NS 2 FRESHWATER PEARL MUSSEL SUB-BASIN MANAGEMENT PLANS

REPORT ON MORPHOLOGICAL MONITORING AND CATCHMENT WALKOVER RISK ASSESSMENTS IN THE OWENAGAPPUL CATCHMENT

September 2009

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INTRODUCTION

In order to assess the hydromorphological alterations within the Owenagappul catchment the EPA WFD classification tool called the River Hydromorphology Assessment Technique (RHAT) was utilised by RPS. This tool was developed through the North South Share project, to classify rivers in terms of their morphology. It is a field technique which assigns a channel typology. This influences the rivers physical attributes assessed in the field. The technique assigns a morphological classification directly related to that of the WFD – high, good, moderate, poor and bad.

RHAT surveys were carried out at high risk areas located within pearl mussel populations. The methodology classifies river hydromorphology based on a departure from naturalness, and assigns a morphological classification, based on semi-quantitative criteria. It is designed to be a rapid visual assessment based on information from desktop studies, using GIS data, aerial photography, historical data and data obtained from previous field surveys as well as observations in the field.

A catchment walkover risk assessment survey sheet was also designed by the project team in conjunction with NPWS in order to focus the collation of the pressure data in the field with respect to the Freshwater Pearl Mussel. The risk sheet was divided into eight categories designed to highlight the main pressures within the catchment. The eight categories are as follows:

- Source of erosion
- Diffuse Nutrient
- Diffuse Silt
- Current Riparian Zone
- Field Drainage
- Outfalls
- Abstractions
- Barriers to Migration

Each sub-pressure within the eight categories is analysed and an overall risk assessment of High, Medium or Low is assigned to that category. The “one out all out principle” is then used to assign the river stretch or point an overall risk category. A detailed description, together with a series of photographs outlining the pressures is also taken. The risk assessment sheets will assist the project team in focussing the specific freshwater pearl mussel measures within the catchment.

Location of survey stretches and points are shown in Figure 1

2.0 METHODOLOGY

Sampling was carried out on the 10th of June 2009.

2.1 RIVER HYDROMORPHOLOGY ASSESSMENT TECHNIQUE (RHAT)

Classification of hydromorphology can be used to contribute to the status classification of water bodies at high ecological status only. However, RHAT plays a vital role in identifying why a water body might be failing to achieve Good Ecological Status as it is based on the observed impact in the field. It can assist in deciding what indirect and direct efforts are needed to improve status and in helping to prevent further deterioration.

The eight criteria that are scored are:

1. Channel morphology and flow types
2. Channel vegetation
3. Substrate diversity and embeddedness
4. Channel flow status
5. Bank and bank top stability
6. Bank and bank top vegetation
7. Riparian land use
8. Floodplain connectivity

Sheet 1 of the RHAT form contains the Field Health and Safety sheet which is filled on arrival at the site. Before the field survey, a desk study is required this element of the survey was completed as part of the development of the draft sub-basin management plans. The reach identification and physical characterisation sections for each field site are recorded on Sheet 2 (see Appendix 1) with all information available from GIS and aerial photographs, including:

a. expected stream type and the description of various stream types
b. catchment and reach-scale pressures (these may help to identify, confirm or explain field observations);
c. expected riparian vegetation types (for high quality status);
d. the weather conditions on the day of the survey, and those immediately preceding the day of the survey. This information is important to interpret the effects of storm events on the survey results;
e. the estimated stream width and the reach length to be assessed (~ 40 x width).
f. any other notable issues (e.g. from previous surveys).

A score is allocated to each relevant attribute (the number of attributes to be assessed will depend on the stream type). Where the condition departs from the reference condition, note should be made if this condition results from a particular identifiable pressure. Where possible and where relevant, all attributes should be included in the assessment, using the assessment sheet (Sheet 3, see Appendix 1). If an attribute is not assessed, the score-summary table should be amended (cells shaded) and a note made as to why the assessment was not carried out. The WFD status can still be calculated on the basis of other attributes, but with a note that a particular attribute was omitted.

Transfer scores for individual attributes to the summary table on the survey Sheet 2. Finally the overall WFD category can be calculated using the following values:

> 0.8	= high
0.6 – 0.8	= good
0.4 – 0.6	= moderate
0.2 – 0.4	= poor
< 0.2	= bad

For the purposes of the assessment as part of the NS2 project, a high status for morphology is desirable for pearl mussel habitats. Through work carried out by the Shannon IRBD project on the Freshwater Morphology Programme of Measures Study, it was found that an observed relationship exists between biological data and a RHAT score. The study confirmed that morphological pressure can impact biology and therefore ecological status. In general, sites with RHAT scores less than 0.6 also have less than good Q scores. Similarly high levels of siltation affecting macrophyte populations are reflected by less than good RHAT scores.

Grid references were recorded at all sites using a GPS together with site photographs which were taken using a digital camera.

2.2 CATCHMENT WALKOVER RISK ASSESSMENT

During the development of the draft sub-basin management plans throughout 2008 a complete desk study was conducted of all relevant biological, water quality and pressure source data within the Owenagappul catchment. Best use was made of all available datasets such as the pressure source data collated by the River Basin District Projects for the Article V Characterisation and Programme of Measures Studies. This work allowed the NS 2 project team to assess the catchment through the combined availability of aerial imagery and digitised pressure information. Where gaps in this data existed together with areas that required ground truthing such as physical barriers to migration, catchment walkover risk assessments were focussed throughout the 2009 field survey season.

The catchment walkover risk assessment sheet (See Appendix 3) covers eight main categories or pressures which are subsequently sub-divided into the various sources. Each source is ticked if present and an overall risk assessment for each pressure assigned from High to Medium to Low over the survey length or point. All eight pressures are combined to give an overall risk assessment to the catchment based on the “one out all out principle”.

3.0 RESULTS

Figure 3.1 indicates where the Owenagappul morphological assessments were carried out throughout the catchment.

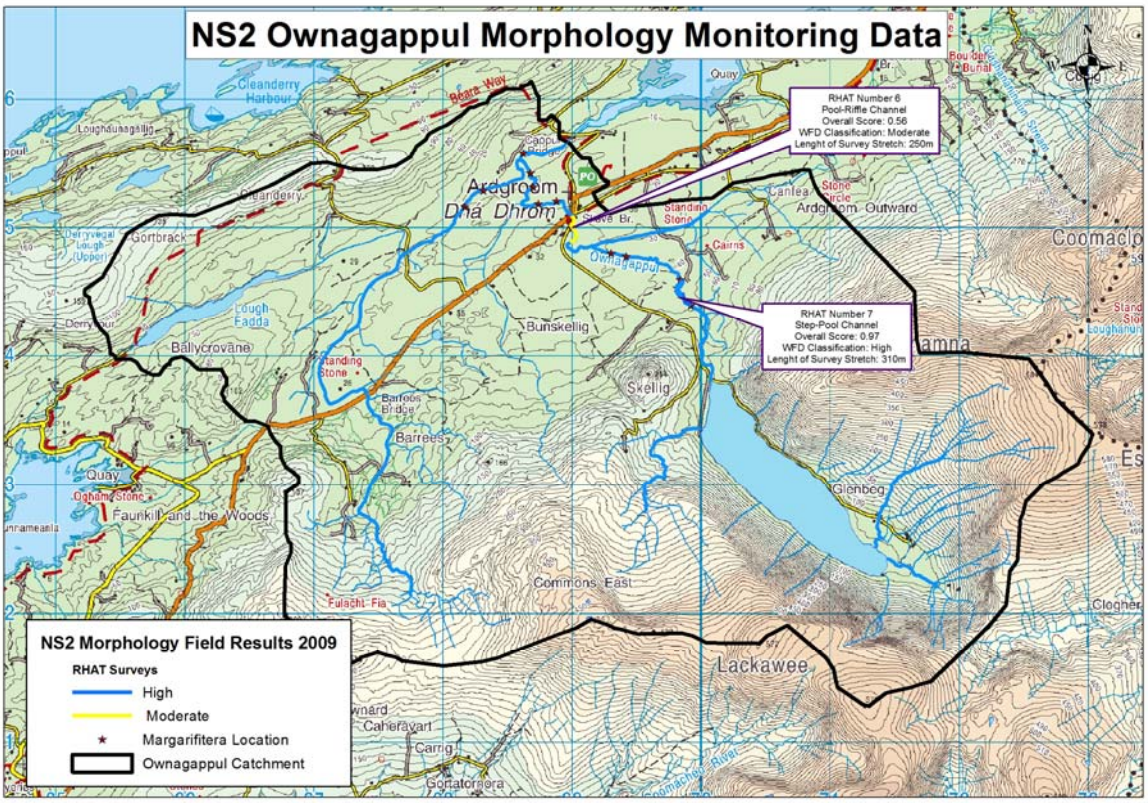


Figure 3.1 Morphology RHAT Assessment Locations

(The RHAT numbering system corresponds to the site code which may mean they are not sequential where a RHAT was not carried out at a particular site)

3.1 RHAT Survey Results

Two RHAT surveys were carried out within the Ownagappul catchment. The results of these surveys can be found in the electronic appendix. One was deemed to be at high status and the other at moderate status. Both surveys were carried out in the vicinity of the Freshwater Pearl Mussel populations. RHAT number 6 was given average scores for all attributes except for barriers to continuity which scored three out of a possible four. The survey stretch began at the bridge in Ardgroom Village and moved upstream. Therefore many urban pressures were present at the beginning of the survey which gradually changed to agricultural further up the channel. All other attributes scored two out of four except bank structure and stability and the riparian landcover which both scored 2.5 out of four. The low scores are largely due to the instances of bank and

vegetation removal which were recorded together with land clearance, dumping on the banks, over deepening and over widening of the channel over a 50m stretch together with the presence of filamenteous algae on the river substrate together with excessive macrophyte growth on the inflowing tributaries and drains.

RHAT number 7 was carried out further upstream on the Ownagappul along an area surrounding by peat substrate. This is a very remote stretch of the river which is a Step-pool cascade channel. All attributes scored well along this survey stretch with only the riparian land cover and the channel vegetation downgraded to 3.5 and 3 respectively. This is due to the lack of bankside vegetation due to the peat setting together with the presence of some fine silts and filamenteous algae on the river substrate. Overall this stretch was found to be in good condition with adults pearl mussels noted in the channel.

Plate 3.1 Representative photographs from reach:

RHAT 6 Site 6 Photo 7 Poor substrate condition	**RHAT 6 Site 6 Photo 4**
	

RHAT 7 Site 7 Photo 8	RHAT 7 Site 7 Photo 6
	

Details in relation to photographs are tabulated in Appendix 2.

3.1 Catchment Walkover Risk Assessment Results

A total of ten sites were surveyed in the Ownagappul sub-basin catchment, with a risk assessment carried out at four of these sites (six stopping points). **Figure 3.2** outlines the stopping point locations in addition to the High to Low Risk Assessment from the Catchment Walkover Risk Assessments. One high risk sites were recorded out of the four that were assessed. A further two were recorded as medium risk with one site being recorded as low risk. **Figure 3.3** outlines the percentage of sites classified at high, medium and low risk together with the number of stopping points throughout the catchment.

The most high risk categories identified were:

- Field Drainage – evident at 100% of high risk sites,
- Outfalls – evident at 100% of high risk sites,

The Current Riparian Zone category of the Catchment Walkover Risk Assessment slightly varies from the seven other categories or pressures. The Current Riparian Zone is not a pressure in itself; however the aspects listed in this category are the interceptors to the pressure and convey the extent or lack of buffer provided by the riparian zone. A high risk riparian zone indicates that the pressures acting on the river are more likely to have significant impact. For example the lack of fencing along a river stretch can lead to excessive trampling and/or poaching which in turn may lead to siltation within a pearl mussel habitat. The various categories and pressures listed in the Catchment Walkover Risk Assessment sheet were designed to assist the project in focussing the measures which will be needed to combat the pressure along its pathway, rather than removing a source which may not always be possible such as intensive agriculture. Recording the Riparian Zone in terms of its current performance as a buffer is important in this regard.

Current Riparian Zone has ten aspects as follows:

- Fencing
- Buffer

- Tree line at bank
- Tree line buffer
- Plantation with no buffer
- Urbanisation
- Flood Protection
- Marshy Land
- Landuse at bank
- Other Sources

Where one or any of these aspects is found to be the cause of significant impact to the riparian zone, or the channel along the stretch then this category may be assigned a high risk score. Figure 2 outlines the percentage number of sites at High, Medium or Low risk. Locations where pressures were evident in the field which were not highlighted through the desk based assessment were also noted as stopping points. These points were not selected prior to fieldwork, they were opportunistic as the catchment drive through was taking place. The pie chart in Figure 2 indicates the percentage of stopping points also.

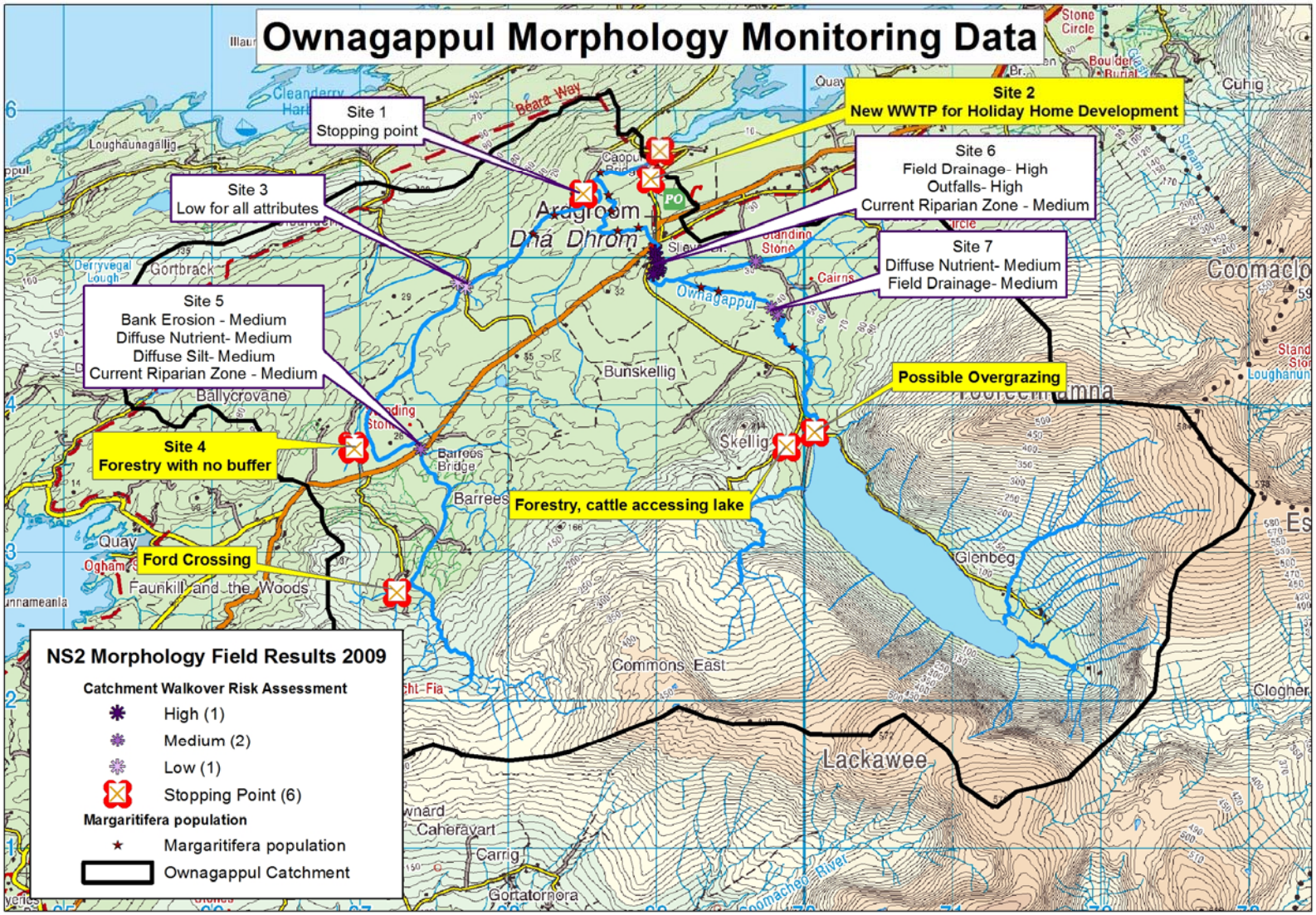
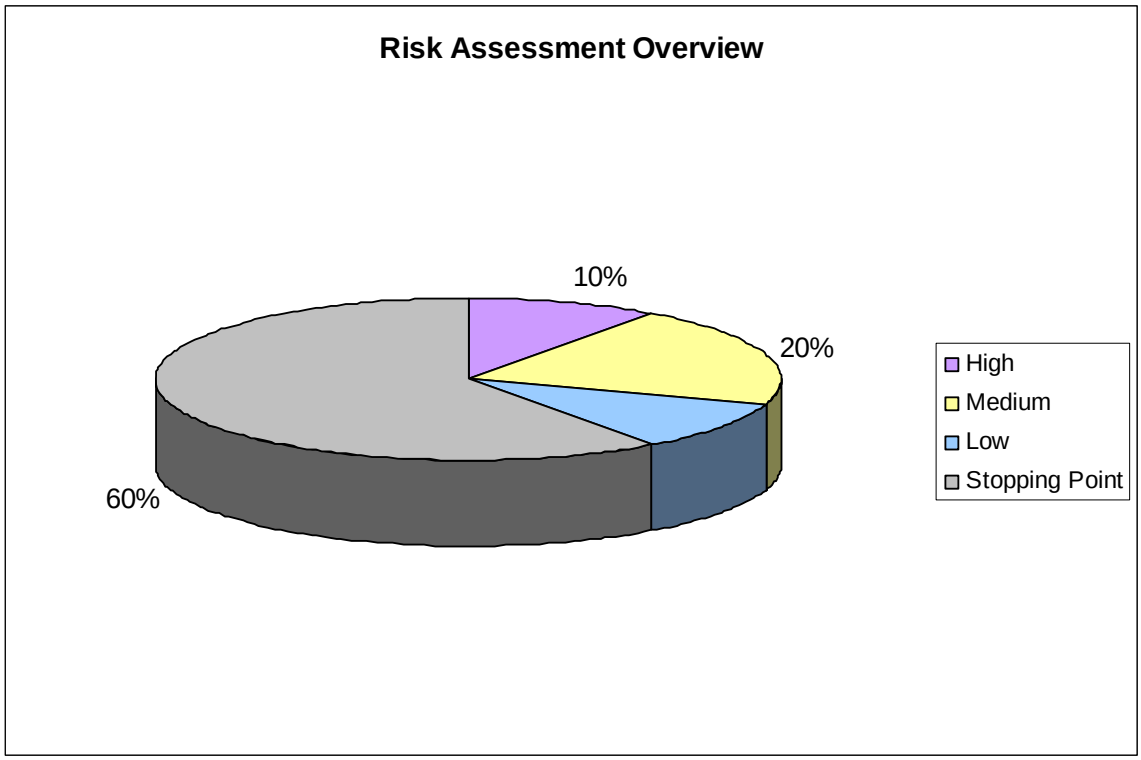


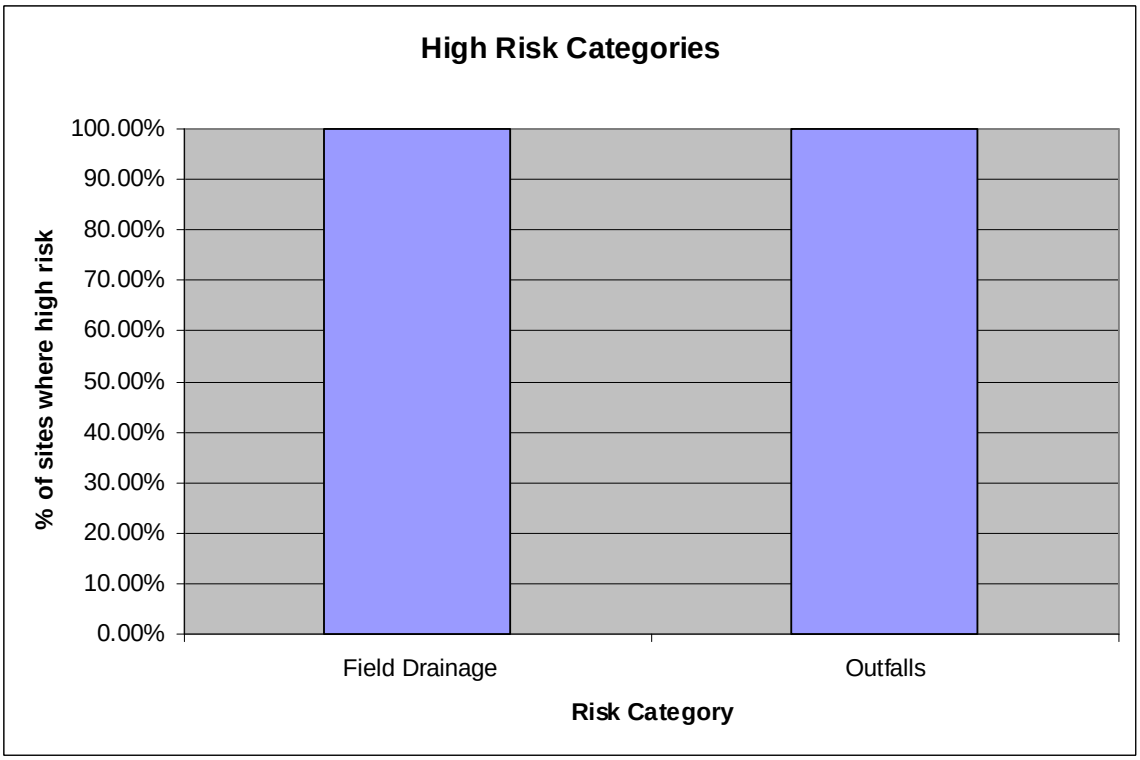
Figure 3.2 Location of Stopping points and Catchment Walkover Risk Assessments

Figure 3.3 Risk Assessment Overview



The break-down of pressure categories identified as high risk are outlined in **Figure 3.4**

Figure 3.4 Break-down of High Risk categories



The sources of field drainage at the high risk site were drainage on a high slope and ‘other sources’ specifically drainage pipes from the nearby. The outfalls identified were an industrial outfall from a waste water treatment plant and storm drains.

4.0 CONCLUSIONS

One risk assessment was undertaken in a location where Freshwater Pearl Mussel populations have been recorded; this was the high risk site recorded within this catchment. This is significant as overall the Ownagappul sub-basin catchment appears in a relatively better condition than some of the other Freshwater Pearl Mussel catchments in Ireland. However, many pressures can still be found acting on this catchment in particular overgrazing, abstraction and on-site systems. All of these will need to be remediated and/or mitigated before the Freshwater Pearl Mussel population can fully recover to favourable conservation status.

APPENDIX A

RHAT Field Sheet

Field Health and Safety sheet

River Name_____ Site Code_____ Date_____

1 = Low risk 5 = High risk

Please circle applicable number

PARKING	1	2	3	4	5
FENCES/BARRIERS	1	2	3	4	5
GROUND STABILITY	1	2	3	4	5
DENSE VEGETATION	1	2	3	4	5
BANK STEEPNESS OR STABILITY	1	2	3	4	5
RISK FROM ANIMALS	1	2	3	4	5
PHONE COVERAGE	1	2	3	4	5

Previous RHS/RAT/RHAT surveys - year and code _____

Details of access _____

RHAT (VERSION 2)

TRIBUTARY / MAIN CHANNEL*

Site Identification

River Name _____ Site Code _____

Nearest WFD site FF10 _____

Water Body ID _____ Start U / S or D / S*

First IGR _____ Last IGR _____

Bank surveyed from L / R / Both / in-Channel*

Desk-study notes		Field Notes
ACTION TO TAKE PRIOR TO FIELDWORK General overall shape of river Check weirs, impoundments etc. on catchment		River type Date
Floodplain connectivity and land use Expected river type Rain last week Estimated river width Estimated survey length Riparian land cover(s) River Agency designated? Other comments including geology - limestone / siliceous / peat*		Time Surveyors Weather conditions now Estimated river width (m) (average 3 readings) Estimated survey length (m) (40 X wetted width) Estimated river depth (m) Channel characteristics (e.g. different stream types on the reach)
RESULTS		Pressures
Hydromorph score WFD class		*Circle as appropriate

Photograph details include IGR or approximate location

_____

_____

_____

_____

N.B. The survey length should be 40x the wetted width with a minimal stretch of 160m but not exceeding 1km.

NS RHAT

Anthropogenic Impacts

River Name _____ Site Code _____ Date _____

Feature		Tick if present, record as E if > 30%		
Resectioning		None ☐	Left bank ☐	Right bank ☐
Reinforcement		None ☐	Left bank ☐	Right bank ☐
Embankments	NO*	LB ☐	RB ☐	Set back LB ☐ SB RB ☐
Culverts**		Y / N / Unknown*		
Over deepening		Y / N / Unknown*		
Wver widened		Y / N / Unknown*		
Narrowing		Y / N / Unknown*		
Fords**		Y / N*		
		Major	Intermediate	Minor
Bridges**	NO*			
Weirs**	NO*			
Fish Pass**	NO*			

Physical features or resource use if applicable. *

Deflectors / Jetties / Arterial drainage / Side channels / Mid channel bar / Field Drains / Mill Race

Navigation / Fishing / Recreation / Forestry/ Urban / Industry / HEP

Trashline present (height __ m) above water / Buffer zone (LBm / RBm back from water edge)

Other observations - Invasives - Trees - Birds - Pollution indicators - Invertebrates*

Rhododendron / Himalayan Balsam / Japanese Knotweed / Giant hogweed / Snowberry / Cherry-Laurel/ Gunnera

Sycamore / Beech / Conifers / Oak / Ash / Alder / Willow / Birch / Hazel / Hawthorn / Blackthorn / Holly

Heron / Sand martin / Grey wagtail / Dippers / Kingfishers /

Sewage fungus / Diatomaceous algae / Oil / Cladophora / Vaucheria / Dumping / Silt on Substrate

Other comments:

_____

** Circle as appropriate E - extensive. ** Tally as appropriate. LB - left bank / RB - right bank*

RHAT RIVER HYDROMORPHOLOGY ASSESSMENT TECHNIQUE

Field Assessment of Morphological Condition

River Name _____ Site Code _____ Date _____

If river in spate ignore 3 and 4 but deduct individual scores from overall if either feature not visible. Greyed boxes may be scored but note why in Comments/Notes.

	Bedrock	Cascade / Step-pool	Pool-riffle-glide	Lowland Meandering
1. Channel form and flow types	4	4	4	4
2. Channel vegetation	4	4	4	4
3. Substrate condition	4	4	4	4
4. Barriers to continuity	4	4	4	4
5. Bank structure & stability L+R	4	4	4	4
6. Bank vegetation L+R	4	4	4	4
7. Riparian land cover L+R	4	4	4	4
8. Floodplain connectivity L+R	4	4	4	4
TOTAL	32	32	32	32
Hydromorph Score *				
WFD class **				

* Hydromorph score - Assessment score = Maximum Possible score

** WFD Class
> 0.8 = high
>0.6 – 0.8 = good
>0.4 – 0.6 = moderate
>0.2 - 0.4 = poor
< 0.2 = bad.

SHEET 5

NOTES

APPENDIX 2

PHOTOGRAPHS

Photographs of site locations and catchment pressures on the Owenagappul River and tributaries 2009. All field work photographs can be found in the accompanying electronic appendix.

Overall Risk * uses the “one out all out” principle

Site No.	Catchment Name	Location	X	Y	Photo No.	Bank Erosion	Diffuse Nutrient	Diffuse Silt	Field Drainage	Outfalls	Abstraction	Barriers to Migration	Current Riparian Zone	Overall Risk*	Pressure/Photo Details
1	Ownagappul	Main Channel: South West of Cappul Bridge	68507	55433	1										Rough grazing
1	Ownagappul	Main Channel: South West of Cappul Bridge	69025	55730	2										Looking downstream
1	Ownagappul	Main Channel: South West of Cappul Bridge	69025	55730	3										Looking upstream at left bank, access difficult
2	Ownagappul	Main channel: Near Ardgroom town	68963	55533	1										Waste water treatment plant for new housing development
2	Ownagappul	Main channel: Near Ardgroom town	68963	55533	2										Waste water treatment plant for new housing development
2	Ownagappul	Main channel: Near Ardgroom town	68963	55533	3										Waste water treatment plant for new housing development
2	Ownagappul	Main channel: Near Ardgroom town	68963	55533	4										Waste water treatment plant for new housing development
2	Ownagappul	Main channel: Near Ardgroom town	68963	55533	5										Waste water treatment plant for new housing development
2	Ownagappul	Main channel: Near Ardgroom town	68963	55533	6										Waste water treatment plant for new housing development

3	Ownagappul	Tributary of Ownagappul East of Lough Fada	67713	54807	1	Low	Low	Low	Low	Low	Low	Low	Low	Low	Looking upstream from bridge
3	Ownagappul	Tributary of Ownagappul East of Lough Fada	67713	54807	2	Low	Low	Low	Low	Low	Low	Low	Low	Low	Looking downstream from bridge
3	Ownagappul	Tributary of Ownagappul East of Lough Fada	67660	54837	3	Low	Low	Low	Low	Low	Low	Low	Low	Low	Inflowing tributary on left bank. Substrate covered in filamentous green algae very poor condition
3	Ownagappul	Tributary of Ownagappul East of Lough Fada	67660	54837	4	Low	Low	Low	Low	Low	Low	Low	Low	Low	Inflowing tributary on left bank. Substrate covered in filamentous green algae very poor condition
3	Ownagappul	Tributary of Ownagappul East of Lough Fada	67660	54837	5	Low	Low	Low	Low	Low	Low	Low	Low	Low	Poor substrate condition downstream of bridge
3	Ownagappul	Tributary of Ownagappul East of Lough Fada	67660	54837	6	Low	Low	Low	Low	Low	Low	Low	Low	Low	Poor substrate condition downstream of bridge
4	Ownagappul	Tributary of Ownagappul West of Barrees	66945	53726	1										Looking downstream no buffer
4	Ownagappul	Tributary of Ownagappul West of Barrees	66945	53726	2										Tree line at bank
4	Ownagappul	Tributary of Ownagappul West of Barrees	66960	53705	3										Upstream of road, very narrow channel, macrophytes present, no buffer, check ortho maps for forestry, what extent, how recent?

4	Ownagappul	Tributary of Ownagappul West of Barrees	66960	53705	4										Upstream of road, very narrow channel, macrophytes present, no buffer, check ortho maps for forestry, what extent, how recent?
5	Ownagappul	Tributary of Ownagappul at Barrees	67409	53701	1	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Looking downstream from bridge
5	Ownagappul	Tributary of Ownagappul at Barrees	67409	53701	2	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Looking upstream from bridge
5	Ownagappul	Tributary of Ownagappul at Barrees	67409	53701	3	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Sheep grazing on right bank
5	Ownagappul	Tributary of Ownagappul at Barrees	67409	53701	4	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Animal trampling on left bank upstream of bridge
5	Ownagappul	Tributary of Ownagappul at Barrees	67409	53701	5	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Forestry plantation upstream
5	Ownagappul	Tributary of Ownagappul at Barrees	67409	53701	6	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Forestry plantation upstream
5	Ownagappul	Tributary of Ownagappul at Barrees	67409	53701	7	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Possible dipping facility for sheep downstream of bridge on right bank
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	1	Low	Low	Low	High	High	Low	Low	Medium	High	Looking upstream from bridge
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	2	Low	Low	Low	High	High	Low	Low	Medium	High	Looking downstream from bridge
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	3	Low	Low	Low	High	High	Low	Low	Medium	High	Filamentous green algae on substrate
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	4	Low	Low	Low	High	High	Low	Low	Medium	High	Filamentous green algae on substrate

6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	5	Low	Low	Low	High	High	Low	Low	Medium	High	Bank re-inforcement on right bank
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	6	Low	Low	Low	High	High	Low	Low	Medium	High	Re-inforcement on right bank
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	7	Low	Low	Low	High	High	Low	Low	Medium	High	Myriophyllum covered with filamentous green algae
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	8	Low	Low	Low	High	High	Low	Low	Medium	High	Dead mussels on left bank
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	9	Low	Low	Low	High	High	Low	Low	Medium	High	Bank re-inforcement on left bank
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	10	Low	Low	Low	High	High	Low	Low	Medium	High	Juvenile mussels on left bank
6	Ownagappul	Main Channel at Slieve Bridge	68991	55037	11	Low	Low	Low	High	High	Low	Low	Medium	High	Juvenile mussels on left bank
6	Ownagappul	Main Channel at Slieve Bridge	68995	54998	12	Low	Low	Low	High	High	Low	Low	Medium	High	Pump on left bank
6	Ownagappul	Main Channel at Slieve Bridge	68995	54998	13	Low	Low	Low	High	High	Low	Low	Medium	High	Land clearance
6	Ownagappul	Main Channel at Slieve Bridge	68995	54998	14	Low	Low	Low	High	High	Low	Low	Medium	High	Land clearance
6	Ownagappul	Main Channel at Slieve Bridge	68995	54998	15	Low	Low	Low	High	High	Low	Low	Medium	High	Land clearance
6	Ownagappul	Main Channel at Slieve Bridge	68995	54998	16	Low	Low	Low	High	High	Low	Low	Medium	High	Land clearance
6	Ownagappul	Main Channel at	68995	54998	17	Low	Low	Low	High	High	Low	Low	Medium	High	Land clearance on bank of

		Slieve Bridge													unmanaged drain which feeds into river
6	Ownagappul	Main Channel at Slieve Bridge	68995	54998	18	Low	Low	Low	High	High	Low	Low	Medium	High	Set back fencing approx 3m looking downstream
6	Ownagappul	Main Channel at Slieve Bridge	68995	54998	19	Low	Low	Low	High	High	Low	Low	Medium	High	Set back fencing approx 3m looking upstream
6	Ownagappul	Main Channel at Slieve Bridge	69017	54968	20	Low	Low	Low	High	High	Low	Low	Medium	High	Trashline 1.5m above current water level
6	Ownagappul	Main Channel at Slieve Bridge	69017	54931	21	Low	Low	Low	High	High	Low	Low	Medium	High	Looking downstream
6	Ownagappul	Main Channel at Slieve Bridge	69017	54931	22	Low	Low	Low	High	High	Low	Low	Medium	High	Looking upstream
6	Ownagappul	Main Channel at Slieve Bridge	69017	54931	23	Low	Low	Low	High	High	Low	Low	Medium	High	Bank re-inforcement on right bank
6	Ownagappul	Main Channel at Slieve Bridge	69017	54931	24	Low	Low	Low	High	High	Low	Low	Medium	High	Very poor substrate condition
6	Ownagappul	Main Channel at Slieve Bridge	69017	54931	25	Low	Low	Low	High	High	Low	Low	Medium	High	Incoming unmanaged land drain source of nutrients
6	Ownagappul	Main Channel at Slieve Bridge	69013	54911	26	Low	Low	Low	High	High	Low	Low	Medium	High	Possibly deepened at some points
6	Ownagappul	Main Channel at Slieve Bridge	68981	54894	27	Low	Low	Low	High	High	Low	Low	Medium	High	Left bank raised, reinforced for one off housing. New house probable also septic tank
6	Ownagappul	Main Channel at Slieve Bridge	68981	54894	28	Low	Low	Low	High	High	Low	Low	Medium	High	Left bank raised, reinforced for one off housing. New house

															probable also septic tank. End point
7	Ownagappul	Main Channel North of Skellig	69821	54617	1	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	Looking upstream from starting point
7	Ownagappul	Main Channel North of Skellig	69821	54617	2	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	Looking downstream from starting point
7	Ownagappul	Main Channel North of Skellig	69821	54617	3	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	Two juevenile mussels on right bank
7	Ownagappul	Main Channel North of Skellig	69821	54617	4	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	One adult mussel approx 3 foot downstream of previous
7	Ownagappul	Main Channel North of Skellig	69821	54617	5	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	Filamentous green algae on substrate
7	Ownagappul	Main Channel North of Skellig	69821	54617	6	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	Filamentous green algae on substrate
7	Ownagappul	Main Channel North of Skellig	69778	54663	7	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	One fish plus numerous pearl mussels in deep pool
7	Ownagappul	Main Channel North of Skellig	69673	54973	8	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	Looking downstream at end point straightened channel
7	Ownagappul	Main Channel North of Skellig	69673	54973	9	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	Looking upstream
7	Ownagappul	Main Channel North of Skellig	69673	54973	10	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	Poor substrate condition, potomageton, ranunculus, reeds and filamentous algae at end point
Stopping point 1	Ownagappul	Tributary of Main	67247	52729	1										Ford crossing

		Channel: South West of Barrees													
Stopping point 1	Ownagappul	Tributary of Main Channel: South West of Barrees	67247	52729	2										Forestry -New up to the right
Stopping point 2	Ownagappul	North end of Glenbeg Lough	70069	53819	1										Upstream of glenbeg lough
Stopping point 2	Ownagappul	North end of Glenbeg Lough	70069	53819	2										Upstream of glenbeg lough
Stopping point 2	Ownagappul	North end of Glenbeg Lough	70069	53819	3										Forestry up from downstream end of lake on skellig hill
Stopping point 2	Ownagappul	North end of Glenbeg Lough	70069	53819	4										Forestry up from downstream end of lake on skellig hill
Stopping point 2	Ownagappul	North end of Glenbeg Lough	70069	53819	5										Filamentous green algae on substrate at weir at bridge
Stopping point 2	Ownagappul	North end of Glenbeg Lough	70069	53819	6										Glenbeg lough
Stopping point 2	Ownagappul	North end of Glenbeg Lough	70069	53819	7										Glenbeg lough
Stopping point 2	Ownagappul	North end of Glenbeg Lough	70069	53819	8										Downstream of bridge outlet
Stopping point 3	Ownagappul	Main Channel below Skellig Hill	69878	53721	1										Looking down at glenbeg from upper road
Stopping point 3	Ownagappul	Main Channel below Skellig Hill	69878	53721	2										Abstraction facility lower end of Lough
Stopping point 3	Ownagappul	Main Channel below Skellig Hill	69878	53721	3										Forestry planted up hill side
Stopping point 3	Ownagappul	Main Channel below	69878	53721	4										Cow in lake at oulet to stream

		Skellig Hill													
Stopping point 3	Ownagappul	Main Channel below Skellig Hill	69878	53721	5										Forestry set back approx 15m from lake - New forestry

Appendix 3 – Catchment Walkover Risk Assessment Survey Sheet

Sheet 1: Catchment Walkovers	Version 1. 07/04/2009
Tributary/Main Channel*	
Site Identification	
River Name	Site Code
Water Body ID	Start U/S or D/S*
First site IGR	Last site IGR
Bank surveyed from L/R/In-channel*	
Photograph details include IGR or approximate location.	

* Select as appropriate

	Present?					
	Yes	No		Grid Reference of specific pressure	No.of Photographs	Comments
Source of Erosion						
Bank erosion						
Land clearance						
In river clearance						
Arable ploughing						
Animal trampling						
Fords						
Channel manipulation						
Hard bank protection measures						
Other sources						
Overall Risk	High	Medium	Low			
Diffuse Nutrient						
Arable						
Grazing						
Improved grassland						
Silage						
Forestry						
Housing						
Industry and associated works						
Other sources						
Overall Risk	High	Medium	Low			
Diffuse Silt						
Arable						
Grazing						
Over-grazing						
Improved grassland (Re-seeding)						
Forest						
Silage						
Industry						
Construction stages						
Housing						
Infilling						
Peat cutting						
Quarries						
Other sources						
Overall Risk	High	Medium	Low			

	Present?					
	Yes	No		Grid Reference of specific pressure	No.of Photographs	Comments
Current Riparian Zone						
Fencing						
Buffer						
Tree line at bank						
Tree line buffer						
Plantation with no buffer						
Urbanisation						
Flood protection						
Marshy land						
Landuse at bank						
Other sources						
Overall Risk	High	Medium	Low			
Field Drainage						
Ditch managed						
Ditch unmanaged						
Drainage on high slope						
Drainage on low slope						
Land drainage (perforated pipes)						
Other sources						
Overall Risk	High	Medium	Low			
Outfalls						
Industrial discharges						
Storm drains						
Culvert outfalls						
Other sources						
Overall Risk	High	Medium	Low			
Abstractions						
Small						
Large						
Overall Risk	High	Medium	Low			
Barriers to migration						
Culverts						
Bridge aprons						
Weirs						
Stone weirs						
Other sources						
Overall Risk	High	Medium	Low			