UKTAG River Assessment Method

Benthic Invertebrate Fauna

Invertebrates (General Degradation): Whalley, Hawkes, Paisley & Trigg (WHPT) metric in River Invertebrate Classification Tool (RICT)

by

Water Framework Directive – United Kingdom Technical Advisory Group (WFD-UKTAG)

Publisher: **Water Framework Directive – United Kingdom Advisory Group (WFD-UKTAG)**
c/o SEPA
Strathallan House
Castle Business Park
Stirling
FK9 4TZ
Scotland
www.wfduk.org

July 2014

ISBN: 978-1-906934-49-1

Health and safety statement

WARNING. Working in or around water is inherently dangerous; persons using this standard should be familiar with normal laboratory and field practice. This published monitoring system does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate health and safety practices and to ensure compliance with any national regulatory guidelines.

It is also the responsibility of the user if seeking to practise the method outlined here, to gain appropriate permissions for access to water courses and their biological sampling.

UKTAG Guide to Invertebrates in Rivers

Invertebrates (General Degradation): Whalley, Hawkes, Paisley & Trigg (WHPT) metric in River Invertebrate Classification Tool (RICT)

1 Introduction

This classification method enables the assessment of invertebrates in rivers (in relation to general degradation, including organic pollution) according to the requirements of the Water Framework Directive (WFD). WHPT metrics replace the BMWP (Biological Monitoring Working Party) metrics used for status classifications in the first river basin planning cycle. Whalley & Hawkes (1996 &1997) and Paisley *et al.* (2007) give a description of the WHPT index, and its derivation.

The River Invertebrate Classification Tool (RICT) (Davy–Bowker et al (2007)) is used to contextualize WHPT scores, by using a RIVPACS (River Invertebrate Prediction And Classification System (Wright (1997)) model to predict site specific reference values and provide a WFD compliant probabilistic classification.

RICT is a web-served application, accessed via the SEPA website, together with copies of the manual, guidance & background documents. Intending users should be aware training is available within the UK environmental regulatory agencies and from the FBA.

1.1 Metrics

The classification comprises two metrics that are assessed separately and then combined in a “worst of” approach to provide the overall invertebrate classification;

WHPT ASPT (Average Score Per Taxon)

WHPT NTAXA (Number of taxa contributing to the assessment)

RICT output includes an EQR, a face value classification and an estimate of the probability of the result belonging to any of the WFD classes. This is provided individually for both of the metrics.

For the purposes of WFD Assessment, WHPT ASPT is applied as an abundance weighted metric.

Ecological Quality Ratios (EQRs) are derived from both of the metrics by RICT, based on observed data and site specific predicted reference values derived from physical and chemical parameters listed in Table 1 below.

Table 1: Predictive variables for RICT

Invariant data	Variant data*
NGR	*Alkalinity*
Slope	*Mean Width*
Discharge Category	*Mean Depth*
Distance from source	*% Boulders/cobbles*
Altitude	*% Pebbles/gravel*
	% Sand
	% Silt/clay

*See EU- STAR website for details on how to obtain variable data.

1.2 Environmental pressures to which the method is sensitive

The method has been primarily designed to respond to organic pollution, however it is suitable for monitoring other types of impact, and is used for assessing the classification parameter “General degradation”.

1.3 Geographic application

This assessment method is appropriate for UK river waters, provided suitable analogue sites exist in the RICT reference database (see Davy-Bowker *et al.* (2012)). For the purposes of WFD, this means that reliance should only be placed on classifications with site suitability codes of 1-3. The method is not suitable for assessment of artificial water bodies such as canals or for temporary watercourses such as winterbournes.

1.4 Intercalibration

This is a process whereby all European Member States were required to compare WFD status classification boundary values for each biological quality element (e.g. phytoplankton, macrophytes) to ensure compatible levels are set across all countries. The process involved some adjustments of class boundary values for many of the classification tools in use and this process has influenced some of the calculations used in the WHPT method. Note that only WHPT ASPT has been intercalibrated. Once a classification method has been intercalibrated, the method and boundaries must be adhered to by Member States for the purposes of WFD assessment and reporting.

Intercalibration focussed on the EQRs that define the boundaries between High and Good (H/G) and between Good and Moderate (G/M).

1.5 Sample frequency

For a site to be classified, two macro–invertebrate samples and associated environmental measurements should be collected per year. Samples should be collected in the spring (01-March – 31-May) and autumn (01-September – 31 November). Sites may be classified using invertebrate data from one, two or three years.

1.6 Sample and associated data collection and analysis

The sampling methods used should be compliant with:

- BS EN 27828:1994, ISO 7828-1985 Water quality. Methods for biological testing. Methods of biological sampling: guidance on hand-net sampling of aquatic benthic macro-invertebrates; and/or
- BS EN ISO 9391:1995, BS 6068-5.15:1995 Water quality. Sampling in deep water for macro-invertebrates. Guidance on the use of colonization, qualitative and quantitative samplers.

Samples and associated data should be collected according to standard RIVPACS (River Prediction and Classification System) procedures, see EU-STAR (2004). The guidance includes macro-invertebrate analysis methods. Macro invertebrate samples should be analysed to RIVPACS taxonomic-level TL2 (Davy-Bowker *et al*., 2010) together with associated log abundances (Table 2), or analysed further, then aggregated to this level.

Table 2: WHPT logarithmic abundance categories

Abundance category	Numerical Abundance
AB1	*1-9*
AB2	*10 – 99*
AB3	*100 – 999*
AB4	*>1000*

2 Procedures for calculating EQRs and generating site/water body classifications

The following sections outline how WHPT EQRs are calculated. Once the two WHPT metrics have been calculated for observed samples, site specific reference values and probabilistic classifications are generated in RICT.

2.1.1 Calculate observed WHPT (ASPT & NTAXA)

For each macro-invertebrate sample calculate WHPT ASPT and WHPT NTAXA.

WHPT ASPT is derived as follows:

WHPT ASPT = Sum AB / WHPT NTAXA

Where AB = value for each taxon according to its abundance, derived from Table 1 and Appendix 1. NTAXA is the number of taxa contributing to the assessment.

A worked example of WHPT index calculation is shown in Appendix 2.

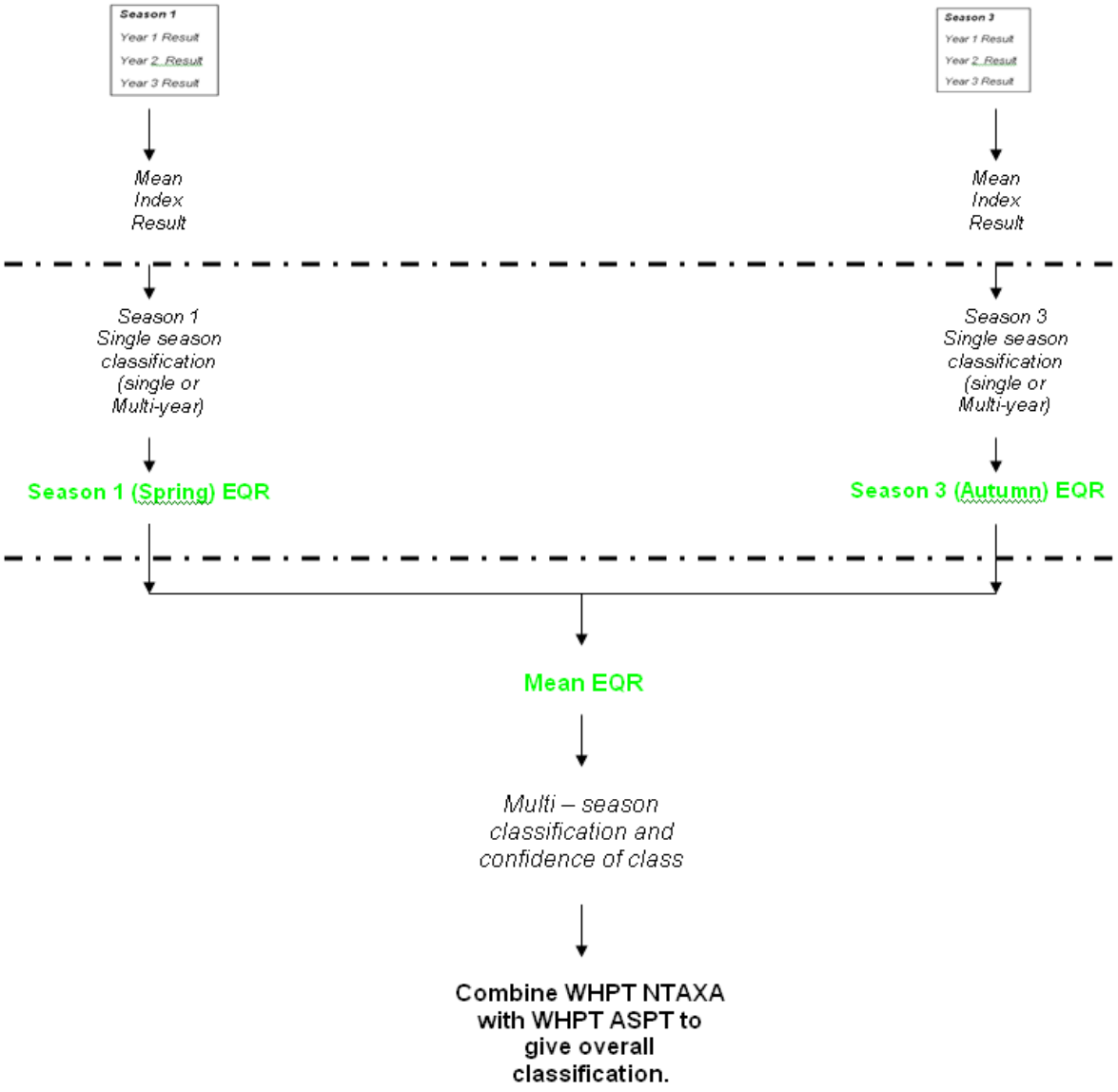
WHPT NTAXA is an index that forms part of the assessment in its own right and is combined with WHPT ASPT as per 1.1.

2.1.2 Generating EQRs and classifying sites

This should be done using RICT. Alternatives are impractical because of the complexity of the model. A detailed guide to the predict and classify process for WHPT will be made available on the RICT website. A description of the algorithms and processes behind RICT can be found in Davy-Bowker et al (2007), Easdale & Croal (2007) and Clarke & Davy – Bowker (2014).

WHPT is combined across seasons by first taking a seasonal mean of the raw index results (ASPT & NTAXA) then generating seasonal classifications (using 1-3 years' worth of data). The seasonal EQRs for each determinand are then combined by averaging, and error terms etc are applied to produce an overall classification. The process is summarised below in Figure 1.

Figure 1: RICT Classification overview



Note that 1-3 years' worth of invertebrate index results can be used. The process is applied to both WHPT ASPT & NTAXA.

Using RICT the process is as follows:

1. Format and upload observed values of WHPT ASPT and WHPT NTAXA for each season, a bias value (an estimate of the average number of taxa missed during laboratory analysis as a result of laboratory error), and environmental data used to predict reference values of WHPT ASPT and WHPT NTAXA.

2. Check settings (see below)

3. RICT will then generate:

- Expected values for each of the samples

- EQI (Observed/Expected)

- EQR (EQI multiplied by a correction factor) values (for the single and combined seasons). Note that for WHPT combination is done via seasonal averaging of the EQR.

- Probabalistic classification of the combined EQR via the boundary values (see table 2 below)

When the classification has been completed, check the results. The first parameter to check is the suitability code. If it is 4 or greater, the classification will be unreliable.

The probability of the site belonging to each class, EQR and most probable class are normally reported for WFD purposes. Classifications can be combined (across years or within waterbodies) by using:

- A “worst of” approach (use the worst class indicated by any of the years)
- The RICT multi-year classification function selected from the settings menu when data from more than one year has been entered into RICT.
- A separate statistical approach, for instance, using VISCOUS software.

2.1.3 RICT settings & WHPT boundaries.

The default settings in RICT are those required for WFD classification. In the interests of clarity, the main user and admin-set parameters are stated below.

Reference adjustment values (Admin settings):

Table 3: Assessment scores

Parameter	Assessment Score				
	1	2	3	4	5
WHPT NTAXA	*1.00*	*1.00*	*1.00*	*0.967*	*0.926*
WHPT ASPT	*1.00*	*1.001*	*1.00*	*0.977*	*0.945*

Reference adjustment values are used to convert raw RIVPACS predictions of WHPT ASPT and WHPT NTAXA that are produced by RICT into reference values. Reference sites in RIVPACS database were the best quality available, but they were not always in reference state: in lowland regions, good quality is often the best that was available. The assessment scores shown in Table 3 relate to the degree to which RIVPACS reference sited deviated from reference state. RICT takes account of the assessment scores of the reference sites that determine the value of the raw predictions.

Classification boundaries (User/Admin defaults):

Table 4: EQRs

Status boundary	WHPT NTAXA EQR	WHPT ASPT EQR
H/G	*0.80*	*0.97*
G/M	*0.68*	*0.87*
M/P	*0.56*	*0.72*
P/B	*0.47*	*0.53*

H = high, G = good; M = moderate, P = poor, B = bad

Seasons (Run Settings): Spring & Autumn (season 5)

Index set (Run Settings): WHPT ABUND

Produce Split Season Classes (Run Settings): Yes

Bias (User/Admin defaults): A global value is pre-set for bias. Experience suggests that this is about right for experienced biologists in the regulatory agencies. Other values may be entered if the laboratory or organisation has a significantly different laboratory error.

Iteration (Run Settings): 10,000

Reference Adjustment (Run Settings): Yes

Further guidance for changing settings is given in the RICT User and RICT Administration manuals. Changing the settings in the Administration sections can only be carried out by those with an Administration account and with permission of the UK Technical Advisory Group's Freshwater Task Team Invertebrate Quality Element group.

3 References

Davy-Bowker, J., Clarke,R., Corbin, T., Vincent, H., Pretty, J., Hawczak, J., Blackburn, J., Murphy,J. (2007) *River Invertebrate Classification tool*. SNIFFER Project WFD72C.

Davy-Bowker, J., Arnott, S., Close, R., Dobson, M., Dunbar, M., Jofre, G., Morton, D., Murphy, J., Wareham, W., Smith, S. & Gordon V. (2010) *Further Development of River Classification Tool.* Final Report, SNIFFER project WFD100.

Davey-Bowker, J., Wilson, S., & Colvill, D. (2012) *RIVPACS IV End Group Descriptions.* FTT Invertebrate BQE Group (available from the RICT Website)

Clarke, R. & Davey- Bowker, J. (2014) *River Invertebrate Classification Tool Science Development Project: Modifications for WHPT and other Abundance-Weighted Indices* SEPA/FBA Unpublished report.

Easdale, M., and Croal, A. (2007) *River Invertebrate Classification Tool – System Developments - Detailed Functional Specification* SNIFFER project WFD72ci[c] (available from the RICT Website)

EU-STAR (2004) *UK Invertebrate sampling and analysis procedure for STAR project, RIVPACS Macro-invertebrate sampling protocol,* EU- STAR website

Paisley, M.F., D.J. Trigg & W.J. Walley (2007) *Revision and Testing of BMWP scores*. Final report SNIFFER Project WFD72a. Edinburgh, SNIFFER.

Walley, W.J. & H.A. Hawkes (1996) *A computer-based reappraisal of the Biological Monitoring Working Party scores using data from the 1990 river quality survey of England and Wales. Water Research* **30** (9): 2086-2094.

Walley, W.J. & H.A. Hawkes (1997) *A computer-based reappraisal of the Biological Monitoring Working Party score system incorporating abundance rating, site type and indicator value. Water Research* **31** (2): 201-210.

Wright, J. F. (1997) *An Introduction to RIVPACS.* In*:* Wright, J.F., Sutcliffe, D.W., Furse, M.T. eds (1997) *Assessing the biological quality of fresh waters: RIVPACS and other techniques.* FBA Ambleside ISBN: 0-900386-62-2

Appendix 1. Taxa used in the WHPT index

	AB1	AB2	AB3	AB4
TRICLADA (Flatworms)				
Dendrocoelidae	**3.0**	**2.6**	**2.6**	**2.6**
Dugesiidae	**2.8**	**3.1**	**3.1**	**3.1**
Planariidae	**4.7**	**5.4**	**5.4**	**5.4**
MOLLUSCA (Snails, Limpets and Mussels)				
Neritidae	**6.4**	**6.5**	**6.9**	**6.9**
Viviparidae	**5.2**	**6.7**	**6.7**	**6.7**
Unionidae	**5.2**	**6.8**	**6.8**	**6.8**
Sphaeriidae (Pea mussels)	**4.4**	**3.5**	**3.4**	**2.3**
Lymnaeidae	**3.6**	**2.5**	**1.2**	**1.2**
Planorbidae (excl. *Ancylus* group)	**3.2**	**3.0**	**2.4**	**2.4**
Valvatidae	**3.3**	**3.1**	**2.7**	**2.7**
Physidae	**2.7**	**2.0**	**0.4**	**0.4**
Acroloxidae	**3.6**	**3.8**	**3.8**	**3.8**
Ancylus group (= Ancylidae)	**5.8**	**5.5**	**5.5**	**5.5**
Bithyniidae	**3.6**	**3.8**	**3.3**	**3.3**
Dreissenidae	**3.7**	**3.7**	**3.7**	**3.7**
Hydrobiidae	**4.1**	**4.2**	**4.6**	**3.7**
OLIGOCHAETA (worms)				
Oligochaeta	**3.6**	**2.3**	**1.4**	**-0.6**
HIRUDINIA (Leeches)				
Piscicolidae	**5.2**	**4.9**	**4.9**	**4.9**
Glossiphoniidae	**3.4**	**2.5**	**0.8**	**0.8**
Erpobdellidae	**3.6**	**2.0**	**-0.8**	**-0.8**

	AB1	AB2	AB3	AB4
Hirudinidae	**-0.8**	**-0.8**	**-0.8**	**-0.8**
CRUSTACEA (Crayfish, Shrimps and Slaters)				
Astacidae (including non-native species)	**7.9**	**7.9**	**7.9**	**7.9**
Corophiidae	**5.7**	**5.8**	**5.8**	**5.8**
Asellidae	**4.0**	**2.3**	**0.8**	**-1.6**
Crangonyctidae	**3.8**	**4.0**	**3.6**	**3.6**
Gammaridae	**4.2**	**4.5**	**4.6**	**3.9**
Niphargidae	**6.3**	**6.3**	**6.3**	**6.3**
EPHEMEROPTERA (Mayflies)				
Siphlonuridae (including Ameletidae)	**11.3**	**12.2**	**12.2**	**12.2**
Heptageniidae (incl. Arthropleidae)	**8.5**	**10.3**	**11.1**	**11.1**
Ephemeridae	**8.3**	**8.8**	**9.4**	**9.4**
Leptophlebiidae	**8.8**	**9.1**	**9.2**	**9.2**
Ephemerellidae	**7.9**	**8.5**	**9.0**	**9.0**
Potamanthidae	**9.8**	**10.4**	**10.4**	**10.4**
Caenidae	**6.5**	**6.5**	**6.5**	**6.5**
Baetidae	**3.6**	**5.9**	**7.2**	**7.5**
PLECOPTERA (Stoneflies)				
Perlidae	**12.6**	**13.0**	**13.0**	**13.0**
Chloroperlidae	**11.4**	**12.2**	**12.2**	**12.2**
Taeniopterygidae	**11.0**	**11.9**	**12.1**	**12.1**
Perlodidae	**10.5**	**11.5**	**11.5**	**11.5**
Capniidae	**9.7**	**9.4**	**9.4**	**9.4**
Leuctridae	**9.3**	**10.6**	**10.6**	**10.6**
Nemouridae	**8.7**	**10.7**	**10.7**	**10.7**

	AB1	AB2	AB3	AB4
ODONATA (Damselflies)				
Calopterygidae (= Agriidae)	**5.9**	**6.2**	**6.2**	**6.2**
Platycnemididae	**6.0**	**6.0**	**6.0**	**6.0**
Coenagrionidae (= Coenagriidae)	**3.4**	**3.8**	**3.8**	**3.8**
ODONATA (Dragonflies)				
Cordulegasteridae	**9.8**	**9.8**	**9.8**	**9.8**
Aeshnidae	**4.7**	**4.7**	**4.7**	**4.7**
Libellulidae	**4.1**	**4.1**	**4.1**	**4.1**
HEMIPTERA (Bugs)				
Aphelocheiridae	**8.6**	**8.5**	**8.0**	**8.0**
Hydrometridae	**4.3**	**4.3**	**4.3**	**4.3**
Gerridae	**5.2**	**5.5**	**5.5**	**5.5**
Mesoveliidae	**4.7**	**4.7**	**4.7**	**4.7**
Nepidae	**2.9**	**2.9**	**2.9**	**2.9**
Naucoridae	**3.7**	**3.7**	**3.7**	**3.7**
Pleidae	**3.3**	**3.3**	**3.3**	**3.3**
Notonectidae	**3.4**	**3.9**	**3.9**	**3.9**
Corixidae	**3.7**	**3.9**	**3.7**	**3.7**
Veliidae	**4.5**	**3.9**	**3.9**	**3.9**
COLEOPTERA (Beetles)				
Gyrinidae	**8.1**	**9.0**	**9.0**	**9.0**
Scirtidae (= Helododae)	**6.9**	**6.8**	**6.8**	**6.8**
Dryopidae	**6.0**	**6.0**	**6.0**	**6.0**
Elmidae	**5.3**	**7.4**	**8.3**	**8.3**
Haliplidae	**3.6**	**3.4**	**3.4**	**3.4**

	AB1	AB2	AB3	AB4
Paelobiidae (= Hygrobiidae)	**3.8**	**3.8**	**3.8**	**3.8**
Dytiscidae	**4.5**	**4.8**	**4.8**	**4.8**
Hydraenidae	**8.5**	**10.5**	**10.5**	**10.5**
Hydrophilidae	**5.8**	**8.8**	**8.8**	**8.8**
Noteridae	**3.2**	**3.2**	**3.2**	**3.2**
MEGALOPTERA				
Sialidae	**4.2**	**4.4**	**4.4**	**4.4**
NEUROPTERA, PLANIPENNIA				
Sisyridae	**5.7**	**5.7**	**5.7**	**5.7**
TRICHOPTERA (Caddis-flies - caseless)				
Philopotamidae	**11.2**	**11.1**	**11.1**	**11.1**
Polycentropodidae	**8.2**	**8.1**	**8.1**	**8.1**
Hydropsychidae	**5.8**	**7.2**	**7.4**	**7.4**
Glossosomatidae	**7.8**	**7.6**	**7.2**	**7.2**
Psychomyiidae	**5.8**	**5.7**	**5.7**	**5.7**
Rhyacophilidae	**8.1**	**9.2**	**8.3**	**8.3**
TRICHOPTERA (Caddis-flies - cased)				
Odontoceridae	**11.1**	**10.3**	**10.3**	**10.3**
Lepidostomatidae	**9.9**	**10.3**	**10.2**	**10.2**
Goeridae	**8.8**	**8.8**	**9.4**	**9.4**
Brachycentridae	**9.6**	**9.5**	**8.9**	**8.9**
Sericostomatidae	**8.9**	**9.4**	**9.5**	**9.5**
Beraeidae	**8.8**	**7.3**	**7.3**	**7.3**
Molannidae	**6.5**	**7.6**	**7.6**	**7.6**
Leptoceridae	**6.7**	**6.9**	**7.1**	**7.1**

	AB1	AB2	AB3	AB4
Phryganeidae	**5.5**	**5.5**	**5.5**	**5.5**
Limnephilidae (including Apataniidae)	**5.9**	**6.9**	**6.9**	**6.9**
Hydroptilidae	**6.1**	**6.5**	**6.8**	**6.8**
DIPTERA (True flies)				
Simuliidae	**5.5**	**6.1**	**5.8**	**3.9**
Tipulidae (including Cylindrotomidae, Limoniidae & Pedicidae)	**5.4**	**6.9**	**6.9**	**7.1**
Chironomidae	**1.2**	**1.3**	**-0.9**	**-0.9**
Athericidae	**9.3**	**9.5**	**9.5**	**9.5**
Ceratopogonidae	**5.4**	**5.5**	**5.5**	**5.5**
Chaoboridae	**3.0**	**3.0**	**3.0**	**3.0**
Culicidae	**2.0**	**1.9**	**1.9**	**1.9**
Dixidae	**7.0**	**7.0**	**7.0**	**7.0**
Dolichopodidae	**4.9**	**4.9**	**4.9**	**4.9**
Empididae	**7.0**	**7.6**	**7.6**	**7.6**
Ephydridae	**4.4**	**4.4**	**4.4**	**4.4**
Muscidae	**4.0**	**2.6**	**2.6**	**2.6**
Psychodidae	**4.5**	**3.0**	**3.0**	**3.0**
Ptychopteridae	**6.4**	**6.4**	**6.4**	**6.4**
Rhagionidae	**9.6**	**9.6**	**9.6**	**9.6**
Sciomyzidae	**3.4**	**3.4**	**3.4**	**3.4**
Stratiomyidae	**3.6**	**3.6**	**3.6**	**3.6**
Syrphidae	**1.9**	**1.9**	**1.9**	**1.9**
Tabanidae	**7.1**	**7.3**	**7.3**	**7.3**

Appendix 2. Worked example of WHPT calculation and RICT Assessment

In the example below, WHPT ASPT & NTAXA are calculated for spring and autumn sites from two sample taxa lists. The required environmental data has been collected and is shown here for information. Both sets of data have been entered into RICT with the WFD settings as above with no multi-year assessment. The data is not shown being put through the details of the RICT algorithms as this would be excessively complex.

WHPT Calculation

	Spring			Autumn		
Taxon name	Count	Ab Cat.	Score	Count	Ab Cat.	Score
Planariidae				1	1	4.7
Dendrocoelidae	1	1	3			
Hydrobiidae	4	1	4.1	7	1	4.1
Bithyniidae	3	1	3.6	1	1	3.6
Lymnaeidae				3	1	3.6
Ancylidae				10	2	5.5
Sphaeriidae				2	1	4.4
Oligochaeta	50	2	2.3	15	2	2.3
Glossiphoniidae				5	1	3.4
Erpobdellidae				1	1	3.6
Hydracarina				1	1	
Asellidae	1	1	4			
Gammaridae	20	2	4.5	35	2	4.5
Baetidae	180	3	7.2	150	3	7.2
Heptageniidae	200	3	11.1	25	2	10.3
Ephemeridae				1	1	8.3
Taeniopterygidae	1	1	11			
Leuctridae	15	2	10.6	30	2	10.6
Perlodidae	35	2	11.5	40	2	11.5
Perlidae				1	1	12.6
Chloroperlidae	1	1	11.4			
Gyrinidae				1	1	8.1
Elmidae	40	2	7.4	150	3	8.3
Rhyacophilidae	4	1	8.1	30	2	9.2
Glossosomatidae	130	3	7.2	3	1	7.8
Hydroptilidae				1	1	6.1
Polycentropodidae				2	1	8.2
Hydropsychidae	25	2	7.2	200	3	7.4
Brachycentridae	40	2	9.5	5	1	9.6
Lepidostomatidae				24	2	10.3
Limnephilidae	3	1	5.9	2	1	5.9
Goeridae	1	1	8.8			
Leptoceridae				1	1	6.7
Pediciidae				3	1	5.4
Simuliidae	20	2	6.1	150	3	5.8
Chironomidae	120	3	-0.9	50	2	1.3
Athericidae				9	1	9.3
Muscidae				1	1	4
		NTAXA	**21**		**NTAXA**	**31**
		SCORE	**143.6**		**SCORE**	**213.6**
		ASPT	**6.8381**		**ASPT**	**6.89032**

Environmental Data

Environmental Variable	Value
ALTITUDE	75
DISCHARGE	3
DIST_FROM_SOURCE	13
NGR_LETTERS	NT
NGR_EAST	45866
NGR_NORTH	68651
SLOPE	5.4
ALKALINITY	131.54
BOULDER_COBBLES	51.67
PEBBLES_GRAVEL	37.33
SAND	9.17
SILT_CLAY	1.83
MEAN_DEPTH	23.67
MEAN_WIDTH	10.25

RICT Output

Classification report

Go Actions

Site	Index	Obs	Exp	Avg Fvb Eqr	Class	Prob	Prob H	Prob G	Prob M	Prob P	Prob B	Suit Code	Bias Val
1	WHPT ASPT Abund	6.885	6.655	1.025	H	95.57	95.57	4.43	0	0	0	1	0
1	WHPT NTAXA Abund	26.109	25.336	1.100	H	100	100	0	0	0	0	1	1.62

1 - 2 of

In this case the site has EQRs of 1.025 & 1.10 for WHPT ASPT Abund & WHPT NTAXA Abund respectively. This classifies the site as “High” for both WHPT ASPT & WHPT NTAXA with high probability (Probabilities of 95.57 & 100). The suitability code is “1” which means that the classification can be relied on as the site has a high likelihood of being within the RICT reference group set. A “worst of” classification based on this data would give a classification of “High” for the RICT quality component under WFD.