman, D, Muville, J & Rees, R, 2007. *The Lyonesse Project, Isles of Scilly: Project Design*. HES, Truro
- Jones, C, 1983. 'Walls in the Sea, the Goradau of Menai' in *The International Journal of Nautical Archaeology and Underwater Exploration* Vol. 12.1 pp 27-40
- McErlean, T, McConkey R. & Forsythe W. (eds.), 2002. *Strangford Lough: an archaeological survey of the maritime cultural landscape*. Blackstaff Environment & Heritage Service: Belfast

- Momber, G, 1991. 'Gorad Beuno, investigation of an ancient fish-trap in Caernarfon Bay' in *The International Journal of Nautical Archaeology* Vol. 20.2 pp 95-109
- Ratcliffe, J, 1989a. *The Archaeology of Scilly: An assessment of the resource and recommendations for its future*. CAU, Truro
- Ratcliffe, J, 1989b. *Priorities for future archaeological recording and management work in the Isles of Scilly*. CAU, Truro
- Ratcliffe, J and Straker, V. 1996. *The Early Environment of Scilly: palaeoenvironmental assessment of cliff-face and inter-tidal deposits 1989-1993*. CAU, Truro
- Roberts, P and Trow, S, 2002. *Taking to the Water: English Heritage's Initial Policy for The Management of Maritime Archaeology in England*. English Heritage
- Robinson, G, 2007. *The Prehistoric Island Landscape of Scilly*. British Archaeological Report 447 Archaeopress: Oxford
- Scourse, JD , 2006. *The Isles of Scilly Field Guide*. Quaternary Research Association, London
- Thomas, C, 1985. *Exploration of a Drowned Landscape: archaeology and history of the Isles of Scilly*. Batsford, London

Appendix I – Risk Log

No	Description	Probability	Impact	Countermeasures	Est time & cost	Owner	Updated
1	Bad weather Unable to travel by inflatable boat to Samson in severe weather	MEDIUM	MEDIUM	It may be possible to take Island ferry boats to Samson in severe weather – but it may be too rough to land on Samson	Lost days are possible Chartering Island boats to reach Samson in bad weather about £150 per day	KC	
2	Staff Illness	LOW	HIGH	The critical persons are: Project manager (KC) in this case LR would deputise Survey (LR) in this case KC would deputise	No cost implications. Slightly less survey would be achieved if team members are unavailable due to illness	KC	
3	Equipment failure The critical item is the hired RTK GPS unit	MEDIUM	MEDIUM	The GPS will be used to fix baselines and collect bathymetric data In case of failure baselines will be fixed by tape to control points which can be surveyed in year 2. Topographic data collected using backup optical level and staff	Failure will result in some extra survey work in 2010	LR	
4	Transport failure Very occasionally the ferry to Isles of Scilly does not sail due to bad weather or mechanical failure	LOW This has happened twice in the last 3 years	HIGH	No countermeasures possible	A number of days of fieldwork would be lost. The alternative (flying) would not be feasible due to heavy equipment – aircraft would be heavily overbooked if the ferry fails.	KC	
5	Open day Weather too bad for schools / public to attend open day	MEDIUM Weather needs to be fairly benign for school children to land on Samson	MEDIUM	Reschedule if possible Visit school instead if weather causes cancellation	If site visit has to be rescheduled extra cost of LR time and travel	CJ	