Belgooly WWDL APPLICATION –SECTION F

ATTACHEMENTS (PART 1 AND 2)

PART 1: Habitats Directive Assessment (Screening Report) in respect of Application by Cork County Council to the EPA for Wastewater Discharge License for Belgooly Agglomeration.

1 Introduction

1.1 Belgooly, a town of approximately 500 people is located on the R600 national secondary route which connects the City of Cork to Kinsale. It is situated just over 6.0 kilometres to the northeast of Kinsale on the River Stick, which on flowing through the village becomes the Belgooly River which is tidal. Kinsale is one of the busiest 'hub towns' in South County Cork. Increased development in Kinsale has had a direct impact on the development of outlying villages. The location of Belgooly has attracted much of this development in the form of housing which has seen the village grow over five fold in the past five to six years.

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1.2 The wastewater generated in Belgooly currently discharges to the Belgooly River. The sewage generated by the new housing developments is receiving some secondary treatment from private 'package treatment units' . Older village areas (pre 2000) do not receive any treatment. There are two separate collection networks in the town; one which serves the majority of the town and discharges at the confluence of two streams and the second collector serves four old stone houses and a bicycle shop and is believed to discharge to the river upstream of the bridge at the junction of the R600 and the R611. This sewer however could not be located. The problems of effluent discharge to this river, which is currently designated a 'Class B' shellfish production area, have been recognised by Cork County Council. The recent phenomenal housing growth in the village has put increased strains on the system and further development will only serve to exacerbate the problem.

1.3 The current loading is 1600PE

Stage One: Screening

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The process which identifies the likely impacts upon a Natura 2000 site of a project or plan, wither alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant.

Stage Two: Appropriate assessment
The consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.

Stage Three: Assessment of alternative solutions
The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.

Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain.
An assessment of compensatory measures, where in the light of an assessment of imperative reasons of overriding public interest, it is deemed that the project or plan should proceed.

1.4 This document brings together all of the information necessary to make determination as to whether there are likely to be significant impacts arising from the discharge from BELGOOLY two sources of discharge and untreated effluent outfall on the adjacent designated Shellfish waters and represents the first stage of this process (Screening).

Step 1:
Provide a description of the plan and other plans and projects that, in combination, have the potential to have significant effects on Natura 2000 sites within the potential impact zone;

Step 2:
Identify Natura 2000 sites which may be impacted by the plan, and compile information on their qualifying interests and conservation objectives;

Step 3:
Determine whether the plan needs to be screened for potential impacts on Natura 2000 sites;

Step 4:
Carry out an assessment of likely effects – direct, indirect and cumulative – undertaken on the basis of available information as a desk study or field survey or primary research as necessary;

Step 5:
Assess the significance of any such effects on the Natura 2000 sites within the impact zone.

1.5 The assessment has been prepared in accordance with the following guidance:

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the Habitats Dreictive 92/43/EEC.

European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habtiats Directive 92/43/EEC.

Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Environment, Heritage and Local Government, 2009.

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2 Appropriate Assessment Screening Matrix

2.1 Description of project	
Location	Belgooly , Cork. (See A1_Map1 of the application).
Description of the key components of the project	The existing sewerage network in Belgooly comprises of three independent networks constructed years apart. The two older networks are combined systems that serve the older village properties along the R600 (Cork - Kinsale) route. The larger of these networks also serves the Cramers Close development on the R612 to Oysterhaven which has a 'temporary package treatment unit'. The most recent network has been constructed to serve the new development and is a separate system that runs through the Riverbank Estate, west of the R600. Although this new system receives biological secondary treatment, neither collector system is considered to receive 'appropriate treatment'. The older smaller network also does not receive appropriate treatment.
Distance from designated sites in potential impact zone*	3.5km from the designated shellfish waters

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2.2 Description of the Natura 2000 sites within the potential impact zone[1]	
Name	None
Site Code	None
Site Description	None
Qualifying Interests of Ballycotton Bay SPA.	None
Other Notable Features of Ballycotton Bay SPA	None
Conservation Objectives	None

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2.3 Assessment Criteria	
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	N/A : no Natura sites d/s of discharge
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site taking into account the following: ○ Size and scale ○ Land-take ○ Distance from the Natura 2000 site or key features of the site: ○ Resource requirements (water abstraction etc.) ○ Emissions (disposal to land, water or air) ○ Excavation Requirements ○ Transportation Requirements ○ Duration of construction, operation, decommissioning ○ Other.	N/A : no Natura sites d/s of discharge
Describe any likely changes to the site arising as a result of: ○ Reduction in habitat area ○ Disturbance to key species ○ Habitat or species fragmentation ○ Reduction in species density ○ Changes in key indicators of conservation value (water quality etc) ○ Climate Change	N/A

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Describe any likely impacts on the Natura 2000 site as a whole in terms of: ○ Interference with the key relationships that define the structure of the site ○ Interference with key relationships that define the function of the site	N/A
Describe from the above those elements of the project of plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	No significant impacts are predicted on Ntura 2000 Sites D/S of discharge

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3. Finding of No Significant Effects Report Matrix (NOT REQUIRED)

Data collected to carry out the assessment			
Who carried out the assessment	**Sources of data**	**Level of assessment completed**	**Where can the full results of the assessment be accessed and viewed**
Mahmoud Shaladan, Cork County Council	CORK COUNTY COUNCIL ENVIRONMENTAL SECTION	Desktop review of cited data.	This report.

Belgooly WWDL APPLICATION – SECTION F :ATTACHEMENT PART 2

PART 2: The assessment of the impact of the discharge at Belgooly agglomeration in relation to the requirements of the Environmental Quality Objectives regulations (S.I. No. 272 of 2009)

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The agglomeration discharges into River Stick, which on flowing through the village becomes the Belgooly River which is tidal .
The ambient sampling results for 2009 at aSW-1a were compared to the relevant EQR/S from the surface water regulations in the following tables. The sample results and the EQR/S were included only if there were values for both, to allow comparison.

The ambient sample results incorporated in the following tables are those laid out in the ambient column of the Revised Table E. However many of these results are at the limit of detection, or are based on averages that include assumed figures. Therefore an additional ambient table, which incorporates actual results for analysis below the Limit of Detection have been included. This “Analysis below the Limit of Detection” is laid out on a separate column in the Revised Table E.

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AMBIENT COMPARISON TABLE (UPSTREAM)

Physico-chemical conditions	Ecological quality ratio/standard Good boundary River Water Body	2011 ambient sampling results at aSW-1a
Nutrient conditions Table 9	**River Water Body**	**Ambient sampling results**
Specific pollutants Table 10	**Other surface waters AA-EQS**	**Ambient sampling results**
Phenol	8	<1.12µg/L
Toulene	10	<0.02µg/L
Xylene	10	<1.00µg/L
Arsenic	20	0.9µg/L
Total Chromium	0.6	1.4µg/L
Copper	5	9.00µg/L
Cyanide	10	6.9µg/L
Flouride	1500	<0.1µg/L
Zinc	40	21.3µg/L
Priority Substances Table 11	**Other surface waters AA-EQS**	**Ambient sampling results**
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<0.5µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	1.3µg/L
Nickel and its compounds	20	4.4µg/L
Priority Hazardous Substances Table 12	**Other surface waters AA-EQS**	**Ambient sampling results**
Cadmium and its compounds	0.2	0.1µg/L
Mercury and its compounds	0.05	<0.02µg/L

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Note the following:

The black results are within the EQR/S.
The red results break the EQR/S.
The blue results may break the EQR/S.
The results highlighted grey are at the limit of detection.
*The sum of the Nitrite and Nitrate sample result has been used for comparison purposes.

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AMBIENT COMPARISON TABLE
(ANALYSIS BELOW THE LIMIT OF DETECTION)

Physico-chemical conditions	***Ecological quality ratio/standard*** ***Good boundary*** ***Transitional Water Body***	***2011 ambient sampling results at aSW-1a***
Nutrient conditions Table 9	***Transitional Water Body***	***Ambient sampling results***
Dissolved Inorganic Nitrogen (mg N/L) (depending on water salinity)	0.25	<0.009
Specific pollutants Table 10	***Other surface waters AA-EQS***	***Ambient sampling results***
Copper	5	<1.0µg/L
Zinc	40	<1.0µg/L
Priority Substances Table 11	***Other surface waters AA-EQS***	***Ambient sampling results***
Lead and its compounds	7.2	<1.0µg/L
Nickel and its compounds	20	<0.75µg/L
Priority Hazardous Substances Table 12	***Other surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds	0.2	<1.0µg/L

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AMBIENT COMPARISON TABLE (DOWNSTREAM)

Physico-chemical conditions	Ecological quality ratio/standard Good boundary River Water Body	2011 ambient sampling results at aSW-1a
Nutrient conditions Table 9	**River Water Body**	**Ambient sampling results**
Specific pollutants Table 10	**Other surface waters AA-EQS**	**Ambient sampling results**
Phenol	8	**<.50µg/L**
Toulene	10	**<0.5µg/L**
Xylene	10	**<1.00µg/L**
Arsenic	20	**3.1µg/L**
Total Chromium	0.6	**19.3µg/L**
Copper	5	**225µg/L**
Cyanide	10	**<5.0µg/L**
Flouride	1500	**<0.1µg/L**
Zinc	40	**8.6µg/L**
Priority Substances Table 11	**Other surface waters AA-EQS**	**Ambient sampling results**
Atrazine	0.6	**<0.01µg/L**
Dichloromethane	20	**<0.5µg/L**
Simazine	1	**<0.01µg/L**
Lead and its compounds	7.2	**0.8µg/L**
Nickel and its compounds	20	**3.9µg/L**
Priority Hazardous Substances Table 12	**Other surface waters AA-EQS**	**Ambient sampling results**
Cadmium and its compounds	0.2	**<0.1µg/L**
Mercury and its compounds	0.05	**<0.02µg/L**

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Note the following:

The black results are within the EQR/S.
The red results break the EQR/S.
The blue results may break the EQR/S however there is saline interference in the analytical method used for test.
The results in pink are at the limit of detection.
*The sum of the Nitrite and Nitrate sample result has been used for comparison purposes.

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AMBIENT COMPARISON TABLE
(ANALYSIS BELOW THE LIMIT OF DETECTION)

Physico-chemical conditions	***Ecological quality ratio/standard*** ***Good boundary*** ***Transitional Water Body***	***2011 ambient sampling results at aSW-1a***
Nutrient conditions Table 9	***Transitional Water Body***	***Ambient sampling results***
Dissolved Inorganic Nitrogen (mg N/L) (depending on water salinity)	0.25	<0.009
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Zinc	40	<1.0µg/L
Priority Substances Table 11	***Other surface waters AA-EQS***	***Ambient sampling results***
Lead and its compounds	7.2	<1.0µg/L
Nickel and its compounds	20	<0.75µg/L
Priority Hazardous Substances Table 12	***Other surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds	0.2	<1.0µg/L

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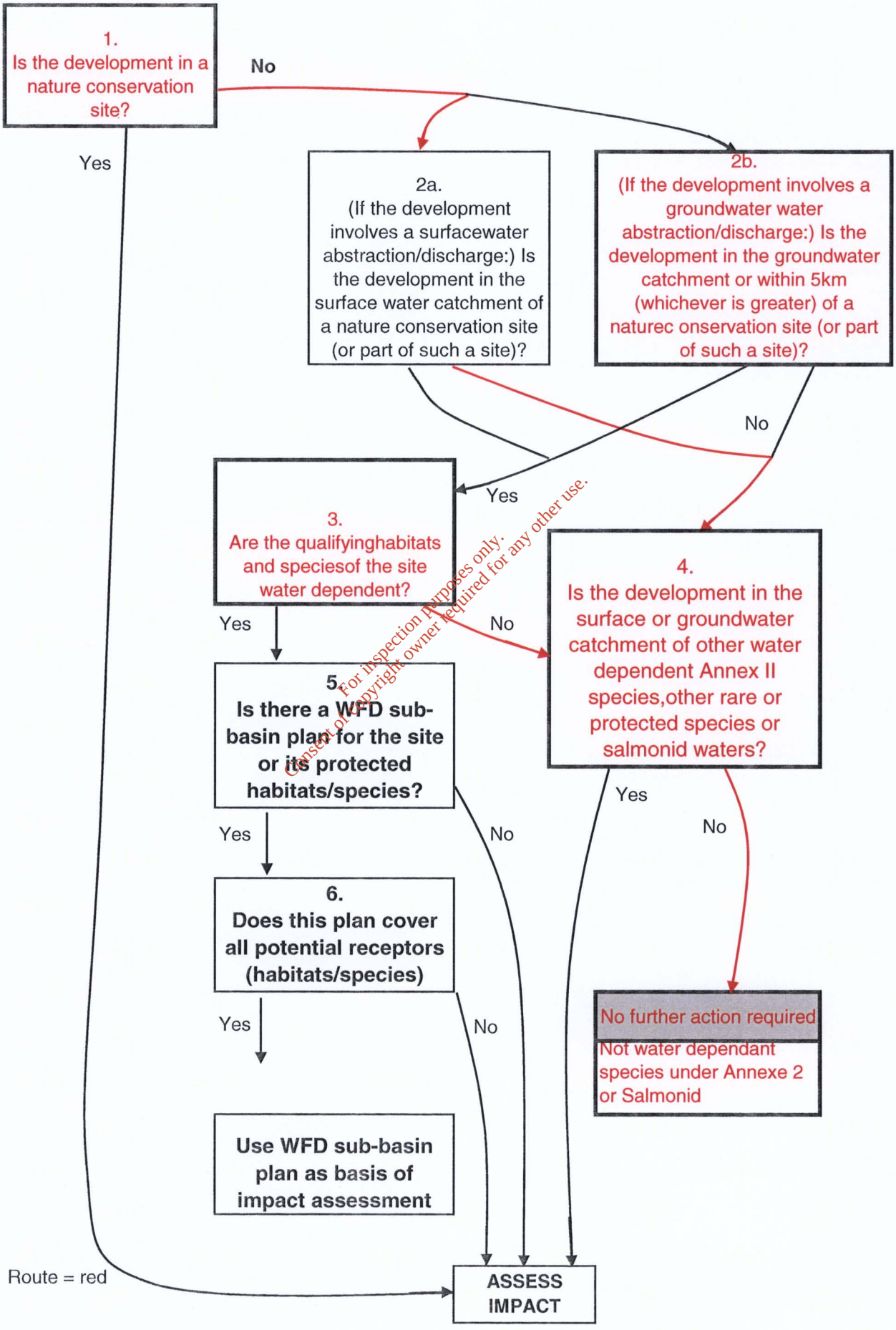
Flow Diagram - Route Highlighted Red & Shaded Grey



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Shaladan

From: Valerie Hannon
Sent: 10 May 2012 13:35
To: Shaladan
Subject: FW: 50%tile value for station 20009 Belgooly

From: Rebecca Quinn [mailto:R.Quinn@epa.ie]
Sent: 10 May 2012 13:27
To: Valerie Hannon
Subject: 50%tile value for station 20009 Belgooly

Hello Valerie,

The hydrometric station Belgooly was located on the Stick river at E166323 N53990. Hydrometric monitoring started at the station in 1977 and ceased in 2006.

All available continuous flow data (01/12/1977 TO 24/07/2006) for the station 20009 Belgooly were evaluated. A flow duration curve was derived from continuous flow data from 01/10/1977 to 30/09/2005. The hydrometric years 01/10/1989 to 30/09/1990, 01/10/1995 to 31/10/1996 and 01/10/2000 to 07/12/2002 were omitted from analysis as greater than 3 months of data was missing. From this flow duration curve the **50%tile value for station 20009 Belgooly is 0.61m^3/s.** The catchment area to the station is 37.7km^2.

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Best Regards,

Rebecca Quinn
Scientific Officer
Environmental Protection Agency
Office of Environmental Assessment
McCumiskey House
Richview
Clonskeagh Road
Dublin 14
Tel: 00353 (0) 1 2680136
Email:r.quinn@epa.ie

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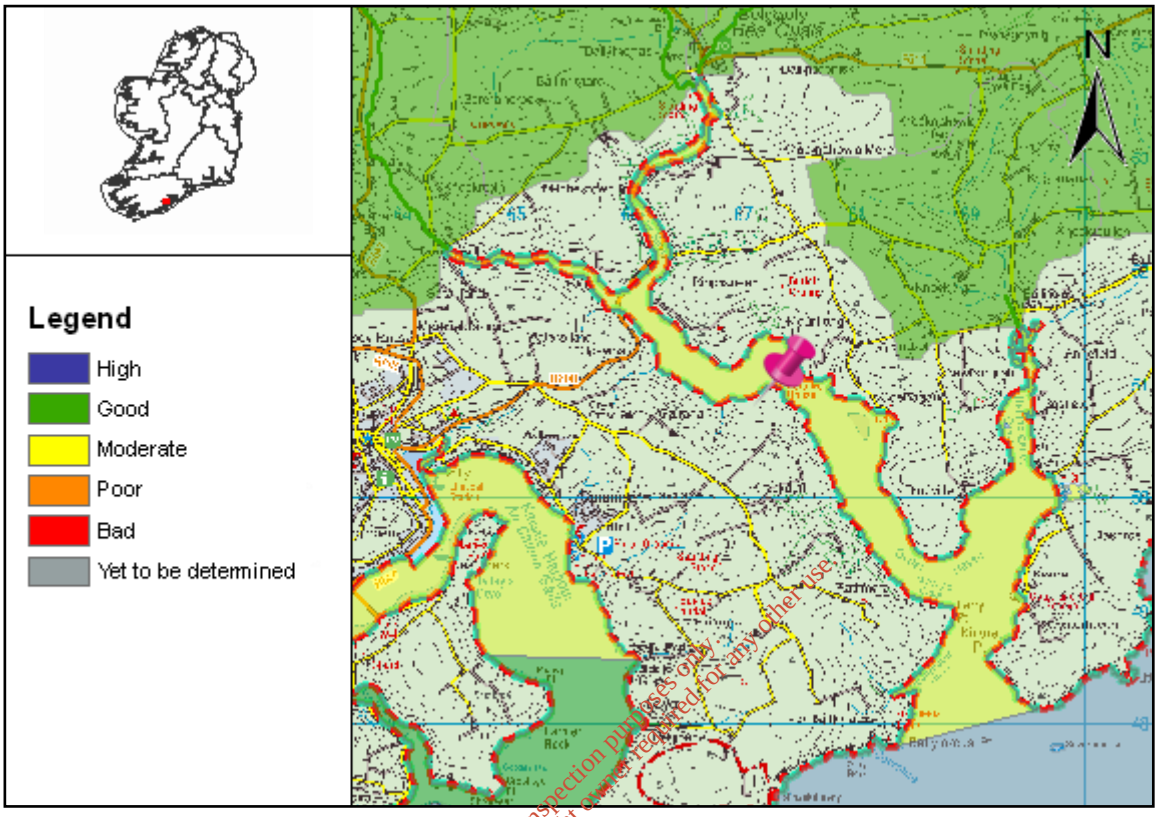
Full Report for Waterbody Oysterhaven



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Summary Information:

WaterBody Category:	Transitional Waterbody
WaterBody Name:	Oysterhaven
WaterBody Code:	IE_SW_070_0100
Overall Status:	Moderate
Overall Objective:	Restore
Overall Risk:	2b Not At Risk
Applicable Supplementary Measures:	Urban & Industrial;

south western river basin district

Report data based upon Draft RBMP, 22/12/2008.

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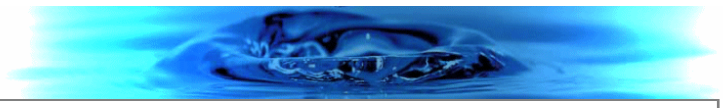

Status Report

WaterBody Category:	Transitional Waterbody
WaterBody Name:	Oysterhaven
WaterBody Code:	IE_SW_070_0100
Overall Status Result:	Moderate

south western river basin district

	Status Element Description	Result
EX	Status from Monitored or Extrapolated Waterbody	Extrapolated
	General Conditions	
DIN	Dissolved Inorganic Nitrogen	
MRP	Molybdate Reactive Phosphorus	
DO	Dissolved Oxygen as percent saturation	
BOD	Biochemical Oxygen Demand	
T	Temperature	
	Biological Elements	
PB	Phytoplankton - Phytoblooms	
PBC	Phytoplankton - PhytoBiomass (Chlorophyll)	
MA	Macroalgae	
RSL	Reduced Species List	
SG	Angiosperms - Seagrass and Saltmarsh	
BE	Benthic Invertebrates	
FI	Fish	
	HydroMorphology	
HY	Hydrology	
MO	Morphology	
	Specific Pollutants	
SP	Specific Relevant Pollutants (Annex VII)	
	Conservation Status	
CN	Conservation Status (Expert Judgement)	
	Protected Area Status	
PA	Overall Protected Area Status	

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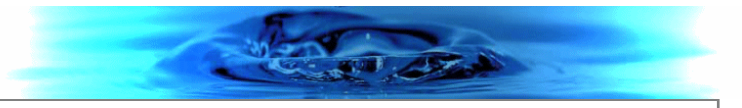

	Overall Status	
ES	Ecological Status	
CS	Chemical Status	
O	Overall Ecological Status	Moderate

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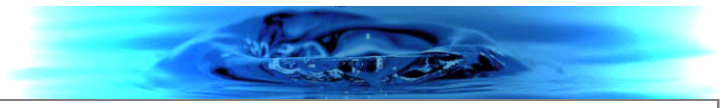

Risk Report

WaterBody Category:	Transitional Waterbody
WaterBody Name:	Oysterhaven
WaterBody Code:	IE_SW_070_0100
Overall Risk Result:	2b Not At Risk

south western river basin district

	Risk Test Description	Risk
	Point Risk Sources	
TP1	WWTPs (2008)	2b Not At Risk
TP2	CSOs	2b Not At Risk
TP3	IPPCs (2008)	2b Not At Risk
TP4	Section 4s (2008)	2b Not At Risk
TPO	Overall Risk from Point Sources - Worst Case (2008)	2b Not At Risk
	Hydrology	
THY1	Water balance - Abstraction	2b Not At Risk
	Marine Direct Impacts	
TMDI 1	Dangerous Substances	
TMDI 2	OSPAR	
TMDI 3	UWWT Regs Designations	
TMDI O	Marine Direct Impacts Overall - Worst Case	
	Point / MDI Worst Case	
TPOL	Worst case of Point Overall and MDI OverallOverall (MIMAS) Morphological Risk - Worst Case (2008)	2b Not At Risk
	Overall Risk	
RA	Transitional Overall - Worst CaseOverall (MIMAS) Morphological Risk - Worst Case (2008)	2b Not At Risk

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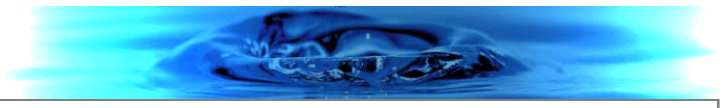

Objectives Report

WaterBody Category:	Transitional Waterbody
WaterBody Name:	Oysterhaven
WaterBody Code:	IE_SW_070_0100
Overall Objective:	Restore

south western river basin district

	Objectives Description	Result
	Objectives	
OB1	Objective 1 - Protected Areas	Restore
OB2	Objective 2 - Protect High and Good Status	Not Applicable
OB3	Objective 3 - Restore Less Than Good Status	Not Applicable
OB4	Objective 4 - Reduce Chemical Pollution	Not Applicable
OBO	Overall Objective	Restore
	Deadline	
YR	Default Year by which the objective must be met	2015
OBO	Overall Objective and Deadline	Restore - 2015

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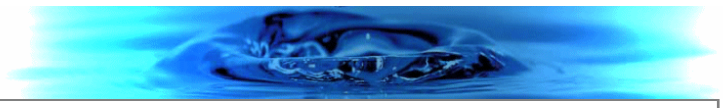

Basic Measures Report

WaterBody Category: Transitional Waterbody

WaterBody Name: Oysterhaven

WaterBody Code: IE_SW_070_0100

south western river basin district

	Basic Measures Description	Applicable
	Key Directives	
BA	Bathing Waters Directive	No
BI	Birds Directive	No
HA	Habitats Directive	No
DW	Drinking Waters Directive	No
SEV	Major Accidents and Emergencies (Seveso) Directive	Yes
EIA	Environmental Impact Assessment Directive	Yes
SE	Sewage Sludge Directive	Yes
UW	Urban Waste Water Treatment Directive	No
UW	Urban Waste Water Treatment Directive	No
PL	Plant Protection Products Directive	Yes
NI	Nitrates Directive	Yes
IP	Integrated Pollution Prevention Control Directive	Yes
	Other Stipulated Measures	
CR	Cost recovery for water use	Yes
SU	Promotion of efficient and sustainable water use	No
DWS	Protection of drinking water sources	No
AB	Control of abstraction and impoundments	No
PT	Control of point source discharges	Yes
DI	Control of diffuse source discharges	Yes
GWD	Authorisation of discharges to groundwater	No
PS	Control of priority substances	Yes
MOR	Control of physical modifications to surface waters	Yes
OA	Controls on other activities impacting on water status	Yes
AP	Prevention or reduction of the impact of accidental pollution incidents	Yes

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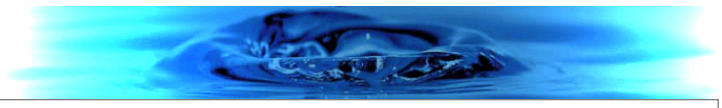

Urban and Industrial Discharges Supplementary Measures Report

WaterBody Category: Transitional Waterbody

WaterBody Name: Oysterhaven

WaterBody Code: IE_SW_070_0100

south western river basin district

	Point discharges to waters from municipal and industrial sources	Result
PINDDIS	Is there one or more industrial discharge (Section 4 licence issued by the local authority or IPPC licence issued by the EPA) contained within the water body?	Yes
PINDDISR	Are there industrial discharges (Section 4 licence issued by the local authority or IPPC licence issued by the EPA) that cause the receiving water to be 'At Risk' within the water body?	No
PB1	Basic Measure 1 - Measures for improved management.	No
PB2	Basic Measure 2 - Optimise the performance of the waste water treatment plant by the implementation of a performance management system.	No
PB3	Basic Measure 3 - Revise existing Section 4 license conditions and reduce allowable pollution load.	No
PB4	Basic Measure 4 - Review existing IPPC license conditions and reduce allowable pollution load.	No
PB5	Basic Measure 5 - Investigate contributions to the collection system from unlicensed discharges.	No
PB6	Basic Measure 6 - Investigate contributions to the collection system of specific substances known to impact ecological status.	No
PB7	Basic Measure 7 - Upgrade WWTP to increase capacity.	No
PB8	Basic Measure 8 - Upgrade WWTP to provide nutrient removal treatment.	No
PS1	Supplementary Measure 1 - Measures intended to reduce loading to the treatment plant.	No
PS2	Supplementary Measure 2 - Impose development controls where there is, or is likely to be in the future, insufficient capacity at treatment plants.	No
PS3	Supplementary Measure 3 - Initiate investigations into characteristics of treated wastewater for parameters not presently required to be monitored under the urban wastewater treatment directive.	No
PS4	Supplementary Measure 4 - Initiate research to verify risk assessment results and determine the impact of the discharge.	No
PS5	Supplementary Measure 5 - Use decision making tools in point source discharge management.	No
PS6	Supplementary Measure 6 - Install secondary treatment at plants where this level of treatment is not required under the urban wastewater treatment directive.	No
PS7	Supplementary Measure 7 - Apply a higher standard of treatment (stricter emission controls) where necessary.	No

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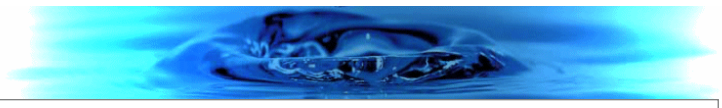

PS8	Supplementary Measure 8 - Upgrade the plant to remove specific substances known to impact on water quality status.	No
PS9	Supplementary Measure 9 - Install ultra-violet or similar type treatment.	No
PS10	Supplementary Measure 10 - Relocate the point of discharge.	No

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Date Reported to Europe: 22/12/2008

Date Report Created 02/12/2009

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OYSTERHAVEN LIVE BIVALVE MOLLUSC (PRODUCTION AREAS) DESIGNATION 2006

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1:50,000

Department of Communications, Marine and Natural Resources
Roinn Cumarsáide, Mara agus Acmhainní Nádúrtha

I	II	III	IV	V	VI
Production Area	**Boundaries**	**Bed Name**	**Species**	**Previous Classification**	**Current Classification**
Oysterhaven	Ballymacus Point to Kinure Point	All Beds	Oysters	B	B

Entity	Entity Re	Station	Station Referen	Station Eas	Station Nor	Sample Re
Stick	20S03	Br. in Riverstick	RS20S030400	165847.2	57935	2011/0822
Stick	20S03	Br. in Riverstick	RS20S030400	165847.2	57935	2011/3108
Stick	20S03	Br. in Riverstick	RS20S030400	165847.2	57935	2011/4018
Stick	20S03	Br. u/s with Main Channell	RS20S030240	165636.9	56992.3	2011/0821
Stick	20S03	Br. u/s with Main Channell	RS20S030240	165636.9	56992.3	2011/1191
Stick	20S03	Br. u/s with Main Channell	RS20S030240	165636.9	56992.3	2011/2225
Stick	20S03	Br. u/s with Main Channell	RS20S030240	165636.9	56992.3	2011/3107
Stick	20S03	Br. u/s with Main Channell	RS20S030240	165636.9	56992.3	2011/4017
Stick	20S03	D/S Riverstick		165974.2	57200.3	2011/0823
Stick	20S03	D/S Riverstick		165974.2	57200.3	2011/1192
Stick	20S03	D/S Riverstick		165974.2	57200.3	2011/3109
Stick	20S03	D/S Riverstick		165974.2	57200.3	2011/4019

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	Hardness	Molybdate	Alkalinity	Chloride	Colour	Ammonium	Conductivit	D.o.%Sat
	CaCO3	P	CaCO3	Cl	Hz	NH4		
	--	Varies	--	--	Varies	Varies	--	150
	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	50
Sample Dat	mg/l	mg/l	mg/l	mg/l	Hazen	mg/l	µS/cm	% O2
23-Mar-11	60	< 0.006		23.9		0.023	199	104
15-Sep-11		0.017				< 0.006	229	99
09-Nov-11	84	0.022	76	25.3		0.037	220	94
23-Mar-11	71	0.006	32	24.2	11	0.022	184	98
13-Apr-11	61	0.015	50	22.7	67	0.083	191	102
13-Jul-11	63	0.021	36		32	< 0.006	188	96
15-Sep-11	67	0.02	48		54	0.009	200	86
09-Nov-11	75	0.023	46	25.3	32	0.024	210	93
23-Mar-11	74	*0.031*		24.1		0.41	205	102
13-Apr-11	71	*0.052*		22.5		*0.609*	196	98
15-Sep-11		*0.128*				*0.63*	246	69
09-Nov-11	85	*0.047*	66	25.4	44	0.327	224	92

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D.o	Nitrate	Nitrite	pH	BOD	Temperatu
O2	NO3	NO2		O2	
15	25	0.05	9	Varies	--
--	--	--	--	--	--
5	--	--	Varies	--	--
mg/l	mg/l	mg/l	pH units	mg/l	Degrees C

12.6	17.5	0.024	7.2	< 1	8.1
10.6	12.97	< 0.013	7.3	1.3	12.4
10	16.2	*0.056*	7.4	< 1	11.6
12	21.1	0.018	7.3	< 1	7.8
11.5	11.3	*0.063*	7.2	1.2	10
10	19.1	0.023	7.5	0.6	13.7
9.4	14.4	< 0.013	7.4	1.1	11.6
10	20.2	0.038	7.5	< 1	11.6
12.3	18	*0.057*	7.4	< 1	8.6
11	12	*0.08*	7.2	2.1	10.1
7.4	14.53	*0.165*	7.2	1.2	12.2
9.9	15.4	*0.078*	7.4	1.5	11.5

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Belgooly WWTP Outlet

Sample	Effluent	Effluent	Effluent	Effluent
Sample Code	GW280	GW362		
Sample Date	18/04/2012	17/05/2012		
Sample Type	Grab	Grab		
Flow M^3/Day	*	*		
BOD mg/L	37	66		
COD mg/L	141	182		
Suspended Solids mg/L	68	133		
Lab Use Only	1	1	0	0

exceeds Urban Wastewater Regulations L

half of LOD for statistical purposes

Unapproved Results

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Belgooly WWTP Outlet

Sample	Effluent
Sample Code	GW362
Sample Date	17/05/2012
Sample Type	Grab
Flow M^3/Day	*
BOD mg/L	66
COD mg/L	182
Suspended Solids mg/L	133
TP-P mg/l	
O-PO4-P mg/l	0.28
Ammonia-N mg/l	32.4
TN-N mg/l	35.98
Nitrate-N mg/l	3.335
TON mg/l	4.06
Nitrite-N mg/l	0.725

Belgooly U/S

Sample	River
Sample Code	GW365
Sample Date	17/05/2012
Sample Type	Grab
BOD mg/L	<1.0
COD mg/L	
Suspended Solids mg/L	
TP-P mg/l	
O-PO4-P mg/l	0.02

Ammonia-N mg/l	0.048
TN-N mg/l	4.12
Nitrate-N mg/l	8.275
TON mg/l	
Nitrite-N mg/l	0.017
DO mg/l	11.48
Temperature ºC	10.7

Belgooly D/S near WWTP

Sample	River
Sample Code	GW363
Sample Date	17/05/2012
Sample Type	Grab
BOD mg/L	1.9
COD mg/L	
Suspended Solids mg/L	
TP-P mg/l	
O-PO4-P mg/l	0.011
Ammonia-N mg/l	0.32
TN-N mg/l	5.47
Nitrate-N mg/l	5.497
TON mg/l	
Nitrite-N mg/l	0.018
DO mg/l	11.64
Temperature ºC	9.8

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Belgooly D/S (Kinsale Rd)

Sample	River
Sample Code	GW364
Sample Date	17/05/2012
Sample Type	Grab
BOD mg/L	2.0
COD mg/L	
Suspended Solids mg/L	
TP-P mg/l	
O-PO4-P mg/l	0.017
Ammonia-N mg/l	0.018
TN-N mg/l	5.47
Nitrate-N mg/l	5.38
TON mg/l	
Nitrite-N mg/l	0.018
DO mg/l	10.23
Temperature ºC	12.1

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			Mean value	UWW Reg Limits
Effluent	Effluent	Effluent		
			51.5	25
			161.5	125
			101	35
0	0	0		

.imits

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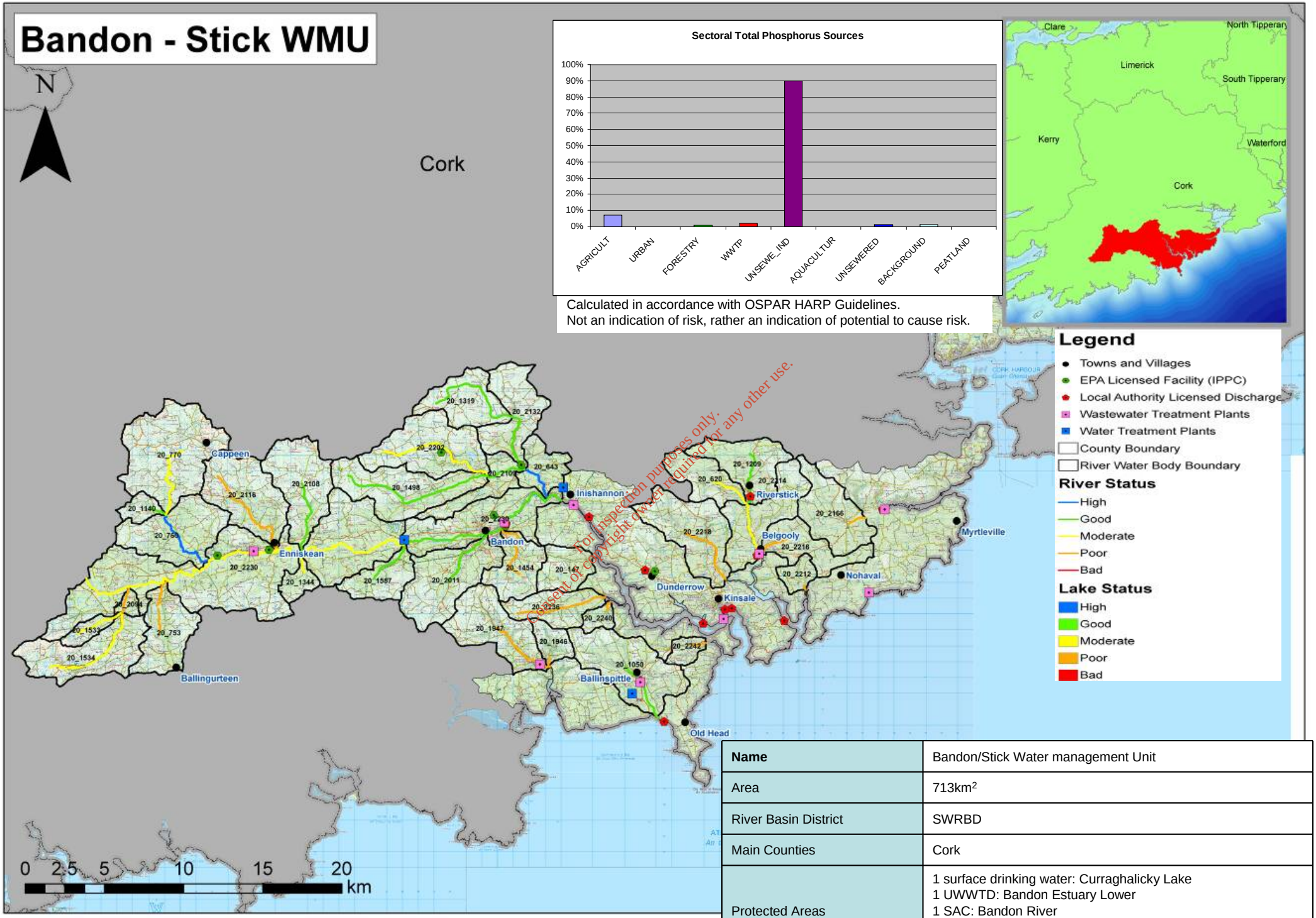
Bandon - Stick WMU

Calculated in accordance with OSPAR HARP Guidelines.
Not an indication of risk, rather an indication of potential to cause risk.



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Name	Bandon/Stick Water management Unit
Area	713km^2
River Basin District	SWRBD
Main Counties	Cork
Protected Areas	1 surface drinking water: Curraghalicky Lake 1 UWWTD: Bandon Estuary Lower 1 SAC: Bandon River Baxters Bridge (Bandon) & Innishannon WTP 1 Freshwater Pearl Mussel catchment (Bandon/Caha)

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Bandon/Stick Water Management Unit Action Plan

STATUS/IMPACTS	
Overall status	There are 36 river water bodies in this WMU -2 High, 11 Good, 8 Moderate, 15 Poor Status.
Status elements	Q score dictates overall status for wbs with less than good status, physchem dictates 2 moderate wbs and fish status dictates 1 poor wb. The moderate lake status is dictated by macrophytes or chlorophyll.
Possible Impacts - EPA Water Quality	BALLINSPITTLE – SW_20_1050 2006 - Satisfactory. Status of WB 2009: Good status dictated by Q score and fish status BALLYMAHANE - SW_20_1498 2003 - Continuing satisfactory. The stream entering just downstream of 0200 (Bridge N of Tullyglas), which was grossly polluted in 2000, was clean in 2003; the location, however, was still being used to mix agricultural chemicals. 2009 - Continuing satisfactory. Status of WB 2009: Good status dictated by Q score, good fishery status and good physchem status***** BANDON – SW_20_2230_2; SW_20_2230_1 2003 - Mostly satisfactory with some improvement at one location (0550) since the previous survey. Continuing slightly polluted downstream of Dunmanway (0300, 0400) and moderately polluted downstream of Bandon (0800). Unsightly sludge from a waterworks had accumulated along the left-hand-side of river upstream of Bandon (0700). A protected invertebrate (pearl mussel) lives in part of the river while the fish fauna includes salmonids (salmon and trout) and cyprinids (minnow) as well as sticklebacks. 2009 - Mostly satisfactory, with Good ecological quality, but only Moderate downstream of Dunmanway, Ballineen and Enniskean. SW_20_2230_2 WB Status 2009 : Good status dictated by Q score. SW_20_2230_1 WB Status 2009: Moderate status dictated by Q status. BEALANASCARTANE – SW_20_2094; SW_20_1534 2009 - Improved with all three locations sampled Good ecological quality SW_20_2094 WB Status 2009 : Poor Status dictated by Q score - not based on 2009 data SW_20_1534 WB Status 2009 : Moderate Status dictated by Q score BLACKWATER (BANDON) – SW_20_760; SW_20_770 2003- Continuing eutrophic in middle reaches (0800) otherwise satisfactory. The protected pearl mussel still survives in parts of this river. 2009 - Satisfactory with Good and High ecological quality. SW_20_760 WB updated Status : Good status dictated by physchem status SW_20_770 WB updated Status : Moderate status is based Q score BRINNY – SW_20_1319; SW_20_2132; SW_20_643 2009 - Satisfactory at the three locations following improvement at Tuough Bridge since previous survey. SW_20_1319 WB updated Status ; Good status dictated by Q score. SW_20_2132 WB updated Status ; Good status dictated by Q score SW_20_643 WB updated Status ; High status dictated by Q score. KILBRITTAIN – SW_20_1947 2006 - Continuing satisfactory. WB Status 2009 : Poor status dictated by poor Fish status. MINANE – SW_20_2166 2009 - Unsatisfactory with Poor ecological quality at Ballyfeard - impacted by seriously polluted stream entering from right-hand side immediately downstream of bridge. WB Status 2009 : Poor status dictated by Q score SALL – SW_20_2202 2009 - Continuing satisfactory. WB Status 2009 : Moderate status dictated by physchem status STICK – SW_20_2214 2009 - Satisfactory, with Good ecological quality, at both locations. WB Status 2009 : Moderate status dictated by physchem status

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Bandon/Stick Water Management Unit Action Plan

PRESSURES/RISKS	
Nutrient sources	90% of TP comes from unsewered industry and 2% from WWTP, 7% from Agriculture
Point pressures	10 WWTP Ballineen Sewerage Scheme, Ballinspittle, Bandon WWTP, Belgooly, Kilbrittain, Kinsale, Minane Bridge, Nohoval, Riverstick WWTP, Innishannon WWTP 5 WTP -Bandon Water Supply Scheme, Ballinspittle New Pws; Inishannon, Ballineen, & Curraghlicky Lake WTP. 9 IPPC licensed activities and 9 Section 4 licensed activities. 1 contaminated site - AIBP Limited T/A AIBP Bandon.
Wastewater Treatment Plants (WWTP) and Industrial Discharges	Bandon WWTP - Non-compliant frequency of monitoring or non-compliant effluent standard where sufficient capacity is available Bandon WWTP - Insufficient future (2015) assimilative capacity (BOD), discharge not to a protected area Innishannon WWTP - Insufficient existing capacity, no evidence of impact, discharge to a protected area Kinsale - PE >2,000, discharge to non-coastal water, no secondary treatment or PE > 10,000, discharge to coastal water, no secondary treatment Kinsale - Insufficient existing capacity, no evidence of impact, discharge to a protected area Minane Bridge - Sufficient existing capacity of treatment plant, evidence of impact, discharge not to protected area Riverstick WWTP - Insufficient existing capacity, evidence of impact, not a protected area Riverstick WWTP - Insufficient future (2015) assimilative capacity (BOD), discharge not to a protected area Ballineen Sewerage Scheme - Sufficient existing capacity, evidence of impact, protected area 5 IPPC licensed activities are causing risk.
Quarries, Mines & Landfills	6 Quarries and 5 Landfills. 1 WB at risk from 2 quarries and 1 landfill - SW_20_2230.
Agriculture	32 WBs at risk - SW_20_2216, SW_20_147, SW_20_2214, SW_20_2236, SW_20_2218, SW_20_1050, SW_20_2011, SW_20_2166, SW_20_2212, SW_20_2240, SW_20_2242, SW_20_2132, SW_20_1947, SW_20_1454, SW_20_1209, SW_20_643, SW_20_753, SW_20_2108, SW_20_2202, SW_20_1319, SW_20_2116, SW_20_2109, SW_20_1344, SW_20_1498, SW_20_620, SW_20_1533, SW_20_1587, SW_20_1534, SW_20_1946, SW_20_2230, SW_20_2094, SW_20_2244.
On-site systems	There are 9764 septic tanks in this WMU, 559 of these are located in areas of very high or extreme risk.
Forestry	None at risk
Dangerous substances	None at risk
Morphology	None at risk
Abstractions	None at risk
Other	

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Bandon/Stick Water Management Unit Action Plan

SELECTED ACTION PROGRAMME *NB All relevant basic measures and general supplementary measures/surveys apply*	
Point Sources	See point source pressures table below for WWTP action programme. IPPC licensed activities – review licenses Section 4s - Review Discharge Licenses
Diffuse Sources	AGRICULTURE - Good Agricultural Practice Regulations and Enforcement Septic Tanks: At Risk septic tanks are to be prioritised for inspections. Subsequent upgrade or connection to municipal systems depends on inspection and economic tests.
Sub-basin plans	1 x Freshwater Pearl Mussel Plans – Bandon Caha – Apply prescribed measures. 2 x Shellfish Waters Pollution Reduction Programmes – Oyster Haven and Kinsale – Apply prescribed measures.
Other	Ensure licensing of quarries under Section 4 of Water Pollution Act 1977. Investigate landfill.

Discharge		Measures							Waterbody	
Point Source Discharge	County	Plants Requiring Capital Works	Agglomerations Requiring Further Investigation Prior to Capital Works	Plants Required to Commence Implementation of Pollution Reduction Programmes for Shellfish Waters	Plants Requiring the Implementation of an Appropriate Performance Management System	Plants Requiring the Investigation of CSO's	Plants Required to Ensure Capacity of Treatment Plant is not Exceeded	Extended Timescale for Measure Implementation	Waterbody Code	Extended Deadline to Achieve Waterbody Objective
Ballineen Sewerage Scheme	Cork West					Yes		Yes	SW_20_2230_1	Yes
Bandon WWTP	Cork South				Yes		Yes	No	SW_20_2230_2	
Innishannon WWTP	Cork South		Yes					Yes	SW_080_0300	Yes
Kinsale	Cork South	Yes		Yes				No	SW_080_0100	
Minane Bridge	Cork South					Yes		No	SW_050_0000	
Riverstick WWTP	Cork South	Yes					Yes	Yes	SW_20_1209	

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Bandon/Stick Water Management Unit Action Plan

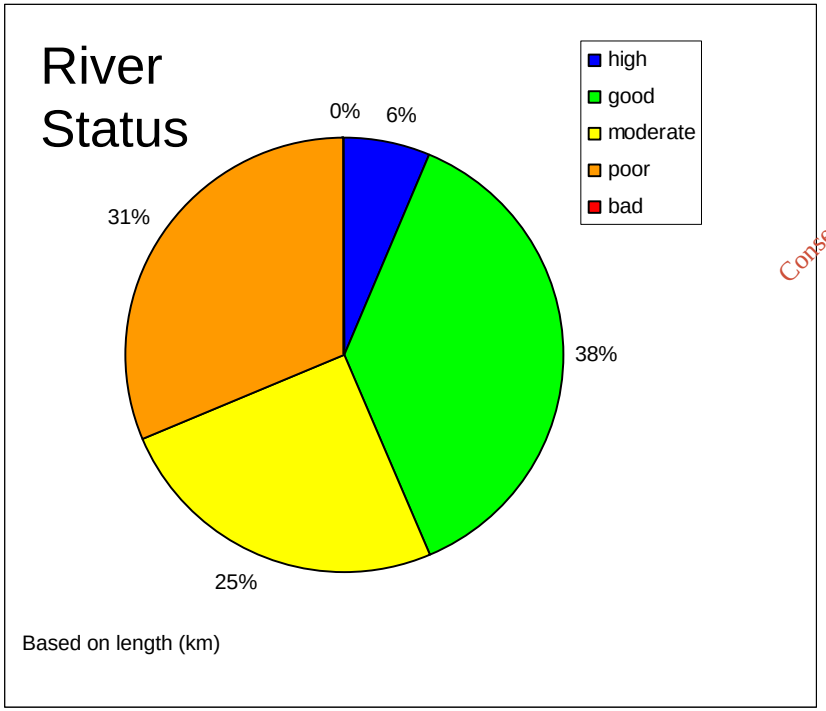
OBJECTIVES	
Good status 2015	Protect 13 waterbodies.
Alternative Objectives	Restore 23 waterbodies by 2021 (SW_20_1344, SW_20_1454, SW_20_147, SW_20_1533, SW_20_1534, SW_20_1946, SW_20_1947, SW_20_2094, SW_20_2116, SW_20_2166, SW_20_2202, SW_20_2212, SW_20_2214, SW_20_2216, SW_20_2218, SW_20_2230_1, SW_20_2236, SW_20_2240, SW_20_2242, SW_20_2244, SW_20_620, SW_20_753, SW_20_770) – extended for nitrogen losses to surface waters via groundwaters (one of which is also extended for wastewater infrastructure to be put in place - SW_20_2230_1) Restore 1 waterbody (SW_20_2230_1) – extended for recovery of Freshwater Pearl Mussel populations.

Transitional Status – Refer to separate transitional waters action programme

Groundwater Status – Refer to separate groundwater action programme

Future Pressures and Developments

Throughout the river basin management cycle future pressures and developments will need to be managed to ensure compliance with the objectives of the Water Framework Directive and the Programme of Measures will need to be developed to ensure issues associated with these new pressures are addressed.



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Bandon/Stick Water Management Unit Action Plan - Rivers

IE_SW_Bandon/Stick																		
			Biological Elements				Supporting Elements					Protected Areas						
Member State Code	Monitored Y (Extrapolated N)	Donor Waterbody	Macroinvertebrates (Q)	Fresh Water Pearl Mussel	Fish	Phytobenthos (Diatoms)	Morphology	Specific Polutants	Physio-chemical	Ecological Status	Chemical Status	Special Area of Conservation	Special Protection Area	Nutrient Sensitive Waters	Drinking Water	Objective	Date objective to be achieved
SW_20_1050	Y		G		G					G						GES	2009
SW_20_1140	N	SW_20_760								G						GES	2009
SW_20_1209	Y									G						GES	2009
SW_20_1319	Y		G							G						GES	2009
SW_20_1344	N	SW_20_1799								M						GES	2021
SW_20_1454	N	SW_20_1947								P						GES	2021
SW_20_147	N	SW_20_1947								P						GES	2021
SW_20_1498	Y		G		G				G	G						GES	2009
SW_20_1533	N	SW_20_1534								M						GES	2021
SW_20_1534	Y		M							M						GES	2021
SW_20_1587	N	SW_20_1498								G						GES	2009
SW_20_1946	N	SW_20_1947								P						GES	2021
SW_20_1947	Y		G		P					P						GES	2021
SW_20_2011	N	SW_20_1498								G						GES	2009
SW_20_2094	Y		P							P						GES	2021
SW_20_2108	N	SW_20_1498								G						GES	2009
SW_20_2109	N	SW_20_2132								G						GES	2009
SW_20_2116	N	SW_20_2094								P						GES	2021
SW_20_2132	Y		G						H	G						GES	2009
SW_20_2166	Y		P						G	P						GES	2021
SW_20_2202	Y		G						M	M						GES	2021
SW_20_2212	N	SW_20_2166								P						GES	2021
SW_20_2214	Y		G						M	M						GES	2021
SW_20_2216	N	SW_20_2166								P						GES	2021
SW_20_2218	N	SW_20_2166								P						GES	2021
SW_20_2230_1	Y		M						H	M		Y				GES	2021
SW_20_2230_2	Y		G						H	G					Y	GES	2009
SW_20_2236	N	SW_20_1947								P						GES	2021
SW_20_2240	N	SW_20_1947								P						GES	2021
SW_20_2242	N	SW_20_1947								P						GES	2021
SW_20_2244	N	SW_20_1947								P						GES	2021
SW_20_620	N	SW_20_2214								M						GES	2021
SW_20_643	Y		H							H						HES	2009
SW_20_753	N	SW_20_2094								P						GES	2021
SW_20_760	Y		H						G	H						HES	2009
SW_20_770	Y		M							M						GES	2021

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Bandon/Stick Water Management Unit Action Plan - Lakes

IE_SW_Bandon/Stick																		
			Biological Elements			Supporting Elements					Protected Areas							
Member State Code	Name	Monitored Y (Extrapolated N)	Macrophytes	Chlorophyll	Fish	Morphology	Nutrient Enrichment	Physico Chemical	Ecological Status	Chemical Status	Special Area of Conservation	Special Protection Area	Nutrient Sensitive Waters	Bathing Water	Drinking Water	Objective	Date objective to be achieved
SW_20_158	Curraghalicky Lake	Y	M	M			G	G	M							GES	2015

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Flow.

Station Information

Station Number	20009	**Station Name**	BELGOOLY	**River/Lake**	STICK
Station Status	Obsolete	**Type of Gauge**	Data Logger	**Owner**	Cork County Council
Easting	166323	**Northing**	53990	**RBD name**	South Western RBD
Records Start	01.12.1977	**Records Cease**	24.07.2006	**Data Available**	Water Level and Flow

Hydrometric Information

Rating Standard Fair

Estimated Long Term 95%-Tile 0.080 m^3/s

95%.

Catchment Size 37.67 km^2

Estimated Long Term Dry Weather Flow 0.025 m^3/s DWF.

4.162 OD (P) (since 05.02.2001)
4.165 OD (P) (since 08.05.1997)
4.16 OD (P) (since 10.06.1994)
4.157 OD (P) (since 18.01.1984)
4.159 OD (P) (since 10.02.1981)
4.141 OD (P) (since 05.02.1980)
4.133 OD (P) (since 22.05.1978)
4.02 OD (P) (since 23.01.1978)
4.009 OD (P) (since 17.08.1977)

(*) means that the flow is regulated

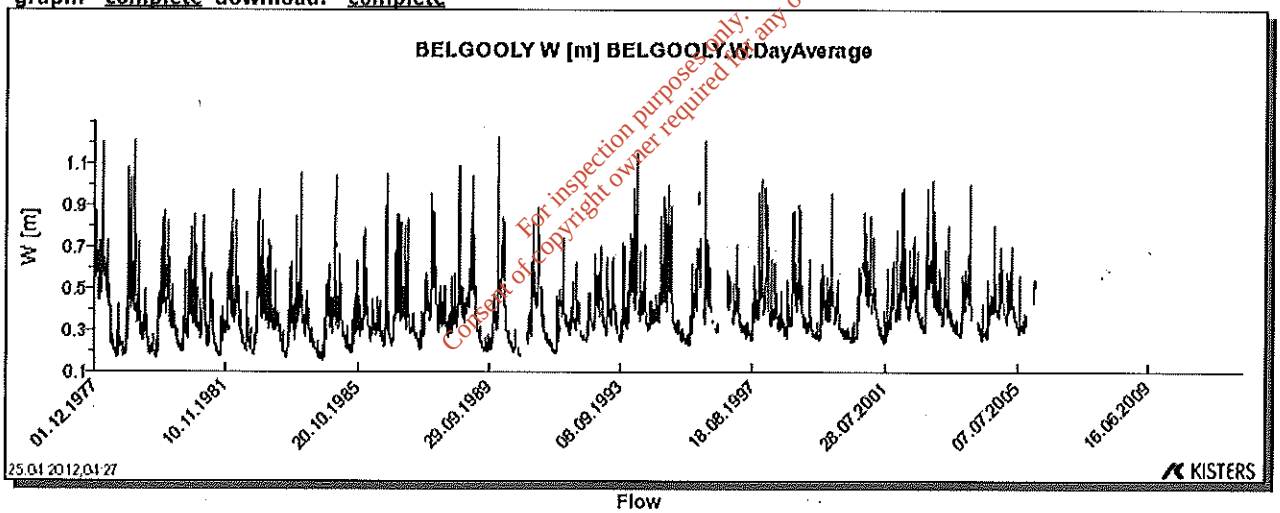
Long Average Rainfall (1961-1990) 1165 mm/annum **Staff Gauge Zero History**

Median flow.

Subject to tidal influence

Water Level

graph: complete download: complete



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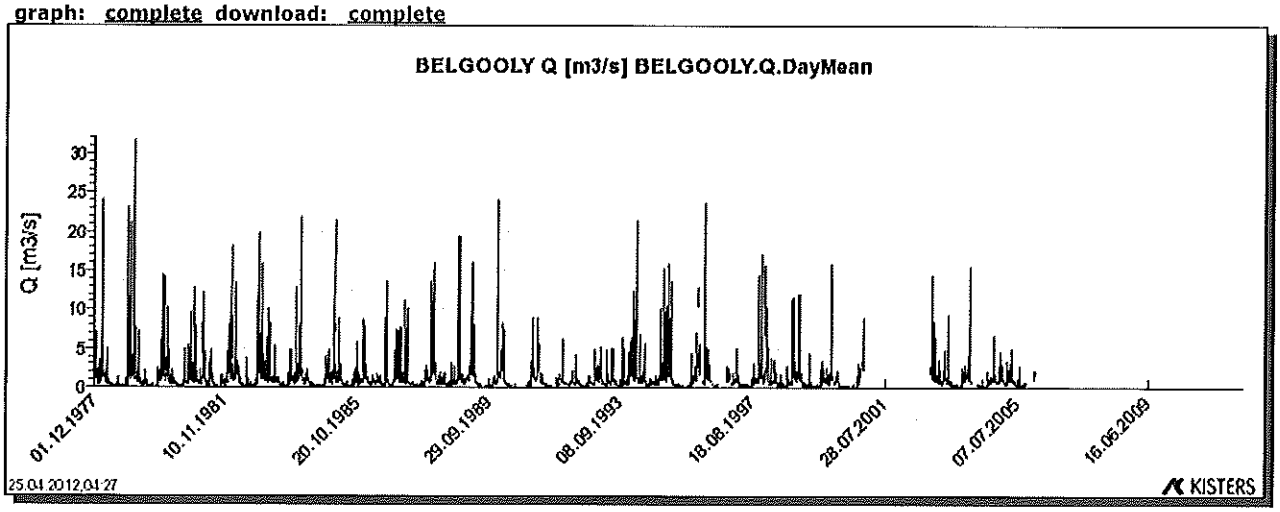
Flow

graph: complete download: complete



Site Photographs (Where Available)

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Station Information

Station Number	20009	**Station Name**	BELGOOLY	**River/Lake**	STICK
Station Status	Obsolete	**Type of Gauge**	Data Logger	**Owner**	Cork County Council
Easting	166323	**Northing**	53990	**RBD name**	South Western RBD
Records Start	01.12.1977	**Records Cease**	24.07.2006	**Data Available**	Water Level and Flow

Hydrometric Information

Rating Standard	Fair	**Catchment Size**	37.67 km^2
Estimated Long Term 95%-Tile	0.080 m^3/s	**Estimated Long Term Dry Weather Flow**	0.025 m^3/s

Long Average Rainfall (1961-1990) 1165 mm/annum

Staff Gauge Zero History

4.162 OD (P) (since 05.02.2001)
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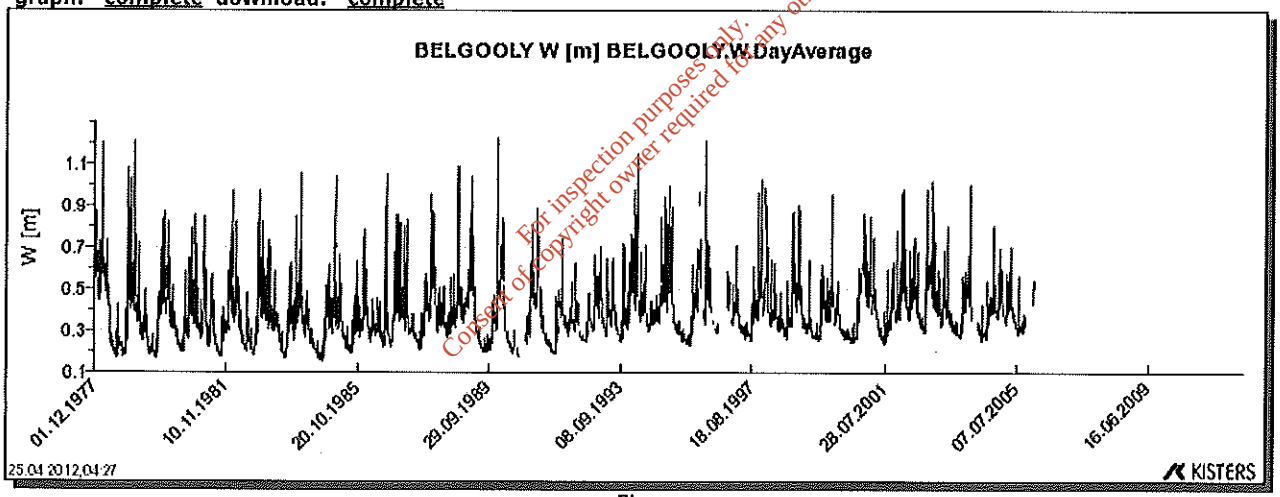
4.133 OD (P) (since 22.05.1978)
4.02 OD (P) (since 23.01.1978)
4.009 OD (P) (since 17.08.1977)

(*) means that the flow is regulated

Subject to tidal influence

Water Level

graph: complete download: complete



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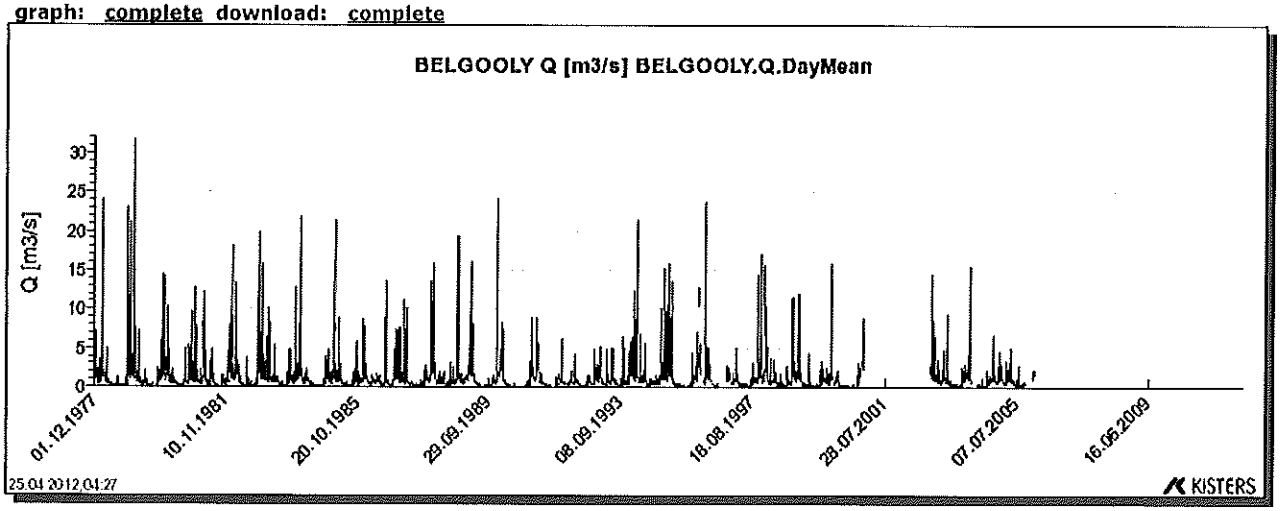
Flow

graph: complete download: complete



Site Photographs (Where Available)

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Shellfish Pollution Reduction Programme

As required by Article 5 of the Shellfish Water Directive 2006/113/EC and
Section 6 of the Quality of Shellfish Waters Regulations, 2006 (S.I. No. 268 of 2006)

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Characterisation Report Number 40

OYSTER HAVEN SHELLFISH AREA
COUNTY CORK

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ABBREVIATIONS

AA	Appropriate Assessment
BOD	Biochemical Oxygen Demand
CFB	Central Fisheries Board
CSO	Combined Sewer Overflow
DED	District Electoral Division
DEHLG	Department of Environment Heritage and Local Government
DO	Dissolved Oxygen
EPA	Environmental Protection Agency
EU	European Union
Ha	Hectare
IPPC	Integrated Pollution Prevention Control
Kg	Kilogram
LU	Livestock Units
NACE	European industrial activity classification
MI	Marine Institute
NPWS	National Parks and Wildlife Service
OSWWTS	On-Site Waste Water Treatment System
P.E.	Population Equivalent
PRP	Pollution Reduction Programme
RBD	River Basin District
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SFPA	Sea Fisheries Protection Authority
SPA	Special Protection Area
SWMC	Shellfish Waters Management Committee
TCE	Tetrachloroethylene
WFD	Water Framework Directive
WSIP	Water Services Investment Programme
WTP	Water Treatment Plant
WWTP	Waste Water Treatment Plant

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1.0 INTRODUCTION

Article 5 of the Shellfish Directive (2006/113/EC) and section 6 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) require the development of Pollution Reduction Programmes (PRPs) for designated shellfish areas in order to support shellfish life and growth and to contribute to the high quality of directly edible shellfish products. Shellfish PRPs relate to bivalve and gastropod molluscs, including oysters, mussels, cockles, scallops and clams. They do not cover shellfish crustaceans such as crabs, crayfish and lobsters.

1.1 Aims and responsibility

The objectives of Shellfish PRPs are to:

- Protect or improve water quality in designated shellfish areas;
- Achieve compliance with water quality parameter values outlined in Annex I of the Shellfish Waters Directive (2006/113/EC) and Schedules 2 and 4 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006);
- Determine the factors responsible for any non-compliances with the water quality parameter values; and
- Ensure that implementation of the Shellfish PRPs does not lead, directly, or indirectly, to increased pollution of coastal and brackish waters.

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Under the Regulations, the Department of Communications, Marine and Natural Resources is responsible for the development of Shellfish PRPs. However, this responsibility was transferred to the Department of the Environment, Heritage and Local Government (DEHLG) on 5th November 2008. An Inter-Departmental /Inter Agency Shellfish Waters Management Committee (SWMC) supports the Department in the development of the Shellfish PRPs.

The Regulations also place an obligation on every public authority to perform its functions in a manner that promotes compliance with the Directive and the Regulations, and to take such actions as are necessary to secure compliance with the Directive and the Regulations and with the Shellfish PRPs.

1.2 Shellfish water quality parameters

Compliance with the directive is measured against achievement of shellfish water quality parameter values outlined in Annex I of the Shellfish Waters Directive (2006/113/EC) and Schedules 2 and 4 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006). Table 1 summarizes these values. Mandatory (I) values must be fully achieved while it must be endeavoured to achieve guideline values (G).

TABLE 1 - Parameters listed in Annex I of the Shellfish Water Directive

Physical	Guideline Values (G)	Mandatory Values (I)
pH (pH units)		7 – 9 pH units
Temperature (°C)	A discharge affecting shellfish waters must not cause the	No mandatory value set in the Directive

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	temperature of the waters to exceed by more than 2°C the temperature of waters not so affected	
Colouration (after filtration) (mg Pt/l)		A discharge affecting shellfish waters must not cause the colour of the waters after filtration to deviate by more than 10 mg Pt/l from the colour of unaffected waters
Suspended Solids (mg/l)		A discharge affecting shellfish waters must not cause the suspended solid content of the waters to exceed the content in unaffected waters by more than 30%
Salinity (%)	12 to 38%	≤ 40% A discharge affecting shellfish waters must not cause their salinity to exceed the salinity of unaffected waters by more than 10%
Chemical	**Guideline Value (G)**	**Mandatory Value (I)**
Dissolved oxygen (Saturation %)	≥ 80%	≥ 70% Should an individual measurement indicate a value lower than 70%, measurements shall be repeated An individual measurement may only indicate a value of less than 60% if there are no harmful consequences for the development of shellfish colonies
Petroleum hydrocarbons		Hydrocarbons must not be present in the shellfish water in such quantities as to: - produce a visible film on the surface of the water and/or a deposit on the shellfish - have harmful effects on the shellfish
Organohalogenated substances	The concentration of each substance in shellfish flesh must be so limited that it contributes in accordance with Article 1 (of the Directive), to the high quality of shellfish products	The concentration of each substance in the shellfish water or in shellfish flesh must not reach or exceed a level which has harmful effects on the shellfish larvae
Metals (Ag, As, Cd, Cr, Cu, Hg, Ni, Pb and Zn) (mg/L)	The concentration of each substance in shellfish flesh must be so limited that it contributes in accordance with Article 1 (of the Directive), to the high quality of shellfish products	The concentration of each substance in the shellfish water or in the shellfish flesh must not exceed a level which gives rise to harmful effects on the shellfish and their larvae The synergic effects of these metals must be taken into consideration
Others	**Guideline Value (G)**	**Mandatory Value (I)**
Faecal coliforms (per 100 mL)	≤ 300 per 100 mL in the shellfish flesh and intervalvular liquid	No mandatory value set in the Directive

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Substances affecting the taste of shellfish		Concentration lower than liable to impair the taste of the shellfish
Saxitoxin (produced by dinoflagellates)	No limit given	No limit given

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1.3 Designated shellfish areas

Fourteen shellfish areas were originally designated in 1994 under the Quality of Shellfish Waters Regulations (S.I. No. 200 of 1994, revoked by S.I. No. 268 of 2006). A further 49 areas were subsequently designated in 2009 under the European Communities (Quality of Shellfish Waters) (Amendment) Regulations, 2009 (S.I. No. 55 of 2009). All 63 designated sites are illustrated in Figure 1 below.

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Note: Map numbers I to XIV refer to waters originally designated under the European Communities (Quality of Shellfish Waters) Regulations 2004 (S.I. No. 200 of 1994), while map numbers 1 to 45 refer to waters designated under the European Communities (Quality of Shellfish Waters) (Amendment) Regulations 2009 (S.I. 55 of 2009). The referenced maps can be found in the relevant regulatory documents.

FIGURE 1 - 63 designated shellfish areas

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1.4 Development of the Shellfish Pollution Reduction Programmes

The Directive and Regulations require that any non-compliances with the shellfish water quality parameter values are identified. The Directive and Regulations further require that the factors responsible for such non-compliances are identified.

Information on impacts and pressures has therefore been collated in an individual characterisation report for each shellfish site from available inventories. The likelihood of the pressures to impact on shellfish water quality parameter values in the shellfish areas has been estimated.

Individual site Pollution Reduction Programmes (PRPs) and a supporting toolkit of measures outline the measures which can be used to control pressures where necessary to protect and improve water quality in a specific shellfish area.

The 2009 Shellfish PRPs (including the supporting characterisation reports and toolkit of measures) represent an initial phase of Shellfish PRP development, drawing on available information sources. Their development has been a desk-based exercise and they provide a good indication of the main pressures likely to be impacting on shellfish water quality and the measures that can be used to control those pressures. Ongoing assessment and monitoring of shellfish waters will be used to confirm the effectiveness of these programmes and to refine the programmes where necessary. As the shellfish monitoring database grows, and as programmes are implemented, incremental changes will be made to ensure compliance with the standards and objectives established.

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PRPs produced during 2009 supersede Action Programmes which were developed in 2006 for the 14 original shellfish areas.

1.5 Assessment of Shellfish Pollution Reduction Programmes

A Strategic Environmental Assessment (SEA) of the Shellfish PRPs and supporting toolkit of measures has been carried out in accordance with the requirements of the EU Strategic Environmental Assessment Directive (2001/42/EC). SEA is a process for evaluating, at the earliest appropriate stage, all of the possible environmental effects of plans or programmes before they are adopted while giving the public and other interested parties an opportunity to comment and to be kept informed of decisions and how they were made. The assessment of the PRPs resulted in mitigation of some of the measures contained in the PRPs and toolkit of measures that were identified as likely to lead to adverse effects on other aspects of the environment. The reports associated with the SEA process can be downloaded from www.environ.ie.

An 'Appropriate Assessment' of the Shellfish PRPs has been carried out in parallel with the SEA assessment in accordance with the requirements of the EU Habitats Directive (92/43/EEC). Appropriate Assessment is a process for evaluating the implications of plans or programmes for sites which have been designated for the protection and conservation of habitats and species of European importance. The reports associated with the Appropriate Assessment can be downloaded from www.environ.ie.

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1.6 Links with the River Basin Management Plans

The EU Water Framework Directive (2000/60/EC) provides a framework for the protection and restoration of the aquatic environment and terrestrial ecosystems and wetlands directly depending on the aquatic environment. In accordance with the requirements of the directive, River Basin Management Plans (RBMPs) were published in draft form in December 2008 with the final RBMPs published in December 2009. They are the primary plans in place in relation to the water environment for the foreseeable future.

Article 13(5) of the WFD states that 'river basin management plans may be supplemented by the production of more detailed programmes and management plans for sub-basin, sector, issue, or water type, to deal with particular aspects of water management'. Shellfish PRPs are an example of such programmes. In addition, Article 13(4) and Annex VII of the WFD requires that RBMPs include 'a register of any more detailed programmes and management plans for the River Basin District dealing with particular sub-basins, sectors, issues or water types, together with a summary of their contents'. The Shellfish PRPs are included in the registers of each of the River Basin Districts.

Articles 4 (1)(c) and 4 (2) of the WFD specify that, in relation to protected areas, where more than one of set of objectives relate to a given body of water, the most stringent shall apply. Designated shellfish areas are included in the WFD register of protected areas provided for in Articles 6 and 7 of the directive.

The WFD strengthens and consolidates a number of existing environmental directives while repealing others on a phased basis. The Shellfish Directive is due to be repealed by the WFD in 2013. Shellfish PRPs are therefore closely aligned with the RBMPs.

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1.7 Layout of the Shellfish Pollution Reduction Programmes

Characterisation Report

- **Section 1**
  Section 1 is an introductory section which puts the Characterisation Reports in context and outlines their contents.

- **Section 2**
  Section 2 describes the general characteristics of the designated shellfish areas as well as their contributing catchments.

- **Section 3**
  Section 3 describes water quality in the designated shellfish areas.

- **Section 4**
  Section 4 consists of a series of maps illustrating the general characteristics of the shellfish areas and catchments, as well as the marine and land-based pressures in the catchments.

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- **Section 5**
  Section 5 provides a series of tables summarising the marine and land-based pressures in the catchments. The likelihood of the pressures to impact on shellfish water quality parameters is discussed. A summary is also provided highlighting the key pressures and potential secondary pressures which are most likely to be impacting on shellfish water quality parameters. The discussions in this section draw on available information including information generated during the WFD implementation process and geographical features of significance. The differing nature of the pressures are also taken into account as pressures vary substantially in terms of how severely they are likely to impact on shellfish water quality parameters.

Pollution Reduction Programmes

- The Pollution Reduction Programmes summarise the specific measures for controlling the key and potential secondary pressures, identified in this characterisation report, which are most likely to be impacting on shellfish water quality in Oyster Haven shellfish area. This can be downloaded from www.environ.ie.

Toolkit of Measures

- The supporting toolkit of measures outlines all of the measures available for controlling all of the pressures which can impact on shellfish water quality. Due to the close alignments between the Shellfish PRPs and the RBMPs, the toolkit is drawn from the programme of measures contained within the RBMPs. This strengthens the integration of shellfish management and wider water quality management policy in Ireland. The toolkit can be downloaded from www.environ.ie.

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2.0 GENERAL CHARACTERISTICS

Name	Oyster Haven Shellfish Area
Map number	40
Year of designation	2009
Area	1.5 km^2
River Basin District	South Western RBD
County	Cork
Location of sampling point	51 deg 42.000 min North (Lat) 8 deg 27.600 min West (Long)
Catchment area	100.3 km^2

Oyster Haven is situated on the coast of County Cork in the South Western River Basin District (Map 1). The designated shellfish area within the bay is 1.5 km^2 in area. It encompasses the shoreline southwest of Mountlong to the shoreline east of Garraha, along the shoreline to a point southwest of Rathmore to a sight line running west to east to Ringville and up the inlet to Ballinclashet and including Ballinclashet Creek

The contributing catchment of the shellfish area is almost 100.3 km^2 in area (Map 3). The River Stick is the main freshwater input into the area.

The population of the catchment is approximately 25,633 (CSO 2006 Survey). However, there is no single large centre of population. Farming in the region is mainly based on sheep and cattle rearing. Approximately 63,190 cattle and 6,165 sheep are grazed in the catchment.

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2.1 Protected areas

The designated shellfish area lies within the Oyster Haven cSAC (Map 11).

2.2 Aquaculture activity

Table 2 summarises the number and area of aquaculture licensed areas within the designated shellfish area. Oyster cultivation is predominant in the area (Map 2). 42 tonnes were harvested in 2006.

TABLE 2 - Aquaculture licensed areas

Fishing and aquaculture types	Number	Area	% Area
Abalone	0	0	0 %
Clams	0	0	0 %
Cockles	0	0	0 %
Lobsters	0	0	0 %
Scallops	0	0	0 %
Mussels	0	0	0 %
Oysters	16	0.4 km^2	26.7 %
Sea Urchins	0	0	0 %
Periwinkles	0	0	0 %
Seaweed	0	0	0 %

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Fishing and aquaculture types	Number	Area	% Area
Other	0	0	0 %

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3.0 WATER QUALITY IN THE SHELLFISH AREA

Dedicated shellfish monitoring data has been collated and compared with shellfish water quality parameter mandatory and guideline values outlined in Annex I of the Shellfish Waters Directive (2006/113/EC) and Schedule 2 and 4 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) (Table 1).

Additional monitoring data from other monitoring programmes has also been collated in order to highlight any water quality issues in the vicinity of the shellfish areas. This can aid in the identification of the pressures most likely to impact on the shellfish areas and thereby in the identification of any measures to be applied. Datasets were collated from the Environmental Protection Agency (EPA), the Marine Institute (MI) and the Sea Fisheries Protection Authority (SFPA). Where applicable these additional monitoring data were compared with the shellfish water quality parameter mandatory and guideline values outlined in Annex I of the Shellfish Waters Directive (2006/113/EC) and Schedules 2 and 4 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) (Table 1).

Marine Institute Shellfish Monitoring Programme

The MI carries out shellfish monitoring at designated shellfish areas. This dedicated shellfish monitoring programme involves analysing for general components, metals and organics in both water and biota samples. The results have been compared with the shellfish mandatory and guideline values outlined in Table 1.

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For this shellfish area, 1 water sample was available from 2004. There were no biota samples available. The shellfish guideline values for biota outlined in Table 1 were not breached in the available sample.

Faecal coliform biota results were also available from the MI from November 2008, February 2009, May 2009 and August 2009. The shellfish guideline value for faecal coliforms in biota outlined in Table 1 was not breached in any of these samples.

EPA Marine Monitoring Programme

The EPA Marine Monitoring Programme analyses for general components in water samples at a large number of marine sites around Ireland. However, there was no data available from this programme for the designated shellfish area.

WFD Monitoring Programme

WFD status classifications from the WFD monitoring programme apply at the water body scale and are generally based on several samples/surveys targeting a variety of parameters including biological, physico-chemical, chemical and hydromorphological elements. The monitoring information on which the marine status classifications are based was collected by the EPA, the MI, the National Parks and Wildlife Service (NPWS) and the Central Fisheries Board (CFB) between 2005 and 2008.

The WFD status of the transitional water body, within which the shellfish area is situated, is ‘moderate’ and therefore unsatisfactory; however, this status was

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extrapolated from similar water body types. The River Suck which discharges into the designated shellfish area is 'moderate' and therefore unsatisfactory, reflecting issues with physico-chemical parameters (Map 12).

Shellfish Flesh Monitoring Programme

Shellfish flesh classifications (carried out under the European Communities (Live Bivalve Molluscs) (Health Conditions for Production and Placing on the Market) Regulations, 1996 (S.I. No. 147 of 1996)) indicate faecal contamination in shellfish flesh. Sampling is carried out by the Sea Fisheries Protection Authority (SFPA) on at least a monthly basis.

The licensed area is classified as Class B meaning that shellfish may be placed on the market for human consumption only after treatment in a purification centre or after relaying so as to meet the health standards for live bivalve molluscs laid down in the EC Regulation on food safety (Regulation (EC) No 853/2004). This indicates faecal contamination in this shellfish area.

Overall Water Quality

The dedicated shellfish samples available for this shellfish area were found to be compliant with shellfish guideline values outlined in Annex I of the Shellfish Waters Directive (2006/113/EC) and Schedule 4 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) (Table 1). Ongoing shellfish monitoring will strengthen the assessment of compliance status at this shellfish area.

The results of the WFD monitoring programme indicate that there are water quality issues in some of the waters discharging in the vicinity of this shellfish area.

The shellfish flesh classification indicates low levels of faecal contamination in the shellfish area. However, the monitoring data available at this shellfish area is compliant with the shellfish guideline value for faecal coliforms.

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4.0 CHARACTERISATION MAPS

The following series of maps illustrate the general characteristics of the designated shellfish area and its contributing catchment, as well as the marine and land-based pressures that could potentially impact on the shellfish area. The pressures are further divided into point source pressures, diffuse source pressures and morphological pressures.

Some of the point source pressures are symbolised according to whether they are 'at risk' or 'not at risk'. These risk designations were developed during the WFD implementation process. Some of the designations date back to the Article V characterisation process in 2004 and 2005 but many of the risk designations were updated in 2008 to feed into the draft RBMPs. The risk designations are based on a variety of information, for example, waste water treatment plants can be designated as 'at risk' because they are serving a larger population then they were designed to cater for or because their discharges are impacting on water quality. Section 5 of this characterisation report provides the detail behind the risk designations for each of the pressures and discusses their likelihood to be impacting on shellfish water quality parameters.

Whilst the risk designations under the WFD provide a useful screening tool for pressures, their relevance in terms of any water quality issues measured in Shellfish Waters has been assessed in further detail to identify key pressures at a particular site. For example the WFD risk may be based on particular impacts to freshwater ecology which are not pertinent to the shellfish water status.

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TABLE 3 - List of maps

Map No.	Map Title	Details
General Characteristics Maps		
MAP 1	Designated shellfish area	Designated shellfish area with summary statistics.
MAP 2	Licensed shellfish areas	Department of Agriculture, Fisheries and Food register of licensed shellfish areas within the designated shellfish area.
MAP 3	Contributing catchment	Nested river water bodies and inter-coastal freshwater bodies discharging in the vicinity of the designated shellfish area.
MAP 4	Topography	Topography of the contributing catchment.
MAP 5	Soil wetness	Soil wetness which indicates drainage characteristics
MAP 6	Vulnerability of groundwaters to pathogens from subsoil discharges	Potential risk of pathogens from sub-soils discharges reaching groundwaters. Based on vulnerability, presence of alluvium, mineral content of soils, wetness, aquifer type, subsoil depth and subsoil permeability.

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Map No.	Map Title	Details
MAP 7	Vulnerability of groundwaters to phosphorus from subsoil discharges	Potential risk of phosphorus from sub-soils discharges reaching groundwaters. Based on vulnerability, presence of alluvium, mineral content of soils, wetness, aquifer type, subsoil depth and subsoil permeability.
MAP 8	Vulnerability of surface waters to pathogens from subsoil discharges	Potential risk of pathogens from sub-soils discharges reaching surface waters. Based on vulnerability, presence of alluvium, mineral content of soils, wetness, aquifer type, subsoil depth and subsoil permeability.
MAP 9	Vulnerability of surface waters to phosphorus from subsoil discharges	Potential risk of phosphorus from sub-soils discharges reaching surface waters. Based on vulnerability, presence of alluvium, mineral content of soils, wetness, aquifer type, subsoil depth and subsoil permeability.
MAP 10	Likelihood of inadequate percolation in subsoils	Likelihood of inadequate percolation in subsoils. Based on aquifer type, vulnerability and subsoil permeability.
MAP 11	Designated protected areas	SACs, SPAs, freshwater pearl mussel areas, recreational waters, drinking waters, nutrient sensitive areas, water dependant habitats and RAMSAR sites within the contributing catchment.
MAP 12	WFD surface water status	River, lake, transitional and coastal water body status resulting from the WFD monitoring programme.
MAP 13	EPA diffuse risk assessment	Water body based risk to waters from diffuse sources. Based on the percentages of diffuse land cover per water body including peatlands, coniferous forestry, agriculture and urban areas.
Marine Pressures Maps		
Point Source Pressures		
MAP 14	Marine finfish farms	Marine finfish farms in the vicinity of the designated shellfish area. Taken from the Marine Atlas.
Morphology Pressures		
MAP 15	Fishing gear activity	Fishing gear activity in the vicinity of the designated shellfish area. Taken from the Marine Atlas.
MAP 16	Structures	Marine morphology structures such as bridges and causeways

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Map No.	Map Title	Details
MAP 17	Physical modifications	Physical modifications such as shoreline reinforcement, embankments, reclaimed land, capital and maintenance dredging, aggregate removal, dumping at sea and heavily modified waters within the designated shellfish area.
Land-based Pressures Maps		
Point Source Pressures		
MAP 18	Municipal waste water systems	Urban waste water treatment plants and combined sewer overflows within the contributing catchment. These are symbolized based on their risk designations.
MAP 19	Agricultural and aquacultural point source pressures	Pig units, and freshwater fish farms within the contributing catchment.
MAP 20	Industrial point source pressures	Industrial IPPCs, Section 4s, water treatment plants, abstractions, mines, quarries, landfills and contaminated sites within the contributing catchment. These are symbolized based on their risk designations.
Diffuse Source Pressures		
MAP 21	On-site waste water systems	On-site waste water treatment plants within the contributing catchment.
MAP 22	Dairy and drystock livestock units	Dairy and drystock livestock units per hectare of farmed land within each DED in the contributing catchment.
MAP 23	Nitrogen fertiliser usage	Nitrogen fertiliser usage per hectare of farmed land within each DED in the contributing catchment.
MAP 24	Phosphorus fertiliser usage	Phosphorus fertiliser usage per hectare of farmed land within each DED in the contributing catchment.
MAP 25	Forestry types with acidification risk areas	Forest cover in the contributing catchment with areas identified as being at risk from acidification.
MAP 26	Forestry types with eutrophication risk areas	Forest cover in the contributing catchment with areas identified as being at risk from eutrophication.
MAP 27	Forestry types with sedimentation risk areas	Forest cover in the contributing catchment with areas identified as being at risk from sedimentation.
Morphology Pressures		

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Map No.	Map Title	Details
MAP 28	Structures	Barriers to migration, both natural and man-made in the contributing catchment.
MAP 29	Physical modifications	Channelisation, heavily modified and artificial water bodies in the contributing catchment.

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MAP 1 - Designated shellfish area

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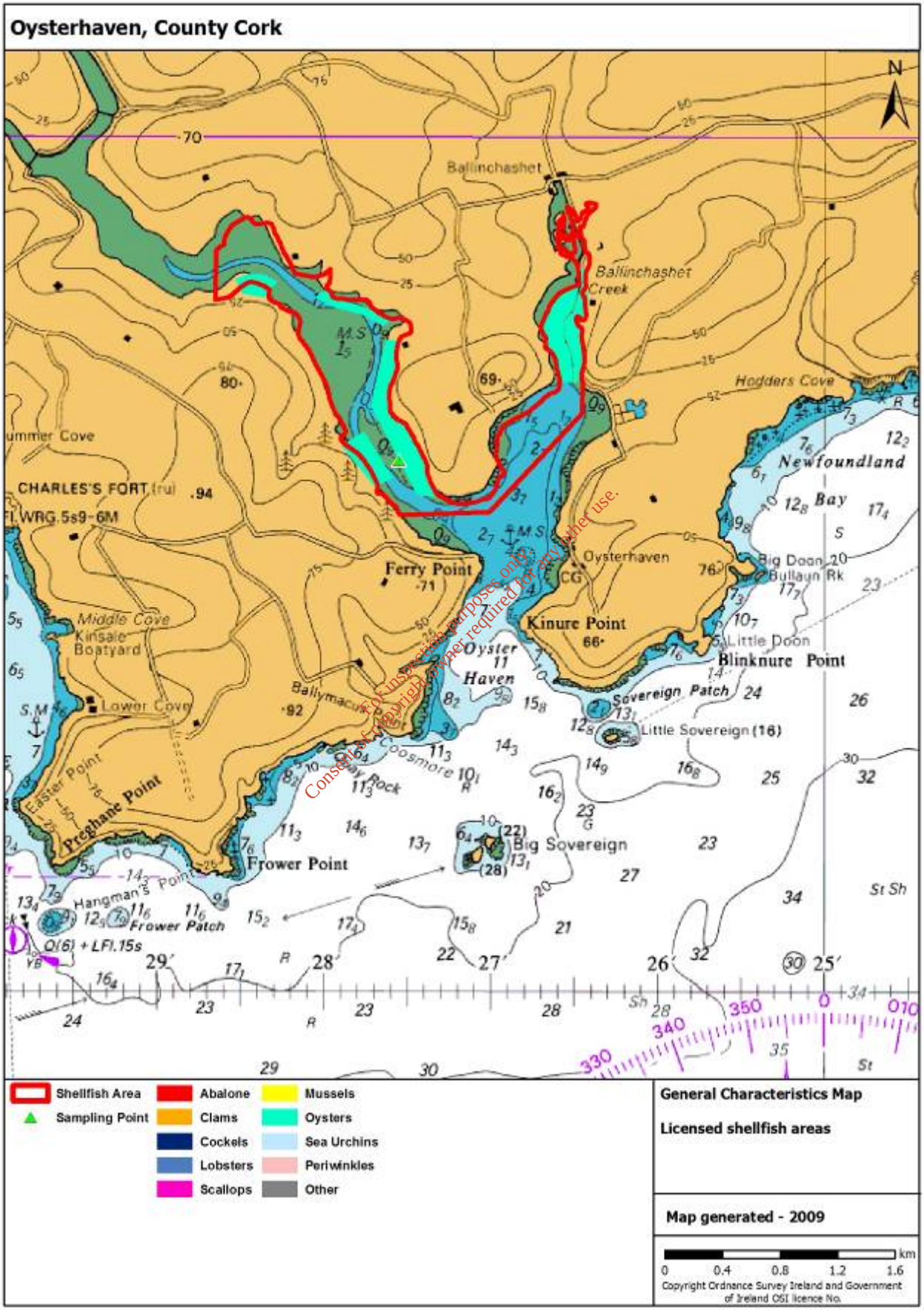
MAP 2 - Licensed shellfish areas



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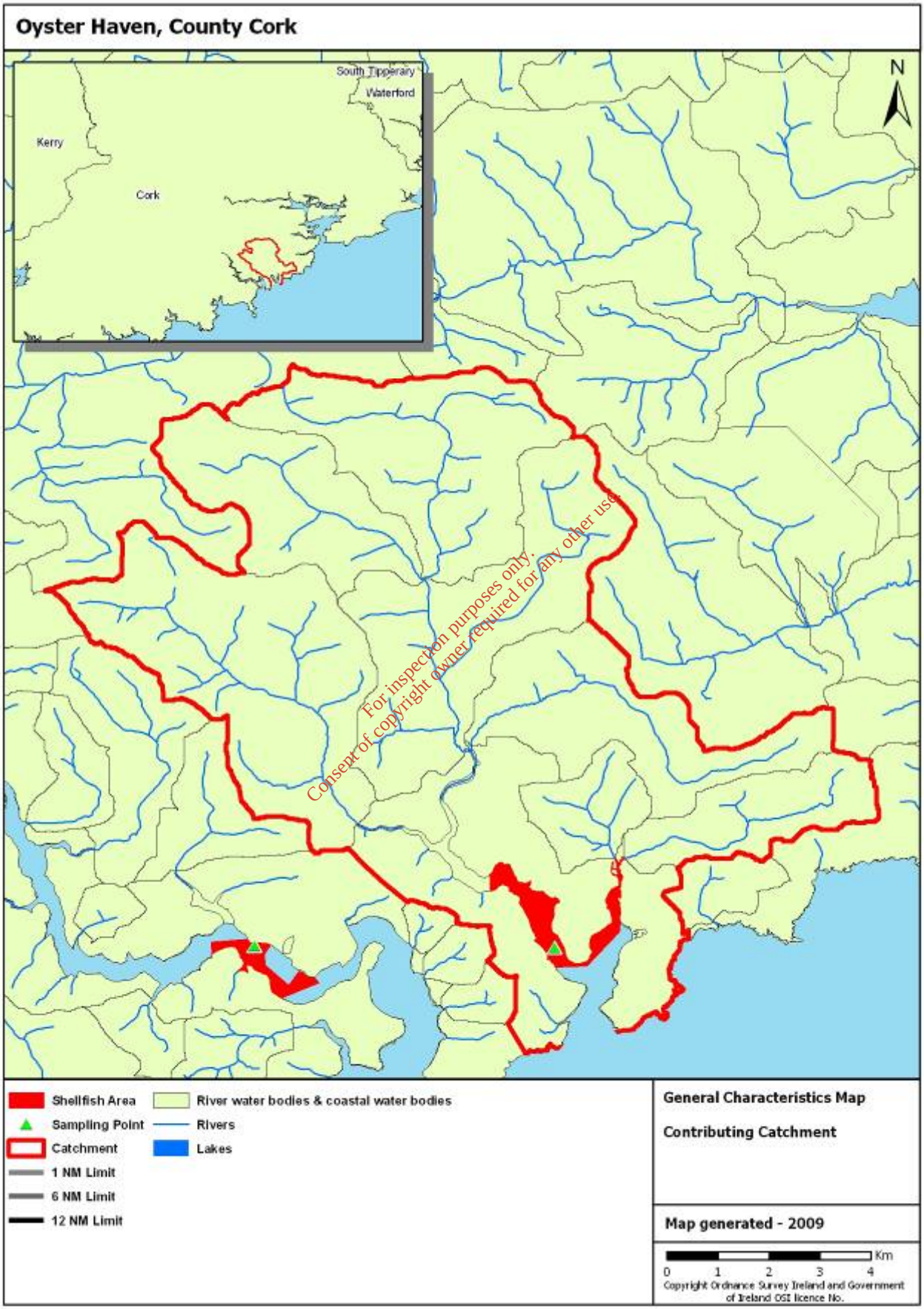
MAP 3 - Contributing catchment



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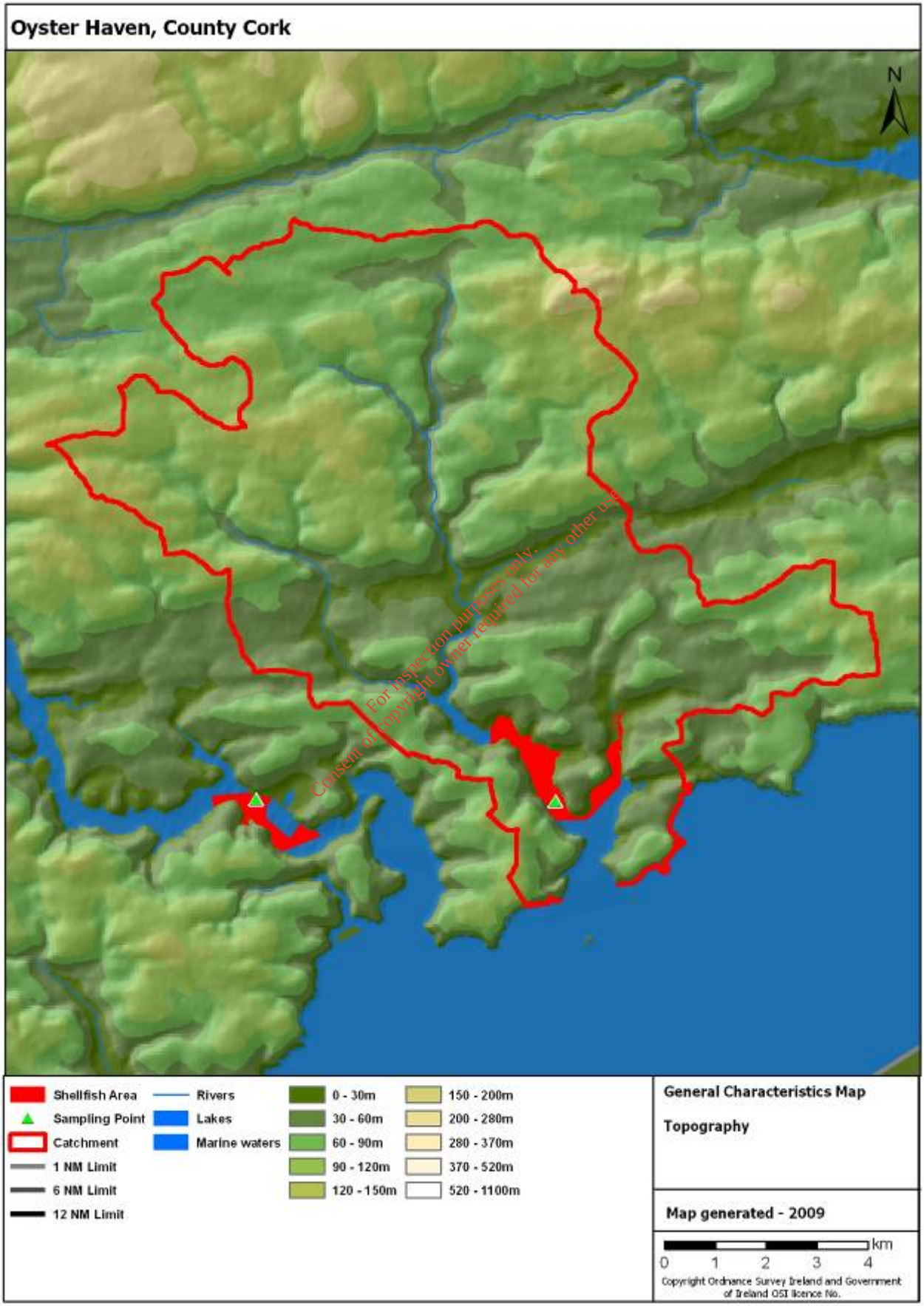
MAP 4 – Topography



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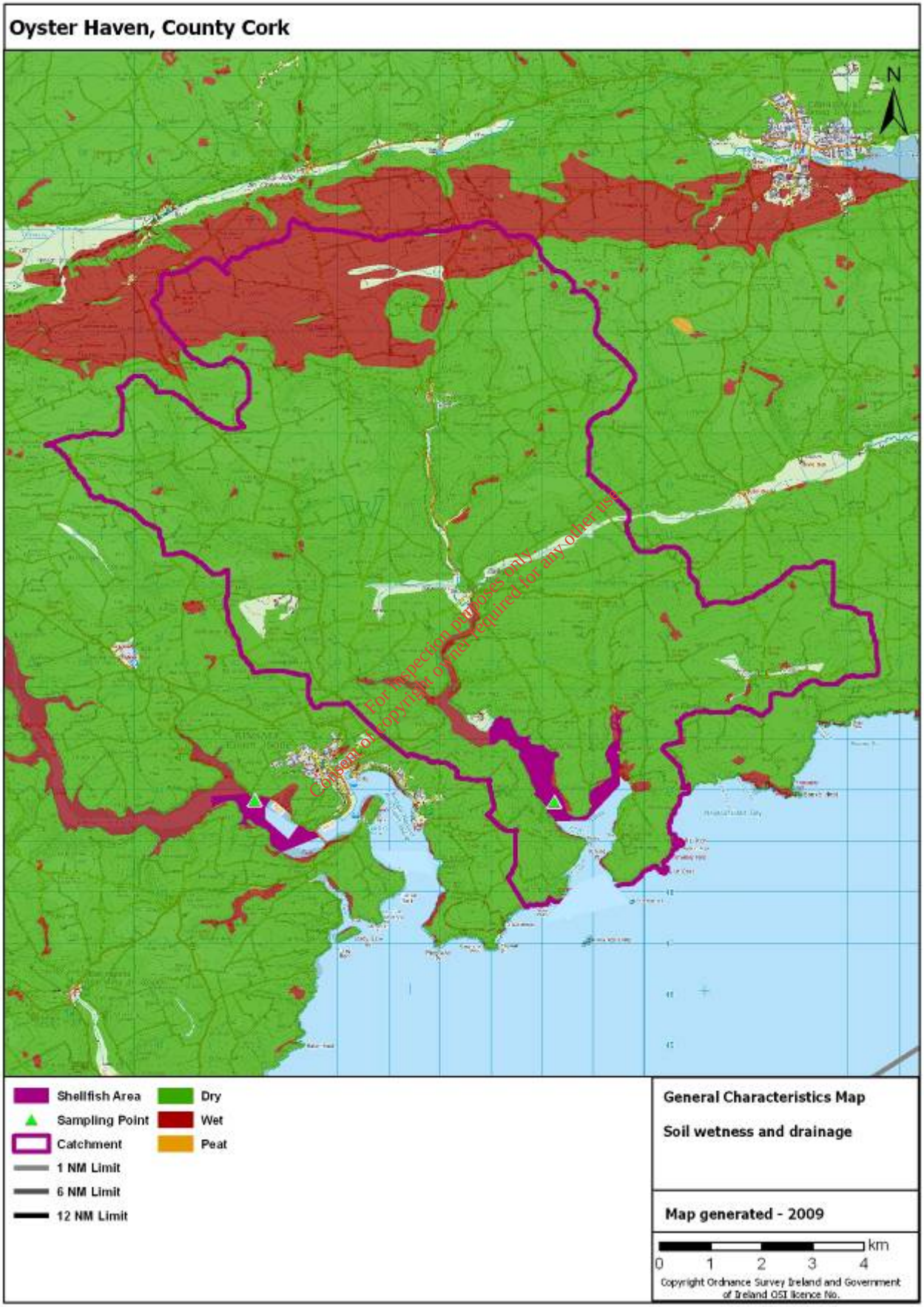
MAP 5 - Soil wetness



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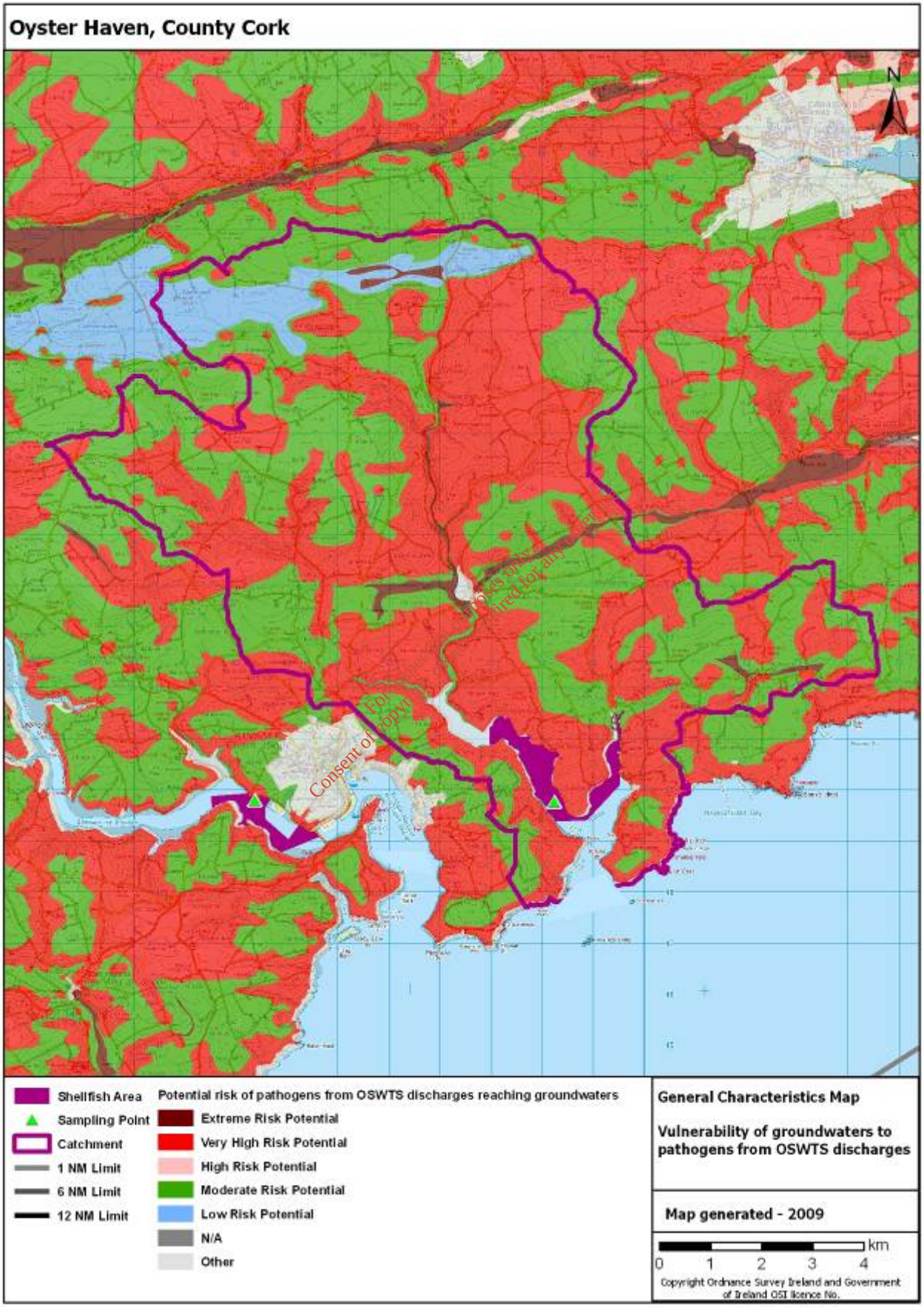
MAP 6 - Vulnerability of groundwater to pathogens from subsoil discharges



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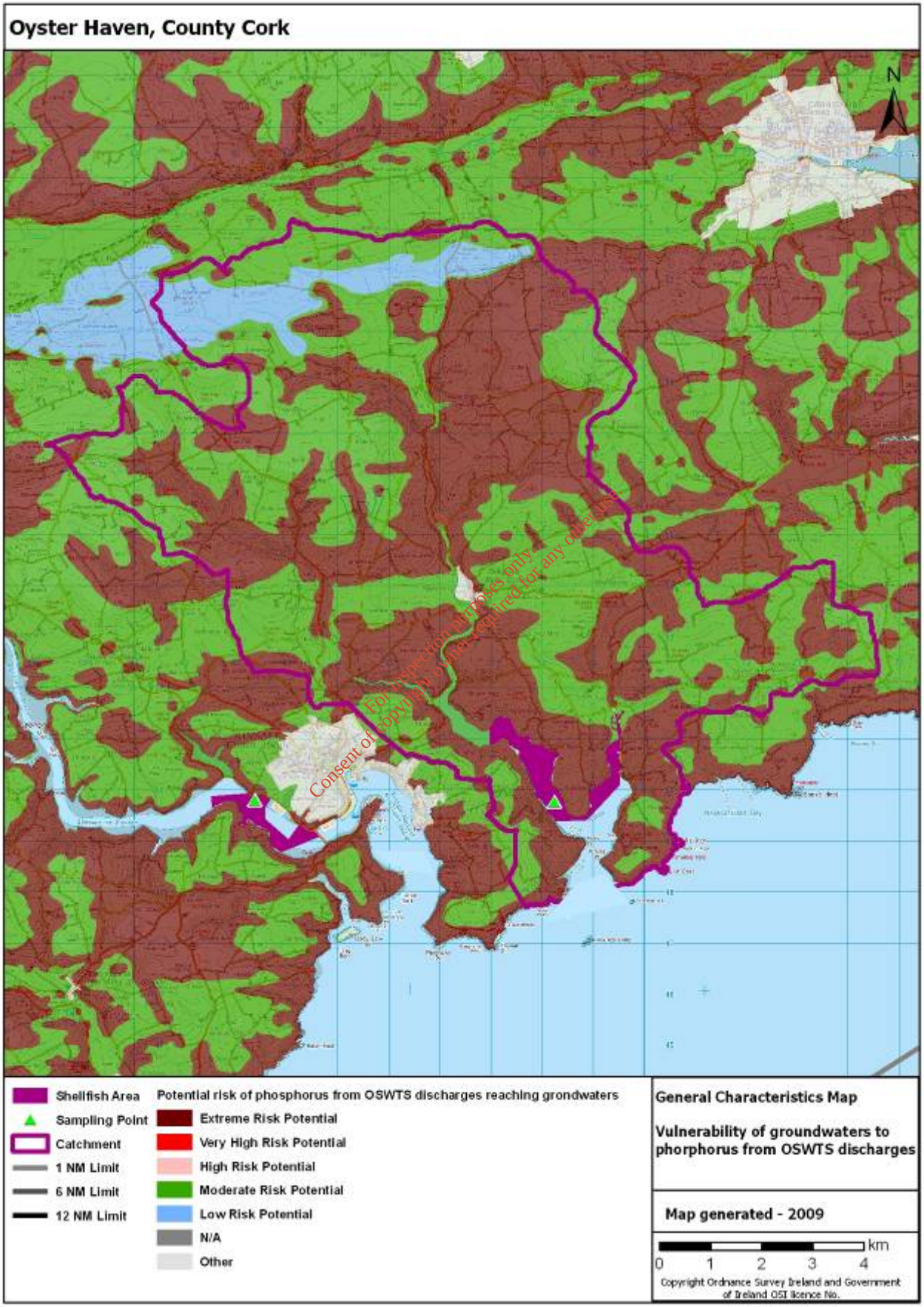
MAP 7 - Vulnerability of groundwater to phosphorus from subsoil discharges



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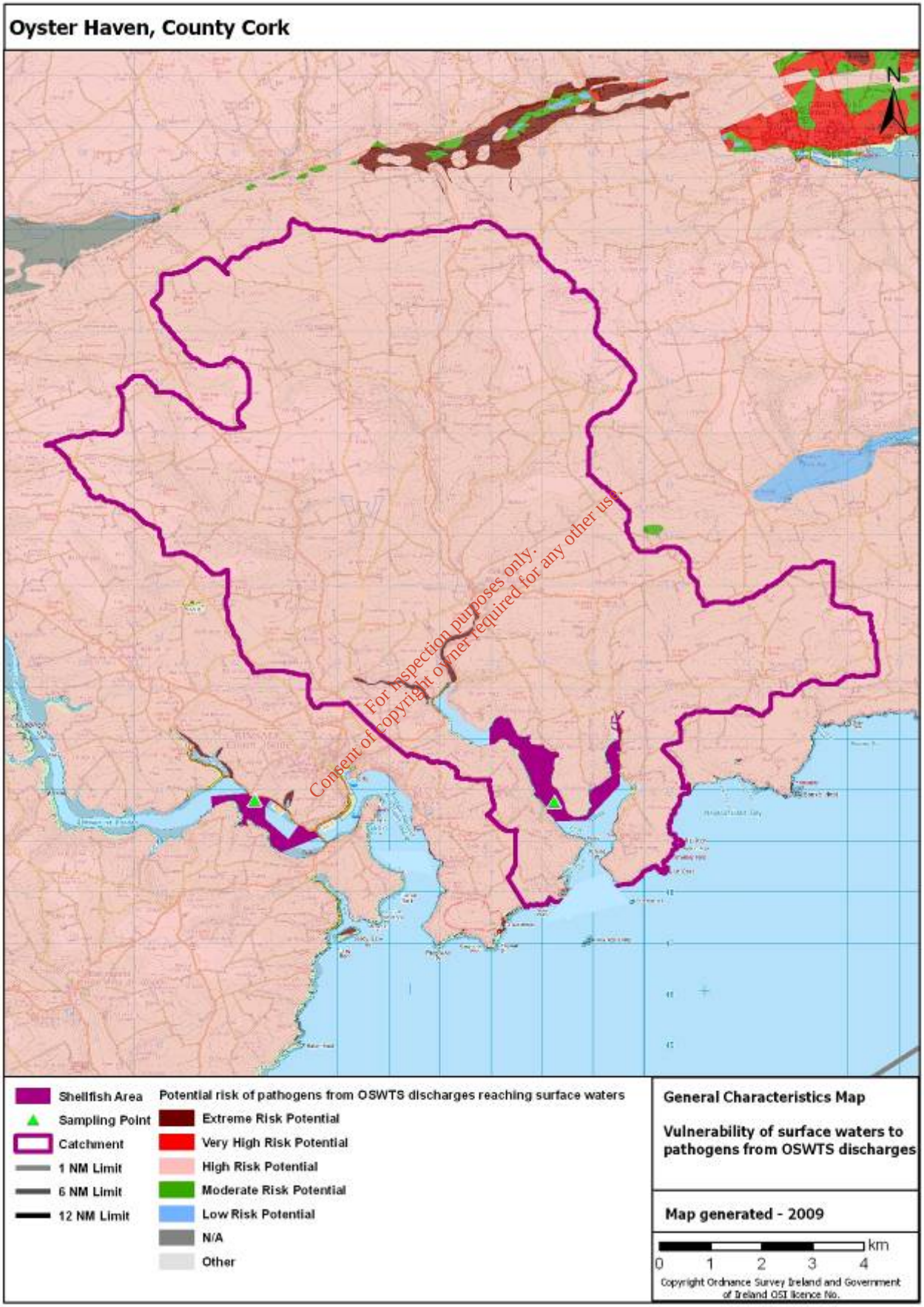
MAP 8 - Vulnerability of surface waters to pathogens from subsoil discharges



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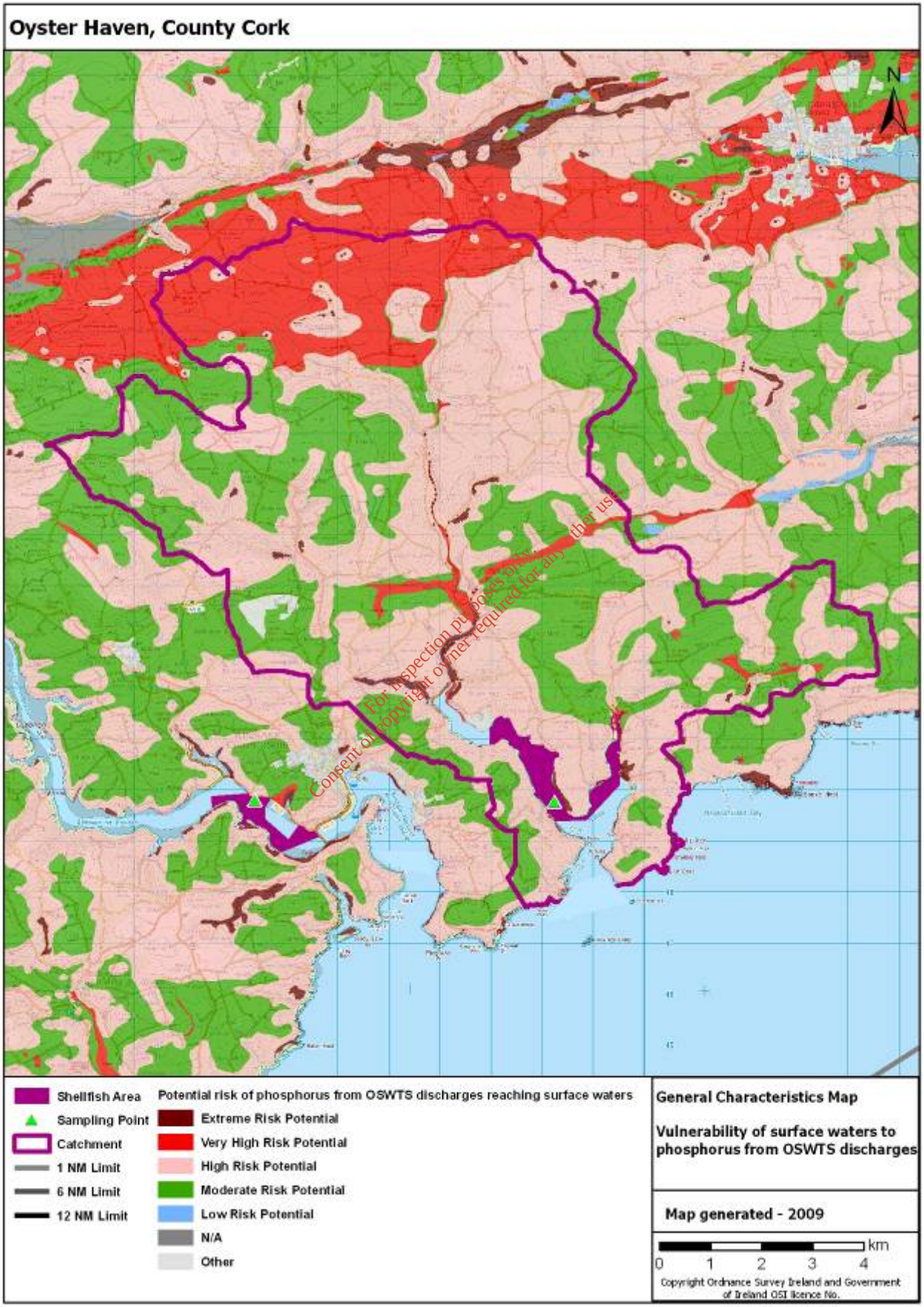
MAP 9 - Vulnerability of surface waters to phosphorus from subsoil discharges



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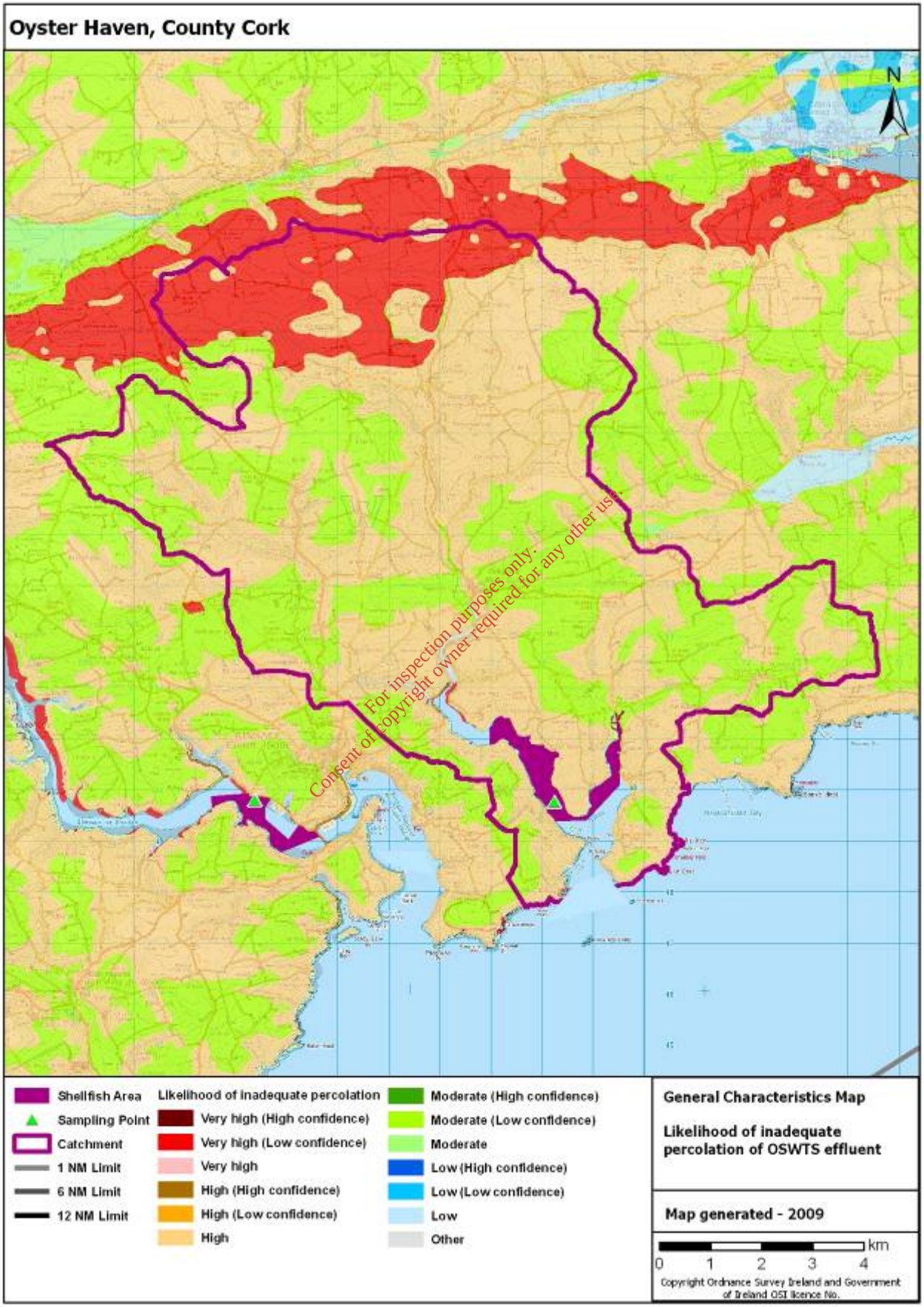
MAP 10 - Likelihood of inadequate percolation in sub-soils



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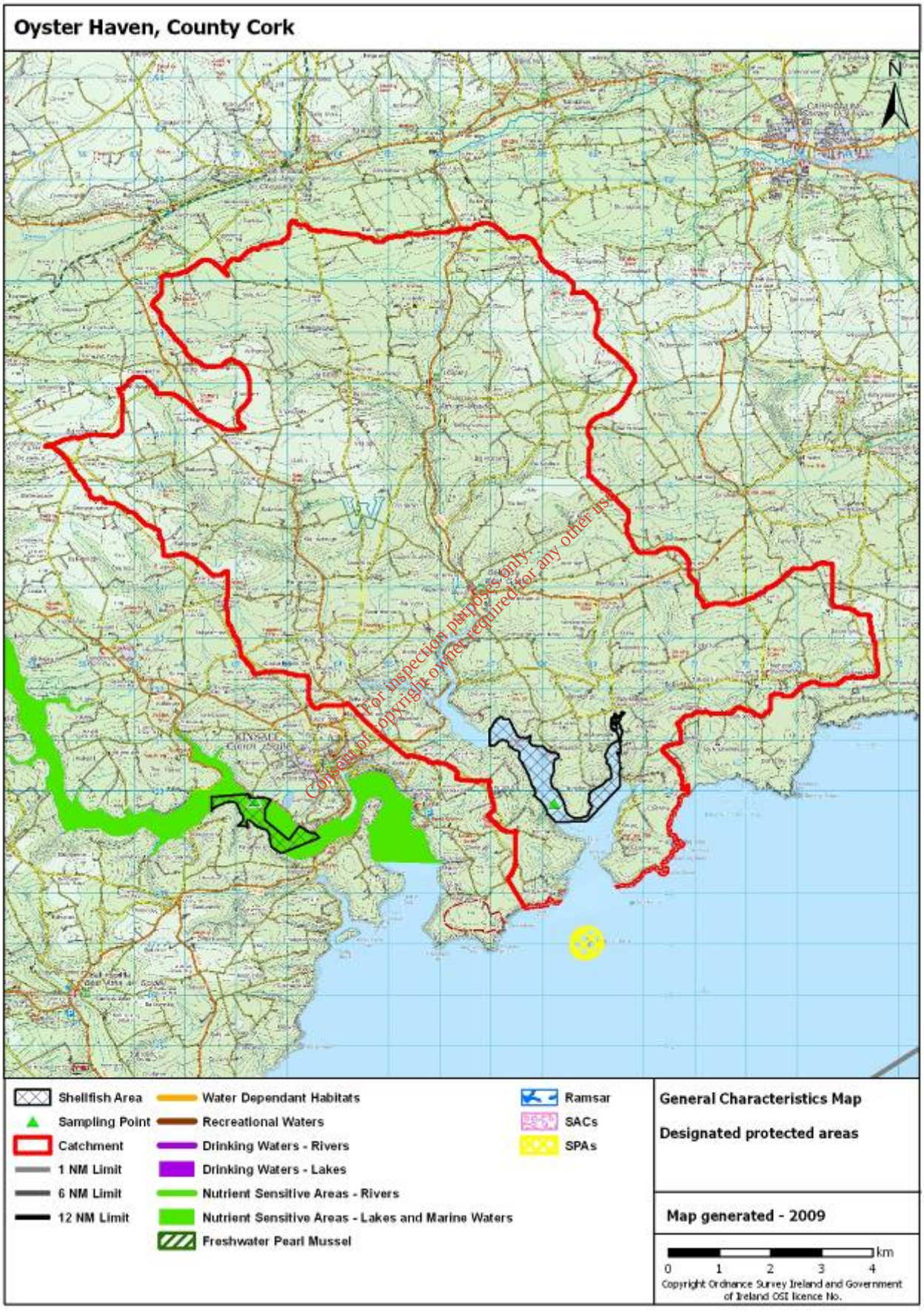
MAP 11 - Designated protected areas



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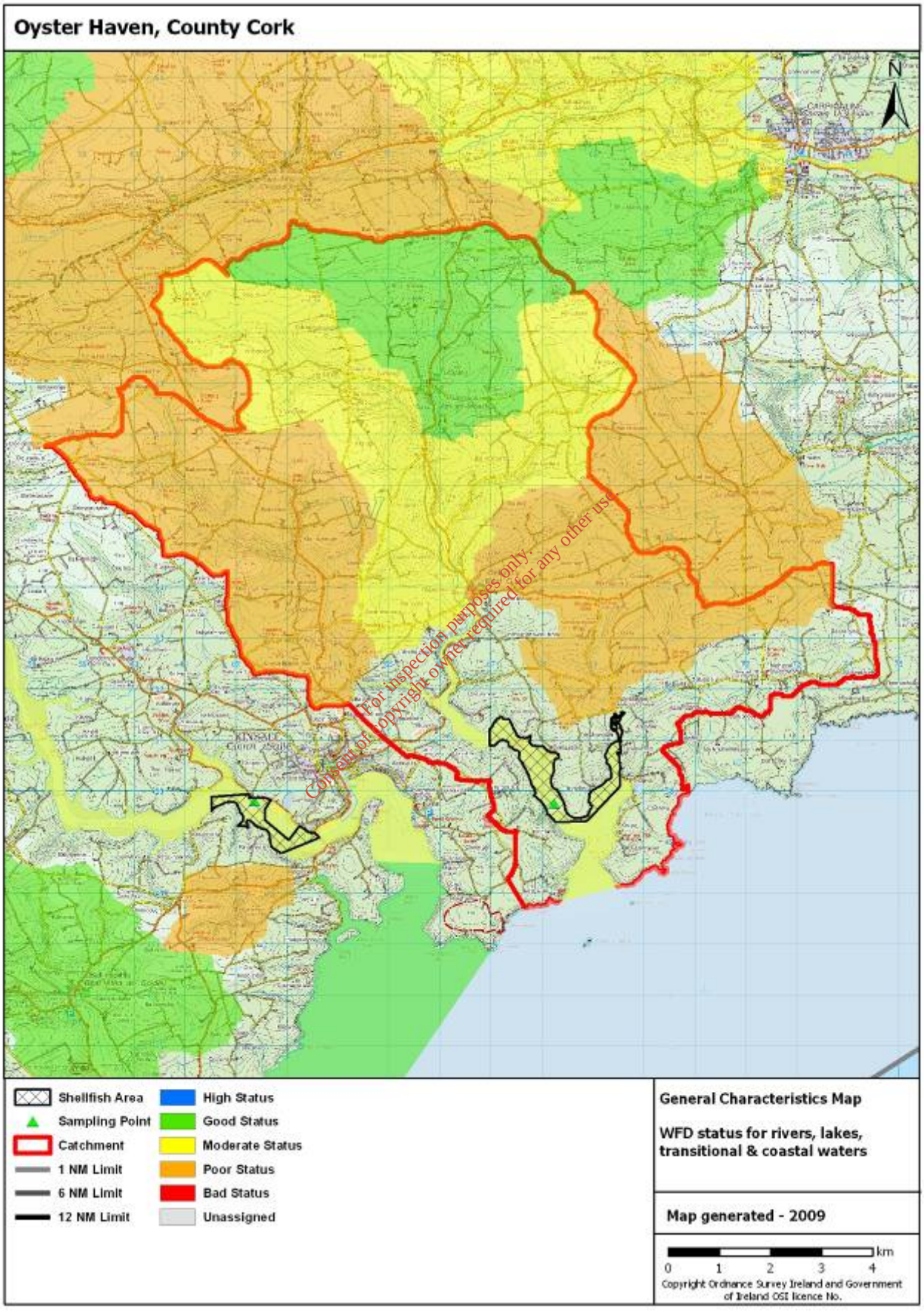
MAP 12 - WFD surface water status



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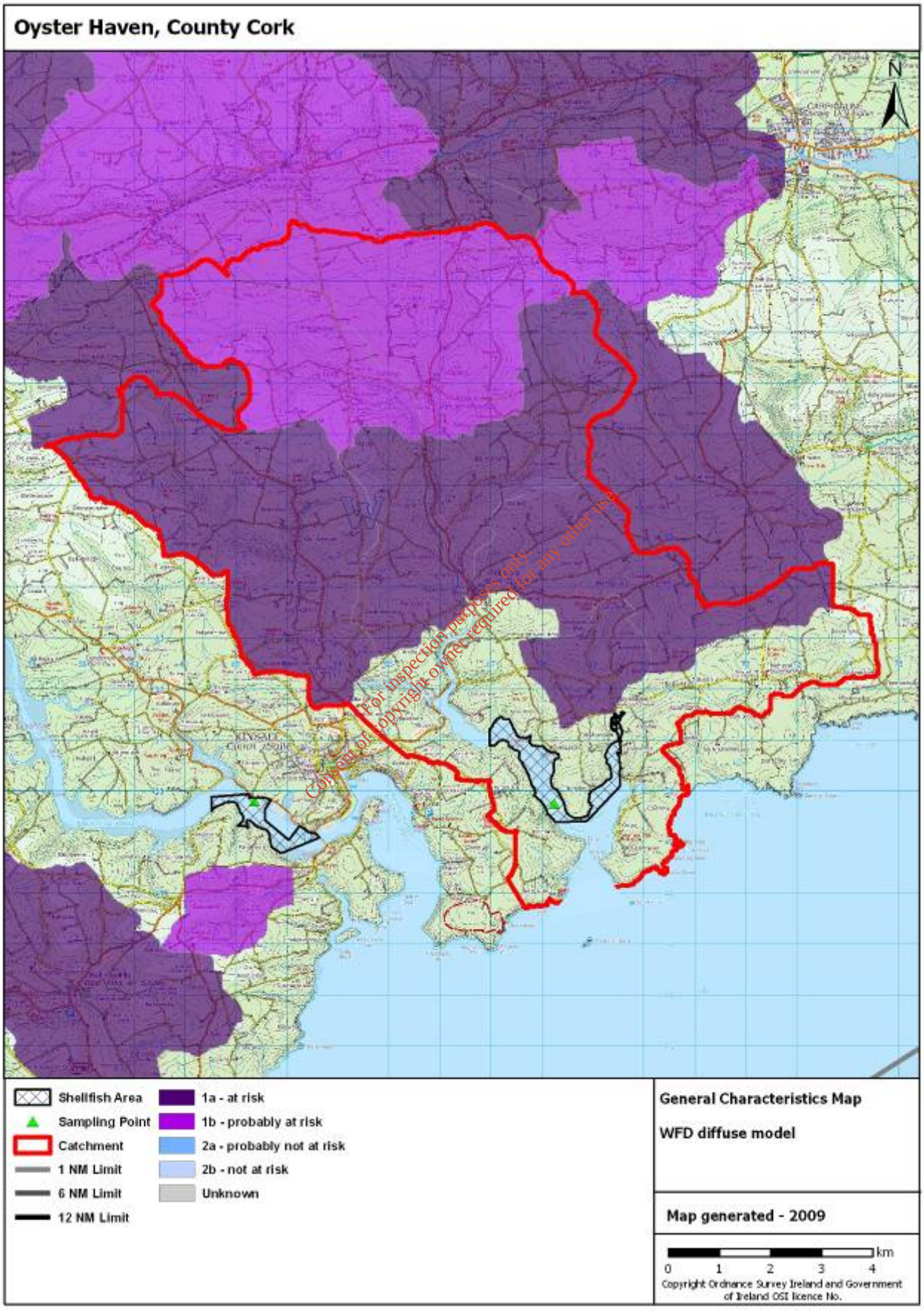
MAP 13 - Diffuse risk assessment



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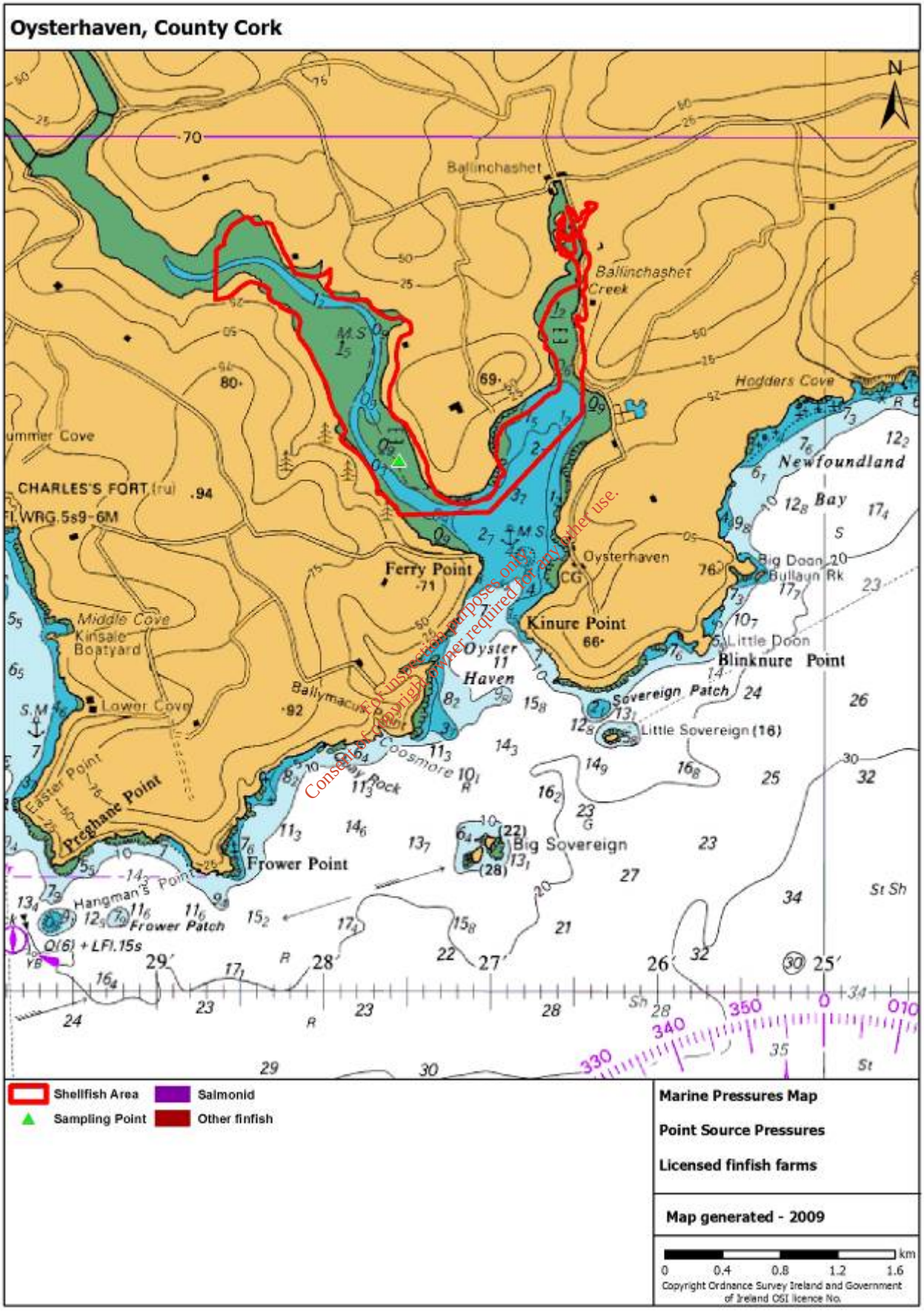
MAP 14 - Licensed finfish areas (None in the vicinity of this shellfish area)



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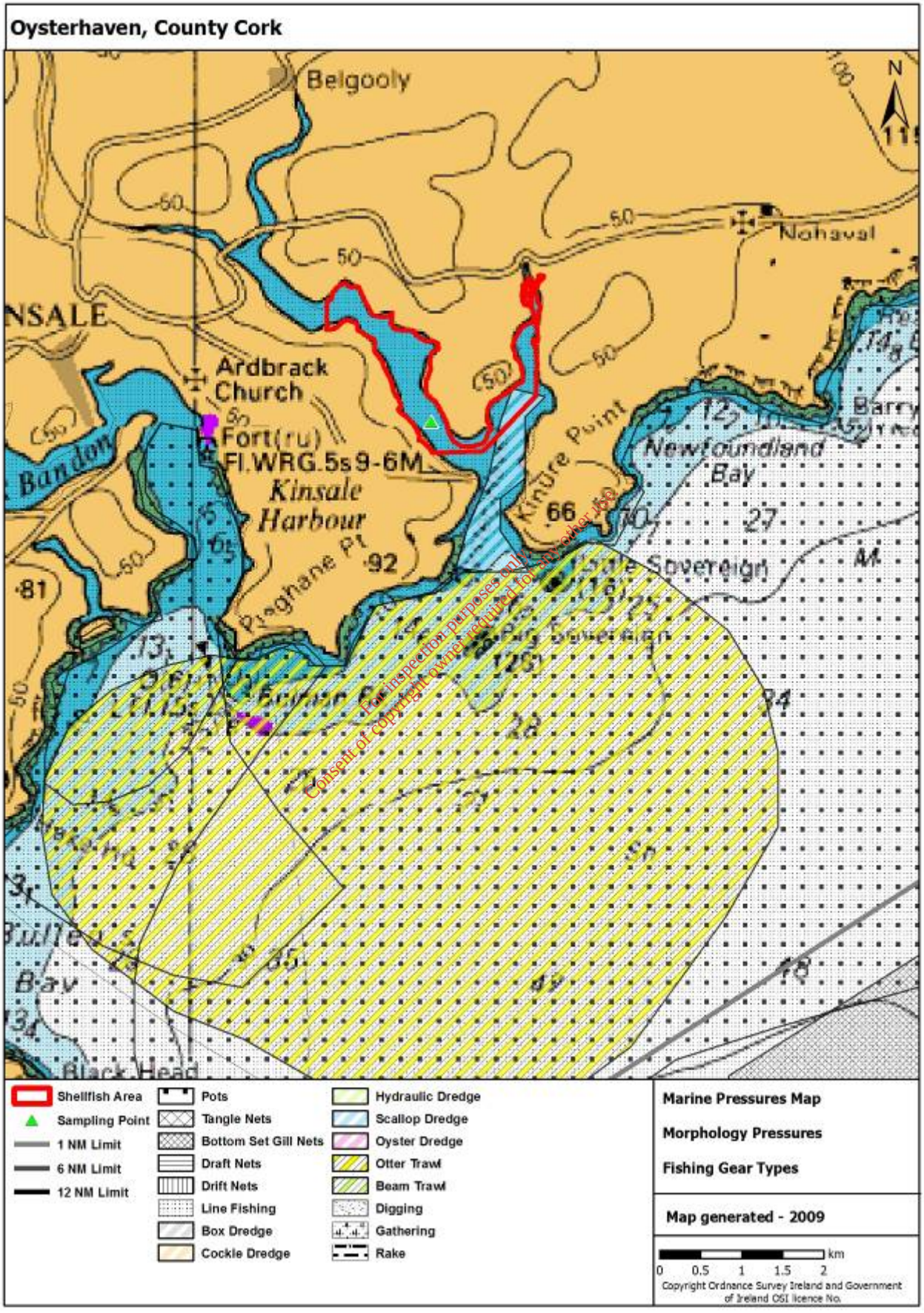
MAP 15 - Fishing gear activity



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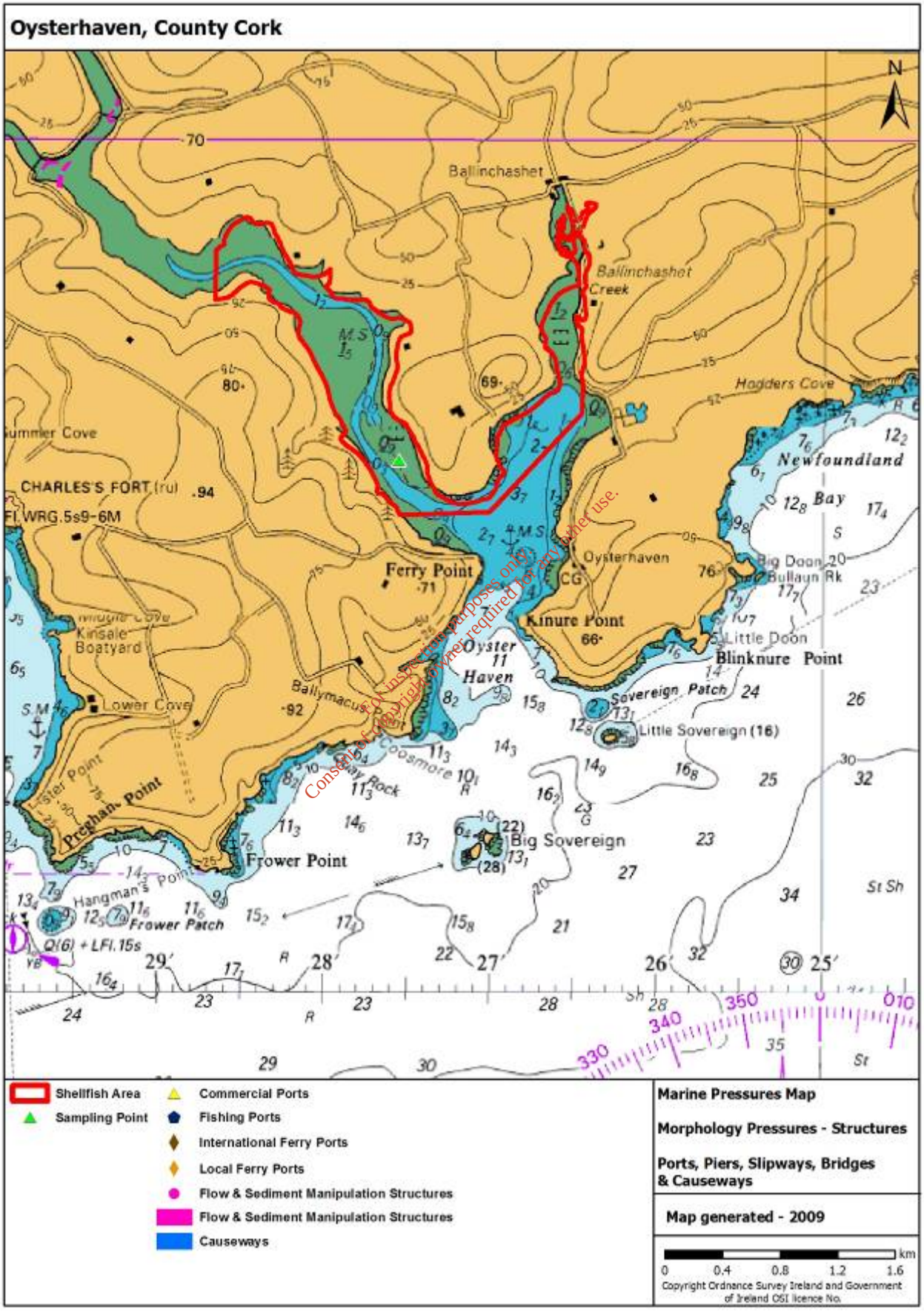
MAP 16 - Marine structures



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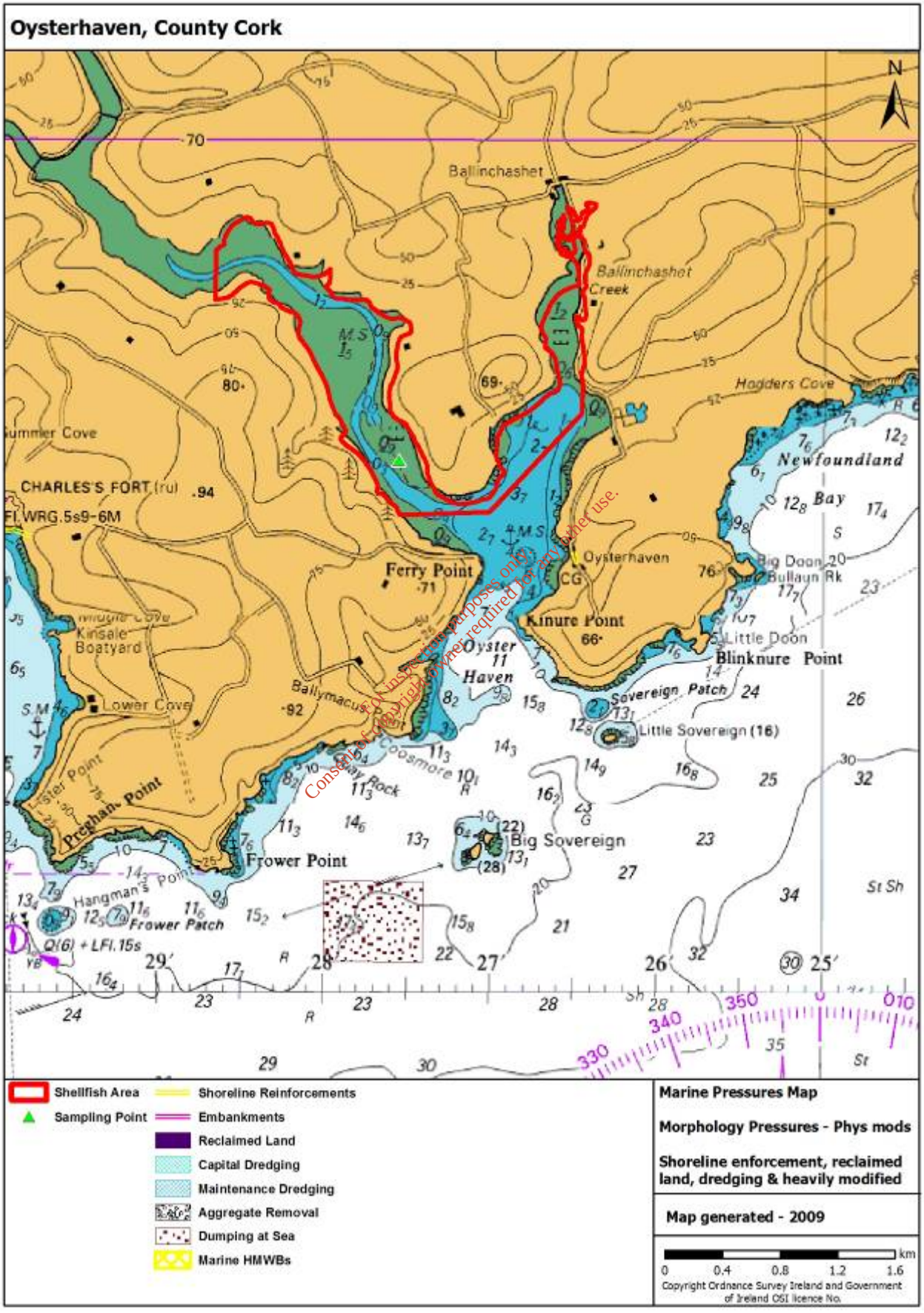
MAP 17 - Marine physical modifications



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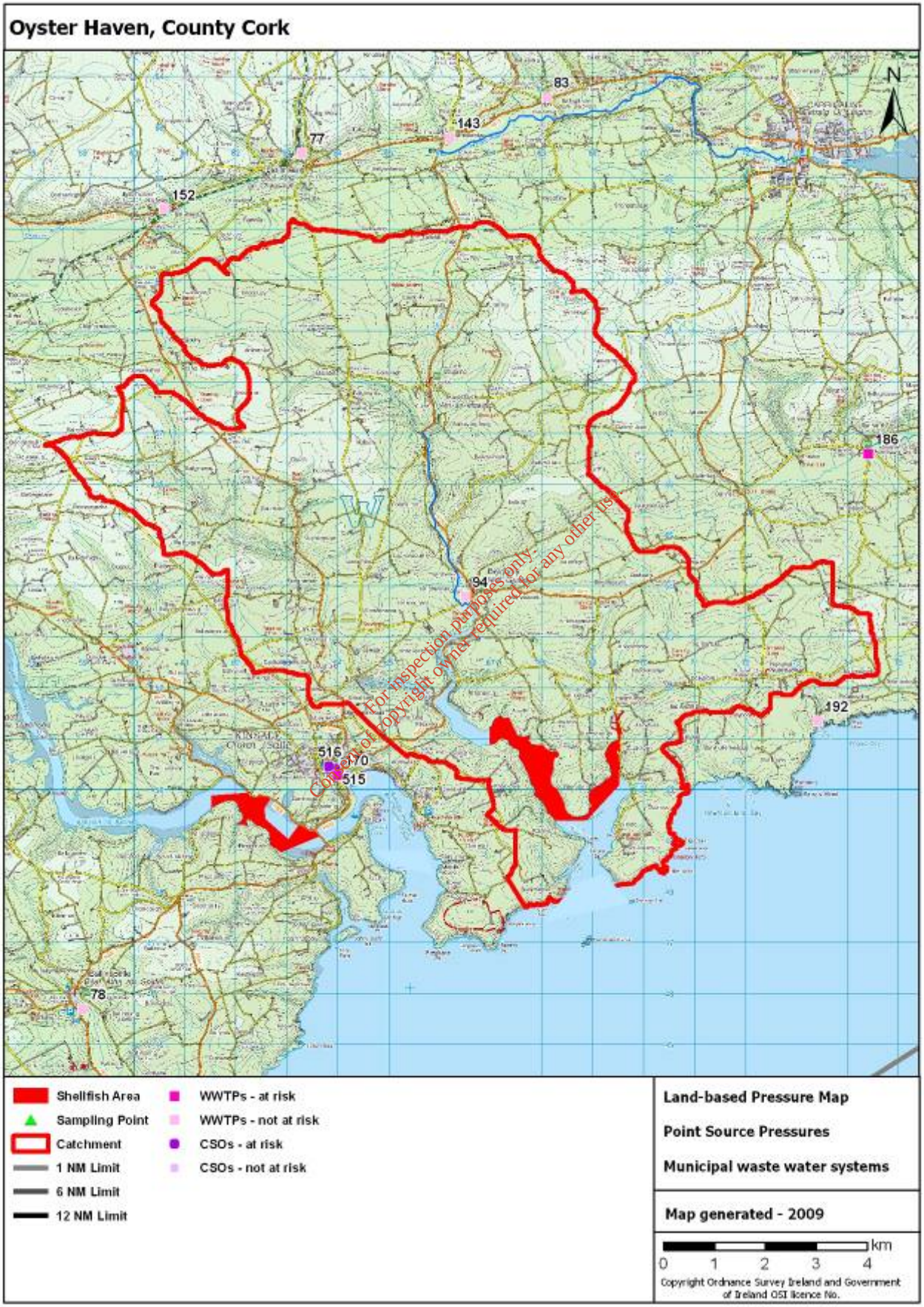
MAP 18 - Municipal waste water systems



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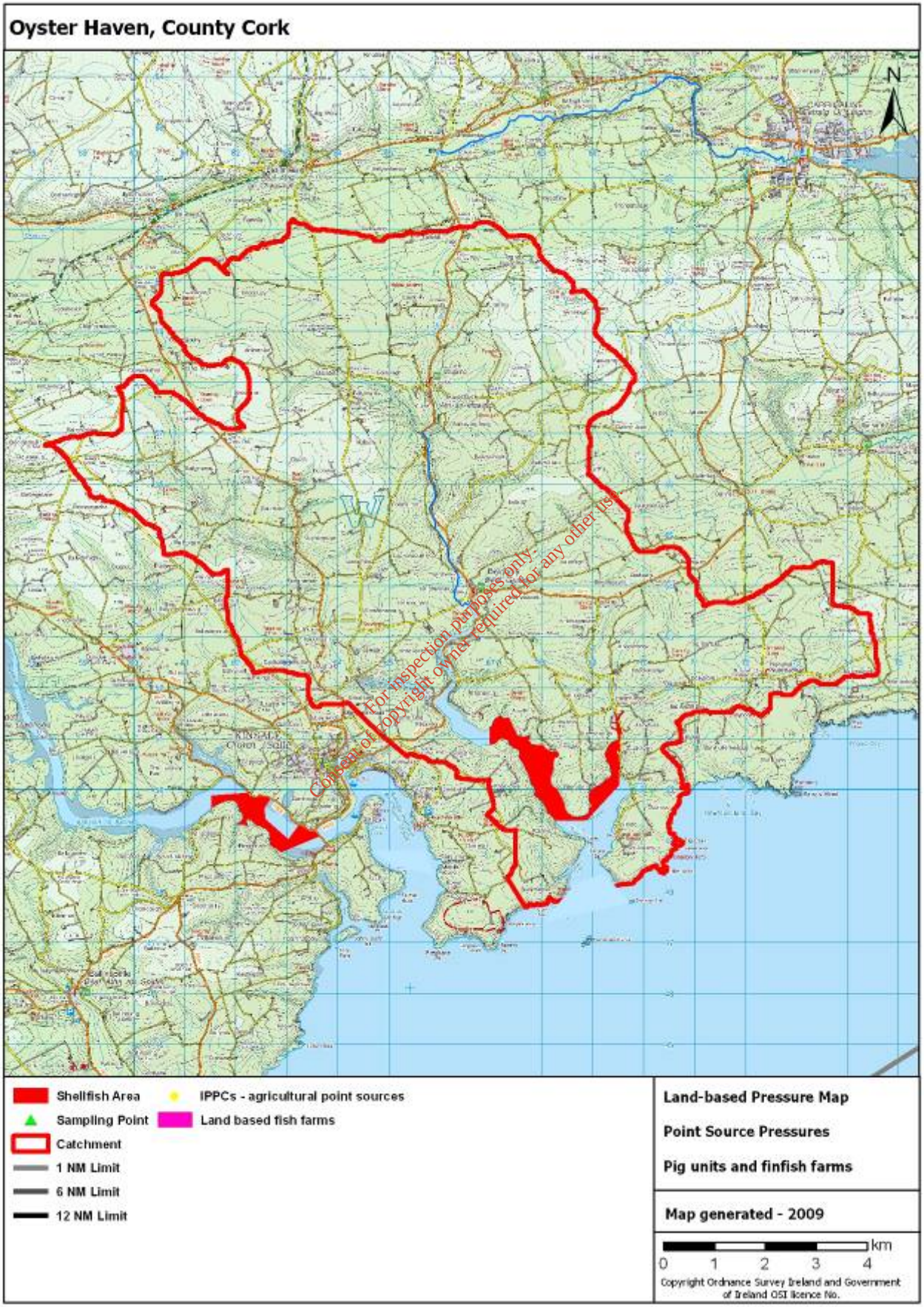
MAP 19 - Pig units and finfish farms (None in this catchment)



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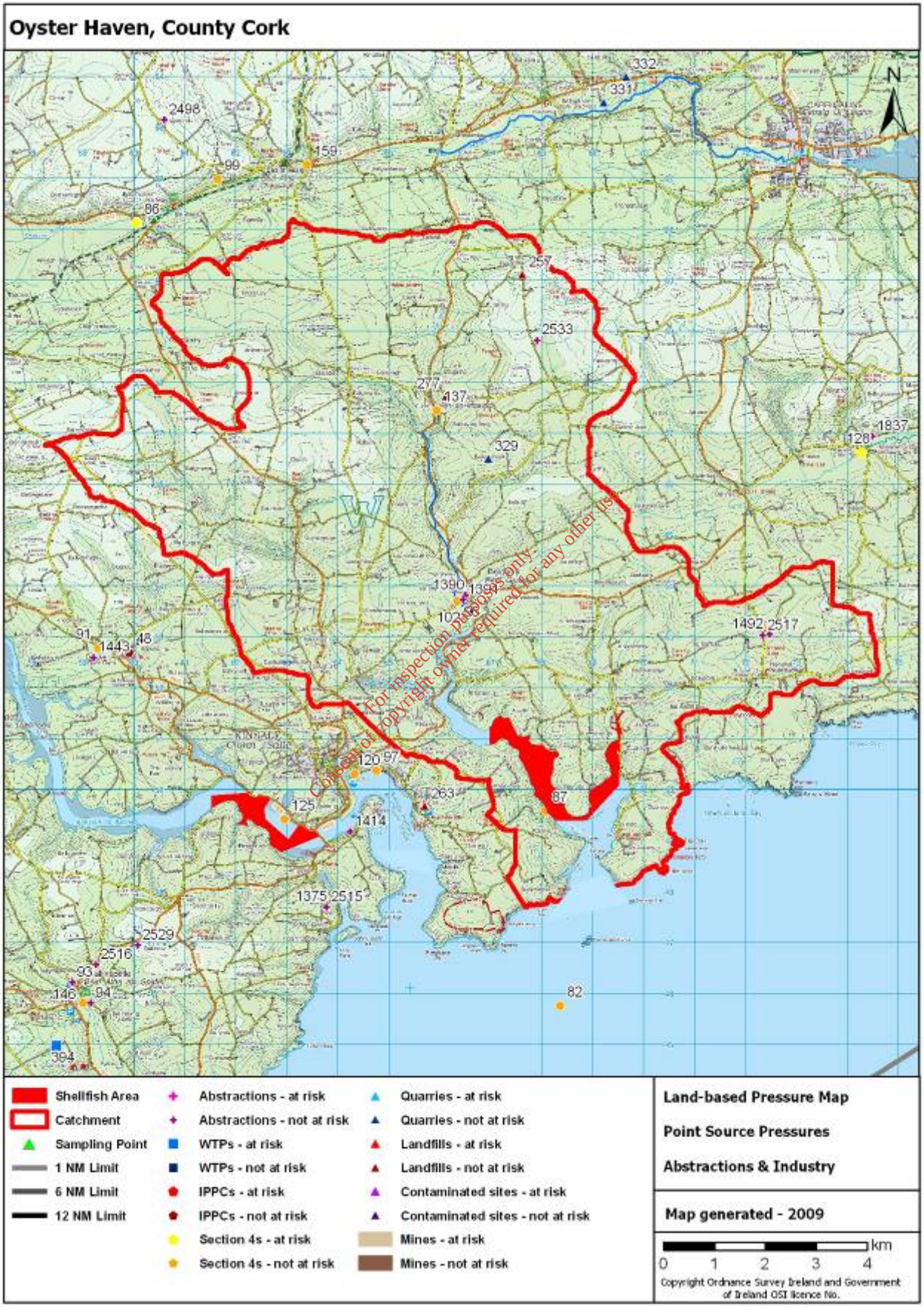
MAP 20 - Industrial point source pressures



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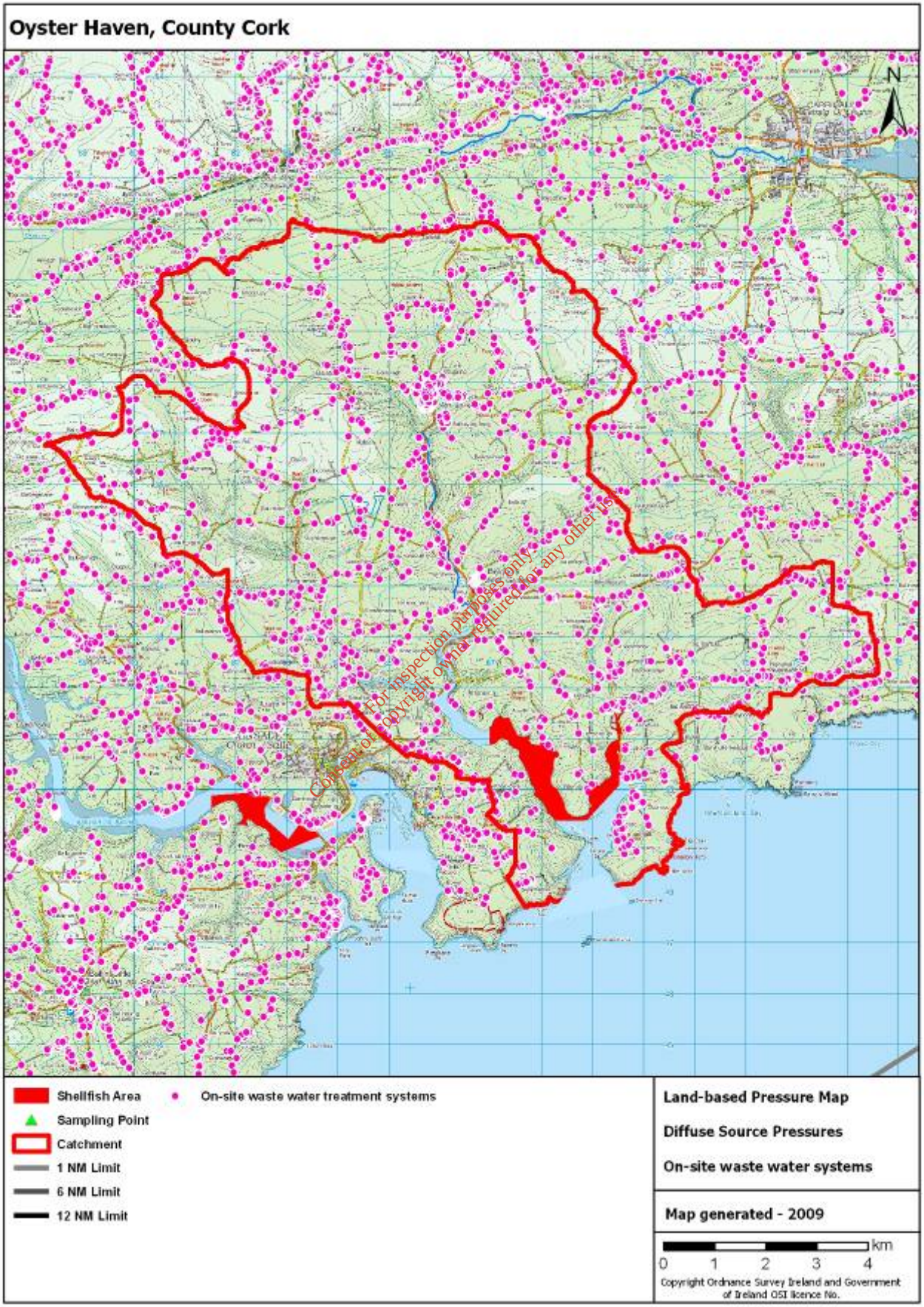
MAP 21 - On-site waste water systems



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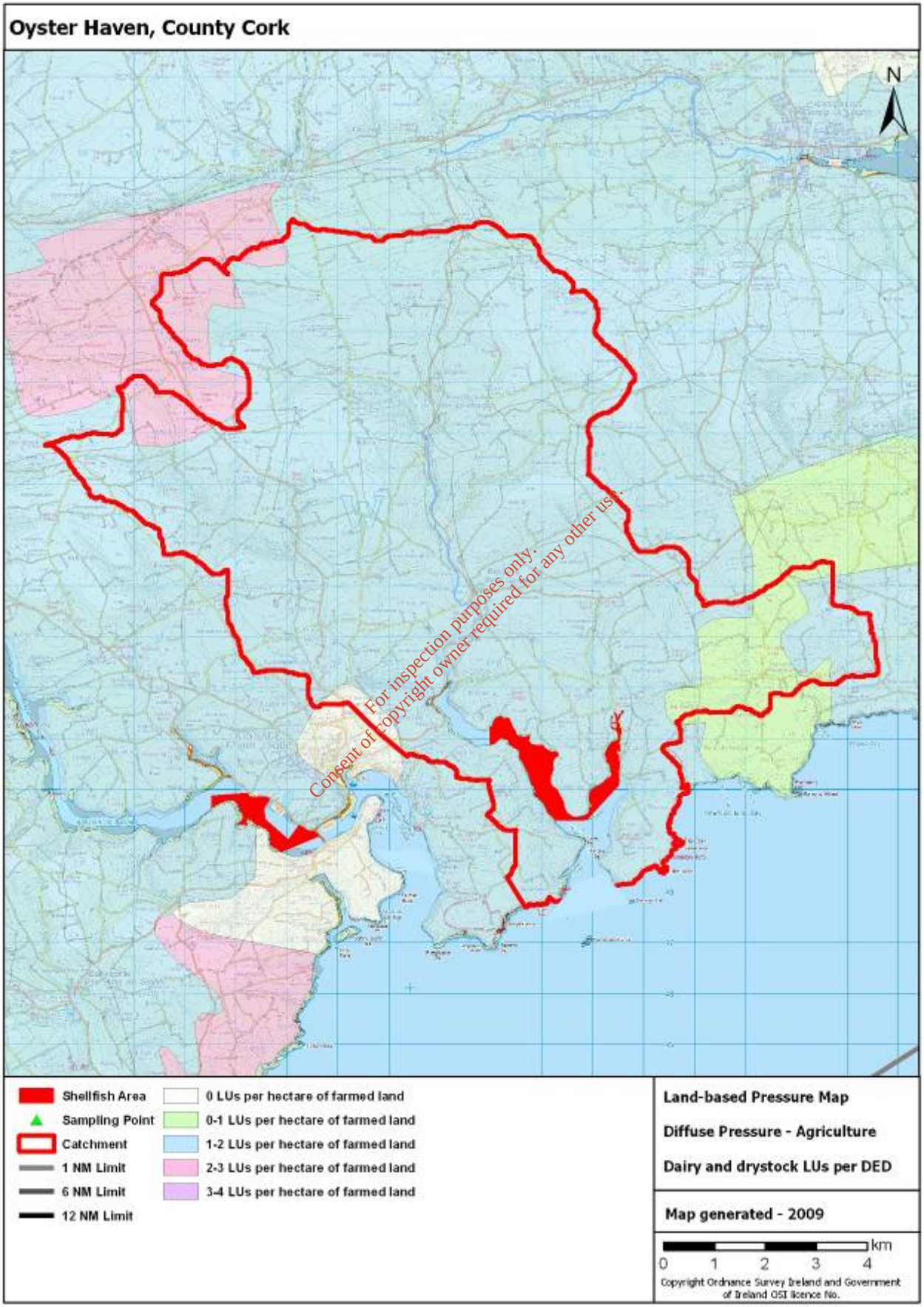
MAP 22 - Dairy and drystock livestock units



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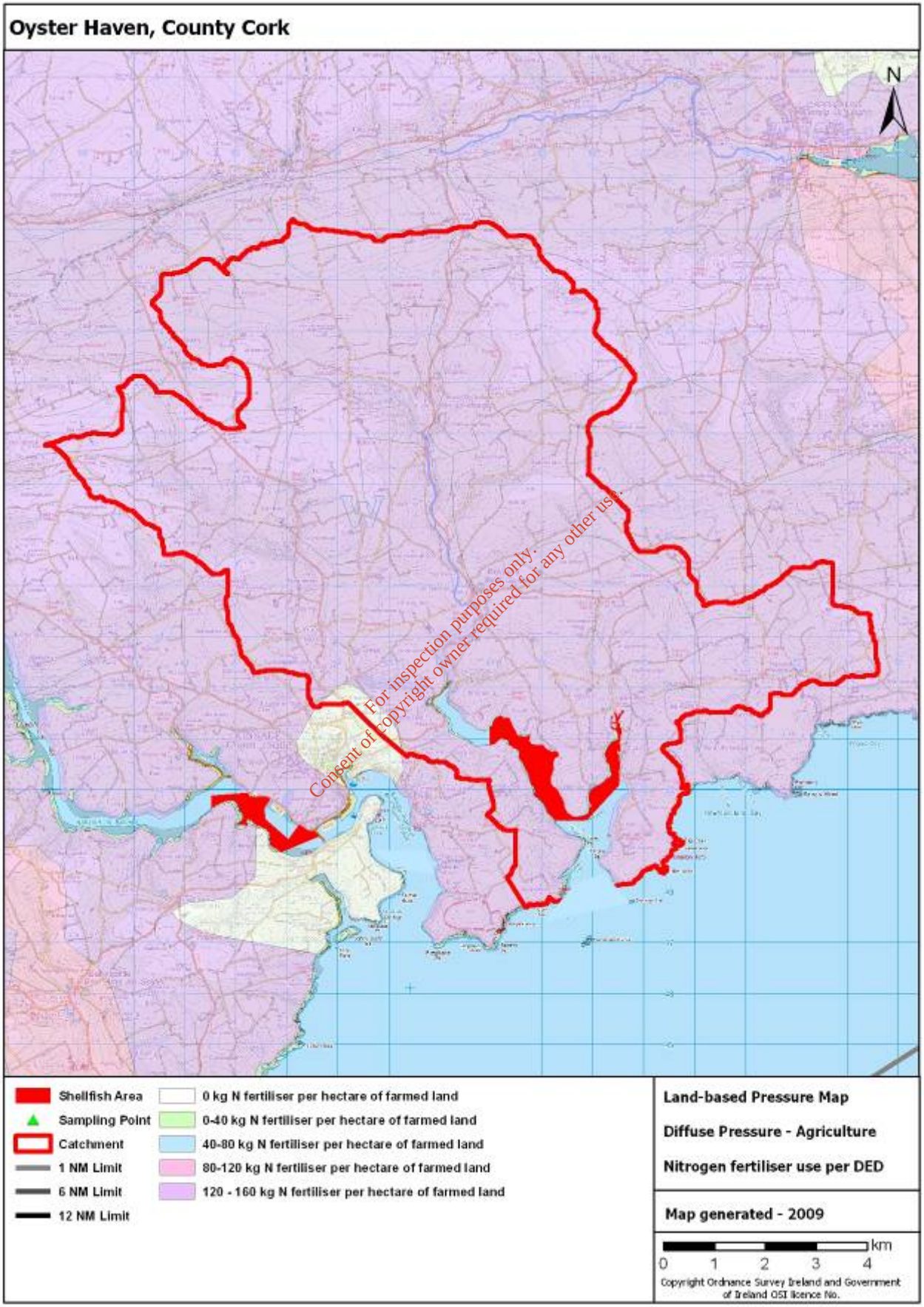
MAP 23 - Nitrogen fertiliser usage



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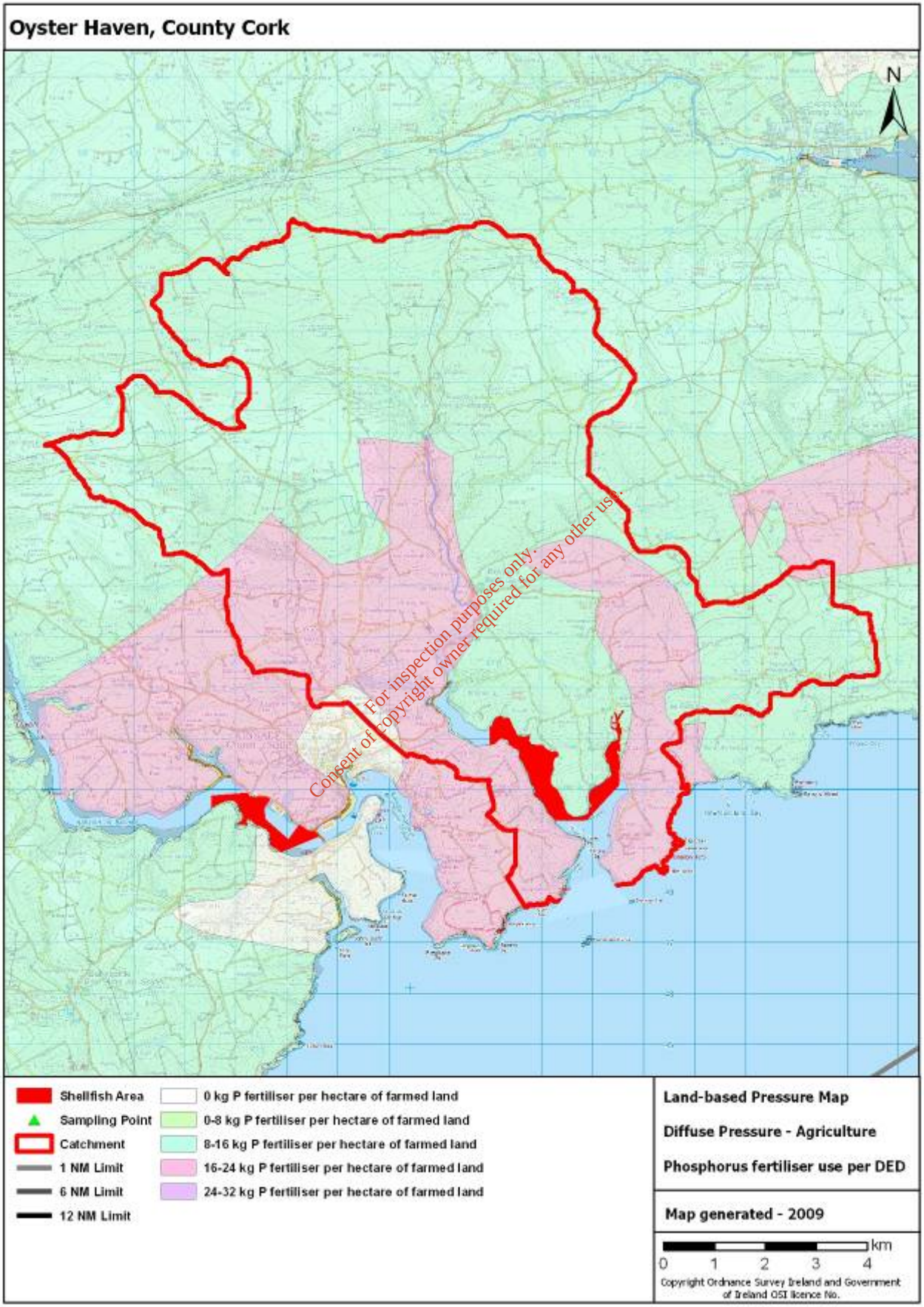
MAP 24 - Phosphorus fertiliser usage



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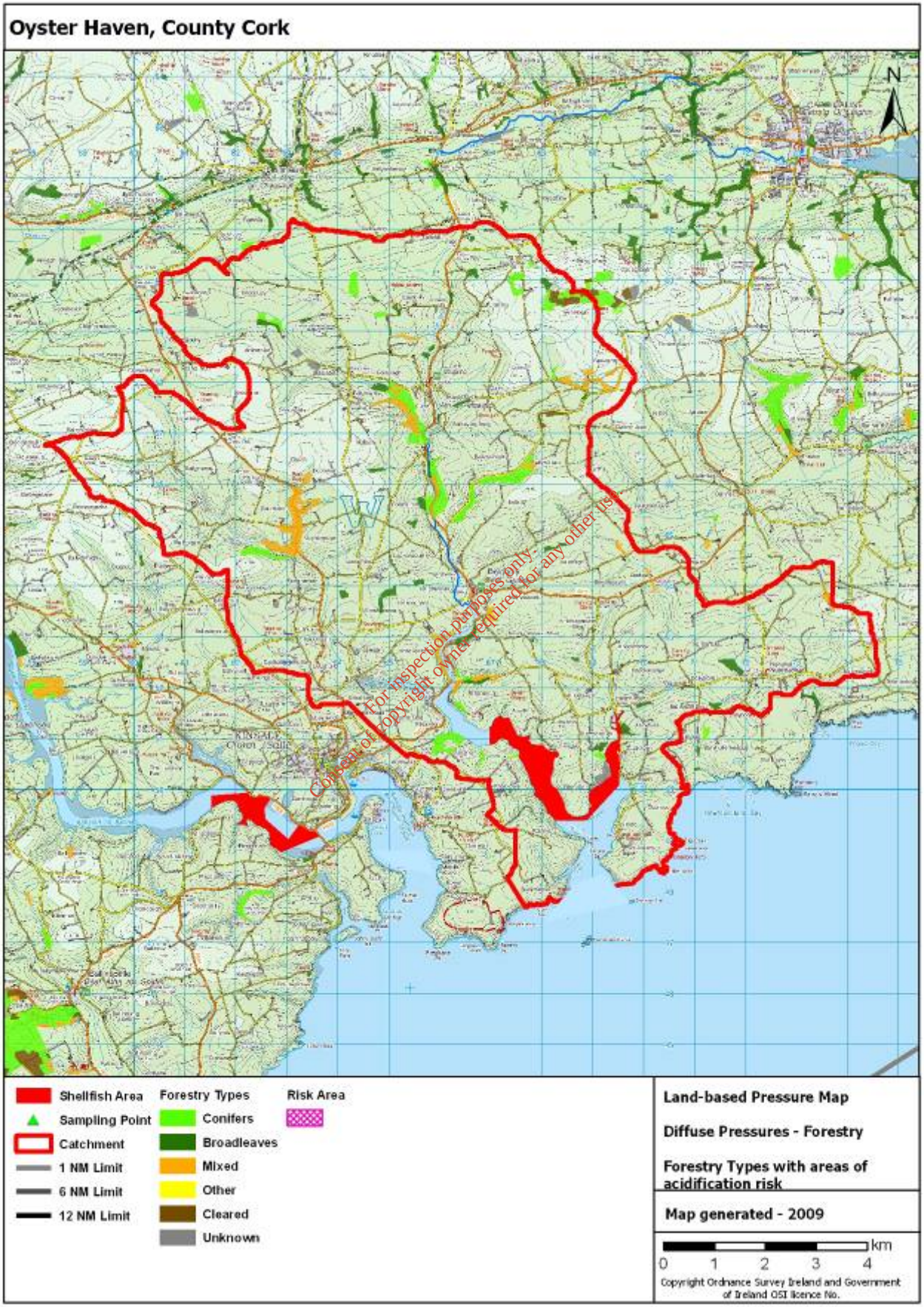
MAP 25 - Forestry types with acidification risk areas



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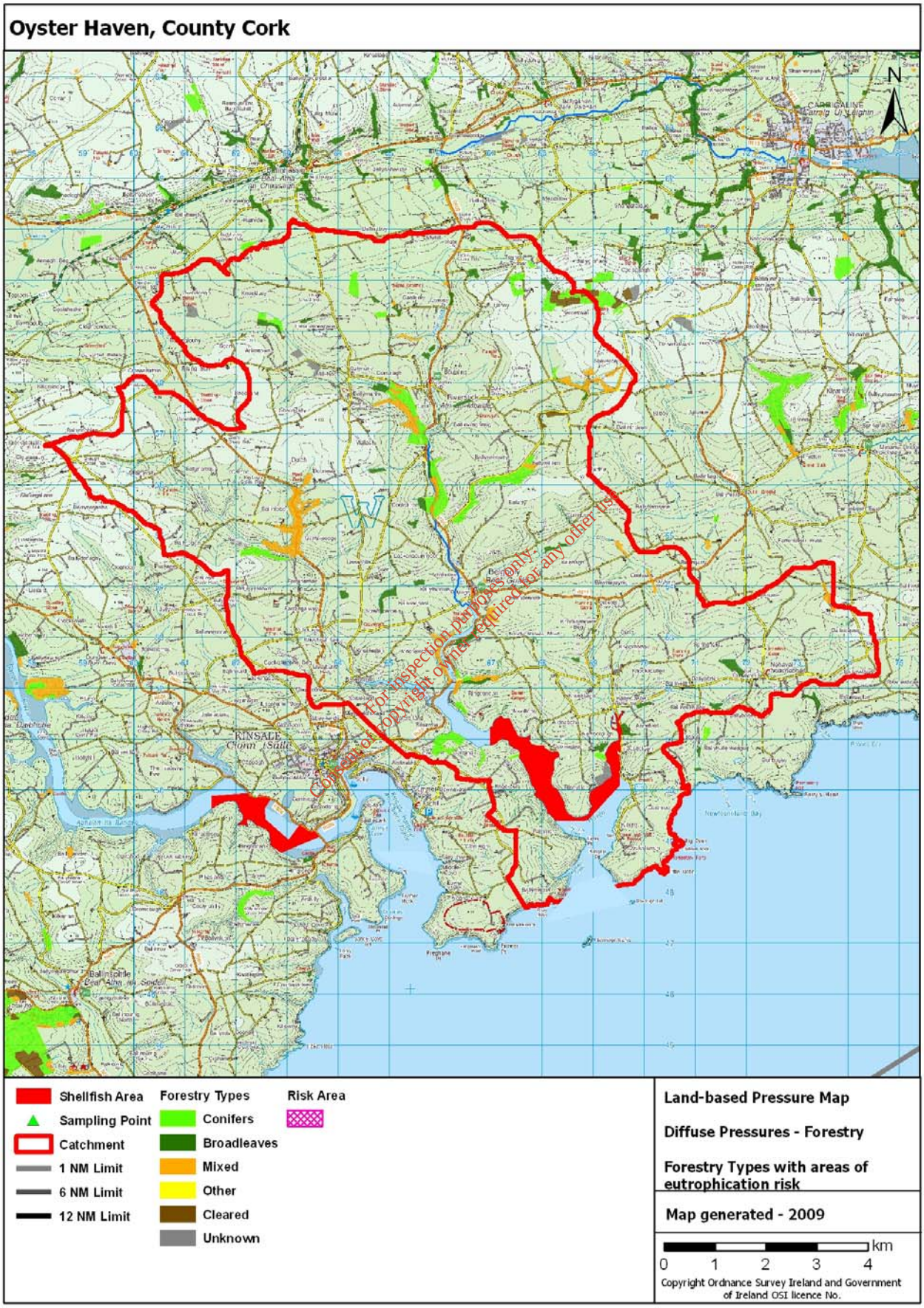
MAP 26 - Forestry types with eutrophication risk areas



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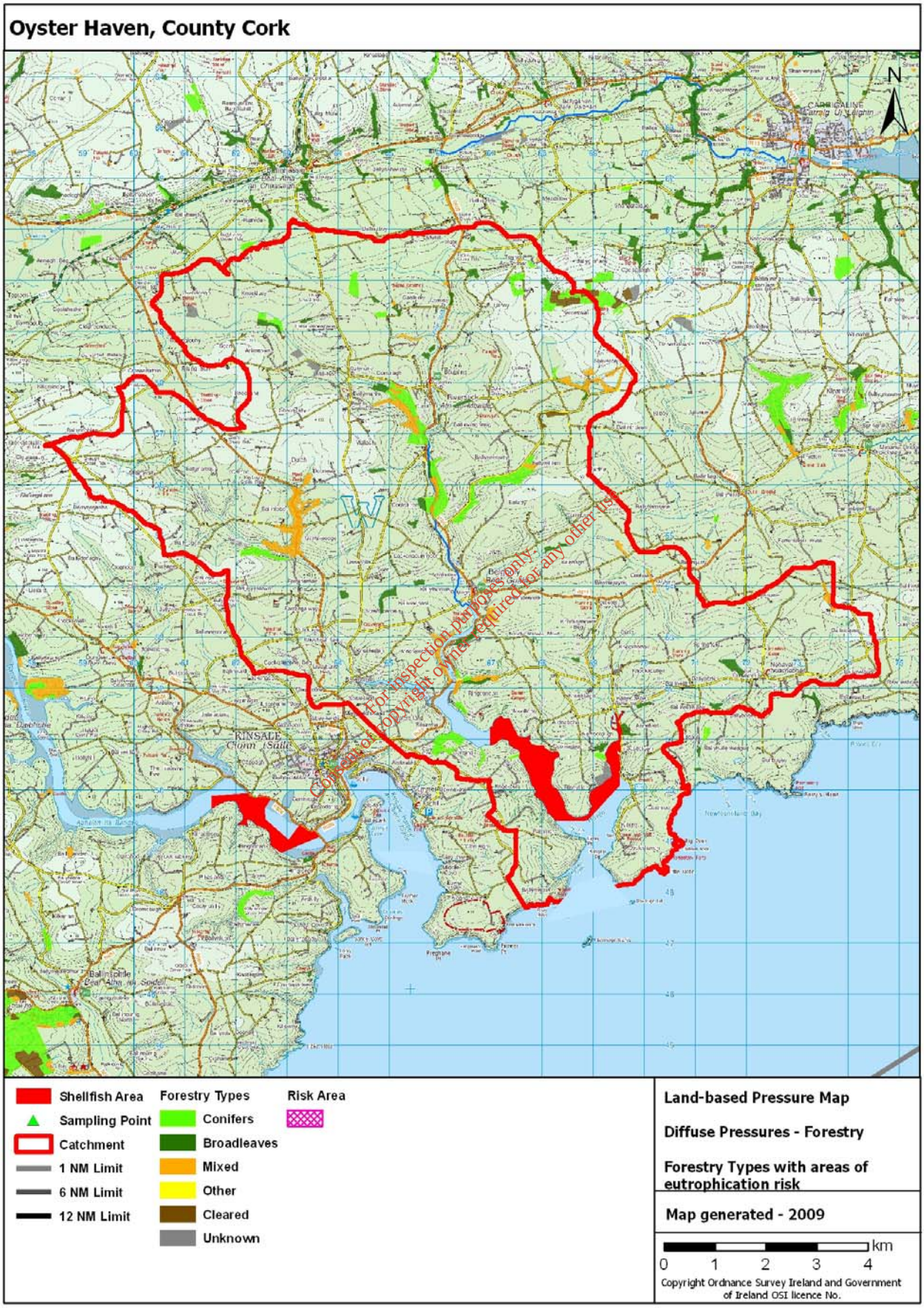
MAP 27 - Forestry types with sedimentation risk areas



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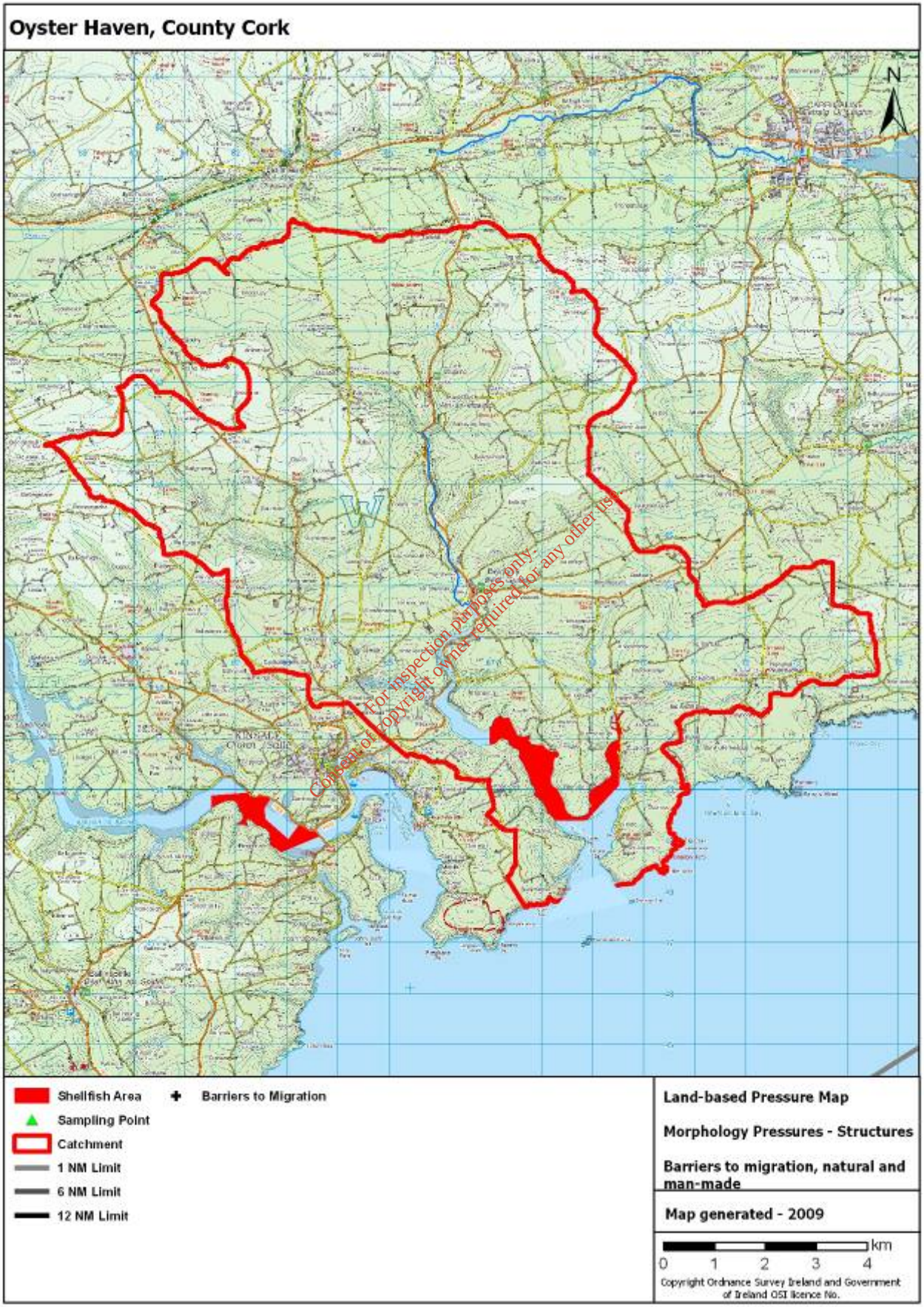
MAP 28 - Freshwater structures (None in this catchment)



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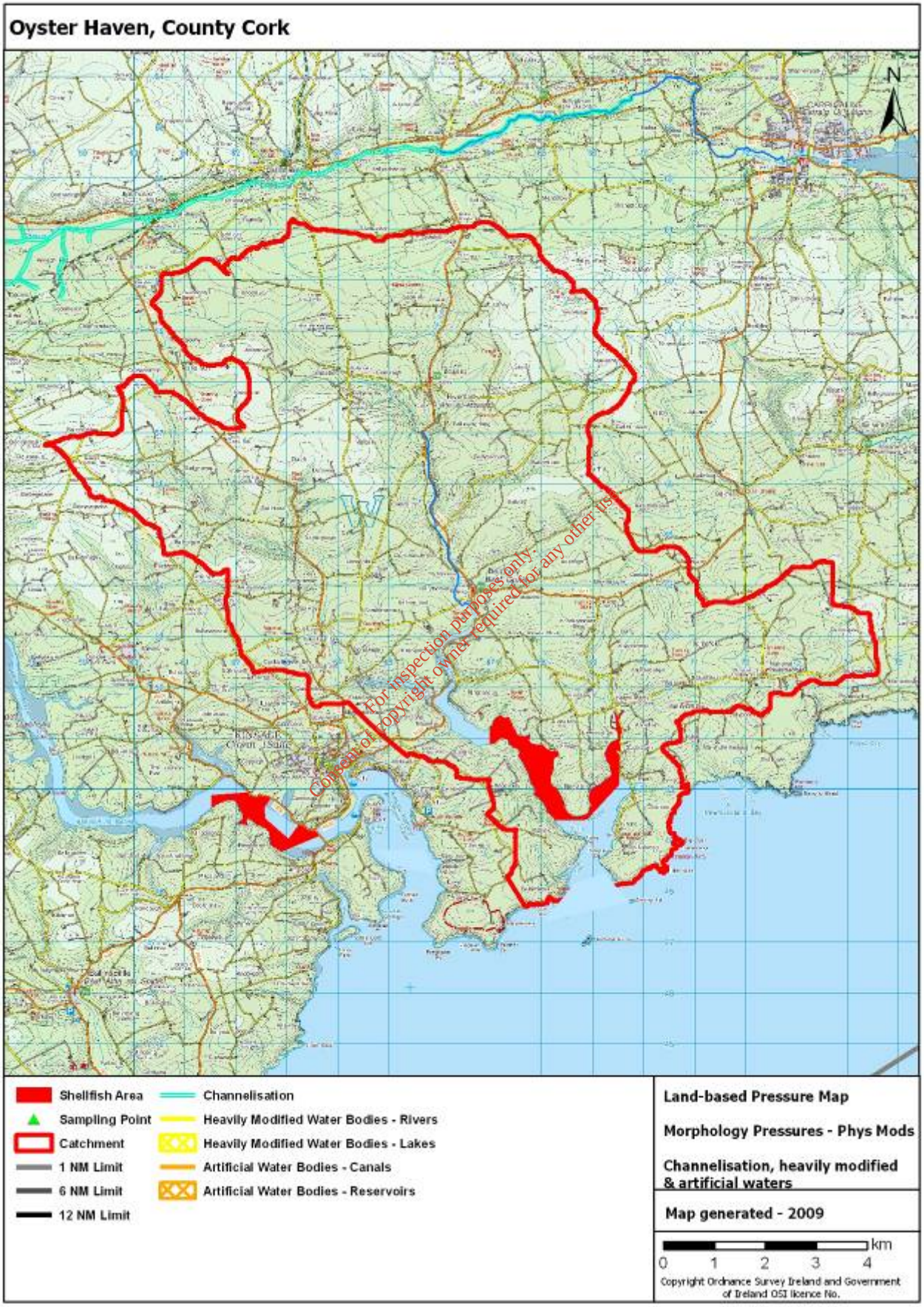
MAP 29 - Freshwater physical modifications



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5.0 PRESSURES

This section of the characterisation report provides a tabular overview and inventory of the marine and land-based pressures in the vicinity of the designated shellfish area and within the contributing catchment up to a distance of 20 kilometres from the shellfish area. The pressure data has been derived from existing inventories. The pressures considered most likely to be related to any measured impacts on shellfish water quality parameters in this shellfish area have been estimated in order to focus management efforts towards the protection and improvement of the water quality in this shellfish area.

The available information considered when determining the likelihood of the pressures to cause impacts includes:

- pressure type

The pressure types, be it marine or land-based, point, diffuse or morphological, vary in terms of: their likelihood to impact on shellfish water quality; the water quality parameters they are likely to affect; and the severity of the impacts. The results of monitoring can therefore provide an indication of which pressure types are likely to be causing impacts.

- pressure magnitude

The magnitude of the pressures acting on a shellfish area can affect the overall potential impact. For marine pressures, the magnitude depends on the number and scale of the pressures but also on the exposure of the shellfish area to the pressures which in turn depends on how open or sheltered the shellfish area is and on water circulation. For land-based pressures, the magnitude depends on the number and scale of the pressures but also on the remoteness of the pressures from the shellfish areas which in turn depends on the distance of the pressures from the shellfish area, the topography of the catchment and the presence of lakes downstream of pressures which can act as pollution sinks.

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- WFD risk designations

A series of risk assessments relating to the main pressures on waters were carried out during the WFD implementation process to identify pressures 'at risk' of impacting the surrounding water environment. These were originally carried out in 2004 and 2005 in accordance with Article V of the directive but many of them were subsequently updated in 2008 to feed into draft River Basin Management Plans. A lot of information about the pressures was collected to undertake these assessments and some of that information is summarised in this section where it is useful in screening which pressures are most likely to impact on shellfish water quality. In all cases, the most up-to-date risk assessment information available was used. Full details of the WFD risk assessments can be found at www.wfdireland.ie.

Whilst the risk designations under the WFD provide a useful screening tool for pressures, their relevance in terms of any water quality issues measured in Shellfish Waters has to be assessed in further detail to identify key pressures at a particular site.

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Table 4 lists all of the pressures considered in the development of the characterisation report and indicates their presence or absence within the shellfish area, within the marine waters in the vicinity of the shellfish area or within the contributing catchment. Those pressures that are present are discussed later in this section.

TABLE 4 - Summary of pressures

Pressure type	Pressure type	Pressures	Present
Marine	Point	Marine finfish farms	No
	Morphology	**Fishing gear activity**	**Yes**
		Structures and associated activities	
		Ports	No
		Flow/Sediment manipulation structures	**Yes**
		Piled structures	**Yes**
		Causeways	No
		Physical modifications	
		Shoreline reinforcement	**Yes**
		Embankments	No
		Reclaimed Land	No
		Capital dredging	No
		Maintenance dredging	No
		Aggregate removal	No
		Disposal at sea	**Yes**
		Marine heavily modified waters	No
Land-based	Point	Municipal waste water systems	
		Urban wastewater systems	**Yes**
		Combined sewer overflows	No
		Agricultural and aquacultural point sources	
		Pig units	No
		Freshwater finfish farms	No
		Industrial point sources	
		Abstractions	**Yes**
		Water treatment plants	No
		IPPCs	No
		Section 4s	**Yes**
		Quarries	**Yes**
		Landfills	**Yes**
		Mines	No
		Contaminated lands	No
		Other	No
	Diffuse	**On-site waste water treatment systems**	**Yes**
		Agriculture	
		Livestock density	**Yes**
		Nitrogen fertiliser usage	**Yes**
		Phosphorus fertiliser usage	**Yes**
		Forestry	**Yes**
	Morphology	Structures	
		Barriers to migration	No
		Physical Modifications	
		Channelisation	No
		Heavily modified waters	No
		Artificial waters	No

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5.1 Marine Pressures

Marine pressures are considered up to a distance of 5 kilometres from the shellfish area. Marine pressures situated further away or in adjacent waterbodies are also mentioned if they are considered significant. Marine pressure types include point source pressures (marine finfish farms) and morphological pressures including fishing gear activity, structures (ports, bridges, piers, slipways etc) and physical modifications (shoreline reinforcement, embankments, dredging etc). The potential impacts associated with these pressures are as follows:

- Point source pressures

Marine finfish farms can be associated with increased nutrient levels in waters, arising from fish excretion and excess feed input.

- Morphological pressures

Fishing activity can be associated with increased suspended sediment levels arising from disturbance of the seabed. The potential severity of the impacts varies depending on the type of fishing gear used and the extent, frequency and duration of the activity. The impact of boats is dealt with in association with marine structures below.

Structures (such as ports, harbours, bridges, slipways and piers) alter natural processes such as flow and silt movement and can therefore affect levels of suspended sediment in marine waters. The activities associated with these structures, for example shipping and boating, are associated with effects on the levels of general physico-chemical parameters, faecal coliforms, metals and chemicals.

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Physical modifications (such as shoreline reinforcement, embankments and dredging) can alter natural processes such as flow and silt movement and can therefore affect levels of suspended sediment. However, once these modifications are established or the activities have ceased, the surrounding environment can acclimatise and impacts do not necessarily continue.

The following tables summarise the nature and extent of marine pressures up to a distance of 5 kilometres from the designated shellfish area. The likelihood for these pressures to impact on shellfish water quality parameters is discussed. The potential severity of the impacts of marine pressures is most closely associated with the activity type, magnitude and proximity and therefore the discussions in this section focus on these factors.

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5.1.1 Point source pressures

There are no marine point source pressures in the vicinity of this shellfish area.

5.1.2 Morphology pressures

An assessment of the risk posed to marine waters from marine morphology pressures was carried out during the WFD implementation process. The results of this assessment show that the marine waters in and around this shellfish area are considered to be 'not at risk' from morphological pressures.

Fishing gear activity

TABLE 5 - Fishing gears

Fishing gear types	Type	Present	Comment
Pots	Static	Yes	Large area to the south of the shellfish area
Tangle Nets	Static	No	NA
Bottom Set Gill Nets	Static	No	NA
Draft Nets	Static	No	NA
Drift Nets	Static	No	NA
Line Fishing	Static	Yes	Widespread throughout the area
Box Dredge	Mobile	No	NA
Cockle Dredge	Mobile	No	NA
Hydraulic Dredge	Mobile	No	NA
Scallop Dredge	Mobile	Yes	Large area within and adjacent to shellfish area
Oyster Dredge	Mobile	No	NA
Otter Trawl	Mobile	Yes	Large area to the south of the shellfish area
Beam Trawl	Mobile	No	NA
Digging	NA	No	NA
Gathering	NA	No	NA
Rake	NA	No	NA

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Table 5 provides a summary of the fishing gear activity occurring within 5 kilometres of the designated shellfish area. Map 15 illustrates these pressures. Boat movements are dealt with below in association with marine structures such as ports and piers.

Static fishing gear types generally would not be expected to impact on shellfish water quality. Mobile fishing gears however disturb the seabed and can therefore affect the levels of suspended sediments in marine waters with the severity of the impacts depending on the frequency, intensity and extent of the fishing activity.

Static fishing gear activity in the area includes widespread line fishing (lines set on the seabed with bated hooks at intervals) and the use of pots (bated traps set on the seabed targeting crustaceans). These static fishing gear types are unlikely to affect shellfish water quality in this shellfish area.

Mobile fishing gear activity includes the use of otter trawls (nets towed along the seabed) and the use of scallop dredges (metal blades which dig into the seabed to

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harvest shellfish). Monitoring in the shellfish area does not indicate any water quality issues which are likely to be associated with the use of mobile fishing gears and the WFD assessment of the risk posed to marine waters from marine morphology pressures deems the marine waters in and around this shellfish area to be 'not at risk'. Therefore, this activity is unlikely to be affecting shellfish water quality in this shellfish area.

Structures and associated activities

TABLE 6 - Marine morphology structures

Marine morphology structures	Direct	0-5km	Comment
Ports	0	0	NA
Flow and sediment manipulation	0	8	Piers
Piled structures	1	6	NA
Causeways	0	0	NA

Table 6 provides a summary of the marine morphology structures located within 5 kilometres of the designated shellfish area. Map 16 illustrates these pressures. Flow and sediment manipulation structures include piers, breakwaters, groynes, flow deflectors and training walls. Piled structures include bridge and pier supports and wind turbines. Causeways include roads and railway lines. These structures affect flow and sediment movement and can therefore impact on levels of suspended sediments, though these impacts can settle down once the structures are well established in an area. The activities associated with marine structures, including shipping and boating, can affect a wide range of water quality parameters including general physico-chemical parameters such as suspended sediment, dissolved oxygen and nutrient levels. Faecal coliform levels can also be affected as well as the levels of harmful substances such as metals and pesticides. Boat movements can lead to erosion and sedimentation effects as well as pollution from fuels.

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There is 1 piled structure directly adjacent to the shellfish area as well as 8 pier structures and 8 additional piled structures within 5 kilometres of the shellfish area. Monitoring does not indicate any water quality issues which are likely to be associated with these structures or their associated activities (such as fishing and boating) and the WFD assessment of the risk posed to marine waters from marine morphology pressures deems the marine waters in and around this shellfish area to be 'not at risk'. Therefore, it is unlikely that the structures themselves or their associated activities are affecting shellfish water quality in this shellfish area.

Physical modifications

TABLE 7 - Physical modifications

Physical modifications	Direct	0-5 km	Comment
Shoreline reinforcement	0	1	NA
Embankments	0	0	NA
Reclaimed land	0	0	NA
Capital dredging	0	0	NA
Maintenance dredging	0	0	NA
Aggregate removal	0	0	NA
Dumping at sea	0	1	Dredge spoil

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Table 7 provides a summary of the physical modifications occurring within 5 kilometres of the designated shellfish area. Map 17 illustrates these pressures. These modifications can affect flow and sediment movement though these impacts can cease once the modifications are established.

There are no physical modifications in the direct vicinity of this shellfish area but there is 1 instance of shoreline reinforcement and 1 marine dumping area within 5 kilometres of the shellfish area. Monitoring in the area does not highlight any water quality issues which are likely to result from these modifications and the WFD assessment has deemed the area to be 'not at risk' from morphological pressures. Therefore, these modifications are unlikely to be affecting shellfish water quality in this shellfish area.

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5.2 Land-based Pressures

The contributing catchment is used to identify the land-based pressures that could potentially be impacting on shellfish water quality and therefore the size of the contributing catchment can be important in determining the magnitude of the pressures. Contributing catchment sizes vary considerably; however, pressures are only considered up to a distance of 20 kilometres from the shellfish area and are, where appropriate, divided into four zones: direct, 0 to 5 kilometres, 5 to 10 kilometres and 10 to 20 kilometres. Pressures within the catchment, but further than 20 kilometres from the shellfish area, are also included if they are considered significant. In addition significant land-based pressures acting in adjacent waterbodies which may have an impact due to tidal influences are also considered where relevant.

Land-based pressure types include point source pressures, diffuse source pressures and morphology pressures. The shellfish water quality parameters potentially impacted by these pressures are as follows:

- Point source pressures can affect the whole suite of shellfish water quality parameters. For example, waste water treatment plants, CSOs and agricultural point sources can impact on the levels of faecal coliforms, nutrients, bacteria and other harmful substances in receiving waters while IPPC licensed industries, mines, quarries and landfills can impact on the levels of polluting substances in receiving waters such as petroleum hydrocarbons, organohalogenated substances and metals. Abstractions are included under this heading and can impact on salinity levels, though not to an extent likely to lead to non-compliances with shellfish water salinity standards, as well as reducing the dilution available for polluting discharges.

- Diffuse source pressures affect many of the shellfish water quality parameters. Agricultural activity and on-site waste water treatment systems (OSWTS) can impact on faecal coliform levels as well as general physico-chemical parameters such as the levels of suspended sediments and dissolved oxygen. Forestry activity can impact on the pH of receiving waters as well as on the levels of suspended solids and nutrients and it is also associated with the use of pesticides which can contain organohalogenated substances.

- Land-based morphology pressures, and associated activities, are not generally associated with impacts on water quality in marine areas. Their impacts are usually associated with the loss of natural freshwater features and habitats and changes to the behaviour of freshwater systems including sediment movement. Channelisation activities however, if occurring close to shellfish areas, can impact on shellfish water quality, particularly the levels of suspended sediment.

The following tables summarise the nature and extent of land based pressures within the catchment up to a distance of 20 kilometres from the designated shellfish area. The likelihood for these pressures to impact on shellfish water quality parameters is discussed. All of the factors discussed at the beginning of this chapter can affect the likelihood for land-based pressures to impact on shellfish waters.

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5.2.1 Point Source Pressures

Urban Wastewater Systems

Table 8 lists the urban waste water treatment plants in the catchment up to a distance of 20 kilometres from the shellfish area. Map 18 illustrates these pressures and map references link the map and table. The information in the table was compiled by the WFD Municipal and Industrial Regulation Study in 2008 and includes:

- the distance of the plants from the shellfish area
- the WFD status of the water body within which the plants are located
- the level of treatment available at the plants
- whether the plants are included in the current Water Services Investment Programme 07-09
- the design capacity (in terms of population equivalents (P.E.)) of the plants
- the percentage at which the plants are operating above or below their design capacity currently
- the percentage at which the plants are likely to be operating above or below their design capacity in 2015 based on population projections
- the WFD risk designations associated with the plants and the reasons behind the risk designations

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The WFD risk assessment in relation to urban waste water treatment plants was updated in 2008 to feed into the draft RBMPs with a further update currently underway (due for completion by November 2009). The plants were designated as 'at risk' for a variety of reasons including:

- A Insufficient WWTP capacity – existing load
- B Insufficient WWTP capacity – future load
- C Insufficient assimilative capacity for BOD – existing load
- D Insufficient assimilative capacity for BOD – future load
- E Insufficient assimilative capacity for nutrients – existing load
- F Insufficient assimilative capacity for nutrients – future load
- G Historical deterioration in downstream Q value where the Q station is within 3 kilometres of the outfall
- H Downstream Q value is less than 4 where the Q station is within 3 kilometres of the outfall
- I Deterioration in upstream to downstream Q value were the distance between Q stations is less then 3 kilometres
- J Exceedance of bathing water quality within 1 kilometre of the outfall
- K Exceedance of shellfish water quality within 1 kilometre of the outfall
- L Expert opinion

Waste water discharges from waste water treatment plants can contain a wide range of potentially polluting components originating from households, industry and urban areas. These discharges can affect the levels of faecal coliforms, nutrients, dissolved oxygen, suspended sediment, organic wastes and harmful chemicals in receiving waters.

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The 2008 risk assessment identified 1 urban waste water treatment plant within the catchment and designated it as ‘not at risk’. The WFD risk assessment was reviewed by experts in September 2009 with regard to Water Services Investment Programme and waste water licensing actions. The most significant plants were identified on the basis of proximity, plant performance, population equivalent and level of treatment.

The agglomeraton at Belgooly has a discharge of 495 P.E. There is currently no municipal waste water treatment plant in place. An application for a certificate of authorisation will be made by Cork County Council by December 2009 pursuant to the requirements of the Waste Water Discharge (Authorisation) Regulations, 2007. New housing developments (since 2002) are connected to private secondary treatment plants with UV disinfection.

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TABLE 8 – Urban waste water treatment plants

Name	Map Ref	Dist	Status	Treatment level	WSIP 07-09	Capacity PE	% surplus existing	% surplus future	At Risk
Belgooly	94	0-5	Moderate	No treatment	Yes	495	nd	nd	No

NOTE: A minus figure in the percentage surplus columns means that the plant is working above its design capacity, nd denotes 'no data' where for example plants are located in areas with no WFD status information

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Abstractions

TABLE 9 – Abstractions

Name	Map Ref	Type	Distance	Status	Abs Rate m^3 day^{-1}	At Risk (Ratio)
Belgooly Pumphouse	1390	Groundwater	0-5	Moderate	140	No
Belgooly WSS BH2	1391	Groundwater	0-5	Moderate	0	No
Bored Well	1492	Groundwater	0-5	nd	25	No
Nohoval (Ballyvorane S)	2517	Groundwater	0-5	nd	30	No
Cullen/Riverstick PWS	2533	Groundwater	5-10	Moderate	0	No

NOTE: nd denotes 'no data' where abstractions are located in areas with no WFD status information

Table 9 lists the abstractions in the catchment up to a distance of 20 kilometres from the designated shellfish area. Map 20 illustrates these pressures and map references link the map and table. Information provided in the table in relation to abstractions includes:

- the type of abstraction (river, lake or groundwater)
- the distance of the abstraction from the designated shellfish area
- the WFD status of the water body within which the abstraction is located
- the abstraction rate, expressed in cubic metres per day
- the WFD risk designations associated with the abstractions and the reasons behind the designations

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The WFD risk assessment in relation to abstractions was updated in 2008 to feed into the draft RBMPs. Abstractions are deemed to be 'at risk' if they account for a significant proportion (>10%) of the resource. For river abstractions, the net abstraction is expressed as a proportion of the Q95 flow (i.e. the flow that is exceeded 95% of the time). For lake abstractions, the net abstraction is expressed as a proportion of the Q50 inflow to the lake (i.e. the long term median inflow). For groundwater abstractions, the net abstraction is expressed as a proportion of recharge volume (i.e. long term average recharge across the groundwater bodies).

Generally it is very unlikely that abstractions would lead to non-compliances with the shellfish standards for salinity in shellfish areas. Abstractions that represent a large proportion of their corresponding resources can decrease available dilution capacity but this is also unlikely to affect shellfish areas.

There are 5 abstractions in the catchment, all of them are groundwater abstractions and none of them are 'at risk'. As these abstractions don't represent a significant proportion of their corresponding resources, it is unlikely that they are affecting any aspect of water quality in this shellfish area.

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Section 4 Licensed Industries

TABLE 10 - Section 4 Licenses

Name	Map Ref	Distance	Status	Risk
Elmsdale Limited	87	Direct	nd	No
Forestbrook Developments Ltd	96	0-5 km	Moderate	No
Hollycourt Developments Ltd	102	0-5 km	Moderate	No
Paul Derham and Donal Daly	137	5-10 km	Good	No

NOTE: nd denotes 'no data' where industries are located in areas with no WFD status information

Table 10 lists the Section 4 licensed industries in the catchment up to a distance of 20 kilometres from the designated shellfish area. Map 20 illustrates these pressures and map references link the map and table. Information provided in the table in relation to the industries includes:

- the distance of the industries from the designated shellfish area
- the WFD status of the water bodies within which the industries are located
- the WFD risk designations associated with the industries and the reasoning behind the designations

The WFD risk assessment in relation to Section 4 licensed industries was updated in 2008 to feed into the draft RBMPs. The industries were designated as 'at risk' for a variety of reasons which are outlined on page 58.

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Discharges from Section 4 licensed industries are diverse and can affect the levels of faecal coliforms, nutrients, suspended sediments, dissolved oxygen as well as a wide range of chemicals in receiving waters.

There are 4 Section 4 licensed industries in the catchment but none of them have been deemed to be 'at risk'. Monitoring does not indicate any water quality issues which are likely to be associated with these activities and therefore it is unlikely that they are affecting shellfish water quality in this shellfish area.

Quarries, mines, landfills and contaminated lands

TABLE 11 - Quarries, mines, landfills and contaminated lands

Name	Map Ref	Distance	Status	Risk	Notes
Alan Coleman	329	0-5	Moderate	No	Quarry
Glinny Landfill	257	5-10	Good	No	Unlined landfill
Riverstick Landfill	277	5-10	Good	No	Unlined landfill

Table 11 lists the quarries, mines, landfills and contaminated lands in the catchment up to a distance of 20 kilometres from the designated shellfish area. Map 20 illustrates these pressures and map references link the map and table. Information provided in the table in relation to the plants includes:

- the distance of the industries from the designated shellfish area
- the WFD status of the water bodies within which the plants are located

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- the WFD risk designations associated with the industries

Some of the WFD risk assessments in relation to these point sources were updated in 2008 to feed into the draft RBMPs but some of the assessments date back to the WFD characterisation process in 2004 and 2005. Expert opinion within Local Authorities was used to assign risk designations to quarries and landfills but monitoring data was used for mines and contaminated lands.

Mining and quarrying operations can impact on levels of suspended solids and metals in receiving waters whilst landfills and contaminated sites can be more diverse and impact on the levels of nutrients, suspended sediments and oxygen levels as well as metals and other chemicals.

There is 1 quarry and 2 landfills within the catchment. Monitoring in the shellfish area does not indicate any water quality issues which are likely to arise from these sources. Also, the landfills are both situated in water bodies whose WFD status is 'good' which suggests that there are unlikely to be impacting on their surrounding water environment. Therefore, they are unlikely to be affecting shellfish water quality in this shellfish area.

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5.2.2 Diffuse Source Pressures

On-site waste water treatment systems

TABLE 12 - On-site waste water treatment systems

Risk	Number	% of total
Total number	1,383	-
Number per km^2 in the catchment	13.43	-
Number per km^2 nationally	1.4	-
Number that are high risk to surface waters from pathogens	1,379	99.71%
Number that are high risk to groundwaters from pathogens	807	58.35%
Number that are high risk to surface waters from phosphorus	845	61.09%
Number that are high risk to groundwaters from phosphorus	805	58.20%
High likelihood of inadequate percolation of leachate	870	62.90%

Table 12 summarises the numbers of on-site waste water treatment systems (OSWWTS) within the catchment up to a distance of 20 kilometres from the designated shellfish area and outlines how many of them are located in areas of high risk to surface and groundwaters from pathogens and phosphorus and how many of them are located in areas where the likelihood of inadequate percolation of leachate is high. Map 21 illustrates the locations of the OSWWTSs while Maps 6 to 10 illustrate the risk to surface and groundwaters and the likelihood of inadequate percolation, all of which is based on soil, sub-soil and geological characteristics. Generally, systems located in areas where effluent cannot get away underground pose a risk to surface waters while systems located in areas where the effluent moves too quickly through the subsoil pose a risk to groundwaters. OSWWTS effluent can impact on the levels of faecal coliforms, suspended sediments, nutrients and dissolved oxygen in receiving waters. In addition, the use of household cleaning products can introduce a range of harmful chemicals to the water environment.

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There are 1,383 systems in the catchment and their density is much higher than the national average. The risk to surface waters and groundwaters from pathogens and phosphorus is high throughout the catchment as is the likelihood of inadequate percolation. Many of these systems are therefore located in hydrologically unsuitable conditions. Other factors which affect the likelihood of these systems to impact surface and groundwaters are whether suitable types of systems are selected, whether they are installed correctly, whether they are properly maintained and whether they are situated close to the designated shellfish area or to ditches, drains, watercourses, wells or boreholes. Monitoring in this shellfish area does not indicate any water quality issues which are likely to be associated with these systems and therefore they are unlikely to be affecting shellfish water quality in this shellfish area.

Agriculture

TABLE 13 - Livestock units and chemical fertiliser usage

Indicator	Catchment (per ha of farmed land)	National Average (per ha of farmed land)
Livestock units	1.24 LU	1.20 LU
Nitrogen fertiliser usage	141.05 kg	92.09 kg
Phosphorus fertiliser usage	15.05 kg	9.74

Nitrates Directive limit = 170 kg N per hectare = approx. 2 LU per hectare

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Nitrates Directive derogation = 250 kg N per hectare = approx. 3 LU per hectare.

Table 13 provides an estimate of the average number of dairy and drystock livestock units and the average loadings of nitrogen and phosphorus chemical fertiliser per hectare of farmed land within the contributing catchment area. Maps 22, 23 and 24 illustrate this. The figures beneath the table express the nitrate limit (and Ireland's derogation) under the Nitrates Directive in terms of livestock densities. Discharges related to agriculture can affect the levels of faecal coliforms, suspended sediments, nutrients and dissolved oxygen in receiving waters. In addition, the use of pesticides and herbicides can introduce a range of harmful chemicals to the water environment.

Approximately 90% of this catchment is farmed land and the estimates of livestock density and fertiliser usage are higher than the national averages. The EPA's diffuse model risk assessment, which investigates the relationship between catchment attributes (percentages of diffuse land cover including agriculture), water chemistry and ecological status, highlights many diffuse risk areas in the catchment (Map 13). However, the prevalence of dry soil types in the catchment (Map 5) means that the risk of agricultural runoff is low. Monitoring in this shellfish area does not indicate any water quality issues which are likely to be associated with agriculture and therefore agriculture is unlikely to be affecting shellfish water quality in this shellfish area.

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Forestry

TABLE 14 - Forestry types

Type	Area	Percentage of area
Conifers	1.56 km^2	1.5 %
Broadleaves	0.63 km^2	0.6 %
Mixed	1.15 km^2	1.1 %
Other	0 km^2	0 %
Cleared	0.19 km^2	0.2 %
Unknown	0.17 km^2	0.2 %
Total	3.70 km^2	3.6 %
Nationally	6,795 km^2	10.0 %

Table 14 presents the area and percentage area of the catchment under the various types of forest cover. Maps 25, 26 and 27 illustrate this. Forestry activity can impact on the pH of receiving waters as well as on the levels of suspended solids and nutrients. It is also associated with the use of pesticides which can introduce harmful chemicals to the water environment.

There is 3.7 km^2 of forested land in this catchment but the percentage area under forest cover is quite low compared to the national average. Unlike agriculture, the location of forestry activity is known and not much forestry activity occurs in close proximity to the shellfish area. The EPA's diffuse model risk assessment, which investigates the relationship between catchment attributes (percentages of diffuse land cover including forestry), water chemistry and ecological status, highlights significant diffuse risk areas in the catchment (Map 13). However, the more recent risk assessment, undertaken by the WFD Forest and Water study, does not highlight any areas of acidification, eutrophication and sedimentation risk (Maps 25, 26 and 27). Monitoring does not indicate any water quality issues which are likely to be

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attributable to forestry and therefore forestry is unlikely to be affecting shellfish water quality in this shellfish area.

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5.2.3 Morphology Pressures

There are no land-based morphology pressures in this catchment.

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5.3 Summary of Key Pressures

Information from existing data sources has been used to identify all of the pressures acting on the shellfish area and to assess their likelihood to be affecting shellfish water quality in this shellfish area.

Monitoring within and in the vicinity of this shellfish indicates low levels of faecal contamination. However the monitoring data available at this shellfish area is compliant with the shellfish guideline value for faecal coliforms.

This summary section highlights:

- **key pressures**

The key pressures are those identified as most likely to be affecting shellfish water quality. The final PRP will confirm and focus on these key pressures.

- **potential secondary pressures**

These pressures are identified as possibly affecting shellfish water quality. The final PRP will either confirm them as key pressures or eliminate them from further consideration.

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5.3.1 Key Pressures

None of the pressures in this catchment are considered likely to be affecting shellfish water quality.

5.3.2 Potential Secondary Pressures

None of the pressures in this catchment are considered to be possibly affecting shellfish water quality.

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Oyster Haven Pollution Reduction Programme

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Name	Oyster Haven Shellfish Area
Map number	40
Year of designation	2009
Area	1.46 km^2
River Basin District	South Western RBD
County	Cork
Location of sampling point	51 deg 42.000 min North (Lat) 8 deg 27.600 min West (Long)
Catchment area	100.33 km^2

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1.0 INTRODUCTION

"I, John Gormley, T.D., Minister for the Environment, Heritage and Local Government pursuant to the provisions of Section 6 of the European Communities (Quality of Shellfish Waters) Regulation 2006 (as amended) S. I. No. 268 of 2006, taking into account the public consultation process and the Strategic Environmental Assessment carried out under Directive 2001/42/EC, on the assessment of certain plans and programmes on the environment hereby establish the following pollution reduction programme for Oyster Haven."

19/01/2010
DATE

Mr John Gormley TD
Minister for the Environment,
Heritage and Local Government

1.1 Programme Objective

Compliance with the standards and objectives established by the Quality of Shellfish Waters Regulations 2006 (S.I. No. 268 of 2006) (as amended) for the designated shellfish growing waters at Oyster Haven and with Article 5 of Directive 2006/113/EC of the European parliament and of the Council on the quality required for shellfish waters.

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1.2 Pollution Reduction Programme

This pollution reduction programme for the shellfish growing waters at Oyster Haven has been established by the Minister for the Environment, Heritage and Local Government in order to protect and improve water quality in the designated shellfish growing areas in Oyster Haven and in particular, to ensure compliance with the standards and objectives for these waters established by the 2006 Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) and with Article 5 of Directive 2006/113/EC of the European parliament and of the Council on the quality required for shellfish waters.

1.3 Supporting Characterisation Report and Toolkit of Measures

The Pollution Reduction Programme stems from the work undertaken in the characterisation report for Oyster Haven. The characterisation is designed to achieve the following:

- establish the catchment that influences the water quality of the designated area;
- identify the different types of pressures or impacts prevalent in the catchment;
- establish an initial assessment of the water quality within the catchment and within the designated shellfish area using all water quality data available;
- from the above three elements identify the pressures that are active in the catchment and subsequently impacting the water quality in the designated

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shellfish area;

- having identified the pressures impacting on the water quality the characterisation report prioritises them in relation to their impact.

The characterisation report thus provides a prioritised list of pressures/impacts/effects on water quality. The pollution reduction programme or action plan takes this prioritised list and addresses each issue with actions to help ensure that compliance with the relevant water quality standards is achieved or ensured.

The measures/actions included in this PRP to address the identified pressures on shellfish water quality in this catchment are based on a National Toolkit of Measures. The National Toolkit has been derived from earlier work carried out on the River Basin Management Plans under the Water Framework Directive (WFD), reflecting the common objective to improve water quality in the two Directives. In addition, designated shellfish waters are part of the WFD Register of Protected Areas, providing a further link between the Pollution Reduction Programmes and River Basin Management Planning.

Within each individual PRP specific measures from the National Toolkit are applied, where required, to address the key and secondary pressures identified in each of the designated shellfish waters.

1.4 Strategic Environmental Assessment and Habitats Directive Assessment

The Strategic Environmental Assessment (SEA) and Habitats Directive Assessment (HDA) processes were carried out in tandem with the PRP compilation process. These assessments both informed the development of alternatives considered for the PRP and included detailed high-level assessments highlighting the potential positive and negative impacts (including cumulative impacts) associated with application of the measures contained in the National Toolkit. In addition, a more focussed assessment was also carried out which considered the individual and cumulative impacts associated with implementation of the measures brought forward into this individual PRP.

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As a result of the SEA and HDA assessments mitigation measures were identified in order to reduce potential negative impacts associated with implementation of the PRP. The relevant mitigation measures are included in Annex 2 of the PRP. The mitigation measures arising from the SEA are noted in black, while the mitigation measures arising from the HDA noted in blue.

1.5 Monitoring of Water Quality

The Marine Institute is carrying out a monitoring programme to monitor the condition of waters in the shellfish growing area and to verify compliance, or otherwise with the water quality standards outlined in Schedules 2 and 4 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) and summarised in Table 1 of the Characterisation Report (Chapter 1 of the Characterisation Report refers). The Marine Institute will submit a report on water quality in respect of the designated area to the Minister each year, and will immediately bring to the attention of the Department of the Environment, Heritage and Local Government any non-compliance with a water quality standard to enable investigation to be undertaken.

1.6 Review/monitoring of Pollution Reduction Programme

This pollution reduction programme will be kept under review by the Minister and will be updated and amended as needed from time to time, having regard to water quality

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conditions within the shellfish growing area including changes in water quality in response to the implementation of measures and other factors arising in the catchment that may affect water quality in the designated area.

The pollution reduction programme will be reviewed at intervals not exceeding three years and, where necessary, at lesser intervals if the monitoring data indicates a deterioration in water quality status or a risk that the objectives or standards laid down in the Regulations will not be achieved.

When the Pollution Reduction Programme is being reviewed the most current baseline data will be consulted.

Prior to the incorporation of the PRP into the second cycle of the River Basin Management Plans a review of the Strategic Environmental Objectives for Water will be carried out as against those drawn up for assessment of the first cycle River Basin Management Plans to ensure that the Shellfish PRP help to meet the wider Water Framework Directive water quality objectives.

1.7 Monitoring of Environmental Impacts

Article 10 of the SEA Directive requires that monitoring be carried out in order to identify at an early stage any unforeseen adverse effects due to implementation of the PRP, with the view to taking remedial action where adverse effects are identified through monitoring. An Environmental Monitoring Programme has been developed which focuses on aspects of the environment that are likely to be impacted by the PRPs. The Environmental Monitoring Programme is included in Table 5 of the National Toolkit of Measures. The Department of the Environment, Heritage and Local Government will be the authority responsible for collecting and collating data under the Environmental Monitoring Programme. The data will be collected at the same time the pollution reduction programme is reviewed.

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1.8 Monitoring Implementation of Pollution Reduction Programme

This PRP is effectively a sub-basin plan of the River Basin Management Plan for the catchment and will be implemented during the first implementation cycle under the Water Framework Directive (i.e up to 2015).

Implementation of the pollution reduction programme will be monitored by Water Quality Section of the Department of the Environment, Heritage and Local Government.

The contact person is:

Mr. Paul Dunne
Assistant Principal
Water Quality Section
Department of the Environment, Heritage and Local Government,
Johnstown Castle Estate
Wexford.

Phone No: 053 9163411 (+00 353 53 9163411)
Fax No: 053 9165594 (+00 353 53 9165594)
Email: paul_dunne@environ.ie

2.0 STATUS/IMPACTS

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Overall status	The results of monitoring undertaken for the purposes of the Shellfish Waters Directive (2006/113/EC) and Schedules 2 and 4 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) do not indicate any water quality issues within / in the vicinity of this shellfish area. The results of WFD monitoring do not indicate any water quality issues within / in the vicinity of this shellfish area. Monitoring of shellfish flesh for food hygiene purposes indicates low levels of faecal contamination in this shellfish area, the bivalve mollusc production areas in Oyster Haven are classified as 'Class B' for the purposes of EC Regulation 854/2004. However, the available shellfish samples at this shellfish area are all in compliance with the shellfish guideline value for faecal coliforms as indicated above. Chapter 3 of the Characterisation Report refers.
Other issues	None
3.0 PRESSURES/RISKS	
3.1 Key Pressures	Analysis of the Characterisation Report for this designated shellfish water suggests that there are no key pressures currently impacting shellfish water quality. Chapter 5 (summary at 5.3) of the Characterisation Report refers.
3.2 Potential Secondary Pressures	Analysis of the Characterisation Report for this designated shellfish water suggests that there are no potential secondary pressures currently impacting shellfish water quality. Chapter 5 (summary at 5.3) of the Characterisation Report refers.
4.0 PROTECTED AREAS	
Designated Shellfish Areas	Oyster Haven designated Shellfish Waters

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5.0 ACTION PROGRAMME – MEASURES	
Future Development	Under Article 4 of the European Communities (Quality of Shellfish Waters) Regulations 2006 (S.I. No. 286 of 2006) (as amended), every public authority that has functions the performance of which may affect shellfish waters shall perform those functions in a manner that will promote compliance with the objectives of this pollution reduction programme and with the objectives of the Shellfish Waters Directive. The functions of particular importance – in light of the objectives of Directive 2006/113/EC and of this PRP – include waste water treatment (licensing and operations), implementation of the GAP Regulations, waste management (licensing and operations), effluent discharge licences, planning and development and building control. Continued monitoring will be carried out during the lifetime of the PRP. Should this monitoring identify pressures that are impacting on shellfish water quality in the designated area, the PRP will be appropriately amended.

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Estimation of Flow Duration Curve for Ungauged Catchment

Environmental Protection Agency

River Name	Stick (River)(20_2214)
XY Location	166422,53626 (ING)

River Segment Map

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Disclaimer
The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.

Disclaimer

The source of hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.

The user should familiarise himself/herself with the catchment being studied and confirm that the ungauged site is in a natural catchment where flows conditions are suitable for the use of the model.

It is strongly recommended that the user examine the catchment descriptors contained in the report produced and confirm that the percentages of the various constituent elements are comparable to a natural catchment.

If the flow in a catchment is not entirely natural, the estimation of flows using the model in these catchments could be affected due to:

- existence of local conduit karst within the catchment;
- the selected location itself is on local conduit karst;
- regulation of the river flow on the river channel (e.g. power station, sluice gates etc)
- impacts of abstractions upstream of the selected location or the impact of the discharge associated with the abstraction into the same/different catchment;
- estimates of flow being sought at locations effected by storage effects at, or near, lake outfalls;
- lack of similar catchments with observed flows, ie where catchment descriptors lie outside the range of available gauging station catchments (e.g. the catchment area is under 5 km²);
- any other special circumstances that may affect river flows.

Expert judgement will be required to ensure that the estimate of flow is not unduly affected by any of these influences.

Please note that the model does not provide estimates of flood peaks and, specifically, should not be used for that purpose.

The EPA has also prepared estimates of DWF and long term 95 percentile flows which are also presented on the EPA web site. These data are presented at http://www.epa.ie/whatwedo/monitoring/water/hydrometrics/data/

The data produced by the model for specific stations should be compared to the data contained in this file of DWF and long term 95percentile flows.

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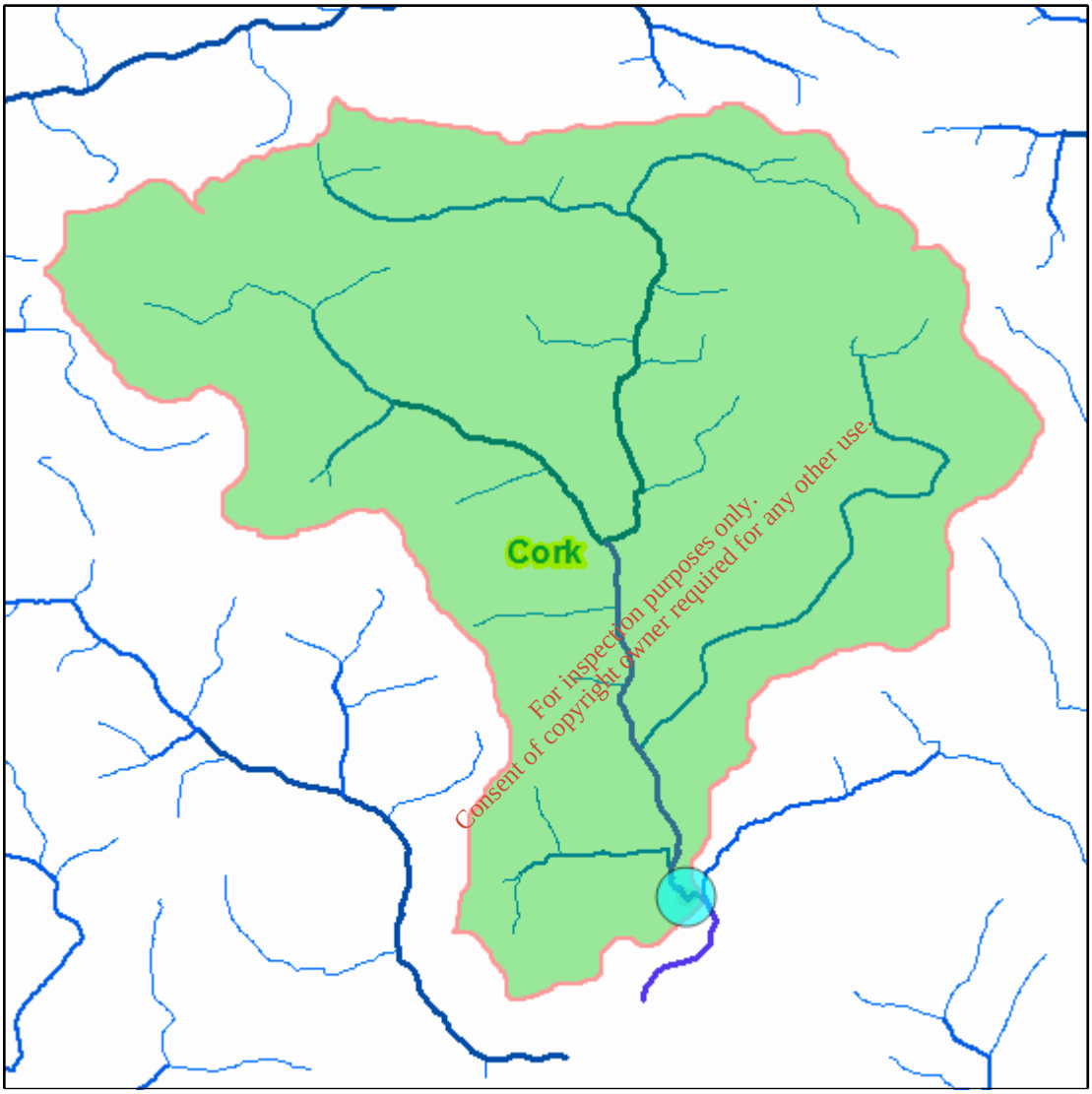
Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

River Name	Stick (River)(20_2214)
XY Location	166422,53626 (ING)

Nested Catchment Map



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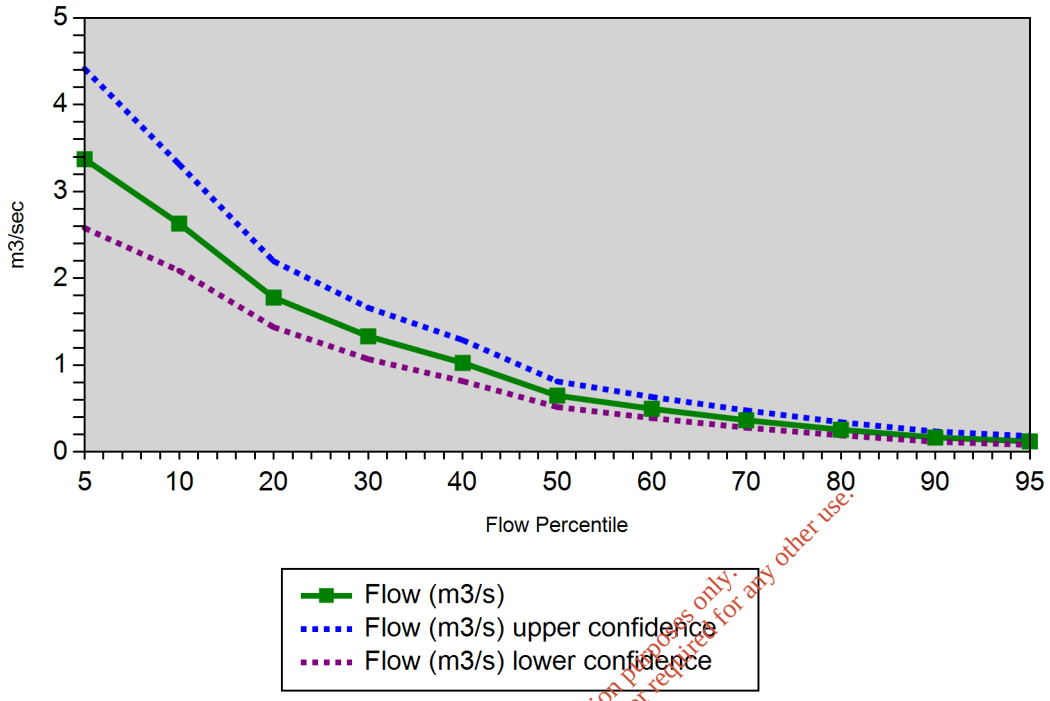
Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

Flow Duration Curve (Flow in m3/sec)



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%ile	flow(m3/sec)	upper 95% confidence limit m3/sec	lower 95% confidence limit m3/sec
5	3.373	4.412	2.579
10	2.63	3.314	2.088
20	1.778	2.197	1.438
30	1.333	1.661	1.07
40	1.026	1.289	0.816
50	0.649	0.813	0.518
60	0.498	0.634	0.391
70	0.366	0.479	0.28
80	0.257	0.343	0.192
90	0.167	0.236	0.118
95	0.123	0.184	0.082

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Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

Catchment Descriptors		
General		
Descriptor	**Unit**	**Value**
Area	sq km	41.1
Average Annual Rainfall (61-90)	mm/yr	1154
Stream Length	km	41.2
Drainage Density	Channel length (km)/catchment area (sqkm)	1
Slope	Percent Slope	7.2
FARL	Index (range 0:1)	1

Soil	
Code	**% of Catchment**
Poorly Drained	30
Well Drained	66.9
Alluvmin	2.9
Peat	0
Water	0
Made	0.2

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Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

Subsoil Permeability		
Code	**Explanation**	**% of Catchment**
H	High	0
M	Moderate	21.5
L	Low	27.6
ML	Moderate/Low	0
NA	No Subsoil/Bare Rock	50.9

Aquifer		
Code	**Explanation**	**% of Catchment**
LG_RG	LG:Locally important sand-gravel aquifer RG: Regionally important sand-gravel aquifer	0
LL	Locally important aquifer which is moderately productive only in local zones	100
LM_RF	LM: Locally important aquifer which is generally moderately productive RF: Regionally important fissured bedrock aquifer	0
PU_PL	PU: Poor aquifer which is generally unproductive PL: Poor aquifer which is generally unproductive except for local zones	0
RKC_RK	Regionally important karstified aquifer dominated by conduit flow	0
RKD_LK	Regionally important karstified aquifer dominated by diffuse flow	0

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Stations in Pooling group			
%ile Flow	**Station 1**	**Station 2**	**Station 3**
5	19044	19032	19009
10	19044	19032	19009
20	19044	19032	19009
30	19044	19032	19009
40	19044	19032	19009
50	18005	19001	16003
60	18005	19001	16003
70	18005	19001	16003
80	18005	16003	19001
90	18005	16003	19001
95	18005	16003	19001

Disclaimer
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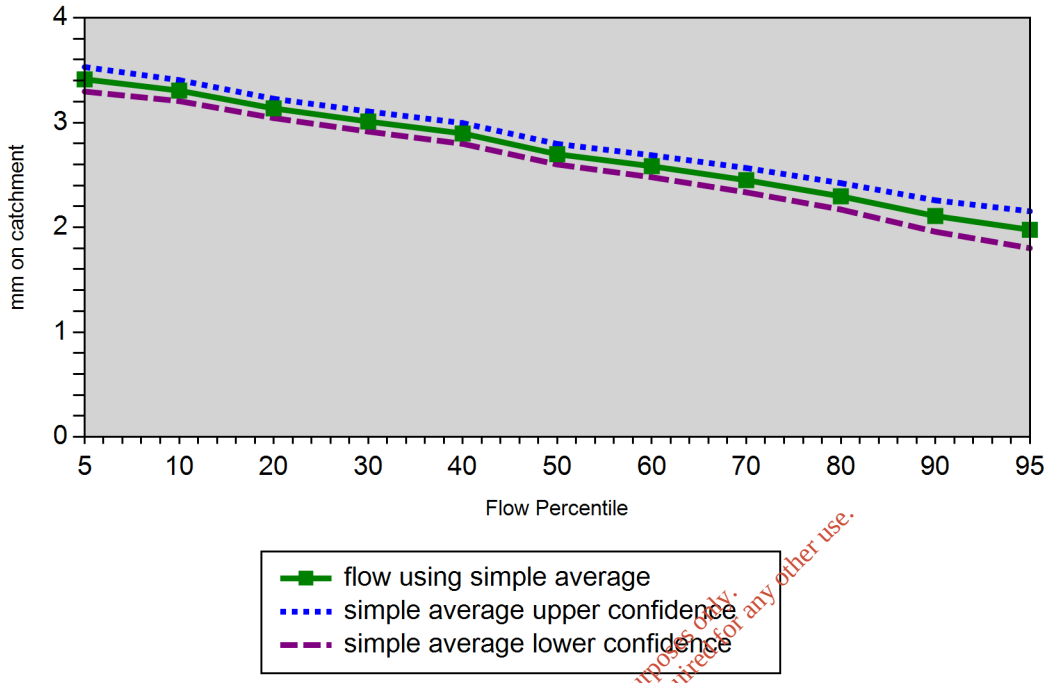
Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

Flow Duration Curve (mm on catchment)



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Log Flow (mm on catchment)			
%ile	mm	upper 95% confidence limit	lower 95% confidence limit
5	3.413	3.53	3.296
10	3.305	3.405	3.205
20	3.135	3.227	3.043
30	3.01	3.106	2.914
40	2.896	2.995	2.797
50	2.698	2.796	2.6
60	2.583	2.688	2.478
70	2.45	2.566	2.334
80	2.296	2.422	2.17
90	2.108	2.258	1.958
95	1.977	2.153	1.801

Disclaimer
The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.

Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

River Name	Stick (River)(20_630)
XY Location	166346,54122 (ING)

River Segment Map

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Disclaimer
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The user should familiarise himself/herself with the catchment being studied and confirm that the ungauged site is in a natural catchment where flows conditions are suitable for the use of the model.

It is strongly recommended that the user examine the catchment descriptors contained in the report produced and confirm that the percentages of the various constituent elements are comparable to a natural catchment.

If the flow in a catchment is not entirely natural, the estimation of flows using the model in these catchments could be affected due to:

- existence of local conduit karst within the catchment;
- the selected location itself is on local conduit karst;
- regulation of the river flow on the river channel (e.g. power station, sluice gates etc)
- impacts of abstractions upstream of the selected location or the impact of the discharge associated with the abstraction into the same/different catchment;
- estimates of flow being sought at locations effected by storage effects at, or near, lake outfalls;
- lack of similar catchments with observed flows, ie where catchment descriptors lie outside the range of available gauging station catchments (e.g. the catchment area is under 5 km²);
- any other special circumstances that may affect river flows.

Expert judgement will be required to ensure that the estimate of flow is not unduly affected by any of these influences.

Please note that the model does not provide estimates of flood peaks and, specifically, should not be used for that purpose.

The EPA has also prepared estimates of DWF and long term 95 percentile flows which are also presented on the EPA web site. These data are presented at http://www.epa.ie/whatwedo/monitoring/water/hydrometrics/data/

The data produced by the model for specific stations should be compared to the data contained in this file of DWF and long term 95percentile flows.

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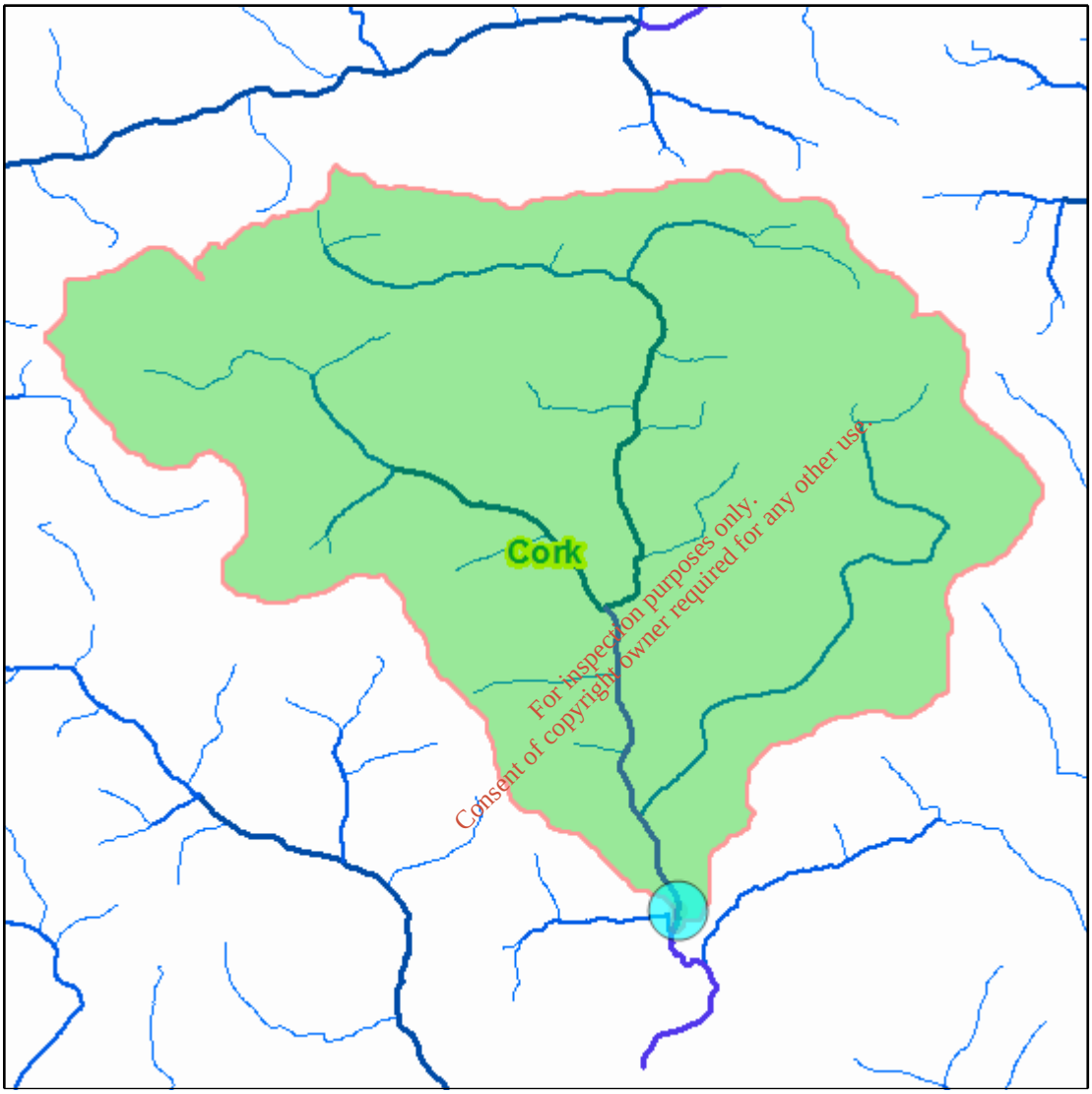
Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

River Name	Stick (River)(20_630)
XY Location	166346,54122 (ING)

Nested Catchment Map



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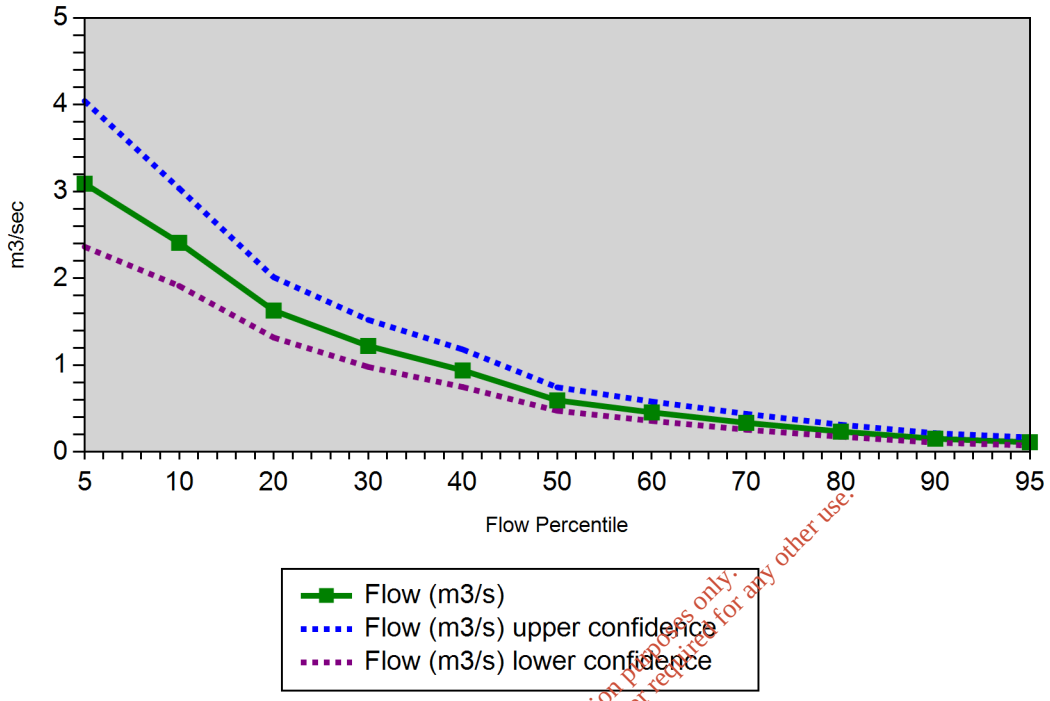
Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

Flow Duration Curve (Flow in m3/sec)



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%ile	flow(m3/sec)	upper 95% confidence limit m3/sec	lower 95% confidence limit m3/sec
5	3.09	4.042	2.363
10	2.41	3.036	1.913
20	1.629	2.013	1.318
30	1.222	1.522	0.98
40	0.94	1.181	0.748
50	0.595	0.745	0.475
60	0.456	0.581	0.358
70	0.336	0.439	0.257
80	0.235	0.314	0.176
90	0.153	0.216	0.108
95	0.112	0.168	0.075

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Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

Catchment Descriptors		
General		
Descriptor	**Unit**	**Value**
Area	sq km	37.7
Average Annual Rainfall (61-90)	mm/yr	1159
Stream Length	km	37.5
Drainage Density	Channel length (km)/catchment area (sqkm)	1
Slope	Percent Slope	7.2
FARL	Index (range 0:1)	1

Soil	
Code	**% of Catchment**
Poorly Drained	32.8
Well Drained	65.3
Alluvmin	1.8
Peat	0
Water	0
Made	0.2

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Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

Subsoil Permeability		
Code	**Explanation**	**% of Catchment**
H	High	0
M	Moderate	19.5
L	Low	30.2
ML	Moderate/Low	0
NA	No Subsoil/Bare Rock	50.4

Aquifer		
Code	**Explanation**	**% of Catchment**
LG_RG	LG:Locally important sand-gravel aquifer RG: Regionally important sand-gravel aquifer	0
LL	Locally important aquifer which is moderately productive only in local zones	100
LM_RF	LM: Locally important aquifer which is generally moderately productive RF: Regionally important fissured bedrock aquifer	0
PU_PL	PU: Poor aquifer which is generally unproductive PL: Poor aquifer which is generally unproductive except for local zones	0
RKC_RK	Regionally important karstified aquifer dominated by conduit flow	0
RKD_LK	Regionally important karstified aquifer dominated by diffuse flow	0

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Stations in Pooling group			
%ile Flow	**Station 1**	**Station 2**	**Station 3**
5	19009	19044	19032
10	19044	19009	19032
20	19044	19009	19032
30	19044	19009	19032
40	19044	19009	19032
50	18005	19001	16003
60	18005	19001	16003
70	18005	19001	16003
80	18005	16003	19001
90	18005	16003	19001
95	18005	16003	19001

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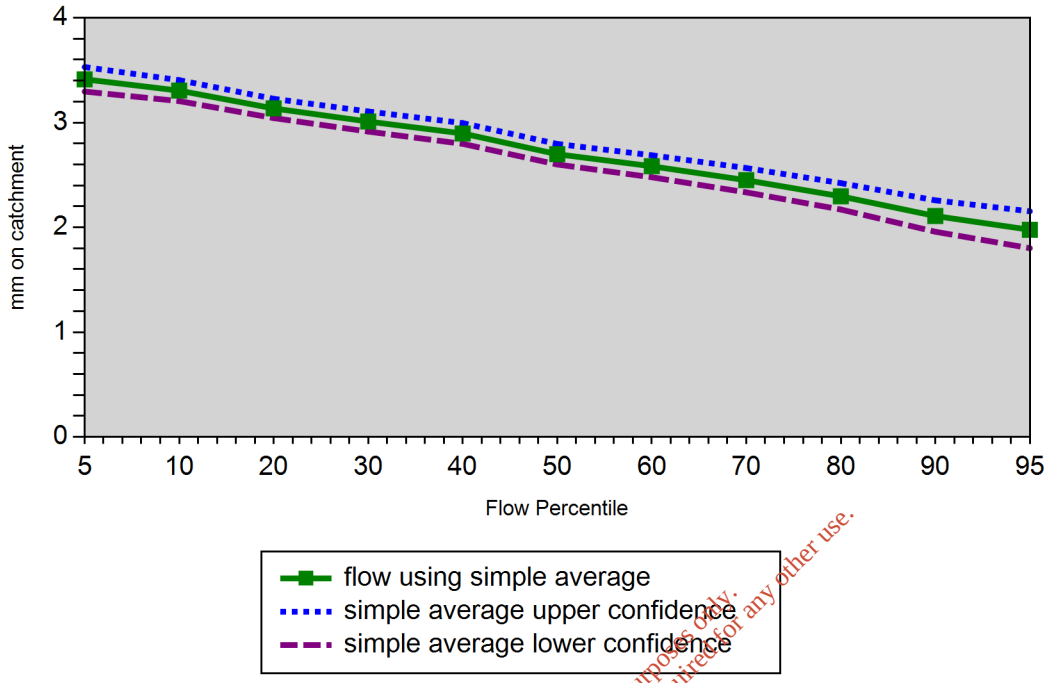
Environmental Protection Agency

Estimation of Flow Duration Curve for Ungauged Catchment

Flow Duration Curve (mm on catchment)



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Log Flow (mm on catchment)			
%ile	mm	upper 95% confidence limit	lower 95% confidence limit
5	3.413	3.53	3.296
10	3.305	3.405	3.205
20	3.135	3.227	3.043
30	3.01	3.106	2.914
40	2.896	2.995	2.797
50	2.698	2.796	2.6
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90	2.108	2.258	1.958
95	1.977	2.153	1.801

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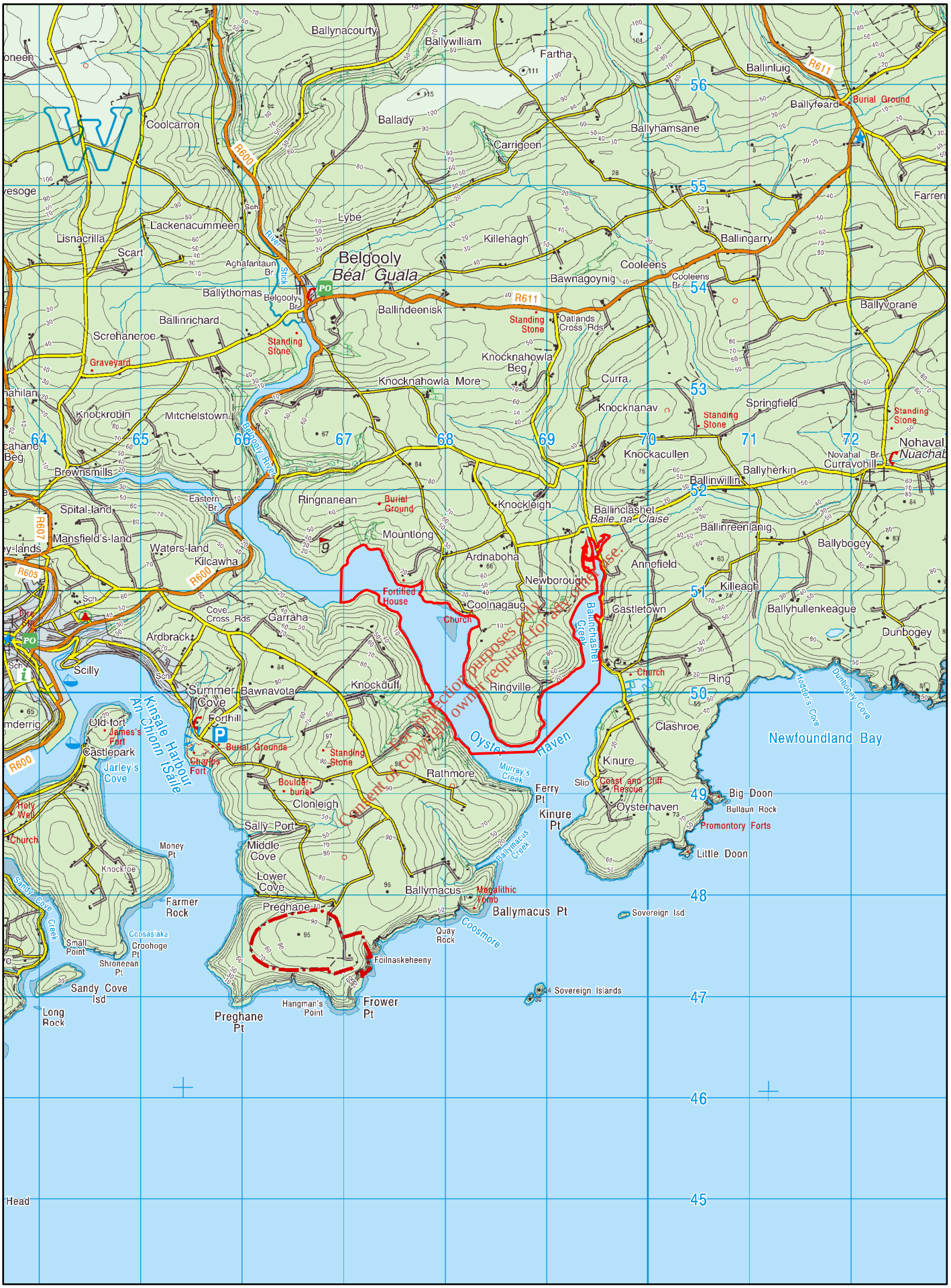

Map 40: Oyster Haven

1:50,000

Designated Shellfish Water

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Date: December 2008

EPA Export 20-09-2012:00:06:05

Cleandra	Mytilus edulis	Closed Pending	03 May 2012
Dunmanus Bay	Mytilus edulis	Open	02 May 2012
Gearhies	Mytilus edulis	Open	03 May 2012
Glengarriff	Mytilus edulis	Open	03 May 2012
Gouleenacoush	Mytilus edulis	Open	25 Apr 2012
Kenmare Inner	Crassostrea gigas	Open	19 Apr 2012
Kenmare Inner	Littorina littorea	Closed Pending	30 Apr 2012
Kilmakilloge	Littorina littorea	Closed Pending	14 Mar 2012
Kilmakilloge	Mytilus edulis	Open	03 May 2012
Kinsale	Crassostrea gigas	Open	10 Apr 2012
Newtown	Mytilus edulis	Open	03 May 2012
Oysterhaven *	Crassostrea gigas	Open	18 Apr 2012
Roaringwater Bay	Littorina littorea	Closed Pending	30 Apr 2012
Roaringwater Bay	Mytilus edulis	Open	03 May 2012
Sherkin West	Crassostrea gigas	Open	26 Apr 2012
Tahilla	Mytilus edulis	Open	26 Apr 2012

In this section:

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Phytoplankton & Shellfish Toxicity Summary - updated May 4th 2012
9th Irish Shellfish Safety Scientific Workshop
Shellfish Harvesting Notification Login
The Biotoxin and Phytoplankton Production Maps

* Oysterhaven status is Open water as on 18/4/2012.

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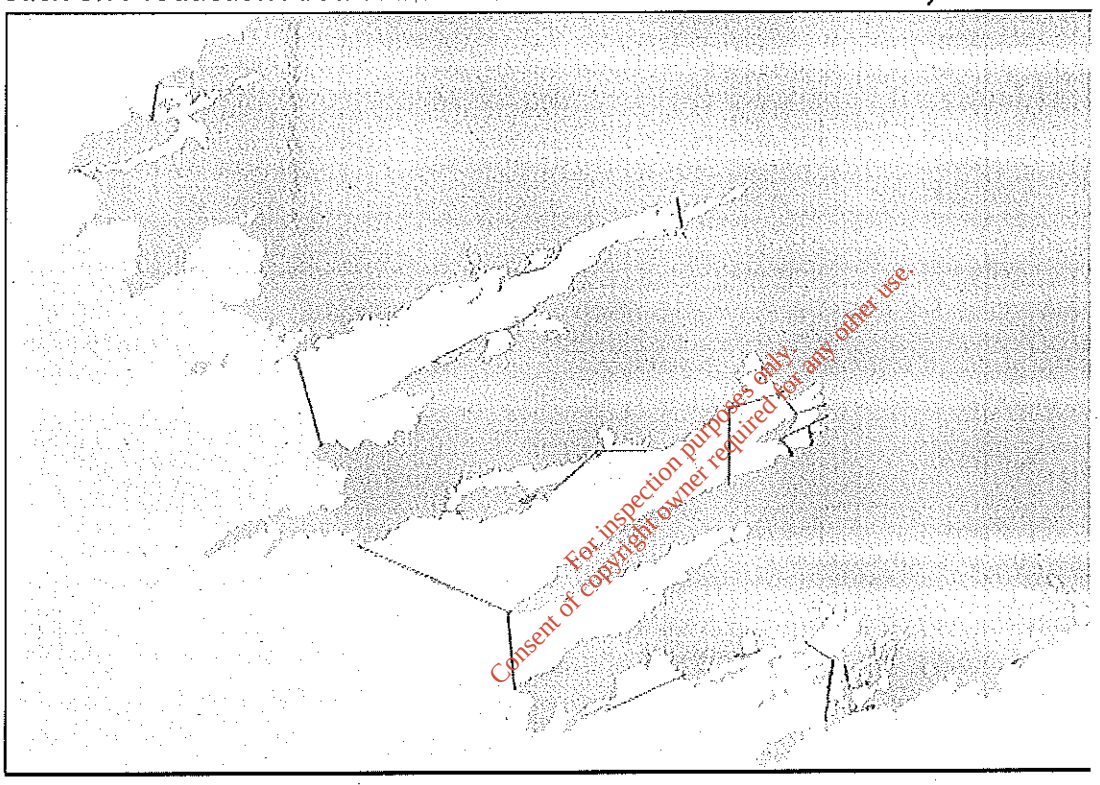
EPA Export 20-09-2012:00:06:05

The status assigned to a production area is based on the last sample supplied. If the production area has not been sampled at the biotoxin sampling frequency for that time of year for that species* it will be deemed closed on the expiry of that period. This closed status will supersede the status given on the last report from that area. Two sam taken at least 48 hours apart are required to re-open an area that has been closed.

* Weekly for all samples of M.edulis and Monthly for all other bivalve species.

Please read the full disclaimer available in the links at the bottom of the page.

Click on Production Area of interest or view Latest Status summary below



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Latest Production Area/Species Status

Production Area	Species	Status	Date Status Assigned
Adrigole	Mytilus edulis	Open	08 Mar 2012
Ardgroom	Mytilus edulis	Open	03 May 2012
Bantry Middle	Mytilus edulis	Open	03 May 2012
Bantry North	Mytilus edulis	Open	02 May 2012
Bantry South	Mytilus edulis	Open	02 May 2012
Castletownbere	Echinus esculentus	Open	22 Mar 2012
Castletownbere	Littorina littorea	Closed Pending	14 Mar 2012
Castletownbere	Mytilus edulis	Closed Pending	03 May 2012

EPA Export 20-09-2012:00:06:05