ENVIRONMENTAL EVIDENCE BASE CONTRIBUTIONS FROM MARINE AND FRESHWATER SCIENCES, COUNTRYSIDE COUNCIL FOR WALES, 2004-2011

C.A Duigan & W. Watkins (Editors)

April 2011

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales
Maes y Ffynnon, Penrhosgarnedd
Bangor, Gwynedd, LL57 2DW

Noddir gan
Lywodraeth Cymru
Sponsored by
Welsh Government

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

Report No.	Staff Science Report No. 11/06/02
Publication date	1 April 2011.
Report title:	ENVIRONMENTAL EVIDENCE BASE CONTRIBUTIONS FROM MARINE AND FRESHWATER SCIENCES, COUNTRYSIDE COUNCIL FOR WALES, 2004-2011
Editors:	C.A. Duigan & W. Watkins
Restrictions:	None

Distribution list (core):

CCW HQ Library, Bangor	**2**	National Library of Wales	**1**
British Library	**1**	Welsh Government Library	**1**
SNH Library (Email)	**1**	Natural England Library (Email)	**1**

Distribution: CCW Council
Director Evidence & Advice
Regional Managers
Group Heads – E&A Directorate
Diana Reynolds, WG
Katherine Raymond, WG
Julia Williams, WG
Shaun Russell, WERH

NEED A REPORT ?

The listed reports are available at the Countryside Council for Wales (Bangor), and copies of staff publications may be obtained directly from the authors.

Contact:
Angharad Jones,
Cyngor Cefn Gwlad Cymru - Countryside Council for Wales
Maes y Ffynnon, Penrhosgarnedd,
Bangor, Gwynedd, LL57 2DW

Tel: 01248 387360
E-mail: An.Jones@ccw.gov.uk

ANGEN ADRODDIAD ?

Mae’r adroddiadau a restrir ar gael yng Nghyngor Cefn Gwlad Cymru (Bangor), a gellir cael gafael ar gopïau o gyhoeddiadau staff yn uniongyrchol gan yr awduron.

Cysylltwch â:
Angharad Jones,
Cyngor Cefn Gwlad Cymru - Countryside Council for Wales
Maes y Ffynnon, Penrhosgarnedd,
Bangor, Gwynedd, LL57 2DW

Ffôn: 01248 387360
E-bost: An.Jones@ccw.gov.uk

Crynodeb
Pwrpas cychwynnol y gofrestr hon yw darparu cofnod o gefnogaeth dechnegol a monitro prosiectau sydd wedi'u comisiynu neu'u gwneud gan staff y Grŵp Gwyddorau Morol a Dŵr Croyw (MFSG), o 2004 ymlaen. Mae'r gofrestr yn cynnwys rhestr o adroddiadau, cyhoeddiadau a gwefannau o dan y penawdau canlynol - Prosiectau Ymchwil a Chefnogaeth Dechnegol wedi'u comisiynu; Adroddiadau Monitro Morol; HABMAP (Mapio Cynefinoedd ar gyfer Cadwraeth a Rheoli'r De o For Iwerddon); Adroddiadau Cronfa Her Rhywogaethau; Adroddiadau a Chyhoeddiadau Staff Grŵp Gwyddorau Morol a Dŵr Croyw; Cyhoeddiadau ac Adroddiadau Ychwanegol; Ysgoloriaethau Ymchwil; Cyhoeddiadau'r Cyngor Cefn Gwlad a Gwefannau Prosiect.

Summary
The primary purpose of this register is to provide a record of technical support and monitoring projects commissioned or undertaken by staff in the CCW Marine & Freshwater Sciences Group (MFSG), from 2004 onwards. The register consists of a list of reports, publications and websites under the following headings - Commissioned Technical Support and Research Projects; Marine Monitoring Reports; HABMAP (Habitat Mapping for Conservation and Management of the Southern Irish Sea); Species Challenge Fund Reports; MFSG Staff Publications and Reports; Additional Publications and Reports; Studentships; CCW Publications; and Project Websites.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION 1
CHAPTER 2: RESEARCH REGISTER 3
COMMISSIONED TECHNICAL SUPPORT AND RESEARCH PROJECTS 3
COASTAL 3
MARINE 3
FRESHWATER 5
REVIEW OF CONSENTS REPORTS 8
MARINE MONITORING REPORTS 9
HABMAP: Habitat Mapping for Conservation and Management of the Southern Irish Sea. 14
SPECIES CHALLENGE FUND REPORTS 15
MFSG STAFF PUBLICATIONS AND REPORTS 16
BOOKS, BOOK CHAPTERS AND CONFERENCE PROCEEDINGS 16
PEER REVIEWED JOURNALS 19
MISCELLANEOUS 21
ADDITIONAL PUBLICATIONS AND REPORTS 22
RESEARCH REPORTS 22
GUIDANCE DOCUMENTS 23
PUBLICATIONS 23
STUDENTSHIPS 25
CCW PUBLICATIONS 27
PROJECT WEBSITES 28

CHAPTER 1: INTRODUCTION TO EVIDENCE REGISTER

INTRODUCTION

The Countryside Council for Wales (CCW) is the Government's statutory advisor on sustaining natural beauty, wildlife and the opportunity for outdoor enjoyment in Wales and its inshore waters. CCW champions the environment and landscapes of Wales and its coastal waters as sources of natural and cultural riches, as a foundation for economic and social activity, and as a place for leisure and learning opportunities. We aim to make the environment a valued part of everyone's life in Wales.

We are an evidence based organisation. Our corporate definition of evidence includes data or information which tends to prove or disprove a theory and incorporates scientific and socio-economic data sources. This register focuses on the contributions the Marine and Freshwater Sciences Group has made to the marine and freshwater evidence base in the period 2004-2011. Building the environmental evidence base is vital for the delivery of CCW's remit as environmental advisors to the Welsh Government. It provides us with essential knowledge and tools to assist with the conservation and management of the environment and forms a reliable foundation for policy development.

Our evidence work supports our day-to-day operations and core CCW functions. In particular it is essential for the delivery of the following work areas:

1. Achievement of Biodiversity Action Plan targets;
2. Underpins policy advice development;
3. Informs casework practices and decisions;
4. Supports our advice to government and other bodies/organisations;
5. Provides monitoring data for conservation site condition assessments, management and state of the environment reporting;
6. Contributes to contingency planning;
7. Informs selection of conservation sites;
8. Helps to deliver the monitoring, management and restoration of designated sites and the conservation of the wider countryside; and
9. Informs the prediction of and adaptation to future environmental change.

RESEARCH REGISTER

The primary purpose of this register is to provide a record of marine and freshwater technical support and monitoring projects commissioned or undertaken from 2004 onwards. Following additional report editing and amalgamation, some references may have changed from the previous edition of the register. Over 70 additions and amendments have been made.

The register consists of a list of reports, publications and websites. It is broken down into nine main sections:

1. **Commissioned Technical Support and Research Projects** (covering Coastal, Marine and Freshwater Research, including Review of Consents Research)
2. **Marine Monitoring Reports**
3. **HABMAP** (Habitat Mapping for Conservation and Management of the Southern Irish Sea)
4. **Species Challenge Fund Reports**
5. **MFSG Staff Publications and Reports**
6. **Additional Publications and Reports** (which have used CCW data or have been funded by CCW)
7. **Studentships**
8. **CCW Publications**
9. **Project Websites**

Unpublished reports and publications in refereed journals and other publications are included. Staff publications include material arising directly from CCW mainstream work, and additional conservation and ecological interests.

Dr. Catherine Duigan
Head of Marine and Freshwater Sciences
April 2011.

This register supersedes Duigan, C.A., Ramsay, K., Hatton-Ellis & Grove, J. (Eds.)(2009). Marine and Freshwater Sciences Research Listings and Report Register 2004-08, Countryside Council for Wales. Staff Science Report No. 08/06/02.

CHAPTER 2: RESEARCH REGISTER

COMMISSIONED TECHNICAL SUPPORT AND RESEARCH PROJECTS

A wide range of coastal, freshwater and marine evidence is reported through the CCW Contract Science Report series. This research and survey was commissioned by CCW from external contractors with a supervising project officer based in MFSG. The results provide the evidence base for CCW practices and advice, including conservation site selection and management, assessing pollution pressures, preparing for and responding to climate change, Biodiversity Action, habitat restoration, and addressing hydro- and geomorphological issues. In addition, some CCW Policy Research Reports have been included here if MFSG staff acted as project managers.

Some of this research has been developed in collaboration with the Environment Agency and other partners. This series includes a number of freshwater monitoring reports, which allow us to report on the condition of designated sites in the context of the Habitats Directive and Water Framework Directive. We have also incorporated reports produced by the Review of Consents process.

COASTAL

Babtie Group (2005). *Identification of Constraints on the Delivery of Sustainable Flood & Coastal Defences.* CCW Contract Science Report No. 669.

Blackwell, H. (2005). *Crymlyn Burrows SSSI, Jersey Marine & Baglan: A Surveillance Programme to Measure Erosion and Accretion on the Dune Front and Foreshore.* CCW Contract Science Report No. 701.

Cousins, N., Chung, P., Coutts, H., Doody, P. & Mcue, J. (2008). *Identifying Biodiversity Opportunities to Inform the Shoreline Management Review (SMP2).* CCW Contract Science Report No. 826.

Halcrow Group Limited (2006). *Assessment for Constraints Imposed on Future Shoreline Management by Rail Assets Adjacent to the Coast.* CCW Contract Science Report No. 756.

McCue, J., Pye, K. & Wareing, A. (2010). *Beach Nourishment Operations in Wales and Likely Future Requirements for Beach Nourishment in an Area of Sea Level Rise and Climate Change – A Pilot Study*. CCW Science Report No. 928.

Perkins, R. (2008). *Sediment Stability and Nutrient Fluxes: Interactions and Biotic Mediation in Coastal Systems: Severn Estuary Pilot Study.* CCW Science Report No. 827.

Pye, K. & Saye, S. (2005). *Geomorphological Response of Welsh Sand Dunes to Sea Level Rise*. CCW Contract Science Report No. 670.

MARINE

Bunker, F., StP., D. & Camplin, M.D. (2007). *A Study of the Milford Haven Maerl Bed in 2005 Using a Drop Down Video and Diving.* CCW Contract Science Report No. 769.

Chambers, S.P. (2005). *Maritime Supralittoral Lichen Survey of the Portmeirion Promontory, Morfa Harlech NNR/SSSI/PLAS cSAC.* CCW Contract Science Report No. 664.

Evans, P. & Wang, J. (2004). *Re-examination of Distribution Data for the Harbour Porpoise on NW European Continental Shelf with a View to Site Selection for this Species.* CCW Contract Science Report No. 635.

Gubbay, S. (2006). *Highly Protected Marine Reserves – Evidence of Benefits and Opportunities for Marine Biodiversity in Wales.* CCW Contract Science Report No. 762.

Gubbay, S. & Earll, R. 2010. *Assessing the Vulnerability of Marine Biodiversity in Wales to the Impacts of Climate Change: Workshop Report.* CCW Contract Science Report No. 934.

Hiddink, J.G. (2006). *Modelling the State of Soft-sediment Benthic Communities in Welsh Coastal Waters.* CCW Contract Science Report No. 733.

Kaiser, M.J. (2004). *Sandbank Survey - Fish Stomach Content, Fish Epibenthic Survey Data Analysis*. CCW Contract Science Report No. 610.

Lush, M. J. & Ashmead, C. E. (2010). *Marine Intertidal Habitat Review and Assessment.* CCW Contract Science Report No. 933.

Mieszkowska, N. (2008). *MarClim Annual Welsh Intertidal Climate Monitoring Survey 2007.* CCW Contract Science Report No. 829.

Mieszkowska, N. (2008). *MarClim Annual Welsh Intertidal Climate Monitoring Survey 2008.* CCW Contract Science Report No. 874.

Mieszkowska, N. (2010). MarClim Annual Welsh Intertidal Climate Monitoring Survey 2009. CCW Contract Science Report No. 921.

Moore, J. (2004). *Collation of Images for Use in the Promotion of Biodiversity Action Plans.* CCW Contract Science Report No. 656.

Moore, J. (2004). *Survey of North Wales and Pembrokeshire Tide Influenced Communities*. CCW Contract Science Report No. 611.

Moore, J. (2008). *Summary Spatial Analysis of Intertidal & Subtidal Biotopes in Welsh Waters.* CCW Policy Research Report No. 08/19.

Northern, K.O. & Irving, R.A. (2008). *An Atlas of Selected Marine Habitats and Species Listed for Section 42 of the NERC Act 2006.* CCW Contract

Science Report No. 833.

Penrose, R. (2004). *Marine Mammal & Turtle Strandings (Welsh Coast). Annual Report 2003.* CCW Contract Science Report No. 640.

Penrose, R. (2005). *Marine Mammal & Turtle Strandings (Welsh Coast). Annual Report 2004.* CCW Contract Science Report No. 693.

Penrose, R. (2008). *Marine Mammal & Turtle Strandings (Welsh Coast).* Annual Reports: *2005; 2006 and 2007.* CCW Contract Science Report No. 740.

Rees, E.I.S. (2004). *Subtidal Sediment Biotopes in Red Wharf Bay and Conwy Bays, North Wales: A Review of their Composition, Distribution and Ecology*. CCW Contract Science Report No. 655.

Richardson, E.A. (2006). *Incorporating Fisheries Socioeconomic Data into Conservation and Biological Management – A Case Study in Wales.* CCW Contract Science Report No. 655.

FRESHWATER

Bennion, H., Burgess, A., Roe, K., Yang, H. & **Thomas, R.** (2010). *Palaeoecological Study of Llyn Padarn.* CCW Contract Science Report No. 918.

Broughton, D.A. & Southey, J. (2008). *Macrophyte Condition Assessment for the Afon Gwyrfai SAC.* CCW Contract Science Report No.817.

Burgess A., Goldsmith B. & **Hatton-Ellis T.** (2006). *Site Condition Assessments of Welsh SAC and SSSI Standing Water Features*. CCW Contract Science Report No. 705.

Clarke, S., Lansdown, R. & Birkinshaw, N. (2009). *Determining the Main Variability Components for Macrophyte Communities in Rivers : JNCC and LEAFPACS Macrophyte Surveys on the River Dee.* CCW Contract Science Report No.852.

Conlan, K., Lane, S., Ormerod, S., & Wade, T. (2006). *Preparing for Climate Change Impacts on Freshwater Ecosystems (PRINCE): Literature Review and Proposal Methodology.* CCW Contract Science Report 792a.

Conlan, K., Wade, T., Ormerod, S., Lane, S., Durance, I. & Yu, D. (2007). *Preparing for Climate Change Impacts on Freshwater Ecosystems (PRINCE): Project Report.* CCW Contract Science Report 792b.

Ellis R., Derbyshire P., Meddins C. & Kirby J. (2004). *Surveys of North West Wales Rivers: Macrophyte Surveys of the Meirionnydd and North Ceredigion Rivers.* CCW Contract Science Report No. 584.

George, D.G., Rouen, M.A., Lamb, H.F. & Bonsall, L. (2008). *Llyn Tegid Monitoring Station 2006-2010. Report No. 2.* CCW Contract Science Report No. 825.

George, D.G., Rouen, M.A., Lamb, H.F. & Bonsall, L. (2009). *Llyn Tegid Monitoring Station 2006-2010. Report No. 3.* CCW Contract Science Report No. 870.

George, D.G., Rouen, M.A. & Lamb, H.F. (2010). *Llyn Tegid Monitoring Station 2006-2010. Report No. 4.* CCW Contract Science Report No. 909.

Gee, J.H.R, Keirle, I., Wheaton, J.M. & Wootton, R.J. (2007). *A Monitoring Strategy for the Afon Teifi Restoration Project.* CCW Contract Science Report No. 773.

Gill, A., Pepper, A., Eaton, J.W., McAllister, H. & Neame, C. (2005). *Restoring the Afon Teifi at Cors Caron NNR: A Project Plan.* CCW Contract Science Report No. 685.

Goldsmith, B., Bennion, H., Hughes, M., Jones, V., Rose, C. & Simpson, G.L. (2006). *Integrating Habitats Directive and WFD Monitoring - Baseline Survey of Natura 2000 Standing Water Habitats in Wales*. CCW Contract Science Report No. 704.

Goldsmith, B. & **Hatton-Ellis, T.W.** (2006). *Phosphorus Concentrations at SAC Lakes in Wales.* A Supplement to: *Integrating Habitats Directive and Water Framework Directive Monitoring: Baseline Survey of Natura 2000 Standing Water Habitats in Wales.* CCW Contract Science Report No. 704 (Supplement).

Holman, I.P., Davidson, T., Burgess, A., Kelly, A., Eaton, J. & **Hatton-Ellis, T.W.** (2009). Understanding the Effects of Coming Environmental Change on Bosherston Lakes as a Basis for a Sustainable Conservation Management Strategy. CCW Contract Science Report No.858.

Jeffries, R., **Thomas, R.,** German, S., Bray, S., Cross, J., Guay, A., White, C. & Hillman, P. (2007). *Fluvial Audit of the River Wye and Tributaries: Geomorphological Assessment*. CCW Contract Science Report No. 776.

Lamb, H., George, D. G. & Rouen, M. A (2007). *Llyn Tegid Monitoring Station 2006-2010 : Report No. 1.* CCW Contract Science Report No.778.

May, L., Dudley, B., Spears, B.M. & **Hatton-Ellis, T.W.** (2008). *Nutrient Modelling and a Nutrient Budget for Llangorse Lake*. CCW Contract Science Report No. 831.

Morris, T. (2008). *Potential Funding Sources for the Afon Teifi Restoration Project*. CCW Contract Science Report No. 836.

Perrow, M.R., Sayer, C.D., Skeate, E.R., Shilland, E.M., Goldsmith, B.J. & Hughes, M.J. (2005). *The Future Management of Falcondale Lake, Site of Special Scientific Interest, Ceredigion*. CCW Contract Science Report No. 620.

Stratford, C.J., (2007). *Hydrological Investigation to Support the Proposed Eradication of Signal Crayfish in Ponds Adjacent to the Afon Bachawy by the Use of Natural Pyrethrum Biocide.* CCW Contract Science Report No. 777.

Williams, J., Johnson, A.C., Keller, V., Weels, C., Holmes, M.G.R. & Young, A.R. (2008). *Catchment Risk Assessment of Steroid Oestrogens from Sewage Treatment Works*. CCW Contract Science Report No. 838.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2005). *Gwyniad Translocation Project 2004-2005: Hydroacoustic Survey of Llyn Tegid*. CCW Contract Science Report No. 618.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2005). *Gwyniad Translocation Project 2004-05: Translocation Attempt*. CCW Contract Science Report No. 703.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2006). *Llyn Tegid Hydroacoustic Surveys 2005*. CCW Contract Science Report No. 713.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2005). *Llyn Tegid Gwyniad Translocation Advice 2005-2006*. CCW Contract Science Report No. 748.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2007). *Llyn Tegid Hydroacoustic Surveys 2006.* CCW Contract Science Report No. 763.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2007). Llyn Tegid Gwyniad Translocation Advice 2006-2007. CCW Contract Science Report No. 795.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2008). *Llyn Tegid Hydroacoustic Surveys 2007*. CCW Contract Science Report No. 814.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2008). *Long-Term Monitoring Plan for Llyn Arenig Fawr*. CCW Contract Science Report No. 815.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2008). *Initial Hydroacoustic Mapping of Macrophyte Communities in the Southern End of Llyn Tegid*. CCW Contract Science Report No. 816.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2008). *A Review of Recent Research and Translocation Activities Concerned with the Gwyniad of Llyn Tegid.* CCW Contract Science Report No. 840.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2008). *Llyn Tegid Hydroacoustic Survey 2008.* CCW Contract Science Report No. 867.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2010). *Llyn Tegid Hydroacoustic Survey 2009.* CCW Contract Science Report No. 903.

Winfield, I.J., Fletcher, J.M. & James, J.B. (2010). *Llyn Arenig Fawr Gwyniad Survey 2009.* CCW Contract Science Report No. 904.

Yeomans, W.E., Murray, D.S., Stevenson, C., McGillivray, C., McColl, D., Dodd, J.A. & **Thomas, R.** (2008). *Monitoring of Bullhead in Welsh SAC rivers: Rivers Usk and Wye.* CCW Science Report No. 818.

REVIEW OF CONSENTS REPORTS

Atkins Consultancy (2005). *Assessment of Obstructions to Shad Migration on the River Usk*. CCW Review of Consents Report No. 16.

Campbell, D., Clarke, S. & Williams, A.E. (2005). *Lamprey Surveys on the Rivers Twyi, Teifi & Cleddau*. CCW Review of Consents Report No. 7.

Centre for Ecology and Hydrology (2006). *Determining a Nitrogen Budget for Merthyr Mawr Sand Dune System.* CCW Review of Consents Report No. 14.

Emery, J.C. & Hill, C.T. (2005). *Fluvial Audit of the Upper Usk Tributaries*. CCW Review of Consents Report No. 15.

Hill, C.T. & Emery, J.C. (2005). *Fluvial Audit of the River Dee*. CCW Review of Consents Report No. 12.

Holmes, N.T.H. (2004). *A Review of Water Quality Monitoring on the Usk Catchment Using Macrophytes*. CCW Review of Consents Report No. 5.

McEwen, L.J. & Milan, D. (2006). *A Fluvial Audit of the Afon Tywi.* CCW Review of Consents Report No. 9., Volume 1: Technical Report.

McEwen, L.J. & Milan, D. (2006). *A Fluvial Audit of the Afon Tywi.* CCW Review of Consents Report No. 9., Volume 2: Maps.

McEwen, L.J. & Milan, D. (2006). *A Fluvial Audit of the Afon Tywi.* CCW Review of Consents Report No. 9, Volume 3: Summary report.

O'Keeffe, N. & Turnpenny, A.W.H. (2005). *Screening for Intake and Outfalls: A Best Practice Guide*. CCW Review of Consents Report No. 21.

West, R. (2005). *River Dee Candidate Special Area of Conservation, Lamprey Survey 2004*. CCW Review of Consents Report No. 18.

West, R. (2005). *River Dee Candidate Special Area of Conservation, Bullhead Survey 2004*. CCW Review of Consents Report No. 19.

MARINE MONITORING REPORTS

This Marine Monitoring Report Series was initiated following the advent of Marine Special Areas of Conservation (SACs). The results allow CCW to report on the Favourable Conservation Status of SAC features and support other reporting obligations. Early reports focused on methodology development. Now baseline information is being reported for the extensive site series with a wide range of habitat and species features. The results provide the evidence base for informed comment on the state of the marine environment, responses to casework and development proposals, site management and support Biodiversity Action. Monitoring aspects of contingency planning are also included.

Allen, J.H., Boyes, S. & Burlinson, F. (2008). *Intertidal Monitoring of Muddy Gravels in Menai Strait and Conwy Bay SAC.* CCW Marine Monitoring Report No. 45.

Allen, J.H., Thomson, S. & **Brazier, D.P.** (2008). *Intertidal Monitoring of Biotope Distribution in Carmarthen Bay and Estuaries SAC in 2005*. CCW Marine Monitoring Report No. 52.

Axelsson, M., Turrell, A., **Holt, R.H.F.** & **Lough, N.** (2006). *Drop–down Video Monitoring in Wales, 2004-2005.* CCW Marine Monitoring Report No. 24.

Baines, M. E. & Evans, P. G. H (2009). *Atlas of the Marine Mammals of Wales*. CCW Marine Monitoring Report No. 68.

Bamber, R.N. (2004). *The Description, Temporal Variation and Monitoring of Important Lagoonal Communities and Species in Wales.* CCW Marine Monitoring Report No. 12.

Banks, A., Bolt, D., Bullock, I.D., Haycock, B., Musgrove, A., Newson, S., Bowers, D.G. (2006). *Menai Strait Turbidity and Other Covariate Surveillance.* CCW Marine Monitoring Report No. 22.

Banks, A., Bolt, D., Bullock, I.D., Collier, M.P., Fairney, N.P., Hasler, C., Haycock, B., Maclean, I.M.D., Roberts, N.P., **Sanderson, W.G.**, Schofield, R.A., Smith, L., Swan, J.M., Taylor, R.H.A. & Whitehead, S. (2007). *Ground and Aerial Monitoring for Carmarthen Bay SPA 2004-07.* CCW Marine Monitoring Report No. 48.

Boyes, S. (2008). *Intertidal Monitoring of* Ruppia maritima *in Carmarthen Bay and Estuaries SAC.* CCW Marine Monitoring Report No. 37.

Boyes, S. (2008). *Intertidal Monitoring of the Biotope SLR.FserX.T in Carmarthen Bay and Estuaries SAC.* CCW Marine Monitoring Report No. 38.

Boyes, S. & Allen, J.H. (2008). *Intertidal Monitoring of* Sabellaria alveolata *Reefs in Pen Llŷn a'r Sarnau SAC in 2004/2005.* CCW Marine Monitoring Report No. 29.

Boyes, S., Allen, J. H., Burdon, D. & Hemmingway, K. (2008). *Intertidal Monitoring of the Mawddach Estuary, Pen Llŷn a'r Sarnau SAC.* CCW Marine Monitoring Report No. 30.

Boyes, S. & **Brazier, D.P.** (2008). *Intertidal Monitoring of the Saltmarsh Boundaries in the Burry Inlet, Carmarthen Bay and Estuaries SAC.* CCW Marine Monitoring Report No. 51.

Boyes, S., **Brazier, D.P.,** Burlinson, F., Mazik, K., Mitchell, E. & Proctor, N. (2009). *Intertidal Monitoring of* Zostera noltii *in the Menai Strait & Conwy Bay SAC in 2004/05.* CCW Marine Monitoring Report No. 31.

Boyes, S., Hemmingway, K. & Allen, J.H. (2008). *Intertidal Monitoring of* Zostera marina *in Pen Llŷn a'r Sarnau SAC in 2004/2005.* CCW Marine Monitoring Report No. 28.

Boyes, S., Hemmingway, K. & Mazik, K. (2009). *Intertidal Monitoring of Sand-Scoured Rockpools in the Cardigan Bay SAC.* CCW Marine Monitoring Report No. 55.

Boyes, S., Mazik, K., & Burdon, D. (2008). *Intertidal Monitoring of* Sabellaria alveolata *in Cardigan Bay SAC.* CCW Marine Monitoring Report No. 43.

Boyes, S., Mazik, K. & **Sanderson W.G.** (2004). Intertidal Monitoring of Hydroid-dominated Rockpools in Carmarthen Bay and Estuaries SAC. CCW Marine Monitoring Report No. 41.

Boyes, S., Mazik, K. & **Sanderson W.G.** (2009). *Intertidal Monitoring of Piddocks in Carmarthen Bay and Estuaries SAC.* CCW Marine Monitoring Report No. 63.

Bunker, F.StP.D. and **Holt., R.H.F.** 2003. *Survey of Sea Caves in Welsh Special Areas of Conservation 2000 to 2002*. CCW Marine Monitoring Report No. 6.

Bunker, F.StP.D. & Moore, J.J. (2006). *Survey of* Alkmaria romijni *Horst (Polychaeta: Ampharetidae) at Carew Castle.* CCW Marine Monitoring Report No. 35.

Burdon, D. & Boyes, S. (2009). *Intertidal Monitoring of Sea Caves in Pen Llŷn a'r Sarnau SAC, 2004.* CCW Marine Monitoring Report No. 54.

Cook, R., Kay, L., **Sanderson, W.G.,** Smith, K., **Stringell, T.B.** & **Wyn, G.** (2006). *Field Report on the Menai Strait Oil Spill of 25th June 2006.* CCW Marine Monitoring Report No. 27.

English, P., DeGregorio, S., **Ramsay, K., Lough, N.E.L. & Lindenbaum, C.P.** (2006). *Tremadog Bay Subtidal Macrobenthic Study. A Report to the Countryside Council for Wales from Emu Ltd, Durley, Southampton.* CCW Marine Monitoring Report No. 32.

Fairney, N., **Sanderson, W.G.,** Schofield, R., Smith, L., Taylor, R. & Whitehead, S. (2006). *Ground and Aerial Monitoring Protocols for Inshore Special Protection*

Areas: Common Scoter in Carmarthen Bay 2002-04. CCW Marine Monitoring Report No. 11.

Holt, R.H.F. (2003). *Welsh Littoral (Intertidal) Rock Biotopes*. CCW Marine Monitoring Report No. 4.

Holt, R. H. F., Ramsay, K., Mowat, S., Kent, F. & Griffith K (2009). *Survey of a Non-native Ascidian (Sea Squirt) Didemnum vexillum in Holyhead Harbour January 2009*. CCW Marine Monitoring Report No. 67.

Hemingway, K., Allen, J.H., Boyes, S. & **Brazier, P.** (2008). *Intertidal Monitoring of a Muddy Gravel Community (VsenMtru) in Pen Llŷn a'r Sarnau SAC in 2004.* CCW Marine Monitoring Report No. 47.

Hemingway, K., Boyes, S. & **Brazier, D.P.** (2004). *Intertidal Monitoring of* Pectenogammarus planicrurus *in Cardigan Bay and Pen Llŷn a'r Sarnau SACs in 2004*. Marine Monitoring Report No. 40.

Henderson, P.A. (2003). *Background Information on Species of Shad and Lamprey*. CCW Marine Monitoring Report No. 7.

Holt, R. & **Cordingley, A.** (2011). *Eradication of the Non-native Carpet Ascidian (Sea Squirt)* Didemnum vexillum *in Holyhead Harbour: Progress, Methods and Results to Spring 2011.* CCW Marine Monitoring Report No. 90.

Howson, C., Mercer, T. & **Brazier, P** (2009). *Intertidal Monitoring of Pen Llŷn a'r Sarnau SAC August 2007*. CCW Marine Monitoring Report No. 59.

Howson, C. & Moore, J. (2010). *Intertidal SAC Monitoring Menai Strait & Conwy Bay SAC June 2008*. Marine Monitoring Report No. 70.

Howson, C., **Sanderson, W.G.,** Scott, S., **Holt, R.H.F.,** Bunker, F.St.P.D., Camplin, M., **Brazier, P.** & Kay, L. (2004). *The Development of an In Situ Monitoring Method for the Algal Dominated Communities of a Glacial Moranic Reef.* CCW Marine Monitoring Report No. 8.

Hull, S.L, Tobin, M.L., Musk, W.A. & **Brazier, D.P.** (2008). *Intertidal Monitoring of Rocky Reefs in Milford Haven, Pembrokeshire Marine SAC.* CCW Marine Monitoring Report No. 42.

Jones, J. & Bunker, F.St.P.D (2003). *Identification of Sponges from Sea Caves at Ramsey and Barafundle*. CCW Marine Monitoring Report No. 9.

Lindenbaum, C., Sanderson, W. G., Holt, R. H. F., Kay, L**., McMath, A. J.** & Rostron, D.M. (2002). *An assessment of Appropriate Methods for Monitoring a Population of Colonial Anemone at Bardsey Island (Ynys Enlli), Wales, UK*. CCW Marine monitoring Report No. 2.

Luddington, L., Bunker, F.StP.D. & Burton, M. (2007). *Algal Monitoring in the Skomer MNR and other sites around Wales.* CCW Marine Monitoring Report

No. 33.

Maclean, I. M. D., Cranswick, P. A., Fairney, N. P., Smith, L. E., Hall, C., Musgrove, A. J., Haycock, B., **Sanderson, W. G.,** Whitehead, S. & Rehfisch, M. M. (2008). *Ground and Aerial Monitoring of Common Scoters in Carmarthen Bay, 2007-2008*. Marine Monitoring Report No. 64.

Mazik, K. (2008). *Intertidal Monitoring of* Ophelia bicornis *in Carmarthen Bay and Estuaries SAC.* CCW Marine Monitoring Report No. 39.

Mazik, K. & Boyes, S. (2009). *Intertidal Monitoring of Eelgrass* Zostera noltii *in the Burry Inlet, Carmarthen Bay and Estuaries SAC.* CCW Marine Monitoring Report No. 53.

Mercer, T.S. (2010). *Across-Wales Intertidal SAC Monitoring, Pen Llyn a'r Sarnau SAC, August 2008*. CCW Marine Monitoring Report No. 73.

Mercer, T.S. & **Brazier, D.P.** (2009). *Intertidal SAC monitoring, Intertidal Monitoring of rocky reefs in Milford Haven, Pembrokeshire Marine SAC, August 2007.* CCW Marine Monitoring Report No. 60.

Moore, J.J. (2004). *Surveys of Cockle and Mussel Stocks in the Dee, Traeth Lafan and Burry Inlet.* CCW Marine Monitoring Report No. 16.

Moore, J.J. (2005). *Development of CCW Impact Assessment Response Framework for a Marine Pollution Incident.* CCW Marine Monitoring Report No. 20.

Moore, J.J. (2006). *State of the Environment in SW Wales, 10 Years After the Sea Empress Oil Spill.* CCW Marine Monitoring Report No. 21.

Moore, J.J. (2009). *Across-Wales Intertidal SAC Monitoring, Menai Strait and Conwy Bay SAC, September 2007.* CCW Marine Monitoring Report 56.

Moore, J. J (2009). *Intertidal SAC Monitoring Cardigan Bay SAC May 2007*. CCW Marine Monitoring Report No. 57.

Moore, J. J (2009). *Intertidal SAC Monitoring Carmarthen Bay and Estuaries SAC June 2007*. CCW Marine Monitoring Report No. 58.

Moore, J.J. (2009). *Survey of Cockle and Mussel Stocks in the Burry Inlet, 2004-2008.* CCW Marine Monitoring Report No. 34.

Moore, J.J. (2010). *Intertidal SAC Monitoring Cardigan Bay SAC May 2008*. Marine Monitoring Report No. 71.

Moore, J., **Brazier, D.P**., & **Hobbs, E.** (2010). *Across-Wales Intertidal SAC Monitoring, Menai Strait & Conwy Bay SAC, June 2009*. CCW Marine Monitoring Report No. 82.

Pelagial Ltd. (2007). *Across- Wales Diving Monitoring Project.* CCW Marine Monitoring Report No. 25.

Pesante, G. & Evans, P. G. H. (2008). *Sea Watch Foundation Welsh Bottlenose Dolphin Photo-Identification Catalogue 2007*. CCW Marine Monitoring Report No. 66.

Pesante, G., Evans, P., Anderwald, P., Powell, D. & **McMath, M.** (2008). *Connectivity of Bottlenose Dolphins in Wales: North Wales Photo-Monitoring Interim Report.* CCW Marine Monitoring Report No. 62.

Pesante, G., Evans, P., Baines, M.E. & **McMath, M.** (2008). *Abundance and Life History Parameters of Bottlenose Dolphin in Cardigan Bay: Monitoring 2005-2007.* CCW Marine Monitoring Report No. 61.

Robinson, L.A. (2007). *Review of Sidescan Sonar Results from North Llŷn.* CCW Marine Monitoring Report No. 50.

Rowe, G.A. (2006). *Carmarthen Bay SAC Sediment Flats Monitoring 2005: Intertidal Core Analysis.* CCW Marine Monitoring Report No. 46.

Sanderson, W. G., Holt, R. H. F., Kay, L**., Wyn, G & McMath, A. J.** (2001). *The Establishment of a Programme of Surveillance and Monitoring for Judging the Condition of the Features of Pen Llyn a'r Sarnau cSAC: 1. Progress to March 2001. (UK Marine SACs Project).* CCW Marine Monitoring Report No. 1.

Smith, K. (2006). *A Multidisciplinary Study of the Morfa Gwyllt Spit Lagoon.* M.Sc. Thesis. University of Wales, Aberystwyth. CCW Marine Monitoring Report No. 44.

Sotheran, I., Foster-Smith, B. & **Holt, R.** (2004). *Development of Field Trials of a Dropdown Video System.* CCW Marine Monitoring Report No.14.

Stillman, R. A. (2009). *Predicting the Effect of Shellfish Stocks on the Oystercatcher and Knot Populations of the Burry Inlet and Three Rivers*. CCW Marine Monitoring Report No. 65.

Strong, P.G., Lerwill, J. & Morris, S.R. & **Stringell, T.B.** (2006). *Pembrokeshire Marine SAC Grey Seal Monitoring 2005.* CCW Marine Monitoring Report No. 26.

Tyler-Walters, H., Marshall, C. & Hiscock, K. (2005). *Description, Temporal Variation, Sensitivity and Monitoring of Important Marine Biotopes in Wales. Volume 1. Background to Biotope Research*. CCW Marine Monitoring Report No. 18/1.

Tyler-Walters, H., Marshall, C. & Hiscock, K. (2005). *Description, Temporal Variation, Sensitivity and Monitoring of Important Marine Biotopes in Wales Volume 2. Littoral Biotopes*. CCW Marine Monitoring Report No. 18/2.

Tyler-Walters, H., Marshall, C. & Hiscock, K. (2005). *Description, Temporal Variation, Sensitivity and Monitoring of Important Marine Biotopes in Wales. Volume 3. Infralittoral Biotopes*. CCW Marine Monitoring Report No. 18/3.

Urgate, F. & Evans, P.G.H. (2006). *Monitoring of Marine Mammals in Cardigan Bay SAC: Surveys from May 2003 to April 2005, and Recommendations for Future Work.* CCW Marine Monitoring Report No. 23.

West, A. D. & McGrorty, S. (2003). *Modelling Oystercatchers and their Food on the Dee Estuary, Traeth Lafan and Burry Inlet SPA to Inform Target Setting and Site Management – Phase 1*. CCW Marine Monitoring Report No. 3.

West, A.D., McGorty, S., Goss-Custard, J.D., **Sanderson, W.G.** & **Gray C.** (2005). *Modelling Shorebirds and Their Food on the Dee Estuary, Traeth Lafan and Burry Inlet SPAs to Inform Target Setting and Site Management – Phase 2*. CCW Marine Monitoring Report No. 19.

Westcott, S.M. & **Stringell, T.B**. (2003). *Grey Seal Pup Production for North Wales, 2002*. CCW Marine Monitoring Report No. 5.

Westcott, S. & **Stringell, T.B.** (2004). *Grey Seal Distribution and Abundance in North Wales, 2002-2003.* CCW Marine Monitoring Report No. 13.

Westcott, S.M. & **Stringell T.B.** (2005). *Field Observations on the Disturbance of Grey Seals in North Wales, 2003.* CCW Marine Monitoring Report No. 15.

Woolmer, A.P. (2003). *The Benthic Ecology of Carmarthen Bay.* Ph D. Thesis. University of Wales, Swansea. CCW Marine Monitoring Report No. 10.

Woolmer, A.P., Maskrey, B. & Lancaster J.E. (2006). *Food Sources for Common Scoter in Carmarthen Bay.* CCW Marine Monitoring Report No. 17.

HABMAP: Habitat Mapping for Conservation and Management of the Southern Irish Sea.

HABMAP was a three-year seabed mapping project covering the southern part of the Irish Sea. The project was partly funded by the INTERREG IIIA programme and included a wide range of partners – CCW, National Museums and Galleries for Wales, University of Wales Cardiff, Trinity College Dublin, University College Cork, Marine Institute (Ireland). The seabed habitat modeling approach has being extended to cover the Dee and the Severn. This register will maintain a master list of outputs produced from this project.

McBreen, F., Wilson, J.G., Mackie, A.S.Y. & Nic Aonghusa, C. (2008). *Seabed Mapping in the Southern Irish Sea: Predicting Benthic Biological Communities Based on Sediment Characteristics.* Hydrobiologia, 606: 93-103.

Robinson, K., **Ramsay, K.**, Wilson, J., Mackie, A., Wheeler, A., O'Beirn, F., **Lindenbaum, C.**, Van Landeghem, K., McBreen, F. & Mitchell N. (2007). *HABMAP: Habitat Mapping for Conservation and Management of the Southern Irish Sea.* Report to the Welsh European Funding Office. CCW

Contract Science Report Number 810.

Robinson, K. A., Darbyshire, T., Van Landegham, K., **Lindenbaum, C.,** McBreen, F., Creaven, S., **Ramsay, K.,** Mackie, A. S. Y., Mitchell, N. C., Wheeler, A., Wilson J. G. & O'Beirn, F. (2009). *Habitat Mapping for Conservation and Management of the South Irish Sea (HABMAP). I: Seabed Surveys.* Studies in Marine Biodiversity and Systematics from the National Museum of Wales. BIOMOR Reports 5(1).

Robinson, K. A., Ramsay. K., Lindenbaum, C., Frost, N., Moore, J., Petrey, D. & Darbyshire, T. (2009). *Habitat Mapping for Conservation and Management of the Southern Irish Sea (HABMAP). II: Modelling and Mapping.* Studies in Marine Biodiversity and Systematics from the National Museum of Wales. BIOMOR Reports 5(2) & DVD.

Robinson, K.A., Ramsay, K., Lindenbaum, C., Walker, P., Frost, N., Vittorio, M. & Wright, A. (2010). *Habitat Mapping for Conservation and Management of the Southern Irish Sea (HABMAP). III: Modelling and Mapping Extension Study.* CCW Science Report Number 951.

SPECIES CHALLENGE FUND REPORTS

The CCW Species Challenge Fund provided a resource to encourage Local Biodiversity Action and to build up the evidence base for Biodiversity Action. BAP research targets have also been addressed using this funding resource. In addition, the data collected has been applied in casework and site management.

Friends of Cardigan Bay (2004). *Part 1: Pembrokeshire Offshore Survey 2003; Part 2: Local Bottlenose Dolphin Survey 2003; Part 3: Enlli Cetacean Survey 2003*. Species Challenge Report No. 03/01/07.

Gower Marine Mammal Group (2004). *South Gower Porpoise.* Species Challenge Report No. 05/01/01.

Houghton, J.D.R. & Hays, G.C. (2006). *The Foraging Ecology of Leatherback Turtles (*Dermochelys coriacea*) in Carmarthen and Tremadog Bays.* Species Challenge Report No. 06/01/01.

Hughes, P. & Thomas, E. (2005). *Sarns and Ceredigion Cetacean Surveys, 2004*. Species Challenge Report No. 04/01/03.

Isojunno, S. (2008). *Temporal Habitat Use of the Harbour Porpoise Around the Skomer and Skokholm Islands.* Species Challenge Report No. 08/01/02.

Jones, N., Shucksmith, R., Dicks, E.F. & Stoyle, G.W. (2005). *Abundance and Distribution of Harbour Porpoise in North Anglesey Waters Determined from 2002, 2003 & 2004 Boat Based Surveys.* Species Challenge Report No. 04/01/02.

Kay, P. & Dipper, F. (2009). *A Field Guide to the Marine Fishes of Wales and*

Adjacent Waters. Marine Wildlife, Llanfairfechan.

Reef Research (2005). *Determining the Reproductive Cycle of* Eunicella verrucosa*.* Species Challenge Report No. 04/01/01.

Reef Research (2005). *Genetic Variation in Populations of* Eunicella verrucosa*.* Species Challenge Report No. 04/01/05.

Shark Trust (2008). *Eyes on the Sea – Engaging Volunteers to Improve the Understanding of Welsh Elasmobranchs.* Species Challenge Report No. 08/01/04.

Solandt, J.L. (2008). *Marine Conservation Society Outer Bristol Channel Megafauna Surveys 2007.* Species Challenge Report No. 08/01/05.

Whale and Dolphin Conservation Society (2005). *Bardsey Island Cetacean Survey, 2004*. Species Challenge Report No. 04/01/04.

Wood, C. (2004). *South Wales SeaSearch and Fan Shell Survey, June-August 2003*. Species Challenge Report No. 03/01/04.

Wood, C. (2003). *Pink Sea Fan Survey 2001 – 2002*. Species Challenge Report No. 03/01/02.

MFSG STAFF PUBLICATIONS AND REPORTS

CCW staff are strongly encouraged to find opportunities to disseminate CCW research findings through external publications in the national and international environmental and scientific press, including peer-reviewed journals and books. Publications have also arisen from participation at conferences, invitations to contribute to specialist publications, and through work on behalf of the Joint Nature Conservation Committee. Some staff members have also participated in external conservation projects on their own time and this contribution to their specialist field is acknowleged here through the recording of relevant reports and publications.

BOOKS, BOOK CHAPTERS AND CONFERENCE PROCEEDINGS

Birch, K. (2008/09). *Diversity of Intertidal Non-native Species in Wales.* Abstract for paper presented at meeting held 21-23 March 2008, Bangor University. Porcupine Marine Natural History Society Newsletter No. 25. 30.

Blackstock, T.H., Howe, E.A., Rothwell, J.P., **Duigan, C.A.** & Jones, P. (Eds)(2011). *Proceedings of a Memorial Conference for Dr. David Paul Stevens, 1958-2007, Grassland Ecologist and Conservationist.* Countryside Council for Wales.

Brazier, P., Birch, K., Brunstrom, A., Bunker, A., Jones, M., Lough, N., Salmon, N. & Wyn, G. (2007). *When the Tide Goes Out. The Biodiversity and Conservation of the Shores of Wales – Results from a 10 Year Intertidal Survey of Wales.* Countryside Council for Wales.

Cooke, A. (2008/09). *The BAP Spots of Wales.* Abstract for paper presented at meeting held 21-23 March 2008, Bangor University. Porcupine Marine Natural History Society Newsletter No. 25: 25-26.

Duigan, C.A. (2004). *Why Do We Care About Upland Waters?* In: *The Future of Britain's Upland Waters,* R.W. Battarbee, C.J. Curtis and H.A. Binney (Eds), Proceedings of a meeting held on 21 April 2004, 8-11. Environmental Change Research Centre, University College London.

Duigan, C. (2008). Contributor to *Lakes*. In: *The Welsh Academy Encyclopedia of Wales*, Davies, J., N. Jenkins, M. Baines and P. I. Lynch (Co-eds), 442-444. University of Wales Press, Cardiff.

Duigan, C.A., Kovach, W. & Palmer, M. (2006). *Vegetation Communities of British Lakes: a Revised Classification*. Joint Nature Conservation Committee.

Duigan, C.A. Orr, H., Sime, I., **McCall, R.** & Clarke, S. (2008). In: *Climate Change Impacts on Freshwater Ecosystems in the UK: Research Priorities to Support Adaptation Responses.* In: *Climate Change & Aquatic Ecosystems in the UK: Science, Policy and Management,* M. Kernan, R.W. Battarbee and H.A. Binney (Eds), proceedings of a meeting held on 16 May 2007, 42-43. Environmental Change Research Centre, University College London.

Duigan, C. A. (2009). *Chapter 2: Rivers in the Welsh Physical and Cultural Landscape.* In: *The Rivers of Wales: A Natural Resource of International and Historical Significance*. Williams, D. D. & **Duigan, C. A.** (Eds), 4-16, Margraf Publishers.

Duigan, C. A., Hatton-Ellis, T., Latham, J., Campbell, S. & Matthews, B. (2009). *Chapter 14: River Conservation in Wales: A Synthesis.* In: *The Rivers of Wales: A Natural Resource of International and Historical Significance*. Williams, D. D. & **Duigan, C. A.** (Eds), 235-268, Margraf Publishers.

Duigan, C., Kovach, W. & **Hatton-Ellis, T.** (2011). *The Biogeography and Ecological Diversity of Welsh Lakes.* In: *Proceedings of a Memorial Conference for Dr. David Paul Stevens, 1958-2007, Grassland Ecologist and Conservationist.* Blackstock, T.H., Howe, E.A., Rothwell, J.P., **Duigan, C.A.** & Jones, P. (Eds), 74-82, Countryside Council for Wales.

Hatton-Ellis, T.W., Grieve, N. & Newman, J. (2004). *Ecology of Watercourses Characterised by Ranunculion fluitantis and Callitricho-batrachion Vegetation.* Conserving Natura 2000 Rivers Ecology Series, No. 11. English Nature, Peterborough.

Hatton-Ellis, T.W. (2008). Contributor to *Rivers*. In: *The Welsh Academy Encyclopedia of Wales*, Davies, J., N. Jenkins, M. Baines and P. I. Lynch (Co-eds), 761-764. University of Wales Press, Cardiff.

Hatton-Ellis, T., Blackstock, T. & Orange, A . (2009). *Chapter 6: Life in Welsh*

Rivers: Plants. In: *The Rivers of Wales: A Natural Resource of International and Historical Significance*. Williams, D. D. & **Duigan, C. A.** (Eds), 69-88, Margraf Publishers.

Higgins, J. & **Duigan, C.** (2009). *So Much To Do, So Little Time: Identifying Priorities for Freshwater Biodiversity Conservation in the USA and Britain.* In: *Assessing the Conservation Value of Fresh Waters: An International Perspective*. Boon, P. J. & Pringle, C. M. (Co-eds), 61-90, Cambridge University Press.

Jones, P., Stevens, D., Latham, J., **Duigan, C. A.** (2009). *Chapter 4: Habitats of Welsh river floodplains.* In: *The Rivers of Wales: A Natural Resource of International and Historical Significance*. Williams, D. D. & **Duigan, C. A.** (Editors), 35-58, Margraf Publishers.

McMath, M. (2008). Contributor to marine habitats and species sections. In: *The Welsh Academy Encyclopedia of Wales*, Davies, J., N. Jenkins, M. Baines and P. I. Lynch (Co-eds), various pages. University of Wales Press, Cardiff.

McMath, M.J. (2008). *Criteria for Selection of Marine Protected Areas.* In: *Selection Criteria for Marine Protected Areas for Cetaceans*, P.G.H. Evans (Ed.), proceedings of the ECS/ASCOBANS/ACCOBAMS workshop held on 22 April 2007, 19-24, European Cetacean Society's Annual Conference, The Aquarium, San Sebastian, Spain. ECS Special Publication Series No. 48.

Murlis, J., with contributions from **Duigan, C.A.**, Nisbet, T. & Mackay, H. (2004). *The Future of Britain's Upland Waters: The Policy Dimension.* In: *The Future of Britain's Upland Waters Conference,* R.W. Battarbee, C.J. Curtis and H.A. Binney (Eds). Proceedings of a meeting held on 21 April 2004, 46-49. Environmental Change Research Centre, University College London.

Prior, A. & **McMath, M.J.** (2008). *Marine Mammals and Noise from Offshore Renewable Energy Projects – UK Developments.* In: *Offshore Wind Farms & Marine Mammals: Impacts and Methodologies for Assessing Impacts*, P.G.H.Evans (Ed.). Proceedings of the ECS/ASCOBANS/ACCOBAMS workshop held on 21 April, 2007, 12-16. The Aquarium, San Sebastian, Spain. ECS Special Publication Series No. 49.

Rhind, P. M., **Jones, R.,** Jones, M. L. M. (2008). *Confronting the Impact of Dune Stabilization and Soil Development on the Conservation Status of Sand Dune Systems in Wales.* Proceedings of the International Conference on Management and Restoration of Coastal Dunes, Santander, Spain (ICCD 2007). Universidad de Cantabria, pp143-152.

Sanderson, W.G., Holt, R.H.F., Rees, E.I.S. & Bennell, J.D. (2008/09). *Horse Mussel Reefs – Biodiversity Hotspots Feeling the Heat.* Abstract for paper presented at meeting held 21-23 March 2008, Bangor University. Porcupine Marine Natural History Society Newsletter No. 25: 26.

Thomas, Rh. (2010). Bullhead Monitoring in the River Dee Catchment. CCW Staff Science Report No 09/6/1.

Thomas, Rh. & Dyson C. (2010). River Usk Shad Egg Survey 2010. CCW Staff Science Report No. 10/8/1.

Williams, D. D. & **Duigan, C. A.** (Eds)(2009). *The Rivers of Wales: A Natural Resource of International and Historical Significance***.** Margraf Publishers.

Williams, D. D. & **Duigan, C. A.** (2009). *Chapter 1: Introduction.* In: *The Rivers of Wales: A Natural Resource of International and Historical Significance***.** Williams, D. D. & **Duigan, C. A.** (Eds), 1-4, Margraf Publishers.

Wyn, G., Brazier, P., Birch, K., Bunker, A., Cooke, A., Jones, M., Lough, N., McMath, A. & Roberts, S. (2006). *Handbook for Marine Intertidal Phase 1 Biotope Mapping Survey.* Countryside Council for Wales.

PEER REVIEWED JOURNALS

Banks, A.N., Hughes, B., Cranswick, P., Smith, L., Fairney N., **Whitehead, S.** & **Sanderson, W.G**. (2008). *The Sea Empress Oil Spill (Wales, UK): Effects on Common Scoter* Melanitta nigra *in Carmarthen Bay and Status Ten Years Later.* Marine Pollution Bulletin, 56: 895-902.

Duigan, C.A., Kovach, W. & Palmer, M. (2007). *Vegetation Communities of British Lakes: A Revised Classification Scheme for Conservation*. Aquatic Conservation: Marine & Freshwater Ecosystems, 17: 147-173.

Duigan, C.A., Kovach, W. & Palmer, M. (2008). *Aquatic Macrophyte Classification, Distribution, and Traits in British Lakes*. Verhhandlungen der Internationalen Vereinigung fuer Theoretische und Angewandte Limnologie, 30: 477-481.

Foden, J. & **Brazier, P.** (2007). *Angiosperms (Seagrass) Within the EU Water Framework Directive: A UK perspective*. Marine Pollution Bulletin, 55: 181-195.

Griffith, K., Mowat, S., **Holt, R. H. F., Ramsay, K.,** Bishop, J. D. D., Lambert G. & Jenkins, S. R. (2009). *First Record in Great Britain of the Invasive Colonial Ascidian Didemnum vexillum Kott, 2002*. Aquatic Invasions 4(4): 581 – 590.

Hatton-Ellis, T.W. (2008*). Editorial: The Hitch Hikers' Guide to the Water Framework Directive.* Aquatic Conservation*:* Marine and Freshwater Ecosystems, 18: 111-116.

Jones, M.L.M., Wallace, H.L., Norris, D., Britain, S.A., Harie, S., **Jones, R.E.**, Rhind, P.M., Reynolds, B.R. & Emmett, B.A. (2004). *Changes in Vegetation and Soil Characteristics in Coastal Sand Dunes Along a Gradient of*

Atmospheric Nitrogen Deposition. Plant Biology, 6: 598-605.

Kaiser, M.J., Bergmann, M., Hinz, H., Galanidi, M., Shucksmith, R., Rees, E.I.S., Darbyshire, T. & **Ramsay, K.** (2004). *Demersal Fish and Epifauna Associated with Sandbank Habitats*. Estuarine, Coastal and Shelf Science, 60: 445-456.

Lindenbaum, C., Bennell, J.D., Rees, E.I.S., McClean, D., Cook W., Wheeler, A.J. & **Sanderson, W.G. (**2008). *Small-scale Variation Within a* Modiolus modiolus *(*Mollusca: Bivalvia*) Reef in the Irish Sea: I. Seabed Mapping and Reef Morphology*. Journal of the Marine Biological Association of the UK, 88: 133-141.

May, L., Spears, B. M., Dudley, B. J. & **Hatton-Ellis, T. W**. (2009). *The Importance of Nitrogen Limitations in the Restoration of Llangorse Lake*. Journal of Environmental Monitoring, 12: 228-346.

Morris, R., Hill, M., Moffatt, A. & **Ramsay, K.** (2005). *The Selection of Natura 2000 Sites in England and Wales, with Particular Reference to the Severn Estuary.* Journal of Marine Science and Environment, 3: 29-36.

Painting, S.J., Devlin, M.J., Malcolm, S.J., Parker, E.R., Mills, D.K., Mills, C., Tett, P., Wither, A., Burt, J., **Jones, R.** & Winpenny, K. (2007). *Assessing the Impact of Nutrient Enrichment in Estuaries: Susceptibility to Eutrophication.* Marine Pollution Bulletin, 55: 74-90.

Rees, E.I.S., **Sanderson, W.G.,** Mackie, A.S.Y. & **Holt, R.H.F. (**2008). *Small-Scale Variation Within a* Modiolus modiolus *(*Mollusca: Bivalvia*) Reef in the Irish Sea: III. Crevice, Sediment Infauna and Epifauna from Targeted Cores*. Journal of the Marine Biological Association of the UK, 88: 151-156.

Rhind, P. & **Jones, R.** (2009). *A Framework for the Management of Sand Dune Systems in Wales*. Journal of Coastal Conservation, 13: 15-23.

Richardson, E.A., Kaiser, M., Edwards-Jones, G. & Ramsay, K. (2006). *Trends in Sea Anglers Catches of Trophy Fish in Relation to Stock Size.* Fisheries Research, 82: 253-262.

Robinson, K.A., Ramsay, K., Lindenbaum, C., Frost, N., Moore, J., Wright, A. P. & Petrey, D. (2011). *Predicting the Distribution of Seabed Biotopes in the Southern Irish Sea.* Continental Shelf Research, 31(2/1): S120-S131.

Sanderson, W.G., Holt, R.H.F. Kay, L., Ramsay, K., Perrins, J. **McMath, A.J.** & Rees, E.I.S. (2008). *Small-scale Variation Within a* Modiolus modiolus *(*Mollusca: Bivalvia*) Reef in the Irish Sea. II. Epifauna Recorded by Divers and Cameras*. Journal of the Marine Biological Association of the UK, 88:143-149.

Smith, L.E., Hall, C., Cranswick, P.A., Banks, A.N., **Sanderson, W.G.** & **Whitehead, S. (**2007). *The Status of Common Scoter* Melanitta nigra *in Welsh Waters and Liverpool Bay, 2001-2006*. Welsh Birds, 5: 4-28.

Stillman, R.A., Moore, J.J., Woolmer, A.P., Murphy, M.D., Walker, P. Vanstaen, K.R., Palmer, D. & **Sanderson, W.G.** (2010). *Assessing Waterbird Conservation Objectives: An Example from the Burry Inlet, UK.* Biological Conservation, 143: 2617-2630.

MISCELLANEOUS

Brierley, A.S., **Sanderson, W.G.** & Dawson, M.N. (2006). *Acoustic Estimation of Jellyfish Numbers in Ongeim'l Tketau (Jellyfish Lake): A Proof-of-concept Study.* Report to Koror State Government on work conducted under Marine Research Permit 05-168.

Birch, K. (2008). *Anglesey's Free Living Seaweeds.* Natur Cymru - The Nature of Wales, 28: 31-33.

Duigan, C.A. (2004). *The Colorado - The Most Fought Over River in the World*. FBA News, 27: 1-2.

Duigan, C.A., **Thomas, R**., Howe, M. & Millband, H. (2007). *Llyn Tegid Leads the Way with Collaborative Environmental Management in Wales*. FBA News, 39: 2 – 6.

Hatton-Ellis, T. (2004). Book Review: *Freshwater Ecology - A Scientific Introduction, by* Gerry Closs, Barbara Downes and Andrew Boulton*. Blackwell Publishing, Oxford, 2004, 221 pp.* Aquatic Conservation: Marine and Freshwater Ecosystems, 14: 541.

Hatton-Ellis, T.W. (2005). *Fish Communities and Fisheries in Wales's National Nature Reserves: A Review.* Freshwater Forum, 24: 82-104.

Hatton-Ellis, T.W. & **Otto, S.** (2007). *Sticklebacks - A Story of Hard Labour, Sex and Cannibalism.* Natur Cymru - The Nature of Wales, 23: 4-7.

Hatton-Ellis, T.W. & **Otto, S.** (2006). *The Enigmatic and Elusive Sewin – Our Welsh Sea Trout.* Natur Cymru - The Nature of Wales, 21: 34-39.

Hatton-Ellis, T.W. Otto, S. & Hatton-Ellis, M.A. (2006). *The Vanishing Ocean Traveller*. Natur Cymru - The Nature of Wales, 19: 27-31.

Hatton-Ellis, T.W. & **Thomas, R.** (2008). *River Basin Management Planning: A Case Study Using the River Usk.* FBA News, 43: 4-8.

Lough, N. (2006). *Combing the Shores for* Sabellaria*.* Natur Cymru - The Nature of Wales, 20: 36-40.

McMath, A.J. & **Stringell, T.B.** (2006). *Grey Seal Pup Production in Wales.* In: *SCOS 2006, Scientific Advice on Matters Related to the Management of Seal Populations: 2006*, SCOS Briefing paper 06/11: 101-108.

McMath, M. (2009). *Photo Identification Surveys of Grey Seals* Halichoerus grypus *on Bardsey.* Bardsey Island Field Observatory Report: 115-121.

McMath, M. & Porter, J. (2010). *Grey Seal Photo-Monitoring.* Bardsey Island Field Observatory Report: 134-141.

Otto, S. (2004). *Welsh Coastal Sandbanks and the North Atlantic Oscillation*. Wales Coastal and Maritime Partnership Bulletin, 8: 6-7.

Otto, S., **Hatton-Ellis, T.W**. & Johnston, D.A. (2005). *Conservation of the European Sturgeon* Acipenser sturio *and Atlantic sturgeon* Acipenser oxyrinchus. Wales Coastal & Maritime Partnership Bulletin, 9: 4-5.

Otto, S., **Hatton-Ellis, T.W.** & Johnston, D.A. (2006). *Nature at Large – Sturgeon.* Natur Cymru - The Nature of Wales, 18: 47.

Smith, K., Briggs, J., Hamer, J. Hill, A. & **Walker, P.** (2011). Natural Heritage Evidence to Support Strategic Planning For Marine Renewable Energy. (2011). CCW Policy Research Report No. 11/3.

ADDITIONAL PUBLICATIONS AND REPORTS

This section consists of additional publications and reports, which have used CCW data, information or have been funded by CCW.

RESEARCH REPORTS

Bennion, H., Davidson, T., Simpson, G., Solovieva, N., Rose, N., Theophile, S., Yang, H., Anderson, N.J., Brooks, S. & Peglar, S. (2004). *Identification of Reference Lakes and Evaluation of Palaeoecological Approaches to Define Reference Conditions for UK (England, Wales, Scotland & Northern Ireland) Ecotypes*. Scottish and Northern Ireland Forum For Environmental Research, Edinburgh. Report No. WFD08.

Carvalho, L., Maberly, S., May, L., Reynolds, C., Hughes, M., Brazier, R., Heathwaite, L., Liu, S., Hilton, J., Hornby, D., Bennion, H., Elliott, A., Willby, N., Dils, R., Phillips, G., Pope, L. & Fozzard, I. (2005). *Risk Assessment Methodology for Determining Nutrient Impacts in Surface Water Bodies*. Environment Agency, Bristol. Report No. SC020029/SR.

Doyle, J.I., Solandt, J-L., Fanshawe, S., Richardson, P. & Duncan, C. (2005). *Marine Conservation Society, Basking Shark Watch Report 1987-2004.* Marine Conservation Society.

Gee, J.H.R., Barber, I., & Scullion J. (2008). *Baseline Report for the Afon Teifi Restoration Project.* CCW Regional Report CCW/WW/08/6.

Houghton, J.D.R., Doyle, T.K., Davenport, J. & Hays, G.C. (2007). *Irish Sea Leatherback Turtle Project. Populations, Origins & Behaviour. European Regional Development Fund INTERREG IIIA Initiative 2003 - 2006.* Final

Project Report.

Jepson, P.D. (Ed.)(2005). *Trends in Cetacean Strandings Around the UK Coastline and Cetacean and Marine Turtle Post-mortem Investigations, 2000 to 2004 inclusive.* DEFRA Contract CRO 238.

Nicolet, P., Weatherby, A., Biggs, J., Williams, P. & **Hatton-Ellis, T.W.** (2007). *A Preliminary Assessment of Important Areas for Ponds (IAPs) in Wales.* Pond Conservation Trust, Oxford .

Penrose, R. (2008). *UK & Republic of Ireland Marine Turtle Strandings & Sightings Annual Reports: 2006 & 2007.*

GUIDANCE DOCUMENTS

Department of the Environment, Food and Rural Affairs (2005). *Nature Conservation Guidance on Offshore Windfarm Development. A Guidance Note on the Implications of the EC Wild Birds and Habitats Directives for Developers Undertaking Offshore Windfarm Developments*.

Pierpoint, C. & Allan, L. (2004). *Bottlenose Dolphins and Boat Traffic on the Ceredigion Marine Heritage Coast, West Wales 2002-2003.* Dept. of Environmental Services and Housing, Ceredigion County Council, Aberaeron.

PUBLICATIONS

Ansmann, I.C., Goold, J.C., Evans, P.G.H., Simmonds, M. & Keith, S.G. (2007). *Variation in the Whistle Characteristics of Short-beaked Common Dolphins,* Delphinus delphis*, at Two Locations Around the British Isles.* Journal of the Marine Biological Association of the UK, 87: 19-26.

Beaumont, E.S. & Goold, J.C. (2007). *Cheap and Accessible Method to Aid Individual Photo-Identification of Grey Seals,* Halichoerus grypus. Journal of the Marine Biological Association of the UK, 87: 1337-1343.

Bianchessi, A. (2007). *Managing Marine SACs: What Can Be Learned From The Cardigan Bay Experience?* In: *Selection Criteria for Marine Protected Areas for Cetaceans*, P.G.H. Evans (Ed.). Proceedings of the ECS/ASCOBANS/ACCOBAMS workshop held on 22 April 2007, 70-75, European Cetacean Society's Annual Conference, The Aquarium, San Sebastian, Spain. ECS Special Publication Series No. 48.

De Boer, M., Clark, J. & Simmonds, M. (2004). *Bardsey Cetacean Survey 2004.* Bardsey Bird and Field Observatory, 48: 123-130.

De Boer, M., Keith, S. & Simmonds, M. (2005). *Bardsey Cetacean Survey 2005*. Bardsey Bird and Field Observatory, 49: 120-27.

Dicks, E.F. & Jones, N. (2004). *Porpoise Watching – Secret of the North*

Anglesey Coast. Natur Cymru - The Nature of Wales, 13: 37-41.

Doyle, T.K., Houghton, J.D.R., Buckley, S.M., Hays, G.C. & Davenport, J. (2007). *The Broad Scale Distribution of Five Jellyfish Throughout a Temperate Coastal Environment.* Hydrobiologia 579: 29-39.

Doyle, T.K., Houghton, J.D.R., McDevitt, R., Davenport, J. & Hays, G.C. (2007). *The Energy Density of Jellyfish: Estimates from Bomb-calorimetry and Proximate-composition*. Journal of Experimental Marine Biology and Ecology, 343: 239-252.

Evans, P. (2008). *The Bottlenose Dolphins of Cardigan Bay.* Natur Cymru – The Nature of Wales, 28: 4-9.

Evans, P.G.H. & Pesante, G. (2007). *Research for Management: The Cardigan Bay Experience.* In: *Selection Criteria for Marine Protected Areas for Cetaceans*, P.G.H. Evans (Ed.), proceedings of the ECS/ASCOBANS/ACCOBAMS workshop held on 22 April 2007, 61-69, European Cetacean Society's Annual Conference, The Aquarium, San Sebastian, Spain. ECS Special Publication Series No. 48.

Evans, P.G.H., Pierce, G.J. & Andre, M. (2007). *Twenty Years of Marine Mammal Research in Europe.* Journal of the Marine Biological Association of the UK, 87: 1-4.

Evans, P.G.H. & Wang, J. (2007). *Harbour Porpoise Spatial Modelling to Identify Possible Hotspots for Marine Protected Areas.* In: *Selection Criteria for Marine Protected Areas for Cetaceans*, P.G.H. Evans (Ed.), proceedings of the ECS/ASCOBANS/ACCOBAMS workshop held on 22 April 2007, 44-51, European Cetacean Society's Annual Conference, The Aquarium, San Sebastian, Spain. ECS Special Publication Series No. 48.

Green, M. & Simmonds, M. (2003). *Cardigan Bay and its Conservation Importance*. Natur Cymru - The Nature of Wales, 7: 36-40.

Houghton, J. (2005). *Tracking Turtles in Welsh Waters.* Natur Cymru, The Nature of Wales, 14: 8-11.

Houghton, J.D.R., Doyle, T.K., Davenport J. & Hays G.C. (2006). *The Ocean Sunfish* Mola mola*: Insights into Distribution, Abundance and Behaviour in the Irish and Celtic Seas.* Journal of the Marine Biological Association of the United Kingdom, 86: 1237-1243.

Houghton J.D.R., Doyle T., Davenport J. & Hays G.C. (2006). *Developing a Simple, Rapid Method for Identifying and Monitoring Jellyfish Aggregations From the Air.* Marine Ecology Progress Series, 314: 159-170.

Houghton J.D.R., Doyle T.K., Wilson M.W., Davenport J. & Hays G.C. (2006). *Jellyfish Aggregations and Leatherback Turtle Foraging Patterns in a Temperate Coastal Environment.* Ecology, 87: 1967-1972.

Hughes, M., Hornby, D.D., Bennion, H., Kernan, M., Hilton, J., Phillips, G. & Thomas, R. (2004). *The Development of a GIS-based Inventory of Standing Waters in Great Britain Together with a Risk-based Prioritisation Protocol.* Water, Air and Soil Pollution, 4: 73-84.

James, C., Fisher, J., Russell, V., Collings, S. & Moss, B. (2005). *Nitrate Availability and Hydrophyte Species Richness in Shallow Lakes*. Freshwater Biology, 50: 1049-1063.

Larsen, S., Vaughan, I.P. & Ormerod, S.J. (2008). *Scale-dependent Effects of Fine Sediments on Temperate Headwater Invertebrates. Freshwater Biology*, 54: 203-219.

Musgrove, A. (2008). *The Scoters of Carmarthen Bay.* Natur Cymru – The Nature of Wales, 28: 34-38.

Jepson, P.D. (Ed.) (2005). *Trends in Cetacean Strandings Around the UK Coastline and Cetacean and Marine Turtle Post-mortem Investigations, 2000 to 2004 inclusive.* DEFRA Contract CRO 238.

Keith, S., Wharam, J. & Simmonds, M. (2006). *Bardsey Cetacean Survey for 2006*. Bardsey Bird and Field Observatory, 50: 142-146.

Pentecost, A. (2009). *The Marl Lakes of the British Isles*. Freshwater Reviews, 2: 167-197.

Saye, S.E. & Pye, K. (2007). *Implications of Sea Level Rise for Coastal Dune Habitat Conservation in Wales*, UK. Journal of Coastal Conservation, 11: 31-52.

Scarlett, P. & O'Hare, M. (2006). *Community Structure of In-stream Bryophytes in English and Welsh Rivers.* Hydrobiologia, 553: 143-152.

Simon, M., Nuuttila, H., Reyes-Zamudio, M.M., Ugarte, F., Verfub, U. & Evans, P.G.H. (2010). Passive Acoustic Monitoring of Bottlenose Dolphin and Harbour Porpoise in Cardigan Bay, Wales, with Implications for Habitat Use and Partitioning. Journal of the Marine Biological Association, 90(5), 1539-1545.

STUDENTSHIPS

This section lists the ouputs from studentships and student placements financially supported and assisted by CCW.

Beaument, E.S. (2005). *A Novel Method to Aid Individual Photo-identification of Grey Seals (Halichoerus grypus)*. MSc Thesis: Marine Mammal Science, University of Wales, Bangor.

Carey, G. J. (2009). *Investigation into the Factors Affecting the Biodiversity of*

Ponds and the Implications on their Conservation Status, in Light of the Biodiversity Action Plan Priority Habitat Designation. Bangor University.

Cremer, S. (2009) *An investigation into the pollution status of two rivers, the Afon Goch and the Afon Cefni, using benthic macro invertebrates as indicators*. Bangor University.

Dick, S.M. (2011). *A Literature Review of the Current Scientific Research into Welsh Lakes.* Bangor University.

Evans, D.R. (2006). *Observations on the Disturbance of Grey Seals (*Halichoerus grypus*) at Haul-out Sites in North Wales and Recommendations on How to Minimise Disturbance Based on Best Practice From Other Countries and Regions.* M.Sc. Thesis, Bangor University.

Gibbs, P. (2008) *Acoustic Monitoring (Sidescan) of Sensitive Protected Habitats (Horse Mussel Beds)*. Bangor University.

Gilard, K. (2007). *Understanding the Relationship Between the Sea, Aquifer and Bosherston Lakes (Pembrokeshire, Wales)*. M.Sc. Thesis, Cranfield University.

Hallas, P. (2008). *Distribution & Dispersal of the Invasive Marine Alga,* Sargassum muticum*, Within Wales: A Multidisciplinary Approach to a Management Problem.* Transfer Report From M.Phil. to Ph.D, University of Glamorgan.

Hartley, J. (2008). *Reproductive Status of the Common Cockle,* Cerastoderma edule L.*, in the Burry Inlet in Relation to the Recent Mass Mortalities.* M.Sc. Thesis, Swansea University.

Heenan, T. (2009). *River Landscapes and Land Use*. B.Sc. Thesis. Bangor University.

Lake, O. (2007). *Temporal Variations of the Horse Mussel,* Modiolus modiolus *(L.) Reef of Porth Dinllaen, Pen Llŷn, Using Acoustic Remote Sensing Techniques*. M.Sc. Thesis, Bangor University.

Lamb, J. (2004). *Relationships Between Presence of Bottlenose Dolphins, Environmental Variables and Boat Traffic; Visual and Acoustic Surveys in New Quay Bay, Wales.* M.Sc. Thesis, Bangor University.

Lott, R. (2004). *Group Size, Social Associations and Resident Patterns of Bottlenose Dolphins (*Tursiops truncatus*) in Cardigan Bay, Wales.* M.Sc. Thesis, Bangor University.

Morgan, H.E. (2007). *A Preliminary Study into the Reproduction and Internal Micro-growth Bands of the Non-native Prosobranch Gastropd,* Crepidula fornicata *(L.) in the Menai Strait (North Wales)*. Student placement, Bangor University.

Miller, J.D. (2007). *Spatial Monitoring and Modeling of Inflows to Bosherston Lakes and Assessment of the Implications of Climate Change*. M.Sc. Thesis, Cranfield University.

Mills, K. (2008). *Pickleridge Lagoon: A Reappraisal of the Management Strategy Following Bank Protection in Response to the Sea Empress Oil Disaster*. University of Wales, Aberystwyth.

O'Riordan, C. (2006). *The Morphology and Macrofaunal Species Diversity of Intertidal* Sabellaria alveloata *reef in South Wales.* M.Sc. Thesis, University of Glamorgan.

Richardson, E.A. (2006). *Socioeconomic and Ecological Implications of an Ecosystem Approach to Marine Resource Management for Wales,UK.* Ph.D. Thesis, Bangor.

Rosas Da Costa Oliver, T.V. (2011). *Grey Seal (*Halichoerus grypus*) Haul-out Use and Possible Associations on Bardsey Island, Wales: a Photo-Identification Study.* M. MBiol Thesis, Bangor.

Sanderson, J. (2011). *Dispersal and the Ontogeny of Foraging Behaviour in Weaned Grey Seal Pups.* B.Sc. Dissertation, Swansea University.

Smith, K. (2006). *A Multidisciplinary Study of the Morfa Gwyllt Spit Lagoon*. M.Sc. Thesis, Aberystwyth University.

Woolmer, A.P. (2003). *The Benthic Ecology of Carmarthen Bay*. Ph.D. Thesis, Swansea University.

Wray, B.R. (2010). *A Comparative Analysis of the Rocky Reef Fish Assemblages on Shallow-Water Carbonate Reefs in Cardigan Bay, Wales.* M.Sc. Thesis, Bangor.

CCW PUBLICATIONS

Anon. (2006). *Marine Wildlife. See it! Note it! Report it!* Countryside Council for Wales.

Anon. (2006). *Marine Mudflats.* Countryside Council for Wales.

Anon. (2005). *Running Waters.* Countryside Council for Wales.

Anon. (2006). *The Seals of Wales.* Countryside Council for Wales.

Anon. (2008). *Fish in Welsh Seas*. Countryside Council For Wales.

Anon. (2008). *Standing Waters.* Countryside Council for Wales.

Anon. (2011). The Natural Environment and Marine Renewable Energy: Mapping the Natural Heritage of Wales. Welsh Government and Countryside Council for Wales.

Duigan, C.A. (2010). What Wales Do You See? http://thewelshview.co.uk/what-wales-do-you-see/

Duigan, C.A. (2011). Welsh Salmon in Hot Water. http://thewelshview.co.uk/welsh-salmon-in-hot-water/

Duigan, C.A. (2011). An Acid Reign – Twenty Years at CCW. http://thewelshview.co.uk/an-acid-reign-%e2%80%93-twenty-years-at-ccw/

Duigan, C.A. (Ed.) (2007). H_20 - Supporting Communication by the Maritime and Freshwater Networks in CCW. Issue 1, Summer 2007.

Duigan, C.A., Lewis, M. & Thomas, R. (Eds) (2008). H_20 - Supporting Communication by the Maritime and Freshwater Networks in CCW. Issue 2, Spring 2008.

Duigan, C.A., Lewis, M. & Thomas, R. (Eds) (2008). H_20 - Supporting Communication by the Maritime and Freshwater Networks in CCW. Issue 3, Winter 2008.

Duigan, C.A. & Thomas, R. (Eds) (2009). H_20 - Supporting Communication by the Maritime and Freshwater Networks in CCW. Issue 4, Summer 2008.

Duigan, C.A.,Thomas, R. & Lindenbaum, K. (Eds) (2009). H_20 - Supporting Communication by the Maritime and Freshwater Networks in CCW. Issue 5, Autumn/Winter 2009.

Duigan, C.A.,Thomas, R. & Wood, S. (Eds) (2010). H_20 - Supporting Communication by the Maritime and Freshwater Networks in CCW. Issue 6, Spring 2010.

Duigan, C.A.,Thomas, R. & Wood, S. (Eds) (2010). H_20 - Supporting Communication by the Maritime and Freshwater Networks in CCW. Issue 7, Winter 2010.

Duigan, C.A.,Thomas, R. & Wood, S. (Eds) (2011). H_20 - Supporting Communication by the Maritime and Freshwater Networks in CCW. Issue 8, Spring 2011.

PROJECT WEBSITES

Charting Progress 2 reports and supporting material - http://chartingprogress.defra.gov.uk/

Conserving Natura 2000 Rivers – http://www.english-nature.org.uk/LIFEinUKRivers/

COWRIE (Collaborative Offshore Wind Research Into The Environment) - http://www.offshorewindfarms.co.uk/Default.aspx

GeoHab - Marine Geological and Biological Habitat Mapping- http://www.ngu.no/geohab/

HABMAP- Habitat Mapping for Conservation and Management of the Southern Irish Sea http://www.habmap.org/

MarClim Project - http://www.mba.ac.uk/marclim/

MARLIN (Marine Life Information Network) - http://www.marlin.ac.uk/

National Biodiversity Network **-** http://www.nbn.org.uk/**100**

UK National Ecosystem Assessment, including Welsh chapter - http://uknea.unep-wcmc.org/

UKLakes – www.uklakes.net