

Water Management in Dorset

A Dorset Local Nature Partnership Position Paper



Aim

Dorset Local Nature Partnership wants to see Dorset boasting some of Europe's best drinking water, the highest quality river, estuarine and bathing water and healthy, wildlife-rich and resilient wetland habitats benefitting both local communities and nature.

Dorset Local Nature Partnership therefore makes the following recommendations:

Recommendations for water management in Dorset

- 1) Progress already made should be continued and best practice measures trialled and then widely adopted, for example those already in place in the Poole Harbour catchment and through soft engineering solutions as outlined below. Greater awareness raising of integrated catchment partnership approaches are needed (e.g. through the development of case studies and a cost/benefit analysis to demonstrate the advantages).
- 2) An holistic ecosystem services approach is needed in decision making and Dorset Local Nature Partnership would like to see the following principles utilised when judging proposals:
 - Water management should be integrated into all development plans.
 - Flood defences should be designed and managed to work with nature, and, wherever possible, should take all opportunities to enhance the natural environment.
 - Soft engineering solutions should be adopted as a first and preferred option.
 - Development should not result in upstream or downstream problems such as increased nutrient load, siltation or flooding.
 - Water quality and quantity both for humans and the natural environment should be maintained and enhanced, without compromising future ability to meet Water Framework Directive good ecological status.
 - Ensure that the essential food supplies produced in Dorset do not damage the water cycle, either directly or through the aquifers, and ensure that the true cost of sustainable food is understood by the consumers.
- 3) A public engagement and education programme is needed to raise awareness about water management in Dorset.



Why look at water management in Dorset?

Water is a defining characteristic for Dorset. From its beautiful coastal waters, so important for tourism and conservation (and fronting up the 'Jurassic Coast' World Heritage Site), to its chalk aquifers that hold so much pure drinking water underground and give rise to exquisite and important chalk streams – water is a major component in what is wonderful about natural Dorset. The lush meadows of the Blackmore Vale, for example, support important agricultural enterprise and are dependent upon rainfall and rivers. As part of the human water cycle, highly treated wastewater is returned to the rivers of Dorset, then flowing into the coastal zone and important estuaries including the Fleet and Poole Harbour. Here, and all along the coast, water quality is vital to maintain clean bathing beaches and shellfisheries. All of these important water resources need careful management and support if they are to be passed on to future generations in excellent condition. The Dorset Local Nature Partnership (LNP) recognises the importance of water management for the sustainable future of Dorset and has chosen to devote its first position paper to this important subject. We focus here on activities within freshwater and coastal catchments, recognising the influence these have on the marine environment but not otherwise addressing management of the marine environment in this paper.

A vision for water management in Dorset

Clean water is one of nature's provisioning services on which we, and wildlife, depend. There are many other ecosystem services, i.e. the way we benefit from these ecosystems, that rivers, streams, estuaries and still waters provide; habitat, fish, recreation and biodiversity to name a few. We want water quality to be protected and, where possible, improved so that Dorset has some of the best drinking water, some of the highest quality river water and some of the best bathing water quality in Europe.

Many of our current problems with poor water quality, flooding of property, declining salmon fisheries and poorly modified river and coastal defences have arisen historically through failure to understand the full implications of our actions. It is essential that planners and developers integrate water management into the issues that arise from development proposals. Flood defences should be designed and managed to work with nature and, wherever possible, should take all opportunities to enhance the natural environment.



Chalk Stream (tributary of River Frome) with good floodplain management – extensive grazing
Photo: DWT



Taking an holistic catchment approach

As a result of the challenges of meeting the European standards for waterbodies, DEFRA is encouraging a holistic catchment wide approach through partnership working. These approaches need to be supported and resourced. In Dorset the Catchment Initiatives work to ensure engagement between all those who plan for, work within or depend upon our waters in their commercial or domestic life and seek to improve both its intrinsic value for wildlife and the services which it provides.

Where development is proposed, we believe that these issues must be taken account of and opportunities to integrate water management into the heart of development plans should be grasped. Because too much water results in flooding and too little gives rise to low flows and drought, these issues should be fully recognised and managed through effective deployment of resources so that lives and property are not put at risk despite the vagaries of the climate. The efficient provision of water supplies, the effective treatment of wastewater and the minimisation of flooding are all achievable, but will require detailed and high level consideration during planning and on-going maintenance. The Dorset LNP and the Catchment Partnerships believe that this is all possible, and to achieve this vision, we offer our knowledge, experience and advice to the Local Planning Authorities and Local Enterprise Partnership during their considerations of enterprise opportunities in Dorset.

Areas of catchments don't always coincide with areas of land holdings or local government boundaries and so the integration of water management throughout catchments, involving all relevant organisations, is necessary to achieve successful, widely accepted outcomes. As an example, rainwater falling at Stourhead eventually flows past Christchurch Priory before entering the sea and many issues and opportunities are likely to arise along the length of its journey. Given the extent of the chalk aquifer under Dorset, every activity on land has a potential impact on our water cycle and it is not acceptable for those who influence, operate or develop plans and strategies within catchments to ignore issues arising upstream and to forget impacts that might occur downstream.



New wetland creation in floodplain on former maize fields – now slowing the drainage and rich in wildlife
Photo: DWT



Intensive arable in former downland
Photo: DWT



Water Framework Directive

The European Water Framework Directive (WFD) came into force in December 2000 and became part of UK law in December 2003. It provides an opportunity to plan and deliver a better water environment, focusing on ecology, through river basin management planning.

The WFD looks at the ecological health of surface water bodies (good status being defined as a slight variation from undisturbed natural conditions), as well as achieving traditional chemical standards. In particular, it will help deal with diffuse pollution which remains a big issue following improvements to most point source discharges. Successful implementation of the WFD will help protect all elements of the water cycle and enhance the quality of our groundwaters, rivers, lakes, estuaries and seas.

The most significant water issues affecting WFD targets in Dorset are:

- Pollution from rural areas - nitrates and phosphates are a particular problem for drinking water supplies and conservation areas that rely on a source of water
- Pollution from waste water – phosphorous from treated waste water
- Physical modification – embankments and sluices
- Negative effects of non-native species – for example signal crayfish are having negative effects on native crayfish and invasive plants are present along many rivers

Progress so far

In 2013, Defra published a policy framework to encourage the wider adoption of the integrated Catchment Based Approachⁱ. Although there is widespread agreement that water management, integrated across catchments, can be very successful, the reality in Dorset is that it has not been widely adopted. However there are some notable successes. A catchment partnership has been built up in rural Dorset into the successful Poole Harbour Catchment Initiativeⁱⁱ and the Stour Catchment Initiativeⁱⁱⁱ is developing via a stakeholder engagement process. In the urban area of Poole and Bournemouth, the Bourne Stream Partnership has also done much good work, as has the Dorset Wild Rivers Project^{iv} which restores damaged river channels and wetlands. Defra has recognised that local partnerships are key to engaging those who influence our waters in the decision making and the restoration measures but that Catchment Partnerships need to secure long term, local funding arrangements to be self-sustaining.

The water quality of less than half of the rivers of Dorset is considered 'good' under current European standards. The Environment Agency, as the regulator, continues to work with Wessex Water and industry to improve this quality in the face of point source discharges from wastewater treatment works, farms and industrial site runoff through surface water drains. However for diffuse pollution, whose sources and causes are less easy to trace and are not controlled by permits, the control is not so straightforward. Eroded soil, nutrients and contaminated runoff from hard surfaces all contribute to a noticeable impact on the clarity of rivers and the smothering effects of the excessive growth of weeds and green slime. Work is in hand via the Catchment Sensitive Farming Initiative and other initiatives to work with farmers and landowners to follow best agricultural practice and reverse the historic rising trend in diffuse pollution. Phosphorus removal from sewage effluent and sustainable drainage (SuDs) are also some of the management tools being applied. In urban areas, projects such as Beachcare / Litter Free Coast & Sea are also working with communities and local business to raise the awareness of the correct disposal of wastes and the impact on local beaches.



It is clear however, that a full commitment to the tools above by operators, planners and developers will be required if the quality of Dorset rivers and estuaries are to be improved and then sustained into the future.

Although the waters of Dorset continue to be enjoyed by residents and visitors, it would be wrong to assume that pressures and stresses on the water environment do not occur. Such pressures include the so-called coastal squeeze, difficulties with public access, a growing threat from invasive organisms and diminishing habitat value due to urbanisation and intensive farming. Against these pressures, new tools are being developed and their use should be encouraged. There is now interest in:

- offsetting where developers provide equivalent habitat to that being diminished
- recognition of the value of ecosystem services leading to effective management of such services
- improved rainfall infiltration leading to increased water storage and consequent minimisation of the effects of abstraction on diminished river flows

These few examples of current pressures and possible solutions demonstrate the urgent need for effective and efficient water management through catchment partnerships. But this will be slow to develop without sustained support and funding.



Algae covered river bed – River Frome
Photo: Wessex Water



Native White-Clawed Crayfish
Photo: DWT



Case study: Reducing nitrogen in the waters of Poole Harbour

Steps are needed to protect Poole Harbour, an internationally important site for wetland birds, from the rise in nitrogen levels which has led to excessive algal mats. Since the addition of nitrogen removal to Poole Sewage Treatment works in 2010, the excess arises primarily from diffuse sources which contaminate the chalk aquifer. This pollution also affects the costs of drinking water treatment.

The solution has involved joint development of policy and implementation plans, practical tools and agreed guidance between the statutory agencies and local councils, agricultural advisors, Wessex Water and the farming organisations. Through the Poole Harbour Catchment Initiative and the Poole Harbour Agriculture group, joined up measures to reduce the harbours nitrogen levels are being agreed to:

- reduce nitrogen lost from farming
- Nitrogen neutral development in Purbeck and West Dorset Districts, and Poole Borough
- offset future loads to sewage treatment works (following significant reduction in 2010 from Poole sewage treatment works by funding additional measures on land.

Where possible, measures have been selected which also reduce soil and phosphate run-off and which are sustainable and improve biodiversity.

As an example of development that addresses nutrient issues, the Silverlake development at Warmwell, which sits in the River Frome catchment, has been planned to remain nutrient neutral relative to the original minerals restoration plans for Warmwell Quarry, to ensure that there are no adverse nutrient impacts on the downstream SSSI fen habitat and Poole Harbour SSSI /SPA. Good water quality on site is also essential to the success of this development of holiday chalets and lodges within a wetland setting. Waste water treatment has been designed as a four stage process with primary and secondary sewage treatment, followed by tertiary treatment using wetland habitat with water discharged to a final wetland where quality can be monitored and adjustments made if necessary. It is estimated that total nitrogen will be reduced by 90% and phosphorus by 95% as the waste water passes through these systems.

Full details available on the Poole Harbour Catchment Initiative Website²



Poole Harbour Macroalgal mats Brands Bay
Photo: Wessex Water



Catchment Sensitive Farming – farmer workshop
Photo: Catchment Sensitive Farming



Future challenges and risks

Whilst seeking a prosperous Dorset where enterprise is encouraged, care is needed to ensure development maintains and supports a healthy environment for the future. Such developments could present significant challenges to water management in Dorset because they could, if not well planned, increase demand for water, present increased pollution threats, and require significant interventions in present natural environments to secure additional flood defences. It is hoped that all regulators and decision making authorities including OFWAT, the Environment Agency and Local Planning Authorities will continue to require and support sustainable investments in water management in Dorset in the long term.

On top of these challenges, there are the predicted significant risks to the UK environment posed by climate change, including increased storminess with increased frequency of extreme rainfall runoff events, sea level rise and a warming of the climate to drier conditions equivalent to a Mediterranean climate. These challenges and risks emphasise the urgent need to prioritise water management in Dorset and to place it at the heart of future enterprise development.

Compacted soils, the loss of water absorbent habitats, drained wetlands, dredged riverbeds, straightened concrete-lined channels, paved gardens and the large areas of hard surfaces in urban areas, all increase the rate that water flows through the landscape and into homes and businesses. It is clear that flooding needs to be addressed through a range of solutions and that the key measures for a flood resilient future must focus around how we use and manage the land. It is a frequent misconception that water on the floodplain is a bad thing. Floodplains can help to reduce the volume of water travelling downstream to the next settlement. And holding water on the floodplain can reduce flooding. By restoring the river's natural capacity to cope with floods via its wetlands, floodplains and riparian woodlands, and holding water where it falls, the risk of flooding downstream is lowered and the need for costly concrete defences dramatically reduced.

Another natural reaction to flooding has been to promote increase dredging of river channels. In 2014 after that winter's severe floods, the Chartered Institute of Water and Environmental Management^v concluded that widespread dredging could make flooding in some communities worse in the future – not better. Sensitive dredging regimes, undertaken as part of a considered package of measures, can increase the speed of water flow, reduce water levels and reduce *small* floods, but dredging can also:

- increase the risk of flooding for communities and businesses downstream
- destabilise river banks, causing erosion, risking damage to infrastructure
- cause a reduction in water quality
- damage wildlife and river ecosystems

Environment Agency studies have shown that flood problems are often site specific and require individual assessment to determine the right course of action, and that without a thorough understanding of this very complex picture, dredging can have unintended consequences which can be significant and permanent.

Opportunities for the future

It is clear that a strong case can be made for the implementation of effective future water management in Dorset through integrated catchment partnership delivery. These initiatives, however, need encouragement and support – especially financial - for both delivery of the restoration projects (in the absence of government support) and to support the development and maintenance of existing and new



catchment partnerships within Dorset. Tools available for the catchment partnerships to implement could involve payments to land managers for the ecosystem services provided by their holdings, including holding water in floodplains, arrangements for effective offsetting and potentially a system of “joined-up” offsetting across the county. Application of a payment for ecosystem services approach would allow the beneficiaries of clean water and recreation to contribute to the restoration of historic damage to our waters.

Potential projects may help to develop a linked-up structure to improve communications and delivery across sectors and develop management tools to enable the catchment partnerships in Dorset to respond to these challenges. In the longer term, support funding from the public and private sectors in Dorset could do much to ensure that the promotion of sustainable economic growth in Dorset is widely accepted.

Because of the changes humans have made in the landscape, there will be an ongoing need for some ‘hard’ engineering solutions, but future plans should rely much more heavily on a range of ‘soft’ engineering and natural flood risk management options which aim to identify and stop the source of diffuse pollution, slow the pathway, protect the receptor & enhance the river, slow water flow in the headwaters, and increase infiltration and storage within catchments.

There are already examples of measures being promoted successfully in Dorset by partners and through the Catchment Sensitive Farming initiative and Dorset Wild Rivers project amongst others, including:

- Wetland creation to establish permanently wet areas, attractive to wildlife which act as flood storage areas and retain water
- In channel weed management, managing water weeds utilising their water-slowing physical properties
- Tree planting including wet woodland creation to slow down surface flow, intercept out of channel flow and encourage infiltration – especially in the headwaters areas
- Reintroduction of river meanders to delay water, allowing downstream flows time to peak (e.g. Lewell Mill – Dorset Wild Rivers^{vi})
- Floodplain reconnection – removing or lowering flood banks to reconnect the natural floodplain
- Maintenance of ditch systems to retain wildlife interest and drainage functions
- Reduction in diffuse pollution especially sediment run-off (e.g. from farm tracks) which causes silt inputs into rivers
- Encouragement of flood tolerant land uses such as flood tolerant pasture and wet grassland rather than crops such as maize and silage within floodplains



Lewell Mill: Pre-works 2014
Photo: DWT



Lewell Mill: One year on – August 2015
Photo: DWT



Final words

Water management is essential to ensure protection and enhancement of Dorset's water resources and wetland habitats for current and future generations. The benefits of the integrated catchment partnership approach needs to be communicated and shared with all those working in Dorset. Further work is also needed to examine case studies and cost/benefit analyses to strengthen the evidence base and ensure more informed decisions are made. Dorset Local Nature Partnership believes the evidence is available, is compelling, and will lead to the development of a robust business model for the integrated catchment partnership approach that can be successfully applied across Dorset. The LNP believes it is also important to educate and engage the public as they can play a crucial role in the conservation and management of the water resources in both urban and rural areas.



Narrowing the channel after cattle poaching
eroded banks
Photo: DWT



Leaky dams – slowing the peak flow events
and 'pushing' the flow out to be held in wet
woodland habitats
Photo: DWT

For more information

Please contact the Dorset Local Nature Partnership for further information:
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Or see the website: www.dorsetlnp.org.uk

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ⁱ Catchment Based Approach: <https://www.gov.uk/government/publications/catchment-based-approach-improving-the-quality-of-our-water-environment>

ⁱⁱ Poole Harbour Catchment Initiative: www.pooleharbourcatchment.co.uk

ⁱⁱⁱ Stour Catchment Initiative: www.stourcatchment.co.uk

Dorset Waste and Minerals Scoping report Topic Paper 5-Water and the Dorset Catchment summary

^{iv} <http://www.dorsetwildlifetrust.org.uk/dorsetwildrivers.html>

^v CIWEM – Floods and dredging – a reality check http://www.ciwem.org/media/1035043/floods_and_dredging_-_a_reality_check.pdf

^{vi} Dorset Wild Rivers: <http://www.dorsetwildlifetrust.org.uk/dorsetwildrivers.html>

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