

3.2 Diffuse Pollution Pilot Scheme (DPP) by Environmental Protection

Executive Summary

- Diffuse water pollution can arise from a number of origins, which individually may be small, but it is their collective impacts that are problematic. Sources include Agriculture, Urbanisation and Road Runoff.
- Diffuse pollution of water is associated with one or more of the following pollutants: nitrogen and phosphorus; pesticides; suspended solids, which can pollute in their own right but may also carry pesticides or nutrients; faecal indicator organisms (e.g. bacteria); oils and hydrocarbons and metals.
- In Jersey, levels of nitrate in surface and groundwater frequently exceed recommended EU and local drinking water standards. As a consequence of high levels of nitrate at source, Jersey Water has to have a derogation under the Water (Jersey) Law, 1972, which allows 33% of samples in any one year to exceed the 50 mg/l limit (but be no greater than 70 mg/l) in the Drinking Water supply. This dispensation should not continue indefinitely and is due again for review in 2013.
- Tackling sources of nitrate and other diffuse pollution is now a high priority area of work for the Environment Division. This is a challenge in a place like Jersey where population density is high and there are many competing pressures on land use.
- The DPP scheme aim is to encourage stakeholders in the trial catchments to work together in order to look at practical methods of reducing diffuse pollutant losses from agricultural land, and to monitor the results in terms of water quality.
- The DPP is a jointly funded Environment Departmental initiative. Depending on outcomes, it is likely to be rolled out Island-wide. It is being consulted on as part of the public consultation on the Rural Economy Strategy 2011-2015.

1. Overview of monitoring program/ project

In Jersey, levels of nitrate in surface and groundwater frequently exceed recommended EU and local drinking water standards.

A voluntary scheme (the Diffuse Pollution Pilot Scheme or DPP) has being introduced to raise awareness of diffuse pollution issues amongst the agricultural community and encourage good agricultural practice in order to reduce contaminant levels in local waters. The project aim is to encourage stakeholders to work together in order to look at practical methods of reducing diffuse pollutant losses from agricultural land, and to monitor the results in terms of water quality.

Initially, data is being collected from a small number of trial farms in order to develop an understanding of nutrient and soil management in Jersey. The outcome of this will aim to record systems and methods currently used and recognise the issues that farmers are facing with nutrient management and diffuse pollution and the environment. From this, opportunities to increase environmental performance on farms and development needs will be identified. Consequently opportunities for professional development will be offered to participants, along with suggestions for best practice implementation in order to reduce diffuse pollutant losses. One trial area is in Fern Valley, the other is in Le Mourier Valley, and the other catchment is at Val de la Mare.

Evaluation will include assessment of engagement with farmers and water quality monitoring. Consideration will then be given to extending the implementation island-wide. The project is in alignment with policy development in the Environmental Management and Rural Economy Section of the Environment Department, and as it is jointly funded is a Departmental initiative. It is being consulted on as part of the public consultation on the Rural Economy Strategy 2011-2015.

2. Legislation

The Water Framework Directive (WFD) came into force in December 2000 in the EU and covers all waters: inland, transitional (estuaries) and coastal. It has set the direction of EU water policy for the foreseeable future. The directive requires that pressures on and threats to water quality be identified and measures put in place to combat these. The aim is for all waters to achieve 'good status' by 2015. One of the most significant pressures on water quality in Jersey is reflected by the commonplace failure of many surface and groundwater samples in relation to the 50mg/l Nitrate (NO₃) limit that is enshrined in EU, UK and local legislation.

Under the Water Pollution (Jersey) Law, 2000 there are legal means in place to tackle both point and diffuse sources pollution. There are now well established mechanisms in place for dealing with point source pollution under the Law. There are also statutory means to set standards and control catchment activities under the Law. Obviously however, there are disadvantages to resorting to statutory measures to make changes in land-use.

There is also a prescribed voluntary 'Water Code', under the Water Pollution (Jersey) Law, 2000 which recommends agricultural practices to reduce nutrient losses, for example by adhering to prescribed Nitrogen application limits. However, it is not known how much these are adhered to in practice. EU and UK action goes much further, and applications of Nitrogen are more strictly controlled under the Nitrates Directive.

By law (Water (Jersey) Law 1972) Jersey Water must supply drinking water with a concentration of nitrate below 50 mg/l. Jersey Water abstracts approximately 97% of its raw water from surface waters. At some times of the year nitrate in source streams exceeds this and Jersey Water can either mix raw waters between sources or run the desalination plant to achieve this. However this approach is unsustainable.

As a consequence of high levels of NO₃ at source, Jersey Water has to have a derogation under the Water Law, which allows 33% of samples in any one year to exceed the 50 mg/l limit (but be no greater than 70 mg/l) in the Drinking Water supply. This derogation is due for review in 2013. However, under consultation Health Protection (Health and Social Services Department) asserted that they could not continue to support this situation unless catchment inputs of nitrogen were tackled. In addition, the Memorandum of Understanding between the Environment Division (as the regulator) and Jersey Water specifically makes the undertaking that catchment management measures should continue to be investigated.

3. Stakeholders

Stakeholders in this project include Environmental Protection and Environmental Management and Rural Economy Sections of the States Planning and Environment Department, local farmers and growers, consumers of the produce, produce marketing organisations, farmer representative bodies (Jersey Farmers Union, RJA&HS), Jersey Water, supermarkets, local user groups of public amenities - water based recreation and local ecosystems and the general taxpayer.

All of the farmers and growers in the three water catchment areas that have been asked have agreed to take part. Maintaining a high quality environment in Jersey is fundamental to the marketing of quality agricultural products. Good agricultural practice brings benefits to farmers, consumers and the environment. It avoids waste, minimises pollution and enhances efficiency thereby reducing costs.

4. Pollution sources and pathways

In Jersey, as in the rest of Europe, diffuse nitrate pollution increased throughout the 1980s. This was primarily attributed to the intensification of agriculture. In fact, the severity of the problem in Jersey led to it being used as a case study in a school text book on pollution (Foster, 1991).

Diffuse water pollution can arise from a number of origins, which individually may be small, but their collective impact can be damaging. Diffuse pollution can be derived from current and past land use in both agricultural and urban environments. Various activities contribute including agriculture, domestic activities, construction and urban life. Pollutants deposited on land, roads and spaces are washed into watercourses by rain. Although not the only source, agriculture, occupying 50% of the land area, is a significant contributor of diffuse pollution in Jersey.

Diffuse pollution of water by agricultural activity usually involves one of the following pollutants:

The plant nutrients, nitrogen and phosphorus;

Pesticides;

Suspended solids, which can pollute in their own right but may also carry pesticides or nutrients; Faecal indicator organisms (e.g. bacteria); and

Oils and hydrocarbons.

Diffuse Pollution effects can include:

- i. Eutrophication: Excess nutrients fuel growth of algal or bacterial populations. This can lead to unsightly blooms, de-oxygenation of the water, harm to fish and other animals.
- ii. Microbiological contamination of water supplies and bathing waters.
- iii. Smothering of habitats by silt and soil.
- iv. Toxicity to plant and animal life, including endocrine disruption in fish.
- v. Groundwater and surface water contamination and the subsequent loss, or need for treatment, of drinking water resources.

The link between diffuse pollution from agriculture and high nitrate concentrations in surface and groundwater in Jersey has been noted in a number of reports over the years (The Nitrate and Pesticide Working Party Report in 1996; the Centre for Research into Environment and Health (CREH) report 'Stream Water Quality on the Island of Jersey' in 1997; British Geological Survey annual and summary reports prepared for the Public Services Dept, 1990-2000; and the Plymouth University final report entitled 'Nitrates and Phosphates in Jersey Surface Waters' of October 2001). For example, Foster (1989) found that the highest nitrate concentrations were found in catchments that were under intensive cultivation (Foster, IDL, Ilbury BW and Hinton MA, Agriculture and Water Quality: A Preliminary examination of the Jersey nitrate problem. Applied Geography (1989), 9, 95-113). Analysis of Environment Division water quality and land use data also points towards a strong correlation between the island-wide area under potatoes, head of cattle and Nitrate levels in local water. Initial use of nutrient budgeting software (PLANET) on a small sample has also shown that there are a number of improvements to be made to equalise farm imports and off-takes of nutrients. Tackling agricultural sources of nitrate and other diffuse pollution is now a high priority area of work for the Environment Division. This is a challenge in a place like Jersey where population density is high and there are many competing pressures on land use.

5. Monitoring undertaken by Environmental Protection

At the moment, background water quality is being monitored in a number of ways. Weekly 'spot' samples are being taken to assess long term water quality trends, auto-samplers are taking samples during some rainfall events (4-6 per year) to determine what nutrients are in the runoff and biological monitoring is being carried out twice a year.

Biological monitoring is a good indicator of long-term water quality because some 'macro-invertebrates' are more tolerant of pollution than others. A wide range of families of high scoring animals indicates better water quality, whereas lower scoring animals indicate poorer quality. The Beautiful Demoiselle (damselfly) nymph and adult - a biodiversity action plan species in Jersey - is an example of a high scoring animal.

6. Analysis and reporting of data

The officer in charge of the DPP is responsible for storm event sampling and the biological sampling, and for monitoring data handling and analysis. She will also be collecting data from the farms. The Environmental Protection Technician is responsible for taking the routine weekly samples and inputting the data into excel spreadsheets. A consultant from the UK is being used to design the assessments being used on farms to collect the initial data – “Current Farm Nutrient Management Systems and Identifying Possible Development Needs”.

7. Budget, manpower and resources considerations

This project has been designed and implemented by one part time officer (0.8 FTE) as a part of her job. In addition, setting up costs so far in 2009 and 2010 have been approximately £15,000 per annum, on consultancy and or monitoring equipment. Further activity in 2011 such as training provision and on farm management plans need to be cost and resourced. Additionally, flow data from the catchments need to be collected and stage discharge relationships quantified in order to estimate pollutant loadings. This has not been possible due to time constraints.

8. Further available reports/info on request:

Catchment Management in Jersey – Towards agricultural best management to reduce diffuse water pollution. (Jemma Batten, Black Sheep Countryside Management, August 2009)

Implementing Best Management Practices to Reduce Diffuse Pollution (Kate Roberts, Environment Division, Planning and Environment Department, States of Jersey, 2010)