

draft RIVER BASIN MONITORING PLAN

# CLASSIFICATION PAMPHLET

## Coastal Waterbody Dundrum Bay – Outer

22<sup>nd</sup> December 2008

## **DUNDRUM BAY OUTER**

### Water body Information

- River Basin District: NE
- Water body type: CW5
- Water body characteristics: Euhaline, mesotidal, moderately exposed
- Water body area: 59.43 km<sup>2</sup>
- Heavily Modified Water Body: No

**OVERALL WATERBODY CLASSIFICATION. (H/G/M/P/B): GOOD  
(PASS/FAIL): PASS**

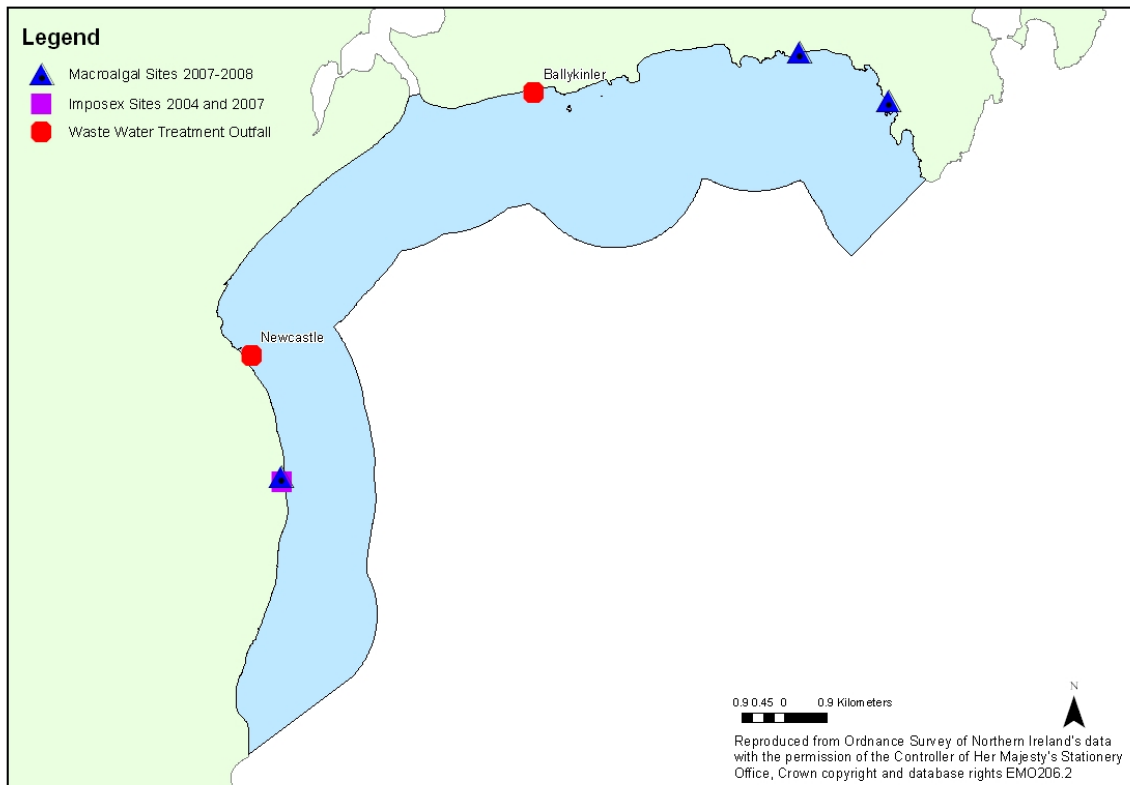


Figure showing pressures and monitoring points within Dundrum Bay Outer (Coastal Water).

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Dundrum Bay Outer

Version Date: 22/12/08

MARINE ASSESSMENT AND LICENSING TEAM

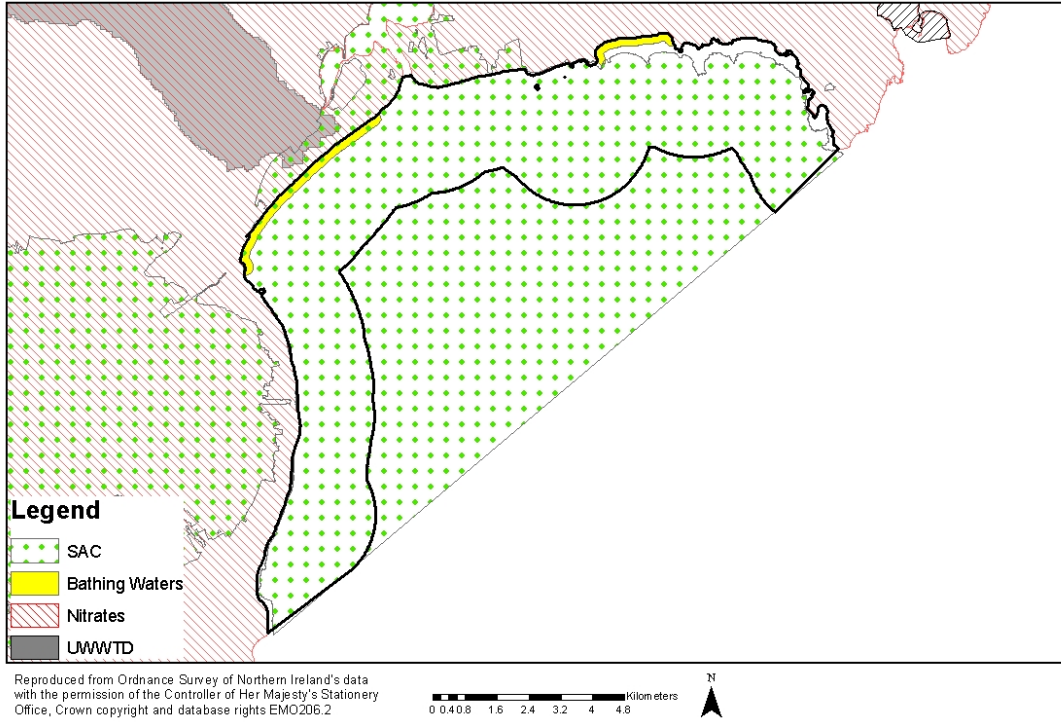



Figure illustrating protected areas within Dundrum Bay Outer (Coastal Water), see Annex F.

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**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			
<i>Main Element</i>	<i>Sub-Element</i>	<i>Applied</i>	<i>Comment</i>
<b>Plants</b>	Macro Algae	✓	
	- <i>Opportunistic Macroalgae</i>	☒	Tool Not Applicable
	- <i>Reduced Species List</i>	✓	
	Angiosperms	☒	Tool Not Applicable
	Phytoplankton	☒	
<b>Benthic Invertebrates</b>	Infaunal Quality Index	☒	
	Imposex	✓	
<b>Fish</b>	Transitional Fish Classification Index		
<b>Physico-Chemical</b>	General Conditions	✓	
	- <i>Dissolved Oxygen</i>	✓	Data to be applied
	- <i>Nutrients</i>	☒	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

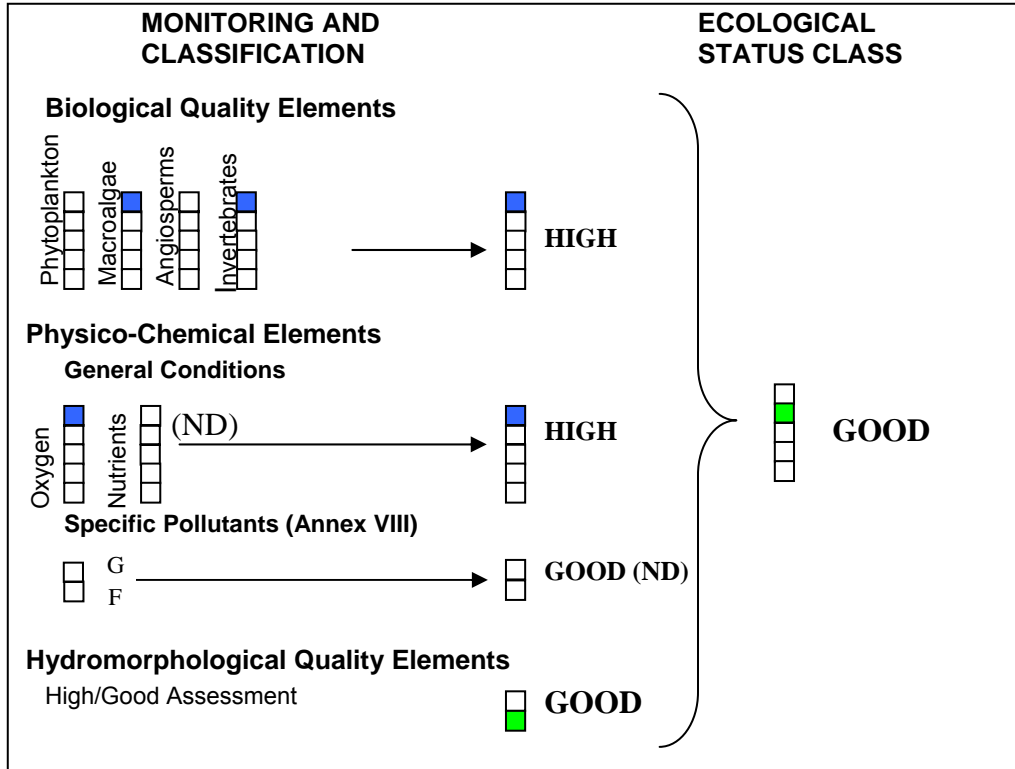


Figure showing ecological classification of Dundrum Bay Outer (Coastal Water)

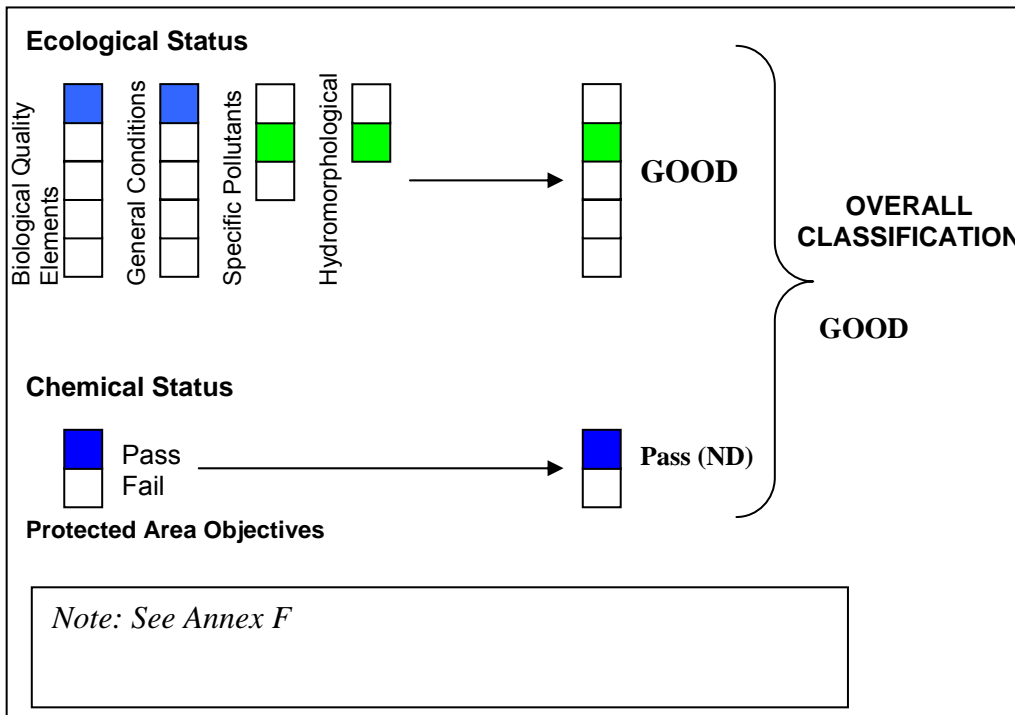


Figure showing overall classification of Dundrum Bay Outer (Coastal Water)

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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)	Frequency (if p.a.)	No. of sites
<b>Biological</b>			
Phytoplankton	90%ile	ND	
Macroalgae			
	RSL	3 x 2008	3
		1 x 2007	
Benthic Invertebrates	Infaunal Quality Index	ND	
	Imposex	2007	
<b>Physico-chemical</b>			
Nutrients		ND	
Salinity			
Temperature			
Dissolved Oxygen (DO)		2008	
Suspended particulate matter (SPM)			
Light (Kd)			
Other polluting substances (Annex VIII)		ND	
<b>Hydromorphology</b>			
<b>Water chemistry</b>			
(Annex X)		ND	



## DUNDRUM BAY OUTER

### ANNEX A: Classification of Biological Quality Elements

#### QE: Phytoplankton

QE phytoplankton assessment (+ Data confidence): **GOOD (No data)**

#### 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

- **Data Availability (spot & continuous samples):**

Phytoplankton =

#### 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

GOOD (No data)

#### 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*)

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

Data confidence:

No data

## 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 Dundrum Bay Outer

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

Classification tools:

Reduced species list (RSL), Macroalgal Blooming Tool (MBT) not applicable.

Reduced Species List (RSL)

Waterbody RSL assessment:

High (Medium)

- WFD surveillance monitoring: 2007,2008
- Data Availability (classification) 2007 - 1 site, 2008 - 3 sites
- Data Store: G:\MARINE\Projects 07\MM07-03 Marine Plants\Macrophyte Survey 07
- 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		
Bloody Bridge (2007)	17	47	40.9	17.02	53.19	0.96	12.77	0.814	HIGH
Bloody Bridge (2008)	16	41	38.1	14.63	51.22	0.86	9.76	0.827	HIGH
Corels Point (2008)	16	45	41.9	15.56	51.11	1.14	13.33	0.830	HIGH
Ringmore Point (2008)	18	45	36.0	11.11	51.11	1.14	13.33	0.832	HIGH
<b>Mean</b>								<b>0.85 ± 0.01</b>	<b>HIGH</b>

Data Confidence:

Medium


- Standard Deviation (±) are included with the mean EQR
- Data QA (expert team)
- WFD specific data data (Reduced species list completed; Full species list not yet carried out, tool not yet completed).
- 4 shores over two years yielded a medium confidence in classification.
- FSL not yet carried out

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Alien taxa present (*Sargassum muticum*):

Not present.

**QE: Angiosperms Dundrum Outer – tool not applicable**

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### QE: Benthic Invertebrates – Dundrum Outer

<b>Overall benthic invertebrate assessment:</b>	<b>High (L)</b>
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Classification tools: 1. Infaunal Quality Index (IQI)  
2. Imposex tool (VDSI)

1. *IQI (v4)*

Water body IQI assessment: *Good (no data)*

No data is available for this water body, though a site at Bloody Bridge was retrieved in 2007.

- **WFD surveillance monitoring:**
- **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

Alien taxa present:

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

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## Dundrum Bay Outer

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

Waterbody VDSI assessment: High (L)

- **Data store:** NIEA imposex shoreline data.xls; MERMAN
- **Data availability:** 2004/2007 NI survey

#### 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
2007	Bloody Bridge	0.19	0.97	High

Data confidence:

Low

- Sample analysis QA through QUASIMEME (High)
- <3 sites (Low)
- Two assessment periods (2004; 2007) (High)

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

### Dissolved Oxygen

Waterbody DO assessment:	<b>HIGH (L)</b>
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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: 2008
- 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*)
8.42	HIGH	2008	**	1	10%

\* 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.
- Low ≤ 4 daily averages x n (no. of assessment years)

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### Nutrients – Winter DIN

Winter DIN assessment

Good (ND)

- **Data store:**
- **Data Availability:**
- **Data Availability (spot & continuous samples):**
  
- **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

### Results:

Mean Winter DIN (uM) (normalised to salinity 32)	Winter DIN Daily average (n)	SPM	SPM (n)	Data Years	Data Quality	Status

Data confidence:

No data

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

**Overall specific pollutants assessment  
Good (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 data available for 2009 classification.


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## ANNEX D: Hydromorphological quality elements

<b>Overall hydromorphology assessment:</b>	<b>Good</b>
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**Classification tools:**  
metrics

1. TRaC Hydromorphology
2. MIMAS

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## ANNEX E: Chemical Status – Annex X Chemicals

**Overall water chemistry assessment:  
Good (ND)**

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

**Classification tools:** Comparison with EQS levels

**Data Availability:** 2008 data available for 2009 classification.

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### ANNEX F: Protected Area Objectives

Water body	Protected area	Designation	Status	Reason for non-compliance
Dundrum Outer	Murlough	SAC	Favourable	
Dundrum Outer	Murlough	Saltmarsh	Unfavourable	Vegetation composition - indicators of negative change ( <i>Spartina</i> )
Dundrum Outer	Dundrum Outer	UWWTD	Sensitive area for bathing water	

#### Bathing Water Directive


Water Body	Identified	2008	2007	2006	2005	2004	2003
Dundrum Outer	Tyrella						
Dundrum Outer	Newcastle						
Dundrum Outer	Murlough						

	Compliance with Guideline standards
	Compliance with Mandatory standards
	Failure to comply with Mandatory standards
	Not on monitoring programme

Newcastle Bathing Water suffers from intermittent bathing water quality. This has been attributed to inadequate sewerage infrastructure in Newcastle town. Although Newcastle waste water treatment works has full secondary treatment, this is not enough to guarantee good bathing water quality at the beach. For this reason, the area was designated as sensitive in 2005, which means that more investment will be required to ensure improve bathing water quality.

#### 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

<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