NS 2 FRESHWATER PEARL MUSSEL SUB-BASIN MANAGEMENT PLANS

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

September 2009

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INTRODUCTION

In order to assess the hydromorphological alterations within the Allow 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 22nd 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 Allow 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 Allow morphology RHAT assessments were carried out throughout the catchment.

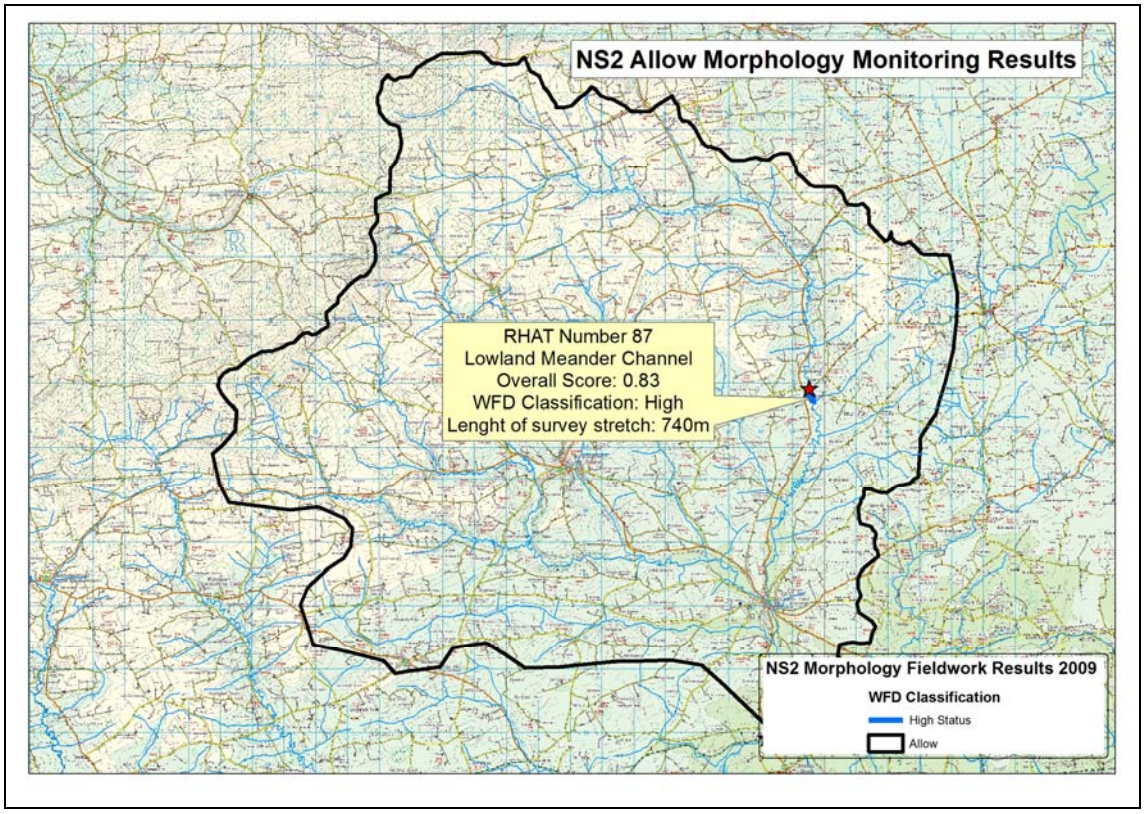


Figure 1 Morphology RHAT Assessment Locations

(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

Due to the single location of pearl mussels within the Allow catchment only one RHAT surveys were carried out. The results of this survey can be found in the electronic appendix. This site was deemed to be at high status scoring 0.83 despite the presence of abundant *Ranunculus* growth at the beginning of the survey at John's Bridge. At this point suspended solids were also noted. It is a lowland meandering channel with occasional pool/riffle sections. The lowest scoring attributes along this stretch were the channel vegetation, substrate condition, riparian landcover and bank vegetation. The two lowest scoring attributes were the substrate condition and the riparian landover both scoring two out of four. This was largely due to the presence of fine sediment at the beginning of the survey stretch together with a bacterial floc which was found covering

the substrate also at the beginning of the survey stretch. (See Photo 13). The Riaprian Landcover attribute was also marked down due to the presence of cattle access with noted trampling and/or poaching along on of the banks. Along some of the survey stretch there was also a very poor buffer zone. (See photo 15). Although these attributes scored low the overall stretch was still classified as being at high status as the pressures recorded were quite localised.

Both dead and live mussels were noted in the channel see photos 9 & 11.

Representative photographs from reach:

RHAT 87 Site 87 photo 3 	**RHAT 87 Site 87 Photo 9** 
RHAT 87 Site 87 Photo 11 	**RHAT 87 Site 87 Photo 13** 

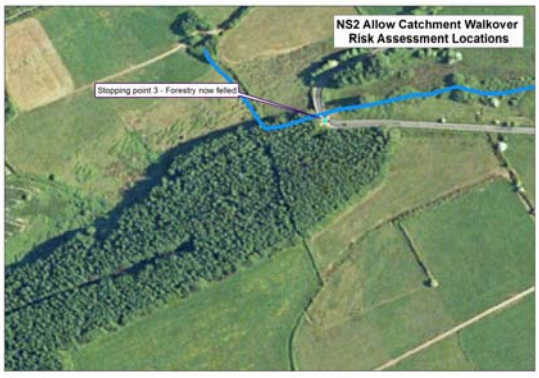
RHAT 87 Site 87 Photo 15	RHAT 87 Site 87 Photo 1
	

Details in relation to photographs are tabulated in Appendix 2.

3.1 Catchment Walkover Risk Assessment Results

A total of 19 sites were surveyed in the Allow Sub-basin catchment; with a risk assessment carried out at 15 of theses sites (Three stopping points). **Figure 2** outlines the stopping point locations together with the High to Low Risk Assessment from the Catchment Walkover Risk Assessments. Eight out of the 15 sites were considered to be high risk with seven classified as medium risk, and two were determined to be low risk. At stopping point 3 a clear felled area was recorded along the riparian zone of the river on the right bank. This area of forestry was recently felled up to the banks of the small tributary with very little buffer zone. From the 2005 aerial imagery we can see the intact forestry coupe and from stopping point 3 photo 4 we can see the felling which has taken place along the steep slopes of the right bank.

Location of Stopping point 3



Stopping point 3 photo 4 - clear felled slope on right bank

Stopping point 3 photo 2 - clear felling on right bank

Figure 3 outlines the percentage at high, medium and low risk sites throughout the catchment together with the number of stopping points.

The most common high risks categories identified were:

- Diffuse Nutrient, Diffuse Silt and Field Drainage which were all evident at 20% of high risk sites. This is not a very high percentage in comparison with other catchments.

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. Although only 13% of high risk sites were as a result of the current riparian zone attribute, 27% of the medium risk sites were as a result of a poor riparian zone. Figure 3 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 3** indicates the percentage of stopping points also.

3.2 Fords

Two Fords were located within the Allow catchment during the course of the catchment walkover risk assessments. The first was located at Site 2 – Doctor's Hill Bridge. This is a significant vehicular ford crossing with tyre marks present leading up to and into the channel.

Site 2 Photo 3 Entrance to Ford	**Site 2 Photo 10 Entrance & Exit point of Ford**
	

A second ford was found just downstream of Kiskeem Bridge at site 4. Again this Ford appears to have both vehicular and animal access across the channel.

Site 4 Ford Crossing	Site 5 Photo 7
	

The third ford was found at site 5 just upstream of Clamper Bridge. It doesn't appear to be used as frequently as the fords which were found at Site 2 and 4, however, it does still appear to have vehicular access on some occasions.

3.3 Nutrient Input

A number of point source pressures were also recorded throughout the catchment. They include Munster Joinery, Newmarket Co-Op and Kanturk Creamery. Throughout the Allow catchment levels of macrophytes and filamentous green algae were found to be abundant and excessive in some instances. The intensive industries located within this catchment may be adding to the nutrient input and therefore increasing the macrophyte and macroalgae growth. In particular, Newmarket Co-Op appears to be having a particular impact on the rampart stream. High levels of *Callitriche* and *filamentous green algae* were found within the channels adjacent to the Newmarket co-op. At the back of this factory a foul smell was found coming from the facility together with a discharge containing fine silts. In Kanturk the sewage discharge point was located downstream of the bridge with filamentous green algae growth and grey water discharge noted.

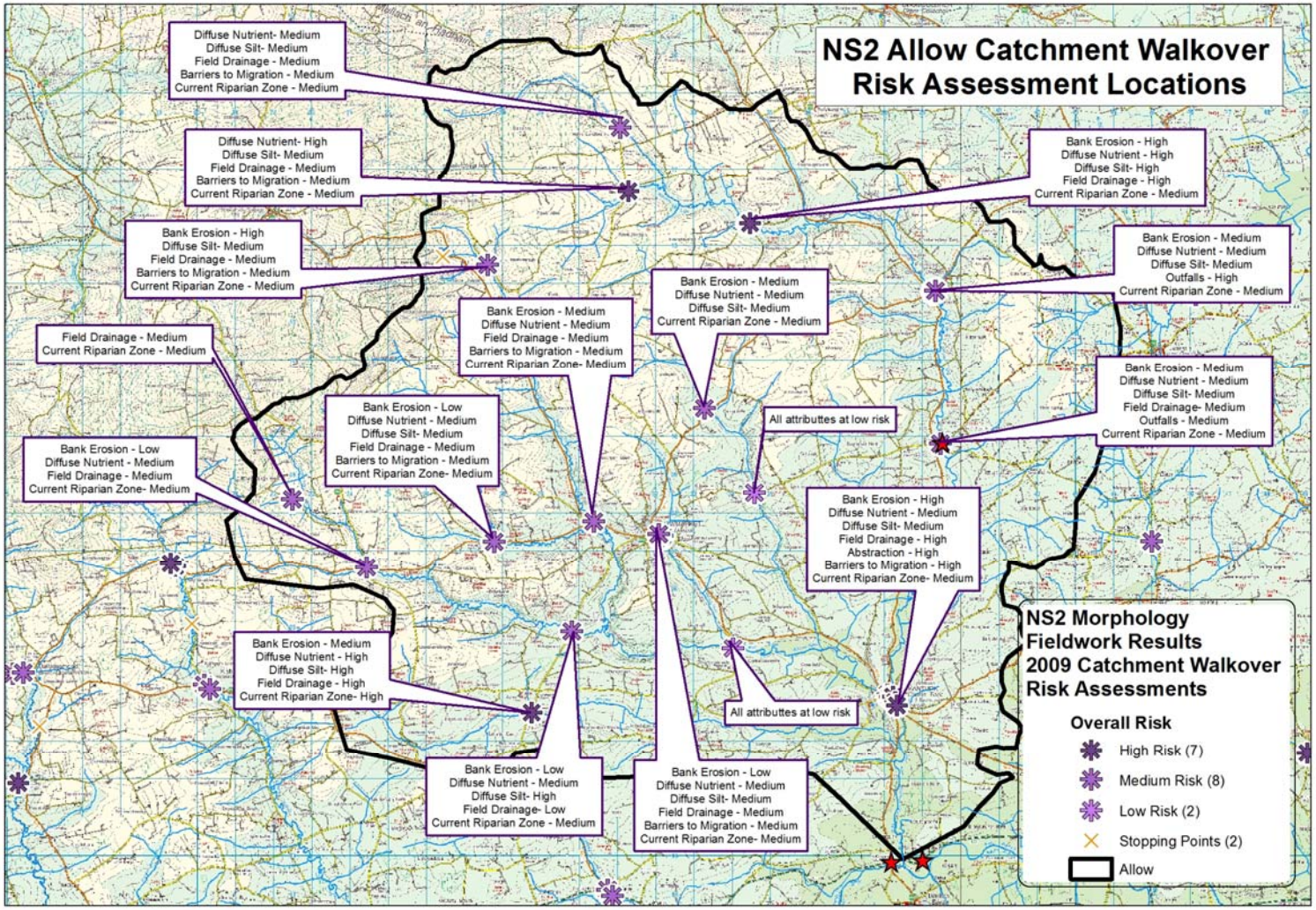


Figure 2 Location of Stopping points and Catchment Walkover Risk Assessment

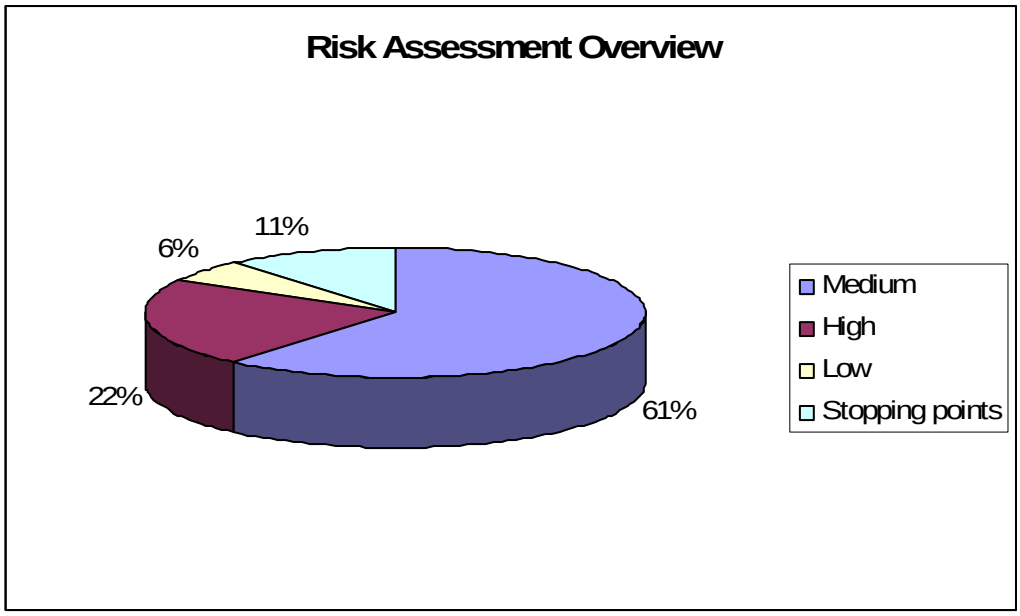
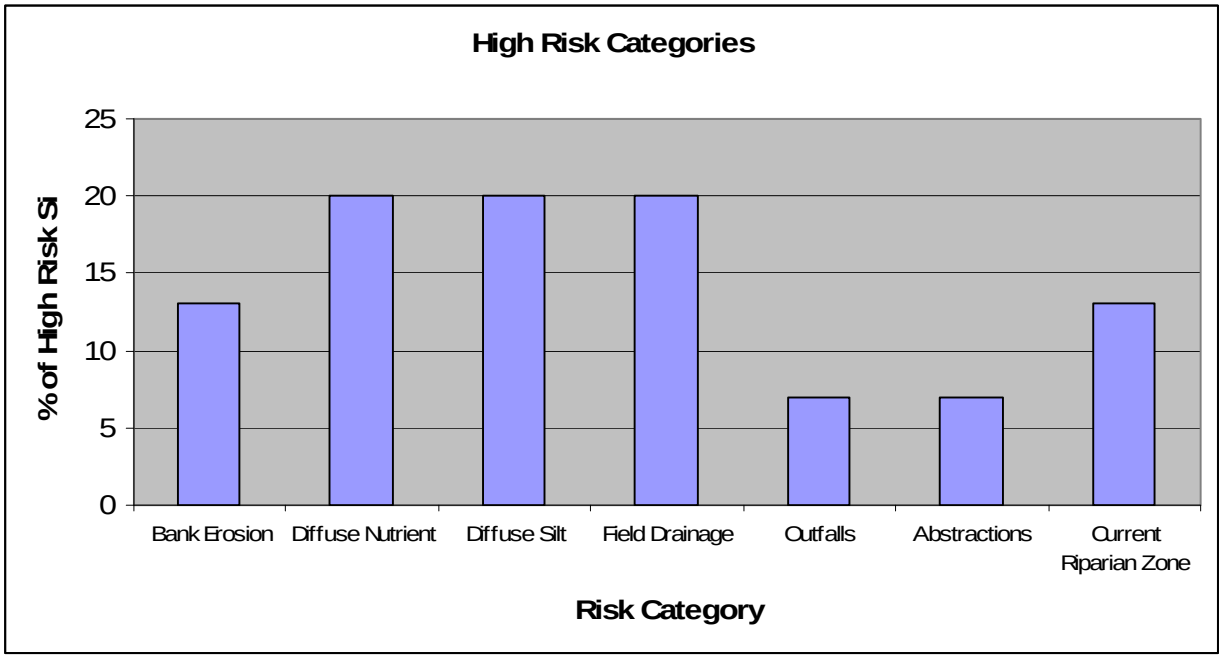


Figure 3 Risk Assessment Overview

The break-down of pressure categories identified as high risk are outlined in Figure 3

Figure 4 Breakdown of High Risk Categories



4.0 CONCLUSIONS

The Allow sub-basin catchment lies within the overall Munster Blackwater catchment. The Allow contains many of the headwaters which feed into the larger Blackwater catchment. In general, high to medium risk assessments were found throughout the catchment both on the tributaries and the main channels. Three fords were located throughout the catchment all with vehicular access which is a direct source of silt to the river channel. Throughout the catchment high levels of macrophytes and macroalgae were recorded which indicate not only a siltation issues but also a nutrient issue as the luxuriant growth was found to be “choking” the channel in many instances.

The pressures within the Allow catchment are also a direct link to the impacts within the Munster Blackwater as the rivers feed into this catchment.

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 Allow 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	Abstractions	Barrier to Migration	Current Riparian Zone	Overall Risk*	Pressures
6	Allow	Owenkeal River	122500	108340	1	Low	Low	Low	Medium	Low	Low	Low	Medium	Medium	Looking upstream from bridge
6	Allow	Owenkeal River	122505	108341	2	Low	Low	Low	Medium	Low	Low	Low	Medium	Medium	Looking downstream from bridge
6	Allow	Owenkeal River	122505	108341	3	Low	Low	Low	Medium	Low	Low	Low	Medium	Medium	Pipe crossing river channel at bridge
6	Allow	Owenkeal River	122499	108391	4	Low	Low	Low	Medium	Low	Low	Low	Medium	Medium	Eroding bank
6	Allow	Owenkeal River	122505	108342	5	Low	Low	Low	Medium	Low	Low	Low	Medium	Medium	New deciduous forest on edge of conifer plantation
7	Allow	Owenkeal River	124447	106567	1	Low	Medium	Low	Medium	Low	Low	Low	Medium	Medium	Looking upstream of bridge, silty/sandy substrate
7	Allow	Owenkeal River	124447	106567	2	Low	Medium	Low	Medium	Low	Low	Low	Medium	Medium	Looking downstream of bridge
7	Allow	Owenkeal River	124447	106567	3	Low	Medium	Low	Medium	Low	Low	Low	Medium	Medium	Left bank, downstream, back yard of house facing out onto channel
7	Allow	Owenkeal River	124447	106567	4	Low	Medium	Low	Medium	Low	Low	Low	Medium	Medium	Small quarry/gravel extraction point 10m from bridge across road on left bank upstream
7	Allow	Owenkeal River	124447	106567	5	Low	Medium	Low	Medium	Low	Low	Low	Medium	Medium	Possible pumping house on left bank upstream
7	Allow	Owenkeal River	124447	106567	6	Low	Medium	Low	Medium	Low	Low	Low	Medium	Medium	Farm shop/co-operative on right bank upstream
8	Allow	Rampart Stream	132142	107339	1	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Culverted area upstream of

															road, 3 round culverts
8	Allow	Rampart Stream	132142	107339	2	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Culverted drain entering on right bank
8	Allow	Rampart Stream	132142	107339	3	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Looking upstream from left bank
8	Allow	Rampart Stream	132142	107339	4	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Drain feeding in from back of main channel
8	Allow	Rampart Stream	132142	107339	5	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Excessive Callitriche growth in main channel
8	Allow	Rampart Stream	132187	107382	6	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Artificial stone weir
8	Allow	Rampart Stream	132183	107376	7	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	2nd Artificial Stone weir
8	Allow	Rampart Stream	132186	107400	8	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	3rd Artificial stone weir
8	Allow	Rampart Stream	132108	107425	9	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Culvert & outfall at back of factory- foul smell
8	Allow	Rampart Stream	132099	107442	10	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Aeration tanks from fertiliser plant
9	Allow	Dalua River, Aldworth	130403	107778	1	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Looking downstream from bridge, excessive ranunculus growth
9	Allow	Dalua River, Aldworth	130403	107778	2	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Looking upstream from bridge excessive macrophyte growth
9	Allow	Dalua River, Aldworth	130403	107778	3	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Reinforced toe
9	Allow	Dalua River, Aldworth	130403	107778	4	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Trampling on bank
10	Allow	Glenlara River	127789	107244	1	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Looking upstream from bridge, some macrophyte growth
10	Allow	Glenlara River	127789	107244	2	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Forestry approx. 1 km upstream

10	Allow	Glenlara River	127789	107244	3	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	View looking downstream from bridge
10	Allow	Glenlara River	127789	107244	4	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	View looking downstream from bridge
10	Allow	Glenlara River	127765	107248	5	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Possible pumping station on right bank
10	Allow	Glenlara River	127789	107244	6	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Land clearance approx 150m from left bank for house
11	Allow	Tributary of Dalua -	127612	114488	1	High	Low	Medium	Medium	Low	Low	Medium	Medium	Medium	Looking upstream with some bankside trampling
11	Allow	Tributary of Dalua -	127612	114488	2	High	Low	Medium	Medium	Low	Low	Medium	Medium	Medium	Tracks leading into channel
11	Allow	Tributary of Dalua -	127612	114488	3	High	Low	Medium	Medium	Low	Low	Medium	Medium	Medium	Tracks right up to and into channel
11	Allow	Tributary of Dalua -	127612	114488	4	High	Low	Medium	Medium	Low	Low	Medium	Medium	Medium	View downstream
11	Allow	Tributary of Dalua -	127612	114488	5	High	Low	Medium	Medium	Low	Low	Medium	Medium	Medium	Build up of silt on left bank
11	Allow	Tributary of Dalua -	127612	114488	6	High	Low	Medium	Medium	Low	Low	Medium	Medium	Medium	Overview of felled area at stopping point 3
12	Allow	Allow Headwaters	131305	116423	1	Low	High	Medium	Medium	Low	Low	Medium	Medium	High	View downstream from bridge
12	Allow	Allow Headwaters	131305	116423	2	Low	High	Medium	Medium	Low	Low	Medium	Medium	High	View upstream from bridge
12	Allow	Allow Headwaters	131305	116423	3	Low	High	Medium	Medium	Low	Low	Medium	Medium	High	Slurry spreading upstream
12	Allow	Allow Headwaters	131305	116423	4	Low	High	Medium	Medium	Low	Low	Medium	Medium	High	Slurry spreading upstream
12	Allow	Allow Headwaters	131305	116423	5	Low	High	Medium	Medium	Low	Low	Medium	Medium	High	Joining trib upstream
13	Allow	Glashwee Bridge	131088	118098	1	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	View downstream from bridge
13	Allow	Glashwee Bridge	131088	118098	2	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Drain on left bank downstream with FGA growth
13	Allow	Glashwee Bridge	131088	118098	3	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	View upstream
13	Allow	Glashwee	131088	118098	4	Low	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Trampling on left

		Bridge													bank upstream
14	Allow	Kanturk	138101	103237	1	High	Medium	Medium	High	Low	High	High	Medium	High	View upstream from survey point
14	Allow	Kanturk	138101	103237	2	High	Medium	Medium	High	Low	High	High	Medium	High	Downstream from point
14	Allow	Kanturk	138101	103237	3	High	Medium	Medium	High	Low	High	High	Medium	High	H.Balsam on right bank
14	Allow	Kanturk	138101	103237	4	High	Medium	Medium	High	Low	High	High	Medium	High	Bridge structure
14	Allow	Kanturk	138152	103174	5	High	Medium	Medium	High	Low	High	High	Medium	High	Significant bridge apron
14	Allow	Kanturk	138152	103174	6	High	Medium	Medium	High	Low	High	High	Medium	High	Significant bridge apron
14	Allow	Kanturk	138152	103174	7	High	Medium	Medium	High	Low	High	High	Medium	High	View downstream from bridge, concrete wall on right bank
14	Allow	Kanturk	138225	103182	8	High	Medium	Medium	High	Low	High	High	Medium	High	Creamery on right bank downstream
14	Allow	Kanturk	138225	103182	9	High	Medium	Medium	High	Low	High	High	Medium	High	View upstream from second bridge
14	Allow	Kanturk	138225	103182	10	High	Medium	Medium	High	Low	High	High	Medium	High	View upstream from second bridge on right bank
14	Allow	Kanturk	138225	103182	11	High	Medium	Medium	High	Low	High	High	Medium	High	View upstream from bridge on left bank
14	Allow	Kanturk	138225	103182	12	High	Medium	Medium	High	Low	High	High	Medium	High	View downstream from bridge, macrophyte growth across channel
14	Allow	Kanturk	138241	103169	13	High	Medium	Medium	High	Low	High	High	Medium	High	Raw sewage outfall on left bank, FGA growth on wall and substrate
14	Allow	Kanturk	138241	103169	14	High	Medium	Medium	High	Low	High	High	Medium	High	Raw sewage outfall on left bank, FGA growth on wall and substrate
14	Allow	Kanturk	138302	103029	15	High	Medium	Medium	High	Low	High	High	Medium	High	Placed stone weir in line with

															creamery
14	Allow	Kanturk	138302	103029	16	High	Medium	Medium	High	Low	High	High	Medium	High	Leaking tank and outfalls from creamery
14	Allow	Kanturk	138302	103029	17	High	Medium	Medium	High	Low	High	High	Medium	High	Overview of creamery
14	Allow	Kanturk	138340	102944	18	High	Medium	Medium	High	Low	High	High	Medium	High	Second placed stone weir
15	Allow	Allow Bridge	139307	113770	1	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	Looking downstream from Bridge
15	Allow	Allow Bridge	139307	113770	2	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	Freemount WWTP
15	Allow	Allow Bridge	139307	113770	3	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	Looking upstream from bridge
15	Allow	Allow Bridge	139307	113770	4	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	Forestry upstream on right bank
15	Allow	Allow Bridge	139294	113772	5	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	Possible abstraction pipe
15	Allow	Allow Bridge	139362	113820	6	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	Possible WWTP
15	Allow	Allow Bridge	139307	113770	7	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	Local School adjacent to channel
15	Allow	Allow Bridge	139310	113814	8	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	Septic tank inspection chamber
15	Allow	Allow Bridge	139347	113825	9	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	School pipes
15	Allow	Allow Bridge	139350	113816	10	Medium	Medium	Medium	Low	High	Low	Low	Medium	Medium	Freemount WWTP signage
16	Allow	Ballynaguilla Bridge	134428	115536	1	High	High	High	High	Low	Low	Low	High	High	Slumping on the left bank
16	Allow	Ballynaguilla Bridge	134428	115536	2	High	High	High	High	Low	Low	Low	High	High	Upstream right bank trampling, cattle acessing the river
16	Allow	Ballynaguilla Bridge	134428	115536	3	High	High	High	High	Low	Low	Low	High	High	Left bank cattle trampling
16	Allow	Ballynaguilla Bridge	134428	115536	4	High	High	High	High	Low	Low	Low	High	High	Looking downstream from bridge, deposition
16	Allow	Ballynaguilla Bridge	134428	115536	5	High	High	High	High	Low	Low	Low	High	High	Forestry downstream on the left bank
16	Allow	Ballynaguilla Bridge	134455	115561	6	High	High	High	High	Low	Low	Low	High	High	Drainage ditch

16	Allow	Ballynaguilla Bridge	134480	115577	7	High	High	High	High	Low	Low	Low	High	High	Drainage ditch
16	Allow	Ballynaguilla Bridge	134480	115577	8	High	High	High	High	Low	Low	Low	High	High	Drainage ditch
16	Allow	Ballynaguilla Bridge	134488	115583	9	High	High	High	High	Low	Low	Low	High	High	House - See Allow photo observation 4 from November surveys.Drain dug to allow run-off from site development to
17	Allow	Barleyhill Bridge	133294	110721	1	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Macrophyte growth in channel
17	Allow	Barleyhill Bridge	133294	110721	2	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Looking upstream from bridge
17	Allow	Barleyhill Bridge	133294	110721	3	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Trampling on left bank
18	Allow	Priory Bridge	134608	108520	1	Low	Low	Low	Low	Low	Low	Low	Low	Low	Looking upstream from bridge
18	Allow	Priory Bridge	134608	108520	2	Low	Low	Low	Low	Low	Low	Low	Low	Low	Dumping in channel
18	Allow	Priory Bridge	134608	108520	3	Low	Low	Low	Low	Low	Low	Low	Low	Low	Unmamaged drain entering on right bank
18	Allow	Priory Bridge	134608	108520	4	Low	Low	Low	Low	Low	Low	Low	Low	Low	Just downstream from bridge
19	Allow	Long Bridge	129819	104871	1	Low	Medium	High	Low	Low	Low	Low	Medium	Medium	Stained channel
19	Allow	Long Bridge	129819	104871	2	Low	Medium	High	Low	Low	Low	Low	Medium	Medium	Overhanging vegetation
19	Allow	Long Bridge	129819	104871	3	Low	Medium	High	Low	Low	Low	Low	Medium	Medium	Forestry downstream on left bank
19	Allow	Long Bridge	129819	104871	4	Low	Medium	High	Low	Low	Low	Low	Medium	Medium	Forestry downstream on left bank
20	Allow	Brogeen Bridge	128767	102754	1	Medium	High	High	High	Low	Low	Low	High	High	Cattle drinking access in channel
20	Allow	Brogeen Bridge	128767	102754	2	Medium	High	High	High	Low	Low	Low	High	High	Tree line plantation
20	Allow	Brogeen Bridge	128767	102754	3	Medium	High	High	High	Low	Low	Low	High	High	Poaching on left bank
20	Allow	Brogeen Bridge	128767	102754	4	Medium	High	High	High	Low	Low	Low	High	High	Unmanaged ditch entering on right bank

20	Allow	Brogeen Bridge	128767	102754	5	Medium	High	High	High	Low	Low	Low	High	High	Eroding banks
20	Allow	Brogeen Bridge	128767	102754	6	Medium	High	High	High	Low	Low	Low	High	High	New conifer tree line downstream from bridge on left bank
20	Allow	Brogeen Bridge	128767	102754	7	Medium	High	High	High	Low	Low	Low	High	High	Unmanaged drainage ditch flowing along field into left bank
20	Allow	Brogeen Bridge	128767	102754	8	Medium	High	High	High	Low	Low	Low	High	High	Unmanaged drain flowing along field entering on left bank
20	Allow	Brogeen Bridge	128767	102754	9	Medium	High	High	High	Low	Low	Low	High	High	Green Belt Ltd Signage
0	Allow	Allen's Bridge	134039	104432	1	Low	Low	Low	Low	Low	Low	Low	Low	Low	View looking upstream from bridge
0	Allow	Allen's Bridge	134039	104432	2	Low	Low	Low	Low	Low	Low	Low	Low	Low	View looking downstream from bridge
87	Allow	John's Bridge	139478	109804	1	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Looking downstream from bridge
87	Allow	John's Bridge	139478	109804	2	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Looking upstream from bridge, excessive macrophyte growth
87	Allow	John's Bridge	139478	109804	3	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Excessive Ranunculus growth upstream of bridge
87	Allow	John's Bridge	139478	109804	4	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Bridge structure
87	Allow	John's Bridge	139478	109804	5	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Dead mussel in channel
87	Allow	John's Bridge	139478	109804	6	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Dead mussel in channel
87	Allow	John's Bridge	139478	109804	7	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Dead mussel in channel
87	Allow	John's Bridge	139478	109804	8	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Approx. 10 live mussels and a recent dead mussel at this point

87	Allow	John's Bridge	139478	109804	9	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Approx. 10 live mussels and a recent dead mussel at this point
87	Allow	John's Bridge	139478	109804	10	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Approx. 10 live mussels and a recent dead mussel at this point
87	Allow	John's Bridge	139478	109804	11	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Approx. 10 live mussels and a recent dead mussel at this point
87	Allow	John's Bridge	139478	109804	12	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Algae on right bank
87	Allow	John's Bridge	139478	109804	13	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Algae on right bank
87	Allow	John's Bridge	139478	109804	14	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Storm drain on right bank. Ranunculus growth in channel at this point.
87	Allow	John's Bridge	139478	109804	15	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Significant cattle poaching on left bank
87	Allow	John's Bridge	139478	109804	16	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	End point of survey looking upstream
87	Allow	John's Bridge	139478	109804	17	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	End point of survey looking downstream
SP	Allow		126444	114710	1										Clear felled area on right bank

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			