



The James  
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**Development of indicators of the impact of  
SRDP (2007-2013) measures on water quality  
and applications to the Lunan Water catchment  
and at national level.**

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## **SUMMARY OF REPORT**

### **Introduction**

European Commission (EC) agri-environment payments account for around 2.5 billion euros per year and are financially the largest measure for implementation of the EC's rural development policy. In Scotland, expenditure for 2008-2011 was around £263m. In the context of water quality, the EC require post-hoc evidence (in the form of policy impact indicators) to assess whether these payments are well designed.

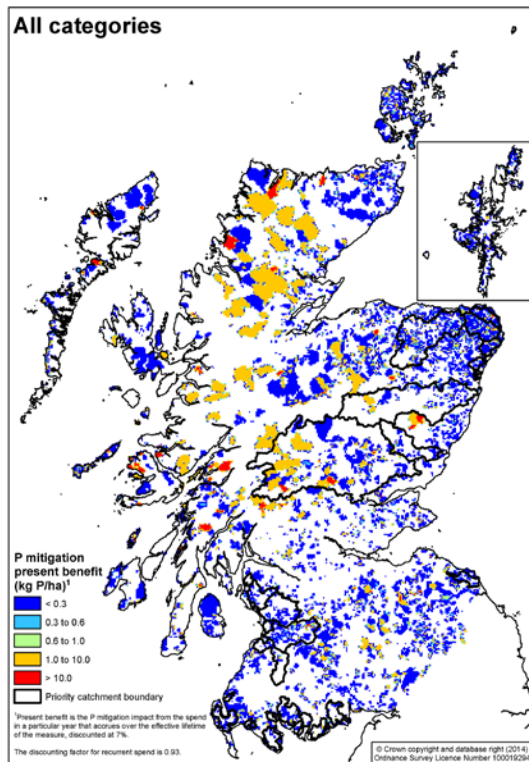
### **Impact indicator development**

The work reported develops a methodology to provide an impact indicator for relevant agri-environment payments (principally Scotland Rural Development Programme (SRDP) water quality options) funded in Scotland from 2007-2013. The Rural Priority options were grouped into several categories according to likely impact on water quality: Manure/slurry storage; Arable reversion to grassland; Low intensity grazing; Water margins; Organic farming; Create, restore and manage wetlands; Extended hedges and grass margins; Restoration of floodplains; Biodiversity of in-by land.

The pollutant that is most frequently associated with failure of Scottish fresh waters to meet good ecological status (GES) is phosphorus (P) in the form of inorganic phosphate. A rationale for the estimation of the impact of each of the categories of measure on P loads to water, has been devised. To calculate these impacts of SRDP on P loads on a 1km<sup>2</sup> scale a Geographic Information System process has been described in a handbook developed by James Hutton Institute (JHI). This enabled processing of field level data by the Scottish Government's Geographic Information Science and Analysis Team (GISAT) in conjunction with the Rural and Environment Science and Analytical Services (RESAS) division. Data was supplied by the Rural Payments and Inspections Directorate (SGRIPID). The output was a set of maps presenting the impact of these measures at 1km<sup>2</sup> scale across Scotland.

### **Results**

The impacts on the annual amount of Total Phosphorus transported by river water bodies to their outlets have been summarised by JHI for individual categories and in total, at national and priority catchment (PC) scales. An impact indicator based on the average concentration



of TP and the standard for good ecological status has been determined for each PC. Figure 1 and Table 1 summarises the findings.

**Figure 1.** Estimated impact on Total P loads of all SRDP measures likely to impact water quality.  
*Note: Priority catchment areas are outlined in black.*

Category F measures, Creation and management of woodland and Category J measures, creation, management and restoration of wetlands have had the strongest impact on P loads, each accounting for 45% of the P loads mitigated, a total of 2.7 kt TP) The strongest overall impact of SRDP measures on

water quality status is likely to be in the Buchan coastal and Ugie catchments.

Category	Category name	No. of 1km <sup>2</sup> squares affected	Impact (kt P mitigated)
A	Manure/slurry storage and treatment	1730	0.010
B	Arable reversion to grassland	58	0.000
F	Woodland creation	8394	1.367
G	Low intensity grazing	17820	0.061
H	Water margins	1957	0.002
I	Organic farming	1726	0.000
J	Create, restore and manage wetlands	3946	1.334
K	Extended hedgerows and grass margins	2891	0.001
M	Restoration of floodplains	566	0.225
N	Biodiversity cropping on in-bye land	253	0.000
<b>Sum of all categories</b>			<b>3.00</b>

**Table 1.** Number of 1km<sup>2</sup> squares affected and estimated present benefit impacts of SRDP measures on P loads from 1 km<sup>2</sup> squares and total impact across Scotland.

The methodology used, especially for the impact of woodlands on remote, west coast catchments, the impact of wetland creation, and the method for accumulating impacts over multiple years, will benefit from further review, now that the initial spatial datasets have been generated and output of the analysis assessed.

An approach for cost:effectiveness analysis (CEA) of SRDP measures for mitigating TP loads to standing waters at catchment scale has been described, which illustrates the sensitivity of the measures employed to target P load reductions. This approach could aid design of catchment scale measures for the next SRDP round.

### **Conclusion**

There is likely to be, over the long term, a net present benefit through the impact of SRDP measures on P loads to water across Scotland. A large proportion of this impact is associated with two measures, creation of woodland and creation, restoration and management of wetlands. The benefits of money spent on these measures is larger partly because they continue to accumulate over time. However, more data on the previous land use on which these measures have been introduced is needed to confirm this.

The impacts on river ecological status of SRDP measures vary greatly across Scotland, with most impact in the Buchan coastal and Ugie catchments, and very small impacts in many of the priority catchments in SW Scotland.

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