

COMPARISON OF RECREATION PARTICIPATION AT WHITESANDS BAY PEMBROKESHIRE 2009 & 2019

(Providing an evidence base for the type, amount and distribution of recreational activities undertaken through Wales Activity Mapping)



A VIEW OVER WHITESANDS BEACH TOWARDS RAMSEY ISLAND ON A SUNNY AUTUMN DAY



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Table of Contents

Executive Summary.....	4
Introduction.....	5
What is Wales Activity Mapping (WAM).....	5
Background to WAM	5
What information is in WAM	7
Activity Layers.....	8
Underlying Activity data:	9
Other Layers.....	10
Methodologies used to obtain data	12
2009 data collection	12
2019 data collection	12
WAM Study Area	14
Case Study - Whitesands Bay.....	15
Activities recorded in 2009 / 2019	16
Spatial Areas of Recreational Activity	18
.....	19
.....	20
Comparison of Summer Usage Data.....	21
Data comparison discussion.....	22
Activity trend.....	25
Comparison of Spatial Recreational Activity Areas.....	27
Comparison of Site Infrastructure	30
Byelaws and Codes of Conduct.....	30
Management Issues, current and potential.....	31
Conclusions	32
Total number of activities recorded in 2009/2019.....	32
Summer usage and trends.....	33
Participant days.....	33
Appendix A: 2019 site and activity survey questions	34
Appendix B: Data set from 2009 and 2019 activity survey at Whitesands Bay.....	37
Appendix C: Supporting details for the 2019 survey.....	39

Executive Summary

Pembrokeshire Coastal Forum (PCF) works to inspire, collaborate and deliver solutions for coastal communities. Our vision is to secure sustainable coasts and oceans for future generations. We work towards this goal via a number of dedicated projects, of which Wales Activity Mapping (WAM) is one.

WAM is a collaborative stakeholder project which provides detailed information on a range of marine and coastal activities, displayed in a mapped Geographical Information System (GIS).

A PCF led project, supported by funding from Natural Resources Wales (NRW), the Welsh Government and the Pembrokeshire Coast National Park Authority (PCNPA), maps the type, amount and location of recreational activities taking place on the South West Wales coastline which includes information on relevant infrastructure and management issues. .

The project follows an evidence based approach to collecting recreation and coastal management information and has been identified as a valuable tool to help develop understanding of current and likely future coastal recreation trends, to inform marine planning and coastal land management.

Data was initially compiled between 2008 and 2010 (referred to in this report as the 2009 dataset). PCF collaborated with a range of stakeholders throughout 2019 to update the data. The update ensures the information stays pertinent for continued benefit to conservation, tourism and planning bodies; providing valid data that can help inform joined up management decisions and plans.

To demonstrate the data set and how it can be used in decision making Whitesands Bay has been chosen as a case study. *Why was Whitesands chosen?* By concentrating on one site, it is possible to examine the data set for a particular site and present a detailed comparison between the data from the two project iterations. The case study provides opportunity to showcase the information within the database, affording an insight as to how the evidence can be utilised to inform management decisions.

The case study details:

- an overview of the information collected and stored in WAM and the methodologies used to source the data
- a comparison of the 2009 and 2019 usage figures at Whitesands Bay
- a comparison of the 2009 and 2019 spatial mapped data for Whitesands Bay
- Any changes present between the data sets and the associated inferences that can be made and conclusions drawn

Introduction

The case study will use Wales Activity Mapping (WAM) to compare the evidence of recreational participation at Whitesands Bay, Pembrokeshire and the near offshore islands. Exploring the difference in both spatial distribution and the amount of recreational activities undertaken by individuals, while explaining how WAM was used to provide the evidence.

It is generally accepted by members of the public and local authorities that the area of Whitesands has increased with activity over the 10 years between 2009 and 2019. The case study will look at individual activity numbers broken down by season, and the spatial area used to conduct these activities. It is hoped that this in depth look at both increases and decreases in the amount of recreation undertaken and where the activities take place will help inform management decisions by local organisations/authorities.

With activity tourism currently growing it is crucial that we take a proactive approach in managing recreation to ensure the long term sustainability of the tourism and recreation industry. Informed decision making uses the best available evidence, WAM provides this information for recreational activities.

What is Wales Activity Mapping (WAM)

Wales Activity Mapping (WAM) is a study into the type, amount and distribution of activities carried out on the South West Wales Coastline which includes information on relevant infrastructure and management issues. All information is hosted and viewable on a GIS viewing system.

Background to WAM

The initial WAM project was instigated in 2008 from a partnership of organisations, involved in the management of the coast and countryside across South West Wales. The partnership sought to assist in the sustainable management of the coastal area to the maximum benefit of all potential users by constructing a coherent picture of outdoor activity. Led by PCF, data collection commenced over the period between 2008 to 2010. The information gathered from the data collection assisted in the development of a framework for management in the region.

The main objectives for the project included:

- To obtain a clear understanding of the key recreational activities within the study area
- To determine the scale and distribution of key activities on a site by site basis
- To ascertain actual and perceived negative impacts of activities on a site in terms of the environment, community and human safety and identify conflicts between users and user groups
- To identify the greatest pressures on the resource, including impacts on designated sites and protected species
- To provide an indication of likely future trends
- To identify opportunities for recreation

The 2019 project set out to achieve the same objectives to those listed above, continuing to follow an evidence based approach to collecting recreation and coastal management information. The

partnership approach developed in 2008 was maintained for the 2019 iteration, with project funding provided by Natural Resources Wales (NRW), Pembrokeshire Coast National Park Authority (PCNPA) and the Welsh Government.

Data collected helps support NRW's current work with Area Statement development and provides an evidence base to inform the PCNPA management plan 2020-2024. The newly collected WAM data provides a current dataset which fulfils a specific evidence need highlighted during the development of the Wales National Marine Plan:

'to develop an understanding of current and likely future distribution and intensity of coastal recreation and tourism activity to support identification of key areas of use and potential future use and understanding' (Marine Planning Wales, 2013¹).

The updated data from the 2019 collection period enables there to be a continuation of a reliable and valid dataset to be available to those needing to consider recreation, conservation and tourism factors. Assisting in:

- development of long term strategies and planning
- management of recreational activities so as to eliminate or prevent user conflicts between participants; between different activities; between recreational participants, local communities and business interests
- spatial planning to minimise or prevent conflicts between recreation, conservation features and socio-economic activities, planning for enhancement, development and marketing of coastal recreation development and management of infrastructure and facilities relating to recreational activities

¹ Marine Planning Wales: Specific Evidence Needs, 2018. Marine Planning WMAAG Meeting Paper 5

What information is in WAM

The WAM data is displayed in a Geographical Information System (GIS), which provides a spatial layer for each recreational activity surveyed. *Figure 1* shows a screen shot of the GIS. In the original 2008 survey 33 activities were covered. In 2019, an additional 11 activities were added to the survey scope bringing the total to 42. These 11 additional activities were included through recommendations from the project steering group and include recreational sports which were in their infancy during 2008 e.g Stand Up Paddleboarding (SUP) and activities which have come further into the forefront due to access and management impacts and the interest to understand more about participant behaviour e.g bait digging.

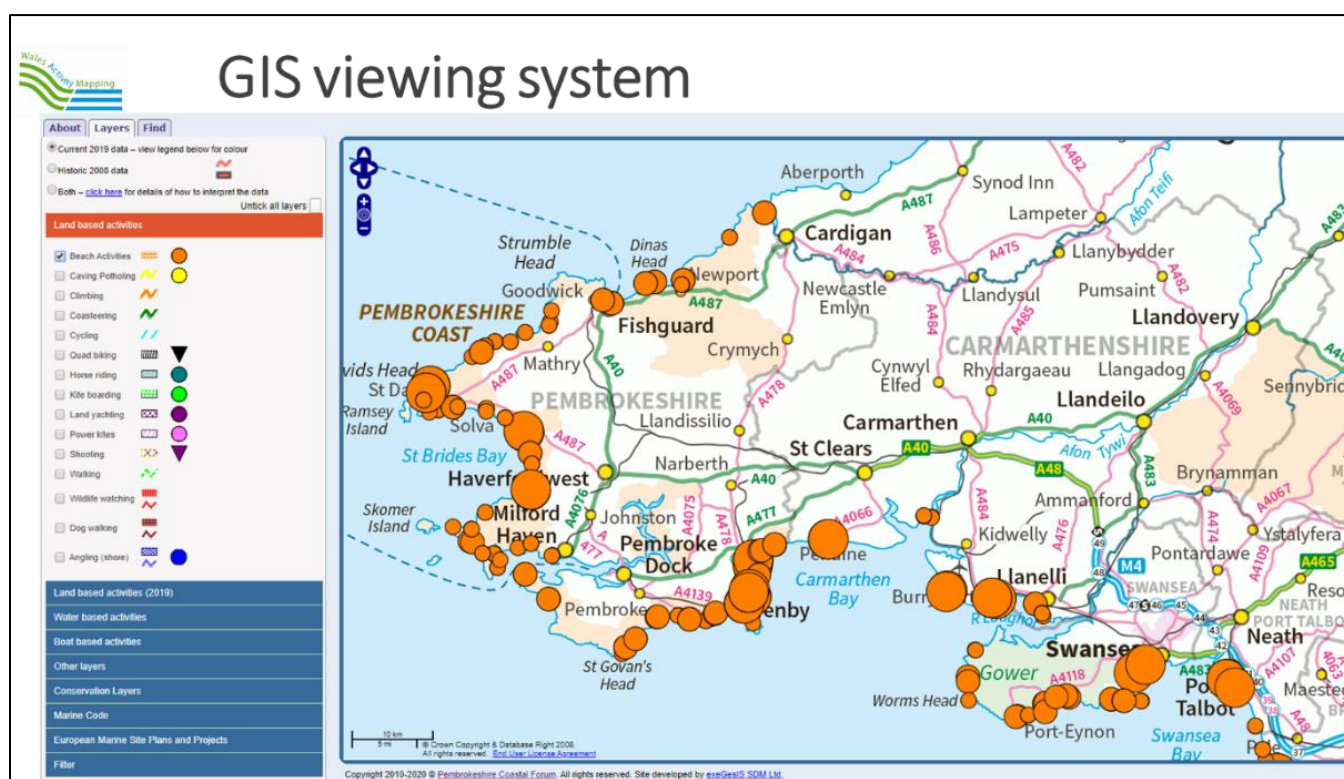


FIGURE 1 WAM GIS VIEWING SYSTEM SHOWING BEACH ACTIVITIES

Activity Layers

Activities are classified through four categories, land based, land based (2019), water based and boat based. The full activity list and classifications can be viewed in *Table No.1*.

No.	Land based activities	No.	Land based activities (2019)	No.	Boat based activities	No.	Water based activities
1	beach activities	16	bait digging	26	diving	35	body boarding
2	caving/potholing	17	event hotspots	27	jet skiing PWC	36	canoeing/kayaking
3	climbing	18	gathering living resources	28	power boats	37	kite surfing
4	coasteering	19	drone flying	29	cruiser sailing	38	snorkelling
5	cycling	20	photographers	30	wake boarding / water skiing	39	surfing
6	quad biking	21	wild camping	31	wildlife boat tours	40	swimming
7	horse riding	22	light aircrafts - powered	32	dingy sailing	41	windsurfing
8	kite boarding	23	overnight camping	33	rowing	42	SUP journeys
9	land yachting	24	sunset watchers	34	*sea angling(boat based)		
10	power kite flying	25	light aircrafts - non-powered				
11	shooting						
12	walking						
13	wildlife watching						
14	dog walking						
15	*sea angling (shore based)						

TABLE 1 ACTIVITIES WITHIN WAM BY CATEGORY

Activities in *red* = additional activities for 2019 survey. *Sea angling split into two - shore based and boat based for 2019 survey

Underlying Activity data:

Information collected on activities is held within spatial layers, an example shown in *Figure 2*. Data includes:

- Usage figures
- Seasonality – frequency of activity usage for each season
- Trend in activity usage based on a five year timeline
- Confidence in the data provided on a 1-5 scale
- Four site specific reports, covering: activity specific details, site infrastructure, management issues, and data provider information
- Spatial supporting documents
- Password protected layers and reports

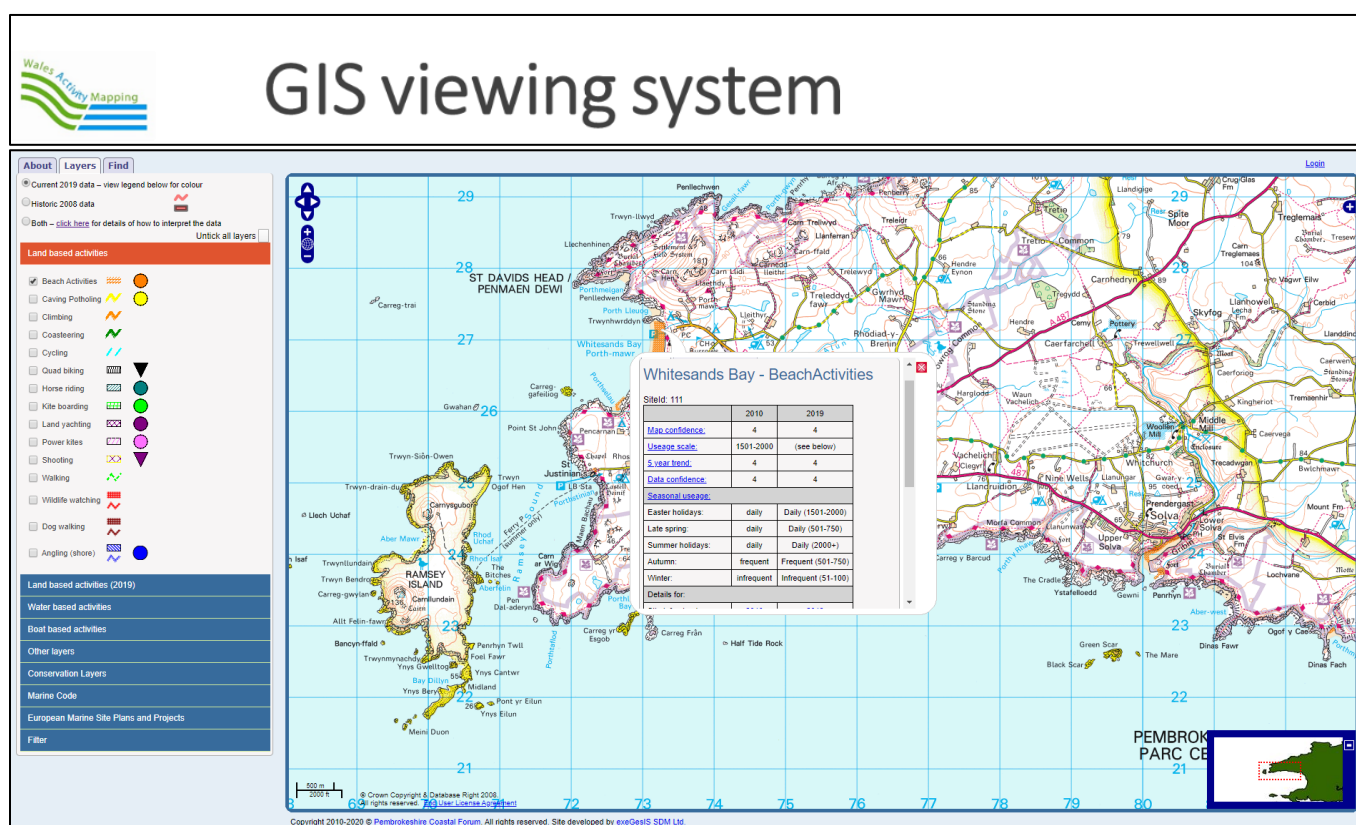


FIGURE 2 WAM GIS VIEWING SYSTEM SHOWING USAGE FIGURE FOR BEACH ACTIVITIES

Other Layers

Further supporting information is provided through a number of other layers in the web viewing GIS, shown in *Table 2* below. Screen shots showing examples of the other layers available are displayed in *Figures 3 and 4*.

Other Layers	Conservation Layers	Pembrokeshire Marine
Public Land*	Sites of Special Scientific Interest (SSSI)	Slow areas
SW Wildlife Trust**	National Nature Reserves (NNR)	Seal areas
Beach awards	Special Protection Areas (SPA)	Seal and Seabird areas
Car parks	Areas of Outstanding Natural Beauty (AONB)	Seabird areas
Dog ban areas	Country Parks	Cetacean areas*****
Lifeguarded beaches	Local Nature Reserve (LNR)	
Climbing restrictions	RAMSAR (Convention on Wetlands of	
Mooring areas	Special Area of Conservation (SAC)	
Slipways	Heritage Coast	
Public Rights of Way	Marine Conservation Zone (MCZ)	
Coasteering		
Economic		

TABLE 2 OTHER LAYERS WITHIN WAM BY CATEGORY

* Along with other public land use, includes information on National Trust land boundaries

** South West Wales Wildlife Trust land boundaries

*** The Coasteering Feasibility Mapping Project takes a holistic view of the coastline and a proactive approach to identifying suitable areas that may have the potential to accommodate commercial coasteering activity. These areas are shown on a password protected coasteering GIS layer. This enables activity centres the ability to comment on suggested areas as we take a partnership approach to voluntary agreements in the sustainable development of coasteering in Pembrokeshire.

**** PCF utilising the specialist expertise of Marine Planning Consultants and Atkins completed a project to provide an economic value to mapped areas of marine/coastal recreation/tourism in two pilot areas of Pembrokeshire. Completed in 2014, the study has provided clear evidence and methods to state how much individual activities are worth to the local economy.

***** Pembrokeshire Marine Code information includes maps which highlight the existing agreed access restrictions that have been drawn up by conservation experts and coastal users, along with codes of conduct. The codes have been agreed in order to preserve and protect the marine wildlife that makes the Pembrokeshire coastline so special.

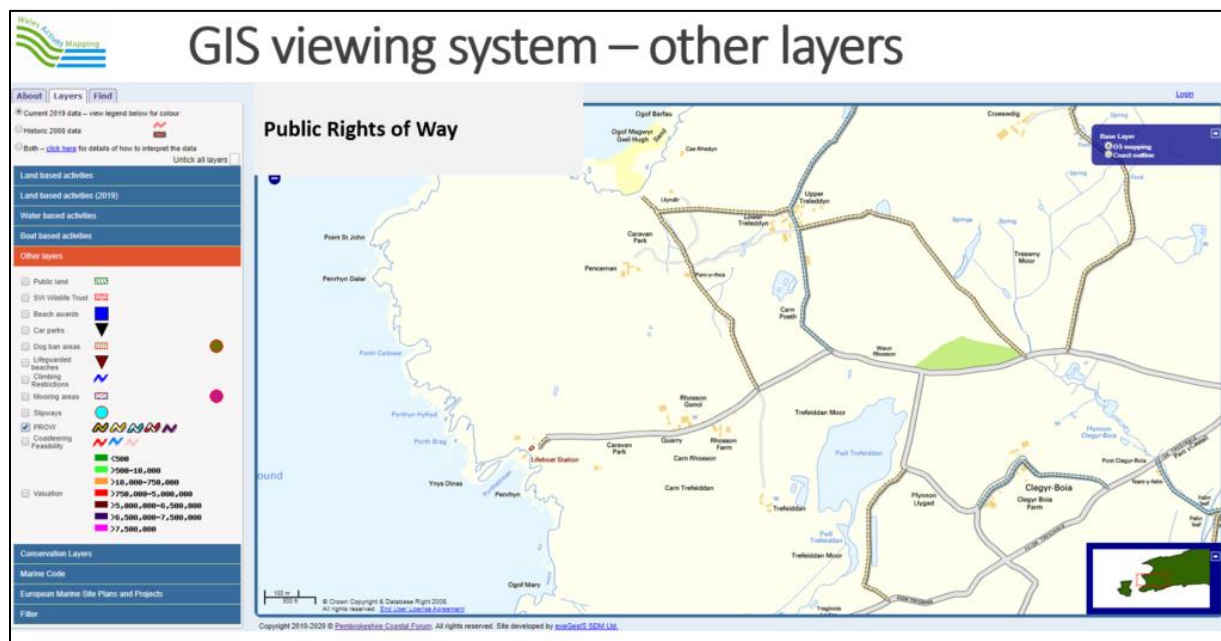


FIGURE 3 WAM GIS VIEWING SYSTEM SHOWING PUBLIC RIGHTS OF WAY

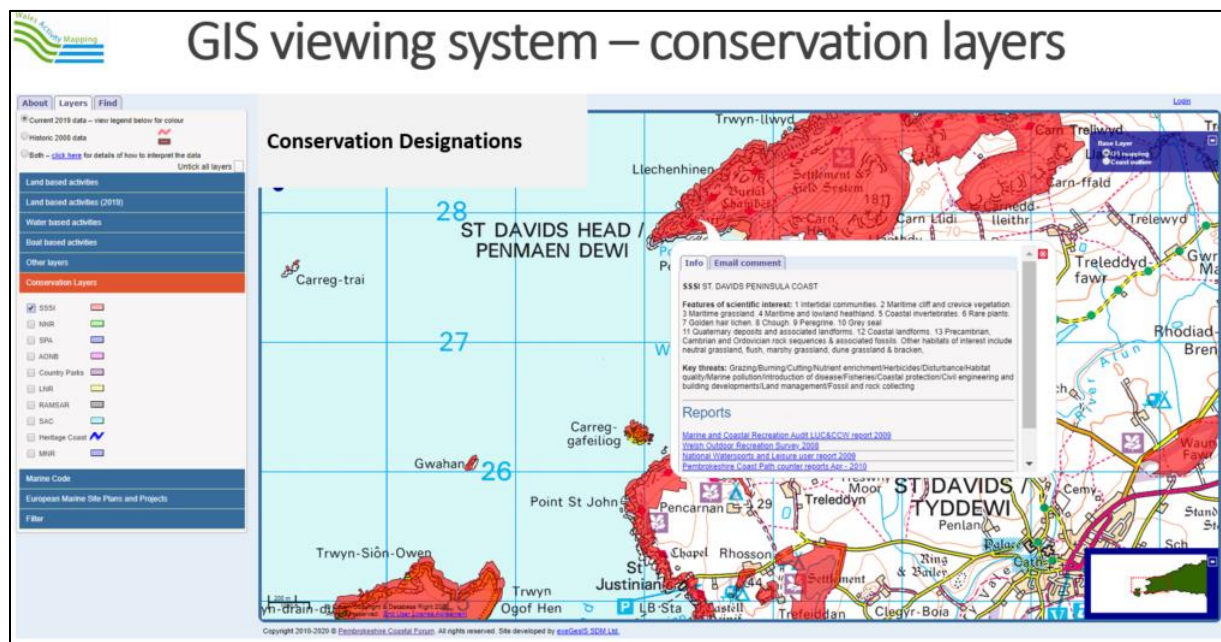


FIGURE 4 WAM GIS VIEWING SYSTEM SHOWING ST DAVIDS PENINSULA COAST SSSI

Methodologies used to obtain data

Both project iterations collected data from a wide knowledge base, which comprised of a range of contacts with an awareness and familiarity of coastal recreation, related infrastructure and management processes. Representatives included outdoor recreation professionals, coastal land managers and local authority representatives.

The surveys created incorporated questions relating to the frequency and usage of the coast for 33 and 45 recreational activities, for 2009 and 2019 projects, respectively. The surveys also included questions on site infrastructure and recreation focused management issues.

Projects were led by a steering group, who met quarterly and comprised of members from:

- Pembrokeshire Coastal Forum
- Relevant Local Authorities
- Pembrokeshire Coast National Park Authority
- National Trust
- Natural Resource Wales
- Milford Haven Port Authority
- Carmarthen Bay and Estuaries European Marine Site (EMS)
- Pembrokeshire Marine Special Area of Conservation (SAC)

2009 data collection

Proformas were posted and e mailed to a range of individuals along with maps and prepaid envelopes to gauge the return rate which turned out to be low. Interviews with wardens, rangers, outdoor centre instructors, recreation managers, beach managers and harbour masters have taken place throughout the region. These face to face interviews have provided the opportunity to complete the proforma and capture spatial information concerning recreational activities by asking data providers to draw on OS maps and Admiralty Sea Charts. The proformas were designed to capture data on coastal recreation including details on infrastructure and management.

Paper based survey data was inputted to a GIS and ACCESS database on a rolling basis after each face to face survey.

2019 data collection

The face to face system was considered to be the optimum method to use to collect the data, which traded time proficiency against the most effective approach to receive the most reliable data set with confidence.

A digital based survey created in an Excel spreadsheet format was developed, with the aim to increase efficiency and decrease potential for data entry errors, along with removing the necessity for double processing. The digitised method improves the scope to be able to upscale the approach to other areas. It also enabled the survey to be shared electronically with contacts, therefore some surveys could be conducted via a video conference platform. Or, contacts who had carried out a face

to face survey for one site, could complete the Excel spreadsheet in their own time for other sites they had knowledge for.

A similar process to 2009 was used for receiving spatial data, utilising Ordnance Survey maps and nautical charts. It was agreed by the steering group to utilise the spatial areas defined in the 2009 project, so contacts were able to make an informed decision on any spatial change to the area the recreation activities are carried out.

Data was collated and exported to an ACCESS database, with the spatial data saved within an SQL GIS database. (The type of information collated is shown in Appendix A which shows site and activity survey questions). 341 interviews, totaling 214 hours, were conducted with 93 contacts, ranging from outdoor recreation professionals, coastal land managers and community council representatives. *Figure 5* highlights the range of supporters involved.



FIGURE 5 SUPPORTERS OF WAM DATA

A number of contacts covered more than one site and therefore took part in multiple interviews. Akin to the 2009 survey, more than one contact provided information for the same site, aiming for three contacts as the optimum. The final data for each site was formalised by taking the average (mode) of the contacts' answers, or if answers varied significantly, the data with the highest confidence was taken as definitive. The survey is believed to currently be the most comprehensive of its type.

Displaying the information from both project iterations on a web based GIS, enables any changes in coastal recreation trends and infrastructure developments within the 10 year period to be viewed.

WAM Study Area

The study area focuses on the coastal strip of the South West Wales region, running from Poppit Sands in the North, round to Bridgend in the South East. The area's northern and southern extents coincide with the coastal region of NRW's South West Area Statement, shown in *Figure 6*.

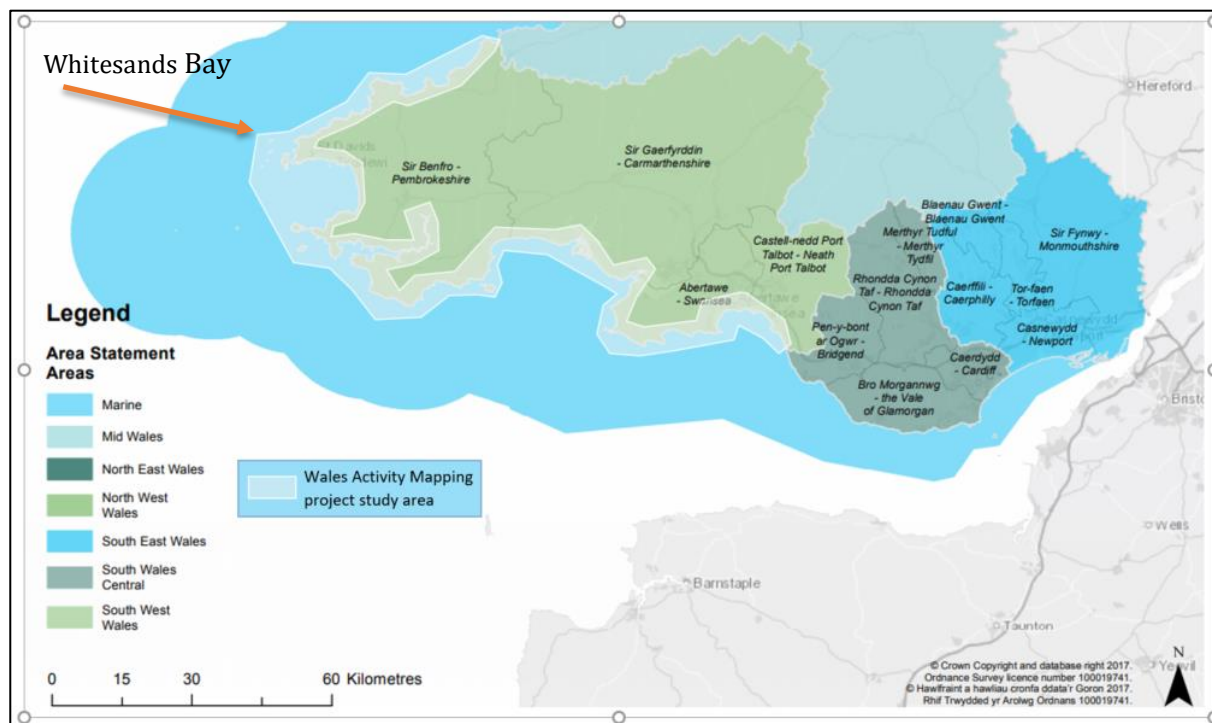


FIGURE 6 WAM STUDY AREA HIGHLIGHTED IN WHITE

Case Study - Whitesands Bay

Whitesands Bay is a wide, west facing, long sandy beach which has been described as the best surfing beach in Pembrokeshire and one of the best tourist beaches in the world. The beach has held a Blue Flag award since 1993, meeting and maintaining a series of stringent environmental, educational, safety and accessibility criteria.



WHITESANDS BEACH WITH RAMSEY ISLAND IN BACKGROUND (CC. VISIT WALES)

The area to the north east of the bay is dominated by a large rocky outcrop known as Carn Llidi. The Pembrokeshire Coast Path passes alongside the bay, giving access in the north to the secluded bays of Porthlleuog and Porthmelgan (which are only accessible on foot), and the rugged coastal scenery of St Davids Head. To the south, the coastal path leads to Porthselau and St. Justinian's, with views across the Ramsey Sound to Ramsey Island. There are a number of megalithic burial chambers, stone hut circles and British Iron Age field systems and enclosures to be seen in the vicinity of Carn Llidi and St Davids Head.

The delineation of the study area for this case study is shown in *Figure 7* with Whitesands Bay, site No.111 being the central focus. Due to their close proximity and relationship to the primary area, reference will be made to surrounding extents, to include St. Davids Head to the north, and St. Justinians and Ramsey Island to the south, site numbers 94, 95 and 82, respectively.

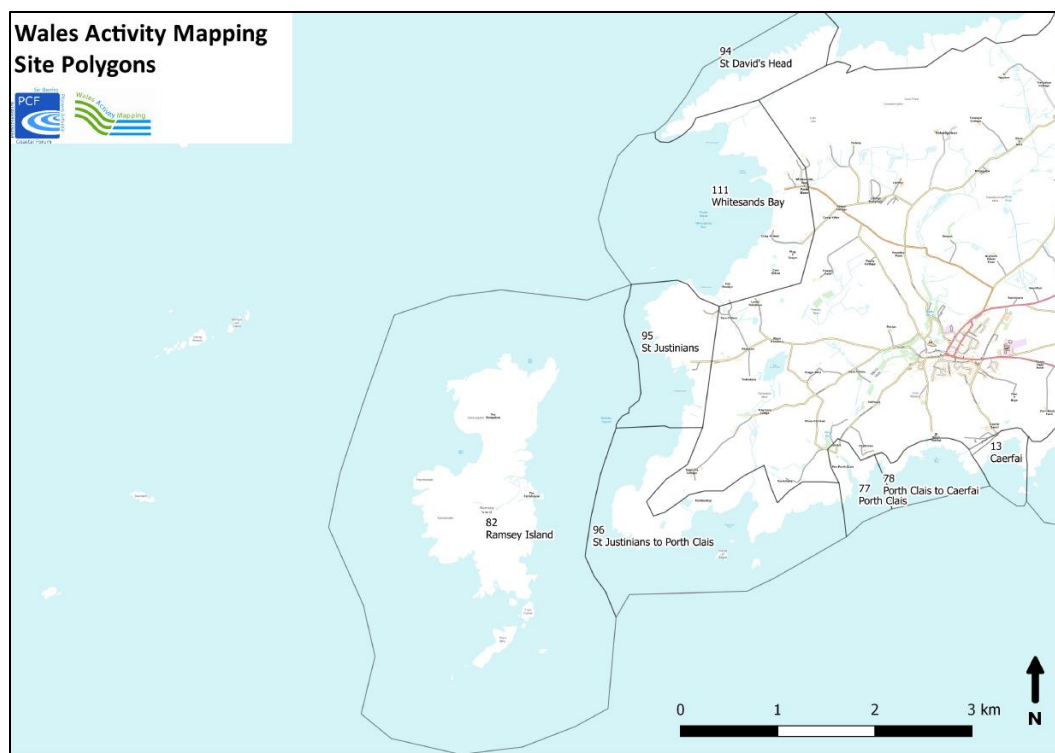


FIGURE 7 WAM WHITESANDS STUDY AREA (NO.111) AND ADJOINING SITES

Activities recorded in 2009 / 2019

The total number of activities recorded at Whitesands Bay from the 2009 and 2019 survey periods can be viewed in *table 3*. Table 3 shows that the total activity numbers recorded were 15 in 2009 and grew to 29 in 2019. This equates to almost a doubling in the types of recreational activities recorded being carried out at the site over the 10 year period. An increase can be seen across all activity categories; water based, land based and boat based, as shown by *table 4*.

This increase in activities needs to be read with some care. With regards to certain activities, it is believed they were apparent in 2009 but were deemed to take place at such low levels, either being relatively new sports or having little management impact, that they were not mentioned in the survey process. Examples of activities where this is thought relevant are overnight camping and stand up paddle boarding.

The addition of 11 new activities to the survey for 2019, is also an underlying factor in the increase. Six out of the 11 new activities have been recorded as occurring in Whitesands Bay. As described before, it cannot be confirmed that these activities did not take place in 2009, as they were not in the survey. They were added to the 2019 survey to help with the current interest in determining participant behaviour and where there has been a perceived growth in the activity. Details are shown in *table 5*. The omission of activities such as powerboating and cruiser sailing within the site in 2009 may be due to the difference between the recording of the data for the site between the two project iterations e.g cruiser sailing being allocated to the Ramsey Island site in 2009 and not delineated to Whitesands Bay.

	2009	2019	
	beach activities	beach activities	power boats
	body boarding	body boarding	power kite flying
	canoeing/kayaking	canoeing/kayaking	rowing
	dinghy sailing	climbing	sea angling(boat based)
	dog walking	coasteering	sea angling(shore based)
	horse riding	cruiser sailing	shooting
	kite boarding	cycling	snorkelling
	kite surfing	dinghy sailing	sunset watchers
	power kites	dog walking	SUP journeys
	sea angling	drone flying	surfing
	surfing	event hotspots	swimming
	swimming	horse riding	walking
	walking	kite boarding	wild camping
	wildlife boat tours	kite surfing	windsurfing
	windsurfing	Overnight Camping	
Total	15	29	

TABLE 3 NUMBER AND TYPE OF ACTIVITIES RECORDED IN THE 2009 AND 2019 SURVEY ITERATIONS

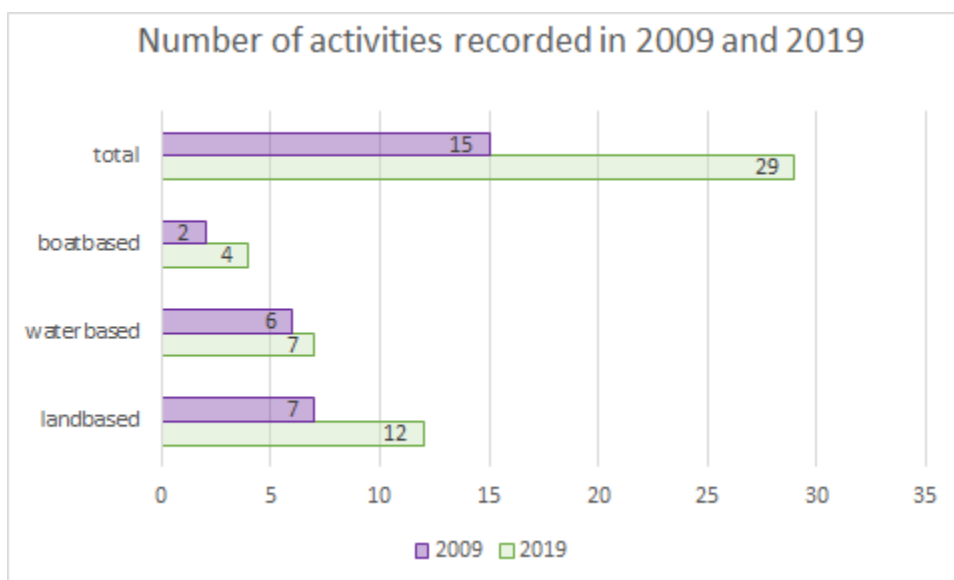


TABLE 4 NUMBER OF ACTIVITIES BY ACTIVITY CATEGORY

1	climbing	Activities that were identified as not happening in 2009, though recorded in 2019	1	drone flying	Activities that were only surveyed in 2019
2	coasteering		2	event hotspots	
3	cruiser sailing		3	overnight camping	
4	cycling		4	sunset watchers	
5	power boats		5	SUP journeys	
6	rowing		6	wild camping	
7	shooting				
8	snorkelling				

TABLE 5 ADDITIONAL ACTIVITIES IDENTIFIED IN 2019

Spatial Areas of Recreational Activity

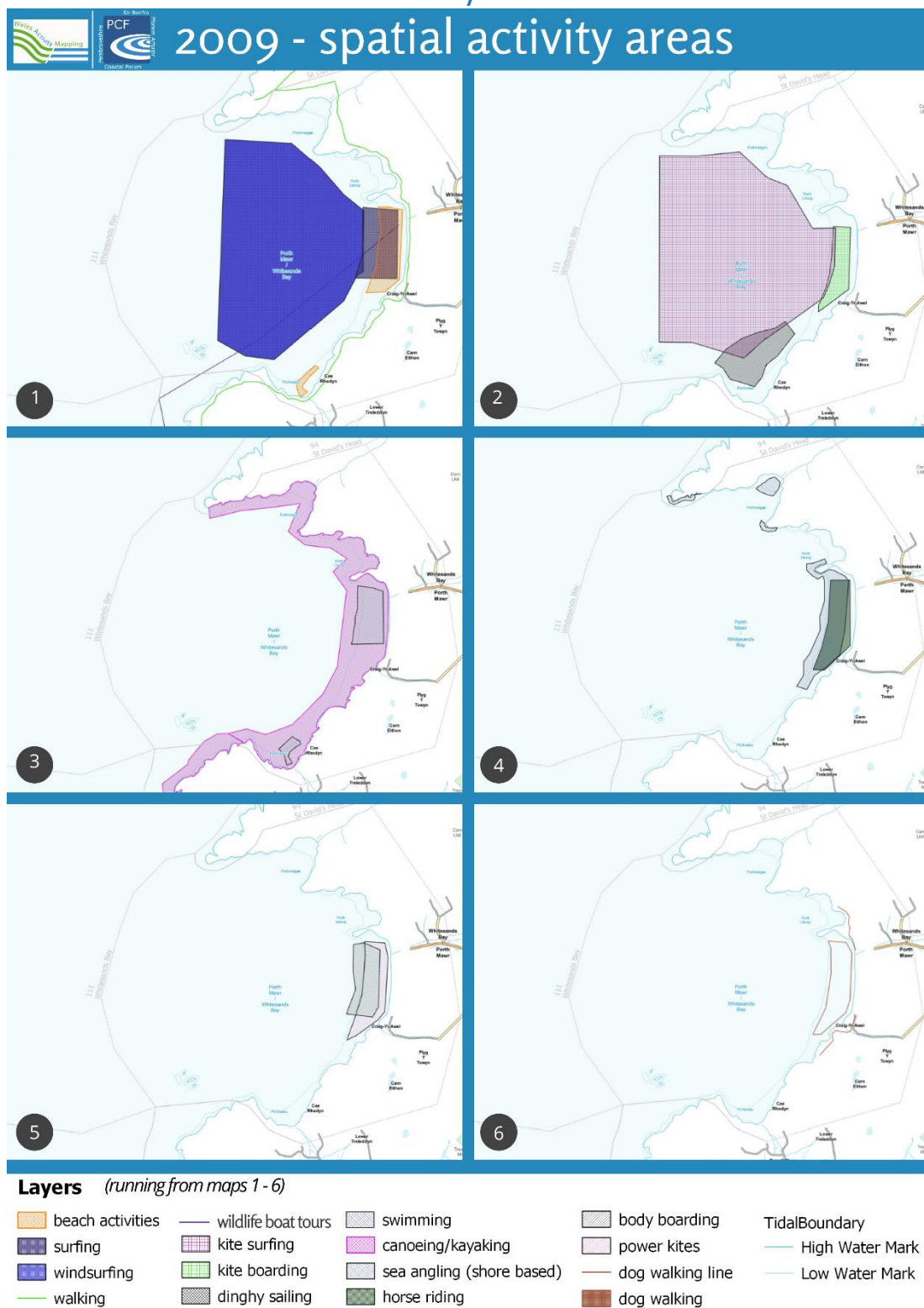


FIGURE 8 MAPS 1-6 SHOWING THE SPATIAL INFORMATION FOR THE 2009 ACTIVITIES TAKING PLACE WITHIN WHITESANDS BAY STUDY AREA



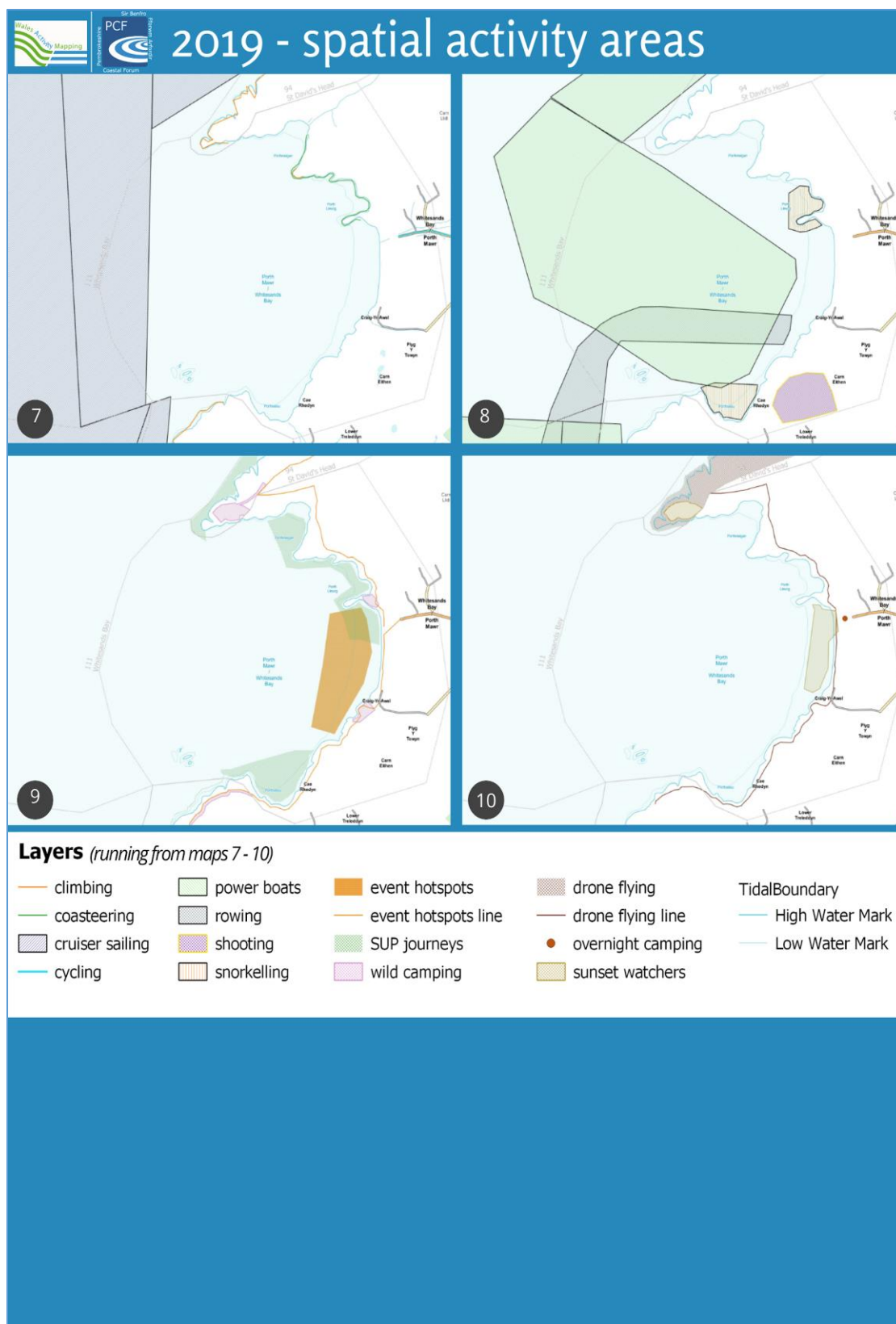


FIGURE 10 MAPS 7-10 SHOWING THE SPATIAL INFORMATION FOR THE 2019 ACTIVITIES TAKING PLACE WITHIN WHITESANDS BAY STUDY AREA

Comparison of Summer Usage Data

During the 2009 survey, contacts were asked to give usage figures, based on a range scale, shown in *table 8*, which related to a typical day during the summer (July and August). A frequency, shown in *table 7* was then applied to the usage scale for each season.

The 2009 data was utilised for the [Economic Valuation of Recreation project](#), which PCF completed with expertise from Marine Planning Consultants and Atkins. Completed in 2014, the project provided an economic value to mapped areas of marine/coastal recreation/tourism in two pilot areas of Pembrokeshire.

Recommendations were taken from this study to improve the accuracy of the WAM data for the 2019 iteration. The 2019 contacts were asked to provide a separate usage scale, shown in *table 8* for each season, along with a frequency *table 7* for that season.

Due to the difference described in the data collection method between the two periods, for the purposes of this case study, the summer usage figures are used, shown in *table 6*. This will enable a viable comparison to be made between the datasets. The full activity dataset for both project iterations can be viewed *Appendix B*.

Term	Days	Dates
Easter	14	2 weeks March/April
Late Spring/early Summer	91	April May June
Summer	62	July August
Autumn	91	Sept Oct Nov
Winter	107	Dec Jan Feb/March 17

TABLE 6 SEASONS DEFINED IN USER DAYS

Frequency term	Definition
Daily	28 days+ per month
Frequent	9-27 days per month
Infrequent	8 days or less per month

TABLE 7 FREQUENCY TERMS DEFINED IN DAYS PER MONTH

Scale ranges	
2009	2019
Not known	Not known
0-25	1-5
	6-15
	16-25
26-50	26-50
51-100	51-100
101-200	101-200
201-300	201-300
301-400	301-400
401-500	401-500
501-750	501-750
751-1000	751-1000
1001-1500	1001-1500
1501-2000	1501-2000
2000+	2000+

TABLE 8 SCALE RANGE DEFINED IN INDIVIDUALS PER DAY

Data comparison discussion

Participant days

Participant days have been calculated for the summer usage figures using the equation shown below. The lower and upper range for each year is shown in *table 9*. These figures describe the total number of participants carrying out each activity over the two month summer season. Total minimum and maximum participant days are greater for the 2019 data than 2009 by approximately 10%.

Summer season participant days = [usage * frequency * number days in season]

Activity		Summer 2009		Summer 2019		2009 Participant Days		2019 Participant Days		% of 2019 #’s to 2009
		Scale	Frequency	Scale	Frequency					
1	beach activities	1501 - 2000	Daily	2000 +	Daily	98,000	- 108,500	112,000	- 124,000	114%
2	body boarding	26-50	Daily	201-300	Daily	2,128	- 2,356	14,000	- 15,500	658%
3	canoeing/kayaking	26-50	Daily	26-50	Daily	2,128	- 2,356	2,128	- 2,356	100%
4	dinghy sailing	0-25	Infrequent	0-5	Frequent	26	- 208	54	- 162	78%
5	dog walking	51-100	Daily		Not recorded	4,200	- 4,650	0	- 0	0%
6	horse riding	0-25	Infrequent		Not recorded	26	- 208	0	- 0	0%
7	kite surfing	0-25	Infrequent	0-5	Infrequent	26	- 208	6	- 48	23%
8	power kite flying	0-25	Frequent	0-5	Daily	234	- 702	168	- 186	26%
9	sea angling (boat)			16-25	Frequent		-	360	- 1,080	n/a
	sea angling (shore)	0-25	Daily	6-15	Frequent	728	- 806	180	- 540	n/a
10	surfing	101-200	Daily	51-100	Daily	8,400	- 9,300	4,200	- 4,650	50%
11	swimming	501-750	Daily	401-500	Daily	35,000	- 38,750	25,200	- 27,900	72%
12	walking	201-300	Daily	201-300	Daily	14,000	- 15,500	14,000	- 15,500	100%
13	windsurfing	0-25	Infrequent	0-5	Infrequent	26	- 208	6	- 48	23%
14	kite boarding	0-25	Infrequent		Not recorded	26	- 208	0	- 0	0%
15	wildlife boat tours	51-100	Daily		Not recorded	4,200	- 4,650	0	- 0	0%
16	climbing	Activities that were identified as not happening in 2009 though recorded in 2019		0-5	infrequent			6	- 48	n/a
17	coasteering			6-15	Infrequent			20	- 160	n/a
18	cruiser sailing			16-25	Daily			1,120	- 1,240	n/a
19	cycling			26-50	Daily			2,128	- 2,356	n/a
20	power boats			16-25	Frequent			360	- 1,080	n/a
21	rowing				Not recorded			0	- 0	n/a
22	shooting				Not recorded			0	- 0	n/a
23	snorkelling			16-25	Frequent			360	- 1,080	n/a
24	Drone Flying	Activities that were only surveyed in 2019		0-5	Infrequent			6	- 48	n/a
25	Event Hotspots			301-400	Infrequent			700	- 5,600	n/a
26	Overnight			43,997	Frequent			180	- 540	n/a
27	Sunset Watchers			26-50	Frequent			684	- 2,052	n/a
28	SUP Journeys			6-15	Daily			560	- 620	n/a
29	Wild Camping			0-5	Frequent			54	- 162	n/a
Total Participant Days						169,148	- 188,610	178,480	- 206,956	110%

TABLE 9 SUMMER SEASON PARTICIPANT DAYS BY ACTIVITY 2009 / 2019

Change in Usage

In *tables 10 -12* activities that have increased, decreased or remained the same in participant days have been identified. This change in participant days is defined as a change in the amount of use, so referred to as an increase, decrease, or no change in use.

Increases in summer activity use

Activity	Description
Beach activities	Increased to the next usage range, to 2000+ in 2019, compared with 1500-2000 in 2009
Body boarding	A large increase in usage, growing by three scale categories, from 26-50 to 201-300 in 2009 and 2019, respectively
Dinghy sailing	Increase in frequency from infrequent to frequent, with usage figures remaining constant
Power kite flying	Usage figures remained constant but there is an increase in frequency from frequent in 2009 to daily in 2019

TABLE 10 ACTIVITIES WITH AN INCREASE EITHER IN SCALE OR FREQUENCY

Climbing, coastering, cruiser sailing, cycling, power boats and snorkelling are all activities which have been identified as occurring at the Whitesands Bay site in 2019. These activities were part of the 2009 survey, but were classed as not occurring in the study area during 2009. It's pertinent to also highlight rowing as part of this group. Although there is not a recorded summer usage in 2019, due to numbers relating to seasonal events, there are high numbers in late spring/early summer and in autumn time.

Decreases in summer activity use

Activity	Description
Dog walking	A complete dog restriction for the entire beach runs from 1st May to 30th September, therefore no usage noted for the summer months in 2019. There is a decrease for this activity over the 10 year period
Horse Riding	Decreased from the lowest usage scale and infrequent in 2009 to not recorded in 2019
Sea angling	Usage figures remained constant, but there is a decrease in frequency from daily to frequent
Surfing	Usage figures show a drop of one scale range over the period
Swimming	Decreased usage figures by one scale category 501-750 and 401-500 in 2009 and 2019, respectively, with the frequency remaining the same
Kiteboarding	Decreased from the lowest usage scale and infrequent in 2009 to not recorded in 2019
Wildlife boat tours	Daily frequency from 51-100 has dropped completely, with the tour boat operator no longer operating from the area

TABLE 11 ACTIVITIES WITH A DECREASE EITHER IN SCALE OR FREQUENCY

No change in summer use:

Activity	Description
Canoeing/Kayaking	Usage figures remained at the same scale and frequency
Kitesurfing	Usage figures in the lowest scale range 0-25 in 2009 or 0-5 in 2019, and frequency, though it is likely that the 2009 number were a high estimate due to less defined scale range
Walking	Usage figures remained at the same scale and frequency
Windsurfing	Usage figures in the lowest scale range, 0-25 in 2009 or 0-5 in 2019, and frequency though it is likely that the 2009 number were a high estimate due to less defined scale range

TABLE 11 ACTIVITIES WITH NO CHANGE EITHER IN SCALE OR FREQUENCY

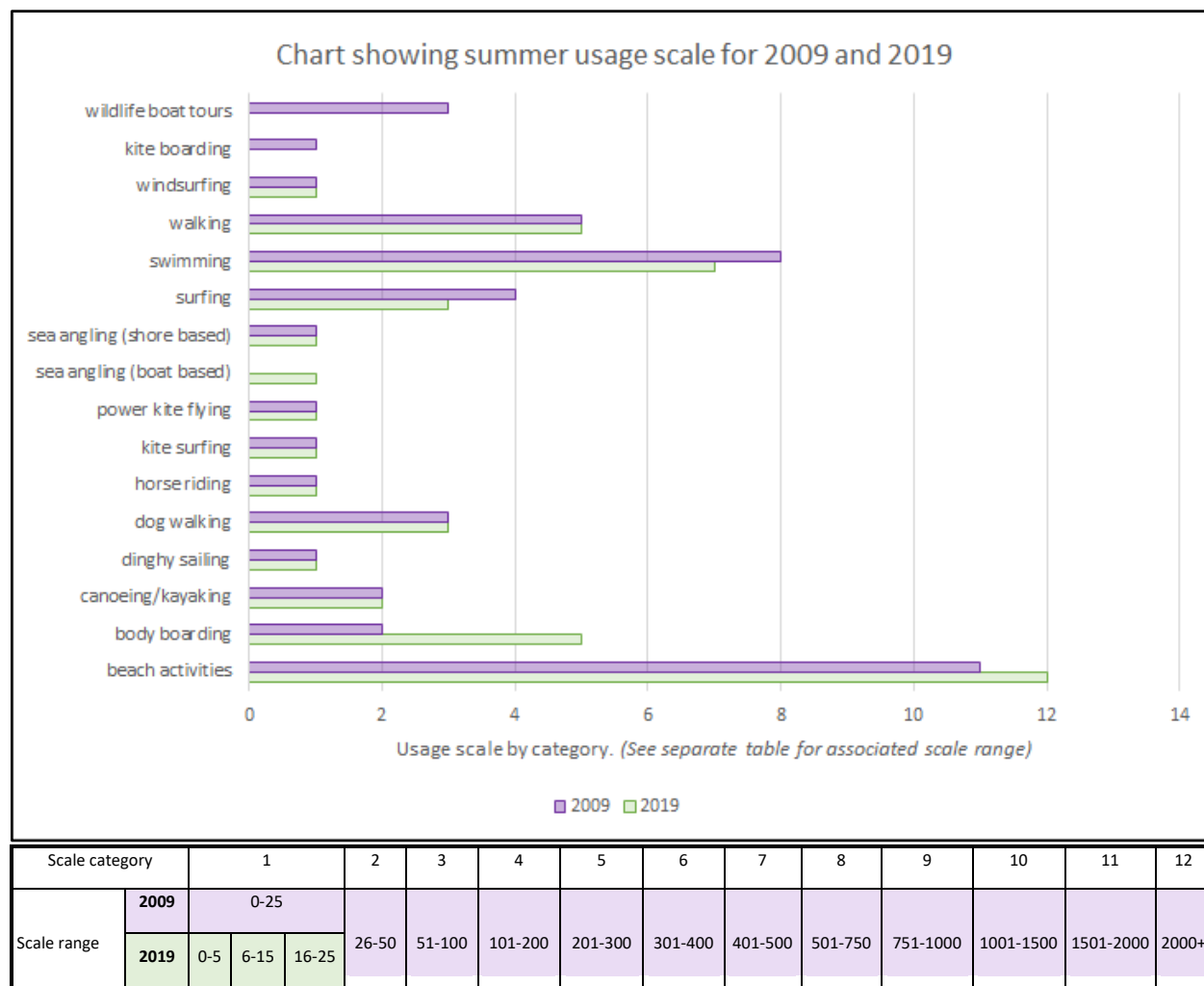


FIGURE 11 SUMMER USAGE SCALE BY ACTIVITY 2009 / 2019

Activity trend

For both surveys, contacts were asked to provide their opinion regarding the trend for each activity, based on the previous five years. Describing each individual activity usage for the site as either: 1 = falling rapidly, 2 = falling steadily, 3 = steady, 4 = rising steadily, 5 = rising rapidly.

It is interesting to observe these figures for the comparative fifteen activities, shown in *table 12*.

Rising trend

Canoeing/kayaking, dinghy sailing, power kite flying and swimming are activities which were thought to be showing a rising trend in 2009.

The rising trend associated with the 2009 data for Canoeing/kayaking does not correlate with an increase in frequency or usage in 2019. This finding could be related to the increase in coastal kayaking with the popularity of sit-on top kayaks approximately a decade ago, with a higher proportion of beach users finding kayaking more accessible with this type of craft, as an alternative to traditional closed cockpit sea kayaks. Therefore, the usage figures reaching their peak in 2009, following a steady trend there on in.

The rising trend considered in 2009 for Dinghy sailing is reflected by an increase in frequency in 2019, from infrequent to frequent.

The rising trend considered in 2009 for Power kite flying is reflected by an increase in frequency in 2019, from frequent to daily.

The 2009 rising trend for Swimming data does not compare with a similar trend in 2019, with usage figures for 2019 being lower, along with a reduced trend rating given, as steady. This is an interesting finding, as it would be easy to assume with the proliferation of open water swimming alongside increased beach activity usage, there would be a concomitant increase in swimming activity and associated trend. The drop in usage described by the 2019 data could be related to figures being supplied by the RNLi Lifeguard supervisor in 2019, with the lifeguard team taking daily numbers of beach users, which enables the usage scale to be more precise.

Steady Activity Trend

Beach activities, Body boarding and Surfing depict a steady activity trend for 2009, which could be considered as inconsistent when looking at their associated usage data in 2019.

Beach activities figures were thought to be at a steady rate in 2009, in comparison to the opinion that a steady rise has occurred over the past 5 years leading up to 2019. Figures could be explained by Whitesands Bay becoming a more popular beach in the summer months, promoted by Visit Wales and other tourism bodies and providers as a safe family blue flag beach.

The large increase in Body Boarding numbers in 2019 does not correlate with the steady trend proposed in 2009. A suggestion for this deviation could be (as described in the above section for 'swimming') that with the RNLi providing information in 2019, the separation of body boarding numbers from surfers could be given higher precision, with surfing showing a decrease in usage in

2019. The definition for bodyboarding between the two project iterations could cause some discrepancy in the data, with differing opinion between contacts on how they view or classify a body boarder e.g participants who are body boarding surfers, or beach goers partaking in bodyboarding as a less dedicated sport.

Surfing usage figures have dropped between the two periods, alongside a steady trend associated with both. Proposed explanation as described for bodyboarding.

Decreasing Trend

Wildlife boat tours was described as having a falling steadily trend, which has been realised by 2019, with no wildlife boat tours currently using the site.

Activity		Summer 2009		Summer 2019		Activity	Activity
		Scale	Frequency	Scale	Frequency	2009	2019
1	beach activities	1501-2000	Daily	2000+	Daily	3	4
2	body boarding	26-50	Daily	201-300	Daily	3	3
3	canoeing/kayaking	26-50	Daily	26-50	Daily	4	3
4	dinghy sailing	0-25	Infrequent	0-5	Frequent	4	3
5	dog walking	51-100	Daily		Not recorded	3	3
6	horse riding	0-25	Infrequent		Not recorded	3	3
7	kite surfing	0-25	Infrequent	0-5	Infrequent	3	3
8	power kite flying	0-25	Frequent	0-5	Daily	4	3
9	sea angling (boat based)			16-25	Frequent	-	3
	sea angling (shore based)	0-25	Daily	6-15	Frequent	3	3
10	surfing	101-200	Daily	51-100	Daily	3	3
11	swimming	501-750	Daily	401-500	Daily	4	3
12	walking	201-300	Daily	201-300	Daily	3	3
13	windsurfing	0-25	Infrequent	0-5	Infrequent	3	3
14	kite boarding	0-25	Infrequent		Not recorded	3	3
15	wildlife boat tours	51-100	Daily		Not recorded	2	-

TABLE 12 SUMMER USAGE FIGURES FOR COMPARABLE ACTIVITIES AT WHITESANDS BAY, ALONG WITH ACTIVITY TREND DATA (1 = FALLING RAPIDLY, 2 = FALLING STEADILY, 3 = STEADY, 4 = RISING STEADILY, 5 = RISING RAPIDLY)

Comparison of Spatial Recreational Activity Areas

Activities with the same spatial area

Table 13 shows the activities which remained the same spatially between the two project iterations (maps showing the activities can be found in *figure 9*).

Activities spatially unchanged		
Beach activities	Walking	Surfing
Horse riding	Body boarding	Swimming
Kite boarding	Canoeing/kayaking	Windsurfing
Power kites	Kite surfing	

TABLE 13 ACTIVITIES WHICH REMAINED UNCHANGED SPATIALLY BETWEEN 2009 AND 2019

Most of the activities listed above need to take place in specific locations on the coast due to the conditions required to carry out the activities. For example, wind-sports such as kite surfing, power kites and windsurfing need the correct wind conditions to be performed. Body boarding and surfing require the correct prevailing conditions and canoeing/kayaking seek the shelter of the coastal belt. Beach activities and horse riding have a finite area to be located in, between low and high water, as well as the spatial area for beach activities and surfing being orchestrated by the RNLI management of the beach during the summer. Walking routes are delineated by the beach area and Pembrokeshire Coast National Park trail. These factors instigate where the activities can be carried out and therefore, spatial changes over the ten year period are unlikely to be seen, as supported by the data collected.

Activities which show a spatial change

Activities which show a spatial change between the two project iterations are shown in *figure 12-14* and listed in table 14.

Activities which show spatial change		
Dog walking	Cruiser sailing	Dinghy sailing

TABLE 14 ACTIVITIES WHICH SHOW SPATIAL CHANGE BETWEEN 2009 AND 2019

Dog walking - 2009



Dog walking - 2009 & 2019



LayersAll 2009 layers: Dog walking 2019: Cruiser sailing 2019: Dinghy sailing 2019: 

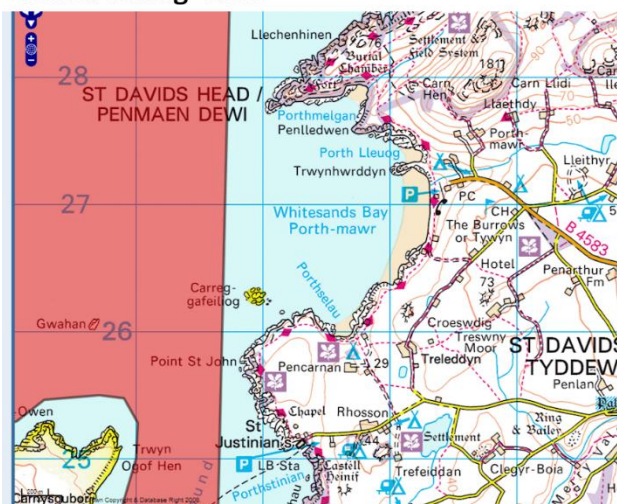
FIGURE 12 SPATIAL CHANGE DOG WALKING

The beach area associated with dog walking has not changed (please note the difference shown on the maps for the beach is not a spatial change and just represents a drawing alteration made from a linear format, shown on the beach in 2009, to a filled in beach area in 2019, in an attempt to more accurately represent the behaviour of beach dog walkers).


There is an increase in dog walking spatially along the Pembrokeshire Coast National Trail, with 2019 data showing dog walkers utilising the full length of the trail, rather than only two segments of coast near the beach in 2009. This spatial increase could be related to the displacement of dog walkers from the beach during the dog restriction between May and September. There is also evidence that an increasing number of tourist accommodation providers are allowing dogs (Visit Pembrokeshire, 2020²), therefore a larger proportion of tourists bringing dogs to the area, which will be displaced to the coastal path during the summer months.

² Visit Pembrokeshire, *Dog friendly holidays in Pembrokeshire* [online] Available at <https://www.visitpembrokeshire.com/holidays-and-breaks/dog-friendly-holidays>, accessed April 2020


Cruiser sailing - 2009




Layers

All 2009 layers: 

Dog walking 2019: 

Cruiser sailing 2019: 

Dinghy sailing 2019: 



Cruiser sailing - 2009 & 2019



FIGURE 13 SPATIAL CHANGE CRUISER SAILING


Cruiser sailing has increased spatially, shown by new areas to the north and south of the mouth of Whitesands Bay. This increase implies cruising boats coming nearer to the shoreline, south through Ramsey sound and hugging the coast north around St. Davids Head. Rather than a change in usage figures, the spatial increase could be related to a difference between the method of delineating the drawn activity areas between the two project iterations, with the attempt for the 2019 data to improve upon the accuracy of the 2009 spatial information.


Dinghy sailing - 2009




Layers

All 2009 layers: 

Dog walking 2019: 

Cruiser sailing 2019: 

Dinghy sailing 2019: 



Dinghy sailing - 2009 & 2019



FIGURE 14 SPATIAL CHANGE DINGHY SAILING

Compared to 2009, Dinghy sailing has increased around to the south of the bay and down through Ramsey Sound. The change could be associated with an increased popularity of Porthselau beach, with dinghy sailing becoming more frequent in the summer and a behaviour change with participants going on longer trips around the coast.

Activities for which there are new recordings of spatial areas in 2019

Activities which have new spatial areas recorded for 2019		
Climbing	Coasteering	Cycling
Powerboats	Rowing	Sea angling (boat based)
Shooting	Snorkelling	

TABLE 15 ACTIVITIES WITH NEW SPATIAL AREAS RECORDED FOR 2019

Maps of these new areas are shown in *figure 10* (maps 7-10).

Activities which no longer occur spatially in the area in 2019

In 2019, Wildlife Boat tours no longer occurred spatially in the area. The difference spatially can be seen in *figures 9 & 10 (Map 1)* with a purple line denoting the wildlife boat tour operator's route from Whitesands beach, which was used as a disembarkation and embarkation point in 2009. This particular boat company no longer operates, with other companies utilising the shorter route to Ramsey Island which is provided at St. Justinian's, south of Whitesands Bay.

Comparison of Site Infrastructure

During the survey periods, alongside activity data, details regarding site infrastructure and management details were also collected. *Table 16* shows the information collected from both project iterations.

Byelaws and Codes of Conduct

Looking at *table 16*, there are differences between the 2009 and 2019 'Byelaws and Codes of Conduct' section. There are more byelaws and codes of conduct listed in 2019. These differences may be related to the number of contacts providing data for the two years, more individuals were surveyed in 2019, and the gathering of information process, rather than a real difference. For example, National Park byelaws along with launching and speed restriction byelaws will have been in place in 2009. The Outdoor Charter Code of Conduct has been stated in 2019, which perhaps relates to a raised knowledge of the Charter through the continuing work over the ten year period to strengthen and increase awareness, rather than a lack of the code in 2009. The British Mountaineering Council code of conduct itemised in 2019 could well be a new element, associated with the new climbing area noted in the 2019 activity survey.

Management Issues, current and potential

Similarities continue between the two project iterations, with the majority of concerns relating to car parking. It was thought in 2009 that car parking was at capacity in the summer holidays, with 2019 details raising the issue of limited access at peak times due to people parking on the narrow entrance roads. The 2019 survey collected additional potential issues surrounding car parking, concerning the ability for nearby landowners to provide their land for additional car parking space. This may well reduce car parking capacity concerns, but brings the potential to impact on the overall capacity of the beach and site.

Issues associated with horses on the beach, over-crowding of participants in the sea, parties and barbeques and policing the Blue Flag no dog area have not been mentioned in the 2019 survey. The majority of horse riders using the site are local to the area and therefore this issue may well have reduced over the ten years, with local riders deciding to stay away from the increasingly popular beach. This is supported by the reduction in horse riding summer usage figures. Overcrowding of participants in the sea may still be a concern at Whitesands, but is appropriately managed by the relevant authorities, such as the RNLI. This issue, along with safety of water users was not highlighted as a current issue via the RNLI beach supervisor contact for the 2019 survey.

In 2019 the '28 day rule' was raised as a current management issue. Under the Caravan Sites and Control of Development Act (1960) and The Town and Country Planning (General Permitted Development) Order (1995), the '28 Day Rule' allows a landowner to use land for tented camping only, without having to get formal planning permission for 28 days in a calendar year (Pembrokeshire Coast National Park Authority, 2017³). The management authorities, such as Pembrokeshire County Council (PCC) and Pembrokeshire Coast National Park Authority (PCNPA), therefore have reduced ability to regulate the opening and closing dates for these sites, rendering them unable to provide a fully coordinated management plan.

³ Pembrokeshire Coast National Park Authority, '28 Day Rule' Certificated Caravan and Camping Sites – a brief guide to what is permitted under planning law [online] Available at https://www.pembrokeshirecoast.wales/Files/files/Planning%20Advice/28_day_eng.pdf accessed April 2020

	2009	2019
Authority Area	PCNPA/ PCC/ St David's City Council	
Management Plan	PCNPA Management plan; Blue Flag Beach Management Plan	
Byelaws Codes Of Conduct	PCC bathing water	<ul style="list-style-type: none"> - Bathing byelaws - National Park byelaws - 5 knot speed restriction - Launching restrictions - byelaws - Complete dog ban - May-September - Outdoor Charter Code Of Conduct - British Mountaineering Council Code Of Conduct
Management Issues	Yes	
Management Issue Details	<ul style="list-style-type: none"> - Car parking at capacity in summer holidays - Parties and barbeques - Horses on beach - Over crowding in sea - Safety of water users and rib launches - Policing blue flag no dog area 	<ul style="list-style-type: none"> - Access issues re: number of people parking and narrow roads - 28 day rule causing potential issues with PCC and PCNPA not being able to regulate opening and closing dates
Potential Management Issue Details	No	Yes
Potential Management Issue Details		<ul style="list-style-type: none"> - Possible car parking business as car parking can be infinite due to more fields opening

TABLE 16 MANAGEMENT DETAILS 2009 / 2019

Conclusions

Total number of activities recorded in 2009/2019

There has been an increase across water based, land based and boat based activities between the two data collection periods; an increase from fifteen to twenty nine individual activities in 2009 and 2019, respectively. There were an additional eleven activities added to the 2019 survey, of which six account for the activity increase at Whitesands Bay. Of the thirty three activities surveyed in 2009, an additional eight were recorded as happening at Whitesands Bay in 2019.

Although, as described earlier in this study, there are some factors that need to be considered before taking the increase at face value, the additional eight activities occurring between the 2009 and 2019 project iterations provide evidence for a growth in recreation at Whitesands Bay.

Summer usage and trends

Four activities, shown earlier in *table 10* show either an increase in summer usage figures or frequency between 2009 and 2019. Of these, beach activities and bodyboarding showed the largest increases. Other than swimming, both activities make up the highest proportion of summer usage at Whitesands Bay. These activities are closely associated with holiday maker pursuits and therefore the increases support an inference of an amplification in tourism in the area between 2009 and 2019.

Decreases in summer activity usage were found for seven activities, shown in *table 11*. With the exception of swimming and wildlife boat tours, the rest of these activities could be classed as being pursued, in the majority, by Pembrokeshire residents, whose behaviour may well have changed over the 10 years; deciding to utilise other beaches, deemed as quieter in the county, during the summer months or avoiding the beaches entirely during the summer period.

Of these activities, swimming could be perceived as an irregularity, as with an increase in beach activities and body boarding an assumption could be made that swimming participation would also grow. The drop in usage described by the 2019 data could be related to figures being supplied by a wider range of contacts, including the RNLI Lifeguard supervisor, providing a more precise usage scale.

Wildlife boat tours, the other activity showing a decrease over the ten year period is due to the particular company ceasing to trade, owing to retirement. It would be thought that this change would have an impact to the number of visitors to the carpark in the summer season.

Participant days

When looking at the fifteen comparable activities, the number of participant days are actually less in 2019. If totaling the full activity list from the 2019 survey, the total participant days (both minimum and maximum range) are greater for the 2019 summer season. These results show that there has been a change to participant activity behaviour, with new activities increasing.

The case study shows how the data within the WAM database can be manipulated to enable a series of questions relating to coastal activity to be analysed; providing an improved illustration of recreation activity usage and trends on a site basis. Delivering an evidence base to inform coastal management decisions.

Of course, it is important to understand that figures collected are not absolute and hold some degree of variation, for example, walking figures are likely to change up to 15% if the weather is not conducive to walking. *'In 2018 we saw a 6% reduction on the year, which was put down to the very hot summer months when people choose to stay on the beaches instead.'* (National Trail Officer Theresa Nolan, 2019) but the data held is still a valuable tool. Data is also time dependent, also explained by Theresa's quote, so to be able to continue having an accurate evidence base for recreation the survey will need to be repeated.

Appendix A:

2019 site and activity survey questions

No.	Question
1	Site Name
2	Site Ref No.
2a	Site ID
3	Authority area? e.g Pembrokeshire Coast National Park Authority
4	Is there a management plan? at location and for the activities
4a	If yes give details
5	Any byelaws/Codes of Conduct? E.g. bathing water bylaws/activity codes of conduct
5a	If yes give details
6	Any management issues at the site?
6a	If yes, give details
7	Potential management issues?
7a	If yes, give details
8	Is there parking at the site?
8a	If yes give details Informal (on verge), Formal, Paid, Capacity if known
9	Give details regarding access
10	Are there toilets
11	Are there disabled facilities?
12	Is there slipways/launching?
12a	If yes, give details Charges? Suitable for which vessel type(s)? PWC, Public or private? Management scheme etc
13	Are there mooring facilities?
13a	If yes, give details Moorings at site, commercial, recreational, visiting vessels? Marina details, management scheme etc
14	Is there anchoring at the site?
14a	If yes, give details to where on the map provided
15	Are there activity centres/recreation providers using the site?
15a	If yes, give details Name/type of centre/club and contact details

1

1

		2
		2
		3
		3
		4
		4
		5
		5
		6
		6
		7
		7
16	Any known future developments for the site?	
17	Date range the data is based on e.g 2017/2018	

TABLE A1: SITE SURVEY 2019

Question No.	Question	
18	Activity Type	
18a	Activity ID	
19	Where does the activity take place?	
20	Who is the managing organisation e.g Carmarthenshire CC	
21	Are there absolute numbers?	
21a	If Yes, give details	
22	Easter holidays 14 days: two weeks March	What is the frequency?
22a		The scale of numbers at the above frequency?
22b		Are participants regular visitors?
22c		Percentage of regular participants?
23	Late Spring/Early summer 91 days: April May June	What is the frequency?
23a		The scale of numbers at the above frequency?
23b		Are participants regular visitors?
23c		Percentage of regular participants?
24	Summer 62 days: July August	What is the frequency?
24a		The scale of numbers at the above frequency?
24b		Are participants regular visitors?
24c		Percentage of regular participants?
25	What is the frequency?	

25a	Autumn 91 days: September October November	The scale of numbers at the above frequency?
25b		Are participants regular visitors?
25c		Percentage of regular participants?
26	Winter 107 days: Jan Feb March 17	What is the frequency?
26a		The scale of numbers at the above frequency?
26b		Are participants regular visitors?
26c		Percentage of regular participants?
27	Do participants conduct multiple activities?	
27a	If yes, what other activity?	
27b	If yes, estimate percentage e.g. % beach activity participants who also bodyboard	
28	What other activity 2?	
28a	Estimate percentage 2	
32	What is the participant profile? Individuals/Groups	
32a	If profile is mixed, what is the estimated % of individuals to groups?	
32b	If profile is mixed, comment on the mix	
33	What organisations operate here? Independent/Activity Centre/Club/Other recreation provider	
34	What is the activity trend?	
34a	Reasoning behind activity trend score	
35	What is the confidence in data: usage	
36	What is the confidence in data: frequency	
37	What is the confidence in your map information?	
<i>*Note</i>	<i>Are there examples of 'good management' in relation to the activity?</i>	

TABLE A2: ACTIVITY SURVEY 2019

Appendix B:

Data set from 2009 and 2019 activity survey at Whitesands Bay

		Scale (2009 data)	Easter holidays frequency	Late Spring/Early summer frequency	Summer frequency	Autumn frequency	Winter frequency	What is the activity trend?	Confidence in data: usage	Confidence in data: frequency	Confidence in data: map
1	angling	0-25	frequent	frequent	daily	frequent	infrequent	3	4	4	4
2	beach activities	1501-2000	daily	daily	daily	frequent	infrequent	3	4	4	4
3	body boarding	26-50	daily	frequent	daily	frequent	frequent	4	4	4	4
4	canoeing/kayaking	26-50	frequent	frequent	daily	frequent	infrequent	4	4	4	4
5	dinghy sailing	0-25	infrequent	infrequent	infrequent	infrequent	infrequent	3	3	4	4
6	dog walking	51-100	daily	daily	daily	daily	daily	3	4	4	4
7	horse riding	0-25	infrequent	infrequent	infrequent	infrequent	infrequent	3	4	4	4
8	kite boarding	0-25	infrequent	infrequent	infrequent	infrequent	infrequent	4	4	4	4
9	kite surfing	0-25	infrequent	infrequent	infrequent	infrequent	infrequent	3	4	3	3
10	power kites	0-25	infrequent	infrequent	frequent	infrequent	infrequent	3	4	4	4
11	surfing	101-200	daily	frequent	daily	daily	frequent	4	4	4	4
12	swimming	501-750	infrequent	frequent	daily	frequent	infrequent	3	4	4	4
13	walking	201-300	daily	daily	daily	daily	daily	3	4	4	4
14	wildlife boat tours	51-100	daily	frequent	daily	frequent	not recorded	3	3	4	4
15	windsurfing	0-25	infrequent	infrequent	infrequent	infrequent	infrequent	2	4	4	4

TABLE B1: DATA FOR WHITESANDS BAY ACTIVITY SURVEY 2009

		Frequency	Scale	Frequency	Scale	Frequency	Scale	Frequency	Scale	Frequency	Scale	What is the activity trend?	Confidence in data: usage	Confidence in data: frequency	Confidence in data: map
		Easter holidays		Late Spring/Early summer		Summer		Autumn		Winter					
1	beach activities	Daily	1501-2000	Daily	501-750	Daily	2000+	Frequent	501-750	Infrequent	51-100	4	3	4	4
2	body boarding	Daily	51-100	Daily	26-50	Daily	201-300	Infrequent	26-50	Infrequent	0-5	3	3	4	4
3	canoeing/kayaking	Frequent	6-15	Frequent	16-25	Daily	26-50	Infrequent	6-15	Infrequent	0-5	3	3	4	4
4	climbing	Not recorded		Not recorded		Infrequent	0-5	Infrequent	0-5	Not recorded		3	4	4	4
5	coasteering	Infrequent	6-15	Infrequent	6-15	Infrequent	6-15	Infrequent	6-15	Not recorded		3	4	4	4
6	cruiser sailing	Frequent	6-15	Daily	16-25	Daily	16-25	Frequent	6-15	Infrequent	0-5	3	3	3	3
7	cycling	Daily	6-15	Daily	6-15	Daily	26-50	Frequent	6-15	Frequent	0-5	3	3	4	4
8	dinghy sailing	Infrequent	0-5	Frequent	0-5	Frequent	0-5	Not recorded		Not recorded		3	3	4	4
9	dog walking	Daily	26-50	Not recorded		Not recorded		Daily	26-50	Daily	26-50	3	4	4	4
10	Drone flying	Infrequent	0-5	Infrequent	0-5	Infrequent	0-5	Infrequent	0-5	Infrequent	0-5	4	3	3	4
11	Event hotspots	Infrequent	301-400	Not recorded		Infrequent	301-400	Infrequent	301-400	Not recorded		3	4	4	5

12	horse riding	Not recorded		Infrequent	0-5	Not recorded		Infrequent	0-5	Infrequent	0-5	3	3	4	4
13	kite boarding	Infrequent	0-5	Infrequent	0-5	Not recorded		Infrequent	0-5	Infrequent	0-5	3	3	4	4
14	kite surfing	Infrequent	0-5	Infrequent	0-5	Infrequent	0-5	Infrequent	0-5	Infrequent	0-5	3	3	3	4
15	Overnight Camping	Frequent	0-5	Frequent	0-5	Frequent	6-15	Frequent	0-5	Infrequent	0-5	4	4	4	4
16	power boats	Frequent	6-15	Frequent	6-15	Frequent	16-25	Frequent	6-15	Infrequent	0-5	3	4	4	4
17	power kite flying	Frequent	0-5	Infrequent	0-5	Daily	0-5	Frequent	0-5	Infrequent	0-5	3	4	4	4
18	rowing	Not recorded		Infrequent	26-50	Not recorded		Infrequent	16-25	Not recorded		3	4	4	4
19	sea angling(boat based)	Not recorded		Frequent	16-25	Frequent	16-25	Not recorded		Not recorded		3	3	3	3
20	sea angling(shore based)	Frequent	6-15	Frequent	6-15	Frequent	6-15	Frequent	6-15	Frequent	0-5	3	4	4	4
21	shooting	Not recorded		Not recorded		Not recorded		Not recorded		Frequent	N/K	3	3	3	3
22	snorkelling	Not recorded		Frequent	6-15	Frequent	16-25	Not recorded		Not recorded		3	3	3	3
23	Sunset watchers	Frequent	6-15	Frequent	6-15	Frequent	26-50	Frequent	6-15	Frequent	6-15	3	3	3	4
24	SUP journeys	Frequent	0-5	Frequent	0-5	Daily	6-15	Frequent	0-5	Frequent	0-5	4	4	4	4
25	surfing	Frequent	51-100	Frequent	26-50	Daily	51-100	Frequent	26-50	Frequent	26-50	3	4	4	5
26	swimming	Daily	201-300	Daily	26-50	Daily	401-500	Daily	16-25	Infrequent	0-5	3	4	4	4
27	walking	Daily	51-100	Daily	101-200	Daily	201-300	Daily	101-200	Daily	26-50	3	3	4	4
28	Wild camping	Infrequent	0-5	Frequent	0-5	Frequent	0-5	Not recorded		Not recorded		3	3	4	4
29	windsurfing	Infrequent	0-5	Infrequent	0-5	Infrequent	0-5	Infrequent	0-5	Infrequent	0-5	3	3	4	4

TABLE B2: DATA FOR WHITESANDS BAY ACTIVITY SURVEY 2019

Appendix C:

Supporting details for the 2019 survey

Activity	Description
Beach activities	Classed as 'bucket and spade' type activities, which take place on the beach and foreshore e.g family beach days
Coasteering	Activity involving the movement along the intertidal zone of a rocky coastline on foot or by swimming
Cruiser sailing	The use of sailing or motor yachts that are built for long distance sailing and offer enough comfort and space to live on-board, travelling from place to place for pleasure
Wildlife Watching	The purpose for visiting the site is for wildlife watching from the shore e.g porpoise watching, bird watching
Overnight Camping	Camping overnight at coastal locations in vehicles e.g camper vans
Light aircrafts_powered	Light weight aircraft with propeller, includes micro-lights and helicopters
Light aircrafts_nonpowered	Aircraft without on-board propulsion, includes glider-planes, hang-gliders and paragliders
Wild camping	Overnight camping which doesn't take place in vehicles and can be in more remote places
Event hotspots	Sites where organised events take place e.g triathlons, coastal running
Gathering living resources	the collection of anything 'living' from the shoreline, *includes winkling, cockles, seaweed and also samphire gathering from the saltmarsh and drift seaweed for fertiliser etc.
Bait digging	Digging the shore for fishing bait, most commonly lugworms and ragworms

TABLE C1: DESCRIPTIONS FOR ACTIVITIES INCLUDED IN THE SURVEY THAT COULD HAVE AMBIGUOUS MEANING

Confidence Score	Factors considered	No. of factors required
1 = No confidence	1. No familiarity with activity and/or location	
2	1. Knowledge of anecdotal evidence 2. Not familiar with particular activity at the location	
3	1. Knowledge of anecdotal evidence 2. Familiar with particular activity at the location 3. Personal experience of viewing/recording activity at the location	2
4	1. Knowledge of anecdotal evidence 2. Familiar with particular activity at the location 3. Personal experience of viewing/recording activity at the location 4. Other data providers providing similar information 5. Repeat visits due to occupation/activity interest	4
5 = complete confidence	1. Knowledge of anecdotal evidence 2. Familiar with particular activity at the location 3. Personal experience of viewing/recording activity at the location 4. Other data providers providing similar information 5. Repeat visits due to occupation/activity interest 6. Absolute numbers known e.g. climbers signing into MOD range	5 with point 6 essential

TABLE C2: DATA CONFIDENCE DESCRIPTIONS

ID	Area - Pembrokeshire
75	Poppit Sands
21	Cemaes Head
19	Ceibwr Bay
20	Ceibwr Bay to Newport Sands
66	Newport Sands
65	Newport Parrog
64	Newport Bay- Parrog to Cwm yr Eglwys
24	Cwm yr Eglwys Dinas Island
81	Pwll Gwaelod Dinas Island
28	Dinas Island to Fishguard
34	Fishguard Lower Town
38	Goodwick
33	Fishguard Harbour to Strumble
99	Strumble Head
100	Strumble Head to Abercastle including Aber Mawr
2	Abercastle
3	Abercastle to Porthgain
79	Porthgain
80	Porthgain to Abereiddi

93	St Brides Haven to Martin's Haven
57	Martin's Haven
86	Skomer
85	Skokholm
39	Grassholm and The Smalls
56	Marloes Sands
109	Westdale Bay
91	St Annes Head
25	Dale
26	Dale to Sandy Haven
84	Sandy Haven
58	Milford Haven
27	Daugleddau
16	Carew and Cresswell Rivers
70	Pembroke River
7	Angle Bay
8	Angle Peninsula North
108	West Angle Bay
8	Angle Peninsula South
36	Freshwater West

4	Abereididi	17	Castlemartin Range
5	Abereididi to St David's Head	11	Broadhaven South, Stackpole and Barafundle Bay
94	St David's Head	97	Stackpole Quay
111	Whitesands Bay	98	Stackpole Quay to Freshwater East
95	St Justinians	35	Freshwater East
82	Ramsey Island	101	Swanlake Bay
96	St Justinians to Porth Clais	53	Manorbier
77	Porth Clais	54	Manorbier Bay to Skrinkle Haven
78	Porth Clais to Caerfai	87	Skrinkle Haven
13	Caerfai	88	Skrinkle Haven to Lydstep Haven
14	Caerfai to Solva	51	Lydstep Point
89	Solva	50	Lydstep Haven
90	Solva to Newgale	37	Giltar Point
62	Newgale Sands	71	Penally Sands
63	Newgale Sands to Nolton Haven	15	Caldey Island/St Margaret's Island
67	Nolton Haven	106	Tenby South Beach
29	Druidston Haven	104	Tenby Castle
30	Druidston to Broadhaven	105	Tenby North Beach
10	Broad Haven North	32	First Point to Monkstone Point
44	Little Haven	22	Coppett Hall and Saundersfoot
45	Little Haven to St Brides Haven	112	Wiseman's Bridge
92	St Brides Haven	6	Amroth

TABLE C3: COASTAL SITES/PEMBROKESHIRE

ID	Area - Carmarthen	ID	Area - Swansea
103	Telpyn Point & Marros Sands	73	Penclacwdd
74	Pendine	47	Llanrhyddian Marsh
43	Laugharne	110	Whiteford Burrows
48	Llansteffan	46	Llangennith/Llanmadoc
31	Ferryside	100	Rhossili
41	Kidwelly	113	Worms Head to Port Eynon Point
69	Pembrey	76	Port Eynon and Horton
12	Burry Port	40	Horton to Oxwich
59	Millennium Coastal Park	68	Oxwich Bay
52	Machynys	107	Three Cliffs Bay
72	Penclachwydd	18	Caswell Bay
49	Loughor Estuary	42	Langland Bay
		60	Mumbles Head & Bracelet Bay
		102	Swansea Bay

TABLE C4: COASTAL SITES/CARMARTHEN AND SWANSEA

ID	Area – Neath Port T	ID	Area - Bridgend
23	Crumlyn Burrows	114	Kenfig
61	Neath Estuary	115	Pink Bay and Sker
1	Aberavon Sands	116	Rest Bay
55	Margam Sands	117	Locks common
		118	Porthcawl town
		119	Sandy Bay/Coney beach
		120	Newton
		121	Merthyr mawr

TABLE C5: COASTAL SITES/NEATH PORT TALBOT AND BRIDGEND

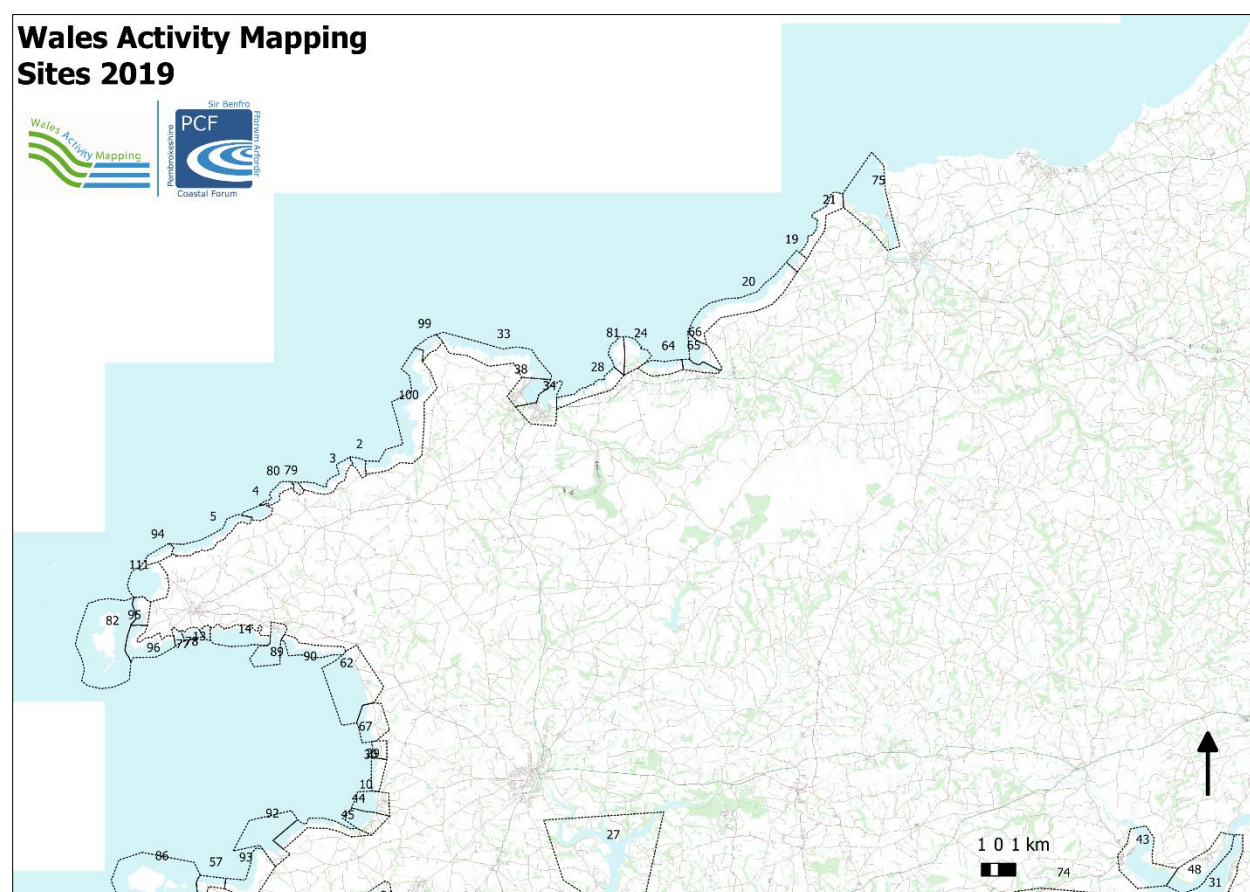


FIGURE C1: COASTAL SITES/NORTH PEMBROKESHIRE

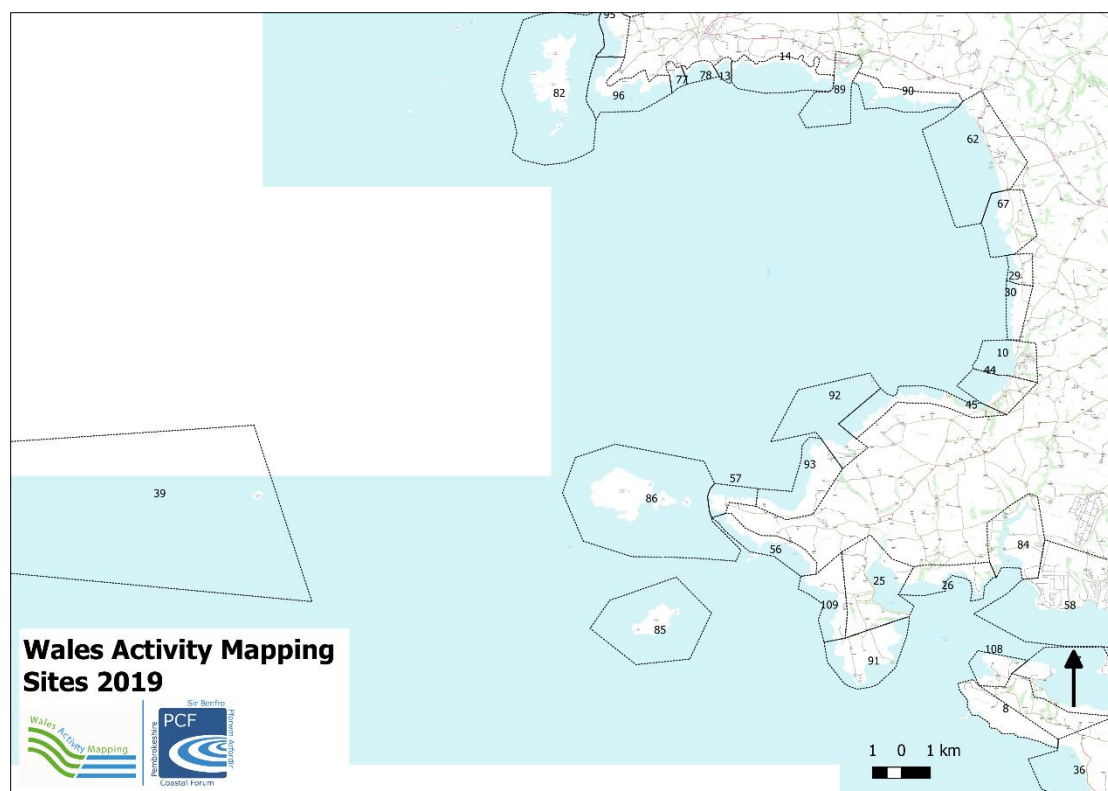


FIGURE C2: COASTAL SITES/MID PEMBROKESHIRE

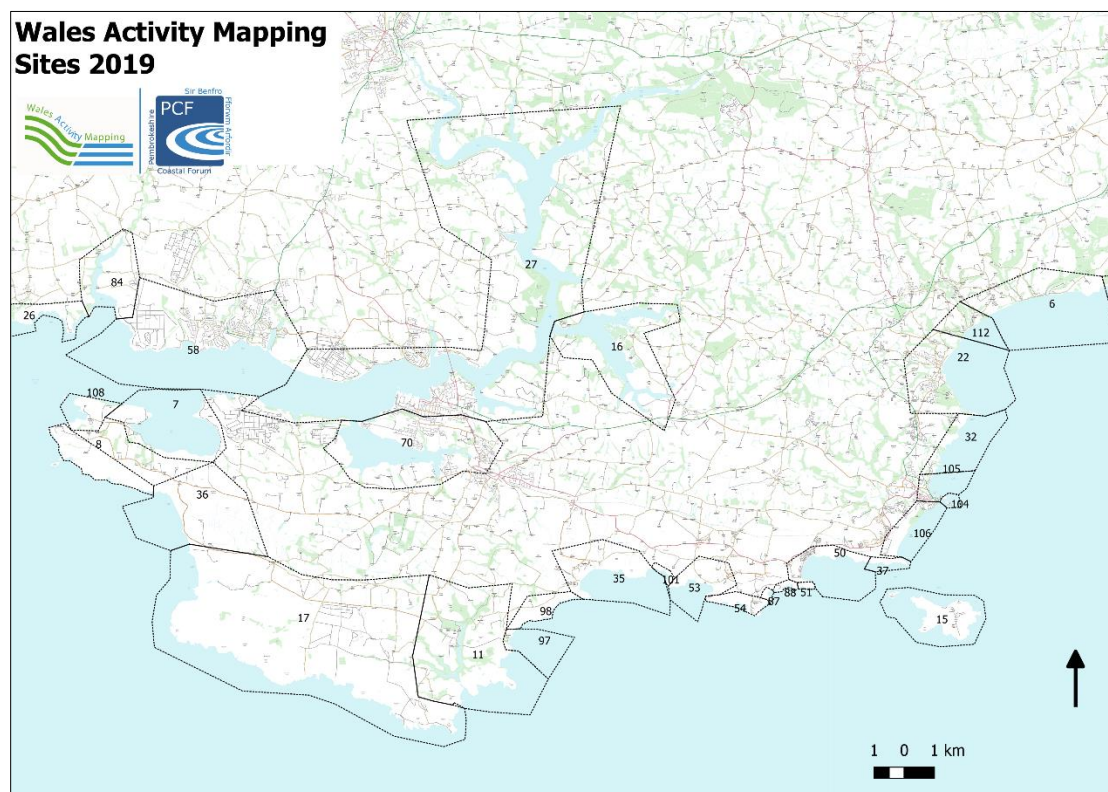


FIGURE C3: COASTAL SITES/SOUTH PEMBROKESHIRE

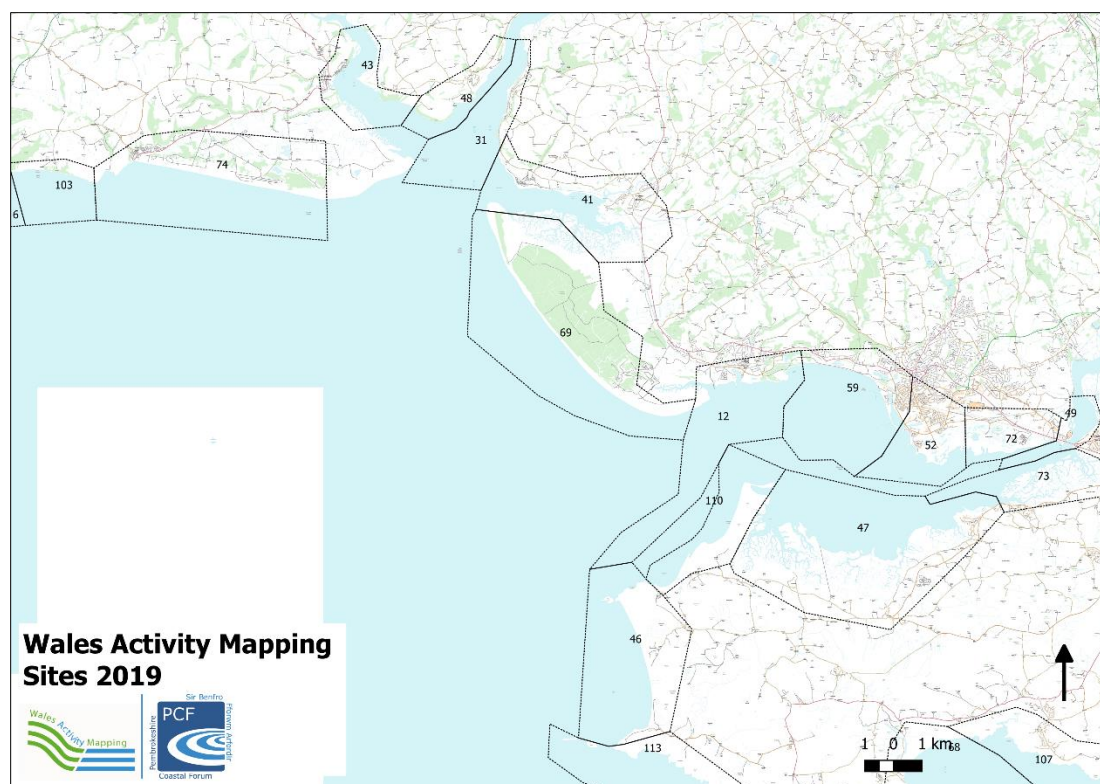


FIGURE C4: COASTAL SITES/CARMARTHEN AND SWANSEA

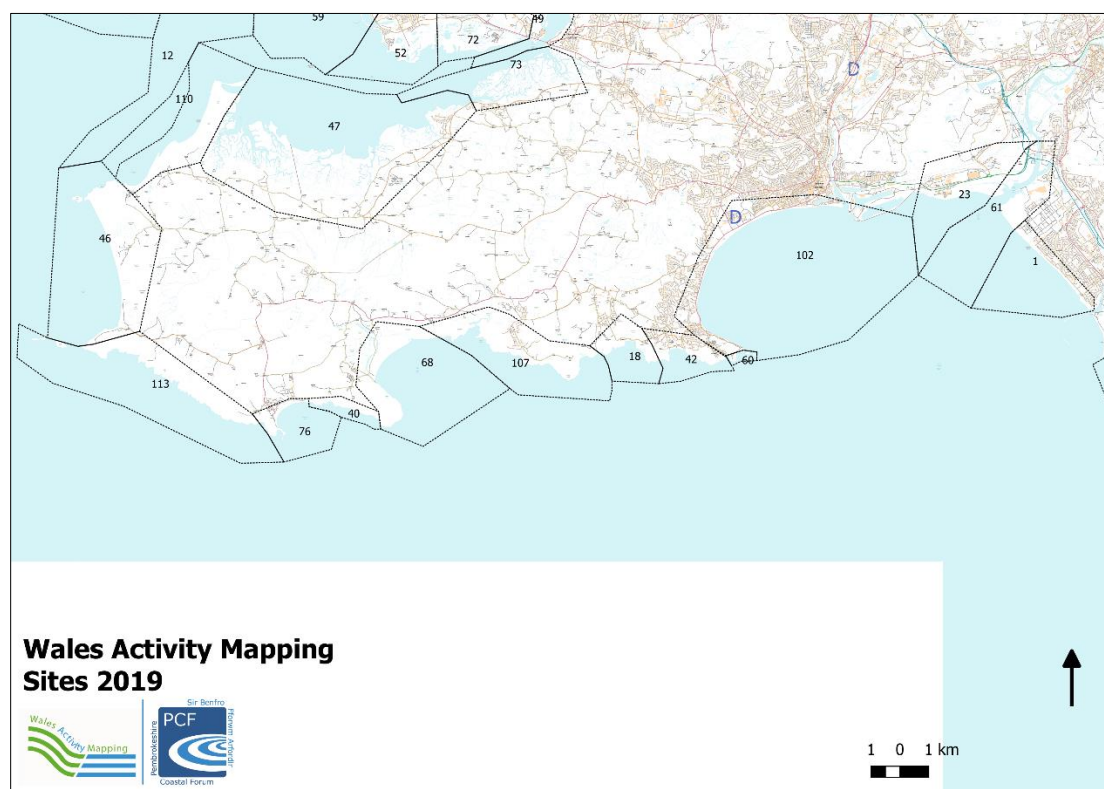


FIGURE C5: COASTAL SITES/SWANSEA AND NEATH PORT TALBOT

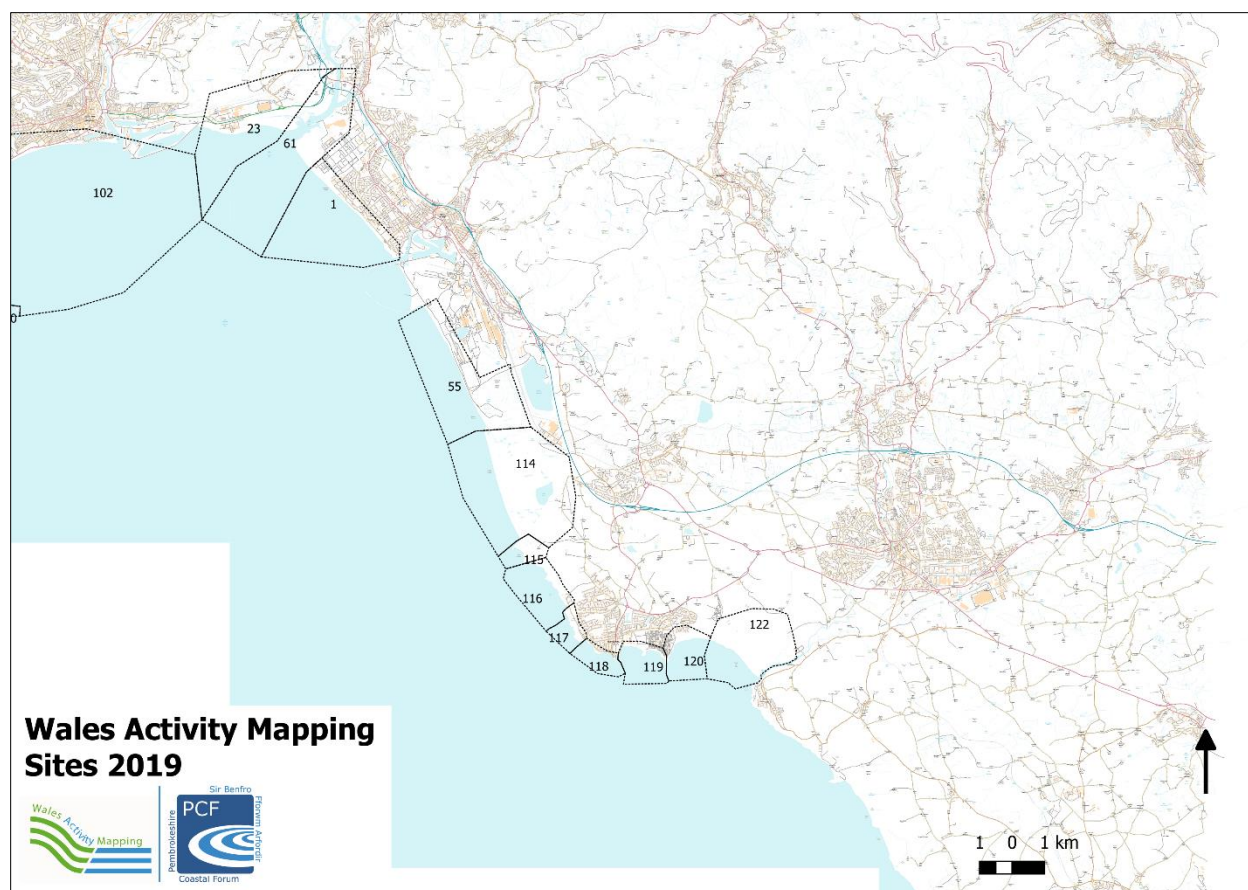


FIGURE C6: COASTAL SITES/NEATH PORT TALBOT AND BRIDGEND