Forest Research

Midlands Woodland for Water Project

Phase 1: Opportunity Mapping Final Report

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Executive Summary

The Midlands Region faces a number of major water issues, with over 100,000 properties at significant risk of flooding and 85% of river waterbodies currently failing to meet the target Good Ecological Status required by the Water Framework Directive. A number of recent publications provide strong evidence of the ability of woodland creation to help tackle these pressures by reducing and delaying flood waters, limiting pollutant loadings and retaining diffuse pollutants. Ongoing studies designed to improve our understanding of the effects of woodland on flood flows have been reviewed and the findings found to further strengthen the supporting evidence base. A significant caveat, however, is the need for care in site selection to ensure that planting does not increase flood risk by synchronising, rather than desynchronising downstream flood flows.

The main aim of this study was to identify priority areas for woodland creation and the improved management of existing woodlands to reduce downstream flood risk and achieve the objectives of the Water Framework Directive. A wide range of spatial datasets were accessed from partners, particularly the Environment Agency, and used to generate a large number of maps and supporting GIS shapefiles showing priority areas potentially available for planting. The results provide a strong basis for developing and refining regional objectives, initiatives and projects to deliver new woodlands where they can best contribute to FRM and meet WFD targets, in addition to generating many other benefits for society.

There are extensive opportunities across the region for woodland creation or the improved management of existing woodlands to mitigate downstream flood risk and improve water quality (Map 39), including:

- 5,189 km^2 (24% of region) of priority sites for woodland planting to reduce downstream flood risk, comprising 4,349 km^2 of wider woodland, 623 km^2 of riparian woodland and 217 km^2 of floodplain woodland

- 4,670 km^2 (22% of region) of high priority land in failing or vulnerable waterbody catchments subject to one or more diffuse agricultural pollution pressures (phosphate, nitrate, pesticides and sediment)

- 1,919 km^2 (9% of region) of priority land where woodland planting could tackle both flood risk and one or more diffuse agricultural pollution pressures; 18% (341 km^2) of this land is free from all sensitivities

- 737 ha of priority land where woodland planting could reduce both flood risk and all four identified diffuse agricultural pollution pressures; 81% (599 ha) of this land is free from all sensitivities

- 112 (>100 ha) sub-catchments with >20% conifer forest cover where the scale of felling could potentially increase local flood risk or reduce water quality, including seven within areas vulnerable to acidification; 2,795 ha of riparian land where conifer woodland remains within 20 m of the river network; and ~100 sub-catchments with >20% forest

cover where further conifer planting could potentially pose a risk to future water resources due to the higher water use of trees.

These opportunities are reasonably widely distributed across the region, although there are notable 'hotspots'. The greatest scope for multiple water benefits arise in the northern parts of the River Severn catchment and in a relatively narrow band along the eastern boundary of the region, stretching from the Warwickshire Avon to the Lower River Trent (Map 40). There is a large degree of overlap between the identified priority land for woodland creation and the many existing regional strategies, plans and projects designed to promote land use change or improve land management to mitigate flooding and diffuse pollution, including Catchment Flood Management Plans and England Catchment Sensitive Farming Delivery Initiative Priority Catchments. A significant proportion of the priority land is subject to sensitivities that may restrict the scale and character of any woodland creation.

It is recommended that partners and other regional stakeholders use these maps and spatial data to target locations where woodland planting can provide the greatest benefits to water at the catchment scale. This includes using the identified opportunities to better integrate woodland into existing and new catchment initiatives to improve the chances of success and help secure longer-term performance. There is also significant scope to overlay the maps with those of other woodland values such as the provision of recreation and health benefits, so that opportunities to further widen the range of potential benefits from planting can be realised.

Woodland planting is limited by economic and other considerations. In particular, landowners and farmers are likely to be resistant to land use change unless it is economically attractive. The study notes that while recent progress has been made in raising the value of woodland grants to promote better targeting of woodland creation for water, more will need to be done to achieve the required level of planting to make a difference at the catchment scale. This is especially the case for tackling agricultural diffuse pollution pressures, which tend to be greatest on arable land. While land values and crop prices will greatly constrain woodland creation on such land, it is thought that small scale planting targeted to riparian buffers and along pollutant pathways could make a significant difference, while having a limited impact of agricultural incomes. There is scope for better integrating available incentives to secure greater land use change, as well as encouraging water companies to help fund woodland creation for water.

Finally, it is recommended that one or more pilot studies are established within the region to demonstrate and help communicate the value and benefits of woodland creation for water. Ideally, any such study should be incorporated within one of the existing pilot catchment sites that have been set up to examine the effectiveness of agricultural best practice measures, but failing this a new site should be sought guided by the opportunity maps. The report provides guidance on the monitoring and evaluation of woodland benefits to provide a more robust local evidence base.
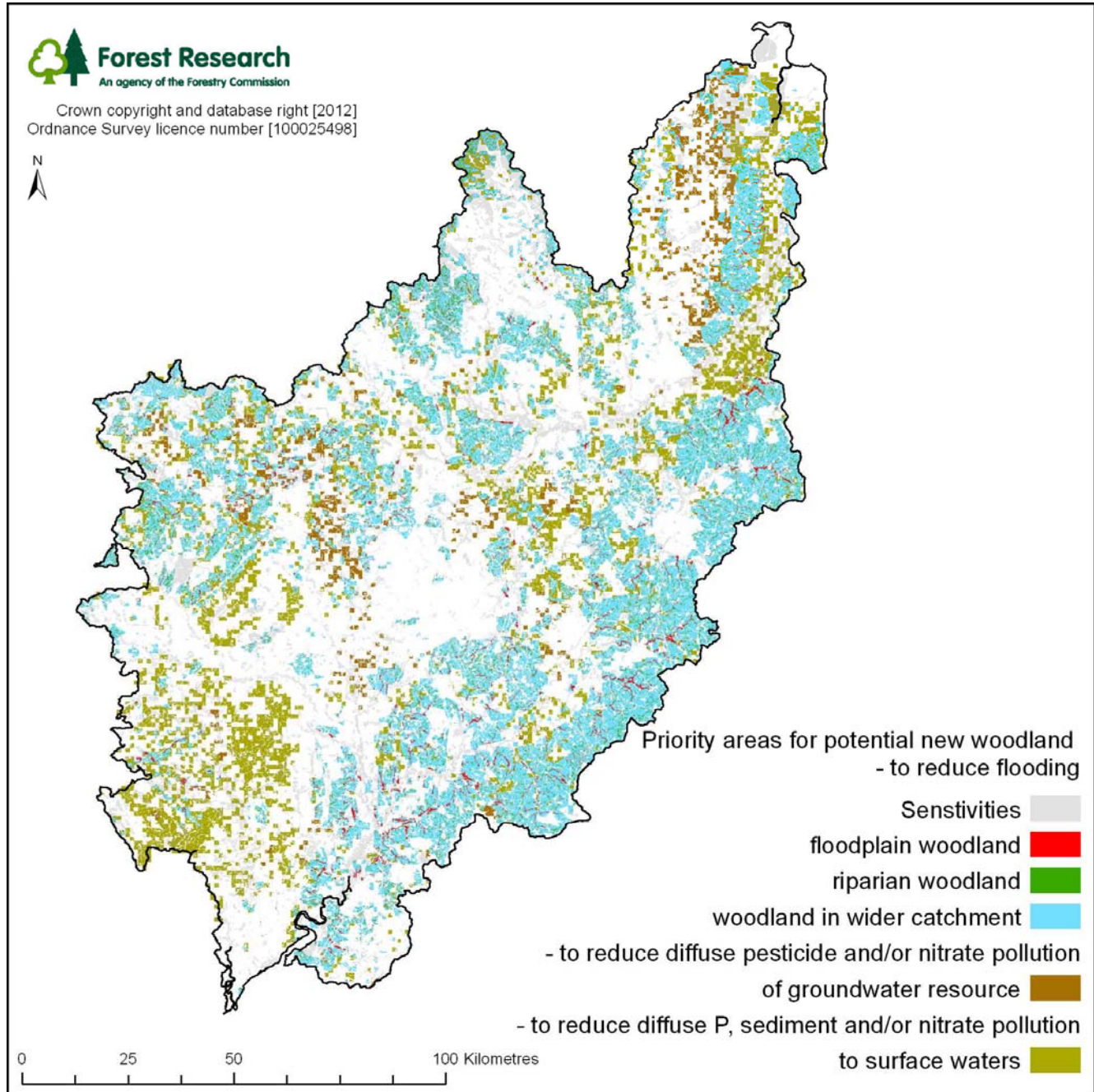
Map 39 Distribution of high priority areas for woodland creation for Flood Risk Management (FRM) in relation to those for reducing one or more diffuse pollutants to surface waters or groundwater

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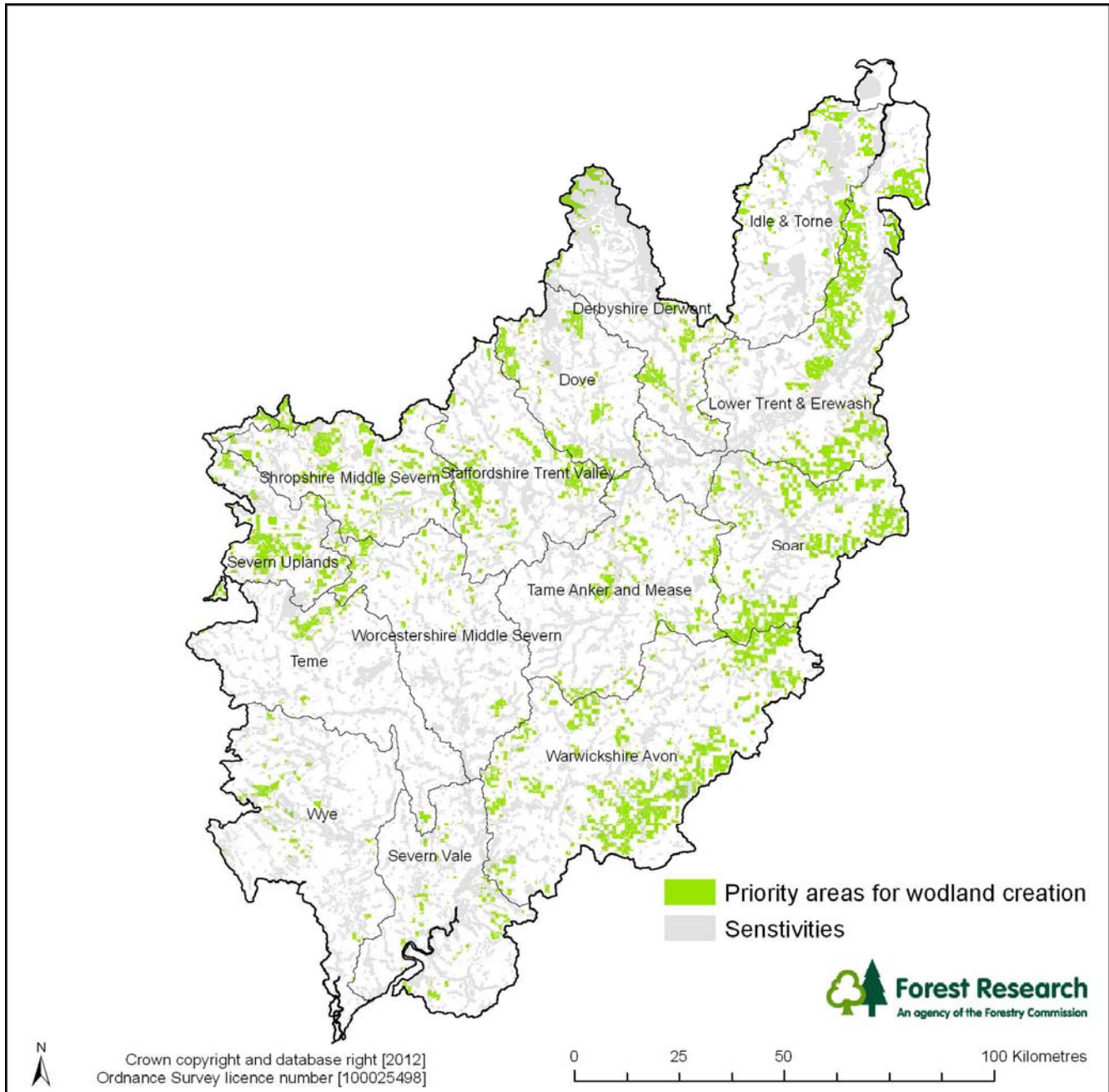
Map 40 Overlapping high priority areas where woodland creation can address both FRM and diffuse pollution pressures