

Wales Activity Mapping: Economic Valuation of Marine Recreation Activity

NON TECHNICAL EXECUTIVE SUMMARY

A project commissioned by Welsh Government's Sustainable
Development Fund and Port of Milford Haven



Port of Milford Haven



Ariennir gan
Lywodraeth Cymru
Funded by
Welsh Government

Parc Cenedlaethol Arfordir Penfro
Pembrokeshire Coast National Park



Completed by Marine Planning Consultants in partnership with Atkins and
Pembrokeshire Coastal Forum



19 November 2013

Report prepared for	
Wales Activity Mapping Working Group	
Project Manager	David Jones, Project Manager
Pembrokeshire Coastal Forum The Old Sail Loft Milford Docks Milford Haven SA73 3AF david.jones@mhpa.co.uk www.walesactivitymapping.org.uk www.pembrokeshirecoastalforum.org.uk	
Contract reference	PCF 119654

Report prepared by	
Marine Planning Consultants Limited	
Project Manager	Caroline Chambers, Project Manager
Project Director	Liam McAleese, Project Director
Report Contributions	Rupert Haines (Atkins) Jack Pitts, GIS Assistant Consultant (MPC) David Jones (PCF) Kath Wellard (Atkins)
Marine Planning Consultants First Floor 67-69 George Street London W1U 8LT caroline@seasurvey.co.uk liam.mcaleese@marineplanning.org.uk www.marineplanning.org.uk	

Report Warranty

This report has been prepared with due care and diligence and with the skill reasonably expected of a reputable contractor experienced in the types of work carried out under the contract and as such the findings in this report are based on an interpretation of data which is a matter of opinion on which professionals may differ and unless clearly stated is not a recommendation of any course of action. Marine Planning Consultants Ltd have prepared this report for the client identified on the front cover in fulfilment of its contractual obligations under the referenced contract and the only liabilities Marine Planning Consultants Ltd accept are those contained therein. Please be aware that further distribution of this report, in whole or part, or the use of the data for a purpose not expressly stated within the contractual work scope is at the client's sole risk and Marine Planning Consultants Ltd recommends that this disclaimer be included in any such distribution.

Non-Technical Executive Summary

Introduction

This pilot study was designed to place a monetary value on the individual marine recreation activities previously set out in the Wales Activity Mapping project (WAM) in Pembrokeshire. Carried out 2008-2010, WAM is the only known project in the UK to provide consistent spatial coverage and participant usage for all known marine recreation activities within the region. WAM therefore provides an ideal platform to formulate an approach to valuing marine recreation.

Carried out by a consortium comprising Marine Planning Consultants (MPC), Atkins and Pembrokeshire Coastal Forum (PCF), the pilot valuation of WAM was funded equally through the Welsh Government's Sustainable Development Fund administered by Pembrokeshire Coast National Park Authority; and the Port of Milford Haven. The study has received review from the WAM Working Group, comprising of a number of private and public sector bodies, either local, or national with a local interest.

Objectives

The overall objective of the project was to source an individual expenditure per person per day value for each activity and to apply this to the number of participant days per year for a given location where the activity takes place, as defined by WAM. This therefore provides the total value of an area per year for each activity; and by combining all activities, the total recreation value for any unique location can be calculated.

As this level of marine recreation valuation has not been carried out to date in the UK, the project was intended as a pilot study, focusing on two case studies in southwest Wales: the marine and coastal areas adjacent to the St David's area and Dale. The intention was that the methodology developed may help enable relatively rapid recreation valuations in the future across broad areas for multiple activities. This will aid the rapid developments being made in policy and commerce alike, particularly to inform marine planning and the designation of Marine Protected Areas, allowing the recreation sector to be better represented (and therefore considered) in future plans.

The project objectives were defined through four principal strands:

- i. Review of approaches adopted to date through a literature review and development of a detailed methodology, informed through analysis of the existing WAM data
- ii. Sourcing of value data from literature and a business survey in each case study
- iii. Case study valuation of St David's and Dale
- iv. Recommendations for potential wider scale use

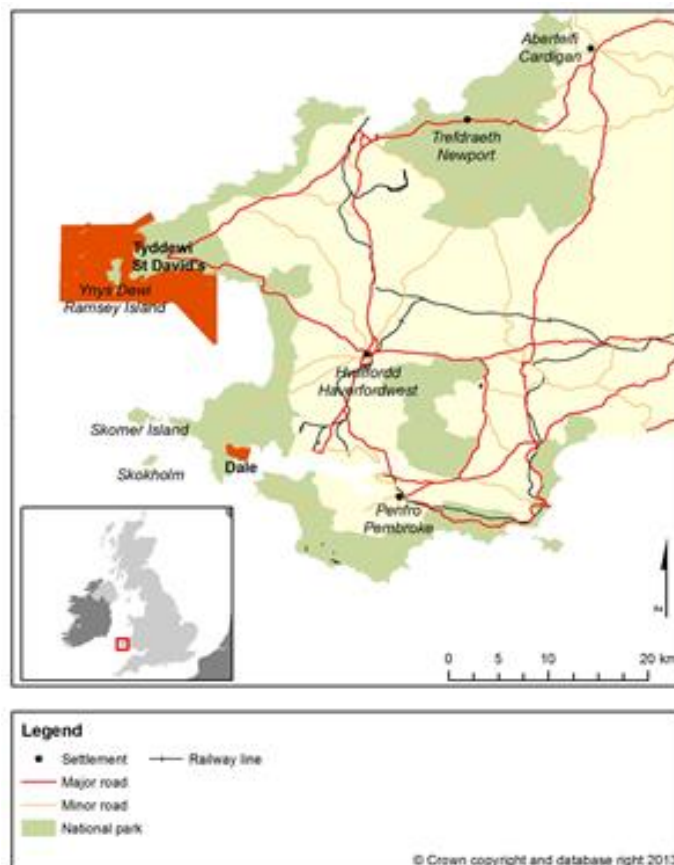
Geographical scope

The case study boundaries, as shown in Figure A, were defined as:

- St David's: All WAM areas from Penllechwen (headland north of Whitesands Bay beyond St David's Head) to Solva Harbour (southeast of St David's) and Ramsey Island, an area of 92km²
- Dale: the Highly Protected Marine Conservation Zone (HPMCZ) proposed in 2012 to be designated under the Marine and Coastal Access Act 2009 in Wales, with a landward boundary running from Dale Point in the south to Watch House Point in the north east, following the lower shore boundary of the Dale bay, an area of 2.9km²

Whilst the maps in the report fit to inshore boundaries as noted above, the actual values quoted per case study in the text have been calculated from up to 600m inshore of the coastline. This allows for the coarser scale used when previously developing the WAM GIS layers, ensuring all activities that waiver between below and above high mean water (whether artificially or in reality) are captured.

Figure A: Case study locations



Approaches adopted to date

To date, the economic valuation of marine and coastal recreation activities has often focussed on the tourism sector as a whole, rather than costs associated directly with carrying out individual activities. Notably some activities, such as sea angling, have been the subject of a number of individual studies. There are a small but growing number of studies that have sought to generate spatially explicit estimates of the value of particular marine recreation activities in specific areas. Methods employed to generate values are typically one of more of the following: primary survey of participants; primary surveys of businesses; and/or application of an 'expenditure per person' value from existing studies, i.e. what is termed 'value transfer'.

Of the studies which have sought to estimate the value of specific marine and coastal recreation activities, the most common calculation undertaken is to multiply an estimate of the number of activity days per annum by the average daily expenditure of an activity participant. This is then presented as the value of the activity to the economy per annum. Such studies have focussed on a small number (up to four) activity types, and undertaken primary surveys of users to elicit expenditure data for their particular case study area.

Other studies have used a 'value transfer' approach, adopting values from other studies which can be appropriately applied to their study area e.g. Fletcher *et al* (2012). There is one key data source which generates expenditure data for a broad range of individual activities in Wales: the Great Britain Tourism and Day Visitor Surveys (GBTS and GBDVS, published for Wales by VisitWales). These two surveys are carried out annually and, since 2011, provide consistent data for a long list of individual recreation activities. Bryan *et al* (2011) used data from these surveys to calculate the economic impact of walking in Wales.

Business surveys have been used to develop estimates of the revenues and employment generated in local economies by recreation and tourism activities, as well as to understand supply chains. For studies which are focussed on specific activities, rather than tourism as a whole, business surveys typically focus on just the activity providers rather than all businesses that the activity participant may use (i.e. recreation hire shops, not accommodation providers). This is largely due to the difficulty in asking general tourism-related businesses to answer detailed questions about a subset of their customers which they may not be able to adequately identify i.e. a hotel owner is unlikely to know how many of their guests undertook kite-surfing and in which locations.

Business survey

This project carried out a survey of recreation activity businesses, i.e. those businesses providing core recreation services such as equipment hire and purchase, lessons, guides and other infrastructure which are used for undertaking any given activity and sold to activity participants. The survey was designed to inform the direct local economic impact of activities in each case study as a whole; and the actual cost per person per day where data was available. This focused on three areas: i) revenue, profit and customers, ii) employees and wages and iii) activity services. Following a pilot of two businesses, a form was sent out to 12 operating

businesses in Dale and 32 in the St David's region, identified through local knowledge and an online search of businesses operating within 5km of the case study area.

Surveys were completed by individuals (business owners/managers) to allow them time to source and calculate the relevant business data. It is hoped that this resulted in more accurate data than if the immediate response had been required through an 'interview' approach. However it meant that a period of four months, significantly longer than anticipated, was ultimately necessary to collect adequate responses. The response rate was 42% in Dale and 50% in St David's, though the content of the forms received varied in number of fields completed. All financial data returned were converted to the financial year 2012/13.

The results from the business survey were used to inform the business revenue (participant cost) per customer; and case study economic impacts in terms of sector revenue, GVA and employment, as detailed below. However some overarching findings from both case studies combined included:

- Revenue was highest for wildlife boat trips, cruiser sailing and coastering at £50 – 300k, followed by kite surfing, power boating, canoe/kayaking and snorkelling at £20-40k
- The average business revenue (participant cost) per customer per day was highest for diving and sea angling charter at <£450, followed by windsurfing tours and lessons at £150, with the remainder at <£120, generally in the region of £50 – 100

Calculation of expenditure per person per day

The average expenditure per person per day was primarily sourced from existing literature. These values are then termed 'transfer values' as they are applied outside of the study they were designed for.

The business survey was used to adjust the expenditure values of coastering and wildlife boat trips so that they include local 'price' information. These are the only two activities where this was possible because (i) they are the only activities that are almost entirely carried out through service providers; and (ii) in most other cases it is not possible to adjust the secondary source expenditure data as no breakdown by expenditure category is provided.

The expenditure per person per day for all other activities was sourced from the literature. The resulting values are presented below, including an average and upper/lower bound value, as well as confidence scores. The upper/lower bound values represent the range of values seen in the literature; and the confidence for each expenditure value, scored from a range of 1 (no confidence) to 5 (absolute confidence), informs on the suitability of the underlying source study (or studies) and the extent to which transfer values for a given activity from the source studies support each other (i.e. are similar in magnitude).

It is important to note that the final expenditure values in Table A, which are subsequently applied in the WAM pilot valuation, are for both local resident and visiting activity participants,

include all types of expenditure associated with the trip and take non-paying participants into account.

Table A: Expenditure per day per participant

Activity	Average (£)	Lower Bound (£)	Upper Bound (£)	Confidence
Beach activities	34	25	43	4
Body boarding	23	17	30	3
Canoeing/kayaking	27	23	30	4
Climbing	21	9	32	2
Coasteering	62	45	80	3
Cruiser sailing (£ per person)	38	28	49	2
Dingy sailing	41	23	62	1
Diving	72	69	93	4
Dog walking	3	2	3	2
Horse riding	137	100	175	2
Jet skiing PWC (£ per boat)	153	112	196	1
Kite boarding	23	17	30	4
Kite surfing	23	17	30	3
Land yachting	23	17	30	3
Power boats (£ per person)	38	28	49	1
Power kite flying	23	17	30	3
Rowing	23	17	30	3
Sea angling	55	44	68	4
Snorkelling	23	17	30	2
Surfing	23	17	30	3
Swimming	25	23	26	2
Walking	23	14	32	3
Wildlife boat tours	48	35	62	4
Wildlife watching	26	19	31	3
Windsurfing	23	17	30	3

Values are for both local resident and visiting activity participants, include all types of expenditure associated with the trip and take non-paying participants into account

The data in Table A are all presented to 2012 prices (with source data adjusted using a GDP deflator where necessary), though it should be noted that the WAM activity data was collected 2008-2010. The report present values in or close to the present financial climate to allow consideration in current management decisions.

A number of assumptions were made in finalising the values which are important to state:

- All secondary expenditure, e.g. food, accommodation and travel, are captured for each activity value, however some of these expenses will be duplicated where a participant is carrying out more than one activity
- The expenditure per person is an average that is weighted by the mix of day and overnight participants included in their sample for that particular study
- Where exact activity type matches could not be made between WAM and the available literature, values for more generic or similar activity types have been used, e.g. windsurfing use a value for 'watersports'
- Where values were provided per vessel (sailing and motor boats), an assumption of 4 people per vessel has been adopted, based on assumptions made in the WAM data previously collected

A number of the allocated values, e.g. beach activities, climbing, kite boarding and horse riding, are sourced from the Great Britain Tourism and Great Britain Day Visit Surveys which provide specific values for Wales. Other notable sources include Ruiz-Frau *et al* (2012), MENE, the project business survey, as well as other more activity specific studies.

Processing of WAM GIS layers

The expenditure values detailed in Table A above were applied to a processed version of the WAM GIS. Firstly, a total number of participants per year were calculated based on the generic daily participant number for any given location; and the frequency of use throughout each season.

Secondly, the GIS layers, originally supplied as a series of points, lines and areas, were prepared into a uniform 100 x 100m gridded cell structure. This had two purposes: i) to allow a non biased map where each value represented is attributed to the same area; and ii) to allow combination of multiple data within a cell, e.g. multiple activities to give a total combined value.

Through a combined ArcGIS and Spreadsheet series of processes, the total number of participants per year for any given activity area was evenly proportioned to each grid cell, which could then be multiplied up by the cost per person per day to give the value per activity. By totalling up the values from each activity the combined activity value of each grid cell was also calculated. Similarly, the lower and upper bound values presented above were applied to this formulae to show the range in value for any one area, as a form of sensitivity testing.

Finally, the spatial variance in the valuation confidence was mapped based on the confidence scores presented above. (As the confidence is uniform for any one activity, this is only relevant to the combined activity valuation.) The confidence has been weighted by the individual activity value in any given grid cell to ensure that the final confidence represents the greatest value.

Note that the original WAM GIS layers also contain confidence values. However it was considered inappropriate to use these as the combination of multiple confidence scores would result in loss of detail to a point of being not useful / misinterpreted.

Following this process, the valuation of the St David's and Dale areas was assessed, as below.

St David's valuation

A predominantly rural and scenic area, the St David's local area provides marine recreation participants with plenty of locations with good sport conditions, ecological interest and reasonable access, both on the mainland and in relation to the six predominantly uninhabited islands. National databases show that there is a permanent resident population of over 3,700¹ in the local area, and that the economy supports 1,240 jobs², with the proportion of jobs linked to tourism and leisure³ being over three times the Wales average. The business survey indicates that the area directly sustains approximately 65 Full Time Equivalents (FTEs) in the marine and coastal recreation activity related services, approximately 7% of all FTEs in the local area⁴.

The WAM database records 23 individual marine and coastal activities across the whole case study area resulting in ~1.8 million participant days per year in the case study area, each of which have been mapped individually. Figure B presents the annual expenditure of participants relating to each location of activity use, for all activities combined. This clearly demonstrates the high value associated with beaches and the access that they provide to the sea, with the highest value in Whitesand's Bay and Caerfai Bay. Other high value areas occur similarly in other areas with good accessibility, such as the estuary at Solva, other small bays along the coastline and the ferry landing points on Ramsey Island and at St Justinians. The areas further offshore typically hold lower value, with a more limited range of activities occurring with relatively low frequency.

Total expenditure associated with activities taking place in the case study area is estimated at £51.4m per annum. Only some of this value will be captured in the local area due to the valuation taking into consideration both the direct expenditure (e.g. equipment hire) as well as indirect expenditure (e.g. travel). In GVA⁵ terms, this equates to a contribution to the Welsh economy of approximately £24.5m. These figures are likely to be overestimates as they may include some double counting for individuals who undertake more than one activity in a day. A

¹ ONS (2013). Census 2011

² ONS (2013). Business Register and Employment Survey. Data for 2011

³ Defined by 5-digit SIC code in line with the ONS Tourism Intelligence Unit methodology.

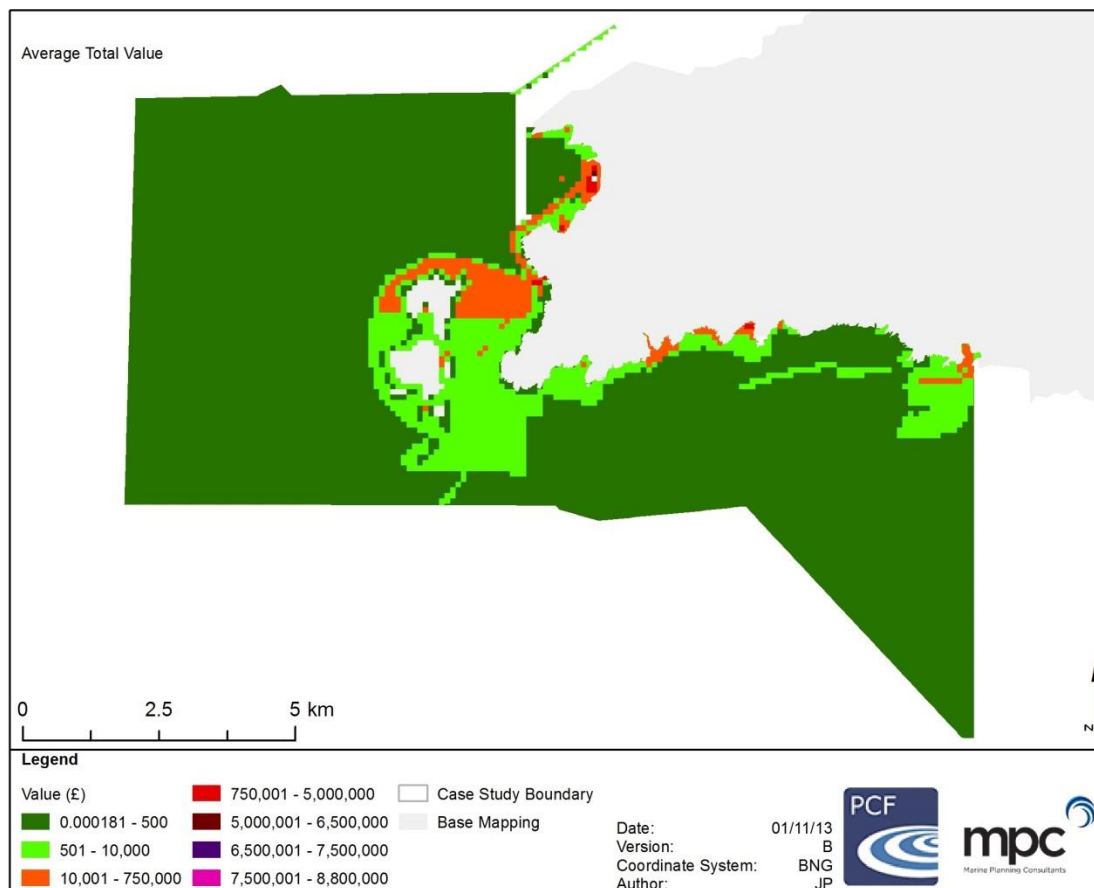
⁴ Local area FTEs calculated using BRES data assuming that 1 PT job = 0.5 FTE

⁵ GVA is a measure of the contribution that an activity makes to the economy. It measures just the 'additional' value of that activity i.e. the value of the output, less the value of any goods and services that contributed to the production process.

more conservative estimate that utilises the lower bound expenditure per person estimates (and thereby could be considered an arbitrary sensitivity test for double counting) is of £37.2m and £17.8m, for total expenditure and GVA respectively.

The business survey, which captures a subset of total expenditure (i.e. excluding food, accommodation, travel etc) indicates that activities in the case study area generate approximately £3.2m of revenue per annum for recreation service businesses located in the local area, equivalent to a direct impact on the local economy of approximately £1.6m of GVA.

Figure B: St David's Combined Activities Value (Expenditure) Map



The majority of activities show total expenditure per annum reaching the upper categories of greater than £10k per annum at any one point (within a grid cell). Those that are always less than £10k include climbing, cruiser sailing, kite boarding, kite surfing, walking, windsurfing and wildlife watching. The highest values are all found close to the shore, apart from wildlife boat trips to Ramsey Island. The three activities with the highest value include i) beach activities which generate an estimated £17.7m per annum of expenditure / £8.5m per annum of GVA (from 500,000 activity days); followed by walking at £11.4m / £5.4m respectively (500,000 activity days); and wildlife boat trips at £9.7m / £4.6m respectively (200,000 activity days). These three activities account for nearly three quarters (75%) of the value generated by

activities in the case study area. These are followed, in decreasing value, by swimming, surfing, sea angling, coastering, dinghy sailing and dog walking, all ranging from £4.8 to 0.5m per annum of expenditure.

Using the upper/lower bound values (sensitivity testing) does not significantly affect the relative economic importance of each activity type, although it does significantly change the total value estimate. Notably, for 'beach activities' the difference between the upper and lower estimates is £9.3m.

Dale valuation

Whilst the Dale case study is also relatively rural, represented by the small village of Dale, it is located within the Port of Milford Haven jurisdiction on the entrance to the Milford Haven estuary, a focal point of the UK's oil and gas industry. However the industry and leisure sectors happily co-exist, with the area known primarily for sailing and windsurfing in Dale bay. These activities are carried out in the recommended Highly Protected Marine Conservation Zones (HPMCZ) proposed to be designated under the Marine and Coastal Access Act 2009 in Wales (since withdrawn).

National databases show that there is a permanent resident population of over 1,400⁶ in the local area, and that the economy supports 188 jobs⁷ (excluding Port of Milford Haven, located upstream). The proportion of jobs linked to tourism and leisure (nearly half⁸) are over four times the Wales average. The business survey indicates that the area directly sustains approximately 15 FTEs in the marine and coastal recreation activity related services (excluding Port of Milford Haven), approximately 10% of all FTEs in the local area⁹.

The WAM database records 14 individual marine and coastal activities across the whole case study area resulting in ~0.2 million participant days per year in the case study area, each of which have been mapped individually. Figure C below presents the annual expenditure of participants relating to each location of activity use, for all activities combined. This clearly demonstrates the high value associated with the beach and its access to the sea, directly adjacent to Dale at the head of the bay. Not surprisingly, much of this expenditure is due to beach activities. Three other areas stand out as being of relatively high value: the inside of the bay, north-west of Black Rock (primarily kayaking, sea angling and dinghy sailing in the area); Monk Haven, on the north side of the bay (primarily sea angling, diving and kayaking); and the

⁶ ONSc(2012). Census 2011

⁷ ONS (2012). BRES (2011 data)

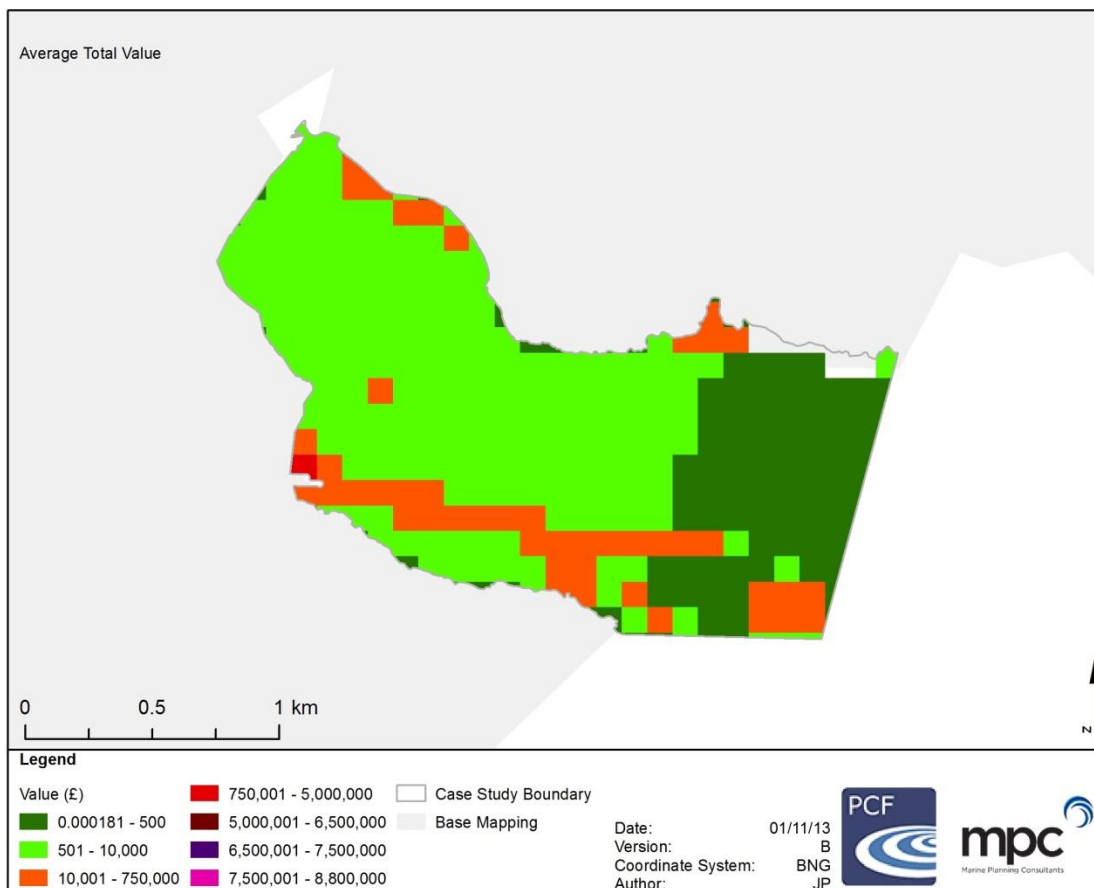
⁸ Defined by 5-digit SIC code in line with the ONS Tourism Intelligence Unit methodology.

⁹ Local area FTEs calculated using BRES data assuming that 1 PT job = 0.5 FTE

area close to the coast running south-east from Dale (primarily diving, jet skiing and sea angling).

Total expenditure associated with activities taking place in the case study area is estimated at £7.2m per annum. In GVA¹⁰ terms, this equates to a contribution to the Welsh economy of approximately £3.5m. These figures are likely to be overestimates as they may include some double counting for individuals who undertake more than one activity in a day. A more conservative estimate that utilises the lower bound expenditure per person estimates (and thereby could be considered an arbitrary sensitivity test for double counting) is of £5.5m and £2.6m, for total expenditure and GVA respectively.

Figure C: Dale Combined Activities Value (Expenditure) Map



¹⁰ GVA is a measure of the contribution that an activity makes to the economy. It measures just the 'additional' value of that activity i.e. the value of the output, less the value of any goods and services that contributed to the production process.

The business survey indicates that activities in the case study area generate approximately £0.8m of revenue per annum for recreation service businesses located in the local area, equivalent to a direct impact on the local economy of approximately £0.4m of GVA.

Five activities – beach activities, dinghy sailing, diving, walking, and sea angling – account for the vast majority of all marine and coastal recreation in the Dale case study area, in terms of both the number of activity days (87% of the total) and participant expenditure (94% of the total). These as well as other activities including jet skiing and windsurfing all show areas with total expenditure per annum in the upper categories of >£10k per annum. The three activities with the highest value include i) beach activities which generate an estimated £2.1m per annum of expenditure / £1.0m per annum of GVA (from 61,300 activity days); followed by diving at £1.8m / £0.9m respectively (25,400 activity days); and walking at £1.3m / £0.6m respectively (54,500 activity days). These three activities account for nearly three quarters (72%) of the value generated by all activities in the case study area. These are followed, in decreasing value, by sea angling, dinghy sailing, kayaking, windsurfing, jet skiing, dog walking, wildlife boat trips, cruiser sailing, power boating, climbing and rowing, all ranging from less than £0.1m to 1.1m per annum of expenditure.

Using the upper/lower bound values (sensitivity testing) results in a slight change in the order of the top 3 activities with up to ±40% change in values.

Recommendations

Based on the data and literature review, and the process through which the valuation was developed, a series of 11 recommendations have been made. These principally address the requirements to develop valuation of the recreation sector in Wales. However they take into consideration work being carried out further afield and many of the recommendations would be of equal benefit beyond Wales.

Extension of pilot methodology beyond case studies

- 1) Extension of pilot methodology to WAM (Cardigan to Bridgend): Repeat spreadsheet and GIS calculations using existing WAM and expenditure per participant data.
- 2) Extension of pilot methodology to Wales: Extension of WAM and application of valuation with consideration of the factors detailed below.
- 3) Extension of pilot methodology beyond Wales: To consider factors detailed below.

Amendments to WAM

- 4) Update to WAM participant usage: Various refinements including: spatial delineation, mitigation of double counting, application of usage to each season, differentiation of confidence for each of usage and frequency, division of relevant activities, e.g. angling (shore / offshore). Also consideration to grouping of activities, grid assignment of spatial footprint and, lastly, hotspots instead of complete coverage.

Improvements to expenditure values

- 5) Enhance use of GBTS/GBDVS expenditure data: Update calculated expenditure per participant values using each new year of GBDVS and GBTS data, in order to incorporate a longer, 3-year run of data.
- 6) Primary survey of participant expenditure at a national scale: A Wales-level survey focussed on activities for which a higher level of confidence is desired, or for which no data is currently available.
- 7) Research into spatially varying expenditure indexes: A national or UK wide research project into how to apply national expenditure per person values to 'types' of coastal areas and to define typologies in Wales in a similar fashion to MMO (2011).

Gaining understanding of the local economy

- 8) Business survey for bespoke case study analysis: Future surveys should be condensed to total annual revenue, customers, employees, wages (each split by inside / outside case study); as well as considering broadening the sectoral base.

Improvements to participant usage

- 9) Improvements to spatial participant usage through national recreation bodies: Collation of participant activity locations, numbers and expenditure at a national scale through survey, coordinated through national bodies; and completion of analyses, maps and reporting.
- 10) Improvements to spatially disaggregated data from GBTS/GBDVS surveys: Engage VisitWales and other relevant organisations to discuss the potential for increasing the Wales sample size.

Assess timescales

- 11) Conclude the period of update required to inform methods: Engage the Welsh Government, Visit Wales and National Park to assess requirements for the data.