

# H<sub>2</sub>O

Produced by Marine & Freshwater Sciences, Countryside Council For Wales  
- Supporting communication by the Maritime and Freshwater Networks in CCW -

## Chairman's Viewpoint

**Water is a threat and a resource, a boundary and a communication channel.** We have seen evidence of all these phenomena over the last few months and need to factor them into our future planning. The tsunami is the extreme example of a benign resource becoming a killer force. From something that sustained life and livelihoods, the Japanese have watched as the waves took away their homes and families. Radioactivity from the destroyed nuclear plant is now spreading through the marine environment which previously cooled its reactors. The consequences could be very serious.

In Wales, we've seen in recent times, on a less dramatic scale, the sea inundate coastal communities and rivers overflowing into farmland and towns. The frequency of such events may increase as the climate becomes more chaotic. If a new environment body is created in Wales, we may have to integrate our current way of working with the



Lavernock Point, a rocky bit on the edge of the Severn. Photo by C. Duigan © CCW.

**Once travel by sea and river was easier than by land. In his book "The Sea Kingdoms", Alistair Moffat shows how the Celtic nations were shaped by maritime migrations and trading routes. Like our own marine scientists, they saw Wales as the rocky bit at the edge of the Irish Sea.**

management of these threats.

**But our seas are also a source of great joy, inspiration and wealth.** CCW also studies and manages the resources that our rivers and seas provide – biodiversity, energy generation and recreation. We've done this through designating sites and species, protecting landscapes and seascapes, creating partnerships and advising developers and planners. In the new jargon, we are seeking to optimise

the ecosystem services while securing ecosystem function.

**And as devolution progresses, the watery edges of the nation become clearer political boundaries.** Where they approach the sea, the rivers Dee and Severn delineate two contrasting approaches to policy. Deciding on Welsh-

specific solutions to environmental problems has become a natural component of our everyday work, and we are developing Welsh-specific institutions to take responsibility for those decisions.

**But we must also work across those boundaries, and see them as communication channels to our neighbours.** European laws and frameworks provide some consistent ways of dealing with common issues, so the international dimension of our work will be even more important in the years ahead.

*Morgan Parry, Chairman,  
Countryside Council for Wales*

## Ramsar— 40th Anniversary

**The Ramsar Convention (<http://www.ramsar.org/>) plans to use its anniversary year to continue bringing attention to the wonders of wetlands and the urgent need to protect them.** They have developed 12 key messages about Ramsar and wetlands, including "wetlands support all", "wetlands are part of the carbon cycle" and "sharing our wetlands is vital".

One of the spring messages

focuses on wetland as biodiversity hotspots, with many key plant and animal species around the world being wetland dependent. Although freshwater wetlands cover far less area than the oceans, they support 30% of all known fish species. It is this biodiversity that supports the many ecosystem services provided by wetlands. Yet wetland species are under threat, often more so than their terrestrial counterparts, through habitat conversion (such as drainage and

conversion) and pollution, as well as over exploitation, invasive alien species, and climate change.

The Convention promotes appropriate land use planning to minimise wetland loss and degradation, accelerated wetland restoration, and site designation and management to secure wetland biodiversity for the future.

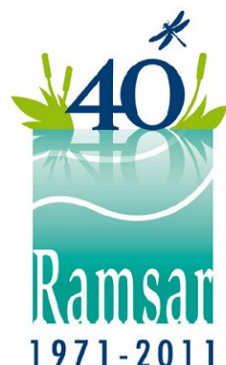
Contact: Mary Roddick  
([m.rodick@ccw.gov.uk](mailto:m.rodick@ccw.gov.uk))

Spring 2011

Issue 8

### Inside this issue:

A Million Ponds	2
Salmon Workshop	2
Burry Mystery Solved	2
Marine Litter-Hotspots	3
The Marine Crawfish	3
Listening in on Dolphins	4
2000 Floods— symptom of climate change?	4
Killer Shrimp	4
State of Our Fresh Waters	5
Staff Profile— Heather Garrett	6



# A Million Ponds

Ponds are rich wildlife habitats, thought to support around 70% of the freshwater species found in lowland landscapes. However around 90% of them have suffered environmental degradation from pollution.

**The Million Ponds Project (<http://www.pondconservation.org.uk/millionponds>) is a national partnership initiative to protect our freshwater wildlife by creating a network of clean water bodies across the UK.** It has a wide range of partners, including Plantlife, Buglife, Natural England, Environment Agency, Defence Estates and the Forestry Commission. CCW and the Tubney Trust are funding project officers to help provide



Pond on Bardsey. Photo by C. Duigan © CCW.

training and advice.

Within the first 4 years the project hopes to create 5,000 clean water ponds across

England and Wales and train at least 1,000 pond makers. There is a commitment to ensure at least 1,000 of the new ponds are specially targeted for Biodiversity Action Plan species and to monitor and quality assure 10-20% of the new ponds made.

So far 1,429 new ponds have already been created across a range of landscapes. In addition 429 people were trained at 20 events and local communities have become more engaged with their environment.

Contact: Becky Good ([rebeccagood@pondconservation.org.uk](mailto:rebeccagood@pondconservation.org.uk))

# Salmon Workshop

At the end of February CCW staff took part in a workshop focused on salmonid science in Wales. The objective of this meeting was to review and develop science needs to support salmonid fisheries and conservation in Wales. The attendance was wide ranging including universities (Cardiff, Swansea, Aberystwyth, Bangor), Environment Agency, Dŵr Cymru and Afonydd Cymru.

**The common research topics identified by CCW and the Agency were largely related to environmental impacts and their potential consequences for salmonids.** They included:

- ▶ Climate change, impacts, mitigation and adaptation;
- ▶ Renewable energy supply impacts;
- ▶ Intensive land use;
- ▶ Predation and recreation impacts, including stocking;



Fishing for salmon in the Wye. Photo by R. Thomas © CCW.

nisms to improve the links between practical fishery and conservation needs and delivery were discussed. The workshop was an illustration of how practical conservation and fisheries science is not always adequately supported by research incentives.

- ▶ Invasive species; and
- ▶ Marine phase impacts on migratory salmonids, salmon and sea trout.

Due to different influences, there was not a close match between the government agencies salmonid information needs and the research being undertaken in the Welsh Universities. However some exceptional strong research areas in Wales (e.g. fish genetics), have the potential to be utilised more. Mecha-

Given the current strong emphasis on the ecosystem approach to management, it was considered important to ensure salmonid species were not studied in isolation from their environment and supporting ecosystem.

It was agreed to hold another workshop in Cardiff University in 2012. **Further information from the Bangor meeting will shortly appear on the website of the Wales Environment Research Hub (<http://www.werh.org/>).**

Contact: Rhian Thomas ([rh.thomas@ccw.gov.uk](mailto:rh.thomas@ccw.gov.uk))

**“Welsh salmon in hot water” by Catherine Duigan on CCW blog: <http://thewelshview.co.uk/welsh-salmon-in-hot-water/>**

# Burry Mystery Solved

**Chronic mass mortalities have been observed within the commercial cockle (*Cerastoderma edule*) beds in the Burry Inlet annually since 2002.** These have not only resulted in heavy financial losses to the commercial fishery, but have also impacted on the nature conservation interests of the Burry Inlet. Oystercatcher (*Haematopus ostralegus*), a species feature of the Burry Inlet Special Protection Area (SPA) and Ramsar Site, are specialist feeders and rely heavily on cockles for food during winter. Lack of their preferred prey has forced the oystercatcher to forage outside the SPA, whilst overall numbers in the area have also declined. Consequently the cockle mortalities have adversely affected the integrity of this important European and International Site (Stillman *et al.*, 2010).

**A 2-year investigation, requested by the Assembly and led by the Environ-**



Dead cockles in the Burry. Photo supplied by Robert Griffiths.

**ment Agency, with support from CCW, CEFAS and Hull, Bangor and Swansea Universities, is now nearing completion.** Significant progress has been made to explain the mortality conundrum. Following similar atypical cockle mortalities in the

Netherlands and the Wash, a Dutch researcher confirmed non-native protozoans were responsible for the identical pathologies of mixed infection patterns. These newly discovered parasites are now present in South Wales, the Wash and the Netherlands, and are thought to have either been solely responsible for or a significant contributor to the respective cockle mortalities.

Contact: Ziggy Otto ([z.otto@ccw.gov.uk](mailto:z.otto@ccw.gov.uk))

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

# Marine Litter Hotspots

CCW is continuing to identify regionally important information from the **Charting Progress 2** (CP2) report—see H2O issue 7, pg 5. Did you know an average of over 2000 items of litter per kilometre of UK beach surveyed was found over the period 2003 to 2007. There is evidence that there has been a considerable rise in the amount of litter—in 1994, 1045 items/km surveyed were recorded and by 2007 this had risen to 2054 items/km surveyed. This equates to an increase of 96.5%. Most of this litter seems to come from the general public either through direct littering on beaches or through land-based litter being swept or blown onto beaches. Over the whole of the UK, fishing is consistently the second major identified source of beach litter, followed by sewage-related debris, shipping, fly tipping and medical uses. Plastic litter items remain the highest material source of litter in all UK sea regions.

**Exposed Welsh waters and coastal areas seem to be accumulating a relatively high litter load.** The Western Channel and Celtic Sea region (which includes Severn Estuary) shows the highest beach



Seal on the Skerries entangled in marine litter. Photo by A. Cordingley © CCW.

litter densities for the whole of the UK; with an average of just over 4600 items/km, well above the UK average. As well as high levels of public litter (average 1506 items/km) this region has extremely high levels of fishing and shipping litter

(averages of 885 and 79 items/km, respectively). The reason for the high litter load on these beaches may be due to the high rates of tourism and fishing in this region, and increased input of shipping litter from the Channel through prevailing winds and currents. The Irish Sea beach litter densities (circa. 2500 items/km) are also higher than the UK average but exhibits little variation.

**Offshore litter is ubiquitous in UK waters**, but at generally low levels; 0-16.81 items/ha with densities of <1 items/ha found at the majority of sites. The significantly higher densities of litter found in Carmarthen Bay (16.81 items/ha), North

Cardigan Bay (11.06 items/ha), Celtic Deep and Rye Bay, would suggest that these are areas of accumulation, i.e. litter sinks. **In the period 2003-2008, Carmarthen Bay and North Cardigan bay were considered the most impacted sites in the UK.** However the data also suggest that weather conditions may play an important role in the accumulation of litter, particularly at the litter sinks where the sea is shallow and can scour out the accumulated litter. Maximum litter density is usually recorded after strong winds and gales, indicating that seabed litter is moved and washed ashore. The most frequent types of offshore litter recorded were polythene sheeting and bags, rope and polythene twine, followed by hard plastic and metal.

**CP2 concludes that this level of marine litter is having a negative impact on achieving the vision of clean and safe seas.** Climate change is expected to drive more litter onto beaches. CP2 also recognises a need to further monitor and assess the level of harm caused by litter in the marine environment.

Read more at:  
<http://chartingprogress.defra.gov.uk/>

## The Marine Crawfish

Like many marine creatures, **the marine crawfish *Palinurus elephas*** is graced with a string of other common names, including crayfish, spiny lobster, rock lobster or red lobster. These large predatory crustaceans (typically 40-50cm long, but can be up to 60cm long) are found in the subtidal on exposed rocky seabeds from



The marine crawfish. Photo by R. Holt © CCW.

Norway to the Azores, and also the western Mediterranean. The UK distribution extends along the west coast from Shetland southwards to the Isles of Scilly, and in Wales includes the west Anglesey coast, the Menai Strait, Llŷn and Pembrokeshire. Up until the 1980s, there was a targeted marine crawfish fishery in Wales. Today however, **crawfish numbers have crashed to the extent that they have all but disappeared from certain areas that were once their stronghold.** Catch Per Unit Effort (CPUE) data available for a Welsh pot-hauled fishery fell from 55,000kg in 1979 to less than 5000kg in 1995. A fishery operating out of Pwllheli using divers during the late 1970s led to a rapid decline in numbers in that area, such

that within 2 years, the fishery was economically unviable. A similar stark decline in marine crawfish fisheries is documented elsewhere across Europe, and a fisheries assessment of the current catches and stock in the Celtic Sea (including the Irish Sea) is reported as 'residual'.

The main period of decline (1960-1980 depending on the area), coincides with a dramatic increase in fishing effort as pots were replaced by trammel nets, diver fisheries and other technological advances. But the lack of reliable historical catch and effort data allows only a circumstantial cause-and-effect relationship to be identified between crawfish decline and increased fishing effort. Where the marine crawfish was once taken in a targeted fishery, it is still caught today in Wales as bycatch through potting, tangle and trammel netting. Despite the low yields, the high unit value makes the bycaught fishery economically feasible.

**Due to its decline, the marine crawfish is a priority Biodiversity Action Plan (BAP) species, and is also identified for priority conservation action by the Welsh Assembly.** The marine crawfish is a component feature of the Annex 1 reef feature in the Pembrokeshire Marine and Pen Llŷn a'r Sarnau SACs. As large predatory crustaceans, the recovery of marine crawfish would contribute to the natural functioning of the marine environment, and to the attainment of favourable conservation status of reef features.

The **Wales Biodiversity Partnership** recently funded **SeaSearch** to canvass recreational divers in Wales to submit records for marine crawfish sightings from old dive log books. Also this coming summer, the Welsh Assembly are funding baseline monitoring of crawfish on specific reefs in Pembrokeshire. This information is useful to help us understand better the extent of decline in this species and perhaps one day, to identify sites for release of any hatchery reared juveniles. To prevent further decline and to enable any natural recovery however, fisheries management measures are an essential component to action required for this species. As well as contributing to the recovery of biodiversity and a healthy functioning marine ecosystem, the recovery of crawfish in Welsh seas in the future could revive a part of Welsh culture through the re-establishment of truly sustainable artisanal fisheries and all the community benefits that come with that.

Contact: Aethne Cooke  
([a.cooke@ccw.gov.uk](mailto:a.cooke@ccw.gov.uk))

Hunter, E., Shackley, S. E. and Bennet, D. B. (1996) Recent studies on the crawfish *Palinurus elephas* in South Wales and Cornwall. *Journal of the Marine Biological Association of the UK*, 76, 963-983.

# Listening in on dolphins

In the past cetacean research in Cardigan Bay has mainly been by visual techniques and photo-identification and heavily reliant on good visibility and long hours of observation. Rough seas, night-time and rain all reduced the effectiveness of these survey methods. Passive acoustic methods on the other hand do not suffer the same drawbacks and can gather the sounds produced by cetaceans for echolocation.



T-pod deployment. Photo supplied by SeaWatch Foundation.

**Now we can listen to dolphins using T-PODs.** These autonomous instruments are programmed to record time-cues of species-specific echolocation signals for long periods of time. Supported by funding from CCW, researchers from the **SeaWatch Foundation** carried out an investigation of bottlenose dolphin and harbour porpoise habi-

tat use and partitioning by deploying ten calibrated T-PODs in Cardigan Bay Special Area of Conservation (SAC) for one year (April 2005-July 2006).

The T-PODs detected both species all year round with a peak of records in April–October for dolphins and in October–March for porpoise, revealing a previously unknown importance of the place to harbour porpoise during winter. Though the two species exist in the same geographical area, simultaneous detections of both species were rare and indications of temporal habitat partitioning between the two species in some parts of the SAC was observed. The one location where simultaneous detections were not as rare was close to the stretch of shoreline where stranding of porpoises

killed by dolphins are most common, suggesting that the observed spatio-temporal overlap leads to inter-specific interactions, in some cases fatal for the porpoise. The cause of this behaviour remains uncertain, but one theory is that numbers and distribution of one of the species has changed so that the two species compete for some resource, such as space or prey.

Contact: Mandy McMath  
([m.mcmath@ccw.gov.uk](mailto:m.mcmath@ccw.gov.uk))

**Simon, M., P. Evans et al. (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 of the United Kingdom, 90(8), 1539–1545.**

## 2000 Floods— symptom of climate change?

Is flooding caused by man-made climate change? This is the sort of question that gets asked every time an extreme weather event impacts our lives. But what can science say about such questions? **A recent paper published in the journal Nature has attempted to unpick the underlying causes of the floods that wrought so much damage in the UK in the autumn of 2000.** They found a sizeable 90% chance that human greenhouse gas emissions increased the risk of a severe flood in autumn 2000 by at least 20% - and a 66% chance that the risk of flooding at that time was increased by more than 90%, due to human influence on climate.

These results were based on modelling the atmospheric events that led to the extreme precipitation in autumn 2000 and then using a sophisticated hydrological



High water in Snowdonia. Photo by Tristan Hatton-Ellis © CCW.

model to translate precipitation into river flow and flood simulations. The work goes a long way towards raising the game of extreme weather attribution from the trivial “was it / wasn’t it” level to a far more mature assessment of likelihood, that should be able to be used as a means to adapt ahead of time to future climatic change.

Timely work indeed, in view of the imminent publication of the UK’s first Climate Change Risk Assessment. The convergence of long term climate models, seasonal climate models and short term weather forecasting models towards one common high-resolution model will further show how weather and climate trends (natural and anthropogenic) interact.

Contact: Rob McCall  
([r.mccall@ccw.gov.uk](mailto:r.mccall@ccw.gov.uk))

**Pall, P. et al. (2011). Anthropogenic greenhouse gas contribution to flood risk in England and Wales in autumn 2000. Nature, 470: 382-385.**

## Killer Shrimp

Cardiff Bay is full of surprises! We knew it already supported an abundant non-native zebra mussel (*Dreissena polymorpha*) population and now an associated species **the killer shrimp (*Dikerogammarus villosus*) has been discovered in the bay.** Both species favour life on artificial surfaces, like marina structures.



Cardiff Bay, a hotspot of non-native species in Wales. Photo by C. Duigan © CCW.

**This killer shrimp is considered one of the most damaging invasive species in a European context.** The lower reaches of the large rivers draining into the Black and Caspian Seas are considered it’s native range. However, the opening of the Danube-Main-Rhine Canal in 1992 seems to have facilitated its rapid march across the continent. It was first found in the UK in Grafham Water Reser-

voir but now its has popped up in Wales in Cardiff Bay and Eglwys Nunydd reservoir in Port Talbot.

Dramatic changes in the ecology and biodiversity of the invaded waters usually occur. It is capable of displacing the native freshwater shrimp fauna. This would have serious consequences for our natural ecosystems, possibly including knock on impacts on trout distribution and changes in their catchability for anglers.

**CCW is working with the Environment Agency and others to raise awareness about the risks associated with the transfer of this species to other sites and possible control measures.**

Contact: Tristan Hatton-Ellis  
([Tristan.Hatton-Ellis@ccw.gov.uk](mailto:Tristan.Hatton-Ellis@ccw.gov.uk))

**Further information on *Dikerogammarus villosus* can be found on the website of the GB Non-native Species Secretariat:**  
<https://secure.fera.defra.gov.uk/nonnativespecies/alerts/>

# State of Our Fresh Waters

## Fresh water is a key biodiversity, landscape and recreational resource in Wales.

An average annual total of 3,000 mm of rainfall falls on Snowdonia, the wettest part of the country. The geological foundation of the region is mainly hard rock with limited underground water storage capacity. Generally rainfall is quickly channelled into rivers which are very responsive to changes in weather. In addition, lakes and wetlands act as surface reservoirs supplementing river flows. Over 20 major river systems drain the total surface area of Wales. We have over 560 lakes > 1ha. Water is supplied to approximately 3 million people, with about two thirds of them concentrated in the southeast around Cardiff. In addition, a significant volume of Welsh water is exported considerable distances to meet the demands of urban areas in England. Some of most valuable and productive agriculture land in Wales is strongly associated with floodplains.

Welsh rivers have a distinctive westward or eastward flowing biogeography. Westward rivers are dominated by salmonids, while eastward rivers often have a more diverse assemblage, including several coarse fish species. Plant communities dominated by bryophytes and a range vascular plants tolerant of fast flows and base-rich conditions are found in the south-east e.g. Wye and Usk. River plant assemblages in the westward flowing rivers have a diverse bryophyte flora adapted to the shaded, base-poor conditions. Wales also supports a relatively diverse range of lake ecosystems, with the biodiversity of our comparable to larger regions in Britain. There is a relatively long history of studying and monitoring Welsh freshwater systems and data from an extensive network of sites is available from a range of organisations.

Welsh river floodplain habitat is seriously degraded and fragmented largely due to agricultural intensification, upland forestry development, urbanisation and flood defence structures. Agricultural grassland is the most extensive land cover within Welsh floodplains, and as a consequence floodplain semi-natural habitat is scarce, with 60% of the area within just 10 river systems. In addition, flood defence structures often isolate areas from inundation. River bank reinforcement and embankment for flood control is widespread, especially in urban environments, with almost the entire length of rivers such as the Taff being impacted in this way.

**Welsh freshwater ecosystems are vulnerable to large-scale (e.g. "Acid rain") and local (urban points sources vs. rural diffuse sources) environmental pressures.** They are undergoing serious



Frozen margins of Llyn Llydaw.  
Photo by V. Bowmaker © CCW.

environmental degradation from a variety of human induced pressures, including pollution, sedimentation, fisheries management, invasive/non-native species introduction, and water regulation. The majority of freshwater sites/features within designated sites in Wales are in unfavourable/ declining condition.

## Upland Welsh freshwater ecosystems are very vulnerable to acid

**deposition due to a combination of local acid sensitivity (base-poor rocks and soils), large volumes of rainfall polluted by sulphur and nitrogen oxides, and local land use.**

Over half of Wales' stream length – around 12,000km – was impacted by acidification making this the single most largest pollution problem of the last century. Ecosystem structure and function in acidified streams has been altered, including reductions in salmonid and dipper populations. **Upland waters in the UK and Wales damaged by "acid rain" are beginning to recover.** Biological recovery is lagging behind chemical trends with acid-sensitive species still occurring only sporadically in recovering streams, and representing only a fraction of the species previously lost.

## Nutrients from diffuse and point sources and other forms of pollution are responsible for decline in the health of freshwater ecosystems across

**Wales.** This type of pollution may take the form of a short term-event/incident or be a persistent influence over a long period of time. Agriculture, sewage and wastewater treatment, industry, and waste management facilities are the major sources of spills/serious pollution incidents in Wales. In general phosphorus classifications indicates decreasing levels but nitrate classification levels are remaining constant. Based on an analysis of EA Local Environment Agency Plans (2000-05), agricultural runoff is identified as particular problem in mid-Wales, with sheep dip as a problem throughout the region but especially west-Wales. Sale of particularly toxic sheep dip has subsequently been suspended. In comparison to areas in central and eastern England, the chemical (including N) and biological quality of Welsh rivers is relatively high; see also H<sub>2</sub>O issue 7 for article on river habitat condition.

## Freshwater ecosystems are very vulnerable to sudden pressure induced changes in structure and function which are difficult to reverse and compromise their use.

Several shallow lake ecosystems in Wales have switched from clear-water plant dominated ecosystems to phytoplankton dominated lakes, or are exhibiting symptoms of a trend in this direction (e.g. Llangorse Lake; Anglesey Lakes; Bosherton). Records of toxic blue-green algal blooms are increasing. In general the environmental condition of Welsh lakes and their biota is not stable but responsive to changes in a range of environmental pressures which can also have a cumulative long term effect. CCW commissioned research is revealing a growing list of Welsh lakes impacted specifically by eutrophication and acidification, including internationally important conservation sites, such as Llangorse Lake, Bosherton Lakes, and Snowdonia mountain lakes. Other pressures having a detrimental impact on Welsh lake systems include water regulation, grazing pressure induced sedimentation, fish stocking and fisheries management. Over one-third of Welsh lakes

have been subject to hydro-morphological alteration or are artificial structures designed mainly to deliver water and/or provide power as an ecosystem goods and service.



The Taff at Merthyr Tydfil. Photo by C. Duigan © CCW.

## Climate change scenarios are set to have a major influence on Welsh freshwater ecosystems and changing patterns in water quantity and temperature are already discernible in Wales.

Records show that in streams near Llyn Brianne, winter temperatures have increased over the last 25 years by c. 1.4-1.7°C with apparent consequences for invertebrates. Declines in Wye salmon and trout populations are being linked to hotter, drier summers. Climate change will be the over-arching driver of future changes in aquatic ecosystems. Changing hydro-, thermal and pollution regimes will affect the ecology and stimulate interactions between particular pressures, such as acidification and eutrophication.

Contact: Catherine Duigan  
[c.duigan@ccw.gov.uk](mailto:c.duigan@ccw.gov.uk)

**An extended form of this status report was produced for the CCW Strategic Advisory Forum (2010) and was submitted as a contribution to the National Ecosystem Assessment.**

Maes y Ffynnon,  
Penrhosgarnedd,  
Bangor, Gwynedd,  
LL57 2DW

Phone: 0845 1306 229



Llywodraeth Cynulliad Cymru  
Welsh Assembly Government  
CORFF HODDING (SPONSORED BODY)

H<sub>2</sub>O Editors: Catherine Duigan  
([c.duigan@ccw.gov.uk](mailto:c.duigan@ccw.gov.uk)), Rhian Thomas  
([rh.thomas@ccw.gov.uk](mailto:rh.thomas@ccw.gov.uk)) & Sarah Wood  
([s.wood@ccw.gov.uk](mailto:s.wood@ccw.gov.uk))

### **Biodiversity Action Plan (BAP) Ecosystem Groups Freshwater Ecosystems; Marine Ecosystems**

*In Wales the BAP process is taken forward by primarily by 9 Ecosystem Groups, the Species Expert group and the Policy group. Further information on membership of these groups can be found at:  
<http://www.biodiversitywales.org.uk/>*

*These ecosystem groups bring together habitat and relevant associated species interests at the Wales level. They are largely made up of experts from the relevant government and non-government organisations.*

*These groups are charged with driving the delivery of priority habitat targets, including those associated with relevant species by identifying and, where appropriate, carrying out the most important actions required by the group as a whole.*

*Chair of the BAP Freshwater Ecosystems Group: Tristan Hatton-Ellis ([t.hatton-ellis@ccw.gov.uk](mailto:t.hatton-ellis@ccw.gov.uk))*

*Chair of BAP Marine Ecosystems Group: Blaise Bullimore ([cbeems.officer@googlemail.com](mailto:cbeems.officer@googlemail.com))*

### **Editor's Notes**

*This newsletter can be downloaded from the marine and freshwater habitats pages of the CCW website:  
<http://www.ccw.gov.uk/>*

*Feedback on content and suggestions for future issues welcome.*

*A collection of back issues of H<sub>2</sub>O is available on Ffynnon within CCW.*

**H<sub>2</sub>O Production: Catherine Duigan & Clare Somerville**

Recently we updated all of CCW's Marine Recorder data holding on the NBN Gateway, reorganising the surveys into 4 zones/groups - Subtidal, Intertidal, Saline Lagoons, Skomer — giving a total of 114 surveys and over 75,000 records. We are also in the process of adding all species records from the Phase 1 Intertidal Project to the gateway and they should be available shortly. Contact Monica Jones ([mn.jones@ccw.gov.uk](mailto:mn.jones@ccw.gov.uk)).

## **Staff Profile—Heather Garrett, Freshwater Monitoring Coordinator, CCW/Environment Agency.**

As a late starter in life, it has taken me several attempts to find out what I wanted to be when I grew up. A childhood spent in the working class suburbs of Bristol didn't really expose me very much to the natural world or anyone with a professional interest in it. I left school at 18 and went to work at the University of Bath, as a laboratory technician in the School of Biological Sciences. I stayed for five years and during that time, the University sponsored my HNC in Applied Biology. But it was the informal education that I received from working alongside other technicians and academics that really opened my eyes to natural history.

I decided to train as a primary school teacher specialising in teaching science. I graduated but became disillusioned by the restrictions imposed by the curriculum and I decided not to teach. I joined the Nature Conservancy Council as a seasonal warden on the Dyfi National Nature Reserve and enjoyed the freedom of teaching visiting school groups, and later the opportunity arose to take on the role permanently. After eight years of supporting environmental education and interpretation pro-



Heather Garrett. Photo by N. Lough.

jects on the Dyfi, I joined the Centre for Alternative Technology, Machynlleth, as their Visitor Centre Manager. I had been tempted by the opportunity to work on large scale interpretation projects for a wider audience. However, two years later I decided to follow-up my underlying passion for the natural world with more formal study.

Supported by my husband, I joined the M Sc. course offered by Birmingham University in biological recording. The course really fired my enthusiasm and the qualification opened the door to more opportunities to work with CCW. I became the Conservation Officer for the Afon Eden and Llyn Tegid, and I acquired a good grounding in freshwater ecology and the process of designating and managing sites as SSSI / SACs. I moved into terrestrial monitoring when I joined the regional SAC monitoring team, spending three very enjoyable

years travelling across North Wales assessing a diverse range of habitats and species.

I've just joined the Marine and Freshwater Science Group as the Freshwater Monitoring Co-ordinator—sponsored jointly by EA and CCW. The aim of the 14 month posting is to assess opportunities for data gathering and sharing. Under the Habitats Directive, CCW has a statutory obligation to report on SAC features and likewise, under the Water Framework Directive, the EA has a greater responsibility to monitor additional biological attributes. By working together, it should be possible to collect and share data that can be utilised by both agencies. I'm looking forward to finding ways of building more links with Agency staff in Wales and enabling CCW staff to use the data in management decisions; because, "If you cannot measure, then your knowledge is meagre and unsatisfactory" - to paraphrase Lord Kelvin.

Contact: Heather Garrett  
([h.garrett@ccw.gov.uk](mailto:h.garrett@ccw.gov.uk))

*You can nominate a watery colleague to appear here by contacting the editors*