NS 2 FRESHWATER PEARL MUSSEL SUB-BASIN MANAGEMENT PLANS

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

September 2009

TABLE OF CONTENTS

INTRODUCTION

In order to assess the hydromorphological alterations within the Currane 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 7 11th 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 Currane 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 1 indicates where the Currane morphology RHAT assessments were carried out throughout the catchment.

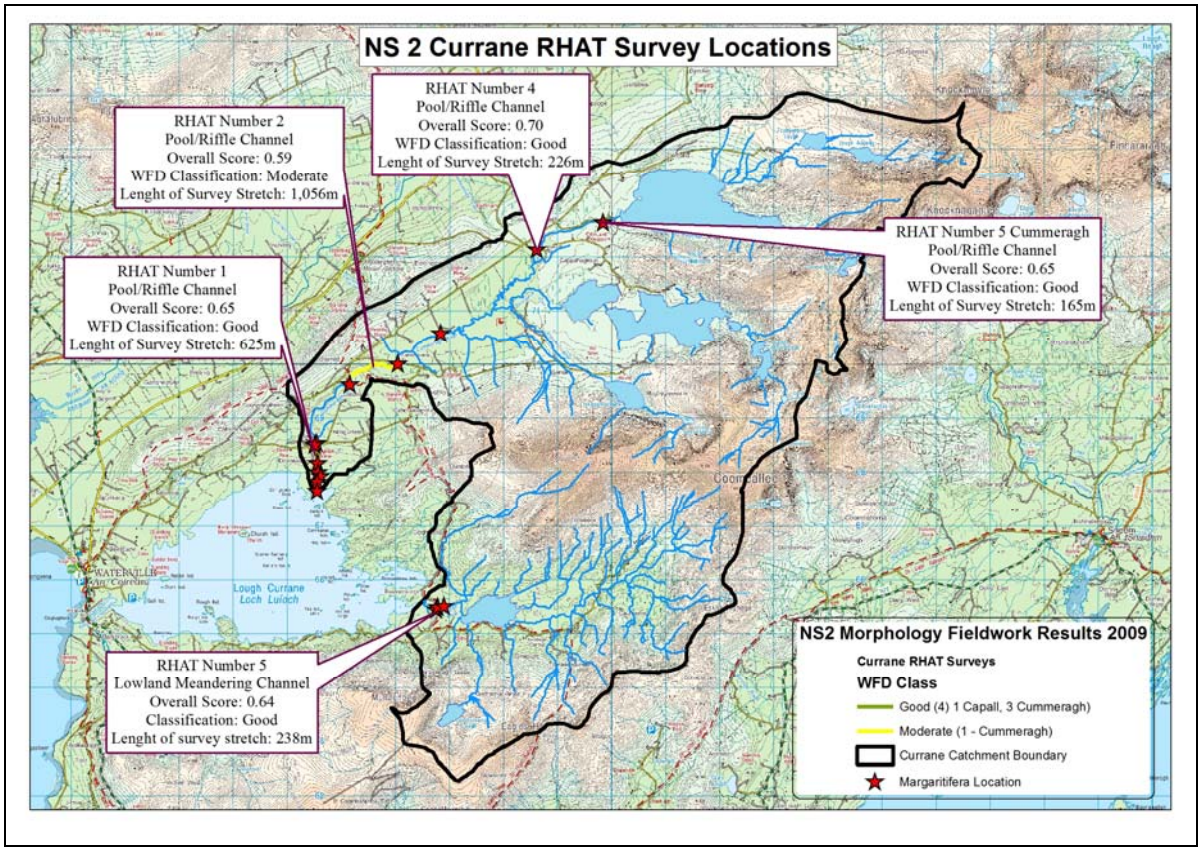


Figure 1 Morphology RHAT Assessment Locations

(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

Five RHAT surveys were carried out throughout the Currane catchment, 4 in the Cummeragh sub-catchment and one in the Cappal sub-catchment. The results of these surveys can be found in the electronic appendix. Four were deemed to be at Good status, two in the upper reaches of the catchment on the Cummeragh at the outlet from Derriana Lough. Despite the good status result for Site 4 many pressures were noted along this stretch. In particular, improved grassland, animal trampling and forestry. Many of the attributes scored low in particular the bank structure and stability which only scored 1.5 for both the left and right bank. This was due to the trampling and

poaching along the riparian zone. The channel vegetation also scored low as the % cover of *Ranunculus* along the channel was more than expected for a pool-riffle channel, <40% was recorded at this point. The riparian landcover also scored quite low as peat cutting and forestry activities were recorded along the survey stretch. Site 5, which is located above site 4 on the Cummeragh nearer to Derriana Lough was also classified as good despite the presence of a stone wall for approx. 40m of the stretch which has lead to the removal of the bank side vegetation. The riparian landcover also scored low as a hatchery was found on the right bank. The substrate condition in the vicinity of the hatchery was quite poor with <50% cover of filamentous algae recorded.

Farther down the Cummeragh again on the main channel RHAT Number 2 covered a 1,056m stretch which was classified as being at moderate status. This is largely due to the excessive coverage of *Ranunculus* and Filamentous Algae along the entire survey stretch as can be seen in Site 2, Photo 18. The channel vegetation attribute was scored zero out of four as a result. The bank structure & stability together with the bank vegetation both scored 1 as again both were found to be in very poor condition with trampling, slumping and poaching all evident along the entire stretch. (Site 2, Photo 9 & 22). The riparian land cover along this stretch has been significantly disrupted in the past. Poaching and trampling have occurred but more recently set back fencing has been fitted. More recently the gorse has been burnt on the right bank (Site 2, Photo 15) with bank erosion occurring all along the left bank. Overall, this stretch has many pressures and impacts acting on the channel which is evident from the catchment walkovers. The levels of both rooted macrophytes and macroalgae are above what would be expected for a channel of this type.

RHAT Number 1 was carried out at the downstream end of the catchment before the Cummeragh flows into Lough Currane. This stretch began at Dromkeare Bridge where the road and the bridge were subsiding. The left bank has been reinforced to give support to the bridge which is leading to a loss of habitat for the pearl mussels which have been recorded at this location. Towards the end of the survey stretch a mink farm, **Willow Herb Ltd.** is located on the left bank with very little buffer zone between the facility and the river. Numerous dead mussels were found along this stretch, with the substrate in a very poor condition. Filamentous algae was found to have <50% coverage, trucks were being washed in the yard adjacent to the main river channel while the survey was being undertaken with a foul smell coming from the facility. Animal

trampling and siltation was also an issue along the stretch. Both solid and liquid waste from the mink farm is spread on lands within the Waterville area.

Representative photographs from reach:

RHAT 4, Site 4, Photo 4 	**RHAT 4, Site 4, Photo 5** 
RHAT 5, Site 5, Photo 2 	**RHAT, Site 5, Photo 4** 

RHAT 2, Site 2 Photo 18 	**RHAT 2, Site 2 Photo 9** 
RHAT 2, Site 2 Photo 22 	**RHAT 2, Site 2 Photo 15** 
RHAT 1, Site 1 Photo 6 	**RHAT 1, Site 1 Photo 10** 

Details in relation to photographs are tabulated in Appendix 2.

3.1 Catchment Walkover Risk Assessment Results

A total of thirteen sites were surveyed in the Currane Sub-basin catchment; five within the Capall and seven within the Cummeragh with two stopping points. **Figure 2** outlines the stopping point locations together with the High to Low Risk Assessment from the Catchment Walkover Risk Assessments. Within the Capall catchment three high risk sites were recorded out of the five that were assessed. Of the two remaining one site was recorded as medium risk, meaning one low risk site was recorded within this catchment. Figure 3 outlines the percentage of sites classified at high, medium and low risk throughout the catchment. The most common high risk categories identified were:

- Current Riparian Zone – at 67% of high risk sites,
- Field Drainage – at 67% of high risk sites.

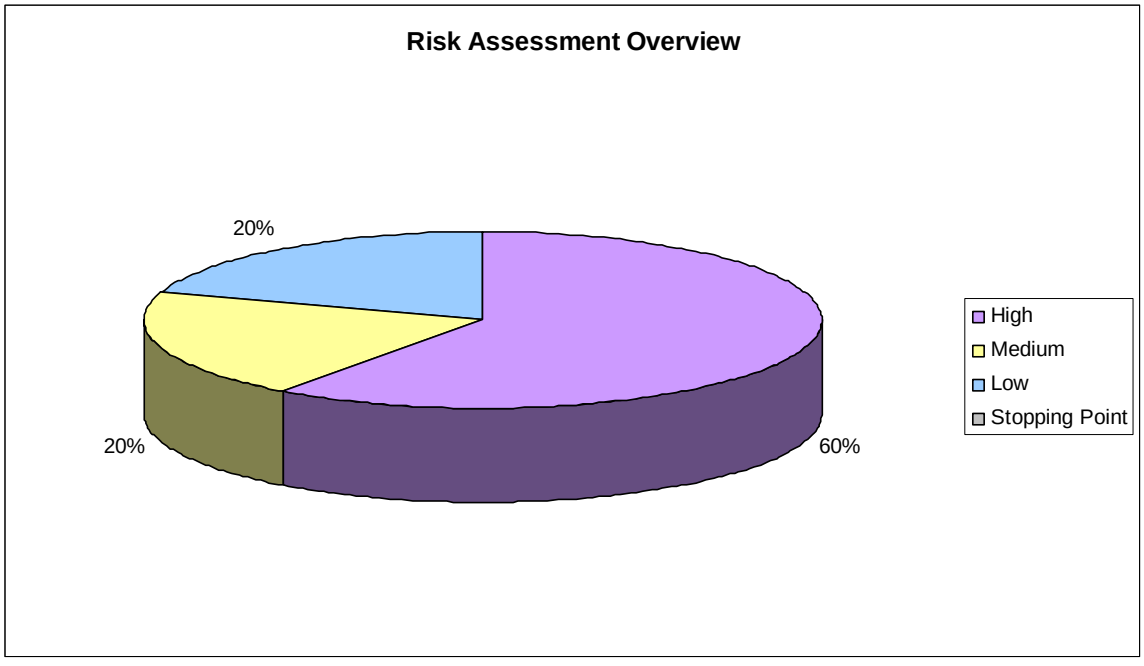


Figure 2 Risk Assessment Overview

The break-down of high risk categories leading to a high risk site are shown in **Figure 4**.

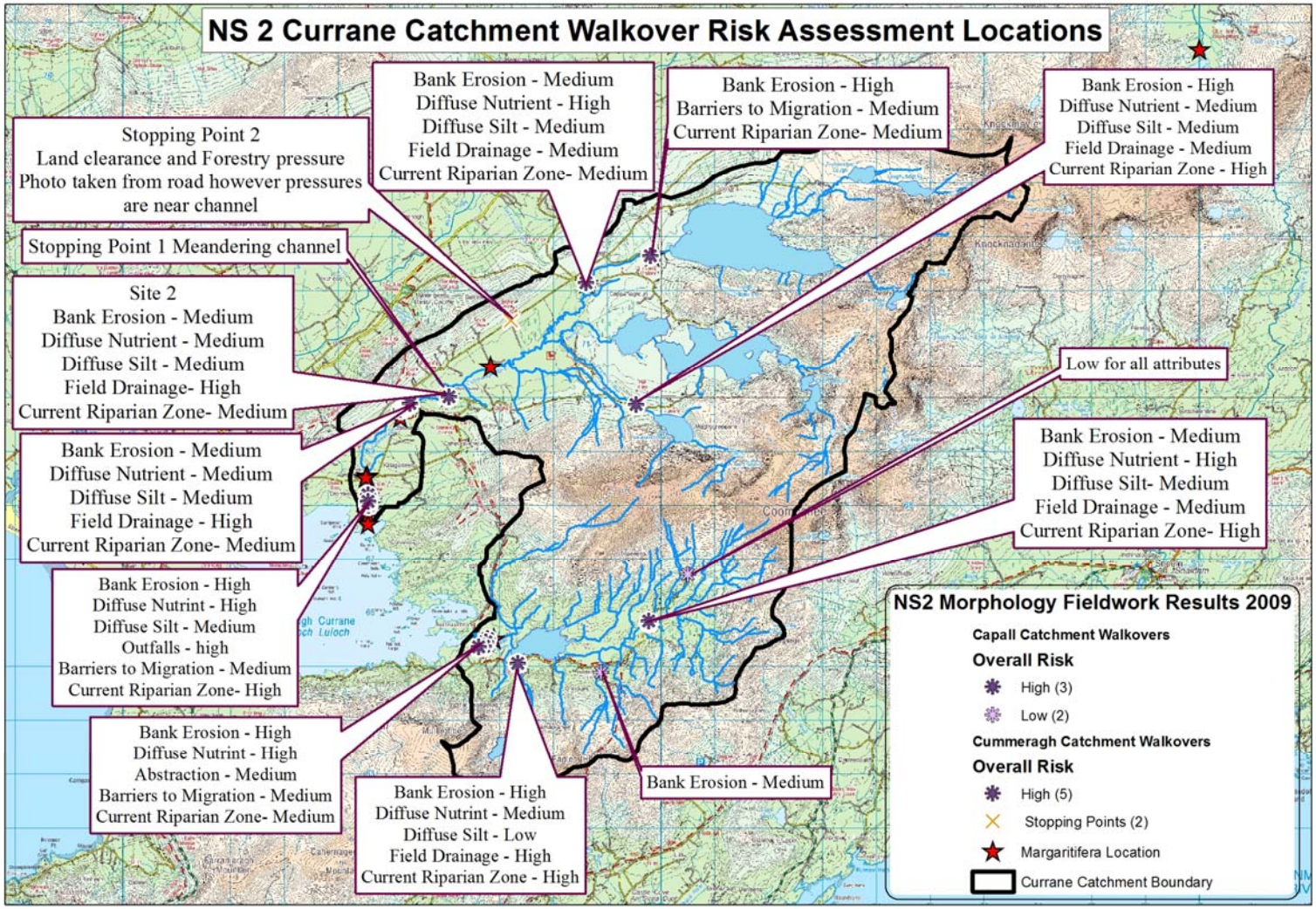


Figure 3 Location of Stopping points and Catchment Walkover Risk Assessments

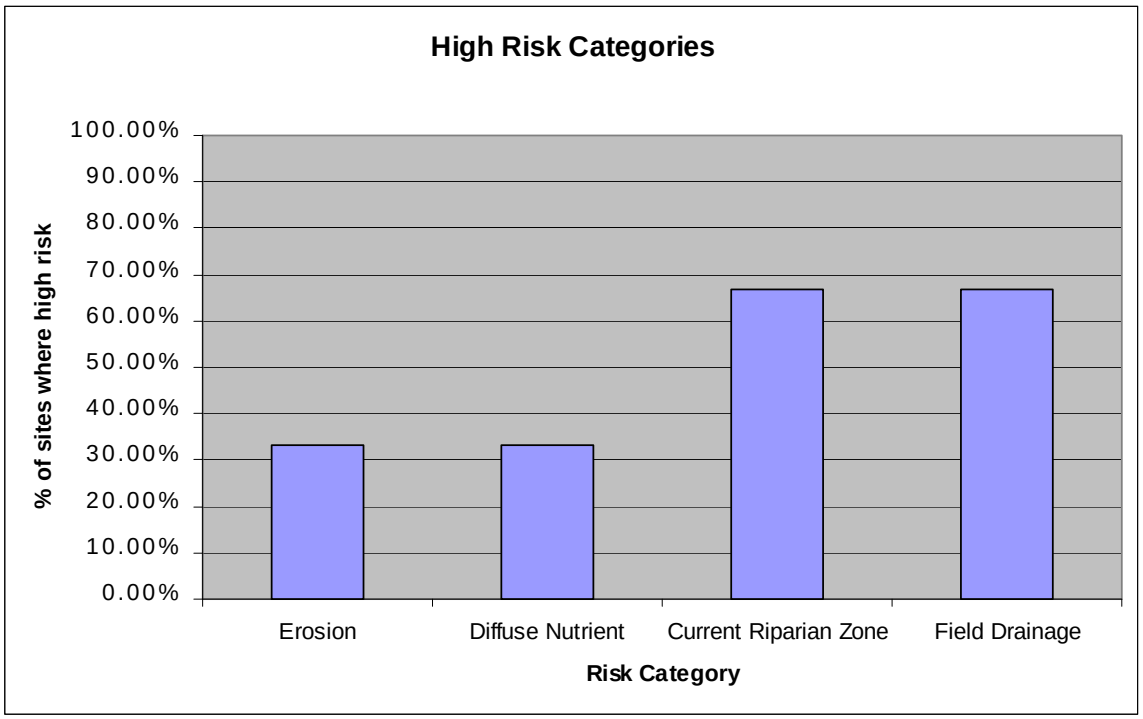


Figure 4 Break-down of High Risk categories

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 focusing 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

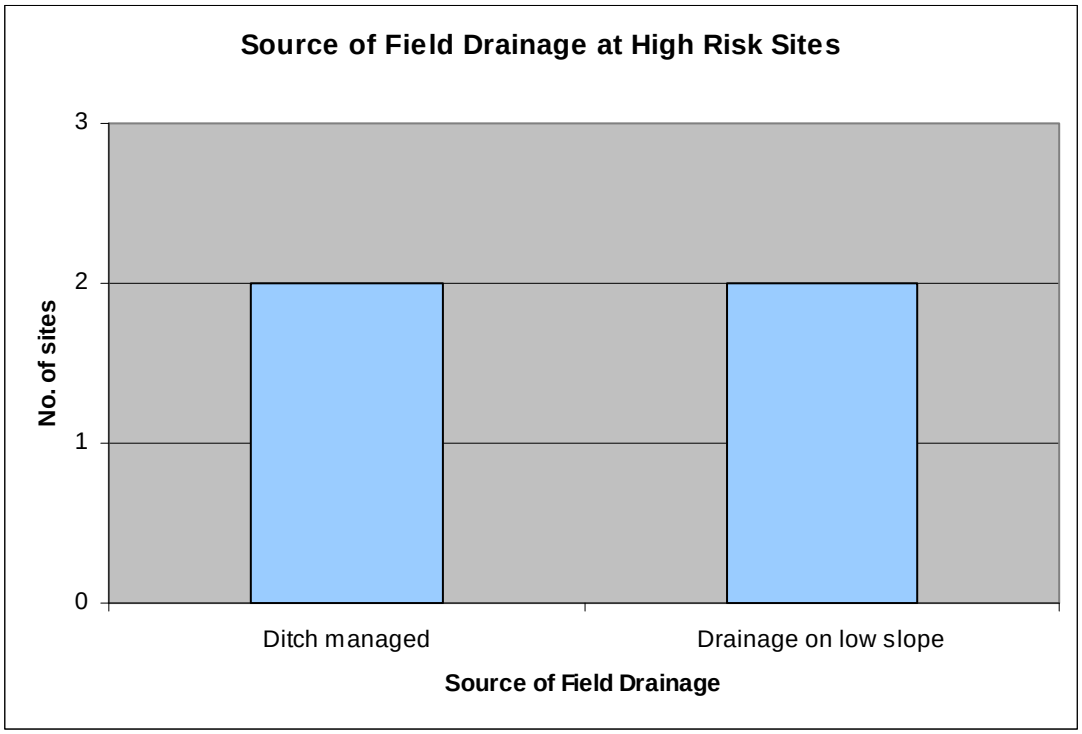
- Plantation with no buffer
- Urbanisation
- Flood Protection
- Marshy Land
- Landuse at bank
- Other Sources

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. It is apparent that the current riparian zone is an issue that must be dealt with within this catchment. The lack of an effective riparian buffer can intensify the impact of other pressures. The main risks associated with the riparian buffer in this catchment were:

- A complete lack of fencing on one or more banks on grazing land – in particular this has created greater risk from erosion from trampling, diffuse nutrient from animals having direct access to the channel.
- A lack of adequate buffer or tree line where the channel comes in close contact with forestry or grazing land; intensifying the impact from erosion and diffuse nutrient particularly during tree-felling.

The most common sources of field drainage at high risk sites were managed ditches and drainage on a low slope; with each being high risk at two sites.

Figure 5 Source of field drainage at high risk sites



All five sites were classified as high risk within the Cummeragh catchment. **Figure 6** outlines the percentage of sites classified at high risk together with the number of stopping points throughout the catchment. The most common high risk categories identified were:

- Erosion – evident at 60% of high risk sites,
- Diffuse Nutrient – evident at 40% of high risk sites,
- Current riparian zone – evident at 40% of high risk sites.

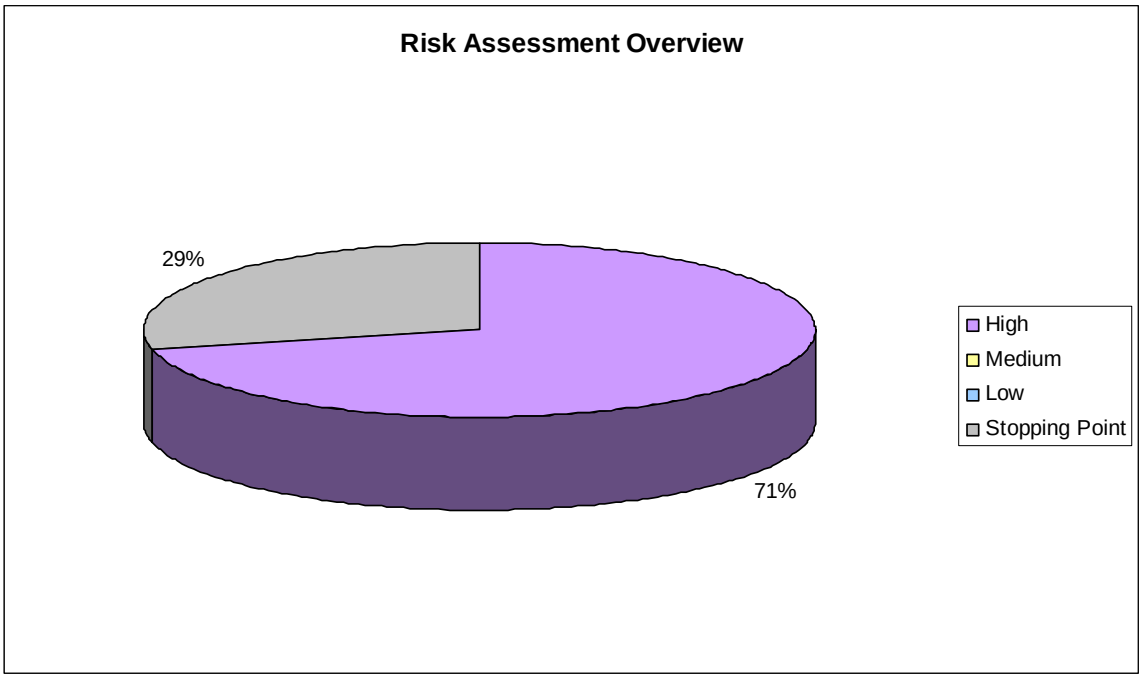


Figure 6 Risk Assessment Overview

The breakdown of pressure categories identified as high risk are outlined in **Figure 7**

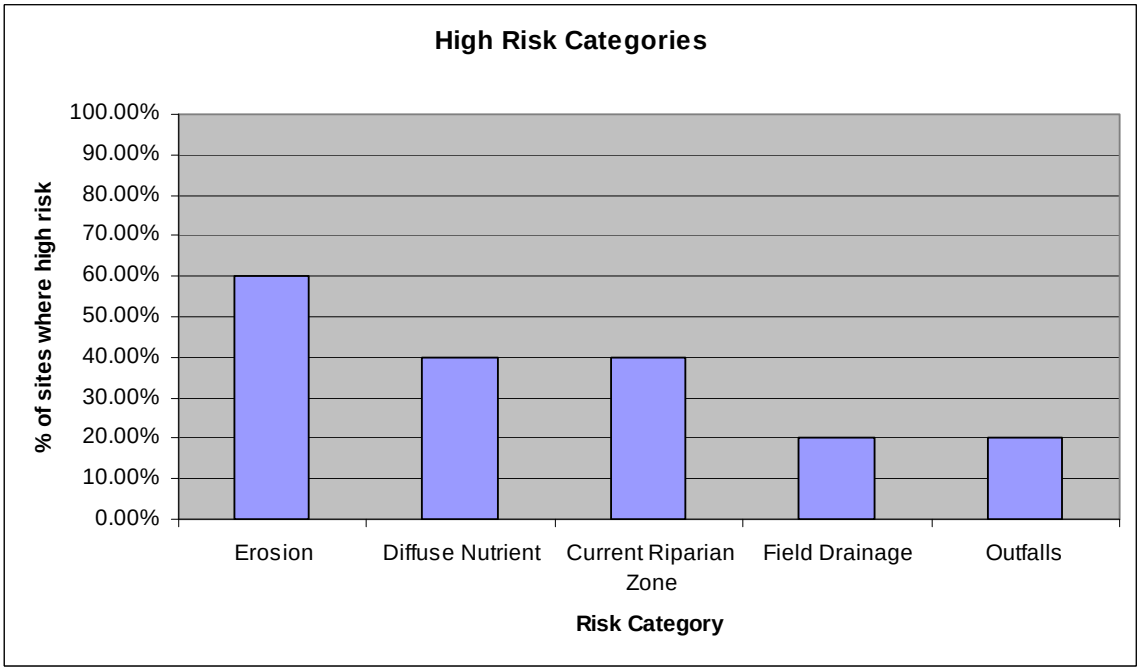


Figure 7 Breakdown of high risk categories

The most common sources of erosion are animal trampling, channel manipulation and bank protection measures each evident at two of the three high risk sites. The additional sources of high risk erosion are shown in **Figure 7.**

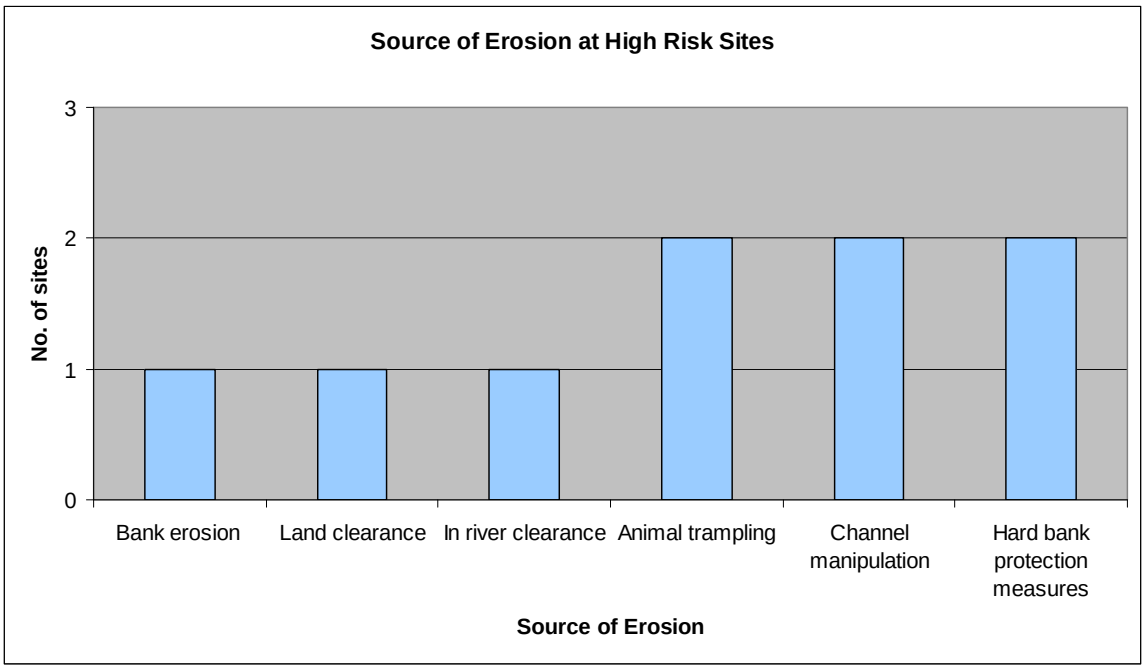


Figure 8 Sources of erosion at high risk sites

It is evident that the current riparian zone category is also a pressure within this catchment, however this pressure generally relates to how a poor riparian zone can intensify other pressures e.g. increased erosion from animal trampling caused by a lack of fencing. Quantitative statistics do not successfully display the pressures created by a poor riparian buffer as they are linked with other pressure categories. The main issue identified within this catchment which lead to a high risk riparian zone was:

- Insufficient fencing giving animals direct access to the channel – increased the pressure of erosion from trampling on banks, increased nutrient enrichment from animals being within or very close to channel.

4.0 CONCLUSIONS

The Capall sub-basin catchment is one of the smallest Freshwater Pearl Mussel sub-basin catchments in Ireland at only 2, 406ha; as such only five risk assessments were carried out. Only one of the risk assessments was undertaken in a location where Freshwater Pearl Mussel populations have been recorded, at the Capall River downstream of Isknagahiny Lough, (high risk for both current riparian zone and field drainage.) The remaining sites were surveyed upstream of Isknaghiny Lough, with the single low risk site located upstream of the risk assessment sites.

The Cummeragh sub-basin catchment is in a poor condition with all risk assessments classified as high risk in addition to pressures being identified through the catchment walkovers at the stopping points. Two risk assessments were carried out in locations where Freshwater Pearl Mussel populations are known to exist both were classified as high risk. Erosion and diffuse nutrient have both been identified as significant pressures within the catchment, intensified by the lack of effective riparian buffer. Investigations should be carried out to assess the impact from the mink farm as a source of point source pollution due to its extremely close proximity to a pearl mussel location.

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 Currane 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	Capall	Trib	60502	66712	1	Low	Low	Low	Low	Low	Low	Low	Low	Low	Inflowing trib
1	Capall	Trib	60502	66712	2	Low	Low	Low	Low	Low	Low	Low	Low	Low	Forestry plantation - intact
1	Capall	Trib	60502	66712	3	Low	Low	Low	Low	Low	Low	Low	Low	Low	Substrate condition
1	Capall	Trib	60502	66712	4	Low	Low	Low	Low	Low	Low	Low	Low	Low	Good substrate condition
2	Capall	Trib	59766	65815	1	Medium	High	Medium	Medium	Low	Low	Low	High	High	Looking upstream from road bridge
2	Capall	Trib	59766	65815	2	Medium	High	Medium	Medium	Low	Low	Low	High	High	Looking downstream from road bridge
2	Capall	Trib	59775	65843	3	Medium	High	Medium	Medium	Low	Low	Low	High	High	Inflowing trib
2	Capall	Trib	59775	65843	4	Medium	High	Medium	Medium	Low	Low	Low	High	High	Reinforced right bank leading up to bridge
2	Capall	Trib	59775	65843	5	Medium	High	Medium	Medium	Low	Low	Low	High	High	Tree line at bank
2	Capall	Trib	59775	65843	6	Medium	High	Medium	Medium	Low	Low	Low	High	High	Very poor substrate condition
2	Capall	Trib	59775	65843	7	Medium	High	Medium	Medium	Low	Low	Low	High	High	Filamentous algae & silt on substrate
2	Capall	Trib	59775	65843	8	Medium	High	Medium	Medium	Low	Low	Low	High	High	Forestry buffer approx. 3 metres from left bank.
3	Capall	Trib	58882	64895	1	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Looking upstream from bridge
3	Capall	Trib	58882	64895	2	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Looking upstream from bridge
3	Capall	Trib	58882	64895	3	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Looking downstream from bridge
3	Capall	Trib	58882	64895	4	Medium	Low	Low	Low	Low	Low	Low	Low	Low	FGA on boulders, cobbles
3	Capall	Trib	58882	64895	5	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Three round concrete culverts
3	Capall	Trib	58882	64895	6	Medium	Low	Low	Low	Low	Low	Low	Low	Low	1+ fish in stream upstream from bridge

4	Capall	Trib	57334	65070	1	High	Medium	Low	High	Low	Low	Low	High	High	Looking downstream from road bridge
4	Capall	Trib	57334	65070	2	High	Medium	Low	High	Low	Low	Low	High	High	Bank erosion on right bank, downstream from bridge
4	Capall	Trib	57334	65070	3	High	Medium	Low	High	Low	Low	Low	High	High	Managed drain entering on right bank, downstream of bridge
4	Capall	Trib	57334	65070	4	High	Medium	Low	High	Low	Low	Low	High	High	No fencing off of sheep on right bank
4	Capall	Trib	57334	65070	5	High	Medium	Low	High	Low	Low	Low	High	High	Bridge Structure
4	Capall	Trib	57342	65059	6	High	Medium	Low	High	Low	Low	Low	High	High	Looking upstream from bridge
4	Capall	Trib	57342	65059	7	High	Medium	Low	High	Low	Low	Low	High	High	Very poor substrate condition, >80% FGA
4	Capall	Trib	57342	65059	8	High	Medium	Low	High	Low	Low	Low	High	High	FGA
5	Capall	Capall bridge	56773	65516	1	High	High	Low	Low	Low	Medium	Medium	Medium	High	Looking upstream from bridge
5	Capall	Capall bridge	56773	65516	2	High	High	Low	Low	Low	Medium	Medium	Medium	High	Filamentous algae on substrate & attached to *myriophyllum*
5	Capall	Capall bridge	56773	65516	3	High	High	Low	Low	Low	Medium	Medium	Medium	High	Looking downstream from bridge
5	Capall	Capall bridge	56773	65516	4	High	High	Low	Low	Low	Medium	Medium	Medium	High	Bridge Structure
5	Capall	Capall bridge	56746	65462	5	High	High	Low	Low	Low	Medium	Medium	Medium	High	Set back forestry
5	Capall	Capall bridge	56746	65462	6	High	High	Low	Low	Low	Medium	Medium	Medium	High	Set back forestry
5	Capall	Capall bridge	56704	65374	7	High	High	Low	Low	Low	Medium	Medium	Medium	High	Portion of river which widens
5	Capall	Capall bridge	56704	65374	8	High	High	Low	Low	Low	Medium	Medium	Medium	High	Inflowing main drain on left bank
5	Capall	Capall bridge	56616	65367	9	High	High	Low	Low	Low	Medium	Medium	Medium	High	Inflowing managed drain
5	Capall	Capall bridge	56616	65367	10	High	High	Low	Low	Low	Medium	Medium	Medium	High	*Potomagetans* in channel
5	Capall	Capall bridge	56616	65367	11	High	High	Low	Low	Low	Medium	Medium	Medium	High	Forestry coupe

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	Cummeragh	Main Channel at Dromkeare	54551	68207	1	High	High	Medium	Low	High	Low	Medium	High	High	Dead mussel on left bank
1	Cummeragh	Main Channel at Dromkeare	54557	68024	2	High	High	Medium	Low	High	Low	Medium	High	High	Looking upstream from starting point
1	Cummeragh	Main Channel at Dromkeare	54557	68199	3	High	High	Medium	Low	High	Low	Medium	High	High	Looking downstream from starting point
1	Cummeragh	Main Channel at Dromkeare	54557	68199	4	High	High	Medium	Low	High	Low	Medium	High	High	Cattle poaching on left bank. Siltation in substrate at this point.
1	Cummeragh	Main Channel at Dromkeare	54558	68081	5	High	High	Medium	Low	High	Low	Medium	High	High	Meat factory on right bank
1	Cummeragh	Main Channel at Dromkeare	54558	68081	6	High	High	Medium	Low	High	Low	Medium	High	High	Meat factory on right bank
1	Cummeragh	Main Channel at Dromkeare	54558	68081	7	High	High	Medium	Low	High	Low	Medium	High	High	Very old footbridge leading to factory
1	Cummeragh	Main Channel at Dromkeare	54558	68081	8	High	High	Medium	Low	High	Low	Medium	High	High	Reinforcement at bridge
1	Cummeragh	Main Channel at Dromkeare	54560	68059	9	High	High	Medium	Low	High	Low	Medium	High	High	Stone weir possibly placed by fisheries
1	Cummeragh	Main Channel at Dromkeare	54560	68059	10	High	High	Medium	Low	High	Low	Medium	High	High	Very poor substrate condition downstream of factory
1	Cummeragh	Main Channel at Dromkeare	54568	68001	11	High	High	Medium	Low	High	Low	Medium	High	High	Filamentous green algae across channel
1	Cummeragh	Main Channel at Dromkeare	54568	68001	12	High	High	Medium	Low	High	Low	Medium	High	High	Dead mussel
1	Cummeragh	Main Channel at Dromkeare	54568	68001	13	High	High	Medium	Low	High	Low	Medium	High	High	Dead mussel
1	Cummeragh	Main Channel at Dromkeare	54558	68081	14	High	High	Medium	Low	High	Low	Medium	High	High	Truck washing at factory

1	Cummeragh	Main Channel at Dromkeare	54558	68081	15	High	High	Medium	Low	High	Low	Medium	High	High	Old animal facility opposite foot bridge to factory
1	Cummeragh	Main Channel at Dromkeare	54558	68081	16	High	High	Medium	Low	High	Low	Medium	High	High	Subsiding road & bridge
1	Cummeragh	Main Channel at Dromkeare	54558	68081	17	High	High	Medium	Low	High	Low	Medium	High	High	Bridge has subsided into river on right bank
1	Cummeragh	Main Channel at Dromkeare	54558	68081	18	High	High	Medium	Low	High	Low	Medium	High	High	Reinforcement at left bank for bridge, loss of pearl mussel habitat
SP 1	Cummeragh	Cahersavane Bridge	56023	70028	1										Overview of river meandering
SP 2	Cummeragh	Cahersavane Bridge	56023	70028	2										Forestry on one bank, rough grazing on the other bank
SP 3	Cummeragh	Cahersavane Bridge	56023	70028	3										Overview of river meandering
2	Cummeragh	Main Channel north of Lislonane	55171	69788	1	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Looking upstream
2	Cummeragh	Main Channel north of Lislonane	55171	69788	2	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Looking downstream
2	Cummeragh	Main Channel north of Lislonane	55171	69788	3	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Burnt furze bush on left bank
2	Cummeragh	Main Channel north of Lislonane	55235	69840	4	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Excessive *ranunculus* growth across channel
2	Cummeragh	Main Channel north of Lislonane	55235	69840	5	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Excessive *ranunculus* growth across channel
2	Cummeragh	Main Channel north of Lislonane	55235	69840	6	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Erosion on left bank
2	Cummeragh	Main Channel north of Lislonane	55273	69871	7	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Poor substrate condition

2	Cummeragh	Main Channel north of Lislonane	55279	69877	8	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Incoming tributary where siltation and poaching are present
2	Cummeragh	Main Channel north of Lislonane	55279	69877	9	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Incoming tributary where siltation and poaching are present
2	Cummeragh	Main Channel north of Lislonane	55279	69877	10	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Incoming tributary where siltation and poaching are present
2	Cummeragh	Main Channel north of Lislonane	55308	69897	11	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Set back fencing present but heavy trampling occurred prior to fencing
2	Cummeragh	Main Channel north of Lislonane	55308	69897	12	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Set back fencing present but heavy trampling occurred prior to fencing
2	Cummeragh	Main Channel north of Lislonane	55332	69893	13	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Filamentous green algae, Mryophillum & Ranunculus across channel
2	Cummeragh	Main Channel north of Lislonane	55332	69893	14	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Filamentous green algae, Mryophillum & Ranunculus across channel
2	Cummeragh	Main Channel north of Lislonane	55332	69893	15	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Overview of section
2	Cummeragh	Main Channel north of Lislonane	55332	69893	16	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Overview of section
2	Cummeragh	Main Channel north of Lislonane	55332	69893	17	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Overview of section
2	Cummeragh	Main Channel north of Lislonane	56062	70023	18	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Looking downstream from end point at Cahersavane Bridge
2	Cummeragh	Main Channel north of Lislonane	56062	70023	19	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Looking upstream from end point at Cahersavane Bridge

2	Cummeragh	Main Channel north of Lislonane	56062	70023	20	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Bank erosion & loss of habitat due to bridge structure on both left and right banks
2	Cummeragh	Main Channel north of Lislonane	56062	70023	21	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Bank erosion & loss of habitat due to bridge structure on both left and right banks
2	Cummeragh	Main Channel north of Lislonane	56062	70023	22	Medium	Medium	Medium	High	Low	Low	Low	Medium	High	Forestry set back from right bank
3	Cummeragh	Inflowing Trib: Oweveen River	59533	69872	1	High	Medium	Medium	Medium	Low	Low	Low	High	High	Poor substrate condition
3	Cummeragh	Inflowing Trib: Oweveen River	59533	69872	2	High	Medium	Medium	Medium	Low	Low	Low	High	High	Poaching from sheep on left bank
3	Cummeragh	Inflowing Trib: Oweveen River	59533	69872	3	High	Medium	Medium	Medium	Low	Low	Low	High	High	Heavily grassed on left bank
3	Cummeragh	Inflowing Trib: Oweveen River	59533	69872	4	High	Medium	Medium	Medium	Low	Low	Low	High	High	Reinforced left bank at bridge
3	Cummeragh	Inflowing Trib: Oweveen River	59533	69872	5	High	Medium	Medium	Medium	Low	Low	Low	High	High	Bridge structure
3	Cummeragh	Inflowing Trib: Oweveen River	59533	69872	6	High	Medium	Medium	Medium	Low	Low	Low	High	High	Filamentous green algae in excess, 100% of channel
3	Cummeragh	Inflowing Trib: Oweveen River	59532	69881	7	High	Medium	Medium	Medium	Low	Low	Low	High	High	Overgrazed by sheep
SP 2	Cummeragh	Main Channel South-West of Cummeragh Bridge	57211	71438	1										Overview of forestry and land clearance
SP 3	Cummeragh	Main Channel	57211	71438	2										Peat cutting/ bogland

		South-West of Cummeragh Bridge													
SP 4	Cummeragh	Main Channel South-West of Cummeragh Bridge	57211	71438	3										Agricultural activity at base of mountain
SP 5	Cummeragh	Main Channel South-West of Cummeragh Bridge	57211	71438	4										Forestry intact
4	Cummeragh	Main Channel at Cummeragh Bridge	58607	72143	1	Medium	High	Medium	Medium	Low	Low	Low	Medium	High	Waterville fisheries sign
4	Cummeragh	Main Channel at Cummeragh Bridge	58607	72143	2	Medium	High	Medium	Medium	Low	Low	Low	Medium	High	Looking upstream from bridge
4	Cummeragh	Main Channel at Cummeragh Bridge	58607	72143	3	Medium	High	Medium	Medium	Low	Low	Low	Medium	High	Looking downstream from bridge
4	Cummeragh	Main Channel at Cummeragh Bridge	58607	72143	4	Medium	High	Medium	Medium	Low	Low	Low	Medium	High	Poaching on left bank upstream from bridge
4	Cummeragh	Main Channel at Cummeragh Bridge	58607	72143	5	Medium	High	Medium	Medium	Low	Low	Low	Medium	High	Ranunculus growth
4	Cummeragh	Main Channel at Cummeragh Bridge	58607	72143	6	Medium	High	Medium	Medium	Low	Low	Low	Medium	High	Digger plus land clearance on right bank upstream of bridge
4	Cummeragh	Main Channel at Cummeragh Bridge	58607	72143	7	Medium	High	Medium	Medium	Low	Low	Low	Medium	High	Looking downstream from bridge peat on left bank forestry downstream
5	Cummeragh	Main Channel at Clod	59804	72643	1	High	Low	Low	Low	Low	Low	Medium	Medium	High	Stone weirs looking upstream
5	Cummeragh	Main Channel at	59804	72643	2	High	Low	Low	Low	Low	Low	Medium	Medium	High	Stone weirs looking downstream

		Clod													
5	Cummeragh	Main Channel at Clod	59804	72643	3	High	Low	Low	Low	Low	Low	Medium	Medium	High	Old stone wall on right bank
5	Cummeragh	Main Channel at Clod	59804	72643	4	High	Low	Low	Low	Low	Low	Medium	Medium	High	Very poor substrate condition
5	Cummeragh	Main Channel at Clod	59804	72643	5	High	Low	Low	Low	Low	Low	Medium	Medium	High	Hatchery
5	Cummeragh	Main Channel at Clod	59804	72643	6	High	Low	Low	Low	Low	Low	Medium	Medium	High	Hatchery

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			