

NEW FOREST WETLAND MONITORING REVIEW

1. Introduction

1.1 Background

The New Forest is of outstanding importance for nature conservation in the UK and Europe due to the size, quality and complex mosaic of habitats. Its conservation importance is recognised in its designation as a Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). The New Forest supports one of only four significant sites of bog woodland, together with one of the six best sites of riverine woodland (ancient residual alluvial forest) in the UK. Together with other scarce wetland habitats the New Forest also contains the most extensive lowland valley mire systems in Western Europe. The network of rivers and streams, despite some interference by man, represent one of the best examples of a nutrient poor, acidic, lowland stream network in southern Britain. In addition, the New Forest is now the most important area in the region for breeding waders.

The New Forest's unique history and associated land management practices of forestry and pastoral commoning have been largely responsible for the development and preservation of habitats and eco-systems in their present form as well as the cause of degradation in some areas. One of the greatest threats to the wetland habitats has been the lack of a holistic approach to the management of the hydrological networks which support these habitats. Indeed, man's past interference has led to the decline of wetland habitats through drainage and straightening of river channels leading to:

- Fragmentation of habitats following drainage & afforestation
- Headward erosion of the mire system
- Erosion of over straightened channels leading to increased deposition of gravel downstream
- Reduction in seasonal flooding
- Impeded drainage due to remnant spoil banks
- Scrub invasion
- Introduction of non-natives

Initiatives have been in-going since the 1990's to restore the New Forest's Wetland habitats through a number of projects including Life 2, Life 3, Pathfinder, Final 4000 and since 2010, the New Forest HLS project. The last 10 years have witnessed the most ambitious project to date in terms of trying to restore wetland habitats, particularly streams and mires with over 59 sites tackled, totalling 29km of watercourses, using HLS funding. As a consequence of this effort, greater scrutiny has been placed on the impact and success of these projects both as a result of the increased regulatory requirements and public interest.

Until around 2014/15 monitoring had been sporadic and was limited to studies carried out as part of Life 3 supplemented by academic research, student projects and survey work carried out by dedicated individuals or regulatory authorities such as the Environment Agency as part of regional survey programmes. Many observations in the field had not been formally recorded or documented

so could not be used effectively as evidence. However, with bigger programmes there has been a recognition that more formal monitoring is required to provide evidence to support the regulatory process and check that the aims and objectives of restoration programmes are being met. To address this requirement, in 2015/16, the HLS Board gave support to the formulation of a more formal monitoring programme which has been evolving ever since. This included the appointment of an HLS Project Monitoring Officer to help oversee the programme.

1.2 Aim of the Review

This review has been carried out by Jane Smith (Corylus Environmental Ltd) and attempts to pull together and build a narrative around the HLS monitoring work carried out to date and covers evidence available from 2014 to February 2020. HLS monitoring has been evolving ever since its inception, using a combination of formal surveys by consultants, documented observations/measurements made by Forestry England staff/volunteers/partner organisations and remote data loggers/cameras. Some sites have pre-restoration surveys and others do not or survey sequences and sample site can be sporadic or have changed over the years. Therefore, this review is not intended to be a formal scientific analysis but instead looks objectively at information available and the results of monitoring to:

- Identify and summarise the type/location of wetland monitoring carried out to date as part of the HLS Wetland Restoration project
- Set out the aims and objectives of the different aspects of wetland restoration and using samples of available/suitable data to evaluate whether the monitoring results to date are showing progress towards meeting these objectives
- Assess Rates of recovery
- Determine whether monitoring methods being used are effective for providing evidence

1.3 Data

The monitoring review has evaluated the following data sets against the wetland restoration objectives:

- Fixed point photos
- Channel data
- Freshwater invertebrate surveys
- Electrofishing
- Spawning Surveys
- Timelapse photography
- 360 Photography
- Water quality data
- Vegetation surveys
- Water level/temperature logs
- MoRPH surveys
- Riverfly surveys

1.4 Wetland Restoration Objectives

The review of monitoring data has considered the following key wetland restoration objectives:

- Restoration of channel/floodplain features & water quality
- Restoration of hydrological function/reconnection with floodplain
- Ecological benefits relating to macro-invertebrate, fish and vegetation communities

Table 1-1 and Appendix A identify which sources of data have used to evaluate to wetland restoration objectives

Table 1-1: Monitoring Data Sources

Restoration objective	Monitoring Data Source
Restoration of channel/floodplain features	Fixed point photos 360 photos MoRPH surveys
Restoration of hydrological function/reconnection with floodplain	Timelapse Cameras Hydrograph data Waterlevel loggers
Ecological benefits relating to macro-invertebrate populations	BUG Macroinvertebrate Surveys 2015-2019 Riverfly Data
Ecological benefits relating to fish populations	APEM Fish Data 2014 BUG Fish Surveys 2015-2019
Ecological benefits relating to vegetation communities	Forestry Commission survey data 2017 Footprint Ecology Vegetation Transect Data 2018 Amanda Marler Vegetation Transect Data 2019
Water quality	BUG Macroinvertebrate & Fish Surveys 2015-2019

1.5 Restoration Work

Most of the restored sites which have been the subject of monitoring have undergone the following work:

- Tree and scrub clearance along the riparian zone and access routes to allow movement of machinery and restoration of the original channels
- Excavation/scraping out of the former, historic channel to restore the original meandering stream course
- Removal of spoil banks along artificial, canalised channels
- Bed level raising using heather bales and clay plugs to bring eroded, over-deepened stream beds back up to their original levels
- Lining restored channels with imported substrate sourced from quarries matching the same geological strata
- Infilling of the redundant, canalised channels using clay plugs and locally sourced inert material

1.6 Evaluation of monitoring results

In order to conclude whether HLS monitoring has met its intended aims the review process has analysed the results of the monitoring data and evaluated whether any trends are being revealed and whether these trends are in accordance with the intended restoration aims and objectives. The findings are summarised using a traffic light approach:

Green – conclusive evidence that wetland restoration sites are meeting or exceeding their intended aims and objectives

Amber – some evidence or positive trends to suggest that that wetland restoration sites are meeting their intended aims and objectives but the results are not entirely conclusive and/or further monitoring is required to produce more robust data sets/evidence.

Red – no conclusive evidence or trends that restoration sites are meeting their intended aims & objectives or data is not sufficient to be able to draw any definitive conclusions.

Each section of the report is devoted to a key objective/monitoring target, notably:

- Section 2 - Restoration of channel/floodplain features
- Section 3 - Restoration of hydrological function/reconnection with the floodplain
- Section 4 - Water quality
- Section 5 - Ecological benefits relating to macro-invertebrate
- Section 6 - Ecological benefits relating to fish
- Section 7 - Ecological benefits relating to vegetation communities

Each section of the report is organised to:

- Explain the background and narrative behind the key wetland restoration objectives
- Identify the specific wetland restoration objective(s) that the monitoring data is attempting to evaluate
- Set out and summarise the monitoring methodology

- Present & discuss the key findings and trends
- Conclude how well the evidence supports wetland restoration objectives and how well objective have been met. Suggestions have also been made for future monitoring.