

North Western River Basin Management Plan

Lough Foyle Classification

December 2009




An Agency within the Department of the
Environment
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NIEA Northern Ireland
Environment
www.ni-environment.gov.uk Agency

RIVER BASIN MANAGEMENT PLAN		
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle	
	Version Date:	22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM	

LOUGH FOYLE

Water body Information

- River Basin District: North Eastern
- Water Body Code: UKGBNII6NW250
- Water body type: CW8
- Water body characteristics: Euhaline, mesotidal, sheltered
- Water body area: 165.73 km²
- Heavily Modified Water Body: No

OVERALL WATERBODY CLASSIFICATION	(H/G/M/P/B): (PASS/FAIL):	MODERATE FAIL	
<p><i>Fishing pressures are liable to prevent this system achieving good status. Fishing pressure (mussel dredging) is affecting the benthic communities and licensing issues still have to be addressed to see if pressure can be regulated and areas left to recover.</i></p>			

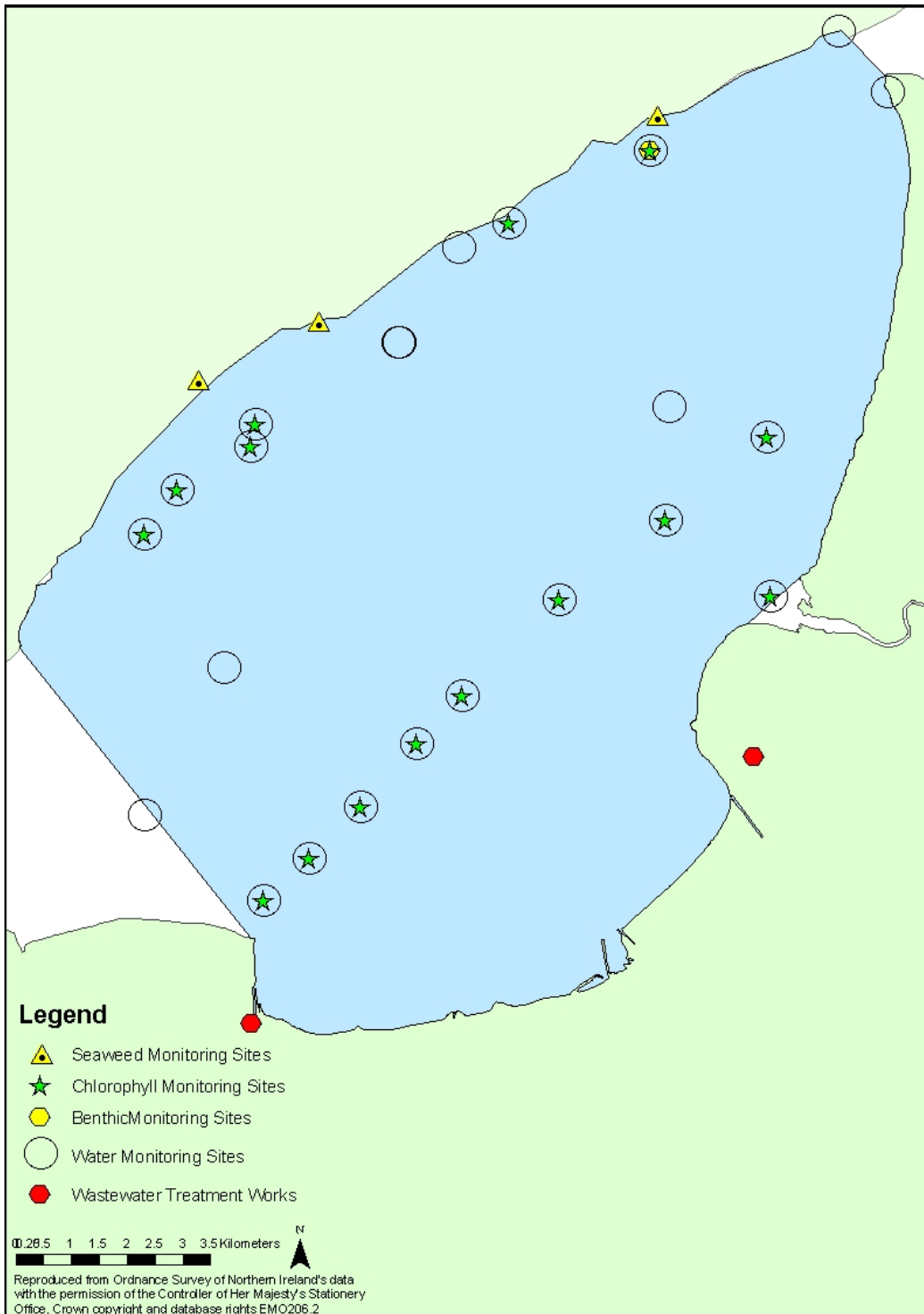
RIVER BASIN MANAGEMENT PLAN




WFD COASTAL WATER BODY CLASSIFICATION
Lough Foyle

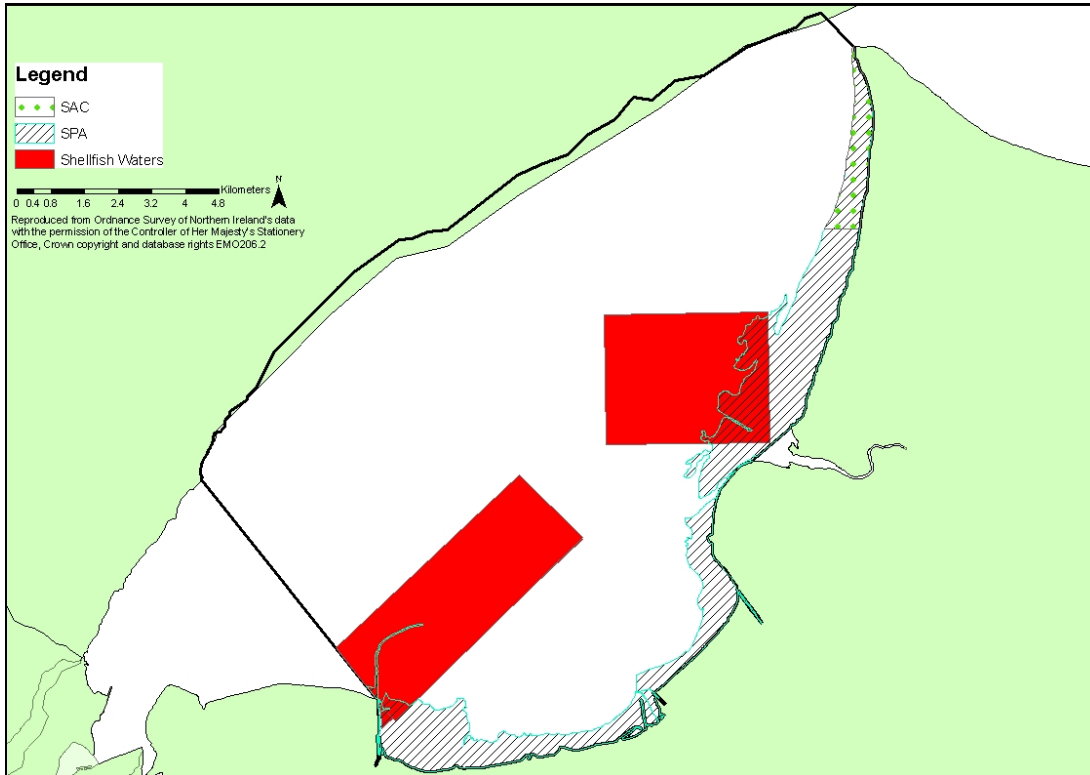
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Map showing pressures and monitoring points within Lough Foyle (Coastal Water).

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	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle
	Version Date: 22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM



Map showing protected areas within Lough Foyle (Coastal Water), see Annex F.

RIVER BASIN MANAGEMENT PLAN			
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle		
	Version Date:	22/12/09	
	MARINE ASSESSMENT AND LICENSING TEAM		

PARAMETERS TABLE

Parameters for which classification systems are available and have been used in the first round of classification. Some biological assessment tools are not suitable for all water bodies due to habitat type.

Ecological Quality Element			
Main Element	Sub-Element	Applied	Comment
Phytoplankton	Biomass	✓	
Macroalgae (Seaweed)	Opportunistic Macroalgae	☒	Tool not suitable.
	Reduced Species List	✓	
Angiosperms	Seagrass	☒	No data available.
	Saltmarsh	Assessed under protected areas.	See Annex F
Benthic Invertebrates	Infaunal Quality Index	✓	
	Imposex	☒	Tool not suitable.
Fish	Transitional Fish Classification Index		
Physico-chemical (Water)	-Dissolved Oxygen	✓	
	-Nutrients	✓	
	Specific Pollutants (Annex VIII substances)	✓	
Hydromorphological Quality Elements	SEPA Rapid Designation	✓	
	TraC MIMAS	✓	
Chemical Status			
Priority Hazardous Substances	Annex X substances	✓	

Waterbody Classification

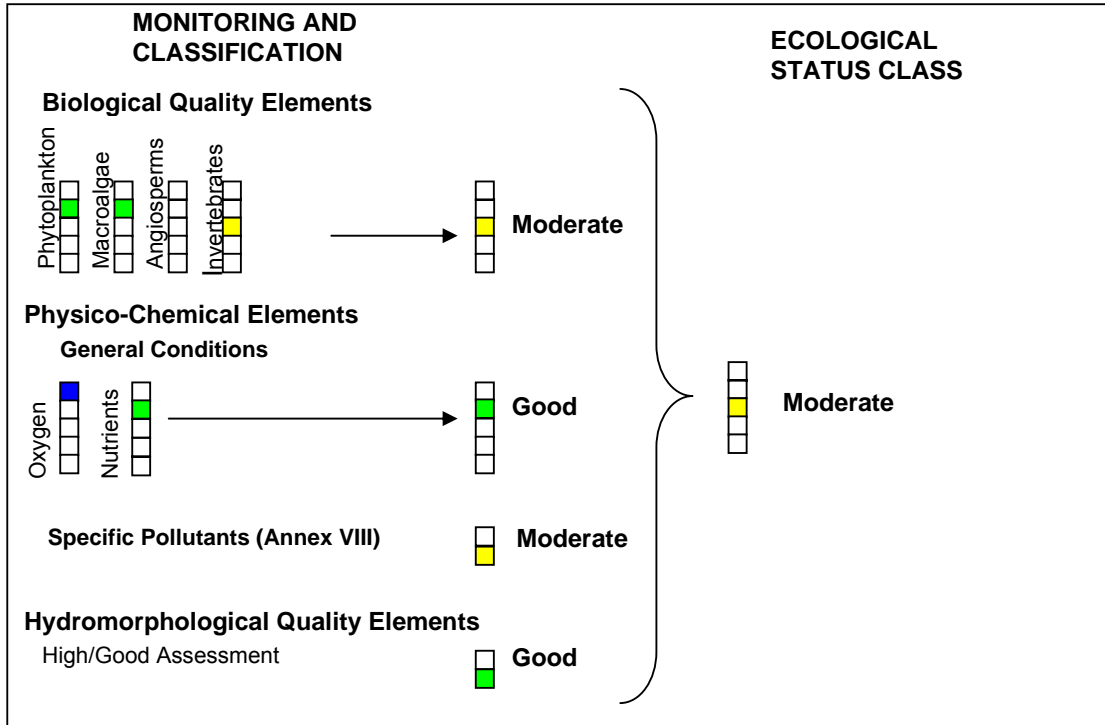


Figure showing ecological classification of Lough Foyle (Coastal Water)

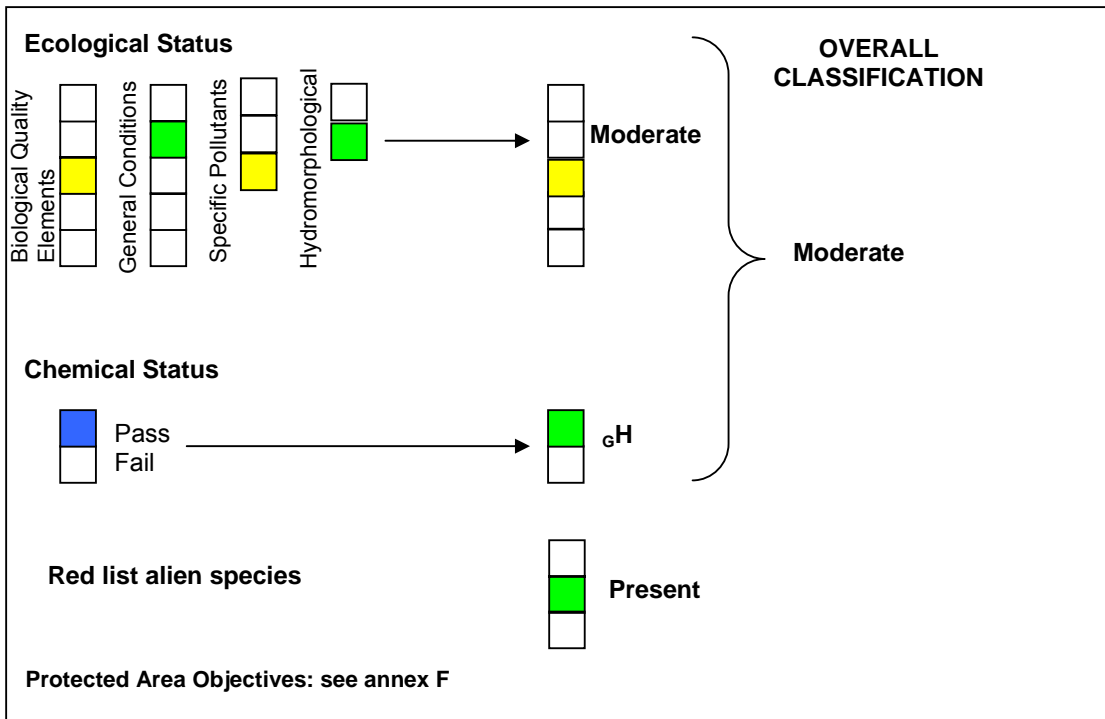



Figure showing overall classification of Lough Foyle (Coastal Water)


RIVER BASIN MANAGEMENT PLAN		
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle	
	Version Date:	22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM	

First River Basin Cycle (2004 – 2008)

Monitoring Level: *Surveillance and operational*

Sampling frequency for each quality element

Quality Elements		Year (if 1 in 3 yrs)	No. of sites
Biological			
Phytoplankton		2004-8	29 sites 124 samples
Macroalgae	Reduced Species List	2008	3 sites
Benthic Invertebrates	Infaunal Quality Index	2006	1 site 5 replicates
	Imposex	ND	
Physico-chemical			
Nutrients		2003-2006	12 sites 22 samples
Salinity		2003-2006	
Temperature		2003-2006	
Dissolved Oxygen (DO)		2002-8	215
Specific polluting substances (Annex VIII)		2002-06	10
Hydromorphology		2007	
Water chemistry			
(Annex X)		2002-06	10

RIVER BASIN MANAGEMENT PLAN	
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle
	Version Date: 22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM

LOUGH FOYLE COASTAL

ANNEX A: Classification of Biological Quality Elements

QE: Phytoplankton

QE phytoplankton assessment (+ data confidence):	GOOD (M)	
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Classification tools:

Classification tools:

1. Chlorophyll biomass index (90%ile).
 2. Species composition, abundance and bloom frequency will be reported in the next classification round.
- Data store (classification):
MARINE\Water Framework Directive\DRAFT WFD CLASSIFICATION REPORTS\QE Phytoplankton\Chl1a 90th Percentile\Final 90th Percentile Phytoplankton - MARINE\Water Framework Directive\DRAFT WFD CLASSIFICATION REPORTS\QE Phytoplankton\Elevated Taxa\Lough Foyle phytotools 2004-2007
 - Data Availability (spot & continuous samples): Chl = spot (2004-2008) AFBINI & NIEA

Chlorophyll Biomass Index - 90%ile (Chl $\mu\text{g l}^{-1}$)

(Growing Season 1st Mar – 30th Sept)

Waterbody Chl. biomass assessment: *GOOD (M)*

Thresholds:

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*)
8.91	GOOD	2004-2008	Medium	19	29	124	68.57%

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

Data confidence: Medium

- The proportion of possible months sampled is moderate, yielding reasonable temporal coverage, spatial coverage is also relatively limited for the waterbody.
- Data from two different Agencies NIEA and AFBINI.

RIVER BASIN MANAGEMENT PLAN		
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle	
	Version Date:	22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM	

QE: Macroalgae Lough Foyle Coastal Waters

QE macroalgal assessment (+ data confidence):	Good (M)	
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Classification tools: 1. Reduced species list (RSL)
2. Macroalgal Blooming Tool (MBT) – tool not applicable

Waterbody RSL assessment: *GOOD (Medium)*

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

Boundaries:

Parameters	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		
Moville 2008	17	51	44.4	15.7	51.0	1.04	13.7	0.819	HIGH
Craigbuoy / Vances Point 2008	10	37	50.32	21.62	43.24	0.85	16.22	0.766	GOOD
Redcastle 2008	16	45	41.85	15.56	48.89	0.80	11.11	0.812	HIGH
Mean								0.8 ±0.03	GOOD


Data Confidence:

Medium

- Standard Deviation (±) 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: N/A

QE: Angiosperms – no data

RIVER BASIN MANAGEMENT PLAN	
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle
	Version Date: 22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM

QE: Benthic Invertebrates – Lough Foyle

QE benthic invertebrate assessment (+ Data confidence):	MODERATE (L)	
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Classification tools: 1. Infaunal Quality Index (IQI) – MODERATE (Low)
 2. Imposex tool (VDSI) – Not applied

IQI (v4)

Water body IQI assessment: The data used for the assessment falls outside the IQI sediment tool EUNIS classification. Therefore there is low confidence in the assessment.


- WFD surveillance monitoring: 2008
- Data store:
 - Benthic invertebrates: UNICORN, NIEA database.
 - Supporting Parameters: Particle Size Analysis, water quality data.
 - Digital images: AMAP folder
- Data Availability (classification): LF5 (2006)
- 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
IQI	>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
2006		LF5	5	0.62	0.1	Moderate
Overall Mean						

Alien taxa present: *Crassostrea gigas*

RIVER BASIN MANAGEMENT PLAN		
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle	
	Version Date:	22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM	

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

Dissolved Oxygen

Dissolved oxygen (+ data confidence):	HIGH (M)	
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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:** 2002 to 2008
- **Data Availability (spot & continuous samples):** Spot & Continuous

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*)
5.93	HIGH	02 to 08	**	215	42.8%

* Proportion of possible months for which data are available

**Data Quality: Medium

- Databases not QA'd.
- 11 (daily averages) x n (no. of assessment years in reporting cycle).

RIVER BASIN MANAGEMENT PLAN		
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle	
	Version Date:	22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM	

Nutrients – Winter Dissolved Inorganic Nitrogen DIN

Winter DIN (+ Data confidence):	Good (L)	
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- **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

Winter DIN thresholds:


Area	Salinity range	DIN (uM)		
		HIGH	GOOD	MODERATE
Coastal (at salinity 32)	30-34.5	<12	≥12 ≤18	>18

Results:

Mean Winter DIN (uM) (normalised to salinity 32)	Winter DIN Daily average (n)	No. of samples (n)	No. of sites	Data Years	Data Quality	Status
						17.29

Data confidence: Low

- Database not QA'd.

RIVER BASIN MANAGEMENT PLAN		
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle	
	Version Date:	22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM	

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

Specific pollutants assessment (+data confidence)	Moderate	
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Classification tools: Comparison with EQS levels.

Data Availability: 2003-07 Shellfish Waters Monitoring. Determinants are being assessed on a rolling programme.

Data confidence: Low

RIVER BASIN MANAGEMENT PLAN




WFD COASTAL WATER BODY CLASSIFICATION
Lough Foyle

Version Date: 22/12/09

MARINE ASSESSMENT AND LICENSING TEAM

ANNEX VIII	Value					EQS ug/l	Ecological Status
	2003	2004	2005	2006	2007		
111_tri	ND	ND	ND	ND	ND		
112_tri	ND	ND	ND	ND	ND		
24_D	ND	ND	ND	ND	ND		
2_chloro	ND	ND	ND	ND	ND		
4_chloro_3	ND	ND	ND	ND	ND		
ammonia	48.04	42.87	63.92	18.53	34.73	21	M
As	1.01	0.663	0.76	NR	0.54	25	GH
Bentazone	ND	ND	ND	ND	ND		
biphenyl	ND	ND	ND	ND	ND		
boron	ND	ND	ND	ND	ND		
chlorine	ND	ND	ND	ND	ND		
chloronit	ND	ND	ND	ND	ND		
chloronit_calc	ND	ND	ND	ND	ND		
Cr	ND	ND	ND	0.103	0.37	0.6	GH
Cu	0.862	0.87	1.37	1.25	0.91	5	GH
Cy	ND	ND	ND	ND	ND		
Cyfluthrin	ND	ND	ND	ND	ND		
cyper	ND	ND	ND	ND	ND		
diazinon	ND	ND	ND	ND	ND		
dichlorvos	ND	ND	ND	ND	ND		
dimethoate	ND	ND	ND	ND	ND		
fenitrothion	ND	ND	ND	ND	ND		
Fe	ND	ND	ND	ND	ND		
linuron	ND	ND	ND	ND	ND		
malathion	ND	ND	ND	ND	ND		
Mn	ND	ND	ND	ND	ND		
mecoprop	ND	ND	ND	ND	ND		
permethrin	ND	ND	ND	ND	ND		
phenol	ND	ND	ND	ND	ND		
toluene	ND	ND	ND	ND	ND		
Vn	ND	ND	ND	ND	ND		
xylenes	ND	ND	ND	ND	ND		
Zn	4.98	2.684	4.24	6.73	2.11	40	GH
G	Good						Mean includes LOD data Mean based on actual values
F	Fail						
GH	Good or better and is normally treated as high						
M	Moderate						


RIVER BASIN MANAGEMENT PLAN		
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle	
	Version Date:	22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM	

ANNEX D: Hydromorphological quality elements

Overall hydromorphology assessment	gH	
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Classification tools:

1. TRaC Hydromorphology metrics
2. MIMAS

RIVER BASIN MANAGEMENT PLAN		
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle	
	Version Date:	22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM	

ANNEX E: Chemical Status – Annex X Chemicals

Specific pollutants assessment (+data confidence)	σ H (L)	
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Classification tools: Comparison with EQS levels.

Annex X: Overall Compliance	Pass
Annex X: Pass/Fail	Pass

Data Availability: 2003-07 Shellfish Waters Monitoring. Determinants are being assessed on a rolling programme.

Data confidence: Low

RIVER BASIN MANAGEMENT PLAN



WFD COASTAL WATER BODY CLASSIFICATION
Lough Foyle


Version Date: 22/12/09

MARINE ASSESSMENT AND LICENSING TEAM

ANNEX X	Value					EQS	Chemical Status	Ecological Status
	2003	2004	2005	2006	2007			
12_Dichloro	ND	ND	ND	ND	ND			
anthracene	ND	ND	ND	ND	ND			
atrazine	ND	ND	ND	ND	ND			
benzene	ND	ND	ND	ND	ND			
benzo	ND	ND	ND	ND	ND			
benzo_a	ND	ND	ND	ND	ND			
Cadmium	0.046	0.046	0.033	0.027	0.021	0.2	G	GH
Chlorfenvos	ND	ND	ND	ND	ND			
Chlorpyr	ND	ND	ND	ND	ND			
Dichloro	ND	ND	ND	ND	ND			
Diuron	ND	ND	ND	ND	ND			
endosulphan	ND	ND	ND	ND	ND			
floranthene	ND	ND	ND	ND	ND			
hcb	<0.001	<0.001	<0.001	<0.001	<0.001	0.01	G	GH
hcbd	<0.002	<0.002	<0.002	<0.002	ND	0.1	G	GH
hch	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	G	GH
hch_calc	ND	ND	ND	ND				
Hg	0.015	0.0238	0.005	NR	0.01	0.05	G	GH
Indeno	ND	ND	ND	ND	ND			
ISP	ND	ND	ND	ND	ND			
Napthalene	ND	ND	ND	ND	ND			
Ni	0.752	0.451	0.64	0.68	0.94	20	G	GH
Nonyl	ND	ND	ND	ND	ND			
Octyl	ND	ND	ND	ND	ND			
Pb	0.2675	0.232	0.111	0.055	0.412	7.2	G	GH
pcp	ND	ND	ND	ND	ND			
simazine	ND	ND	ND	ND	ND			
TBT	ND	ND	ND	ND	ND			
TCB	ND	ND	ND	ND	ND			
TCB_calc	ND	ND	ND	ND	ND			
trichloromethane	ND	ND	ND	ND	ND			
trifluralin	ND	ND	ND	ND	ND			

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

RIVER BASIN MANAGEMENT PLAN	
	WFD COASTAL WATER BODY CLASSIFICATION Lough Foyle
	Version Date: 22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM

ANNEX F: Protected Area Objectives

Water body	Protected area	Designation	Status	Reason for non-compliance
Lough Foyle	Lough Foyle	SPA	Favourable	
Lough Foyle	Lough Foyle	Saltmarsh	Unfavourable	Vegetation composition - indicators of negative change (<i>Spartina</i>). Vegetation composition & structure – too few
Lough Foyle	Magilligan	SAC	No marine features, though the boundary includes the intertidal.	
Lough Foyle	Longfield Bank & Ball's Point	Shellfish Waters	Compliant. Single sample exceedance in Zinc and HCH-g in 2006. Not repeated.	

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.

Annex G: Red list Alien Species

Crassostrea gigas (proposed red list species) and *Spartina anglica* are present in this water body.

RIVER BASIN MANAGEMENT PLAN



WFD COASTAL WATER BODY CLASSIFICATION
Lough Foyle

Version Date: 22/12/09

MARINE ASSESSMENT AND LICENSING TEAM

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
GH	Good/High
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

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Our aim is to protect, conserve and promote
the natural environment and built heritage for
the benefit of present and future generations.

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