Final River Basin Management Plans

Background Documentation

Alternative Objectives: Approach to Extended Deadlines

July 2010

NDP
NATIONAL DEVELOPMENT PLAN

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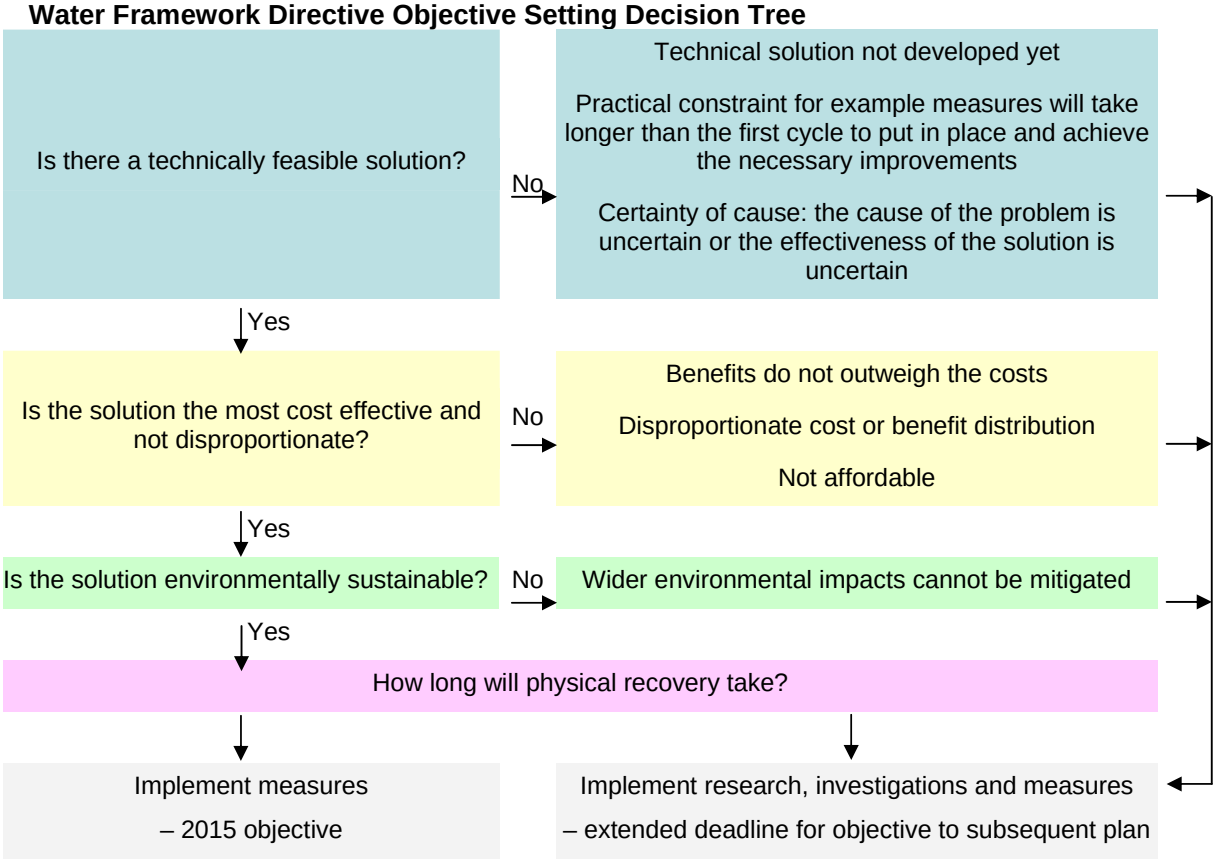
1.0 Introduction

This document summarises the cases for extended deadline exemption which are detailed in the final River Basin Management Plans for the North Western, Neagh Bann, Shannon, South Eastern, South Western and Western River Basin Districts. The exemptions are based on the Water Framework Directive objective setting decision tree.

Water Framework Directive Objective Setting Decision Tree



The development of extended deadlines was undertaken under the review and guidance of several organisations. Consultations were held with:

- National Advisory Committee
- Department of the Environment, Heritage and Local Government
- National Parks and Wildlife Service
- Environmental Protection Agency
- Office of Public Works
- Teagasc
- Department of Agriculture Fisheries and Food

The purpose of consultations was to ensure the scientific robustness of the technical decisions made, and to ensure that the extended deadlines do not impinge on the achievement of objectives under other environmental legislation.

The following cases for extended deadlines are presented in this report:

- Wastewater treatment plant discharges;
- Mines and Contaminated Lands – discharges to groundwaters;
- Agriculture: Nitrogen losses from agriculture to groundwaters;
- Agriculture: Phosphorus losses from agriculture to surface waters by runoff;

- Agriculture: Phosphorus losses from agriculture to surface waters via groundwater pathways;
- Forestry – acidification risks;
- Chemical pollution and chemical status failures – priority substances and specific pollutants;
- Morphology – channelisation risks;
- Morphology – overgrazing risks;
- Nitrogen losses to estuaries;
- Delayed recovery of highly impacted sites.

Each case is described under the following headings:

- Pressure / Reason for extended deadline;
- Precise Type of Exemption being sought (for example technical constraint or physical recovery as per the Decision Tree);
- Specific Reason for Exemption – this outlines the technical reasons as to why Good Ecological Status is not achievable by 2015;
- Quality Elements thought likely to fail – based on the technical reasons, this outlines the elements for which GES is unlikely to be achieved by 2015;
- Date – proposed extended deadline;
- Conclusion – Case summary;
- Action – Follow up action required.

The exemptions were based on district level analysis of pressure and risk datasets supplemented by cases based on detailed local information brought forward by Local Authorities (which have the responsibility for setting objectives in the River Basin Management Plan under the Water Policy Regulations 2003 (as amended).

Note that economic assessment is required where it is necessary to determine whether a particular measure should be applied or whether less stringent objectives or deferred objectives should be set on the basis of disproportionate cost. Guidance on economic assessment and a baseline report on the economic analysis of water use in Ireland are available as economic background documents to river basin management plans on www.wfdireland.ie. The Environmental Protection Agency has begun some additional work with regard to quantifying the benefits of the water environment. Economic analysis has not been used to justify deferral of measures or extension of objectives in the North Western, Neagh Bann, Shannon, South Eastern, South Western and Western River Basin Districts.

2.0 Wastewater Discharges from Some Treatment Plants

Pressure / Reason
Wastewater discharges from some treatment plants

The precise type of exemption being sought
Extended Deadline: Technical constraint – practical constraint

The specific reasons the exemption is being proposed
Wastewater treatment plant upgrades have been prioritised on the basis of compliance with the urban wastewater treatment regulations requirements, operational problems (overloading or insufficient assimilative capacity), known impacts in receiving water quality and discharges in proximity to protected areas. This prioritised list has been considered alongside the Water Services Investment Programme (WSIP) review and an EPA risk based priority list. Priority upgrades required within the catchments of designated Shellfish waters have been identified in Pollution Reduction Programmes and likewise those for Freshwater Pearl Mussels have been identified in Sub-basin Management Plans.

The time required to plan and design upgrades to treatment plants and to achieve approvals and licensing means it is not technically possible to achieve good status in 2015. Case by case assessment was undertaken by Local Authorities to identify water bodies where infrastructure provision is critical to achieving good status and where such practical constraints exist.

The quality elements thought likely to fail
Mainly phosphorus levels or oxygen conditions supporting ecological status.

Date
2021 (Local Authority case by case assessment)

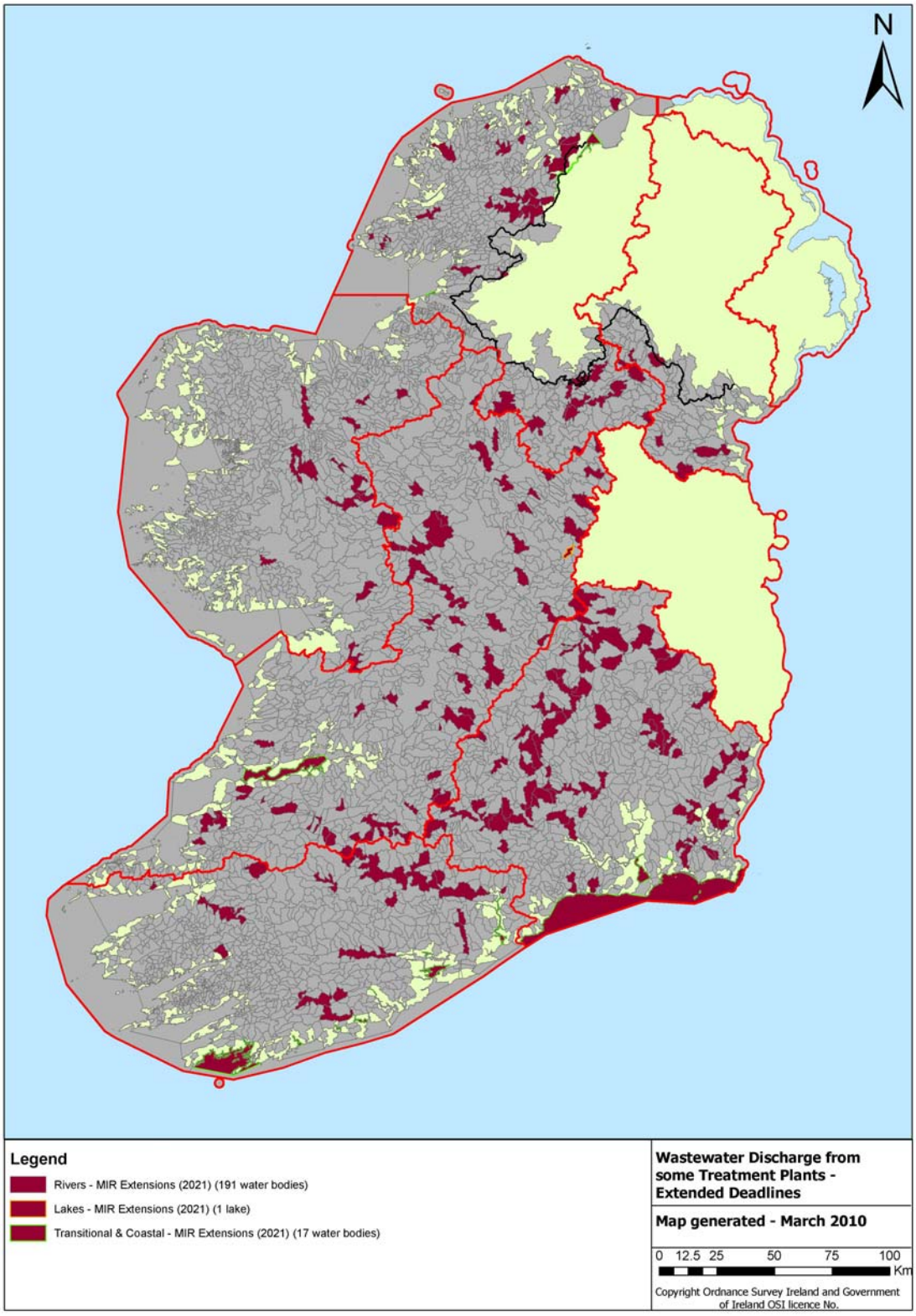
Conclusion – the relevant objective deadlines for receiving water bodies were extended on the basis that there are practical constraints preventing good status being achieved by 2015.

Action – Local Authorities to upgrade plants through the Water Services Investment Programme and operate and manage plants in accordance with discharge authorisation.

Table 2.1 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	33	6	55	65	19	13
Lakes	0	1	1	0	0	0
Transitional	1	1	2	2	5	0
Coastal	1	0	0	1	2	0
Groundwater	0	0	0	0	0	0

Map 1 Wastewater Treatment Plant extensions – Rivers, Lakes, Transitional, Coastal



3.0 Mines, Urban and Contaminated Lands

Pressure / Reason
Groundwater point source risks (mines, urban and contaminated lands)

The precise type of exemption being sought
Extended Deadline: Physical Recovery - Scientific data indicates status recovery extends beyond 2015.

The specific reasons the exemption is being proposed
Site specific investigation and restoration programmes are needed for waters impacted by contaminated land, urban areas and mine sites. Where substantial impact has taken place (for example polluted groundwaters below urban areas or historical contaminated lands or mining activities), scientific data indicates that status recovery may take a significant number of years, possibly more than three planning cycles (18 years).

In some cases there may be a requirement to develop less stringent objectives for waters as it may not be possible for this recovery to take place within three planning cycles or a disproportionate cost analysis (evaluating environmental benefits) may indicate that the required measures (which may be very costly) would not be economically justified.

The quality elements thought likely to fail
Chemical and supporting elements affecting ecological status

Date
Mines 2027; contaminated sites and urban lands 2021

Conclusion
The objective deadlines for relevant water bodies were extended to allow time for recovery following site specific restoration plans.

Action
EPA propose to co-ordinate environmental research in addition to the ongoing monitoring of these sites in order to address knowledge gaps. This will help to identify potential technical solutions to control pollution from these sites.

The Department of the Environment, Heritage and Local Government are transposing Directive 2006/21/EC of the European Parliament and of the Council on the management of waste from extractive industries. Under Article 20 the Environmental Protection Agency and Geological Survey Ireland are preparing an inventory of closed sites 'which cause serious negative environmental impacts or have the potential of becoming, in the medium or short term, a serious threat to human health or the environment'. This joint study assessed over 100 sites in 32 mining districts, ranging in size from the largest historic mine sites in Ireland, where mining took place in recent decades, to smaller sites where there has been little or no mining activity for many decades. An inventory of quarries is to be completed by May 2012. The project will result in:

- An ***Inventory*** of historic mine sites in Ireland, compiled in digital and GIS format;
- A compilation of all relevant information on each site in ***GIS format*;**
- ***Site Investigation and Characterisation Reports*** for each of the sites; and
- A methodology for ***Risk-Ranking*** these sites to establish the level of risk to the environment and to human and animal health associated with them.

Future steps for this project involve the completion, publication and dissemination of the report in 2010. A technical workshop is proposed to focus on the information collated and look at short and medium term intervention as well as longer term remediation steps.

At present a feasibility study on remedial works and a long term management plan are being progressed for Avoca under the funded studies of Department of Communications, Energy and Natural Resources. A comprehensive remediation project is currently underway at

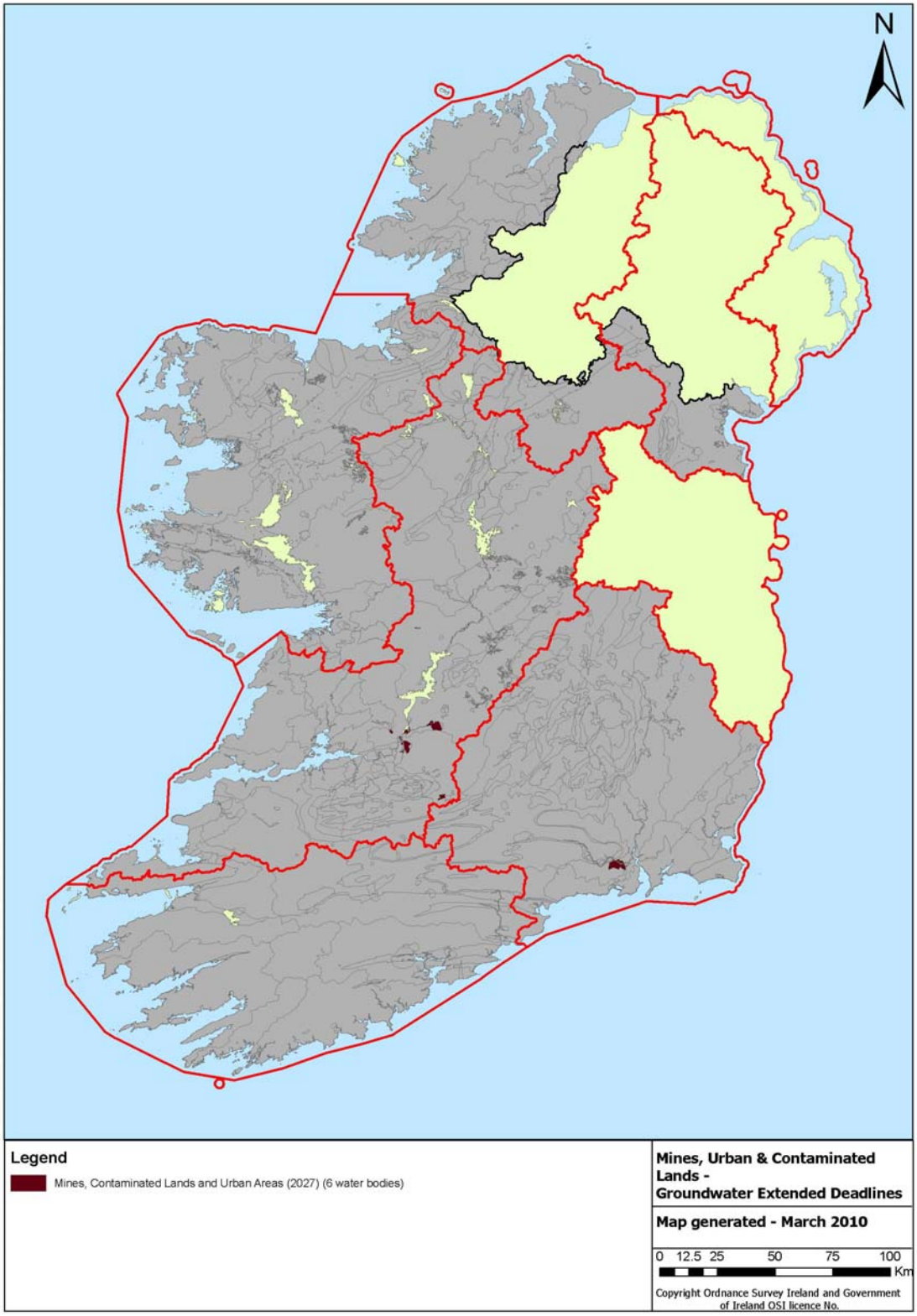
Silvermines. Further monitoring of Waterford urban area will be undertaken under the Water Framework Directive monitoring programme. Contaminated site remediation is enforced by the EPA where an Integrated Pollution Prevention and Control or Waste license exists. Further assessment and costing of the measures for contaminated land sites that impact on water quality is required leading to review of the objectives and economic assessment in 2015. It should also be noted that there are other such sites posing water quality risks and if the WFD monitoring programme identifies additional status impacts these sites will have to be investigated.

Table 3.1 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	0	0	4	2	0	0
Lakes	0	0	0	0	0	0
Transitional	0	0	0	0	0	0
Coastal	0	0	0	0	0	0
Groundwater	0	0	4	2	0	0

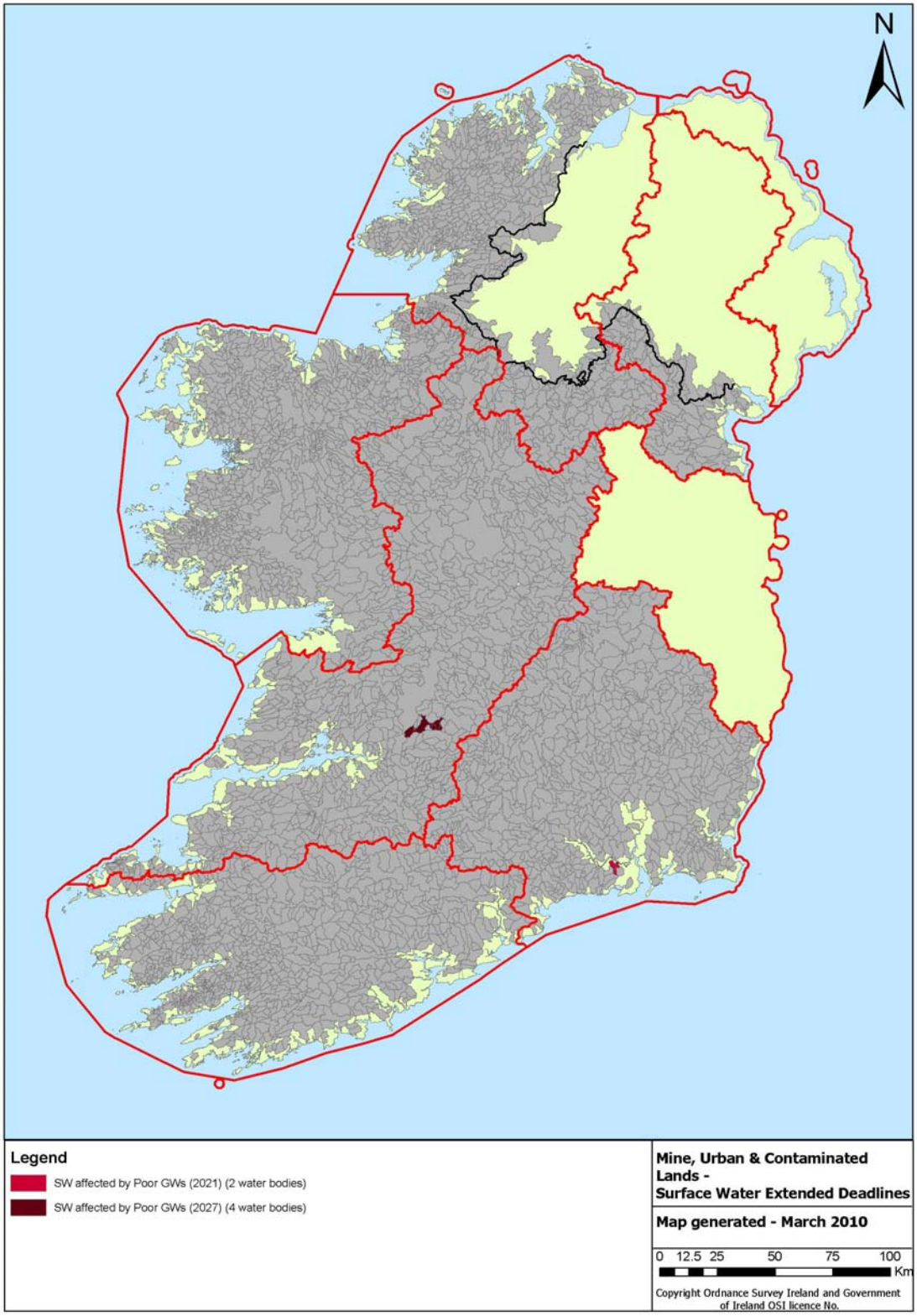
Map 2 Mines, Urban and Contaminated Lands extensions

Groundwaters



Map 3 Mines, Urban and Contaminated Land extensions

Rivers



4.0 Agriculture

4.1 Nitrogen Losses

Pressure / Reason
Nitrogen losses from agriculture to groundwaters.

The precise type of exemption being sought
Extended Deadline: Physical Recovery - Scientific data indicates status recovery extends beyond 2015.

The specific reasons the exemption is being proposed
The Good Agricultural Practice (GAP) regulations have been introduced. Scientific studies undertaken by Teagasc have calculated the recovery timescale for nitrates to reduce in the soil root zone and unsaturated zone due to changes in agricultural practice and to flush through the groundwater body. This study relates to the physical settings of the two impacted groundwater bodies in Ireland. Recovery of elevated nitrate levels in groundwaters bodies is expected to take place in approximately 20 years even with full implementation of the GAP regulations (Ref *Fenton et al*, in press).

The quality elements thought likely to fail
Nitrogen levels in groundwaters.

Date
2027

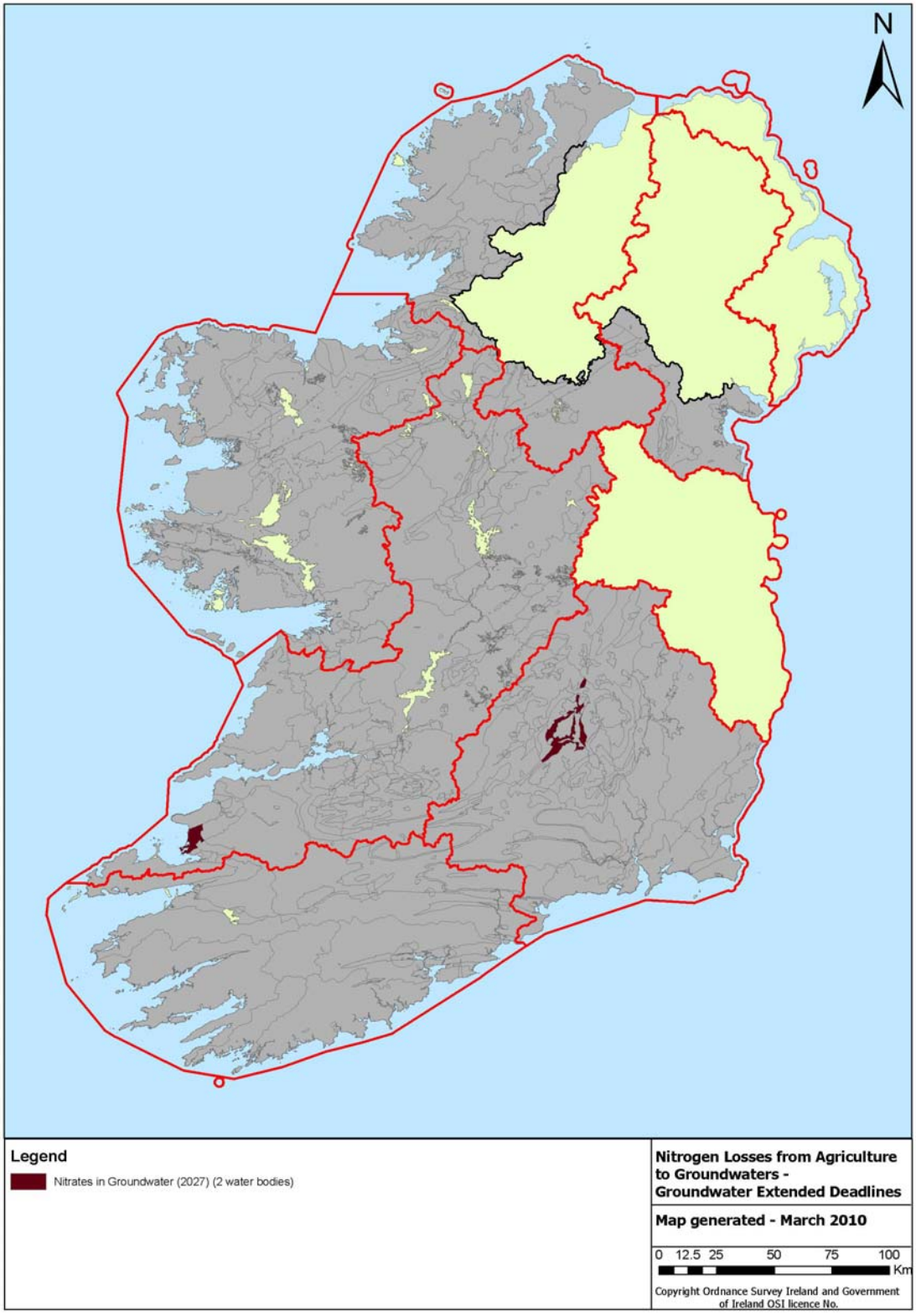
Conclusion
The objective deadlines for relevant water bodies were extended to allow time for recovery following implementation of the GAP regulations.

Action
Agricultural catchment programmes (ACP) are underway and a review of the Nitrates Action Plan commenced in December 2009; the findings of these activities will determine if further agricultural measures are required. Until the ACP findings are available there is no evidence that additional or supplementary agricultural measures would be effective in these areas. The EPA will continue to monitor status and trends under WFD programmes. Local authorities will review objectives if necessary.

Table 4.1 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	0	0	0	0	0	0
Lakes	0	0	0	0	0	0
Transitional	0	0	0	0	0	0
Coastal	0	0	0	0	0	0
Groundwater	0	0	1	1	0	0

Map 4 Agriculture – nitrate in groundwater extensions



4.2 Phosphorus (Runoff)

Pressure / Reason
Phosphorus losses from agriculture to surface waters by runoff.

The precise type of exemption being sought
Extended Deadline: Physical Recovery - Scientific data indicates status recovery extends beyond 2015.

The specific reasons the exemption is being proposed
In some areas it is projected that it will take time for high soil P nutrient levels to reduce even after changing agricultural practices in compliance with the GAP regulations and therefore nutrient losses to waters may persist. Teagasc has undertaken a scientific study of soil P reduction at field level with an average recovery time of 7 to 15 years. Slow recovery areas have been identified at a river water body scale using an EPA risk based model overlying datasets for high agricultural intensity (>1.8 lu/ha) or within a 10 km radius buffer around intensive agricultural enterprises with areas where soil P desorption will be slow (for example wet and gley soils). These datasets have been supplemented with Local Authority expert knowledge of catchment conditions (Limerick, Louth, Monaghan and Cavan). The downstream catchment effect on lake recovery is dependant on river recovery timescale. Lake catchments that include river water bodies with slow recovery rates and are impacted by elevated nutrient concentrations and/or eutrophication have also been identified (Ref Schulte et al, in press).

The quality elements thought likely to fail
Phosphorus levels supporting ecological status.

Date
2021

Conclusion
The objective deadlines for relevant water bodies were extended to allow time for recovery following implementation of the GAP regulations.

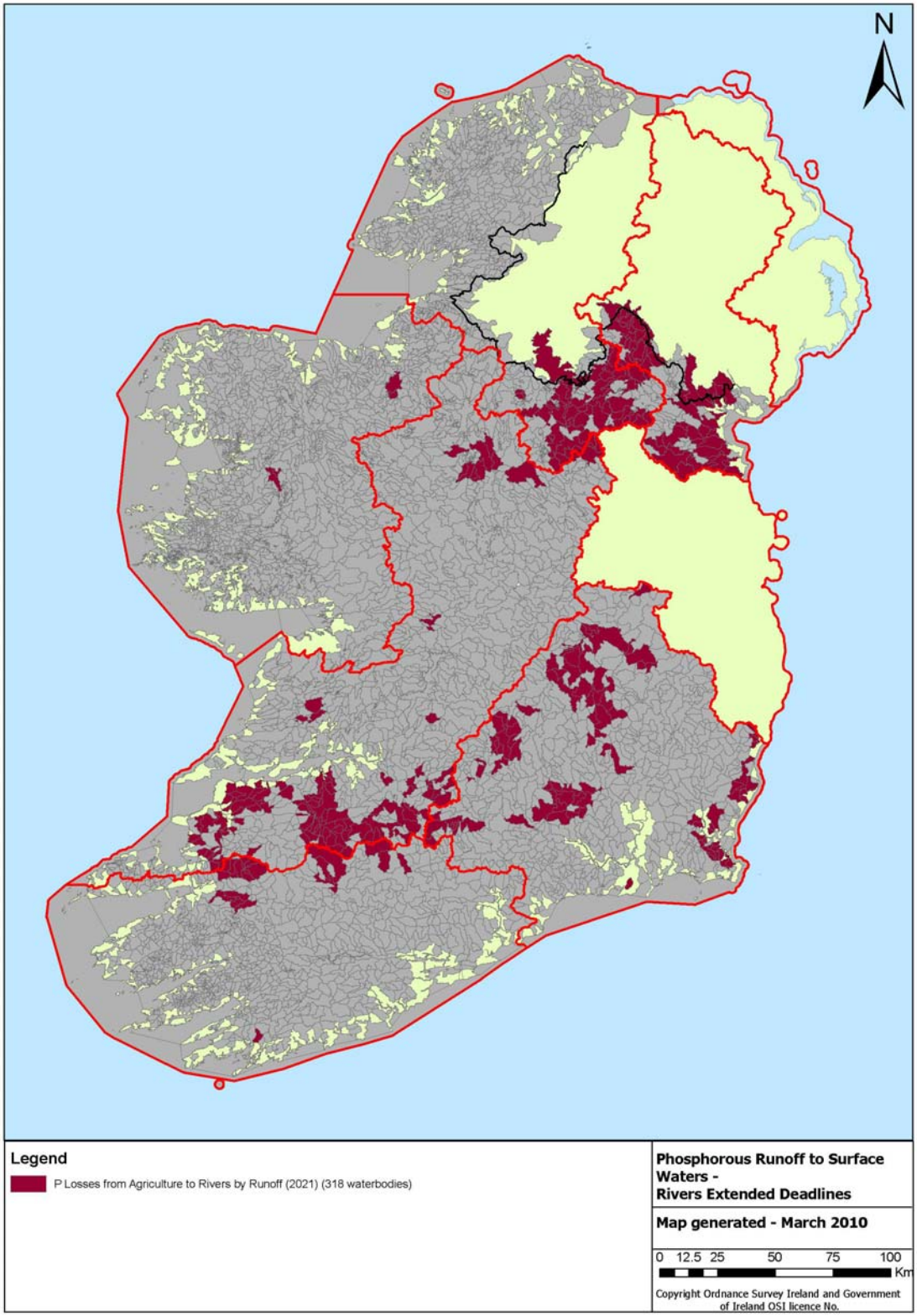
Action
Agricultural catchment programmes (ACP) are underway and a review of the Nitrates Action Plan commenced in December 2009; the findings of these activities will determine if further agricultural measures are required. Until the ACP findings are available there is no evidence that additional or supplementary agricultural measures would be effective in these areas. The EPA will continue to monitor status and trends under WFD programmes. Local authorities will review objectives if necessary.

Table 4.2 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	49	49	103	91	22	4
Lakes	51	10	5	0	1	1
Transitional	0	0	0	0	0	0
Coastal	0	0	0	0	0	0
Groundwater	0	0	0	0	0	0

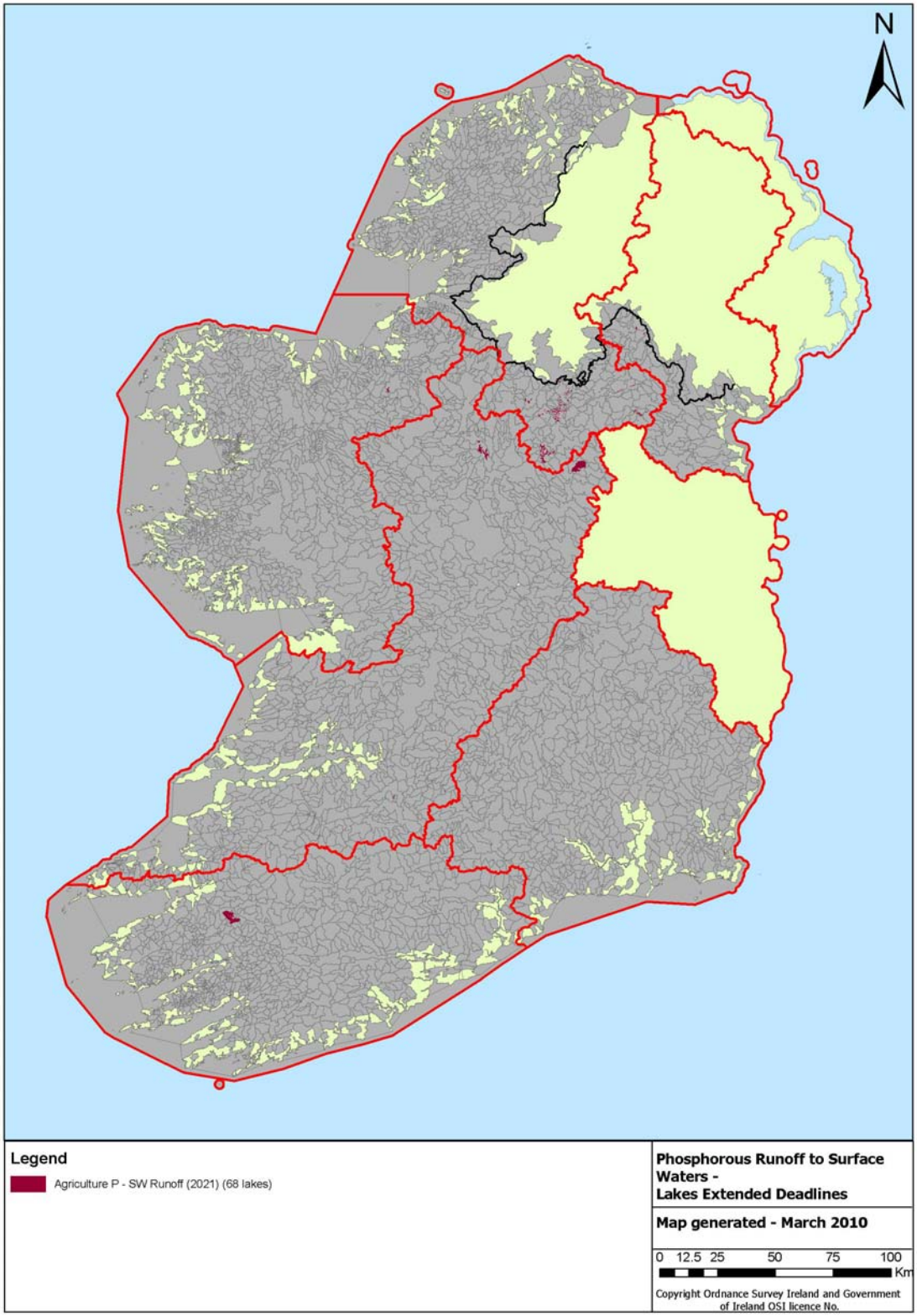
Map 5 Agriculture – phosphorus runoff to surface waters extensions

Rivers



Map 6 Agriculture – phosphorus runoff to surface waters extensions

Lakes



4.3 Phosphorus (Groundwater pathways)

Pressure / Reason
Phosphorus losses from agriculture to surface waters via groundwater pathways (karst).

The precise type of exemption being sought
Extended Deadline: Technical constraint - Certainty of cause of problem or benefit of solution.

The specific reasons the exemption is being proposed
The EPA has identified groundwater bodies that contribute significantly to surface water phosphorus loading in karst areas. A scientific agricultural catchment programme (ACP) is being undertaken by Teagasc in karst areas to identify what (if any) agricultural supplementary measures are required. The effectiveness of agricultural measures in karst settings in Ireland is yet to be determined by the ACP and further technical solutions have not been evaluated.

The quality elements thought likely to fail
Phosphorus levels supporting ecological status.

Date
2021

Conclusion
The objective deadlines for relevant groundwater bodies and their associated surface water bodies were extended to allow time to assess the effectiveness of existing agricultural measures and identify and implement any additional agricultural measures to the current GAP regulations.

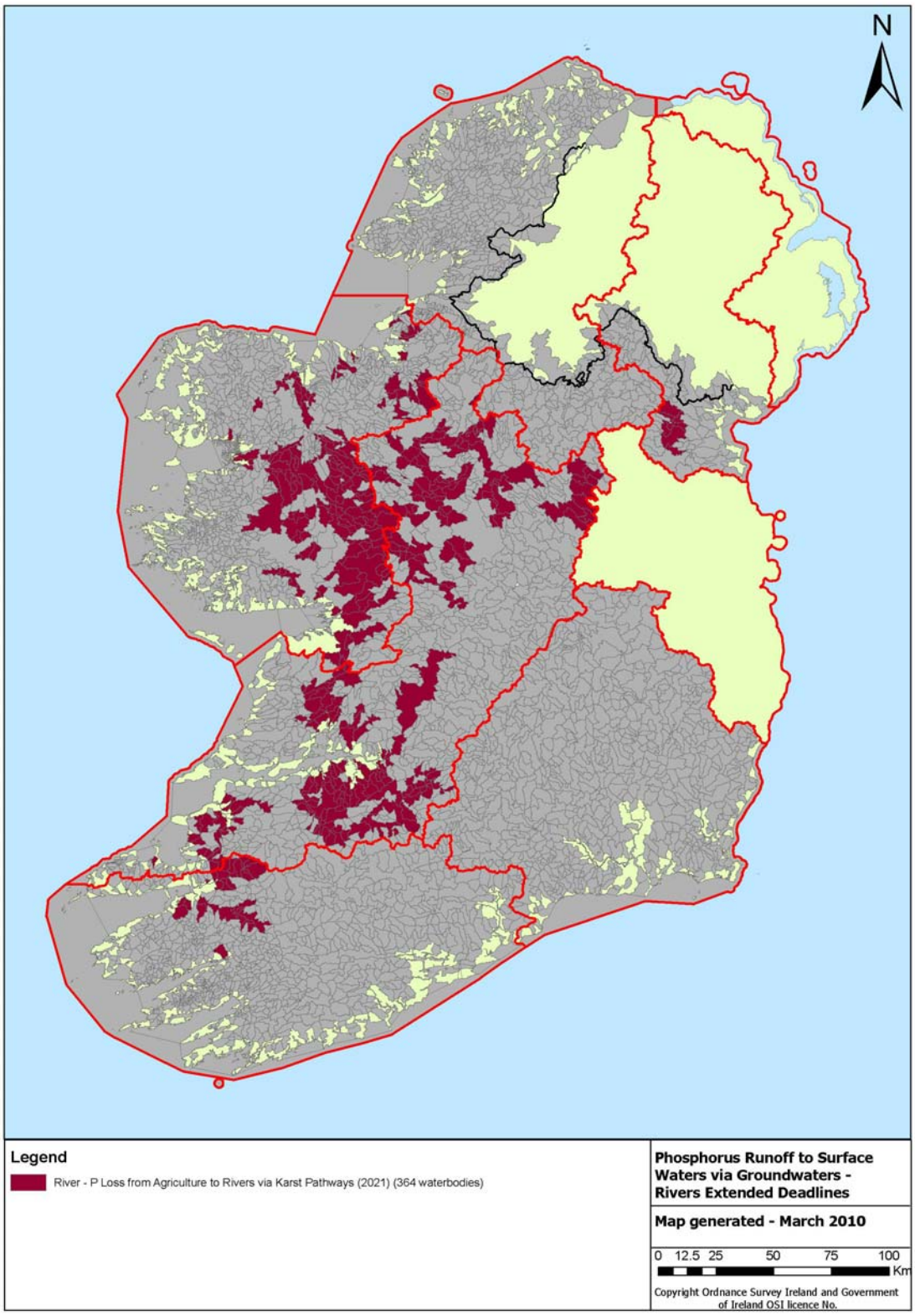
Actions
There are five key actions required to progress agriculture measures in karst areas:
- Agricultural catchment programmes are underway, the findings of which will determine if further agricultural measures are required, consequently water body objectives will be reviewed in light of these findings;
- Review of the Nitrates Action Plan commenced in December 2009; its findings will be incorporated into the Good Agricultural Practice Regulations and RBMP agricultural measures and water body objectives will be reviewed in light of these findings;
- DAFF are to increase farm inspections in karst areas under the GAP Regulations – karst areas with associated turloughs and oligiotrophic lakes and freshwater pearl mussel river water bodies should be considered for inspection prioritisation;
- NPWS are undertaking mapping of the zones of contribution of turloughs to focus measures on a more detailed scale than that of the groundwater body;
- DAFF are to consider, in the context of the next Rural Development Programme post 2013, piloting a targeted agri-environmental incentive scheme to promote environmentally friendly farming in the Lough Caragh catchment of the western lakes, which is a sensitive catchment underlain by karst geology.

Table 4.3 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	0	8	188	0	24	144
Lakes	0	4	30	0	1	14
Transitional	0	0	0	0	0	0
Coastal	0	0	0	0	0	0
Groundwater	0	2	56	0	5	34

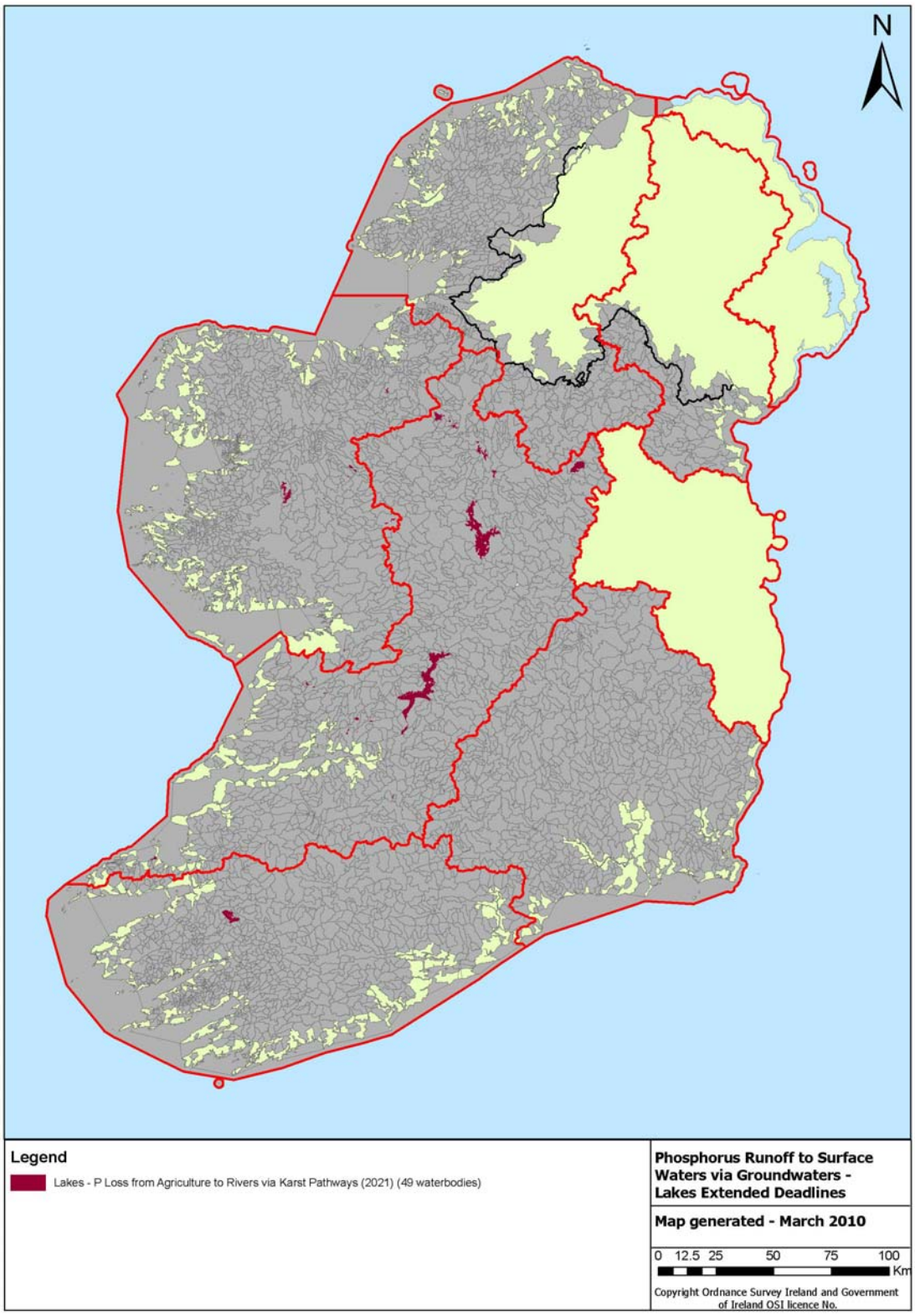
Map 7 Agriculture – phosphorus runoff to surface waters via groundwaters extensions

Rivers



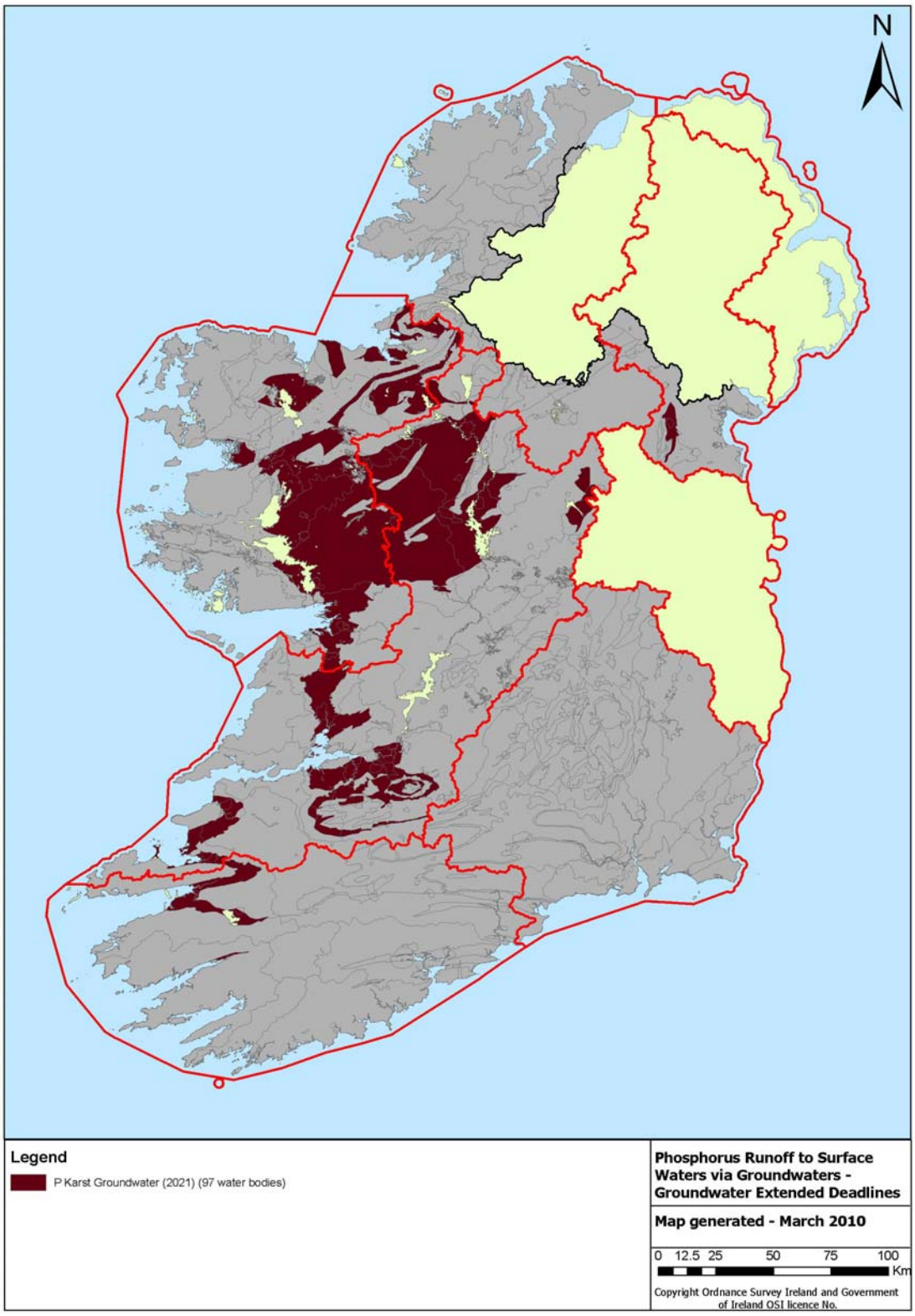
Map 8 Agriculture – phosphorus runoff to surface waters via groundwaters extensions

Lakes



Map 9 Agriculture – phosphorus runoff to surface waters via groundwaters extensions

Groundwaters



5.0 Forestry

Pressure / Reason
Forestry / acidification risks

The precise type of exemption being sought
Extended Deadline: Technical constraint - Certainty of cause of problem or benefit of solution.

The specific reasons the exemption is being proposed
Areas likely to be sensitive to acidification pressures have been mapped and possible additional measures to restore potential acidification impacts identified. These measures were developed by the Forest and Water Programme of Measures study, drawing on forestry research and codes of practice. While these measures are based on the best information available, the extent to which ecological restoration can be achieved, to the state that may or may not have existed prior to the establishment of forest cover, is not known. The impacts of acidification are not being detected in the overall monitoring programme and may be locally confined to smaller order streams. Investigation of the effectiveness of acidification measures is required to determine what measures will be effective in particular settings. The timescale of forestry measure implementation is dictated to some degree by a forest's life cycle (i.e. from initial afforestation or replanting to final clearfelling), which is several decades. The rate of a recovery due to acidification measures is not known but it is reasonable to expect that benefits would accrue gradually over time as the original forest cover is replaced under measures such as restructuring. The timescale for the investigative or pilot programme and implementation would require three cycles before measures can be evaluated, implemented and water quality responds.

The quality elements thought likely to fail
pH, invertebrates (also fishery spawning habitats are common in these smaller order streams)

Date
2027

Conclusion
The objective deadlines for relevant surface water bodies were extended to allow the pilot investigations to take place, subject to the additional requirements of the Freshwater Pearl Mussel Sub Basin Plans. In addition, all measures to address eutrophication and sedimentation impacts must be implemented (i.e. the specific acidification only measures are deferred). Status confidence is to be considered by the EPA.

Action
EPA and Fisheries Boards will undertake status monitoring to confirm impacts in 13 water bodies at risk from acidification where status is less than good. Forest Service will undertake the required investigative programme. Trialling of some acidification measures has recently commenced under the COFORD/EPA Hydrofor project. This is a multidisciplinary 5-year project to investigate the impacts of forests and forestry operations on Ireland's aquatic ecology. Results from the project will help to refine existing codes of practice on the sizing of clearfells, design guidelines for riparian woodland, buffer zones and possibly acidity buffering to protect biota in receiving waters from any adverse damage from soil and nutrient releases resulting from harvesting operations. The key aspects of the research are:

- Undertake a review of international and national literature on potential impacts of forestry on surface water quality with respect to acidification, eutrophication and sedimentation at the various stages in the forest life cycle;
- Compile a database of relevant data from previous projects dealing with forest surface water interactions and explore the data for relationships between factors;
- Undertake temporal and spatial assessment of the inputs from forest activities and impacts (acidification, eutrophication, sedimentation) from planting to felling, on the hydrochemical and ecological quality of water taking into account mitigation measures;

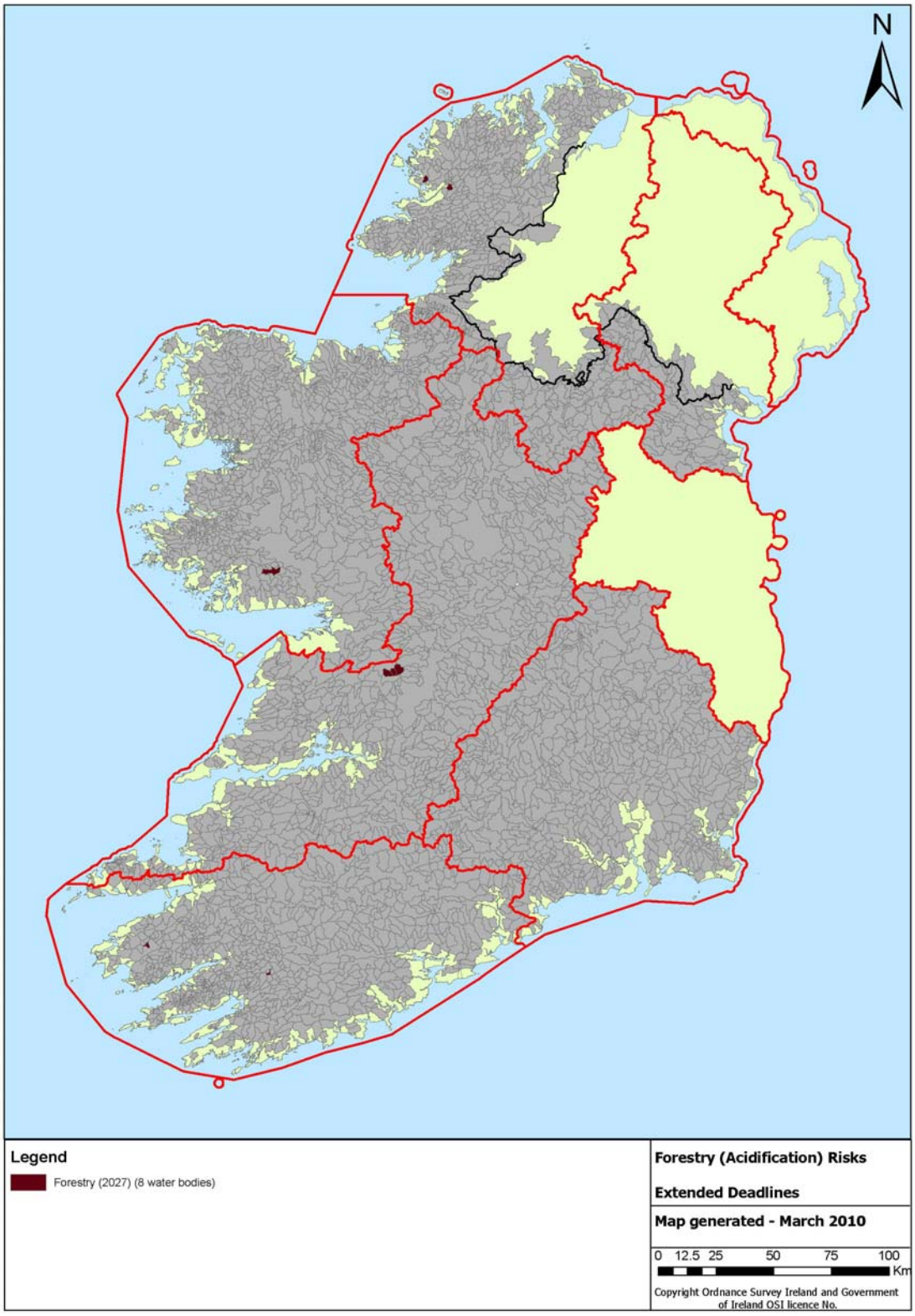
- Quantify nutrient and sediment losses to water in relation to the nature, scale and duration of forestry activities in a sub-set of instrumented catchments;
- Test the effectiveness of buffer strips in ameliorating inputs of nutrients and sediments from forest operations and consider design guidelines for the planning, construction and maintenance of buffer strips;
- Evaluate the likely impact of expansion of forest cover in Ireland on hydro-ecology.

Current research includes the study of the extent to which acidification pressures impact linearly downstream in a river catchment, riparian zone enhancement to provide compensatory productivity and drainage management studies. The Hydrofor project is due to report in 2014. Whilst the research is ongoing measures will be taken to maintain the gradual restructuring of forests in these areas through the development and implementation of forest design that creates greater diversity in the second and subsequent rotations.

Table 5.1 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	2	0	3	0	2	1
Lakes	0	0	0	0	0	0
Transitional	0	0	0	0	0	0
Coastal	0	0	0	0	0	0
Groundwater	0	0	0	0	0	0

Map 10 Forestry Extensions



6.0 Chemical Pollution and Chemical Status Failures

Pressure / Reason
Failures of chemical status by priority substances (mainly polyaromatic hydrocarbons PAH based on the limited dataset currently available) in all surface water bodies and chemical pollution (from specific pollutants) in transitional and coastal waters.

The precise type of exemption being sought
Extended Deadline: Technical constraint - Certainty of cause of problem or benefit of solution.

The specific reasons the exemption is being proposed
The national monitoring programme has been recently expanded to include a much boarder range of substances. More time is needed to determine the extent of chemical status non-compliance in surface waters and the extent of chemical pollution in transitional and coastal waters. Longer timescales are also required to identify the causes and sources of exceedences (for example PAH may be air borne and may turn out to be quite ubiquitous) and to investigate and implement measures.

The quality elements thought likely to fail
Priority substances, specific pollutants

Date
2021

Conclusion
The objective deadlines for relevant surface water bodies were extended to allow the sources and solutions for these chemical non-compliances to be investigated.

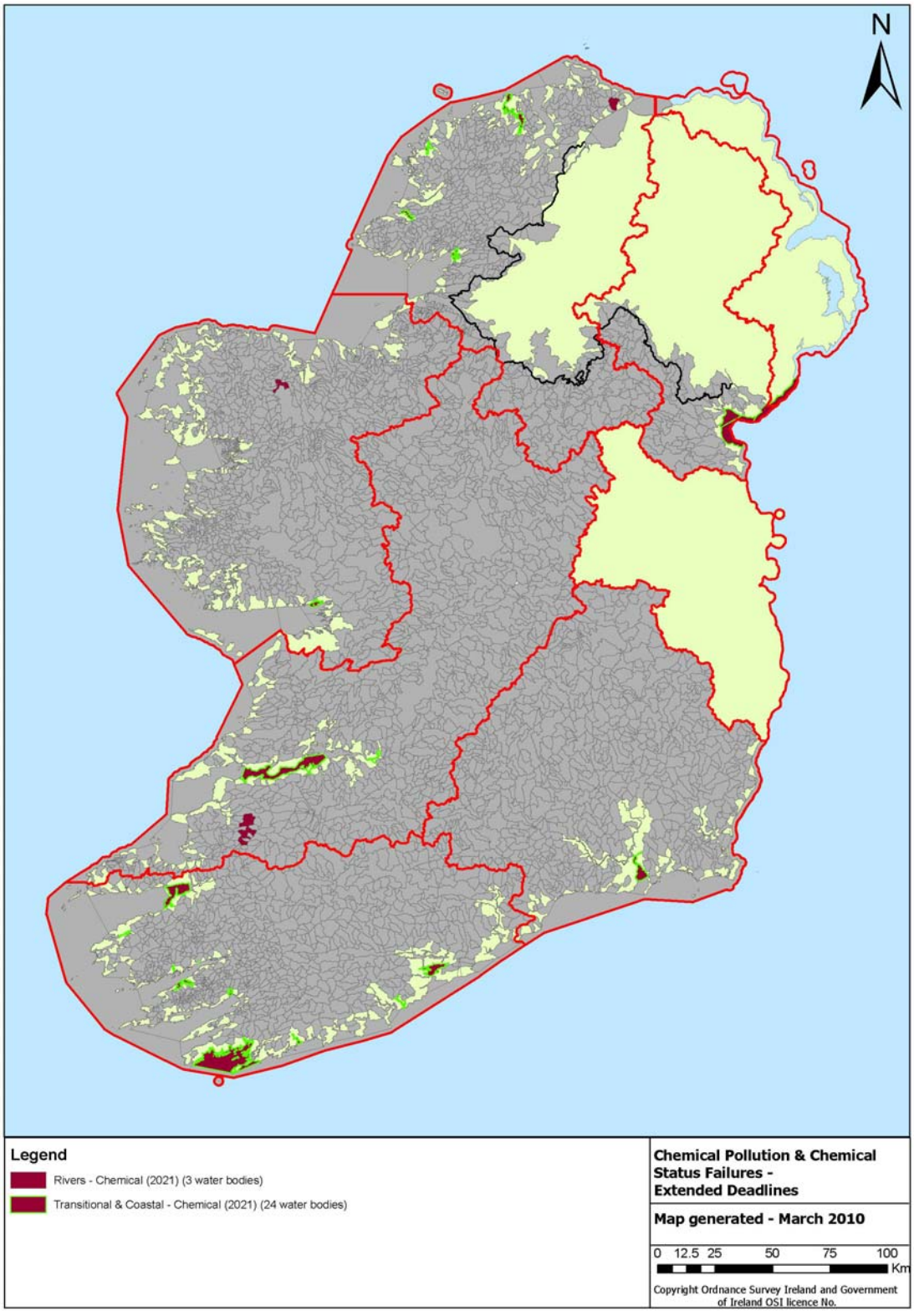
Action
EPA and Marine Institute will monitor waters and establish a register of emissions, discharges and losses of priority substances. Local Authorities will prepare pollution reduction programmes in accordance with the Surface Water Environmental Objectives Regulations.

Further review of objectives will be required in 2015 firstly as a result of additional status non-compliances and secondly to consider the likely timescales for implementation and recovery resulting from any measures proposed to address the sources of these non-compliances.

Table 6.1 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	1	0	1	0	0	1
Lakes	0	0	0	0	0	0
Transitional	5	1	2	1	9	1
Coastal	1	2	0	0	2	0
Groundwater	0	0	0	0	0	0

Map 11 Chemical Status Extensions



7.0 Morphology (Physical Modifications)

7.1 Channelisation

Pressure / Reason
Morphology / channelisation risks

The precise type of exemption being sought
Extended Deadline: Physical Recovery - Scientific data indicates status recovery extends beyond 2015

The specific reasons the exemption is being proposed
Measures are to assist recovery by prioritising impacted water bodies for river enhancement works. Water bodies with channelisation risks and good macroinvertebrate ratings but known poor fish status (indicating impact) have been identified for possible enhancement. Where impact is suspected but fish status is not available to confirm this, investigation is required.

Research in Ireland to date has demonstrated that certain forms of river enhancement works on drained channels, can significantly improve fish life while still maintaining channel conveyance capacity. Typical works include construction of a selection of in-stream low level structures such as vortex weirs, deflectors, rubble mats, creating pools, spawning beds combined, where appropriate, with bank stabilisation, riparian fencing and tree planting. The enhancement works introduce more in-stream physical diversity, mimicking a more natural channel form with a resultant positive ecological impact. Fish populations will take time to recover post river enhancement.

The quality elements thought likely to fail
Fish

Date
2021

Conclusion
The objective deadlines for relevant surface water bodies were extended to allow time for the measures to be implemented and recovery to take place.

Action
The OPW are responsible for water bodies relevant to Arterial Drainage Schemes (nationally 11 water bodies wholly and a portion of 2) and Local Authorities are responsible for those relevant to Drainage Districts (nationally 3 wholly and a portion of 2). Site specific supplementary measures will be investigated and detailed during the period 2010 – 2012. The primary technical feasibility criteria are sufficient water quality and gradient. Current expertise shows that project success requires a gradient of >0.2% (2m/km). Water bodies found to be technically feasible will have enhancement works implemented during 2012 – 2015. Recovery timescales are in the order of 5 – 10 years (depending on the river system) and consequently the objectives may require further review in 2015.

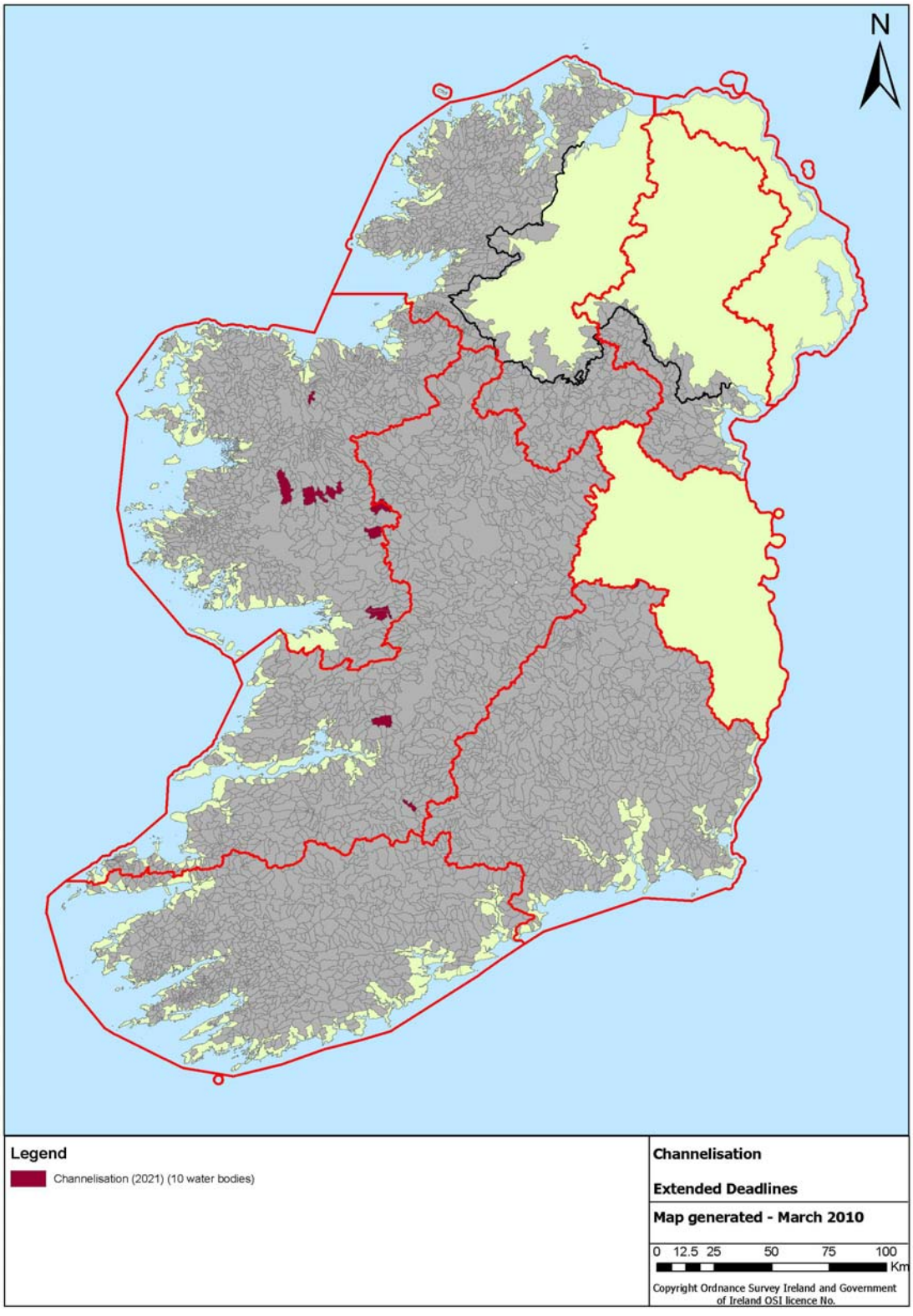
OPW are undertaking works to assist recovery in the Arterial Drainage Scheme water bodies and these works will be commenced under the current Environmental River Enhancement Programme (EREP) 2008 – 2012. This is a nationwide programme, funded by OPW, rolled out as a component of the national Arterial Drainage Maintenance Programme. The objective is to implement river enhancement works on arterially drained channels with a particular focus on Salmonids. Central Fisheries Board is contracted as the Service Provider. Their function includes, identifying scheduled scheme channels which will have optimum enhancement potential in terms of gradient, flow and bed regime for salmonids using existing data sources and augmenting with further surveys as appropriate, carry out pre and post works biodiversity and hydromorphological assessments at representative reaches scheduled for enhancement

and prepare enhancement designs and assist on-site supervision. OPW supply all construction materials and construct the works through its direct plant and labour force. Subject to resources, it is envisaged that the EREP will continue past 2012 and will be the primary mechanism to implement feasible hydromorphological measures on a long term basis for Arterially Drained catchments. Indicative resources are in the order of €1m/annum achieving various types of enhancement works on up to 50km/annum. Local Authorities are responsible for undertaking works to assist recovery in the Drainage District water bodies. EPA and Fisheries Boards will monitor catchments.

Table 7.1 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	0	0	2	0	0	8
Lakes	0	0	0	0	0	0
Transitional	0	0	0	0	0	0
Coastal	0	0	0	0	0	0
Groundwater	0	0	0	0	0	0

Map 12 Morphology – River Channelisation Extensions



7.2 Overgrazing risks (by expert judgement)

The precise type of exemption being sought

Extended Deadline: Physical Recovery - Scientific data indicates status recovery extends beyond 2015

The specific reasons the exemption is being proposed

Overgrazing pressures have been addressed by commonage destocking programmes in certain catchments. In some cases physical damage to rivers (e.g. bank erosion) will not recover naturally and may require physical enhancement works. These water bodies are of less than good status with likely poor fish status. Site-specific studies are needed to investigate, and if appropriate design and cost river enhancement works. However, physical recovery and recovery of fish populations take from 3 to15 years after river enhancement, so objectives may need review in 2015.

The quality elements thought likely to fail

Fish

Date

2021

Conclusion

The objective deadlines were extended in relevant water bodies to allow the measures to be implemented and recovery time to take place.

Action

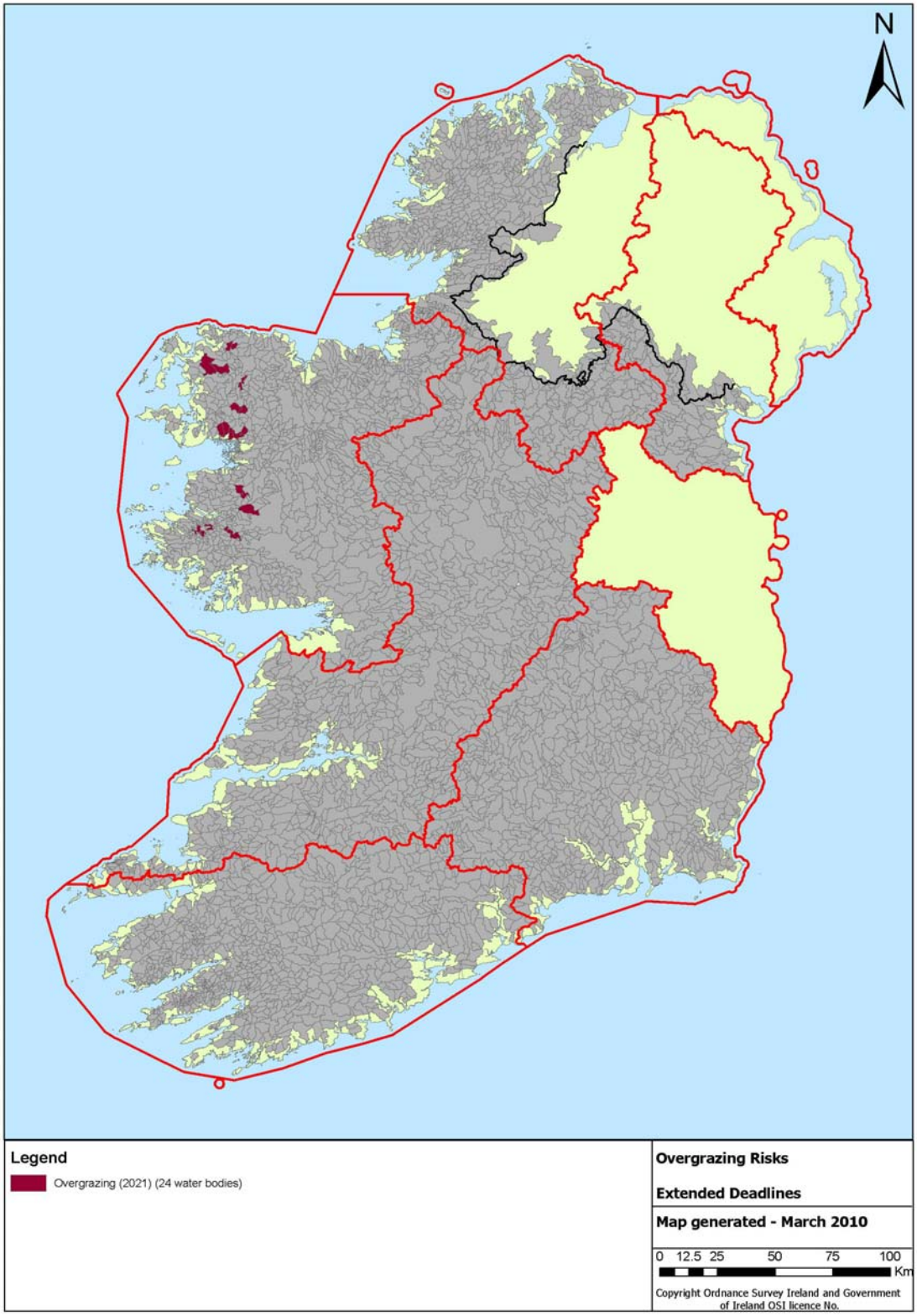
EPA and Fisheries Boards to undertake status monitoring to confirm impacts in 24 water bodies at risk from overgrazing. There are an additional 120 water bodies identified by expert judgement which require status assignment to be considered by the EPA to confirm if fish status reflects their current good / high classifications. EPA propose to co-ordinate environmental research to address knowledge gaps in relation to these sites. DAFF will monitor stocking rates in the relevant catchments to determine whether overgrazing pressures have been mitigated.

A site specific study is required to investigate, design and cost the works to assist recovery in these water bodies. Subject to these investigations and economic analysis implementation of the measures should be undertaken by OPW/CFB. Overgrazing studies and site specific supplementary river restoration measures would be investigated and detailed during the period 2010 – 2012 and implemented during 2012 – 2015. Recovery timescales are in the order of 3 – 15 years (depending on the river system) and consequently the objectives may require further review in 2015.

Table 7.2 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	0	0	0	0	0	24
Lakes	0	0	0	0	0	0
Transitional	0	0	0	0	0	0
Coastal	0	0	0	0	0	0
Groundwater	0	0	0	0	0	0

Map 13 Morphology – overgrazing extensions



8.0 Nitrogen Losses to Surface Water

Pressure / Reason
Eutrophication in transitional and coastal waters

The precise type of exemption being sought
Extended Deadline: Technical constraint - Certainty of cause of problem or benefit of solution.

The specific reasons the exemption is being proposed
Estuaries are eutrophic due to nitrogen inputs from upstream catchments. Evidence suggests that this may be due to elevated nitrogen in groundwaters resulting from land applications of nitrogen on free draining soils [Fenton, et al. in press]. These groundwaters may be contributing significant nitrogen loads to river catchments which discharge to the estuaries. This poses a technical constraint as the source of the problem has not yet been established with certainty and it is not yet clear what (if any) measures are required or how effective technical solutions would be. In addition once measures have been addressed the recovery is likely to be slow.

Pathways from surface freshwaters via groundwaters to receiving marine waters have been identified at a water body scale using a risk based approach. The EPA has identified groundwater bodies that contribute significantly to surface water nitrogen loading The approach identifies river water bodies at less than good status overlying these groundwaters, which contribute over 50% of the nitrogen load to receiving transitional and coastal water bodies that are themselves below good status and have median winter nitrate concentrations over 50% above 2.6 mg/l N target value (indicative of eutrophication).

Scientific studies undertaken by Teagasc have calculated the recovery timescale for nitrates to reduce in the soil root zone and unsaturated zone due to changes in agricultural practice under the GAP Regulations and to flush through the groundwater body. The recovery of elevated nitrate levels in groundwaters bodies is expected to take in excess of 6 years.

A further assessment has been made of the recovery timescales for the receiving transitional and coastal water bodies. Winter dissolved inorganic nitrogen (WDIN) exceedances (tonnage) were assessed against the water exchange rates (calculated from relative water residence times, as per Painting et al, 2007) for marine water bodies to estimate nitrogen exceedance trends. This value was compared to riverine input and sectoral source apportionment established from OSPAR riverine input calculations. Objective deadlines have been extended for less than good status marine waters, where diffuse sources are the main nitrogen input and significant temporal WDIN exceedances occur. This is based on the Irish reporting of the PARCOM Recommendation 88/2 on the Reduction in Inputs of Nutrients to the Paris Convention Area which has established that over the reporting period of 1995 to 2005 there has been a 4% reduction in nitrogen discharges/losses from diffuse sources, consequently recovery timescale will take place beyond 2015.

The quality elements thought likely to fail
Eutrophication in transitional and coastal waters

Date
2021

Conclusion
The objective deadlines for relevant surface water bodies were extended to allow the sources and solutions for this eutrophication impact to be investigated.

Action
EPA and local authorities will monitor and review objectives under WFD programmes. Agricultural catchment programmes (ACP) are underway and a review of the Nitrates Action Plan commenced in December 2009; the findings of these activities will be reviewed where

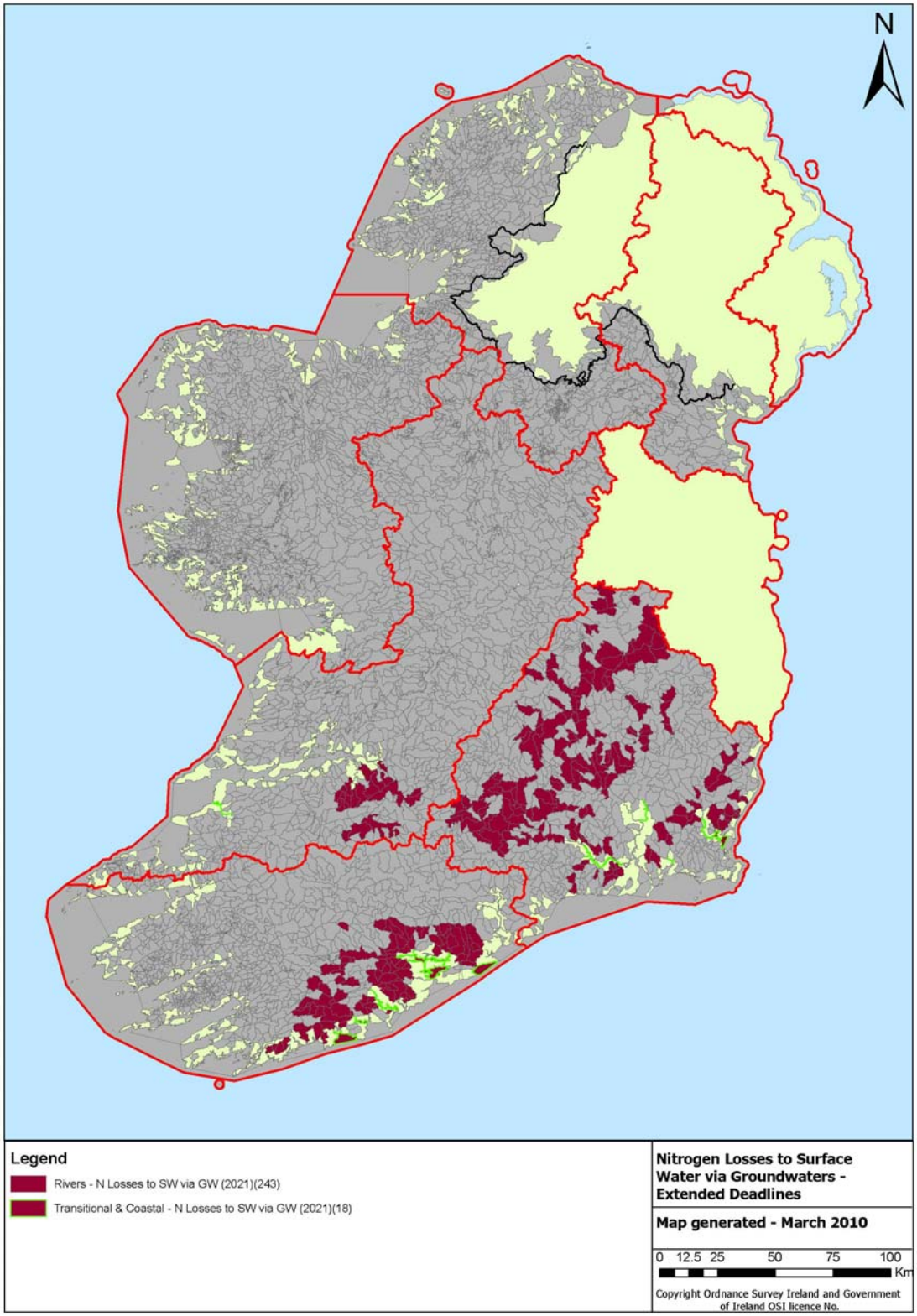
relevant. Until the ACP findings are available there is no evidence that additional or supplementary agricultural measures would be effective in these areas.

Table 8.1 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	0	0	18	144	81	0
Lakes	0	0	0	0	0	0
Transitional	0	0	1	4	9	1
Coastal	0	0	0	0	3	0
Groundwater	0	0	0	0	0	0

Map 14 Nitrogen losses to surface waters

Rivers, Transitional, Coastal



9.0 Status Recovery Timescales

Pressure / Reason
Highly impacted water bodies where status recovery timescale is delayed

The precise type of exemption being sought
Extended Deadline: Physical Recovery - Scientific evidence indicates status recovery exceeds 6 years (2009 – 2015)

The specific reasons the exemption is being proposed
RecentEnvironmental Protection Agency water quality surveys show improvements resulting from the introduction of basic measures such as the nitrates action programme and investment in wastewater treatment plant upgrades. 4% of rivers have improved from below good status to at least good status during the past four reporting periods:

	95-97	98-00	01-03	04-06	07-08
A - unpolluted	66.9	69.8	69.2	71.4	70
B - slightly polluted	18.2	17	17.9	18.1	19
C - moderately polluted	14.0	12.4	12.3	10.0	11
D - seriously polluted	0.9	0.8	0.6	0.6	0.5

The most recently published annual data (07 – 08) shows a further reduction in seriously polluted sites due to targeted action, this rate of recovery would be expected to increase as a result of implementing river basin management plans. However EPA surveys suggest that recovery is slower for waters where status is more than one band below good (i.e. poor or bad).Consequently, it is considered that during the first plan period some bad status water bodies may only improve by one status class to poor status and some poor status water bodies may only improve one status class to moderate status. Recovery rates have been assessed by Local Authorities on a case-by-case basis considering the pressures acting. It is expected that, as a result of the complex mix of pressures present and the level of impact restoration of status to good in certain poor and bad status sites will extend beyond the first plan period.

In addition, it is anticipated that some of the measures in the freshwater pearl mussel Sub-basin Management Plans may not be fully implemented by 2015. Natural recovery timescales suggest that there will be insufficient improvement by 2015 in the species' habitat to allow the quality elements to pass the criteria in the FPM Regulations. Consequently, the species and its habitat will remain in unfavourable conservation status beyond the first plan period.

The quality elements thought likely to fail
Overall ecological status

Date
2021 / 2027

Conclusion
The objective deadlines for relevant surface water bodies were extended to allow time for the measures to be implemented and recovery to take place.

Action

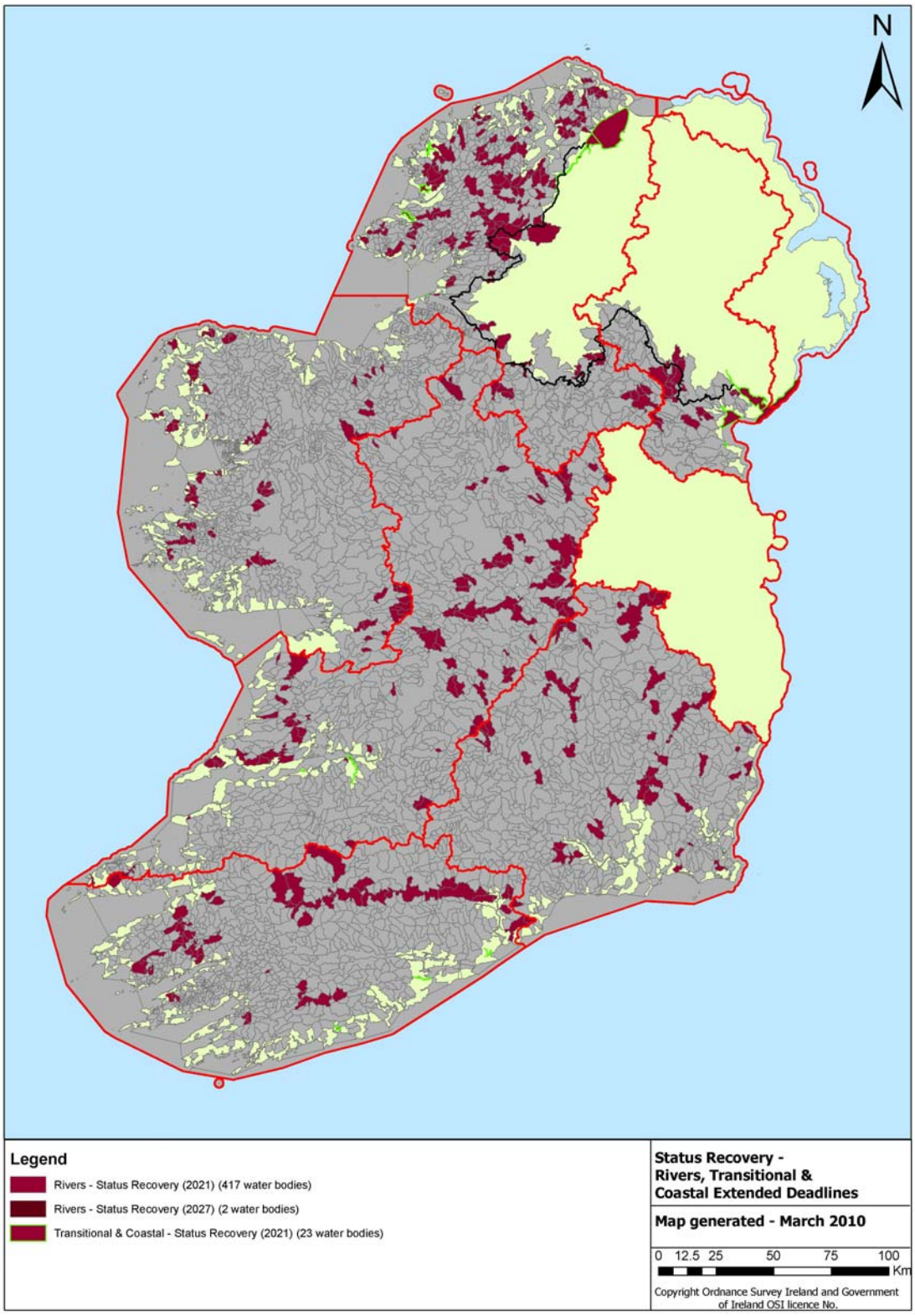
EPA will monitor and report on status recovery rates. Implementation of Sub-basin Management Plans in accordance with the FPM Regulations (SI 296 of 2009).

Table 9.1 Number of Water Body Extensions by River Basin District

	NWRBD	NBRBD	ShRBD	SERBD	SWRBD	WeRBD
Rivers	134	15	90	46	54	80
Lakes	7	0	3	0	0	2
Transitional	6	7	2	0	3	0
Coastal	3	2	0	0	0	0
Groundwater	0	0	0	0	0	0

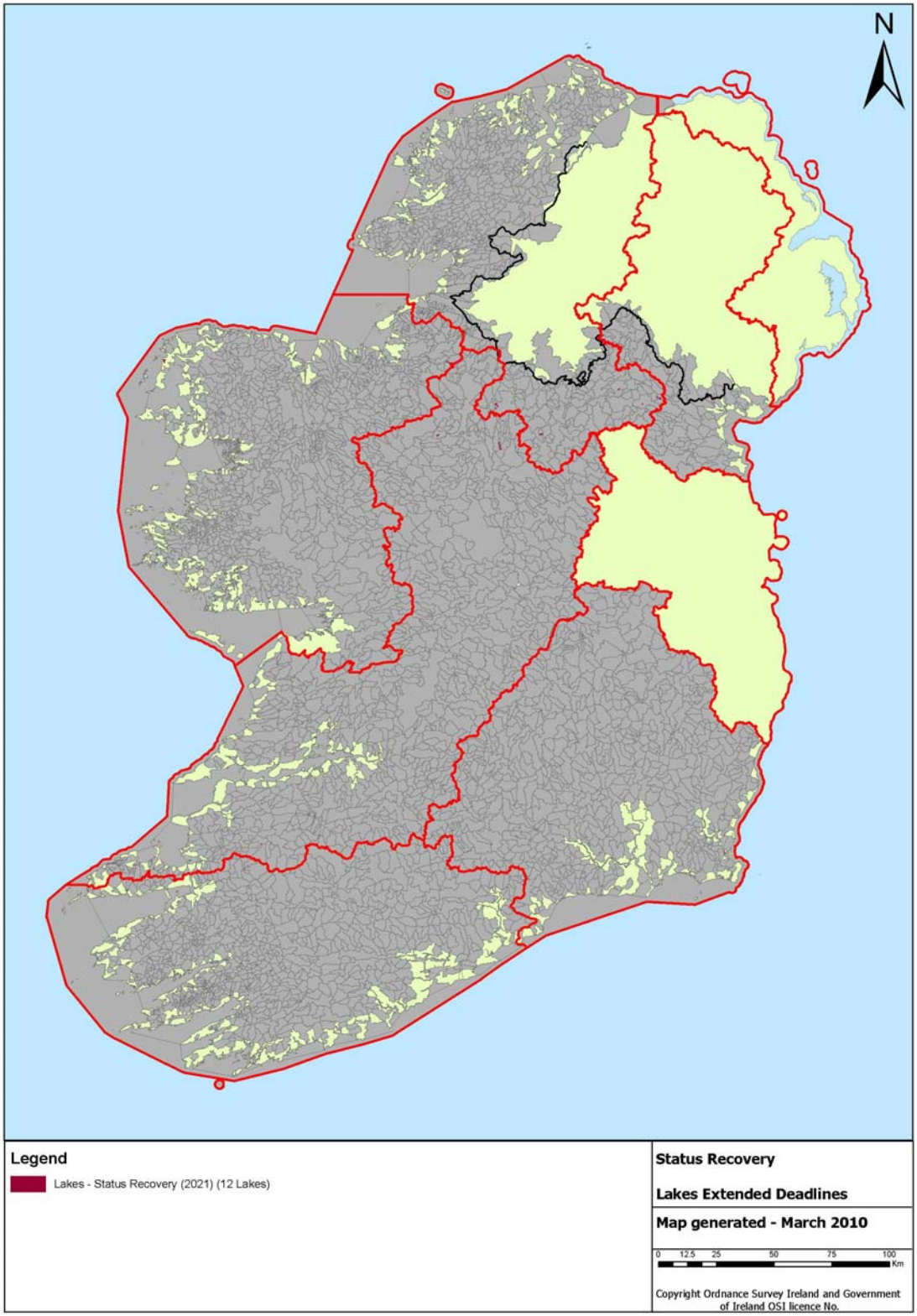
Map 15 Status recovery timescales extensions

Rivers



Map 16 Status recovery timescales extensions

Lakes



10.0 Summary Level of Ambition

The number of extended deadlines for river, lake, transitional, coastal and groundwater water bodies and the resulting river basin district percentage level of ambition (based on total water body numbers in each RBD) has been calculated by combining the individual extended deadlines. *Note: a single water body might have more than one timeline extension in which case it is the longer extension that dictates the objective.*

The statistics for the North Western, Neagh Bann, Shannon, South Eastern, South Western and Western River Basin Districts have been tabulated and mapped. *Note: Since status has not yet been assigned for all transitional and coastal water bodies, summary statistics on the percentage level of ambition per RBD has not been calculated.*

Table 10.1 Number of Water Body Extensions – North Western RBD

	Total Extensions	%	% Level of Ambition
Rivers	210	30	70
Lakes	58	25	75
Transitional	7	-	-
Coastal	5	-	-
Groundwater	0	0	100

Table 10.2 Number of Water Body Extensions – Neagh Bann RBD

	Total Extensions	%	% Level of Ambition
Rivers	69	73	27
Lakes	14	82	18
Transitional	8	-	-
Coastal	3	-	-
Groundwater	2	7	93

Table 10.3 Number of Water Body Extensions – Shannon RBD

	Total Extensions	%	% Level of Ambition
Rivers	355	40	60
Lakes	34	30	70
Transitional	6	-	-
Coastal	0	-	-
Groundwater	60	25	75

Table 10.4 Number of Water Body Extensions – South Eastern RBD

	Total Extensions	%	% Level of Ambition
Rivers	275	41	59
Lakes	0	0	100
Transitional	5	-	-
Coastal	1	-	-
Groundwater	3	2	98

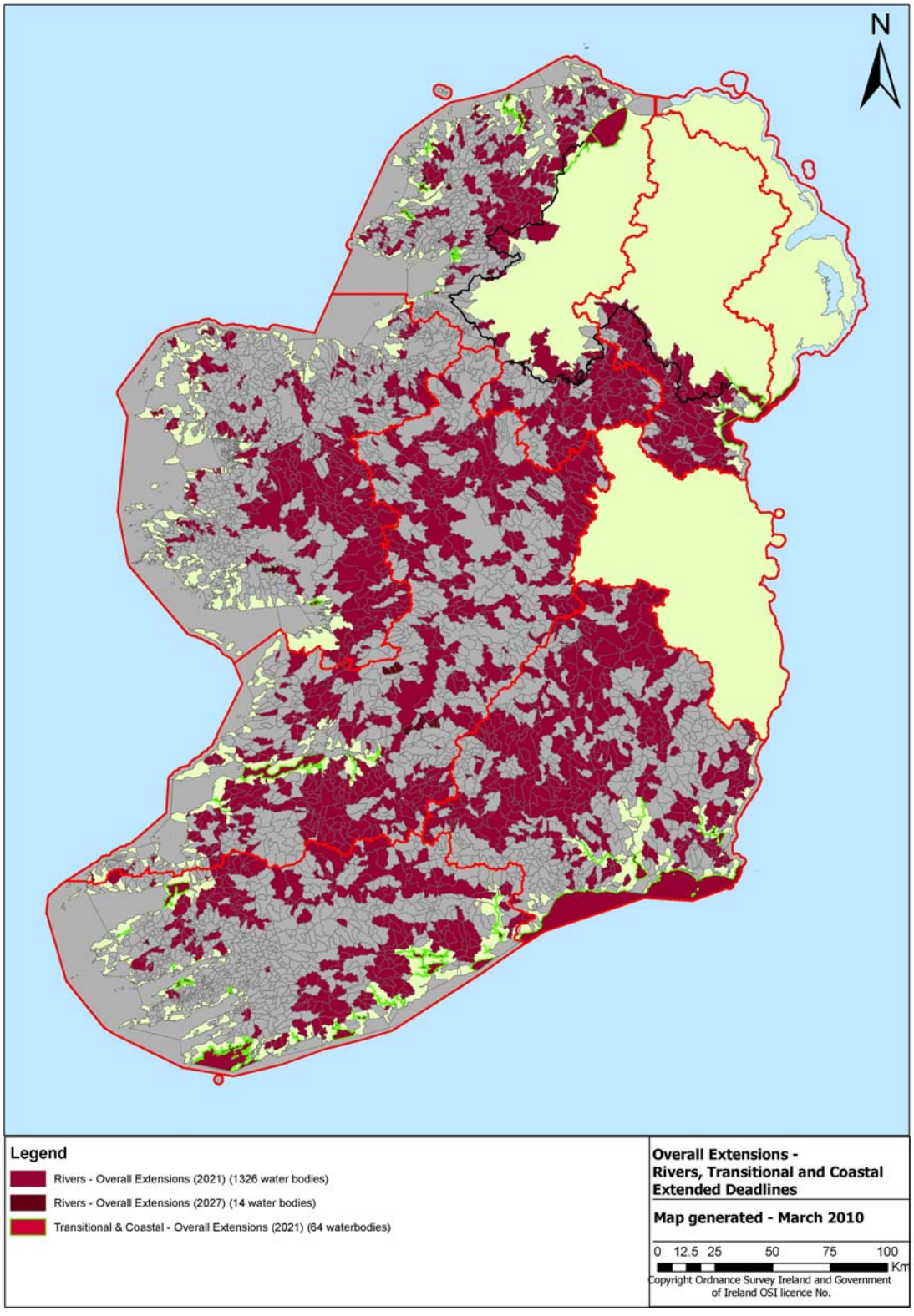
Table 10.5 Number of Water Body Extensions – South Western RBD

	Total Extensions	%	% Level of Ambition
Rivers	178	20	80
Lakes	1	1	99
Transitional	23	-	-
Coastal	4	-	-
Groundwater	5	6	94

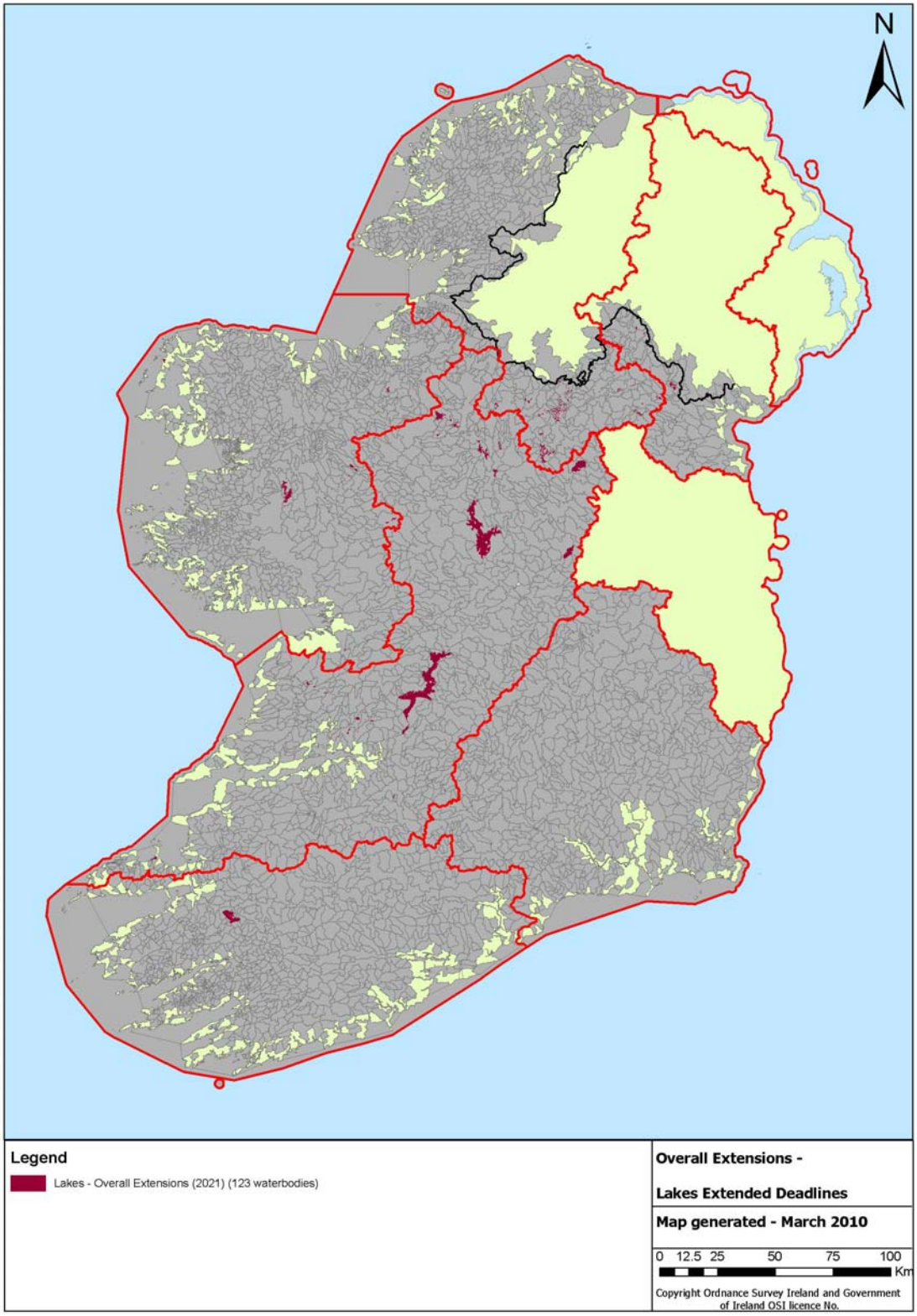
Table 10.6 Number of Water Body Extensions – Western RBD

	Total Extensions	%	% Level of Ambition
Rivers	253	26	74
Lakes	16	5	95
Transitional	2	-	-
Coastal	0	-	-
Groundwater	34	32	68

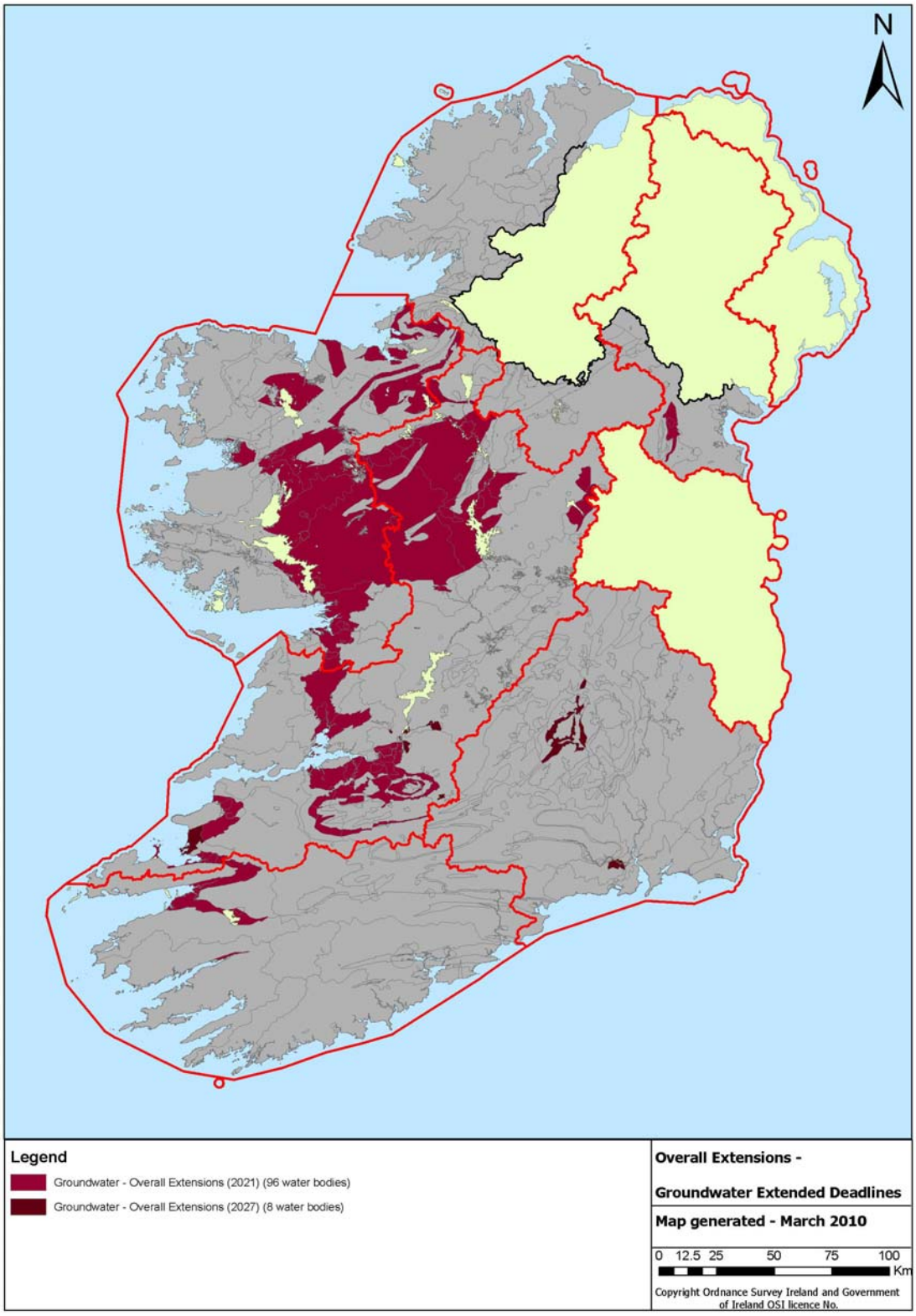
Map 17 River, transitional and coastal water bodies - overall extended deadlines



Map 18 Lake water bodies - overall extended deadlines



Map 19 Groundwater water bodies - overall extended deadlines



11.0 References

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Lag Time: A Methodology For The Estimation Of Vertical, Horizontal Travel & Flushing Timescales To Nitrate Threshold Concentrations In Irish Aquifers *Fenton et al under review*

A review of nitrate lag times in Europe and their implications for the Water Framework Directive *Fenton et al under review*

Modelling phosphorus decline: expectations of the Water Framework Directive in Ireland *Schulte et al in press*