

draft RIVER BASIN MONITORING PLAN

CLASSIFICATION PAMPHLET

Transitional Waterbody Foyle and Faughan

22nd December 2008

FOYLE AND FAUGHAN (TRANSITIONAL WATER)

Water body Information

- River Basin District: NE
- Water body type: Transitional Water 2 (TW2)
- Water body characteristics: Partly mixed/stratified, mesotidal, sand and mud, mesohaline
- Water body area: 34.29 km²
- Heavily Modified Water Body: YES

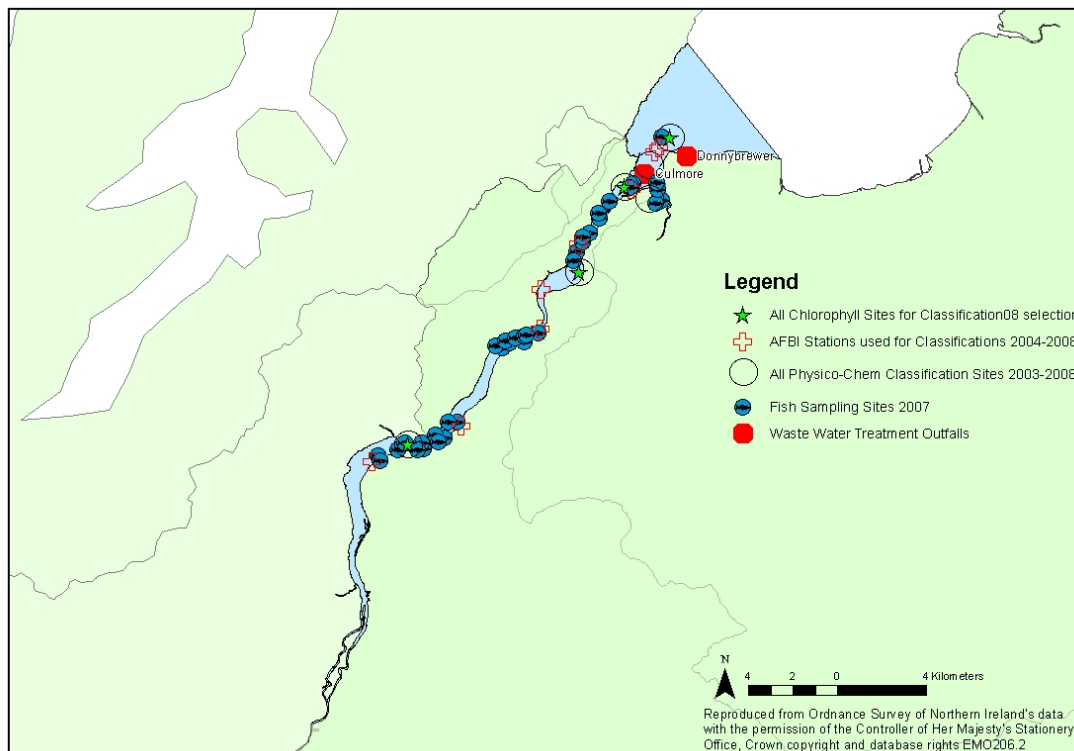
WATERBODY CLASSIFICATION:

MODERATE (FAIL)

Transitional waters are recognised across Europe as being difficult to classify as each one is unique. Transitional environments are naturally stressed systems with high spatial and temporal variability. Tools for assessment are not well developed for this classification. However additional tools may be available for March 2009.

As this water body is heavily modified, ecological potential has to be determined. This stage has not yet been completed, and this classification is based on ecological status.

A further recommendation is to split this waterbody, in recognition that only the lower end of the estuary is heavily modified. The need for this has become apparent during the classification process.



Pressures and monitoring points (historic and planned) within Foyle and Faughan (Transitional Water).

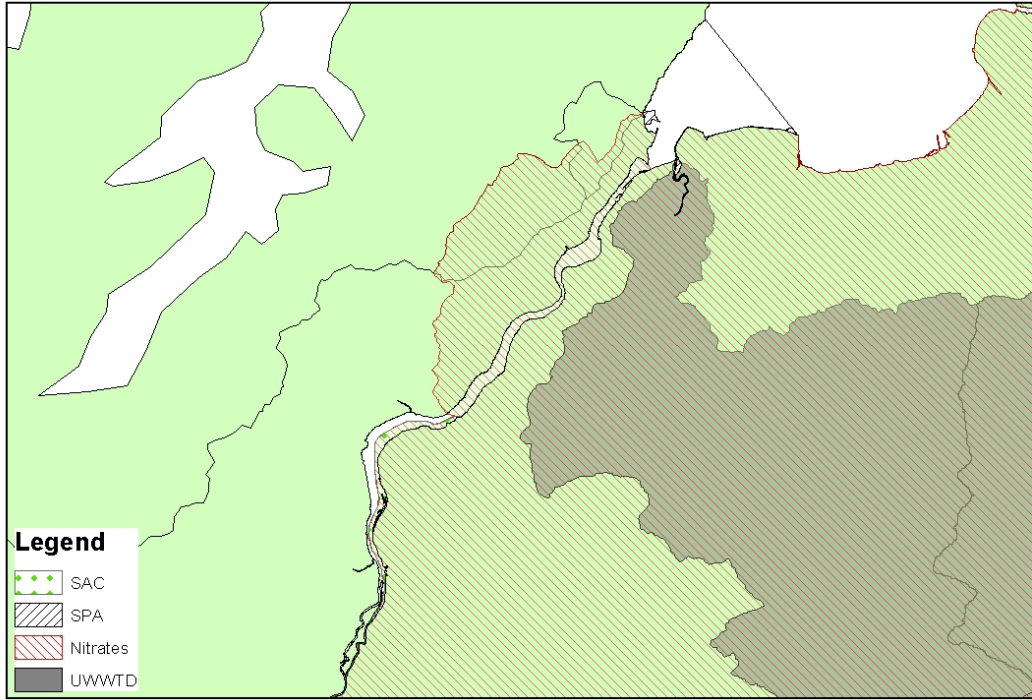
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Foyle and Faughan


Version Date: 22/12/08

MARINE ASSESSMENT AND LICENSING TEAM



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Protected areas within Foyle and Faughan (Transitional Water).

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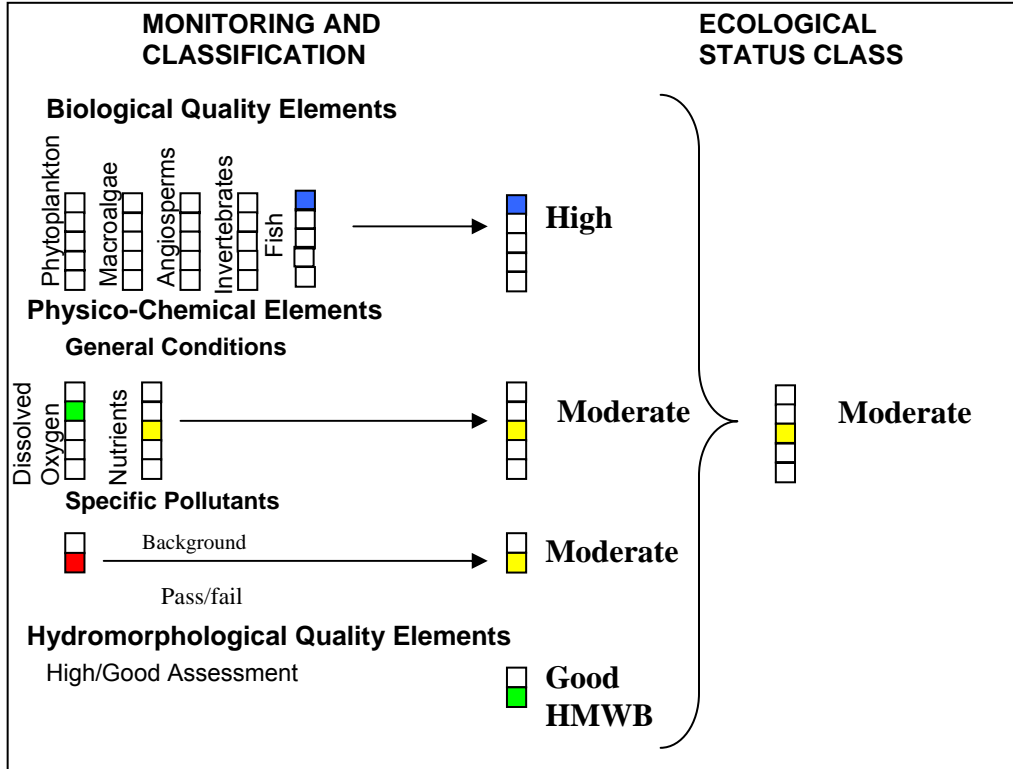
Parameters Requiring Assessment (for this exercise)

PARAMETERS TABLE

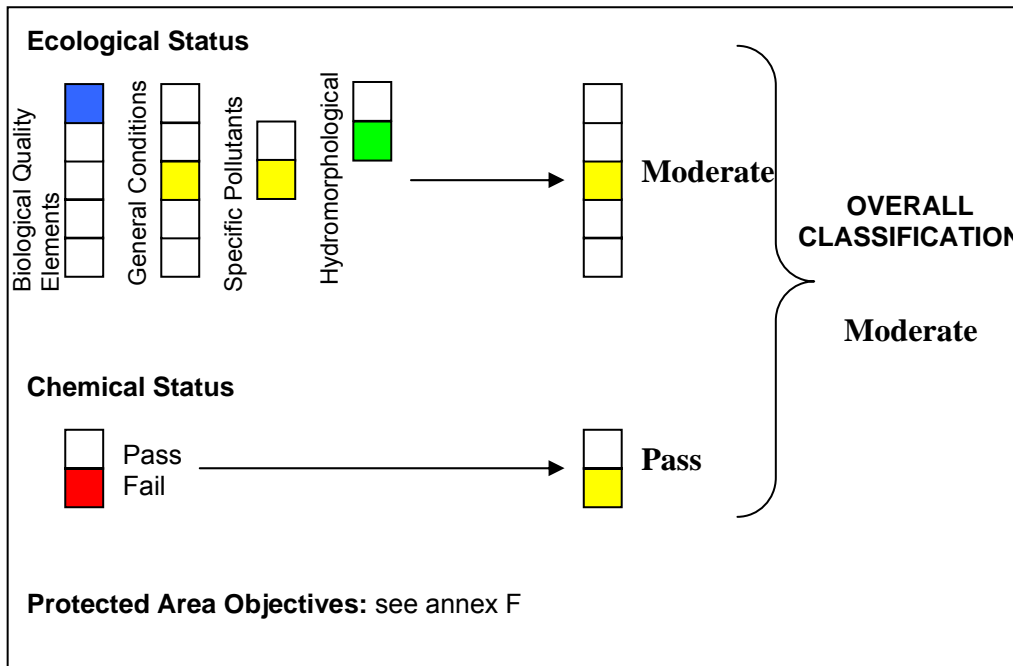
(Parameters for which classification systems are available and have been used in the first round of classification)

Ecological Quality Element			
<i>Main Element</i>	<i>Sub-Element</i>	<i>Applied</i>	<i>Comment</i>
Plants	Macro Algae		
	- <i>Opportunistic Macroalgae</i>	☒	Tool not applicable
	- <i>Reduced Species List</i>	☒	Tool not applicable
	Angiosperms	☒	Tool not applicable
	Phytoplankton	✓	Tool under development
Benthic Invertebrates	Infaunal Quality Index	☒	Tool under development
	Imposex	☒	Tool not applicable
Fish	Transitional Fish Classification Index	✓	
Physico-Chemical	General Conditions		
	- <i>Dissolved Oxygen</i>	✓	
	- <i>Nutrients</i>	✓	
	Specific Pollutants (Annex VIII subs)	✓	
Hydromorphological Quality Elements	SEPA Rapid Designation	✓	
	TraC MIMAS	✓	
Chemical Status			
Priority Hazardous Substances (Annex X)	Annex X Substances	✓	


Waterbody Classification



Ecological classification of Foyle and Faughan (Transitional Water)



Overall classification of Foyle and Faughan (Transitional 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 years)	Frequency (if p.a.)	No. of sites
Ecological			
Phytoplankton - 90 %ile		2007	
Macroalgae	Fucoid extent	TUD	
	MBT	TNA	
Angiosperms	Seagrass	TNA	
	Saltmarsh	TUD	
Benthic Invertebrates	Infaunal Quality Index	TUD	
Fish	Spring	2007	
Physio-chemical			
Nutrients		2003-6	15 samples 3 sites
Salinity		2003-6	
Temperature		2003-6	
Dissolved Oxygen		2006-7	6
Suspended Particulate Matter			
Light (Kd)			
Specific polluting substances (Annex VIII)		2002-2007	
Hydromorphology			
Water chemistry (Annex X)			
Priority hazardous substances		2002-2007	

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ANNEX A: Classification of Biological Quality Elements

QE: Phytoplankton **NO CURRENT REF CONDITIONS FOR TWs**

QE: Macroalgae – tool not applicable/ tool under development

QE Angiosperms – tool not applicable

QE: Benthic Invertebrates – tool under development for transitional waters

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QE: Transitional Fish – Foyle/Faughan

Overall transitional fish assessment: *High (L)*

Classification tools: Transitional Fish Classification Index (TFCI)

Data store:

- Fish: NIEA fish data – MS Excel
- Supporting Parameters: NIEA physico-chemical parameters – MS Excel

Data Availability:

- WFD surveillance monitoring 2006 (Faughan) and 2007 (Foyle & Faughan); Faughan - two surveys in 2006, two surveys in 2007; Foyle – single survey in 2007; sampling methods – seine netting & fyke nets.
- CSSEG fish monitoring 1999-2007 (Foyle); single annual survey; sampling method – beam trawling.


EQR boundaries:

	Bad	Poor	Moderate	Good	High
EQR	<0.2	≥0.2; <0.4	≥0.4; <0.6	≥0.6; <0.8	≥0.8

Results:

Transitional Fish Classification Index (TFCI) – 2007 data


Metric Number	Metric	Score
1	Species composition	4
2	Presence of Indicator species	3
3	Species relative abundance	4
4	No. of taxa making up 90% of the abundance	5
5	No. of estuarine resident taxa	3
6	No. of estuarine-dependent marine taxa	4
7	Functional guild composition	5
8	No. of benthic invertebrate feeding taxa	5
9	No. of piscivorous taxa	5
10	Feeding guild composition	5
	TFCI	43
	EQR	0.83

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Data confidence:

LOW

- Survey methodologies and protocols (High)
- Realistic type-specific reference conditions (Medium)
- Data QA (Medium)
- Statistical testing and intercalibration (Low)

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

Dissolved Oxygen

Waterbody DO assessment: Good (M)

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: 2006 to 2007
- 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*)
4.97	Good	06 to 07	**	10	29.2%

* Proportion of possible months for which data are available

**Data Quality

Medium

- Instruments subject to regular calibration checks and quality assurance programme, but databases not QA'd.
- Medium = 5 – 10 (daily averages) x n (no. of assessment years in reporting cycle)

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Nutrients – Winter DIN

Winter DIN assessment **Moderate (M)**

- Data store:
\\marine on ehslis2k \Water Framework Directive\Nuala-Lesley Nutrients\DIN for Classification\Coastal Water
- Data Availability: 2003 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	DIN (uM) Winter mean M/P	DIN (uM) Winter mean P/B
Transitional (at salinity 25)	5-25	20-30	30-45	45-67.5	>67.5


Results:

Mean Winter DIN (uM) (normalised to salinity 25)	Winter DIN Daily average (n)	No. of samples (n)	No. of sites	Data Years	Data Quality	Status
52.61	3	15	3	2003 - 2006	Database not yet QA'd	Moderate

Data confidence:

- Database not QA'd.

Medium

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ANNEX C: Classification of physico-chemical quality elements: Other specific Pollutants

Overall specific pollutants assessment	FAIL
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Annex VIII: Overall Compliance	Fail
Annex VIII: Pass/Fail	Fail

Classification tools: Comparison with EQS levels.

Data Availability: CSSEG/NMMP monitoring data 2002-2007.

Data confidence: Low until 2008 data assessed.

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ANNEX VIII	Value						EQS ug/l	Ecological Status
	2002	2003	2004	2005	2006	2007		
111 tri	<0.04	<0.04	<0.04	<0.04	<0.04	<0.025	100ug/l	GH
112 tri	ND	ND	ND	ND	ND	<0.75	300ug/l	GH
24 D	ND	ND	ND	ND	ND	ND		
2 chloro	ND	ND	ND	ND	ND	ND		
4 chloro 3	ND	ND	ND	ND	ND	ND		
ammonia	6.61	6.015	5.99	5.955	ND	ND	21ug/l	GH
As	ND	0.825	0.55	0.6375	0.875	ND	25ug/l	GH
Bentazone	ND	ND	ND	ND	ND	ND		
biphenyl	ND	ND	ND	ND	ND	ND		
boron	ND	ND	ND	ND	ND	ND		
chlorine	ND	ND	ND	ND	ND	ND		
chloronit	ND	ND	ND	ND	ND	ND		
chloronit_cal c	ND	ND	ND	ND	ND	ND		
Cr	ND	ND	ND	ND	0.069	ND	0.6 ug/l	GH
Cu	1.185	1.0525	1.08	0.593	0.9565	ND	5 ug/l	GH
Cy	ND	ND	ND	ND	ND	ND		
Cyfluthrin	ND	ND	ND	ND	ND	ND		
cyper	ND	ND	ND	ND	ND	ND		
diazinon	<14	<14	2.3	1.883	0.8375	ND	0.01ug/l	M
dichlorvos	<20	<20	<1	<1	1.25	ND	0.04ug/l	M
dimethoate	ND	ND	ND	ND	ND	ND		
fenitrothion	<12	<12	<1	<5	3.25	ND	0.01ug/l	M
Fe	ND	ND	ND	ND	ND	ND		
linuron	ND	ND	ND	ND	ND	ND		
malathion	<12	<12	<5	<5	1.75	ND	0.02ug/l	M
Mn	ND	ND	ND	ND	ND	ND		
mecoprop	ND	ND	ND	ND	ND	ND		
permethrin	ND	ND	ND	ND	ND	ND		
phenol	ND	ND	ND	ND	ND	ND		
toluene	ND	ND	ND	ND	ND	ND		
Vn	ND	ND	ND	ND	ND	ND		
xylenes	ND	ND	ND	ND	ND	ND		
Zn	3.6	5.813	2.9625	ND	2.63	ND	40ug/l	GH

G	Good
F	Fail
GH	Good or better and is normally treated as high
M	Moderate

	Mean includes LOD data
	Mean based on actual values


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ANNEX D: Hydromorphological quality elements

Overall hydromorphology assessment: Heavily Modified Water Body

Classification tools:

1. TRaC Hydromorphology metrics
2. MIMAS

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ANNEX E: Chemical Status

Overall water chemistry assessment:	FAIL
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Annex X: Overall Compliance	Fail
Annex X: Pass/Fail	Fail

Classification tools: Comparison with EQS levels.

Data Availability: CSSEG/NMMP monitoring data 2002-2007.

Data confidence: Low until 2008 data assessed.

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ANNEX X	Value						EQS	Chemical Status	Ecological Status
	2002	2003	2004	2005	2006	2007			
12 Dichloro	<5	<5	<5	<5	<5	<2	10ug/l	G	GH
anthracene	ND	ND	ND	ND	ND	ND			
atrazine	<15	<15	<10	<10	4.625	ND	0.6ug/l	F	M
benzene	ND	ND	ND	ND	ND	ND			
benzo	ND	ND	ND	ND	ND	ND			
benzo a	ND	ND	ND	ND	ND	ND			
Cadmium	0.025	0.0283	0.0238	0.0283	<0.04	ND	0.2ug/l	G	GH
Chlorfenvos	ND	ND	ND	ND	ND	ND			
Chlorpyr	ND	ND	ND	ND	ND	ND			
Dichloro	ND	ND	ND	ND	ND	ND			
Diuron	ND	ND	ND	ND	ND	ND			
endosulphan	ND	ND	ND	ND	ND	ND			
floranthene	ND	ND	ND	ND	ND	ND			
hcb	<1	<1	<1	<1	<1	ND	0.01ug/l	F	M
hcbd	<2	<2	<2	ND	<2	<0.01	0.1ug/l	F	M
hch	<1	<1	<1	<1	<1	ND	0.002ug/l	F	M
hch calc	ND	ND	ND	ND	ND	ND			
Hg	<0.05	10.738	5.125	<10	ND	ND	0.05ug/l	F	M
Indeno	ND	ND	ND	ND	ND	ND			
ISP	ND	ND	ND	ND	ND	ND			
Napthalene	ND	ND	ND	ND	ND	ND			
Ni	0.685	0.835	0.5775	0.65	0.649	ND	20ug/l	G	GH
Nonyl	ND	ND	ND	ND	ND	ND			
Octyl	ND	ND	ND	ND	ND	ND			
Pb	<5	<5	0.1143	0.097	0.037	ND	7.2ug/l	G	GH
pcp	<0.04	<0.04	<0.04	<0.04	<0.04	ND	0.4ug/l	G	GH
simazine	<20	<20	<10	7.53	3.25	ND	1ug/l	F	M
TBT	ND	ND	ND	ND	ND	ND			
TCB	ND	ND	ND	ND	ND	<0.15	0.4ug/l	G	GH
TCB calc	ND	ND	ND	ND	ND	ND			
trichloromethane	ND	ND	ND	ND	ND	ND			
trifluralin	<2	<2	<2	<2	<2	ND	0.03ug/l	F	M

G	Good
F	Fail
GH	Good or better and is normally treated as high
M	Moderate

	Mean includes LOD data
	Mean based on actual values


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ANNEX F: Protected Area Objectives

Water body	Protected area	Designation	Status	Reason for non-compliance
Foyle and Faughan	Foyle and Faughan	SAC	Assessment ongoing, River Foyle favourable	

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.

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Glossary

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