

## Appendix 4. Ponds: Dissemination of results and knowledge exchange activities

### Appendix 4.1 Journal papers and published articles

- Article in *Cumberland News* 'Ponds capture huge amount of sediment', 13<sup>th</sup> July 2012, featuring MOPS pond at Whinton Hill
- Article in *Westmorland Gazette* 'River clean up project to be trialled in Eden', Thursday 16th September 2010, covering DTC launch featured a photograph of the new MOPS wetland at Newton Rigg as an example of a mitigation option
- Deasy, C. Quinton, J.N, Silgram, M., Stoate, C., Jackson, R. Stevens, C. J. and Bailey, A. P. 2010. Mitigation Options for Phosphorus and Sediment (MOPS): Reducing Pollution in Runoff from Arable Fields. *The Environmentalist* **180**: 12-17
- Deasy, C., Quinton, J.N. Silgram, M. Bailey, A. Jackson B. and Stevens C.J. 2010. Contributing Understanding of Mitigation Options for Phosphorus and Sediment to a Review of the Efficacy of Contemporary Agricultural Stewardship Measures. *Agricultural Systems* 103, 105-109.
- Ockenden, M., Quinton, J., Favaretto, N., Deasy, C. and Surrige, B. 2014. Reduced nutrient pollution in a rural stream following septic tank upgrade and installation of runoff retention measures. *Environmental Science: Processes & Impacts* 16, 1627-1645.
- Ockenden, M.C., Deasy, C., Quinton, J.N., Bailey, A.P., Surrige, B., Stoate, C., 2012. Evaluation of field wetlands for mitigation of diffuse pollution from agriculture: sediment retention, cost and effectiveness. *Environmental Science and Policy* **24**:110-119. DOI: 10.1016/j.envsci.2012.06.
- Ockenden, M.C., Deasy, C., Quinton, J.N., Surrige, B. and Stoate, C. 2014. Keeping agricultural soil out of rivers: Evidence of sediment and nutrient accumulation within field wetlands in the UK. *Journal of Environmental Management* 135, 54-62.

### Appendix 4.2 Published conference papers

- Ockenden, Mary ; Deasy, Clare ; Quinton, John ; Favaretto, Nerilde ; Surrige, Ben ; Stoate, Chris, 2012. The effectiveness of field wetlands in retaining pollutants from agricultural runoff: case studies from the UK. In: *Agriculture and the Environment IX: Valuing Ecosystems: Policy, Economic and Management Interactions*. ed. Karen McCracken. Edinburgh, 2012. Proceedings of the SAC-SEPA Biennial Conference, Edinburgh, 3rd-4th April 2012, pp. 244-249.
- Ockenden, Mary; Deasy, Clare; Quinton, John; Favaretto, Nerilde; Stoate, Chris (2012) Reducing diffuse pollution in agricultural catchments: retention of sediment and nutrients in field wetlands. In: *Hydrology for a Changing World: Proceedings of British Hydrological Society National Symposium*, Dundee, Scotland. 9-11 July 2012. ISBN: 1903741181.

### Appendix 4.3 Unpublished conference papers

- Diffuse Agricultural Pollution Mitigation Methods Workshop, North Wyke, Devon, oral presentation, 25th-26th September 2012
- Centre for Sustainable Water Management, Lancaster, oral presentations, June 2012 and October 2012
- EGU General Assembly 2012, oral presentations (2), Vienna, 22nd-27th April 2012
- Waitrose Innovation Forum, oral presentation, London, 15th February 2012
- Catchment Management workshop, oral presentation, Belford, Northumberland, 24-25th November 2011
- Catchment Science 2011, oral presentation, Dublin, 14-16th September 2011
- EGU General Assembly oral presentation, Vienna, 4th-8th April 2011
- CSF/DTC workshop, oral presentation, Lancaster, 1st March 2011
- AGU General Assembly oral presentation, San Francisco, 13th-17th December 2010
- IPW6 oral presentation, Seville, 27th September – 1st October 2010

- National DTC launch workshop, oral presentation, 16th-17th September 2010
- BHS2010, oral presentation, Newcastle, 19th-23rd July 2010
- Water Quality 2010 oral presentation, Leeds, 23-24th June 2010
- COST Workshop 869, oral presentation, Jokioinen, Finland, 14-16th June 2010
- EGU General Assembly oral presentation, Vienna, May 3rd-7th 2010
- IWAM CPD training event oral presentation at Loddington, 11th March 2010
- IEMA Knowledge Transfer event oral presentation, Manchester, 27th January 2010
- FBA North East group meeting oral presentation, London, 25th March 2009

#### **Appendix 4.4 Poster presentations**

- SAC/SEPA Biennial Conference, poster presentation, Edinburgh, 3rd-4th April 2012
- EGU General Assembly poster presentation, Vienna, 23rd - 27th April 2012
- Diffuse Agricultural Pollution Mitigation Methods, poster presentation, North Wyke, Okehampton, Devon, 25th – 26th September 2012
- EGU General Assembly poster presentation, Vienna, 20-24th April 2009
- EGU General Assembly, poster presentation, Vienna, 20-24th April 2009
- Lancaster University Faculty of Science and Technology Christmas Conference, poster presentation, Lancaster, 16th December 2008

#### **Appendix 4.5 Other literature and media features**

- Media feature: Radio 4 Farming Today This Week (broadcast 1 December 2012) visited the Allerton project at Loddington. Dr Alistair Leeke (GWCT) discussed minimum tillage and MOPS2 ponds for slowing runoff.
- MOPS2 website <http://mops2.diffusepollution.info>
- Post to EGU Soil Blog, October 2012
- Article in BSSS newsletter, May 2012
- Revised MOPS2 wetlands leaflet (April 2012)
- Produced wetland construction guidelines 'Creating a Field Wetland', October 2012
- Produced policy brief document 'Field Wetlands Reduce Diffuse Pollution from Agricultural Land', May 2012
- MOPS2 data online at [http://lec-field.lancs.ac.uk/VDV/vdv\\_gmap.php?sid=23](http://lec-field.lancs.ac.uk/VDV/vdv_gmap.php?sid=23)
- Information boards for four farms with wetland sites (winter 2010)
- Revised MOPS2 wetlands leaflet (winter 2010)
- Media feature: Radio 4 Farming Today discussed the MOPS wetlands at Loddington in a programme on Diffuse Pollution in October 2010

#### **Appendix 4.6 Visitors hosted**

##### *Groups*

- Farming & Wildlife Advisory Group (FWAG, 90 visitors) visit wetlands at Loddington, Leicestershire, 3 December 2012
- Scientists from Institut National de la Recherche Agronomique, Rennes, France, visit Crake Trees, Crosby Ravensworth, Cumbria, 26<sup>th</sup>-27<sup>th</sup> November 2012
- Forestry Commission (15 visitors) visit wetlands at Loddington, 15 September 2012
- Nottingham University students (15) visit wetlands at Loddington, September 2012
- Leicester University students (15 visitors) visit wetlands at Loddington, 9 September 2012
- Environment Agency Ground staff (30 visitors) visit wetlands at Loddington, Leicestershire, 6 September 2012
- GWCT (24 visitors) visit wetlands at Loddington, 21-22 July 2012

- Making Environmental Stewardship More Effective (MESME, 24 visitors) visit wetlands at Loddington, Leicestershire, 17 July 2012
- Natural England (NE, 11 visitors) visit wetlands at Loddington, 12 July 2012
- GWCT/LEAF (80 visitors) visit wetlands at Loddington, 26 June 2012
- Reading University agricultural students visit to Crake Trees, Crosby Ravensworth, Cumbria, 25<sup>th</sup> June 2012
- Defra Science Visit to EdenDTC and MOPS2. Visit to Crake Trees, Crosby Ravensworth, Cumbria, 15<sup>th</sup> May 2012
- Catchment Change Network group visit to Crake Trees, Crosby Ravensworth, Cumbria, 26<sup>th</sup>-27<sup>th</sup> March 2012
- Pyhajarvi Institute, Finland visit to Crake Trees, Crosby Ravensworth, Cumbria, 20<sup>th</sup> March 2012
- FP7 programme 'Stinno' KE workshop visit to Crake Trees, Crosby Ravensworth, Cumbria, 9<sup>th</sup> March 2012
- Environment Agency (Paul Leinster + 12) visit wetland sites at Loddington, Leicestershire, 2 November 2011
- Nottingham University students (25 visitors) visit wetland sites at Loddington, Leicestershire, 8 October 2011
- Game & Wildlife Conservation Trust (GWCT, 16 visitors) visit wetland sites at Loddington, Leicestershire, 6 September 2011
- Farming & Wildlife Advisory Group (FWAG, 35 visitors) visit wetland sites at Loddington, Leicestershire, 15 June 2011
- Royal Association of British Dairy Farmers (RABDF, 60 visitors) visit wetland sites at Loddington, Leicestershire, 9 June 2011
- Institution of Agricultural Engineers (20 visitors) visit wetland sites at Loddington, Leicestershire, 6 June 2011
- Regional CSF (NW/NE/Yorkshire & Humber) visit to wetland sites at Whinton Hill, Plumpton, Cumbria, 16<sup>th</sup> November 2010
- Association of Rivers Trusts visit to Whinton Hill, Plumpton, Cumbria, 13<sup>th</sup> October 2010
- Country Land Agents visit to Crake Trees, Crosby Ravensworth, Cumbria, 29<sup>th</sup> September 2010
- National CSF visit to wetland sites at Loddington, Leicestershire, as part of IWAM CPD training event, 11<sup>th</sup> March 2010
- Lancaster Environment Centre visit to new constructed wetland sites at Crake Trees, Crosby Ravensworth, Cumbria, 13<sup>th</sup> December 2009
- Defra (Luke Spadavecchia and Dan McGonigle) visit to new constructed wetland sites at Crake Trees, Crosby Ravensworth, Cumbria, 15<sup>th</sup> September 2009

#### *Individuals*

- Phil Jordan, Irish Catchments Programme, visit to Crake Trees, Crosby Ravensworth, Cumbria, 25<sup>th</sup> January 2012
- Nerilde Favaretto, Federal University of Parana, Brazil (UFPA), visits to all MOPS2 sites during sabbatical year at Lancaster University, working on nutrient retention in wetlands, March 2011 – January 2012
- Karin Johannesson, Linköping University, and Pia Kynkaanniemi, Swedish University of Agricultural Sciences (SLU), Uppsala, visits to Newton Rigg, Whinton Hill & Crosby Ravensworth wetland sites during two week visit to LEC to work with MOPS team on constructed wetlands and particle size distribution of sediments, 11<sup>th</sup> January 2011
- Pieter Fiener, University of Cologne visit to Crake Trees, Crosby Ravensworth, Cumbria, 2<sup>nd</sup> September 2010 to discuss potential research collaborations
- Andrew Jarrett, Cranfield University, visit to discuss MOPS wetlands in relation to MSc dissertation funded by RSPB on strategies to reduce diffuse water pollution from arable farms, 26<sup>th</sup> August 2010

- Robin Horner, Lancashire and Cheshire Area Manager, RSPB, visit to discuss sourcing of wetland plants and collaboration on diffuse pollution issues, 5<sup>th</sup> August 2010
- Peter Kinnell, University of Canberra, Australia, visit to Whinton Hill, Plumpton, Cumbria, 10<sup>th</sup> June 2010

#### **Appendix 4.7 Student research collaborations**

- Katie Johnson, Lancaster Environment Centre, starting MSc project on Biodiversity in wetlands in 2013
- Adam Freer, Lancaster Environment Centre, PhD project 'Pollutant swapping in constructed farm wetlands' (expected completion 2014)
- Matt Bellwood, Lancaster Environment Centre, BSc dissertation 'Adsorption and desorption of P from sediments taken from the Whinton Hill Wetland'
- Adrian Dale, Lancaster Environment Centre, BSc dissertation 'Evidence for diurnal turnover of the Whinton Hill Wetland'
- Jessica Adams, Lancaster Environment Centre, BSc dissertation 'Spatial patterns of water quality at Whinton Hill Wetland'
- Adam Freer, Lancaster Environment Centre, Lancaster University, MSc dissertation 'Pollution swapping at the Whinton Hill Wetland'
- Guy Douglas, School of Civil Engineering & Geosciences, Newcastle University, MSc dissertation 'An Investigation Into Enhancing Small Hydropower Generation Using Catchment Management In Scotland' data provided from MOPS Whinton Hill drain wetland
- Katharine Giddings, Lancaster Environment Centre, Lancaster University, MSc dissertation 'The impact of constructed farm wetlands on groundwater quality' data collected from MOPS Whinton Hill drain wetland
- Andrew Wilson, Lancaster Environment Centre, Lancaster University, MSc dissertation 'Nutrient retention within constructed farm wetlands' data collected from MOPS Whinton Hill drain wetland

#### **Appendix 4.8 Advice provided**

- Provided published and grey literature to group (led by CEH, Wallingford) reviewing effectiveness of constructed wetlands
- Provided advice and information to Jan Sendzimir (IIASA, Austria) on costs and benefits of small pond construction, low tillage and shelterbelts, November 2012
- Provided advice to the EA Flood Risk Management group on the use of settlement features at Wymondham, Melton Mowbray, November 2010
- Provided information on wetland costings to JBA Consulting for a Long Term Costing project on flood risk management options for the Environment Agency, October 2010
- Provided information on the use of IR15C sensors for monitoring turbidity to Simon Browning, Innovation Officer within the EA Evidence Directorate to help assess sediment pressures under the Water Framework Directive, September 2010
- Participation in PEDAL2 expert workshop, Lancaster, 18-19<sup>th</sup> November 2009
- Participation in FERA expert elicitation workshop on 'Recapturing the environmental benefits of set-aside – a voluntary approach', London, 14<sup>th</sup> May 2009
- Participation in CSL expert elicitation workshop on 'Recapturing the environmental benefits of set-aside', London, 11<sup>th</sup> March 2009

#### **Appendix 4.9 Meetings and events**

- MOPS2 steering group meeting, London, 11th January 2012
- Involvement in Eden DTC (Demonstration Test Catchment) project, continuing
- Participation in River Wyre CSF steering group meetings, Lancashire, quarterly
- MOPS2 steering group meeting, London, 23<sup>rd</sup> November 2010

- Mitigation measures meeting (Defra, EA, West Country Rivers Trust), Devon, 19<sup>th</sup>-20<sup>th</sup> September 2010
- Co-convened session on Management and Restoration Impacts on Runoff Regimes, Water Quality and Ecosystem Services at EGU General Assembly, Vienna, Austria, April 2010
- Co-organised CSF training day for arable mitigation options, Loddington, March 2010
- MOPS2 steering group meeting, London, 7<sup>th</sup> December 2009
- Participation in networking event between the Lancaster Environment Centre and Centre for Ecology and Hydrology, Lancaster, 16<sup>th</sup> March 2009
- Meetings with farmers at wetland field sites, February 2009-present
- Meetings with Eden Rivers Trust to explore potential field sites and discuss collaboration, Penrith, February 2009-present
- Meetings with Pond Conservation to discuss links between MOPS and W\_F\_L and potential biodiversity projects, Penrith, March 2009 and Oxford, June 2009
- Attended launch of Million Ponds Project, London, 19<sup>th</sup> February 2009
- MOPS2 steering group meeting, London, 20<sup>th</sup> November 2008
- MOPS2 project launch, Loddington, 1<sup>st</sup> August 2008

#### **Appendix 4.10 Field visits**

- Visit to Lunan Monitored Catchment project, Scotland, with James Hutton Institute, 11<sup>th</sup> July 2012
- Visit to Belford Catchment Solutions Project, Northumberland, 25<sup>th</sup> November 2011
- Visit to Ann Valley wetland project, Wexford, Ireland, 10<sup>th</sup> November 2010
- Visits to RSPB Leighton Moss Nature Reserve, 12<sup>th</sup> and 24<sup>th</sup> August 2010
- Visit to Irish Catchment Programme field sites, Dublin, 14<sup>th</sup> January 2010
- Visit to River Eye CSF group sites and discussions with the EA and Natural England about constructed wetlands as mitigation options, Leicestershire, 14<sup>th</sup> October 2009
- Visit to Soil and Environment Research group at Bioforsk, Ås, Norway, 18-29<sup>th</sup> May 2009. Funded by the Royal Society to allow exchange of expertise on soil and nutrient transfer processes in catchments and diffuse pollution mitigation options. Activities included an oral presentation, one-to-one meetings with experts and visits to new and established constructed wetlands
- Visits to ten local farms in Lancashire and Cumbria during site selection, with the Newcastle Proactive group, the Eden Rivers Trust and the River Wyre CSF officer, January 2009 to February 2010
  - Wyre catchment, Lancashire: Hillam Lane Farm, Cockerham; Newland Home Farm, Bay Horse; Manor House Farm, Claughton
  - Lune catchment, Cumbria: Tatham Hall, Wray
  - Eden catchment, Cumbria: Sykeside, Soulby; South Whinfell, Cliburn; Brackenburgh Home Farms, Calthwaite; Crake Trees, Crosby Ravensworth; Dedra Banks, Newby, Sewborwens Farm, Newton Rigg
- Visit to Newcastle University Proactive site and discussions with the Proactive group about diffuse pollution mitigation options, Nafferton Farm, Northumberland, 21<sup>st</sup> October 2008