

draft RIVER BASIN MONITORING PLAN

# CLASSIFICATION PAMPHLET

## Coastal Waterbody Larne Lough North

22<sup>nd</sup> December 2008



An Agency within the Department of the  
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Northern Ireland  
**Environment**  
Agency

## LARNE LOUGH NORTH

### Water body Information

- *River Basin District:* NE
- *Water body type:* CW8
- *Water body characteristics:* Euhaline, mesotidal, sheltered
- *Water body area:* 1.29 km<sup>2</sup>
- *Heavily Modified Water Body:* Yes

### **OVERALL WATERBODY CLASSIFICATION (H/G/M/P/B):**

**MODERATE (EP TBC)**

**(PASS/FAIL): FAIL**

Downgraded to MODERATE based on adjacent waterbody classification and need for further data.

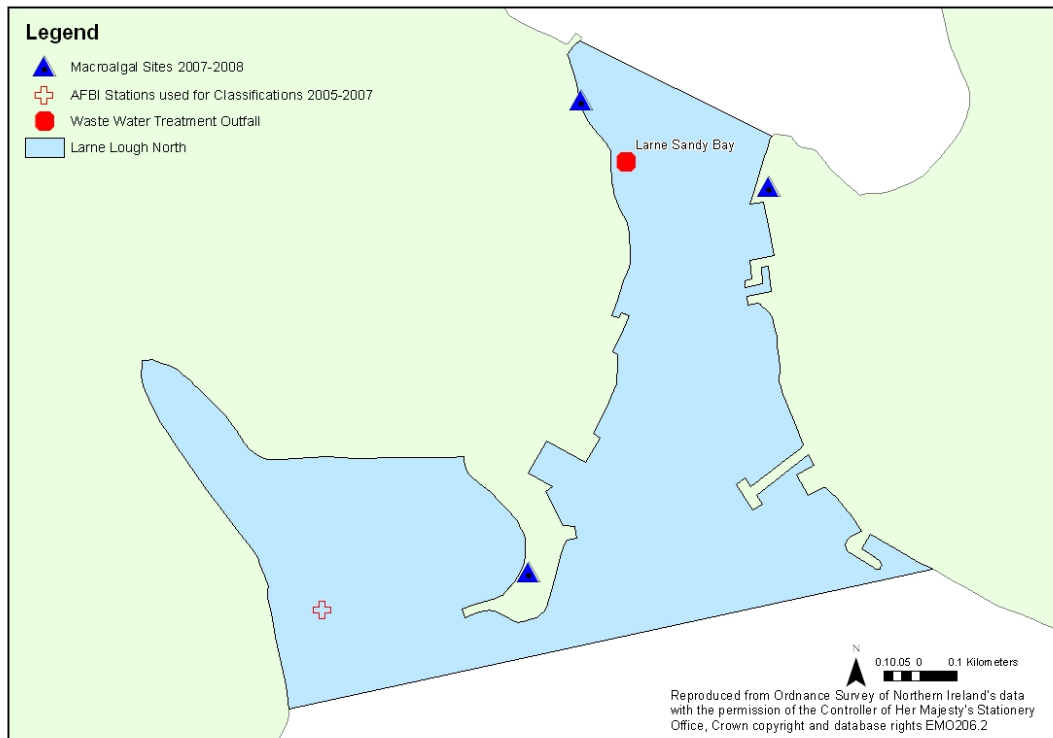


Figure showing pressures and monitoring points within Larne Lough North (Coastal Water).

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MARINE ASSESSMENT AND LICENSING TEAM

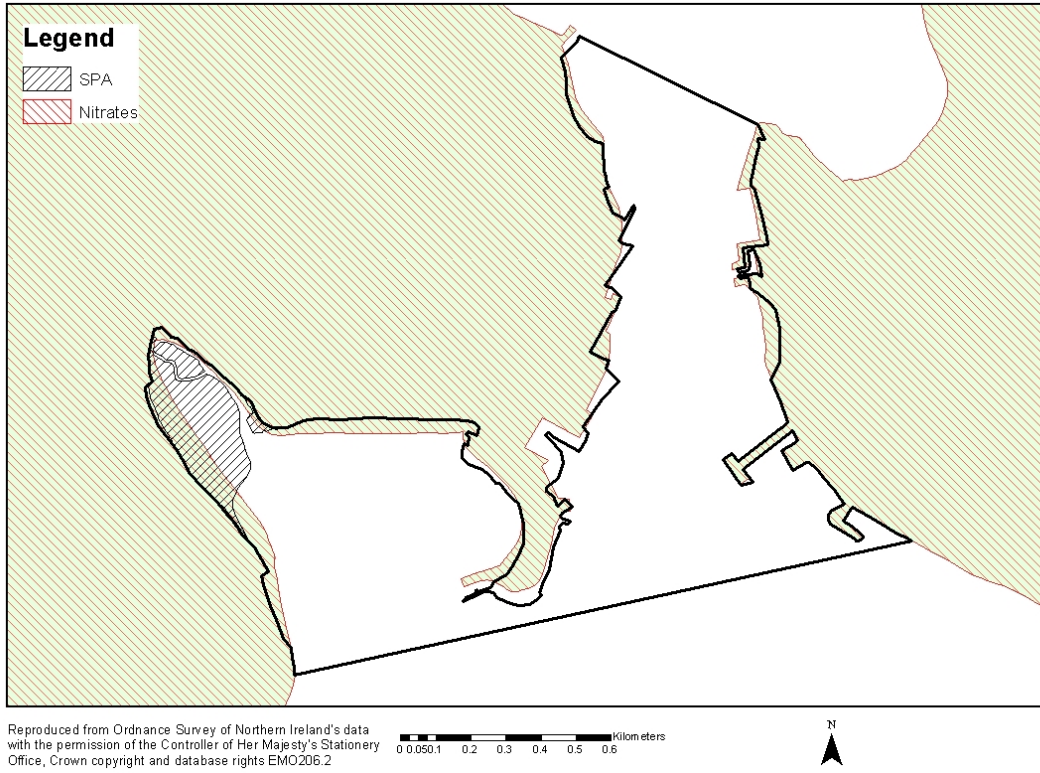


Figure of protected areas within Larne Lough North (Coastal Water), see Annex F.

**PARAMETERS TABLE**

(Parameters for which classification systems are available and have been used in the first round of classification. Note: for some parameters data is not yet available hence the tools have not been applied).

Ecological Quality Element			
Main Element	Sub-Element	Applied	Comment
<b>Plants</b>	Macro Algae	✓	
	-Opportunistic Macroalgae	☒	Tool Not Applicable
	-Reduced Species List	✓	
	Angiosperms	☒	Tool Not Applicable
	Phytoplankton	✓	
<b>Benthic Invertebrates</b>	Infaunal Quality Index	☒	No data available
	Imposex	☒	No data available
<b>Fish</b>	Transitional Fish Classification Index		
<b>Physico-Chemical</b>	General Conditions	✓	
	-Dissolved Oxygen	✓	
	-Nutrients	☒	No data available
	Specific Pollutants ( Annex VIII subs)	☒	No data available
<b>Hydromorphological Quality Elements</b>	SEPA Rapid Designation	✓	
	TraC MIMAS	✓	
Chemical Status			
<b>Priority Hazardous Substances (Annex X)</b>	Annex X Substances	☒	No data available

**Waterbody Classification**

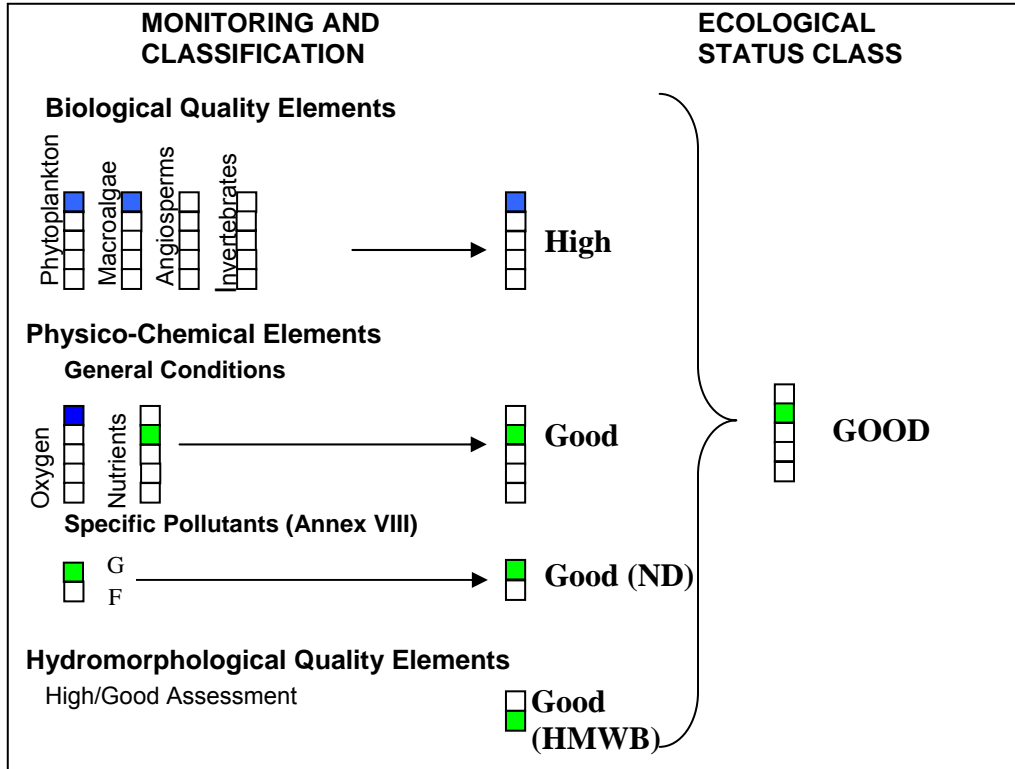


Figure showing ecological classification of Larne Lough North (Coastal Water)

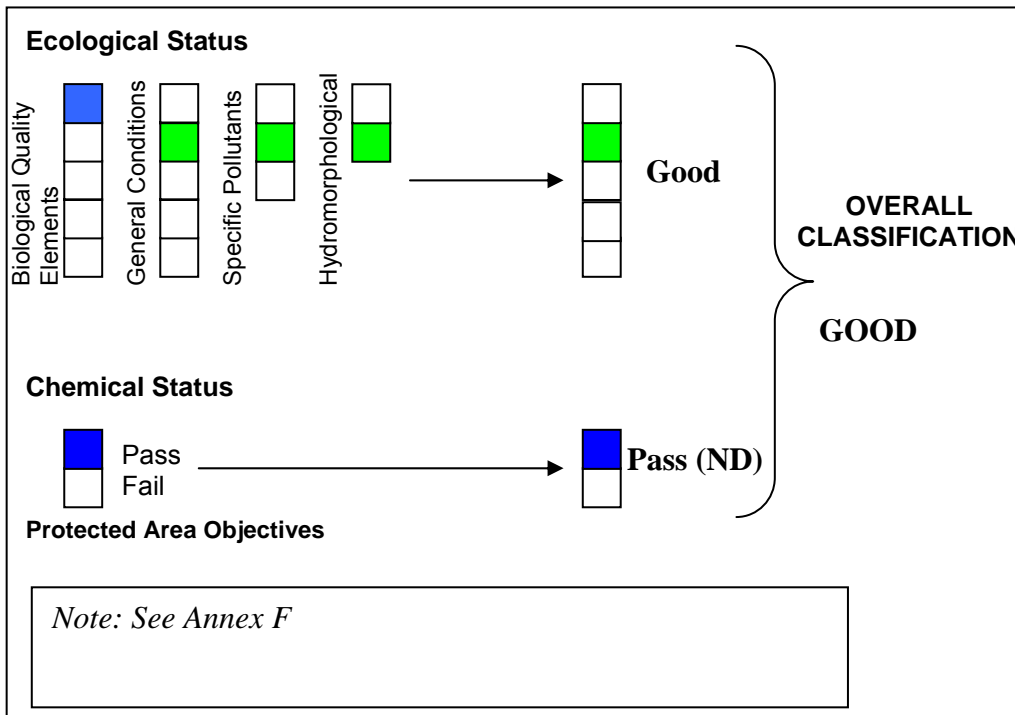


Figure showing overall classification of Larne Lough North (Coastal Water)

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First River Basin Cycle (2004 – 2008)

Monitoring Level:

*Surveillance*

Sampling frequency for each quality element

Quality Elements	Surveillance		
	Year (if 1 in 3 yrs)	Frequenc y (if p.a.)	No. of sites
<b>Biological</b>			
Phytoplankton	2005-8		1 sites 8 samples
	RSL	2008	3
Benthic Invertebrates	Infaunal Quality Index	2003-2006	
	Imposex	ND	
<b>Physico-chemical</b>			
Nutrients	2005-2006		4 samples 1 site
Salinity	2005-2006		
Temperature	2005-2006		
Dissolved Oxygen (DO)	2003-2004		9
Suspended particulate matter (SPM)			
Light (Kd)			
Specific polluting substances (Annex VIII)	ND		
<b>Hydromorphology</b>			
<b>Water chemistry</b>			
(Annex X)	ND		

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## LARNE LOUGH NORTH

### ANNEX A: Classification of Biological Quality Elements

#### QE: Phytoplankton

**QE phytoplankton assessment (+ Data confidence): HIGH (L)**

Classification tools:

First round reporting now

1. Chlorophyll biomass index (90%ile)
2. Elevated taxa count index

- Data store (classification):  
MARINE\Water Framework Directive\DRAFT WFD CLASSIFICATION REPORTS\QE Phytoplankton\Chlla 90th Percentile\Final 90th Percentile Phytoplankton -
- Data Availability (spot & continuous samples):  
Chl = spot (2005-2007) AFBINI

1. *Chlorophyll Biomass Index - 90%ile (Chl  $\mu\text{g l}^{-1}$ )*  
(Growing Season 1<sup>st</sup> Mar – 30<sup>th</sup> Sept)

Waterbody Chl. biomass assessment  
Thresholds

HIGH (L)

Water Ref. Area		Status				
		High	Good	Moderate	Poor	Bad
North/Irish Sea	Chl $\mu\text{g l}^{-1}$	<5	5-10	10-15	15-20	>20
	EQR	0 -1.0	1.0-0.8	0.8-0.6	0.6-0.4	0.4-0.2

Results


90%ile	Status	Data Years	Data Quality	No. of daily averages	No. of Sites	No. of Samples	Data Confidence (proportion of possible months with data*)
4.14	HIGH	2005-2007	Low	0	1	8	28.57%

\* proportion of possible months (of growing season in years assessed) for which data are available

Data confidence:

Low

- The proportion of possible months sampled and the number of spatial samples collected yielded a low confidence in data confidence.
- Data collected was from AFBINI. No records of chlorophyll data from NIEA could be found within this waterbody.

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## 2. Elevated Taxa Count Index

### Waterbody Elevated Taxa Assessment

- Thresholds:

Tool	Thresholds	
	North/Irish Sea	Atlantic
I <sub>1</sub> - Individual Species Count (excl. Phaeocystis) (%)	250,000 (cells l <sup>-1</sup> )	
I <sub>2</sub> - Phaeocystis Counts (%)	10 <sup>6</sup> (cells l <sup>-1</sup> )	
I <sub>3</sub> - Total Taxa Count (%)	10 <sup>7</sup> (cells l <sup>-1</sup> )	
I <sub>4</sub> - Elevated Biomass Count (%)	>10 (µg l <sup>-1</sup> )	>5 (µg l <sup>-1</sup> )

Waterbody Elevated count (%) = [I<sub>1</sub> (%) + I<sub>2</sub> (%) + I<sub>3</sub> (%) + I<sub>4</sub> (%)] / 4


- EQR Boundaries:

Class	% Exceedance	EQR
High	0-15	0.67-1.0
Good	15-30	0.33-0.67
Moderate	30-40	0.28-0.33
Poor	40-50	0.20-0.33
Bad	>50	0-0.20

## Results

I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	Elevated Count Mean	Status	Data Years	No. of sampling occasions	No. of phytoplankton samples

Data confidence:

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## QE: Macroalgae Larne North

**QE Macroalgae assessment (+ Data confidence): HIGH (M)**

Classification tools: Reduced species list (RSL),  
Macroalgal Blooming Tool – not applicable

### *Reduced Species List (RSL)*

Waterbody RSL assessment:

*HIGH (Medium)*


- WFD surveillance monitoring: 2008
- Data Availability (classification) 2008, 3sites
- Data Store: G:\MARINE\Projects 08\Marine Macrophytes

Boundaries:

Parameter s	Quality Status	Bad	Poor	Moderate	Good	High
	Sub-metric quality status	0.0 – 0.2	0.21 – 0.4	0.41 – 0.6	0.61 – 0.8	0.81 – 1.0
Species richness (adj. for shore)		0 – 3	3 – 10	10 – 20	20 – 34	34 – 68
Proportion of Chlorophyta (% G)		80 – 100	45 – 80	30 – 45	20 – 30	0 – 20
Proportion of Rhodophyta (% R)		0 – 10	10 – 25	25 – 35	35 – 45	45 – 100
Ecological Status Group ratio (ESG)		0.0 – 0.2	0.2 – 0.4	0.4 – 0.6	0.6 – 0.8	0.8 – 1.2
Proportion of opportunists (% opp)		50 – 100	35 – 50	25 – 35	15 – 25	0 – 15

### Results

Shore	Sub-Metric EQR							RSL EQR	Status
	Shore desc.	Sp. richness	Adj. Sp. Richness	% G	% R	ESG	% Opp		
Chaine Monument 2008	15	41	41	12.2	56.1	1.28	9.76	0.873	HIGH
Curran Point 2008	12	35	42	17.1	45.7	0.84	11.4	0.809	HIGH
Ferris Point 2008	12	40	48.4	17.5	55.0	1.35	12.5	0.849	HIGH
<b>Mean</b>								<b>0.84 ±0.03</b>	<b>HIGH</b>


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Data Confidence: Medium

- Standard Deviation ( $\pm$ ) are included with the mean EQR
- Data QA (expert team)
- WFD specific data (Reduced species list completed; Full species list not yet carried out, tool not yet completed).
- 3 shores (good spatial coverage) over single year (poor temporal trend assessment).
- FSL not yet carried out

Alien taxa present (*Sargassum muticum*): Not present

QE: Angiosperms Belfast Lough Harbour –Tool not applicable

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**QE: Benthic Invertebrates – Larne North**

Overall benthic invertebrate assessment: GOOD (ND)

Classification tools: 1. Infaunal Quality Index (IQI)  
2. Imposex tool (VDSI)

1. IQI (v4)  
Water body IQI assessment: Good (ND)  
No data is available for this water body.

- **WFD surveillance monitoring:** 2008
- **Data store:**
  - Benthic invertebrates
  - Supporting Parameters
  - Digital images
- **Data Availability (classification):**
- **Habitat max values (sub-tidal mud):** 1-(AMBI/7) = 0.78, 1-Lambda' = 0.72, Taxa = 24
- **Boundaries (Intercalibrated NEAGIG):**

Class	Bad	Poor	Moderate	Good	High
<b>IQI</b>	>0.0 ≤0.24	≥0.24 <0.44	≥0.44 <0.64	≥0.64 <0.75	≥0.75

**Results**

Year	Survey	Station	n	Mean	± S.D	Status
<b>Overall Mean</b>						

Data confidence: Low  
No data

Alien taxa present:

<i>Eriocheir sinensis</i> (Chinese mitten crab)	No
<i>Crepidula fornicata</i> (Slipper limpet)	No

## Larne Lough North

**2. VDSI (*Nucella lapillus*)**

Waterbody VDSI assessment:

Good (ND)

- Data store:
- Data availability:

Boundaries:


Class	Moderate	Good	High
VDSI	≥4.0	≥0.3 <4.0	<0.3
EQR	<0.33 -0	≥0.33 <0.95	0.95 – 1.0

Results:

Year	Shore	VDSI	EQR	Status

Data confidence:

No data

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## ANNEX B: Classification of physico-chemical Quality Elements: General

### Dissolved Oxygen

**Waterbody DO assessment: HIGH (L)**

Classification tools: Comparison of 5% ile against reference standards

- Data store: \\marine on ehslis2k \Water Framework Directive\DRAFT WFD CLASSIFICATION REPORTS\Dissolved Oxygen
- Data Availability: 2003,2004
- Data Availability (spot & continuous samples): Spot
- Thresholds:

WFD Status	Marine 5%ile	Objectives
HIGH	≥5.7 mg/L	All life stages of salmonids and transitional fish
GOOD	≥4.0 <5.7 mg/L	Presence of salmonids and transitional fish
MODERATE	≥2.4 <4.0 mg/L	Most life stages of non-salmonid adults
POOR	≥1.6 <2.4 mg/L	Presence of non-salmonids, poor survival of salmonids
BAD	<1.6 mg/L	No salmonids present, marginal survival of resident species

### Results:


5% ile DO (mg/L)	Status	Data years	Data Quality	No. of daily averages	Data Coverage (proportion of possible months with data*)
8.00	HIGH	03, 04	**	9	12.5%

\* Proportion of possible months for which data are available

\*\*Data Quality

LOW

- Instruments subject to regular calibration checks and quality assurance programme, but databases not QA'd.
- Sampling frequency, low.

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### Nutrients – Winter DIN

<b>Winter DIN Assessment</b>	<b>Good (L)</b>
------------------------------	-----------------

- Data store: \\marine on ehslis2k \Water Framework Directive\Nuala-Lesley Nutrients\DIN for Classification\Coastal Water
- Data Availability: 2005 to 2006, DIN & salinity (November to February)
- Data Availability (spot & continuous samples): spot
- N regulation thresholds:

Area	Salinity range	DIN (uM) Winter mean H/G	DIN (uM) Winter mean G/M
Coastal (at salinity 32)	30-34.5	12-18	18-30


Results:

Mean Winter DIN (uM)	Winter DIN Daily average (n)	No. of samples (n)	No. of sites	Data Years	Data Quality	Status
17.71	1	4	1	2005 - 2006	Database not yet QA'd	Good

Data confidence:

Low

- Database not QA'd .

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**ANNEX C: Classification of physico-chemical quality elements: Specific Pollutants (Annex VIII)**

**Overall specific pollutants assessment  
gH (ND)**

<b>Annex VIII: Overall Compliance</b>	Pass- No data
<b>Annex VIII: Pass/Fail</b>	Pass- No data

**Classification tools:** Comparison with EQS levels

**Data Availability:** 2008 WFD Dedicated monitoring data available for 2009.


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## ANNEX D: Hydromorphological quality elements

**Overall hydromorphology assessment: HMWB Good**

**Classification tools:**

1. TRaC Hydromorphology metrics
2. MIMAS

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## **ANNEX E: Chemical Status – Annex X Chemicals**

**Overall water chemistry assessment:    Good (No Data)**

<b>Annex X: Overall Compliance</b>	Pass- No data
<b>Annex X: Pass/Fail</b>	Pass- No data

**Classification tools:** Comparison against EQS.

**Data Availability:** 2008 WFD Dedicated monitoring data available for 2009.

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### ANNEX F: Protected Area Objectives

<b>Water body</b>	<b>Protected area</b>	<b>Designation</b>	<b>Status</b>	<b>Reason for non-compliance</b>
Larne Lough North	Larne Lough	SPA	Favourable	
Larne Lough North	Larne Lough	Saltmarsh	Favourable-maintained	

#### **Nitrates Directive**

Until 1 January 2007, Northern Ireland had designated seven NVZs on the basis of elevated nitrate levels in groundwaters. These NVZs were very small and covered less than 1% of Northern Ireland's area. However, Northern Ireland also has a widespread problem of eutrophication of surface waters and a large proportion of this nutrient enrichment is attributable to agriculture. Following extensive consultation, the total territory of Northern Ireland was established as the area to which an action programme would be applied under the Protection of Water Against Agricultural Nitrate Pollution Regulations (Northern Ireland) 2004 with effect from 29 October 2004.

## GLOSSARY

<b>AFBI</b>	Agri-Food and Biosciences Institute (under contract to NIEA)
<b>AMBI</b>	AZTI Marine Biotic Index
<b>Annex 10</b>	Annex 10 Priority Hazardous Substances
<b>Annex 8</b>	Annex 8 Specific Pollutants
<b>Article 5</b>	Characterisation, typology, pressures and impacts analysis
<b>ASSI</b>	Area of Special Scientific Interest
<b>DIN</b>	Dissolved Inorganic Nitrogen
<b>DO</b>	Dissolved Oxygen
<b>EQR</b>	Ecological Quality Ratio
<b>EQS</b>	Ecological Quality Status
<b>EUNIS</b>	European Nature Information System
<b>FSL</b>	Full Species List
<b>GEP</b>	Good Ecological Potential
<b>H/G/M/P/B</b>	High/Good/Moderate/Poor/Bad (Classification Status)
<b>H/M/L</b>	High/Medium/Low (Confidence)
<b>HMWB</b>	Heavily Modified Water Body
<b>IQI</b>	Infaunal Quality Index
<b>IRBD</b>	International River Basin District
<b>LOD</b>	Limit of Detection
<b>MBT</b>	Macroalgal Blooming Tool
<b>MEP</b>	Moderate Ecological Potential
<b>NB</b>	Neagh Bann
<b>ND</b>	No data
<b>NE</b>	North Eastern
<b>NEAGIG</b>	North Eastern Atlantic Geographical Intercalibration Group
<b>NIEA</b>	Northern Ireland Environment Agency
<b>N-regs</b>	Nitrogen Regulation
<b>NVZ</b>	Nitrate Vulnerable Zone
<b>NW</b>	North Western
<b>Physico-chem</b>	Physical and chemical monitoring
<b>RSL</b>	Reduced Species List
<b>SAC</b>	Special Area of Conservation
<b>SEPA</b>	Scottish Environment Protection Agency
<b>SPA</b>	Special Protected Area
<b>TNA</b>	Tool Not Applicable
<b>TraC MImAS</b>	Transitional and Coastal Morphology Impact Assessment System
<b>TUD</b>	Tool Under Development
<b>UKAS</b>	United Kingdom Accreditation Service
<b>UKTAG</b>	United Kingdom Technical Advisory Group for Water Framework Directive
<b>UNICORN</b>	Database for marine organisms.
<b>UWWTD</b>	Urban Waste Water Treatment Directive (91/271/EEC)
<b>VDSI</b>	Vas Deferens Sequence Index
<b>WFD</b>	Water Framework Directive