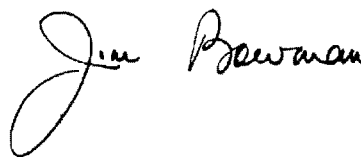


Conclusions

Lake water quality is in a satisfactory condition in the upper reaches of the River Shannon. Progressive increases in the levels of planktonic development are noted in lakes downstream of the oligotrophic Lough Allen to Lough Ree, and in Lough Key on the Boyle River, attesting to increasing nutrient inputs to the inflowing rivers. While many of these lakes are still classified as mesotrophic (Table 13) they are at the upper boundary limit of this category and if current trends are maintained these lakes will soon be classified as eutrophic. Lough Forbes already has planktonic algal developments consistent with such a category.

Lough Ree has been classified as strongly eutrophic in recent years and the findings of the recent monitoring point to a continuation of the decline in the water quality of this lake. The unsatisfactory water quality of a number of rivers in the catchment, noted in 1993-94, still persists and the nutrient loads carried by these rivers support the excessive algal growths recorded in the lake. No improvement in the water quality of Lough Ree can be expected until the sources of the nutrients are significantly reduced or eliminated.

Increased light penetration and reduced planktonic algal populations were recorded in Lough Derg in 1997 indicating a considerable improvement in the water quality of the lake, particularly in the middle and lower sections of the lake, compared to previous years (further improvements in these parameters were noted in July 1998). This welcome improvement in water quality in the lake may be attributed to two developments. Firstly the phosphorus removal facility at the Nenagh Sewage Treatment Plant has resulted in a marked reduction in phosphate and possibly also in total phosphorus in the Nenagh River which flows into Dromineer Bay. The decline in algal development in the Bay and surrounding areas coincided with this reduction in the phosphorus content of the inflowing river. Secondly in 1997, the Zebra Mussel *Dreissena polymorpha* was discovered in Lough Derg and it has been suggested that it was present in the lake undetected for the previous two years (McCarthy *et al.*, 1997). These organisms are filter feeders and can remove considerable amounts of planktonic algae from the surrounding water. It is not possible at this stage to determine the relative contribution of these developments to the reduction of planktonic algae in the lake and further data collection needs to be carried out.



BSc, PhD, Senior Scientific Officer, EPA

Table 13 Existing Trophic Status 1995-1997 (River Shannon Lakes)

	Oligotrophic	Mesotrophic	Moderately Eutrophic	Strongly Eutrophic	Highly Eutrophic	Trophic Status
Maximum Chlorophyll	<8	8-25	25-35	35-55	56-75	
Shannon Lakes						
Allen	6.2(18.9)*					Oligotrophic
Acres			34.7			Moderately Eutrophic
Key		15.8	(23.4)			Mesotrophic
Oakport		21.0				Mesotrophic
Drumharlow		18.5				Mesotrophic
Boderg		21.0				Mesotrophic
Bofin		23.8				Mesotrophic
Forbes			25.8			Moderately Eutrophic
Ree				39.9 (44.3)		Strongly Eutrophic
Derg			28.3	(43.9)		Moderately Eutrophic

* Recorded in semi-enclosed bay at Southern end of Lough Allen

Notes

1. Modified version of the O.E.C.D. lake classification scheme based on values of annual maximum chlorophyll concentration. Relevant data are given for the River Shannon Lakes for the period 1995-97. The data for Loughs Allen, Key, Ree and Derg are the maximum means of the values recorded on each sampling occasion in these lakes. The maximum individual values are given in parentheses for these lakes.

Water Quality – Existing Status

Catchment Monitoring
& Management System

Table 14 Existing Trophic Status 1995-1997 (Other Lakes)

	Oligotrophic	Mesotrophic	Moderately Eutrophic	Strongly Eutrophic	Highly Eutrophic	Trophic Status
Maximum Chlorophyll	<8	8-25	25-35	35-55	56-75	
Lough Sheelin						
1995				52		Strongly Eutrophic
1996			28			Moderately Eutrophic
1997					63.3	Highly Eutrophic
Lough Owel						
1995		13.1				Mesotrophic
1996		11.6				Mesotrophic
1997		13.5				Mesotrophic
Lough Derravarragh						
1995		15.66 (19.06)				Mesotrophic
1996		8.24 (10.97)				Mesotrophic
1997		14.11 (14.59)				Mesotrophic
Lough Ennell						
1995		18.6 (20.0)				Mesotrophic
1996		12.51 (14.18)				Mesotrophic
1997		16.9 (22.0)				Mesotrophic
Lough Graney						
1995		18.0				Mesotrophic
1996	4.0					Oligotrophic
1997		17.7				Mesotrophic
Notes						
1. Modified version of the O.E.C.D. lake classification scheme based on values of annual <u>maximum</u> chlorophyll concentration..						
2. The Lough Sheelin data are supplied by Cavan County Council and Central Fisheries Board. Sampling frequency:- 1995 (64 occasions) , 1996 (30 occasions), 1997 (32 occasions).						
3. The Loughs Ennell, Owel and Derravarragh data are supplied by Westmeath County Council. Loughs Ennell and Owel are sampled monthly between March and October each year; Lough Derravarragh monthly during May to September. The data for Loughs Derravarragh and Ennell are the <u>maximum means</u> of the values recorded on each sampling occasion. The maximum individual values are given in parentheses.						
4. The Lough Graney data are supplied by Clare County Council. Sampling frequency:- 1995 (7 occasions between March and August), 1996 (2 occasions, April and August), 1997 (4 occasions, April to September).						

Proposed Water Quality Standards

European Union policy and legislation are an important basis for water quality protection, especially with respect to the setting of quality standards, environmental protection and conservation measures.

The current 'Proposal for a Council Directive establishing a framework for a Community action in the field of water policy' (Framework Directive) proposes to establish a framework for the protection of inland surface water, transitional waters, coastal waters and groundwater. The Framework Directive will require Member States to achieve the environmental objectives of:

- preventing deterioration of ecological status and pollution of surface waters and restoring surface waters, with the aim of achieving good ecological quality;
- preventing deterioration of groundwater status, restoring bodies of groundwater, and ensuring a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater status in all bodies of groundwater; and
- achieving compliance with any standards and objectives relating to Protected Areas.

The most recent policy statement from the Government (Department of the Environment and Local Government) regarding water quality management is contained in the document entitled 'Managing Ireland's Rivers and Lakes - A Catchment-Based Strategy Against Eutrophication' which was introduced in May 1997. The Strategy highlights the growing tendency towards the

enrichment of waters beyond natural levels (ie eutrophication) by nutrients, particularly phosphorus. The primary objective of the Strategy is to address the ongoing enrichment of Irish surface waters. The measures provided in this Strategy document focus on the main potential sources of pollution - sewage, agriculture and industry. Particular note is taken of the importance of Lough Derg and Lough Ree as major natural resources providing valuable supplies of drinking water and recreational and tourism activities.

The Minister has set an interim policy target of avoiding any further disimprovement in surface water quality. Rivers and lakes will be classified utilising a baseline of water quality status established using the most recent EPA monitoring programmes (1995-1997). A timeframe of ten years is proposed for the achievement of three minimum targets:

- the elimination of seriously polluted river stretches;
- the incremental improvement in river channels currently slightly polluted or moderately polluted; and
- the restoration of lakes which are eutrophic to satisfactory conditions and the improvement of lakes which are currently hypertrophic.

For the long-term, in rivers, the Minister proposes the elimination of seriously, moderately and slightly polluted stretches; in other words, the attainment of at least a Q4 rating or higher (unpolluted status/Class A) under the EPA's biological quality classification system for all rivers, or the corresponding phosphorus standard. With respect to lakes, the Strategy seeks the elimination of hypertrophic and eutrophic conditions so as to achieve at least

mesotrophic status (satisfactory conditions). If lakes were previously oligotrophic, the plan seeks to restore such lakes to the prior condition (satisfactory/highest quality).

The Minister recognises that phosphorus is a key element in assessing the quality of surface waters and as such sets out interim Environmental Quality Standards (EQSs) to apply, at the latest, by 2007.

The Policy Document recognises that, under the terms of the Environmental Protection Agency Act 1992 (Urban Waste Water Treatment) Regulations 1994, certain lakes and sections of rivers are designated as sensitive areas on the basis that they are eutrophic or likely to become eutrophic (Third Schedule). These lakes include Lough Derg and Lough Ree. The rivers designated within the catchment include sections of the Nenagh, Camlin and Tullamore Rivers. As a result, phosphorus reduction facilities must be provided on discharges to these sensitive areas from towns with population equivalents (p.e.) greater than 10,000.

The interim targets have now been adopted by Regulation (S.I. No. 258 of 1998, Local Government (Water Pollution) Act, 1997 (Water Quality Standards for Phosphorus) Regulations, 1998). It is therefore a requirement of the Lough Derg and Lough Ree catchment monitoring and management system to adopt the targets specified by the Regulation as water quality objectives to be achieved by the year 2007.

The overall objective of attaining satisfactory conditions throughout the catchment i.e. Q4 Rating or better and/or MRP $\leq 30 \mu\text{g P/l}$ for rivers and mesotrophic status for lakes is proposed as the ultimate objective in keeping with National Policy.

In addition, it is proposed that a 'fishery' use category in keeping with EPA discussion document Environmental Quality Objectives and Environmental Quality Standards for the Aquatic Environment (EPA, 1997) should be applied to all rivers and lakes within the catchment. Unless local conditions dictate otherwise, the appropriate Environmental Quality Standards would be those for salmonid fishery water quality.

Interim Targets (see Table 15)

- ◆ an interim policy target of avoiding any further disimprovement in water quality;
- ◆ the elimination of seriously polluted river stretches (by 2007);
- ◆ the incremental improvement in river channels currently slightly polluted or moderately polluted (by 2007); and
- ◆ the restoration of lakes which are eutrophic to satisfactory conditions and the improvement of lakes which are currently hypertrophic (by 2007).

Long-term targets

- ◆ long-term elimination of seriously, moderately and slightly polluted stretches of rivers i.e. the attainment of a Q4 rating or higher (unpolluted status/class A);
- ◆ long-term elimination of hypertrophic and eutrophic lake conditions so as to achieve at least mesotrophic status (satisfactory conditions); and
- ◆ long-term restoration of formerly oliotrophic lakes (satisfactory/highest quality).

Lough Derg & Lough Ree Water Quality – Proposed Standards

Table 15 Required Levels of Improvement (S.I. 258 of 1998)

Rivers				
Existing Biological Quality (Q) Rating/(Q) Index			Target Standard by year 2007	
			Minimum Target Biological Quality (Q) Rating	MRP Medium Concentration* (µg P/l)
5	} unpolluted	(satisfactory)	5	15
4-5			4-5	20
4			4	30
3-4	slightly polluted	(unsatisfactory)	4	30
3	} moderately polluted	(unsatisfactory)	3-4	50
2-3			3	70
≤2	seriously polluted	(unsatisfactory)	3	70

Note: Compliance based on achievement of either target MRP or Q Rating

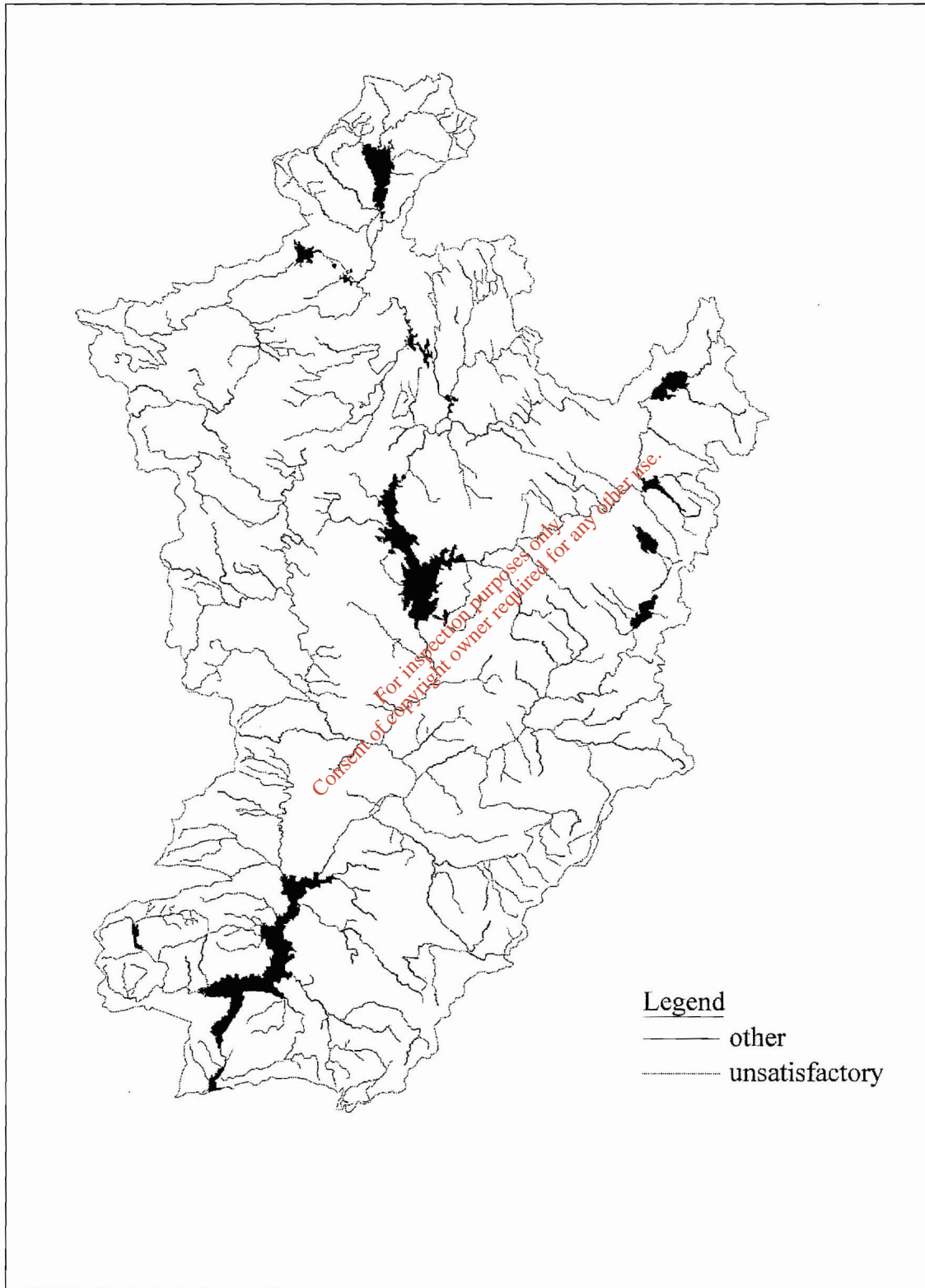
Lakes				
Existing Trophic Status			Target Standard by year 2007	
			Minimum Target Trophic Status	Total P annual average Concentration* (µg P/l)
Ultra-Oligotrophic	} satisfactory		Ultra-Oligotrophic	≤5
Oligotrophic			Oligotrophic	>5-≤10
Mesotrophic			Mesotrophic	>10-≤20
Eutrophic	} unsatisfactory		Mesotrophic	>10-≤20
Hypertrophic			Eutrophic	>20-≤50

*Average Concentration to be determined using a minimum ten samples.

Source: Statutory Instruments S.I. No. 258 of 1998. Local Government (Water Pollution) Act, 1977 (Water Quality Standards for Phosphorus) Regulations, 1998.

Water Quality – Proposed Standards

Catchment Monitoring
Management System



Map 16 Unsatisfactory length of River (1995-1997)
(River length not attaining Q4 Rating or better or median MRP concentration of $\leq 30 \mu\text{g P/l}$)

Special Study Areas - Current Monitoring

The findings to date of the river monitoring programme undertaken by the project are reviewed for the special study areas (Nenagh, Hind, Camlin and Brosna subcatchments). The evaluations are of necessity of a descriptive nature only due to the limited period for which the programme has been in operation to date. A detailed and quantitative evaluation will be prepared for all the river systems in the Lough Derg and Lough Ree Catchment at the end of the second year of the project.

The findings now presented are in the main based on the results of physico-chemical monitoring of the rivers over the period April to July 1998. Reliance has also been placed on a limited biological survey undertaken in 1997 by the Consultants. It should be emphasized that a chemical programme of limited duration may not always successfully detect the effects of enrichment because of the uptake of phosphorus by plant growth in the river, particularly in the Spring/Summer period.

Nenagh Subcatchment

There is indication of occasional organic pollution in the upper reaches of the Ollatrim River evidenced by elevated ammonia and phosphorus levels. Dissolved oxygen values exceeding 150% saturation have been detected on occasion in the upper and lower reaches. A dissolved oxygen saturation of 185% has been recorded for the lowermost reach of the Ollatrim.

The excessive plant growth, as a result of eutrophication, strongly influences the Dissolved

Oxygen regime of rivers and the high daytime Dissolved Oxygen readings obtained indicate enriched river conditions.

Whilst an excess of Dissolved Oxygen is not a problem in itself, the daytime conditions may be mirrored by deoxygenation at nighttime when plant respiration occurs.

Elevated phosphorus levels were found in the upper reaches of the Ballintotty River. Nitrate levels are high in the lower reaches, with values greater than 7 mg N/l detected on occasion. It is probable that the high nitrate levels are associated with the large proportion of arable land within the Ballintotty river catchment.

Upstream of Nenagh Town, the quality of the Nenagh River appears to be satisfactory.

The Clareen Stream which enters the Nenagh River in the vicinity of the town is seriously polluted by urban and/or trade effluents.

Downstream of the Town, the physico-chemical monitoring suggests the Nenagh river to be in a satisfactory condition. This is supported by the findings of a biological survey undertaken by the Consultants downstream of Nenagh Bridge in 1997. The survey provided a Biological Quality Rating of Q4, an improvement on the previous Q3-4 value reported by the EPA for 1996.

The water quality improvements are associated with the installation of phosphorus removal at the Nenagh wastewater treatment works which became operational in January 1997.

Water Quality – Current Monitoring

Catchment Monitoring
& Management System

The EPA Kilkenny Regional Laboratory reports significant improvement in the Nenagh River for 1997 with a reduction in median phosphorus concentrations (MRP) from 0.16 mg P/l (1995) to 0.05 mg P/l (1997) downstream of the sewer outfall.

Hind Subcatchment

At its uppermost reaches, in the vicinity of Roscommon Town, there is evidence of serious organic pollution arising from sewage and trade effluents. Dissolved oxygen values are significantly depleted on occasion and ammonia and phosphorus levels are elevated.

Overall, the Hind is polluted over much of its length due mainly to effluents from the town of Roscommon.

Camlin Subcatchment

There is evidence of serious organic pollution in the uppermost reaches of the Camlin subcatchment where dissolved oxygen levels of 40% saturation have been recorded at the bridge north of Cartron (River Rhine). This is most likely due to sewage effluents from the town of Granard.

Conditions are improved at Ballymore Bridge approximately 3 km downstream where the current physico-chemical monitoring and the findings of a biological survey undertaken in 1997 by the Consultants indicate satisfactory conditions (Q4 Rating).

Thereafter, conditions appear generally satisfactory at the following locations: Bridge downstream of

Cloonfin Lough, Bridge upstream of Ballinalee Bridge, Ballinalee Bridge and Argar Bridge. However, reduced dissolved oxygen levels (75% saturation) have been recorded for the end of June and early July 1998 at Ballinalee Bridge, suggesting the possibility of occasional organic pollution at this location.

Two tributary streams entering the Camlin River downstream of Ballinalee Bridge, and generally draining the 'Corn Hill' area, exhibit high phosphorus levels. Runoff of agricultural nutrients suspected.

Water quality is generally satisfactory as the river enters Longford Town.

Below Longford, quality deteriorates due to effluents from the Town and elevated phosphorus levels are evident for the remainder of its length.

Brosna Subcatchment

The physico-chemical monitoring suggests the Brosna to be fair/satisfactory upstream of Mullingar, however, a biological survey undertaken in 1997 by the Consultants at the Bridge downstream of Lough Sheever indicates the river to be moderately polluted (Q2-3) at that location.

Within the town, there is evidence of occasional pollution in the vicinity of the industrial estate where high suspended solid levels (~60 mg/l) have been detected.

At Butler's Bridge, upstream of Lough Ennell, dissolved oxygen levels are reduced to ~70%

saturation. Phosphorus concentrations at Butler's Bridge are also high indicating enriched conditions.

Downstream of Lough Ennell physico-chemical monitoring suggests river quality to be satisfactory at Newell's Bridge, Ballynagore, Kilbeggan Bridge, Lehinch (upstream of Clara) and Bolart Bridge.

The Moate Stream which enters the River Brosna downstream of Bolart Bridge exhibits consistently high phosphorus levels. This is considered to be due to effluents from the town of Moate.

The Tullamore River is moderately polluted downstream of Tullamore on the basis of a biological survey undertaken in 1997 by the Consultants. Phosphorus concentrations are elevated below the Town and a dissolved oxygen level of 54% saturation was recorded on one occasion.

Suspended solid values are relatively high (10 - 35 mg/l) between Kilcolgan and Ferbane on the River Brosna and may be associated with peat milling operations in the vicinity.

Downstream of Ferbane, a biological survey undertaken in 1997 indicates moderately polluted conditions (Q3 Rating).

Remedial Measures

Upgrading of Roscommon, Granard, Longford, Moate and Tullamore wastewater treatment works is currently underway which will ameliorate some of the water quality issues highlighted above.



Lake Angling

Sustainability

Sustainability is considered to be a cornerstone of environmental policy in Ireland. Development must be accommodated within the capacity of the environment to support it, without the environment suffering lasting damage or depletion. All major sectoral policies are required to adhere to this principle. In the National Development Plan 1994-1999 the principle of integrating environmental considerations into the key sectoral areas (the integration principle) has been adopted. It recognises the need to maintain a sound environment as the natural resource base and guarantor of a range of economic activities.

Interest in sustainable development and public concern regarding environmental threats requires a capability to assess and monitor the state of the environment, and also to detect changing conditions and trends. There is increasing interest in the measurement of environmental performance and in evaluating how well the Government is doing in its efforts to implement domestic environmental policies and to meet international commitments. Environmental indicators are increasingly seen as one of the tools necessary for helping to chart and track the course towards a sustainable future (Organisation for Economic Co-operation and Development (OECD) 1994).

Indicators

An indicator can be defined as a parameter, or a value derived from parameters, which provides information about a phenomenon. Indicators reduce

the number of parameters which normally would be required to give an “exact” presentation of a situation. They simplify the communication process by which the results of measurement are provided to the user.

A number of different conceptual frameworks have been produced allowing for the identification and development of environmental indicators. At the international level the OECD uses the Pressure-State-Response framework. This describes the concept where human activities exert *pressures* on the environment. These pressures result in a change in the quality and quantity of natural resources and a change in the *state* of the environment. Society then has a *response* to these changes through environmental general economic and sectoral policies.

The Pressure-State-Response framework thus distinguishes three broad types of indicators;

- ◆ indicators of environmental pressures;
- ◆ indicators of environmental conditions or state;
- ◆ indicators of societal responses.

It is considered that a Pressure-State-Response approach is appropriate for use by the Lough Derg and Lough Ree Catchment Monitoring and Management System. The proposed environmental indicators are presented in Table 16 and will be used in conjunction with the GIS to measure the success of the present catchment management programme.

Table 16 Proposed Environmental Indicators

Pressure Indicators	
	◆ Phosphorus and BOD emissions to waters from municipal Wastewater Treatment Plants
	◆ Phosphorus and BOD emissions to waters from industry
	◆ Chemical fertiliser loading (Phosphorus and Nitrogen)
	◆ Phosphorus loading from livestock
	◆ Nitrogen loading from livestock
	◆ Annual Phosphorus and Nitrogen loadings to Lough Derg and Lough Ree
State Indicators	
	◆ Trophic Status of Lakes (annual maximum chlorophyll and minimum light penetration)
	◆ Fishery Water Quality Status (including BOD, ammonia, dissolved oxygen)
	◆ Biological Quality Rating of Rivers
	◆ Annual Median Phosphorus Levels (Rivers)
	◆ Annual Median Nitrogen Levels (Rivers)
	◆ Soil Phosphorus Levels
Response Indicators	
	◆ Progressive reduction in Phosphorus and BOD emissions to waters from municipal Wastewater Treatment Plants
	◆ Progressive reduction in Phosphorus and BOD emissions to waters from industry
	◆ Market share of phosphate-free detergents
	◆ Reduction in chemical fertiliser use (Phosphorus and Nitrogen)
	◆ Increase in Rural Environmental Protection Scheme (REPS)
	◆ Progression towards Elimination of Elevated Soil Phosphorus Levels
	◆ Progressive reduction in annual Phosphorus and Nitrogen Loadings to Lough Derg and Lough Ree

Agricultural Indicators

To encourage good environmental management at farm level the Government has launched a National Strategy for sustainable development which incorporates a range of actions (Department of Environment and Local Government, 1997):

- A Code of Good Agricultural Practice to Protect Waters from Pollution by Nitrates was launched in July 1996.
- Revised recommended application rates for phosphorus fertilisers for grassland were launched in December 1996. Towards this end, the National Strategy has targeted a reduction of 10% per annum in artificial phosphorus fertiliser usage over a five period.
- Nutrient advice for Phosphorus and Potassium Fertiliser use was launched in July 1998.

- A Code of Good Agricultural Practice for the re-use of Biosolids in Agriculture is being developed.
- Nutrient Management Plans provide an opportunity both to minimise adverse environmental effects and to make the most efficient use of economic resources. Nutrient Management Plans are a feature of the Rural Environmental Protection Scheme (REPS). The Department of Agriculture and Food has targeted up to 30% of farmers to be participating in REPS by 1999.

In order to assess the effectiveness of these strategies, a series of agricultural environmental indicators are proposed for the Lough Derg and Lough Ree catchment as presented in Table 16. The following baseline conditions were established in order to identify future trends and to gauge progress.

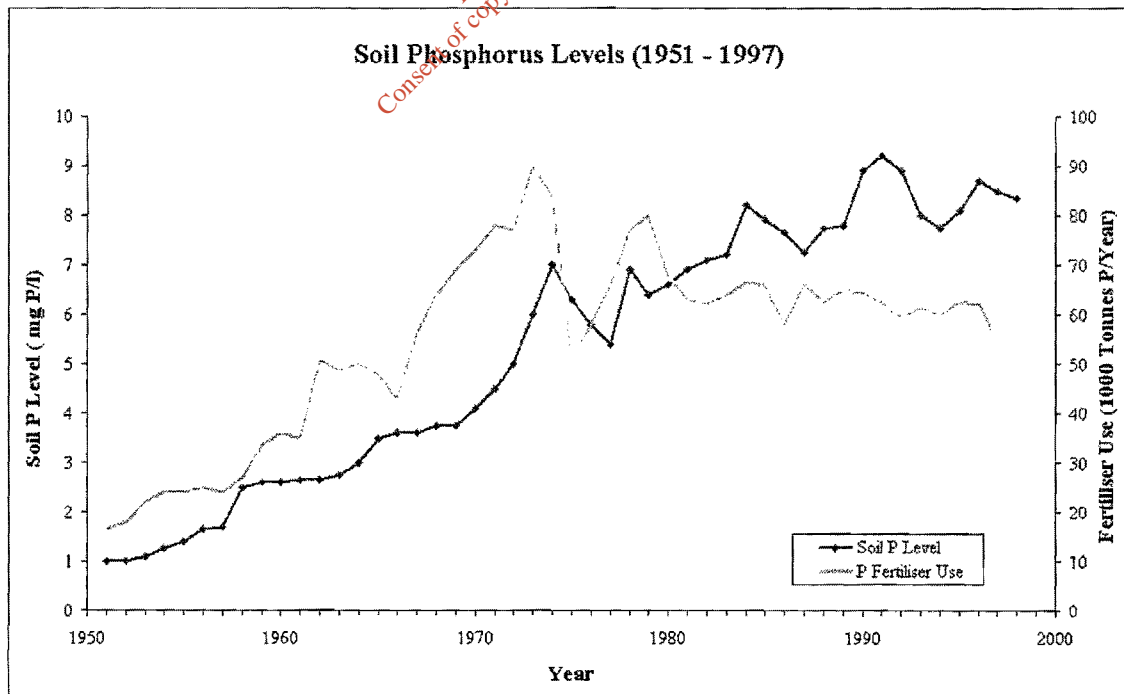


Figure 3 Trends in National Soil Phosphorus Levels and Fertiliser Use 1951-1997

Source: Teagasc

Chemical Fertiliser Loading

Chemical Fertiliser loading has been established for the year 1995 based on cropping rates (1991 census) and the 1995 fertiliser use survey (Teagasc). The estimated chemical fertiliser loading within each of the main subcatchments is presented in Table 17 and Map 17.

The determination of future trends will depend on the availability of future Teagasc periodic fertiliser use surveys.

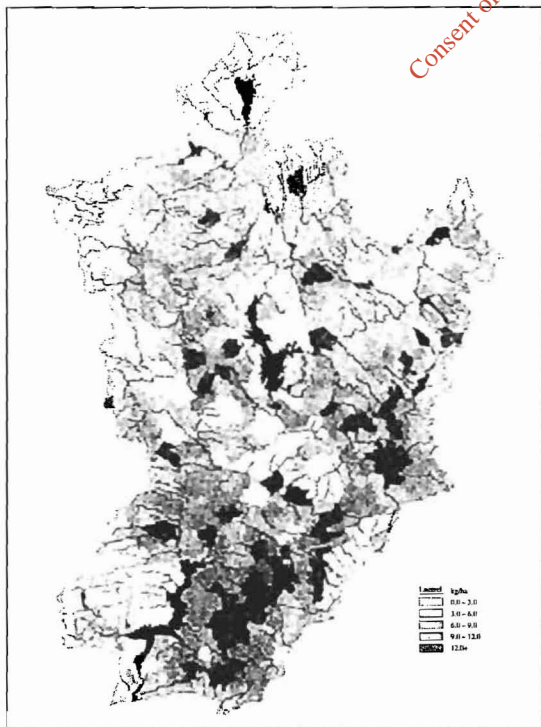
Organic Fertiliser Loading

The organic fertiliser loading has been established based on livestock numbers (1991 census) and standard animal nutrient production rates. The estimated organic loading to each of the main subcatchments is presented in Table 18 and Map 18.

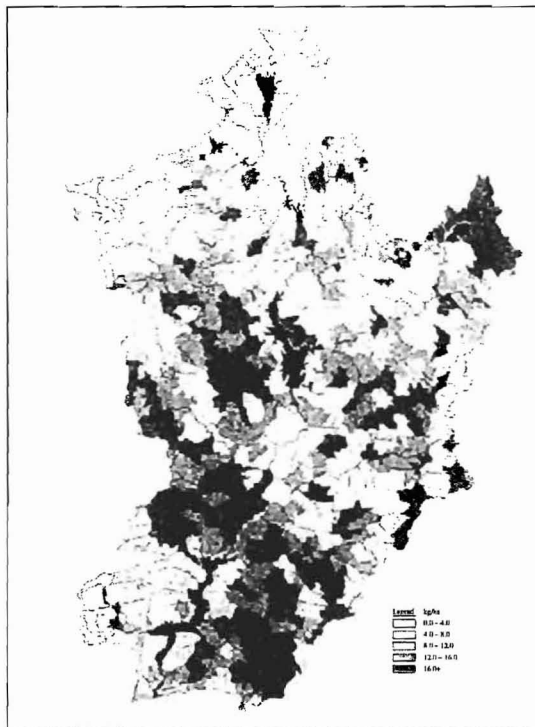
Table 17 Estimate of Chemical Fertiliser Loading (1995)

Subcatchment	Phosphorus (kg/ha/year)	Nitrogen (kg/ha/year)
Ballyfinboy	11.0	62.3
Brosna	8.6	55.7
Camlin	8.5	59.0
Graney	5.3	37.4
Hind	10.5	74.8
Inny	8.4	59.2
Kilcrow/Cappagh	8.0	54.3
Little Brosna	9.1	56.5
Nenagh	9.6	61.2
Rinn	7.7	52.6
Shannon (at Roosky)	5.7	40.1
Shannon Corridor	7.9	51.5
Suck	7.9	54.0
Woodford/Coos	3.4	22.8

Source: Teagasc



Map 17 Chemical P Fertiliser Loading (1995)



Map 18 Organic P Fertiliser Loading (1991)

Table 18 Estimate of Organic Fertiliser Loading
(1991)

Subcatchment	Phosphorus from Animal Manures (kg/ha/year)	Nitrogen from Animal Manures (kg/ha/year)
Ballyfinboy	16.2	89.9
Brosna	14.3	72.7
Camlin	15.2	75.1
Graney	9.2	51.2
Hind	17.9	106.5
Inny	23.9	83.2
Kilcrow/Cappagh	14.2	84.1
Little Brosna	17.8	85.2
Nenagh	19.5	93.2
Rinn	10.3	57.6
Shannon (at Roosky)	7.4	43.5
Shannon Corridor	13.4	73.1
Suck	13.4	80.8
Woodford/Coos	6.4	34.6

Source: Teagasc

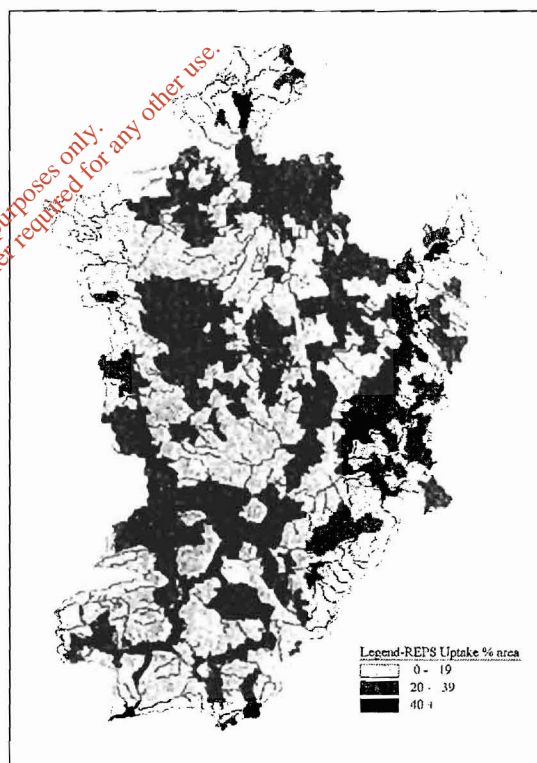
Soil Phosphorus Levels

Soil Phosphorus levels (1991-1995) have been estimated based on the mean results of soil samples received by Teagasc on a 10 km² grid basis. Each area represents the mean of around 150 samples. The Soil Phosphorus levels are considered to be reasonably representative but may be subject to large

variations as evidenced by the detailed soil surveys undertaken within the selected agricultural mini-catchments.

Rural Environmental Protection Scheme (REPS)

The Department of Agriculture and Food has made available the area of land under REPS within the catchment as presented in Table 19 and Map 19 to provide baseline conditions (December 1997).



Map 19 Uptake of REPS (Dec 1997)

Table 19 Uptake of REPS (December 1997)

Subcatchment	% land within REPS
Ballyfinboy	15.4
Brosna	18.8
Camlin	23.8
Graney	13.2
Hind	24.9
Inny	19.7
Kilcrow/Cappagh	22.0
Little Brosna	16.9
Nenagh	19.4
Rinn	26.6
Shannon (at Roosky)	15.0
Shannon Corridor	20.2
Suck	18.9
Woodford/Coos	13.5

Source: Department of Agriculture and Food

Towns and Industrial Indicators

The Phosphorus and BOD emissions to waters from urban agglomerations and industry will be quantified through the current monitoring programme.

The present market share of Phosphate-free detergents will be ascertained with the co-operation of the Irish Detergent and Allied Products Association. This will form a baseline to evaluate the effectiveness of future promotional programmes aimed at increasing their market share.

Water Quality Indicators

Water quality response to the catchment management programme will be evaluated against existing conditions (1995-1997) for both rivers (Maps 13, 14 and 16) and lakes (Tables 13 and 14).

Previous investigations of Lough Derg (Bowman *et al*, 1993) and Lough Ree (Bowman, 1996), Table 20, provide baseline MRP export rates to the lakes and will be used for comparison with the results of the current monitoring programme.

Table 20 MRP Export Rates (1991-1994)

Subcatchment	MRP Export Rate (mg/m ² /year)
Ballyfinboy	20
Brosna	25
Camlin	55
Graney	23
Hind	64
Inny	26
Kilcrow/Cappagh	16
Little Brosna	31
Nenagh	92
Rinn	–
Shannon (at Roosky)	10
Shannon Corridor	–
Suck	13
Woodford/Coos	–

Source: Bowman 1993 and 1996

Consultations

Primary Consultees

Implementation of the Lough Derg and Lough Ree Catchment Monitoring and Management System is overseen by an Operational Management Group representative of a wide range of statutory interests with the view to providing an integrated catchment-based approach in promoting water quality management.

The following bodies are represented on the Operational Management Group :

- ◆ Bord Na Móna
- ◆ Cavan County Council
- ◆ Central Fisheries Board
- ◆ Clare County Council
- ◆ Department of the Environment and Local Government
- ◆ Electricity Supply Board
- ◆ Environmental Protection Agency
- ◆ Galway County Council
- ◆ Leitrim County Council
- ◆ Longford County Council
- ◆ Offaly County Council
- ◆ Roscommon County Council
- ◆ Shannon Regional Fisheries Board
- ◆ Teagasc
- ◆ Tipperary (NR) County Council
- ◆ Westmeath County Council

The Operational Management Group meets at quarterly intervals to oversee the project.

In addition to formal meetings, there is ongoing consultation with officers of the individual bodies on

matters of direct relevance to the successful implementation of the Monitoring and Management System.

Elected Representatives

Elected representatives throughout the catchment are being kept informed of all aspects of the project as it proceeds.

A presentation on the project has been provided to meetings of the following local and regional authorities :

- ◆ Cavan County Council
- ◆ Clare County Council
- ◆ Galway County Council
- ◆ Leitrim County Council
- ◆ Longford County Council
- ◆ Roscommon County Council
- ◆ Tipperary (NR) County Council
- ◆ Westmeath County Council
- ◆ Mid West Regional Authority
- ◆ Midland Regional Authority
- ◆ West Regional Authority

The purpose of the presentations is to ensure that local elected representatives are kept informed of the project and its objectives and afforded direct opportunity to have influence on its development.

Interest Groups

Direct consultation has commenced with bodies and groups that are immediately concerned with the catchment and have interests relevant to water quality.

- ◆ Ferbane Focus Group
- ◆ Irish Farmer's Association
- ◆ Lough Derg Working Group
- ◆ Lough Ree Conservation Society
- ◆ Save Our Lough Derg (S.O.L.D.)
- ◆ Shannon Regional Fisheries Board

Information Dissemination and Public Consultation

It is especially important that the general public be informed of the project and its objectives in order to be provided a real opportunity to influence its outcome and to contribute to the development of the Monitoring and Management System.

It has been therefore necessary to generate awareness of the project in order to encourage public participation with the view to understanding the various issues that arise:

- ◆ Advertisements were placed in local and national newspapers inviting written submissions from interested members of the public.
- ◆ A project information leaflet was produced and disseminated by the various public bodies involved with the project.
- ◆ Landowners in the agricultural study areas were briefed on the project and its objectives by way of local meetings.



Presentation to the Midland Regional Authority, Coolamber Manor, Lisryan, Co Longford.

A number of written submissions have been received to date:

- ◆ Mr Adrian Lindsay-Fynn
- ◆ Mr David Perry
- ◆ Lough Ree Conservation Society
- ◆ Mr Laurence C Kelly
- ◆ Mr Ofko Holtkamp
- ◆ Mr Declan T Quigley
- ◆ The Department of the Marine and Natural Resources (Forest Service)

Exhibits

The project has participated in a number of public exhibits where the objectives and scope of the work have been presented:

- ◆ Tomorrow's Farm and Rural Enterprise held at Mellow's College, Athenry. This was the premier Teagasc agricultural event in 1998 and had a specific focus on the environment.
- ◆ Lough Ree Environmental Summer School, Lanesborough, County Longford.

Other Consultations

Discussion with other relevant organisations has also taken place:

- ◆ The Department of Agriculture and Food
- ◆ The Office of Public Works
- ◆ The Heritage Council
- ◆ The Local Government Computer Services Board
- ◆ The Irish Detergent and Allied Products Association

Project Co-ordinator

A full-time Project Co-ordinator has been appointed to liaise between the various agencies and interest groups and to facilitate the efficient implementation of the Project.

Matters Arising

The following summarises the principal issues that arose during the first phase of the Consultation Process :

◆ *Upkeep of Monitoring and Management System*

A perceived lack of co-ordination between the various state agencies is seen as an obstacle to the efficient management of water quality in the Shannon Region. It was suggested that there is need for a long-term catchment-based approach to maintain the monitoring and management effort 'post-project', and that the GIS Management System should become the prime basis for identifying problem areas and formulating management solutions.

Concern was expressed regarding the management of water quality within the Lough Derg and Lough Ree catchment.

A suggestion was made regarding the establishment of an EPA Regional Inspectorate for the Midlands Region.

◆ *Access to Information*

Concern was expressed by a number of contributors regarding difficulty in gaining access to reliable environmental information. Monitoring data generated by the project should be readily accessible to interested parties, including information on local authority and industrial effluents.

A recommendation was made regarding the publication of periodic reports that would draw attention to non-compliance with relevant standards.

◆ *Phosphate Content of Detergents*

Numerous contributors made reference for the need to restrict, or otherwise address, detergents containing phosphates.

It was suggested that the project should establish additional pilot studies to determine the benefits of phosphate-free detergents and the effects of domestic pollution in areas not served by public sewers, particularly at locations close to lake shores.

◆ *Agriculture*

There was overall support for what is seen as a positive approach towards agriculture.

Agricultural pollution was a general concern and the Rural Environmental Protection Scheme (REPS) is seen as a way to make an important contribution to water quality improvements.

A suggestion was made that the administration of REPS might be integrated with river catchment management programmes.

There was general consensus that the unnecessary use of Phosphorus and Nitrogen fertiliser should cease. It was considered critical that information learned during the course of the project be communicated back to the farming community.

Concerns were expressed that the farmyard might be identified as a major pollution source and that the necessary financial support would not be available to address the problem.

There is need to clarify current differences of opinion regarding phosphorus recommendations so that farmers can proceed with confidence.

Concerns were raised regarding the development of intensive pig rearing units in high risk areas.

◆ *Peat Milling*

A number of contributors raised concern regarding the impact of peat milling operations within the catchment.

◆ *Afforestation*

The proposed increase in afforestation and the implications for water quality are concerns that were expressed on a number of occasions. Particular concern in this regard arose in relation to Lough Allen.

◆ *Boating*

The impact of boating on water quality is a concern. The deficiency of 'pump-out' facilities for Lough Ree, particularly in the vicinity of Athlone, has been raised.

◆ *Zebra Mussels*

The recent arrival of the zebra mussel to the Lough Derg and Lough Ree catchment has given rise to much concern, particularly with regard to its long term impact on fisheries and the lake ecosystem.

◆ *Angling*

Contributors have made reference to declining angling stocks, particularly trout.

Reference has also been made to the untapped potential of tourism angling on Lough Ree and on the adjoining River Shannon.

Consultations

◆ Drainage

Conflicting issues have arisen in this regard. Farmers are concerned with the flooding of farmland. In contrast, a suggestion has been made that the Office of Public Works should review its Maintenance Drainage Programmes on the basis of changed economic circumstances and environmental needs.

◆ Pollution Incidents

It was suggested that an emergency response service, manned 24-hours per day, be made available within the catchment with well publicised contact numbers to enable the general public to inform the relevant authorities of any pollution incident encountered

◆ Endangered Species

Lough Derg and Lough Ree are home to the Pollan (*Coregonus autumnalis pollan*) which is regarded as an endangered species in Ireland and in need of protection.

It is intended that the Consultation Process will continue for the duration of the Project to ensure that all relevant issues will be afforded full consideration in the development of the Lough Derg and Lough Ree Catchment Monitoring and Management System.

Input from interested parties and individuals will be actively encouraged.



Minister of State Noel Treacy T.D., and Minister of State Noel Davern T.D., visiting the project exhibit, Tomorrow's Farm and Rural Enterprise, Atheury.

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Project Steering Group

Mr Vincent Brennan, Roscommon County Council
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Mr Owen Boyle, Department of Environment & Local Government
Mr David Moore, Department of Environment & Local Government
Dr Jim Bowman, Environmental Protection Agency

Project Operational Management Group

Mr Trevor Champ	Central Fisheries Board
Mr Brian Kenny	Leitrim Co. Co.
Mr Michael Clohessy	DoELG
Mr Robert Cullen	ESB
Mr Jim Maguire	Tipperary (NR) Co. Co.
Mr John Cunningham	Roscommon Co. Co.
Mr Des Page	Offaly Co. Co.
Mr Eamon Cusack	Shannon Regional Fisheries Board
Mr P J Phelan	Teagasc
Mr Greg Duggan	Westmeath Co. Co.
Mr David Timlin	Clare Co. Co.
Mr Roger Timlin	Longford Co. Co.
Mr Liam Gavin	Galway Co. Co.
Mr Donal Wynne	Board na Móna
Mr Frank Gibbons	Cavan Co. Co.

DoELG Administration

Mr Mark Griffin

Project Co-ordinator

Mr Pat Duggan

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The Report was prepared by



**KIRK McCLURE
MORTON**

CONSULTING ENGINEERS

Kirk McClure Morton
Elmwood House
40 Upper Grand Canal Street
DUBLIN

Telephone 01 667 4167

Fax 01 667 4161

in association with



BRADY SHIPMAN MARTIN

The following sub-consultants are currently undertaking specialist studies

KMM MarEnCo	:	Laboratory and River Water Quality Assessment
Pat Minnock	:	Agricultural Assessment
Paul Johnston	:	Fisheries Assessment

For further information

Queries and submissions in relation to the project may be forwarded to: Mr Pat Duggan, Project Co-Ordinator, Lough Derg & Lough Ree Catchment, Monitoring and Management System, Monksland Civic Offices, Monksland, ATHLONE, Co Roscommon.

Phone 0902 93838

E-mail shannonlakes@tinet.ie