

North Eastern River Basin Management Plan

Lagan 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 TRANSITIONAL WATER BODY CLASSIFICATION Lagan Estuary	
	Version Date:	22/12/09
	MARINE ASSESSMENT AND LICENSING TEAM	

LAGAN ESTUARY (TRANSITIONAL WATER)

Water body Information

- River Basin District: North Eastern
- Water body type: Transitional Water 2 (TW2)
- Water body code: UKGBNI5NE100010
- Water body characteristics: Partly mixed/stratified, mesotidal, sand and mud, mesohaline
- Water body area: 0.33 km²
- Heavily Modified Water Body: Yes

OVERALL WATERBODY CLASSIFICATION	MODERATE Ecological Potential (EP) or worse	
(PASS/FAIL):	FAIL	
<p>In this round of classification HMWBs can only be classified as 'good EP or better' or 'moderate EP or worse'.</p>		

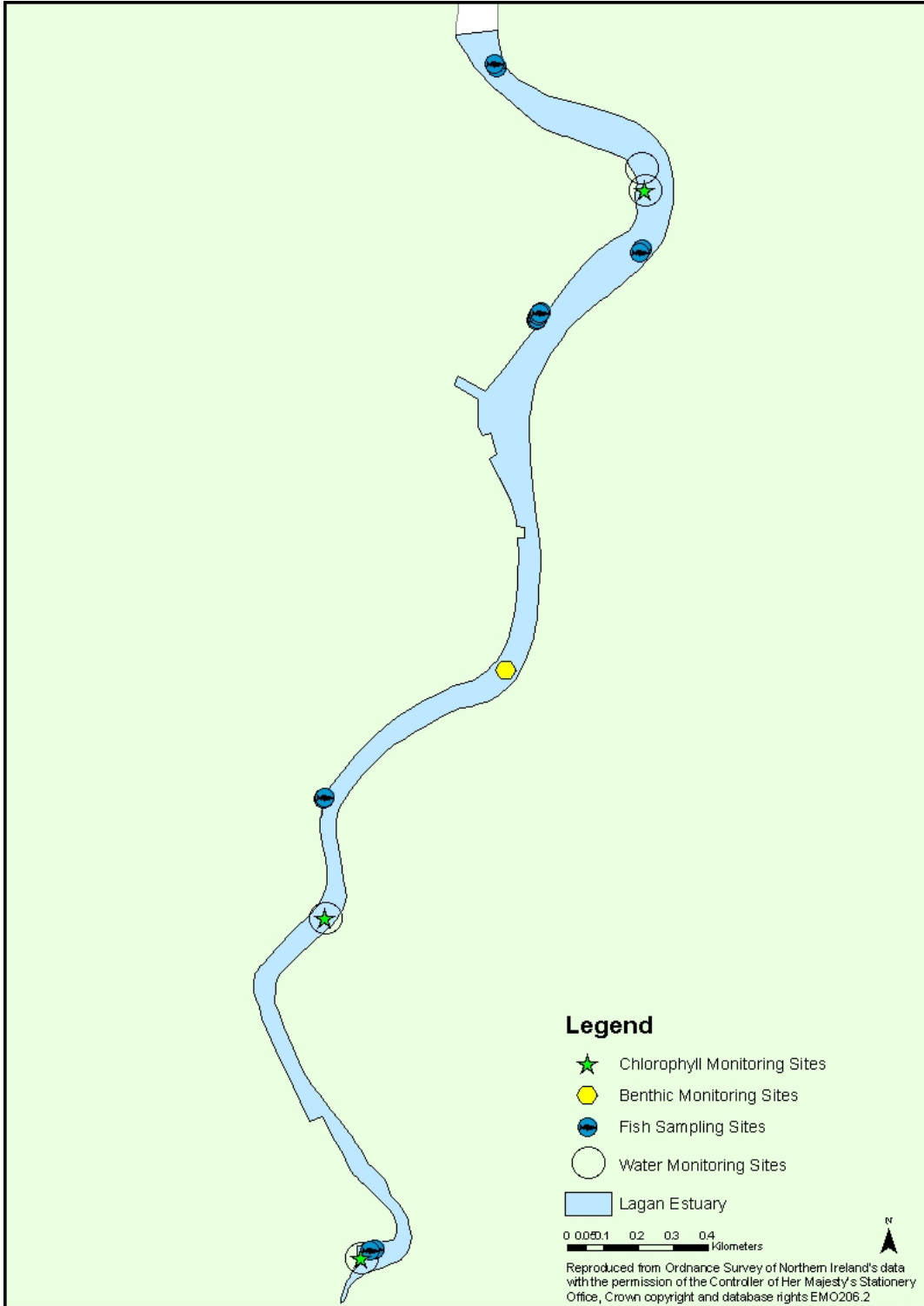
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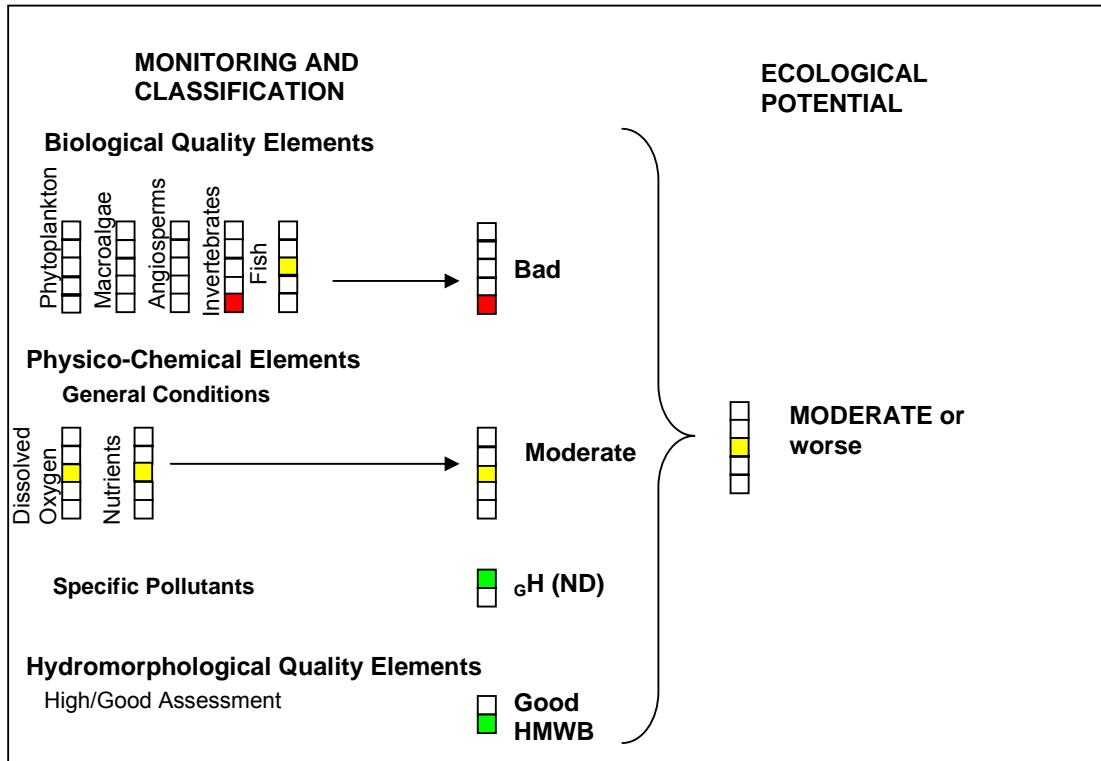
Pressures and monitoring points (historic and planned) within Lagan Estuary (Transitional Water).

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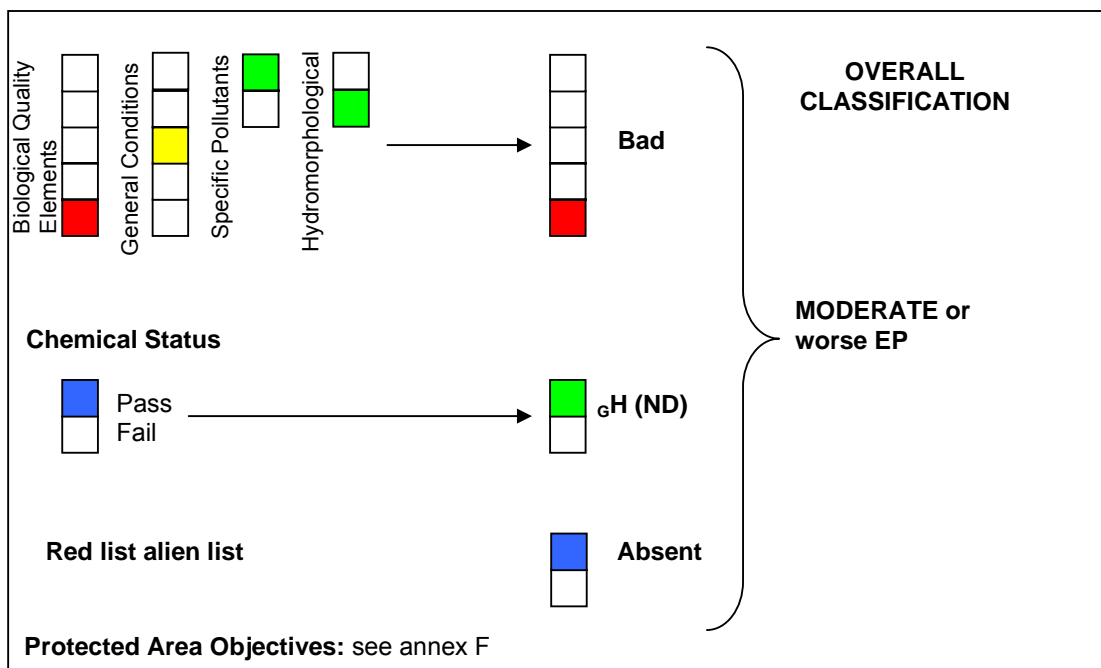
PARAMETERS TABLE

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			
<i>Main Element</i>	<i>Sub-Element</i>	<i>Applied</i>	<i>Comment</i>
Benthic Invertebrates	Infaunal Quality Index	✓	Tool under development
Fish	Transitional Fish Classification Index	✓	
Physico-Chemical (water)	General Conditions		
	-Dissolved Oxygen	✓	
	-Nutrients	☒	
	Specific Pollutant (Annex VIII subs)	☒	
Hydromorphological Quality Elements	SEPA Rapid Designation	✓	
	TraC MIMAS	✓	
Chemical Status			
Priority Hazardous Substances (Annex X)	Annex X Substances	☒	



Ecological classification of Lagan (Transitional Water)



Overall classification of Lagan (Transitional Water)


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First River Basin Cycle (2004 – 2008)

Monitoring Level: Surveillance

Sampling frequency for each quality element.

Ecological		Year (if 1 in 3 years)	No. of sites
Phytoplankton - 90 %ile		2004-8	5 sites 78 samples
Benthic Invertebrates	Infaunal Quality Index	2007-8	1
Fish	Spring	2008	
	Autumn	2008	
Physio-chemical			
Nutrients		TNA	Salinity limitation
Salinity		Continuous	
Temperature		Continuous	
Dissolved Oxygen		Continuous	
Specific pollutants (Annex VIII)		ND	
Hydromorphology		2007	
Water chemistry (Annex X)			
Priority hazardous substances		ND	

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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

Overall benthic invertebrate assessment (+ data confidence):	BAD (L)	
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Classification tools:

1. Infaunal Quality Index (IQI)
2. Imposex tool (VDSI) – N/A

1. IQI (v4)

Water body IQI assessment:

BAD

The sediment grabs for this water body were anoxic and devoid of life.

- WFD surveillance monitoring: 2008
- Data store:
- Benthic invertebrates, UNICORN NIEA database
- Supporting Parameters, Particle Size Analysis, Water Quality Dataset
- Digital images, AMAP folder.
- Data Availability (classification):
- Habitat max values (sub-tidal mud): $1-(AMBI/7) = 0.78$, $1-\text{Lambda}' = 0.72$, $\text{Taxa} = 24$


Boundaries (Intercalibrated NEAGIG):

Class	Bad	Poor	Moderate	Good	High
IQI	$>0.0 \leq 0.24$	$\geq 0.24 < 0.44$	$\geq 0.44 < 0.64$	$\geq 0.64 < 0.75$	≥ 0.75

Results:

Year	Survey	Station	n	Mean	± S.D	Status
2007		ORBR		0		BAD
2008		ORBR		0		BAD
Overall Mean						BAD

Data confidence: Low

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QE: Transitional Fish – Lagan

Overall fish assessment (+ data confidence):	MODERATE (M)	
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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 2005-2008; one survey in 2005, two surveys in 2006, 2007, and 2008; sampling methods – seine netting & fyke nets.

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) – 2008 data

Metric Number	Metric	Score
1	Species composition	4
2	Presence of Indicator species	2
3	Species relative abundance	2
4	No. of taxa making up 90% of the abundance	2
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	2
9	No. of piscivorous taxa	4
10	Feeding guild composition	4
TFCI		32
EQR		0.55

Data confidence: Medium

- Survey methodologies and protocols (Medium)
- 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

Dissolved oxygen (+ data confidence):	MODERATE (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:** 02,03,04,06,07,08
- **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*)
3.97	Moderate	02 - 04 06 - 08	**	205	33.3%

* 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.
- High = 11 (daily averages) x n (no. of assessment years in reporting cycle)

Nutrients, Winter Dissolved Inorganic Nitrogen

The data collected for this assessment was outside the current salinity limits of this tool.


Winter DIN (+ Data confidence):	MODERATE (ND)	
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ANNEX C: Classification of physico-chemical quality elements: Other specific Pollutants

Specific pollutants assessment (+data confidence)	gH (ND)	
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Data Availability: No data


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ANNEX D: Hydromorphological quality elements

Overall hydromorphology assessment	HMWB-GEP	
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Classification tools:


1. TRaC Hydromorphology metrics
2. MIMAS

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ANNEX E: Chemical Status

Overall water chemistry assessment (+data confidence)	gH (ND)	
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Data confidence: No data.

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ANNEX F: Protected Area Objectives

Water body	Protected area	Designation	Status	Reason for non-compliance
Lagan Estuary	Tidal Lagan	UWWTD	Sensitive area	

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
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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the natural environment and built heritage for
the benefit of present and future generations.

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