Standardisation of river classifications:

Framework method for calibrating different biological survey results against ecological quality classifications to be developed for the Water Framework Directive

Contract No: EVK1-CT 2001-00089
6th deliverable, due 31/07/04, entitled:

Results of the sampling programme

(Paper version)

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Partners no 1 (CEH, United Kingdom), 2 (BOKU, Austria) 3 (UDE, Germany) and 4 (Alterra, The Netherlands)

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Energy, Environment and Sustainable Development
Key Action 1: Sustainable Management and Quality of Water

Contents

1 INTRODUCTION

1.1 Objectives

The aims of this report are:

- To outline the procedures for the collection of new data for the purposes of the STAR project
- To provide the European Commission with accessible sets of the biological and supporting environmental data collected during the project in order to meet its general and specific objectives.

The general objectives of STAR include:

- Integration of data collected from a variety of Biological Quality Elements (BQE) required to assess the ecological status of rivers under the terms of the Water Framework Directive (WFD) (European Commission,. 2000).
- Inter-calibration of the assessments derived in different river types, eco-regions and Member States
- Quantification of the errors associated with the field and laboratory protocols used to obtain the data

The collection and processing of data required to meet these objectives form Workpackage 7 (WP7) and Workpackage 8 (WP8) of the project.

A specific objective of WP7 ("Core stream types 1 and 2") is:

- To provide complete sets of data from sites of two stream types (small, shallow, upland streams and medium-sized, deeper lowland streams) distributed across Central and Northern Europe, in order to inter-calibrate methods, integrate data from a variety of taxonomic/morphological sources

Specific objectives of WP8 ("Additional stream types") include:

- To supplement the aims of Workpackage 7 and the objectives of the project.
- To extend the coverage of existing or developing pan-European assessment methods and databases.

1.2 Format of the deliverable

The deliverable comprises two complementary components:

- This written document
- Databases containing all the data specifically collected during and for the project

2 METHODS

2.1 Participating partners

17 of the 22 partners participated in WP7 and/or WP8. These were as follows:

- Centre for Ecology and Hydrology ..... United Kingdom
- University of Duisburg-Essen ..... Germany
- BOKU – University of Agricultural Sciences ..... Austria
- Swedish University of Agricultural Sciences..... Sweden
- Masaryk University Brno ..... Czech Republic
- Hellenic Centre for Marine Research, IIW..... Greece
- Consiglio Nazionale delle Ricerche ..... Italy
- University of Évora ..... Portugal
- National Environmental Research Institute..... Denmark
- Vyzkumny ustav vodohospodarsky T.G. Masaryka..... Czech Republic
- Autonomous Province of Bolzano..... Italy
- University of Metz ..... France
- Research Institute Senckenberg..... Germany
- University of Łódź..... Poland
- University of Latvia..... Latvia
- Slovak Academy of Sciences ..... Slovak Republic
- Comenius University Bratislava..... Slovak Republic

2.2 Site selection

Stream types

Details of the site selection are provided in the second project deliverable (Hering & Strackbein, 2002). They will be summarised briefly here.

Participating partners selected sets of sites in specific eco-regions. Each set usually comprised between 10 and 15 sites of similar character that represented a degradation gradient in response to a pre-selected, dominant environmental stressor/pressure. The exception to this rule was Latvia where 24 sites of one individual type were sampled.

Each set of sites were first defined by the System A typology outlined in section 1.2.1 of Annex II of the WFD. Sites were thus characterised by their altitude, upstream catchment size and pre-dominant geological type.

The WP7 sites comprised two groups of sets of sites:

- Core stream type 1
- Core stream type 2

Both sets of sites were also included in the preceding AQEM project (EVK1-CT1999-00027) and much of the macro-invertebrate and environmental data collected in the two projects are compatible for analytical purposes.

Core stream 1 sites were all at "mid-altitude" (200m-800m) and had "small" catchment areas (10-100km2). In practice it was decided that all sites would be chosen to be in the range 200 – 500m.

Core stream 2 sites were all classed as "lowland" (<200m) and had "medium" catchment areas (100-1000km2).

Each set of sites was chosen to be of a common geological type, selected from the WFD options of "calcareous", "siliceous" and "organic". The WFD offered no definitions of these classes and none were uniformly accepted by Member States at the inception of STAR. STAR partners adopted their own specific definitions of these terms based on either catchment geology or a parameter indicative of catchment geology such as the alkalinity of the stream water at the sampling location.

Partners further refined their definition of their site groups by other common geographical or environmental characteristics. The many examples include:

- Small-sized streams in the southern calcareous Alps (Italy)
- Small-sized Buntsandstein-streams (Germany)
- Small-sized, crystalline streams of the ridges of the Central Alps (Austria)

Additional stream types were selected to fulfil four potential roles, as defined in the agreed project Description of work (DoW). They were intended to:

- allow new, characteristic sites of individual states to be included in the analysis
- provide an opportunity to extend the range of sites in existing European assessment systems
- extend the range of sites at which the AQEM and RIVPACS field methods are compared
- provide an opportunity to test alternative sampling / assessment methods of specific importance to individual consortium Member States (e.g. IBGN, IBE and PERLA).

The additional site sets were selected according to the same set of System A criteria as the core stream sites and some additional site sets therefore categorised in the same System A compartments as the core stream sites whilst others did not.

Thus, all the 22 sets of sites (Table 1) ultimately used in the project for data collection were therefore defined hierarchically by the same following criteria:

a) Eco-region

b) Site altitude
Catchment area of site
Geology

c) Specific geographical and environmental characteristics

Table 1 The numbers sets of sites (site types) sampled in each country

Country	Core stream type 1	Core stream type 2	Additional types
Austria	1	0	1
Czech Republic	1	0	1
Denmark	0	1	0
France	0	0	1
Germany	1	1	1
Greece	0	0	1
Italy	0	0	2
Latvia	0	1	0
Poland	0	2	0
Portugal	0	0	1
Slovakia	2	0	0
Sweden	0	1	1
United Kingdom	0	1	1
TOTAL	**5**	**7**	**10**

A total of 288 sites from 12 core stream and 10 additional stream types were sampled during the project for one or, usually, more BQE's (Appendix I). This compares with the intended numbers stated in the project DoW of 302 sites from 16 core and 9 additional sites.

The shortfall of 14 sites resulted from an over-ambitious expectation of the University of Łódź that they would sample 48 sites in four stream types during their single year of sampling. In fact they sampled 24 sites in two stream types, exceeding the number of sampled sites by most partners. This was partially compensated for by several partners sampling one or more extra sites.

The shortfall in site types was explained by the loss of two Polish site types (see preceding paragraph) and by Latvia combining all its sites into a single site type.

In addition to the site types recorded above and in the appendices, Greece sampled three extra sets of sites comprising 25 extra sites. Furthermore, Italy and Greece also sampled in additional seasons to the two seasons' sampling stipulated in the DoW.

The extra Greek and Italian data will be used in some project outputs and increases the number of sampled sites above the notional figure stated in the DoW.

Environmental stresses

A single stress was associated with each of 22 STAR site types. Ideally this stress (pressure) type should be the only one operating at sites within a STAR set of sites from a single site type. However, this ideal is impracticable for most sites below moderate status and the criterion for the selection of sites was redefined so that a dominant stress was associated with each of 22 STAR site types.

The major stress categories recognised by the study were:

- Organic pollution (including eutrophication
- Toxic pollution (including acidification)
- Habitat degradation

The predominant stressors for each of the 22 site types are given in Table 2

Table 2 Stream type definitions and pre-dominant stressors

Country	Definition	Core/Add	Stress
Austria	Small-sized, shallow mountain streams	Core1	Habitat
Austria	Small-sized crystalline streams of ridges of the Central Alps	Add	Habitat
Czech Republic	Small-sized, shallow mountain streams	Core1	Organic
Czech Republic	Small-sized streams in the Central sub-alpine Mountains	Add	Habitat
Denmark	Medium-sized lowland streams	Core2	Habitat
France	Small-sized, shallow headwater streams in Eastern France	Add	Organic
Germany	Medium-sized lowland streams	Core2	Habitat
Germany	Small-sized, shallow mountain streams	Core1	Habitat
Germany	Small-sized Buntsandstein-streams	Add	Habitat
Greece	Small calcareous mountain streams in W., Central & S. Greece	Add	Organic
Italy	Small-sized streams in the southern calcareous Alps	Add	Habitat
Italy	Small-sized calcareous streams in the Central Apennines	Add	Habitat
Latvia	Medium-sized lowland streams	Core2	Organic
Poland	Medium-sized lowland streams (Eco-region 14)	Core2	Organic
Poland	Medium-sized lowland streams (Eco-region 16)	Core2	Organic
Portugal	Medium-sized streams-lower mountainous areas in Southern Portugal	Add	Organic
Slovakia	Small-sized calcareous mountain stream in the E Carpathians	Add	Organic
Slovakia	Small-sizes siliceous mountains streams in the W Carpathians	Add	Organic
Sweden	Medium-sized lowland streams	Core2	Mixed
Sweden	Medium-sized streams on calcareous soils	Add	Organic
UK	Small-sized, shallow lowland streams	Add	Organic
UK	Medium-sized lowland streams	Core2	Organic

Combined site selection strategy

For each stream type in each country a roughly defined number of sites was sampled for each level of ecological status ('High' [ca. 3 sites], 'Good' [ca. 3 sites], 'Moderate' [ca. 2 sites], 'Poor' [ca. 2 sites] and 'Bad' [ca.2 sites]) except that Ecological Status 'Bad' is considered unlikely to occur and was not recognised for habitat degradation.

A list of sites, dominant stresses and pre-classified ecological status is provided in Appendix II.

2.3 Biological Quality Elements

The WFD recognises four Biological Quality Elements that must or should be sampled in rivers for specific monitoring purposes, with specific emphasis on their inclusion for surveillance monitoring. These are:

- Phytoplankton
- Macrophytes and phytobenthos
- Benthic invertebrate fauna
- Fish fauna

The WFD states (section 1.3.1 of Annex V) that:

> "Surveillance monitoring shall be carried out for each monitoring site for … parameters indicative of all biological quality elements …"

The STAR project sampled three of these elements, macrophytes and phytobenthos, benthic invertebrates and fish. Separate sampling programmes were established for macrophytes and for phytobenthos which, for the purposes of the project were regarded as two distinct BQE's.

The paucity of phytobenthos in the small streams sampled in the STAR project led to their exclusion from the sampling programme on the basis that they could not be measured with "adequate confidence and precision" (WFD: Section 1.3, Annex V).

Surveillance monitoring programmes for the purposes of the classification of ecological status of rivers, as defined by the WFD (Section 1.1.1, Annex V), also requires monitoring for supporting elements including hydromorphological elements, chemical and physicochemical elements, and specific pollutants.

The STAR sampling programme included detailed collection of hydromorphological data, together with limited collection of supporting chemical, physical and geographical information.

Chemical, physical and geographical information were collected for each STAR site. The sampling of biological and hydromorphological elements for each of the 22 STAR stream types is given in Table 3, with individual site information provided in Appendix III.

Table 3 The biological and hydro-morphological quality elements sampled for each STAR site type

COUNTRY	Site type definition	Phytobenthos	Macropphytes	Invertebrates	Fish	Hydromorphology
Austria	Small-sized, shallow mountain streams	■	■	■	■	■
Austria	Small-sized crystalline streams of ridges of the Central Alps			■		■
Czech Repub	Small-sized, shallow mountain streams	■	■	■	■	■
Czech Repub	Small-sized streams in the Central sub-alpine mountains	■	■	■	■	■
Denmark	Medium-sized lowland streams	■	■	■	■	■
France	Small-sized, shallow headwater streams in Eastern France	■	■	■	■	■
Germany	Medium-sized lowland streams	■	■	■	■	■
Germany	Small-sized, shallow mountain streams	■	■	■	■	■
Germany	Small-sized Buntsandstein-streams	■	■	■	■	■
Greece	Small calcareous mountain streams, W., Central & S. Greece	■	■	■	■	■
Italy	Small-sized streams in the southern calcareous Alps	■		■	■	■
Italy	Small-sized calcareous streams in the Central Apennines	■	■	■	■	■
Latvia	Medium-sized lowland streams	■	■	■	■	■
Poland	Medium-sized lowland streams (Eco-region 14)	■	■	■	■	■
Poland	Medium-sized lowland streams (Eco-region 16)	■	■	■	■	■
Portugal	Medium-sized streams-lower mountainous areas:S. Portugal	■	■	■	■	■
Slovakia	Small-sized calcareous mountain stream in the E Carpathians	■	■	■	■	■
Slovakia	Small-sizes siliceous mountains streams in the W Carpathians	■	■	■	■	■
Sweden	Medium-sized lowland streams	■	■	■	■	■
Sweden	Medium-sized streams on calcareous soils	■	■	■	■	■
UK	Small-sized, shallow lowland streams	■	■	■	■	■
UK	Medium-sized lowland streams	■	■	■	■	■

2.4 Sampling methods

A series of standard national and international sampling protocols, each with supporting laboratory/bankside sample processing protocols, were selected for use in the project.

Many of these are displayed on the STAR website (www.eu-star.at) under the public-access section "Protocols"). The methods for each biological/hydromorphological elements will be listed briefly here.

Phytobenthos

Phytobenthos samples were collected using the protocols associated with the Trophic Diatom Index (TDI) indexation method.

The procedure is in accordance with the Draft European Standard: Guidance standard for the routine sampling an pre-treatment of benthic diatoms from rivers (prEN 13946).

Macrophytes

Macrophyte surveys were undertaken using the protocols associated with the Mean Trophic Rank (MTR) indexation method.

This method is the standard procedure used in the United Kingdom in association with the implementation of the European Union Urban Wastewater Directive and is compatible with methodologies used in several of the other Member States participating in STAR. It is compatible with the draft CEN (Comite Européen de Normalisation) standard for the surveying of aquatic macrophytes in running waters (prEN 14184).

Macro-invertebrates

A variety of internal and national sampling methods were used in order to address issues of inter-calibration of methodologies. These were:

AQEM: This sampling method was devised for use in the EC AQEM project (www.aqem.de). It was used by all partners and is the common standard that will facilitate inter-calibration of other protocols.

RIVPACS: This sampling method (River InVertebrate Prediction and Classification System) is used in the UK in association with an eponymous software system that uses predicted (reference) and observed metric values to calculate EQR's for bio-assessment purposes. In STAR the method was used by partners from UK, Germany, Austria and Greece.

IBE The Indice Biótico Esteso (IBE) is widely used in Italy and involves bankside sorting of samples. It has also been applied successfully in Nicaraguan streams. In STAR this method was formally used in Italy but extra, informal IBE samples were also collected in Greece.

IBGN The Indice Biologique Global Normalisé (IBGN) is widely used in France. In STAR the method was only used in France.

DSFI This protocol is the national sampling method associated with the calculation of the Danish Stream Fauna Index (DSFI). In STAR this method was only used in Denmark.

LVS 240:1999 This method is the national protocol for Latvia. In STAR this method was only used in Latvia.

Swedish The un-named Swedish national sampling protocol was only used in Sweden in the STAR project.

PERLA The PERLA method is widely used in the Czech Republic. The method is associated with a predictive software system similar to the UK RIVPACS. In STAR this method was only used by the Czech and Slovak partners.

Polish The un-named Polish national sampling protocol was only used in Poland in the STAR project.

Portuguese An un-named Portuguese sampling protocol was only used in Potugal in the STAR project.

All methods using hand-nets were compatible with the CEN Standard on the handnet sampling of aquatic macro-invertebrates (EN 27828).

Fish

The fish sampling protocol, as published on the "Protocols" page of the STAR website, required catch depletion fishing using stop nets. The majority of partners followed the protocol but a minority either did not use stop-nets or did not use depletion fishing or did not use either.

The STAR protocol was derived from, and is compatible with the section in the draft CEN standard on sampling of fish with electricity concerning wadable rivers (prEN 14011).

Hydromorphology

The River Habitat Survey (RHS) protocol was used for hydromorphological surveys. The method was devised and is commonly used in the UK. It had also previously been applied in other European countries including Italy and Poland.

All RHS surveyors are required to be certificated. The UK Environment Agency, CEH and sub-contractor Nigel Holmes provided three days of training for all participating partners through two three day courses held in France and Poland.

Only accredited surveyors were used to collect the STAR data.

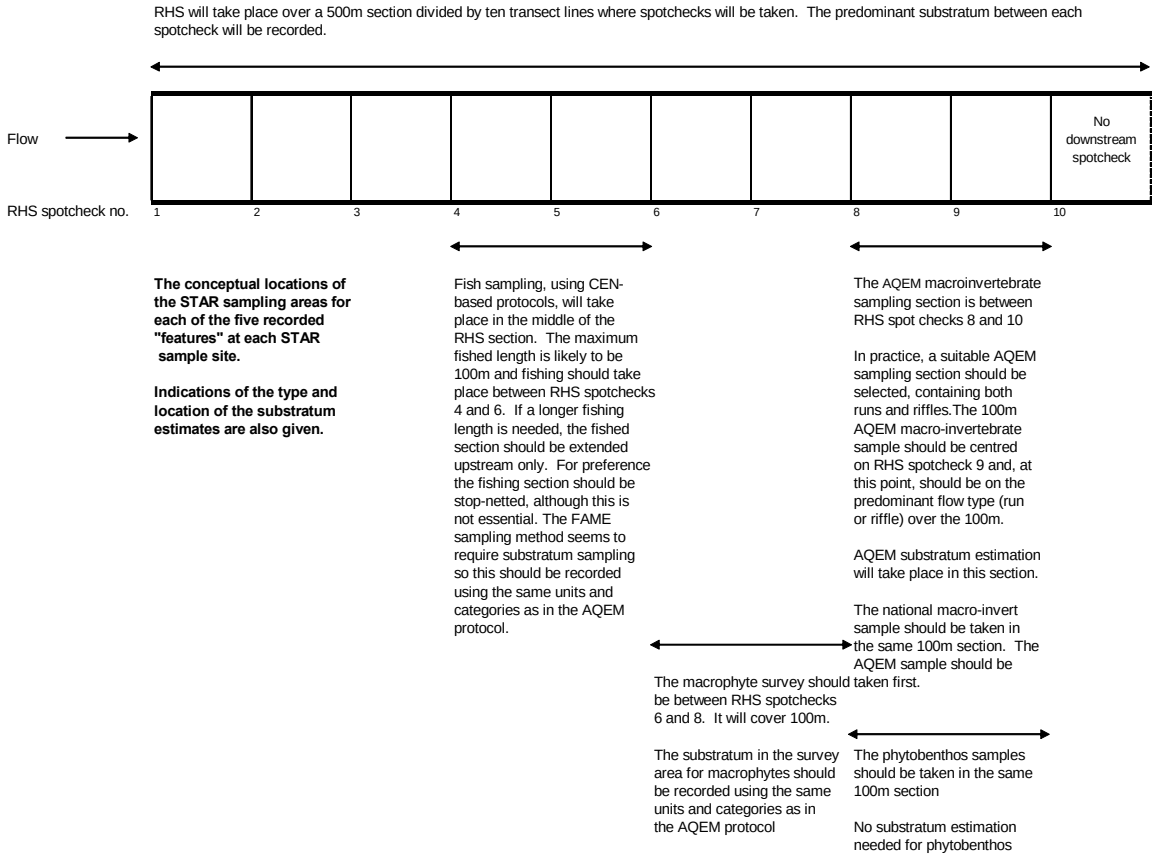
The RHS sampling methodology is compatible with the evolving draft CEN guidance standard for assessing the hydromorphological features of rivers (prEN14614).

2.5 Sampling programme

All biological and hydromorphological sampling and surveying of a site was collected within a 500m survey area, typical in character for that section of the river.

A conceptual model (Figure 1) was developed for allocating the theoretical location of each type of sample within the 500m survey area. However, partners were provided with the freedom to deviate from this model were local circumstances dictated.

Figure 1 The conceptual sampling framework to be used wherever feasible at each sampling site



2.5.1 The main sampling programme

Phytobenthos

A single sample of benthic diatoms was collected at almost all sampling site by the participating partners. According to the partner's choice the sample was taken from either hard substrata, sand or the surface of macrophytes. A single sample was collected as an aggregate collection of material from more than one object (stone, plant stem etc.).

Details of the sampling protocol, including substratum selection, are given on the project website.

Wherever possible, the sample was taken within the macro-invertebrate sampling area which was between 350 – 450m below the upstream limit of the survey area (Figure 1).

Samples were collected after a period of stable flow and, if this criterion was met, preferably in spring.

Macrophytes

A single MTR survey was conducted at almost all sampling site by the participating partners.

The sampling reach was 100m in length and ideally was located between 250 and 350m below the upstream limit of the survey area (Figure 1).

Macrophyte sampling surveys were undertaken in late summer/early autumn in most cases, as stated in the project DoW.

Macro-invertebrates

AQEM samples were taken at all sites by each participating partner. At each site in the 22 main stream types, with a very small number of exceptions, each partner also collected samples using a notional "national" sampling method. This was normally a widely used protocol within the individual partner's Member State but the UK RIVPACS protocol was used in three countries (Germany, Austria and Greece) without a common national sampling protocol.

Wherever possible, the sample was taken within the macro-invertebrate sampling area which was between 350 – 450m below the upstream limit of the survey area (Figure 1).

Both AQEM and national samples were collected in at least two seasons, of which one was always spring. The second sample was collected in either summer or autumn. No firm definitions of the three seasons were applied because of regional climatic differences. However March, April and May were the most commonly allocated spring months, June, July and August were the most commonly allocated summer months and September, October, November were often assigned as autumn.

Fish

Fish sampling was carried out at most sites. Sampling was on a single occasion and normally involved two fishing runs of a stop-netted area in excess of 100m2. However, as stated above, a significant minority of sites did not meet each of these three parameters.

In most cases the sampling reach was 100m in length and ideally was located between 150 and 250m below the upstream limit of the survey area (Figure 1). However, partners were given licence to extend the sampling length upstream in order to attain an adequate, representative catch. Normally any extension of the sampling area remained within the 500m survey area but there were some exceptions to this practice.

Fish surveys were undertaken in late summer/early autumn in most cases, as stated in the project DoW.

Hydromorphology

River Habitat Surveys were undertaken on a single occasion at most STAR sites. In theory, the RHS survey area was selected first and all subsequent sampling locations for the other BQE's were located within the RHS survey area according to the conceptual model.

Hydromorphological surveys were undertaken in late summer/early autumn in most cases, as stated in the project DoW.

Supporting chemical, physico-chemical and geographical elements

A survey of key chemical, physico-chemical and geographical elements was undertaken at each site. This was termed the STAR site protocol and was a cut down version of the protocol developed in the AQEM project. The modified AQEM protocol, as used in STAR, is presented in the "Protocols" section of the STAR project website.

The modified version of the AQEM site protocol involves collection of field and cartographic data from maps and GIS. Most field data are collected during the first site visit but a limited number of time variant variables are measured/recorded on each sampling visit.

General

The sampling programme presented above is the general model. Several partners have elaborated on this programme with additional sampling methods and/or seasons. Conversely, not all partners have sampled/surveyed each site for each BQE in each recommended season.

On balance, the number of sites examined, samples taken and surveys completed exceeds that stated in the project DoW.

The databases provided contain all the information collected from the sites comprising the 22 site types for each sampling occasion. Some additional data are also included in the data-sets resulting from extra sampling or extra sites or from other project WPs. However not all extra sample data are currently held on the project databases and may, alternatively, be held by the partner that collected them.

2.5.2 The replicate sampling programme

For the purposes of WP11 and WP12, replicate sampling programmes for phytobenthos and macro-invertebrates was established. The results of these programmes, in conjunction with the main sampling programme and the audit programme (WP9) will be used to estimate and account for the variation associated with biological data collection for the purposes of bio-assessment of the ecological status of river sites.

Phytobenthos

Two sources of replicate data were collected. These were a ring test conducted during the second project workshop in La Bresse, France and a replicate sampling programme undertaken by a sub-set of partners in association with the macro-invertebrate replicate sampling programme (see below).

In La Bresse the majority of partners participating in WP7 and WP8 each collected three replicate samples from each of two different substratum types at each of two different sampling sites. Each partner sampled two substrata from the three tested, hard surfaces, sand and macrophytes.

The results of the ring test are presented in separate deliverable 5b. These data are not currently stored in the project database holding the results of the main phytobenthos sampling programme.

Replicate sampling of phytobenthos alongside the main sampling programme was undertaken in France, Greece, Portugal, Sweden and the UK. Results of these samples are stored in the database holding the results of the main phytobenthos sampling programme.

Macro-invertebrates

A structured field sampling programme was operated for both STAR/AQEM and "national" invertebrate samples.

All partners participating in WP7 and/or WP7, except Partner 12 (LABBIO), 21 (SAS-IZ) and 22 (DE-CUB) collected two STAR/AQEM and two "national" samples in each sampling season from each of six of the sites in their individual sampling programme.

Partners were instructed to collect their pairs of replicate samples from the same 100m sampling area (see Figure 1) but the second sample of each pair could be taken by the same sampler as the first sample or by a second, different person. Partners were expected to apply a consistent "same sampler" or "different sampler" policy for each of their sites. Where a "different sampler" policy operated, each sampler should undertake and record their own STAR/AQEM habitat cover estimates before deciding how many sample units to be collected from each habitat type.

Where partners were sampling more than one stream type the replicate samples were normally distributed evenly amongst those stream types.

In general, partners were requested to spread their replicate sites across a range of ecological statuses but with tendency to favour the higher quality sites with greater species richness.

2.6 Site numbering

A simple site numbering system overarches and is compatible with all three STAR databases (AQEMDIP 2.6, macrophyte database and hydromorphology database) and with FIDES, the fish database developed by the FAME project..

Sites are numbered sequentially from 600 to 1035, with some omissions. Site numbers have no functionality but are a linking field to country, river name and site name and hence to all fields in the project databases.

2.7 Sample/survey numbering

The STAR project inherited and enhanced the AQEM, eight-character sample numbering system through the addition of eight further descriptive characters. The two 8-character components, sample number and sample descriptor combine to form a 16 character sample code.

Character 1 of the sample code represents the country of origin of the sample: (A=Austria, C=Czech Republic, D=Germany, F=France, I=Italy, H=Greece, K=Denmark, L=Latvia, M=Finland, N=The Netherlands, O=Poland, P=Portugal, S=Sweden, U=United Kingdom, V=Slovak Republic, W=Norway).

Characters 2 and 3 represent the stream type.
Characters 4 to 7 are unrestricted digits selected by the individual partners for that sample. They may or may not include hierarchical information according to the decisions of individual partners.

Character 8 represents the sampling season (1=spring, 2=summer, 3=autumn, 4=winter).

Character 9 represents the biological quality element (I=macro-invertebrates, P=phytobenthos).

Character 10 defines the sampling method (S=STAR/AQEM, M=original AQEM, Q=Italian AQEM, R=RIVPACS, C=PERLA, B=IBE, E=EBEO, I=IBGN, A=Austrian method, K=DSFI method, L= LVS 240:1999, P=Portuguese method, O=Polish method, V=CSN 83 0532: 1981, W=Swedish method, X=other invertebrate method, D=Diatoms).

Character 11 indicates main or replicate sampling.

Character 12 defines the phytobenthos substratum if available (H=hard, M=macrophyte, S=sand/silt).

Characters 13 and 14 represent the sample unit (depending on the method chosen: 0C=combined sample, LO=lotic, LE=lentic, 01 to 20=separate sample units).

Character 15 indicates main or replicate sub-sampling.

Character 16 indicates whether the sample has been subject to internal or external audit or both.

2.8 Taxon codes

Macro-invertebrates

The taxa in the macro-invertebrate taxalist is based upon two principal types of taxon codes:

ID_ART (ID_AQEM):	Unique 4 to 5 character number codes (sequential numbers)
Shortcode:	Unique 8 letter codes derived from characters within the taxon name

Both codes originate form the Austrian ECOPROF database that was extended within the AQEM project and then further enlarged within the STAR project. These codes are intended to be available for all European freshwater macro-invertebrate taxa.

There are several national taxon codes that are also included into the database but only exist for selected taxa: the German DV number (1 to 5 character sequential number code), the Dutch TCM code (1 to 4 character sequential number code), the British Furse code (8 character number/letter code) and the Czech PERLA code (17 character number code).

Phytobenthos

The phytobenthos taxa are coded with a unique 4 letter code based on the diatom list originating from OMIDIA (Lecointe, C., M. Coste & J. Prygiel (2003). This taxon code is available for all existing taxa and was amended during the STAR project for new taxa.

There are several national taxon codes that are also included into the database but only exist for selected taxa.: the Austrian ID_Art (3 to 4 character sequential number code) and the British NEWCODE (8 character number code).

2.9 Databases

Three databases were designed/modified for the STAR project:

- AQEMDip Version 2.6 holds both phytobenthos and macro-invertebrate data and is an extension to the earlier version created within the AQEM project. The principal modification is the new inclusion of phytobenthos but there are many other extensions to, and improvements in the functionality and performance characteristics of the latest version.

- The macrophyte database (STARMTR1) is an extensively modified version of an earlier database designed by the Institute of Freshwater Ecology (now part of CEH).

- The un-named hydro-morphological database (STARRHS1) is an extensively modified version of an earlier database designed by the Institute of Freshwater Ecology (now part of CEH). It is specifically designed to hold RHS data and is capable of storing data collected by four different versions of the RHS protocol, including the southern European version.

The STAR fish data are stored in FIDES, the fish database designed by the FAME project (EVK1 -CT-2001-00094) and kindly made available by that project's co-ordinator (BOKU) and the other members of the FAME consortium.

3 RESULTS

3.1 Databases

3.1.1 Phytobenthos, macro-invertebrates and site protocol (AQEMDIP 2.6)

Source

Based on Austrian Software ECOPROF (BOKU - University of Natural Resources & Applied Life Sciences, Vienna, www.ecoprof.at) and on AQEM DIP 1.3 (AQEM Project, www.aqem.de)

Programmers

Main program and structure, database structure, biological data input, DLL programming, technical support

> Robert Vogl, Softwarehaus Graf&Partner (www.grafsoft.co.at) in co-operation with IRV Software (http://www.irv-software.at/), Austria

Site protocol, parts of export function, setup and installation, technical support coordinator

> Jörg Strackbein, UDE, Germany
> (http://www.uni-duisburg-essen.de/fb10/forschen/index.shtml)

Taxadatabase, scientific consulting, technical and scientific support

> Astrid Schmidt-Kloiber, BOKU, Austria (http://www.boku.ac.at/hfa)

Supporting taxalists

Responsible for content of the taxalist:

> Astrid Schmidt-Kloiber, BOKU, Austria
> Armin Lorenz, UDE, Germany
> Johan van der Molen, Alterra, The Netherlands

Contents of taxalists

> 11434 macro-invertebrate taxa (July 2004)
> 9105 diatoms (July 2004)

Technical information (AQEMDIP 2.6):

Programmed in MS Visual Basic 6
Database MS Jet Engine
Setup by InstallShieldExpress 3
Developed on MS Win NT4/WIN2000 prof. systems

System requirements: standard Office PC, MS Win 98SE, NT4, 2000, MS Office 97 or higher, (runs also on XP). Recommended: MS Win NT4 or 2000, MS Office 97/2000, English versions

Executable 4.5 MB, taxadatabase for macro-invertebrate 17MB, taxadatabase for diatoms 2MB

Complete software ca. 32MB

Technical Information (taxalists)

Access 97

Technical support

Technical support: via mail (see manual for details) and website (www.aqem.de)

General information on the use of AQEMDIP can be found in the AQEMDIP manual **(Appendix X)**

3.1.2 Macrophyte database

Source

Based on an early Mean Trophic Rank database developed by the Institute of Freshwater Ecology/Centre for Ecology & Hydrology, UK - www.dorset.ceh.ac.uk

Programmer

Database structure, including all tables, queries, forms, reports, macros and visual basic code:

> John Davy-Bowker, Centre for Ecology & Hydrology, UK - www.dorset.ceh.ac.uk

Database testing, including testing of River Habitat Survey Indices:

> John Davy-Bowker, Pete Scarlett, Mike Furse. Centre for Ecology & Hydrology, UK - www.dorset.ceh.ac.uk

Supporting taxonomic standardisations

Taxonomic standardisations for data output and analysis:

> Krzysztof Szoszkiewicz, ACAU Poland

Technical information (STARMTR1):

Programmed in MS Access 2000
Database Engine - MS Access 2000
Setup – non run-time application (open source)
Developed on MS Win 2000 & XP prof. systems
System requirements: high specification PC, MS Win 2000/XP, MS Office 2000

Complete software ca. 43MB

Technical support

Technical support for STAR partners: via email to:

> John Davy-Bowker (jobo@ceh.ac.uk) or contact CEH via web site at www.dorset.ceh.ac.uk

Brief information on the database is provided in Appendix V.

3.1.3 Hydromorphology (RHS) database

Source

Based on an early River Habitat Survey database developed by the Institute of Freshwater Ecology/Centre for Ecology & Hydrology, UK - www.dorset.ceh.ac.uk

Programmer

Database structure, including all tables, queries, forms, reports, macros and visual basic code:

> John Davy-Bowker, Centre for Ecology & Hydrology, UK - www.dorset.ceh.ac.uk

Database testing, including testing of River Habitat Survey Indices:

> John Davy-Bowker, Pete Scarlett, Mike Furse, Cynthia Davies, John Murphy.
> Centre for Ecology & Hydrology, UK - www.dorset.ceh.ac.uk

Technical information (STARRHS1):

Programmed in MS Access 2000
Database Engine - MS Access 2000
Setup – non run-time application (open source)
Developed on MS Win 2000 & XP prof. systems
System requirements: high specification PC, MS Win 2000/XP, MS Office 2000

Complete software ca. 55MB

Technical support

Technical support for STAR partners: via email to:

> John Davy-Bowker (jobo@ceh.ac.uk) or contact CEH via web site at www.dorset.ceh.ac.uk

Brief information on the database is provided in Appendix V.

3.1.4 Fish database

The FIDES database used to store the STAR fish data was produced by the EC Framework V project FAME. Technical data on the database may be obtained via the project website (fame.boku.ac.at). The FIDES user-manual is also supplied here (Appendix VII) by kind permission of the FAME project.

3.2 Number of samples

The total number of samples/surveys, including replicate samples, that are known to have been collected/undertaken at the 288 sites in the 22 stream types comprising WP7 and WP8 are shown in Table 4.

Table 4 The number of samples and surveys from the 288 sites from the 22 stream types included in WP7 and WP8

Biological Quality Element	Number of samples/surveys
Phytobenthos (diatoms)	265
Macrophytes	235
Macro-invertebrates (AQEM)	712
Macro-invertebrates (National)	721
Fish	229
Hydromorphology	263

A full list of STAR personnel responsible for collecting, processing, identifying, recording and managing the data from these samples is given in Appendix VIII.

3.3 Software supplied

This report is accompanied by the supply of the three specific STAR databases and the biological and environmental data from WP7 and WP8 that they contain.

Under the terms of the STAR DoW (Table 3.4.2 – deliverables list), the supply of databases is RE and its dissemination is restricted by the consortium to the 22 partners in the STAR consortium and to the officials of the European Commission responsible for the management of the STAR project (EVK1-CT-2001-00089).

4 DISCUSSION

The STAR WP7 and WP8 sampling programme involved amongst the most extensive collection of standardised riverine biomonitoring data ever assembled, both in its geographical coverage and its range of biological quality elements. It has involved the sampling of 288 sites in 14 Member States spread between Portugal in the west to Poland in the east and from Italy and Greece in the south to Sweden in the North.

The data collected is an extremely valuable resource for use both within and outside the STAR project. They are supported by equally useful databases and taxon lists that will have both internal project and external applications.

5 REFERENCES

European Commission. 2000. Directive of the European Parliament and of the Council 2000/60/EC establishing a framework for community action in the field of water policy. *European Commission PE-CONS 3639/1/100 Rev 1*, Luxemborg.

Hering, D & Strackbein, J. 2002 STAR stream types and sampling sites. A report to the European Commission on the STAR Project (EVK1-CT-2001-00089), 28pp

Lecointe, C., M. Coste & J. Prygiel 1993 - "OMNIDIA" software for taxonomy, calculation of diatom indices and inventories management**. –** *Hydrobiologia*, **269/270 :** 509-513.

Appendix I List of stream types and categories (core1, core2 or additional) for STAR WP7 and WP8

Site number	Country	Stream type	Type description	Core or additional
600	Austria	A05	small-sized, shallow mountain streams	core1
601	Austria	A05	small-sized, shallow mountain streams	core1
602	Austria	A05	small-sized, shallow mountain streams	core1
603	Austria	A05	small-sized, shallow mountain streams	core1
604	Austria	A05	small-sized, shallow mountain streams	core1
605	Austria	A05	small-sized, shallow mountain streams	core1
606	Austria	A05	small-sized, shallow mountain streams	core1
607	Austria	A05	small-sized, shallow mountain streams	core1
608	Austria	A05	small-sized, shallow mountain streams	core1
609	Austria	A05	small-sized, shallow mountain streams	core1
610	Austria	A05	small-sized, shallow mountain streams	core1
611	Austria	A05	small-sized, shallow mountain streams	core1
612	Austria	A05	small-sized, shallow mountain streams	core1
952	Austria	A05	small-sized, shallow mountain streams	core1
953	Austria	A05	small-sized, shallow mountain streams	core1
700	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
701	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
702	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
703	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
704	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
705	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
706	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
707	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
708	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
709	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
710	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
711	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
712	Austria	A06	small-sized crystalline streams of the ridges of the Central Alps	additional
954	Austria	A06	small-sized, crystalline streams of the ridges of the Central Alps	additional
955	Austria	A06	small-sized, crystalline streams of the ridges of the Central Alps	additional
956	Austria	A06	small-sized, crystalline streams of the ridges of the Central Alps	additional
957	Austria	A06	small-sized, crystalline streams of the ridges of the Central Alps	additional
958	Austria	A06	small-sized, crystalline streams of the ridges of the Central Alps	additional
959	Austria	A06	small-sized, crystalline streams of the ridges of the Central Alps	additional
960	Austria	A06	small-sized, crystalline streams of the ridges of the Central Alps	additional
961	Austria	A06	small-sized, crystalline streams of the ridges of the Central Alps	additional

Site number	Country	Stream type	Type description	Core or additional
613	Czech Republic	C04	small-sized, shallow mountain streams	core1
614	Czech Republic	C04	small-sized, shallow mountain streams	core1
615	Czech Republic	C04	small-sized, shallow mountain streams	core1
616	Czech Republic	C04	small-sized, shallow mountain streams	core1
617	Czech Republic	C04	small-sized, shallow mountain streams	core1
618	Czech Republic	C04	small-sized, shallow mountain streams	core1
619	Czech Republic	C04	small-sized, shallow mountain streams	core1
620	Czech Republic	C04	small-sized, shallow mountain streams	core1
621	Czech Republic	C04	small-sized, shallow mountain streams	core1
622	Czech Republic	C04	small-sized, shallow mountain streams	core1
623	Czech Republic	C04	small-sized, shallow mountain streams	core1
624	Czech Republic	C04	small-sized, shallow mountain streams	core1
625	Czech Republic	C04	small-sized, shallow mountain streams	core1
626	Czech Republic	C04	small-sized, shallow mountain streams	core1
713	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional
714	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional
715	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional
716	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional
717	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional
718	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional
719	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional
720	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional
721	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional
722	Czech Republic	C05	small-sized streams in the Central sub-alpine Mountains	additional

Site number	Country	Stream type	Type description	Core or additional
662	Denmark	K02	medium-sized lowland streams	core2
663	Denmark	K02	medium-sized lowland streams	core2
664	Denmark	K02	medium-sized lowland streams	core2
665	Denmark	K02	medium-sized lowland streams	core2
666	Denmark	K02	medium-sized lowland streams	core2
667	Denmark	K02	medium-sized lowland streams	core2
668	Denmark	K02	medium-sized lowland streams	core2
669	Denmark	K02	medium-sized lowland streams	core2
670	Denmark	K02	medium-sized lowland streams	core2
671	Denmark	K02	medium-sized lowland streams	core2
672	Denmark	K02	medium-sized lowland streams	core2
673	Denmark	K02	medium-sized lowland streams	core2
723	France	F08	small-sized, shallow headwater streams in Eastern France	additional
724	France	F08	small-sized, shallow headwater streams in Eastern France	additional
725	France	F08	small-sized, shallow headwater streams in Eastern France	additional
726	France	F08	small-sized, shallow headwater streams in Eastern France	additional
727	France	F08	small-sized, shallow headwater streams in Eastern France	additional
728	France	F08	small-sized, shallow headwater streams in Eastern France	additional
729	France	F08	small-sized, shallow headwater streams in Eastern France	additional
730	France	F08	small-sized, shallow headwater streams in Eastern France	additional
731	France	F08	small-sized, shallow headwater streams in Eastern France	additional
732	France	F08	small-sized, shallow headwater streams in Eastern France	additional
733	France	F08	small-sized, shallow headwater streams in Eastern France	additional
734	France	F08	small-sized, shallow headwater streams in Eastern France	additional

Site number	Country	Stream type	Type description	Core or additional
649	Germany	D03	medium-sized lowland streams	core2
650	Germany	D03	medium-sized lowland streams	core2
651	Germany	D03	medium-sized lowland streams	core2
652	Germany	D03	medium-sized lowland streams	core2
653	Germany	D03	medium-sized lowland streams	core2
654	Germany	D03	medium-sized lowland streams	core2
655	Germany	D03	medium-sized lowland streams	core2
656	Germany	D03	medium-sized lowland streams	core2
657	Germany	D03	medium-sized lowland streams	core2
658	Germany	D03	medium-sized lowland streams	core2
659	Germany	D03	medium-sized lowland streams	core2
660	Germany	D03	medium-sized lowland streams	core2
661	Germany	D03	medium-sized lowland streams	core2
627	Germany	D04	small-sized, shallow mountain streams	core1
628	Germany	D04	small-sized, shallow mountain streams	core1
629	Germany	D04	small-sized, shallow mountain streams	core1
630	Germany	D04	small-sized, shallow mountain streams	core1
631	Germany	D04	small-sized, shallow mountain streams	core1
632	Germany	D04	small-sized, shallow mountain streams	core1
633	Germany	D04	small-sized, shallow mountain streams	core1
634	Germany	D04	small-sized, shallow mountain streams	core1
635	Germany	D04	small-sized, shallow mountain streams	core1
636	Germany	D04	small-sized, shallow mountain streams	core1
637	Germany	D04	small-sized, shallow mountain streams	core1
638	Germany	D04	small-sized, shallow mountain streams	core1
815	Germany	D06	small-sized Buntsandstein-streams	additional
816	Germany	D06	small-sized Buntsandstein-streams	additional
817	Germany	D06	small-sized Buntsandstein-streams	additional
818	Germany	D06	small-sized Buntsandstein-streams	additional
819	Germany	D06	small-sized Buntsandstein-streams	additional
820	Germany	D06	small-sized Buntsandstein-streams	additional
821	Germany	D06	small-sized Buntsandstein-streams	additional
822	Germany	D06	small-sized Buntsandstein-streams	additional
823	Germany	D06	small-sized Buntsandstein-streams	additional
824	Germany	D06	small-sized Buntsandstein-streams	additional

Site number	Country	Stream type	Type description	Core or additional
735	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
736	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
737	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
738	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
739	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
740	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
751	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
753	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
756	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
757	Greece	H04	small-sized calcareous mountain streams in Western, Central and Southern Greece	additional
849	Italy	I05	small-sized streams in the southern calcareous Alps	additional
850	Italy	I05	small-sized streams in the southern calcareous Alps	additional
851	Italy	I05	small-sized streams in the southern calcareous Alps	additional
852	Italy	I05	small-sized streams in the southern calcareous Alps	additional
853	Italy	I05	small-sized streams in the southern calcareous Alps	additional
854	Italy	I05	small-sized streams in the southern calcareous Alps	additional
855	Italy	I05	small-sized streams in the southern calcareous Alps	additional
856	Italy	I05	small-sized streams in the southern calcareous Alps	additional
857	Italy	I05	small-sized streams in the southern calcareous Alps	additional
858	Italy	I05	small-sized streams in the southern calcareous Alps	additional
835	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
836	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
837	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
838	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
839	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
840	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
841	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
842	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
843	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
845	Italy	I06	small-sized calcareous streams in the Central Apennines	additional
847	Italy	I06	small-sized calcareous streams in the Central Apennines	additional

Site number	Country	Stream type	Type description	Core or additional
997	Latvia	L02	medium-sized lowland streams	core2
998	Latvia	L02	medium-sized lowland streams	core2
999	Latvia	L02	medium-sized lowland streams	core2
1006	Latvia	L02	medium-sized lowland streams	core2
1007	Latvia	L02	medium-sized lowland streams	core2
1017	Latvia	L02	medium-sized lowland streams	core2
1018	Latvia	L02	medium-sized lowland streams	core2
1019	Latvia	L02	medium-sized lowland streams	core2
1020	Latvia	L02	medium-sized lowland streams	core2
1021	Latvia	L02	medium-sized lowland streams	core2
1022	Latvia	L02	medium-sized lowland streams	core2
1023	Latvia	L02	medium-sized lowland streams	core2
1024	Latvia	L02	medium-sized lowland streams	core2
1031	Latvia	L02	medium-sized lowland streams	core2
1035	Latvia	L02	medium-sized lowland streams	core2
996	Latvia	L02	medium-sized lowland streams	core2
1002	Latvia	L02	medium-sized lowland streams	core2
1005	Latvia	L02	medium-sized lowland streams	core2
1010	Latvia	L02	medium-sized lowland streams	core2
1013	Latvia	L02	medium-sized lowland streams	core2
1016	Latvia	L02	medium-sized lowland streams	core2
1027	Latvia	L02	medium-sized lowland streams	core2
1030	Latvia	L02	medium-sized lowland streams	core2
1034	Latvia	L02	medium-sized lowland streams	core2

Site number	Country	Stream type	Type description	Core or additional
894	Poland	O02	medium-sized lowland streams (Eco-region 14)	
895	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
896	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
897	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
898	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
899	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
900	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
901	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
902	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
903	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
904	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
905	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
906	Poland	O02	medium-sized lowland streams (Eco-region 14)	core2
907	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
908	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
909	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
910	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
911	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
912	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
913	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
914	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
915	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
968	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
916	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
917	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2
918	Poland	O03	medium-sized lowland streams (Eco-region 16)	core2

Site number	Country	Stream type	Type description	Core or additional
859	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
860	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
861	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
862	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
863	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
864	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
865	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
866	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
867	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
868	Portugal	P04	medium-sized streams in lower mountainous areas of Southern Portugal	additional
969	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
970	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
971	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
972	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
973	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
974	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
975	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
976	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
977	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
978	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
979	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
980	Slovakia	V01	small-sized calcareous mountain stream in the East Carpathians	additional
981	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
982	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
983	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
984	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
985	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
986	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
987	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
988	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
989	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
990	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
991	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
992	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional
993	Slovakia	V02	small-sized siliceous mountains streams in the West Carpathians	additional

Site number	Country	Stream type	Type description	Core or additional
685	Sweden	S05	medium-sized lowland streams	core2
686	Sweden	S05	medium-sized lowland streams	core2
687	Sweden	S05	medium-sized lowland streams	core2
688	Sweden	S05	medium-sized lowland streams	core2
689	Sweden	S05	medium-sized lowland streams	core2
690	Sweden	S05	medium-sized lowland streams	core2
691	Sweden	S05	medium-sized lowland streams	core2
692	Sweden	S05	medium-sized lowland streams	core2
693	Sweden	S05	medium-sized lowland streams	core2
694	Sweden	S05	medium-sized lowland streams	core2
695	Sweden	S05	medium-sized lowland streams	core2
696	Sweden	S05	medium-sized lowland streams	core2
697	Sweden	S05	medium-sized lowland streams	core2
698	Sweden	S05	medium-sized lowland streams	core2
699	Sweden	S05	medium-sized lowland streams	core2
874	Sweden	S06	medium-sized streams on calcareous soils	additional
875	Sweden	S06	medium-sized streams on calcareous soils	additional
876	Sweden	S06	medium-sized streams on calcareous soils	additional
877	Sweden	S06	medium-sized streams on calcareous soils	additional
878	Sweden	S06	medium-sized streams on calcareous soils	additional
879	Sweden	S06	medium-sized streams on calcareous soils	additional
880	Sweden	S06	medium-sized streams on calcareous soils	additional
881	Sweden	S06	medium-sized streams on calcareous soils	additional
882	Sweden	S06	medium-sized streams on calcareous soils	additional
883	Sweden	S06	medium-sized streams on calcareous soils	additional
887	Sweden	S06	medium-sized streams on calcareous soils	additional
888	Sweden	S06	medium-sized streams on calcareous soils	additional

Site number	Country	Stream type	Type description	Core or additional
639	United Kingdom	U15	small-sized, shallow lowland streams	additional
640	United Kingdom	U15	small-sized, shallow lowland streams	additional
641	United Kingdom	U15	small-sized, shallow lowland streams	additional
642	United Kingdom	U15	small-sized, shallow lowland streams	additional
643	United Kingdom	U15	small-sized, shallow lowland streams	additional
644	United Kingdom	U15	small-sized, shallow lowland streams	additional
645	United Kingdom	U15	small-sized, shallow lowland streams	additional
646	United Kingdom	U15	small-sized, shallow lowland streams	additional
647	United Kingdom	U15	small-sized, shallow lowland streams	additional
648	United Kingdom	U15	small-sized, shallow lowland streams	additional
889	United Kingdom	U15	small-sized, shallow lowland streams	additional
890	United Kingdom	U15	small-sized, shallow lowland streams	additional
891	United Kingdom	U15	small-sized, shallow lowland streams	additional
674	United Kingdom	U23	medium-sized lowland streams	core2
675	United Kingdom	U23	medium-sized lowland streams	core2
676	United Kingdom	U23	medium-sized lowland streams	core2
677	United Kingdom	U23	medium-sized lowland streams	core2
678	United Kingdom	U23	medium-sized lowland streams	core2
679	United Kingdom	U23	medium-sized lowland streams	core2
680	United Kingdom	U23	medium-sized lowland streams	core2
681	United Kingdom	U23	medium-sized lowland streams	core2
682	United Kingdom	U23	medium-sized lowland streams	core2
683	United Kingdom	U23	medium-sized lowland streams	core2
892	United Kingdom	U23	medium-sized lowland streams	core2
893	United Kingdom	U23	medium-sized lowland streams	core2

Appendix II List of river and site names, pre-classified ecological status (5-"High" to 1 "Bad) and dominant degradation stress for the stream type. High status sites are deemed to have no operating stress and are the reference sites for the stream type.

Country	Stream type	River name	Site name	Status	Dominant stressor
Austria	A05	Sarmingbach	Wolfsschlucht	5	None
Austria	A05	Kleine Ysper	upst. Yspermühl	5	None
Austria	A05	Gießenbach	upst. Grasmühle	5	None
Austria	A05	Grosse Ysper	near Altenmarkt	4	Habitat
Austria	A05	Sarmingbach	upst. Angern	4	Habitat
Austria	A05	Gießenbach	downst. Grasmühle	4	Habitat
Austria	A05	Höllbach	near Würnsdorf	4	Habitat
Austria	A05	Sarmingbach	Waldhausen	3	Habitat
Austria	A05	Sarmingbach	Waldhausen - artificial channel (lower part)	3	Habitat
Austria	A05	Kleine Ysper	Artnermühle - artificial channel (lower part)	3	Habitat
Austria	A05	Sarmingbach	Waldhausen - artificial channel (upper part)	1	Habitat
Austria	A05	Höllbach	upst. Würnsdorf	1	Habitat
Austria	A05	Kleine Ysper	Artnermühle - artificial channel (upper part)	1	Habitat
Austria	A05	Gießenbach	Klausmühle	4	Habitat
Austria	A05	Gießenbach	Klausmühle - downst. weir	1	Habitat
Austria	A06	Stainzbach	Höllgraben	5	None
Austria	A06	Wildbach	near Kramermirtl	5	None
Austria	A06	Stullneggbach	near Kruckenberg	5	None
Austria	A06	Weiße Sulm	Sulmklamm	5	None
Austria	A06	Stainzbach	near Marhof	4	Habitat
Austria	A06	Wildbach	upst. Schoberberg	4	Habitat
Austria	A06	Stullneggbach	near Aichegg	4	Habitat
Austria	A06	Weiße Sulm	Wernersorf	4	Habitat
Austria	A06	Stullneggbach	near Mainsdorf	3	Habitat
Austria	A06	Stainzbach	Bad Sauerbrunn	3	Habitat
Austria	A06	Weiße Sulm	near Wernersdorf	3	Habitat
Austria	A06	Gradnerbach	near Köflach	2	Habitat
Austria	A06	Schwarze Sulm	near Kleingraden	2	Habitat
Austria	A06	Schwarze Sulm	PP Schwanberg - headrace section	3	Habitat
Austria	A06	Schwarze Sulm	PP Schwanberg - residual flow	3	Habitat
Austria	A06	Schwarze Sulm	PP Schwanberg - artifical channel	1	Habitat
Austria	A06	Schwarze Sulm	Schwanberg - downst. PP	5	None
Austria	A06	Stainzbach	Bad Sauerbrunn - side channel	4	Habitat
Austria	A06	Stullneggbach	upst. Grünberg - upst. sediment control dam	5	None
Austria	A06	Stullneggbach	upst. Grünberg - in sediment control dam	2	Habitat
Austria	A06	Stullneggbach	upst. Grünberg - downst. sediment control dam	3	Habitat

Country	Stream type	River name	Site name	Status	Dominant stressor
Czech Republic	C04	Luborca	Luborca	5	None
Czech Republic	C04	Velka Hana	Rychtarov	5	None
Czech Republic	C04	Mala Hana	Ruprechtov	5	None
Czech Republic	C04	Cerny potok	Biskupice	4	Organic
Czech Republic	C04	Velicka	Suchovske mlyny	4	Organic
Czech Republic	C04	Sudomericky potok	Mlynky	4	Organic
Czech Republic	C04	Okluka	Vicov	4	Organic
Czech Republic	C04	Nectava	Brezinky	4	Organic
Czech Republic	C04	Sumice	Kandia	3	Organic
Czech Republic	C04	Olesna	Zvole	3	Organic
Czech Republic	C04	Drahansky potok	Myslejovice	3	Organic
Czech Republic	C04	Usobrnsky potok	Novy Dvur	3	Organic
Czech Republic	C04	Umori	Zbraslavec	2	Organic
Czech Republic	C04	Bykovka	Cerna Hora	1	Organic
Czech Republic	C05	Huntava	Valsovsky dul	5	None
Czech Republic	C05	Sitka	Horni Zleb	5	None
Czech Republic	C05	Trusovicky potok	Belkovice	5	None
Czech Republic	C05	Oslava	Techanov	4	Habitat
Czech Republic	C05	Luha	Sloup	4	Habitat
Czech Republic	C05	Nemilka	Ruzove udoli	4	Habitat
Czech Republic	C05	Oskava	Oskava	3	Habitat
Czech Republic	C05	Drazuvka	Sumvald	3	Habitat
Czech Republic	C05	Trebuvka	Dlouha Loucka	2	Habitat
Czech Republic	C05	Trebuvka	Borsov	1	Habitat

Site number	Country	Stream type	River name	Site name	Status	Dominant stressor
662	Denmark	K02	Karstoft Aa	Noerre Grene	5	None
663	Denmark	K02	Mattrup Aa	Stids Moelle	5	None
664	Denmark	K02	Lindenborg Aa	Roede Moelle	5	None
665	Denmark	K02	Sunds Noerre Aa	Noerre Linaa	5	Habitat
666	Denmark	K02	Rind Aa	Hoegild	5	Habitat
667	Denmark	K02	Kastbjerg Aa	Edderup	4	Habitat
668	Denmark	K02	Fjederholt Aa	Okkels	4	Habitat
669	Denmark	K02	Tange Aa	Lillemoelle	4	Habitat
670	Denmark	K02	Skibsted Aa	Skibstedbro	3	Habitat
671	Denmark	K02	Skals Aa	Faarup	3	Habitat
672	Denmark	K02	Ry Aa	Jerslev bro	3	Habitat
673	Denmark	K02	Ryom Aa	Koed	2	Habitat
723	France	F08	Ignon	Ignon upstream Fresnois	5	None
724	France	F08	Aube	Aube at Aubepierre-sur-Aube	5	None
725	France	F08	Seine	Seine at the 'Ermitage du Val de Seine'	5	None
726	France	F08	Aujon	Aujon upstream Giey-sur-Aujon	4	Organic
727	France	F08	Rognon	Rognon at Montot-sur-Rognon	4	Organic
728	France	F08	Ornain	Ornain downstream Abainville	4	Organic
729	France	F08	Meuse (Bassoncourt)	Meuse between Daillecourt and Bassoncourt	3	Organic
730	France	F08	Anger	Anger downstream Jainvillotte	3	Organic
731	France	F08	Madon	Madon at Hagécourt (pont bleu)	3	Organic
732	France	F08	Meuse (Bourg-Sainte-Marie)	Meuse between Bourg-Sainte-Marie and Bourmont	1	Organic
733	France	F08	Mouzon	Mouzon at Sartes	1	Organic
734	France	F08	Saônelle	Saônelle downstream Villouxel	1	Organic

Site number	Country	Stream type	River name	Site name	Status	Dominant stressor
649	Germany	D03	Stepenitz	Stepenitz near Putlitz (BB)	5	None
650	Germany	D03	Eltingmühlenbach	Eltingmuehlenbach near Greven (NRW)	5	None
651	Germany	D03	Rhin	Rhin near Raegelsdorf (BB)	5	None
652	Germany	D03	Örtze	Oertze N of Poitzen (NS)	5	None
653	Germany	D03	Aue	Aue E of Wildeshausen (NS)	4	Habitat
654	Germany	D03	Lachte	Lachte W of Lachendorf (NS)	4	Habitat
655	Germany	D03	Berkel	Berkel SE of Vreden (NRW)	4	Habitat
656	Germany	D03	Böhme	Boehme S of Vierde (NS)	3	Habitat
657	Germany	D03	Karthane	Karthane near Muehlenholz/Karthan (BB)	3	Habitat
658	Germany	D03	Dinkel	Dinkel near Heek (NRW)	3	Habitat
659	Germany	D03	Issel	Issel N of Loikum (NRW)	2	Habitat
660	Germany	D03	Stever	Stever near Hullern (NRW)	2	Habitat
661	Germany	D03	Dinkel	Dinkel at Gronau (NRW)	1	Habitat
627	Germany	D04	Weißer Wehebach	Wehebachtalsperre	5	None
628	Germany	D04	Elbrighäuser Bach	Neuludwigsdorf	5	None
629	Germany	D04	Kall	Kalltalsperre	4	Habitat
630	Germany	D04	Platißbach	Eicherscheider Berg	4	Habitat
631	Germany	D04	Prether Bach	Oberprether Mühle	4	Habitat
632	Germany	D04	Linnepe	Linneperhütte	4	Habitat
633	Germany	D04	Wolfferter Bach	Wiesen	3	Habitat
634	Germany	D04	Salwey	Niedersalwey	3	Habitat
635	Germany	D04	Marienwasser	Wemlighausen	3	Habitat
636	Germany	D04	Lahn	Feudingen	3	Habitat
637	Germany	D04	Dreisbach	Dreis-Tiefenbach	2	Habitat
638	Germany	D04	Rahmede	Breitenhagen	1	Habitat
815	Germany	D06	Aubach	Aubach above Wiesthal	5	None
816	Germany	D06	Ilme	Ilme above Relliehausen	5	None
817	Germany	D06	Orb	Orb below Bad Orb	4	Habitat
818	Germany	D06	Itterbach	Itterbach above Kailbach	4	Habitat
819	Germany	D06	Hafenlohr	Hafenlohr above Lichtenau	4	Habitat
820	Germany	D06	Bieber	Bieber above Rossbach	4	Habitat
821	Germany	D06	Klingbach	Klingbach below Hausen	3	Habitat
822	Germany	D06	Jossa	Jossa below Sahlensee	3	Habitat
823	Germany	D06	Orb	Orb in Bad Orb	2	Habitat
824	Germany	D06	Aura	Aura in Burgsinn	1	Habitat

Site number	Country	Stream type	River name	Site name	Status	Dominant stressor
735	Greece	H04	Peristeria	Artiki	3	Organic
736	Greece	H04	Peristeria	Kalo nero	2	Organic
737	Greece	H04	Tsouraki	Tsouraki	5	None
738	Greece	H04	Tsouraki	SL 98	4	Organic
739	Greece	H04	Krathis	Tsivlos	5	None
740	Greece	H04	Peiros	Prevedos	1	Organic
751	Greece	H04	Koiliaris	Aptera	3	Organic
753	Greece	H04	Gadouras	Gadouras	4	Organic
756	Greece	H04	Gorgopotamos	Gorgopotamos Bridge	5	None
757	Greece	H04	Gorgopotamos	Gorgopotamos Village	4	Organic
849	Italy	I05	Rio della Cascata (K.10.15)	Rio della Cascata at km 3,3	5	None
850	Italy	I05	Rio S. Nicolò (B.25.80)	Rio S. Nicolò at km 1,4	4	Habitat
851	Italy	I05	Rio di Camin (B.65.95)	Rio di Camin at km 5,2	3	Habitat
852	Italy	I05	Rio Gardena (I)	Rio Gardena at km 11,7	4	Habitat
853	Italy	I05	Rio Gardena (I)	Rio Gardena at km 4,4	2	Habitat
854	Italy	I05	Rio Gardena (I)	Rio Gardena at km 2,3	5	None
855	Italy	I05	Rio Funes (B.300)	Rio Funes at km 2,7	4	Habitat
856	Italy	I05	Rio Stolla (C.400.10)	Rio Stolla at km 9,4	3	Habitat
857	Italy	I05	Rio Stolla (C.400.10)	Rio Stolla at km 6,9	5	None
858	Italy	I05	Rio Sesto (J.105)	Rio Sesto at km 15,8	1	Habitat
835	Italy	I06	Farma	Farma Iesa (SI) reference downstream	5	None
836	Italy	I06	Albegna	Albegna Roccalbegna (GR) reference	5	None
837	Italy	I06	Merse	Merse Monticiano (SI)	4	Habitat
838	Italy	I06	Feccia	Feccia Monticiano (SI)	3	Habitat
839	Italy	I06	Lente	Lente downstream Pitigliano (GR)	2	Habitat
840	Italy	I06	Senna	Senna Piancastagnano (SI) SS 2	3	Habitat
841	Italy	I06	Paglia	Paglia Piancastagnano (SI) SS 2	3	Habitat
842	Italy	I06	Fiora	Fiora downstream farm S. Fiora (GR)	1	Habitat
843	Italy	I06	Fiora	Fiora Cellena (GR)	4	Habitat
845	Italy	I06	Zancona	Zancona loc. Zancona (GR) reference	5	None
847	Italy	I06	Ente	Ente downstream Podere dei Frati (GR)	2	Habitat

Site number	Country	Stream type	Core or additional	River name	Site name	Status	Dominant stressor
997	Latvia	L02	core2	Kekava	In the park area of Kekava village	1	Organic
998	Latvia	L02	core2	Kuja	middle part, above crossing way Cesvaine-Aizkuja	2	Organic
999	Latvia	L02	core2	Licupe	near farmstead "UpesMarkuti"	4	Organic
1006	Latvia	L02	core2	Tumsupe	Above Podkajas farmstead	4	Organic
1007	Latvia	L02	core2	Veseta	Near by Vutalva	4	Organic
1017	Latvia	L02	core2	Age	Lower part of river in Saulkrasti town	2	Organic
1018	Latvia	L02	core2	Kisupe	The lower part of Kisupe in Saulkrasti town	2	Organic
1019	Latvia	L02	core2	Peterupe	The lower part, in the territory of cooperative "VEF"	2	Organic
1020	Latvia	L02	core2	Vitrupe	Pie Kirbizu forestry	4	Organic
1021	Latvia	L02	core2	Iecava	In the park area of Iecava village	1	Organic
1022	Latvia	L02	core2	Misa	Above crossing of ViaBaltica road	3	Organic
1023	Latvia	L02	core2	Ige	Below "Mileni"	4	Organic
1024	Latvia	L02	core2	Korgite	~500 m from river mouth	4	Organic
1031	Latvia	L02	core2	Letiza	Middle part	3	Organic
1035	Latvia	L02	core2	Zana	Below settlement Pampali	3	Organic
996	Latvia	L02	core2	Arona 3	Lower part, nearby "Rubeni"	5	None
1002	Latvia	L02	core2	Mergupe 3	Lower part	5	None
1005	Latvia	L02	core2	Pededze 3	Lower part	5	None
1010	Latvia	L02	core2	Raunis 3	Lower part	5	None
1013	Latvia	L02	core2	Rauza 3	Lower part, near farmstead "Caunites"	4	Organic
1016	Latvia	L02	core2	Strikupe 3	Lower part	5	None
1027	Latvia	L02	core2	Amula 3	Lower part	5	None
1030	Latvia	L02	core2	Koja 3	Lower part	5	None
1034	Latvia	L02	core2	Riezupe 3	Lower part	5	None

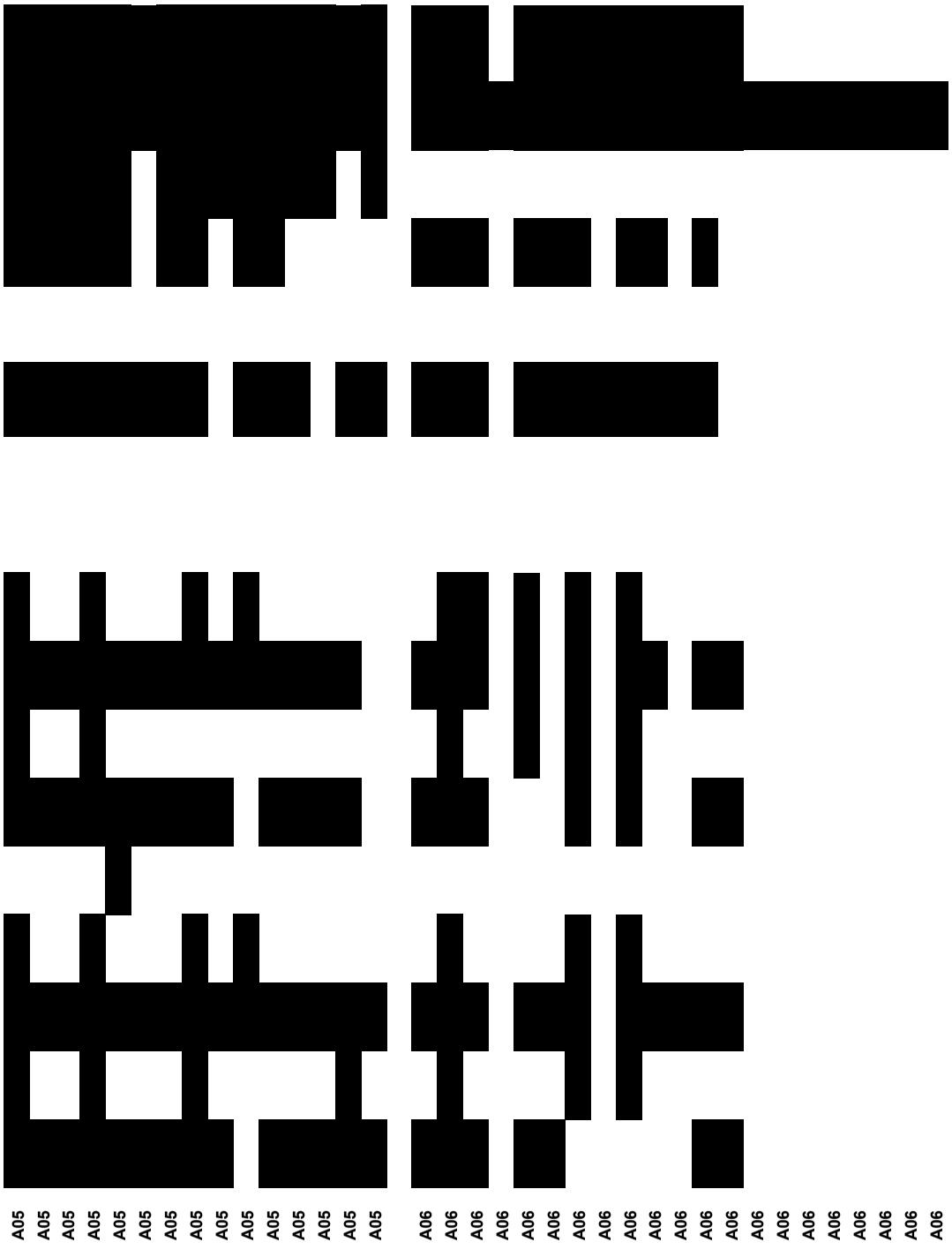
Site number	Country	Stream type	River name	Site name	Status	Dominant stressor
894	Poland	O02	Pilawa (profile Szwecja)	Szwecja	5	None
895	Poland	O02	Dobrzyca (profile Czapla)	Czapla	5	None
896	Poland	O02	Plytnica (profile above Plytnica)	Plytnica	5	None
897	Poland	O02	Pliszka (profile Konotop)	Drzewce	4	Organic
898	Poland	O02	Korytnica (profile Jaźwiny)	Jazwiny	5	Organic
899	Poland	O02	Ilanka (profile Maczkow)	Maczkow	3	Organic
900	Poland	O02	Samica (profile Kraplewo)	Kraplewo	3	Organic
901	Poland	O02	Struga (profile Katy)	Katy	2	Organic
902	Poland	O02	Meszna (profile Katy)	Dziedzice	1	Organic
903	Poland	O02	Ner (profile Lutomiersk)	Lutomiersk	1	Organic
904	Poland	O02	Grabia (profile Rokitnica-Mrerzaczka)	Jamborek	3	Organic
905	Poland	O02	Mala Welna (profile Kiszkowo)	Kiszkowo	3	Organic
906	Poland	O02	Wieprza (profile Gradki Dolne)	Gradki Dolne	5	None
907	Poland	O03	Slina (profile Zawady)	Zawady	2	Organic
908	Poland	O03	Mlawka (profile Szrensk)	Szrensk	1	Organic
909	Poland	O03	Sokolda (profile Nowa Rozedranka)	Podkamionka	4	Organic
910	Poland	O03	Ploska (profile Przechody)	Krolowy Most	4	Organic
911	Poland	O03	Suprasl (profile Zarzeczany)	Walily Stacja	3	Organic
912	Poland	O03	Narew (profile - border on the country)	Babia Gora	5	None
913	Poland	O03	Iutownia (profile Pogorzelce)	Stara Bialowieża	5	None
914	Poland	O03	Narewka (profile Bialowieża)	Podolany	3	Organic
915	Poland	O03	Lesna Prawa (profile Stopily)	Stopily	1	Organic
968	Poland	O03	Lesna Prawa (Hajnowka)	Hajnowka		
916	Poland	O03	Rospuda (profile Jozefowo)	Jozefowo	4	Organic
917	Poland	O03	Blizna (profile Szczerba)	Szczebra	3	Organic
918	Poland	O03	Wolkuszanka (Wolkusz)	Wolkusz	4	Organic

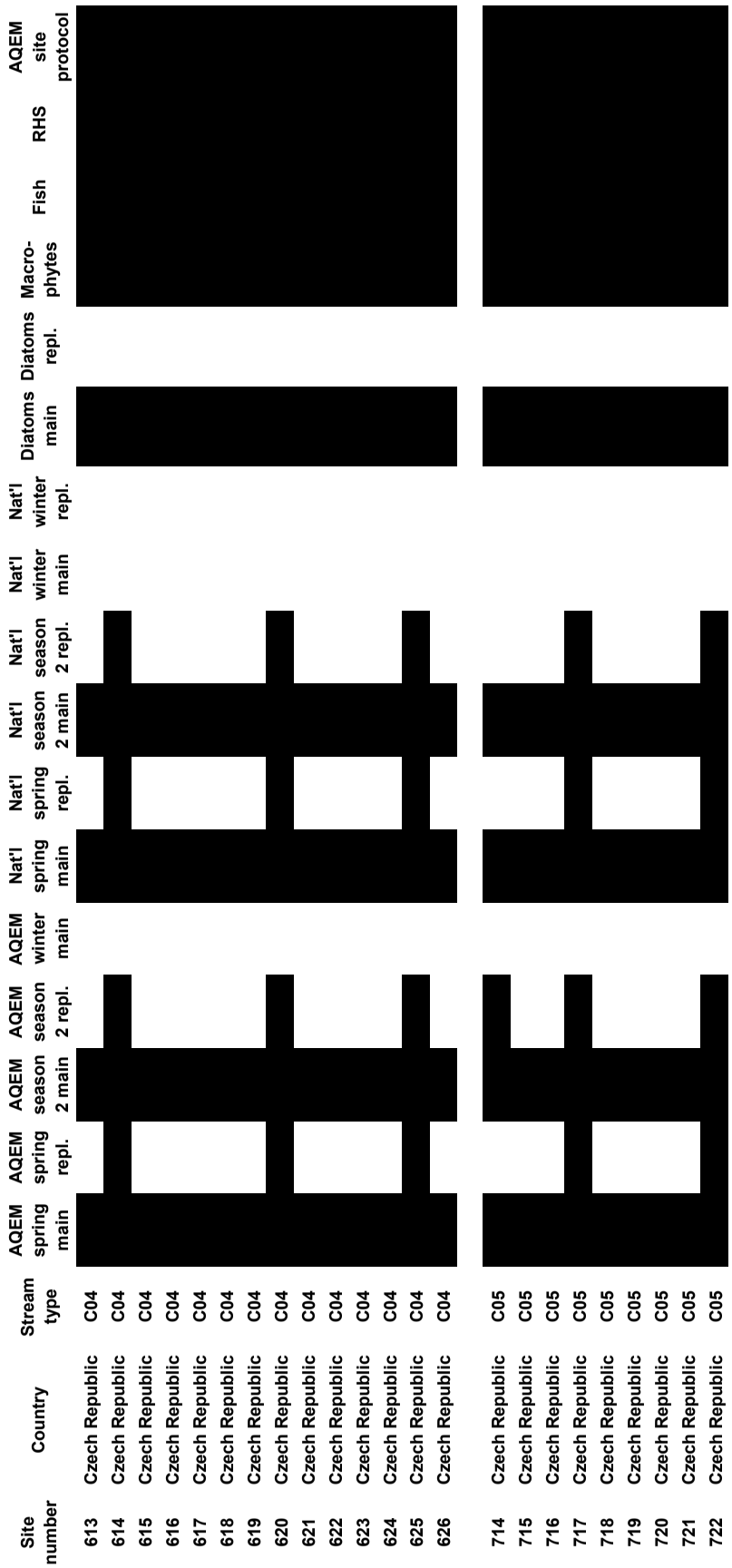
Site number	Country	Stream type	Core or additional	River name	Site name	Status	Dominant stressor
859	Portugal	P04	additional	Vascão	Vascão	5	None
860	Portugal	P04	additional	Murtigão	Murtigão	4	Organic
861	Portugal	P04	additional	Pardiela	Pardiela	1.5	Organic
862	Portugal	P04	additional	Caia	Caia	1.5	Organic
863	Portugal	P04	additional	Xévora	Xévora	3	Organic
864	Portugal	P04	additional	Tripeiro	Tripeiro	5	None
865	Portugal	P04	additional	Taveiró	Taveiró	5	None
866	Portugal	P04	additional	Alpreade	Alpreade	4	Organic
867	Portugal	P04	additional	Ponsul	Ponsul	3	Organic
868	Portugal	P04	additional	Baságueda	Baságueda	4	Organic
969	Slovakia	V01	additional	Laborec 1	Mokré lúky	4	organic
970	Slovakia	V01	additional	Laborec 2	Medzilaborce	2	organic
971	Slovakia	V01	additional	Rieka 1	Zlomy	5	none
972	Slovakia	V01	additional	Rieka 2	Hŕbky	4	organic
973	Slovakia	V01	additional	Stružnica 1	pod Hrčastým	5	none
974	Slovakia	V01	additional	Stružnica 2	pri Jelšine	5	none
975	Slovakia	V01	additional	Svetlička	nad Svetlicami	3	organic
976	Slovakia	V01	additional	Udava 1	pri chate	5	none
977	Slovakia	V01	additional	Udava 2	hranica s CHKO	4	organic
978	Slovakia	V01	additional	Udava 3	Hostovické lúky	3	organic
979	Slovakia	V01	additional	Udava 4	Pasečné	3	organic
980	Slovakia	V01	additional	Výrava	nad Pod Bystrím	3	organic
981	Slovakia	V02	additional	Žitava 1	pri Živánskej veži	5	none
982	Slovakia	V02	additional	Žitava 2	Machulince	3	organic
983	Slovakia	V02	additional	Žitavica	pri Pred Žitavou	4	organic
984	Slovakia	V02	additional	Bystrica 1	pod Veľkou skalou	5	none
985	Slovakia	V02	additional	Bystrica 2	pri lyžiarskom vleku	5	none
986	Slovakia	V02	additional	Bystrica 3	Horná domovina	3	organic
987	Slovakia	V02	additional	Bystrica 4	Bystričany	3	organic
988	Slovakia	V02	additional	Hostiansky potok 1	pri Pod Javorom	5	none
989	Slovakia	V02	additional	Hostiansky potok 2	pod Obecným vrchom	4	organic
990	Slovakia	V02	additional	Hostiansky potok 3	nad Topoľčiankami	1	organic
991	Slovakia	V02	additional	Pokútsky potok 1	pod Za Žliabkom	5	none
992	Slovakia	V02	additional	Pokútsky potok 2	pod Ostrým Grúňom	4	organic
993	Slovakia	V02	additional	Stupavský potok	Pod Dračím hrádkom	4	organic

Site number	Country	Stream type	River name	Site name	Status	Dominant stressor
685	Sweden	S05	Nittälven	Downstream Nordtjärnsälven	5	None
686	Sweden	S05	Silveran		5	None
687	Sweden	S05	Jonsbergsån	Upstream Jonsberg		
688	Sweden	S05	Pajsoan	Upstreams the bridge	4	Organic
689	Sweden	S05	Sävälven	Upstream Sävefors	4	Organic
690	Sweden	S05	Sverkestaan	Halldammsforsen	3	Organic
691	Sweden	S05	Hörksälven	Brattforsen	3	Organic
692	Sweden	S05	Kisaån	Downstream Nedre Fölingen		
693	Sweden	S05	Gusumån	Gusum		
694	Sweden	S05	Sandan	Rif Kojan	4	Toxic
695	Sweden	S05	Saxhyttån	Saxhyttan		
696	Sweden	S05	Storan	Downstream Storakvarn	3	Toxic
697	Sweden	S05	Rastälven	Grängeshyttan	3	Toxic
698	Sweden	S05	Borkhultsan	Downstream nya dammen	2	Toxic
699	Sweden	S05	Sagan	Sala	2	Toxic
874	Sweden	S06	Älgängsan	Furuvik	5	None
875	Sweden	S06	Forsmarksan	Johannisfors	5	None
876	Sweden	S06	Hågaån	Lurbo		
877	Sweden	S06	Tämnaran		4	Organic
878	Sweden	S06	Strömaran		4	Organic
879	Sweden	S06	Penningbyan	Kvarnberget	4	Organic
880	Sweden	S06	Järsöströmmen	S. Järsö	4	Organic
881	Sweden	S06	Muskan		3	Organic
882	Sweden	S06	Kagghamraan		3	Organic
883	Sweden	S06	Husbyan	Finsta	2	Organic
887	Sweden	S06	Skeboan		3	Organic
888	Sweden	S06	Broströmmen		3	Organic

Site number	Country	Stream type	River name	Site name	Status	Dominant stressor
639	United Kingdom	U15	Ecchinswell Brook	Headley	5	None
640	United Kingdom	U15	Sweatford Water	Fordingbridge	5	None
641	United Kingdom	U15	Tadnoll Brook	Old Knowle	5	None
642	United Kingdom	U15	Westbury Brook	Westbury	4	Organic
643	United Kingdom	U15	Tadnoll Brook	Crossways	4	Organic
644	United Kingdom	U15	Barkham Brook	Arborfield	4	Organic
645	United Kingdom	U15	Caundle Brook	Glanvilles Wootton	4	Organic
646	United Kingdom	U15	Cuddington Brook	Cuddington	3	Organic
647	United Kingdom	U15	Pill River	Blue Anchor	3	Organic
648	United Kingdom	U15	Cliff Brook	Crowton	2	Organic
889	United Kingdom	U15	Hyde Brook	Bishops Cleeve	2	Organic
890	United Kingdom	U15	Arrowe Brook	Moreton	1	Organic
891	United Kingdom	U15	Wettenhall Brook	Wettenhall	1	Organic
674	United Kingdom	U23	Clun	Marlow	5	None
675	United Kingdom	U23	Llynfi	Glasbury	5	None
676	United Kingdom	U23	Onny	Plowden Woods	5	None
677	United Kingdom	U23	Monnow	at Monmouth Cap	4	Organic
678	United Kingdom	U23	Ogmore	Bridgend	4	Organic
679	United Kingdom	U23	Onny	Stokesay	4	Organic
680	United Kingdom	U23	Rhymney	Bedwas	3	Organic
681	United Kingdom	U23	Sirhowy	Ynysddu	3	Organic
682	United Kingdom	U23	Dean	Handforth	2	Organic
683	United Kingdom	U23	Cole	Small Heath	2	Organic
892	United Kingdom	U23	Tame	Stockport	1	Organic
893	United Kingdom	U23	Darwen	Cann Bridge	1	Organic

Appendix III The samples collected and surveys undertaken at each site




Site number
Country
Stream type
AQEM spring main
AQEM spring repl.
AQEM season 2 main
AQEM season 2 repl.
AQEM winter main
Nat'l spring main
Nat'l spring repl.
Nat'l season 2 main
Nat'l season 2 repl.
Nat'l winter main
Nat'l winter repl.
Diatoms main
Diatoms repl.
Macro-phytes
Fish
RHS
AQEM site protocol
613 Czech Republic C04
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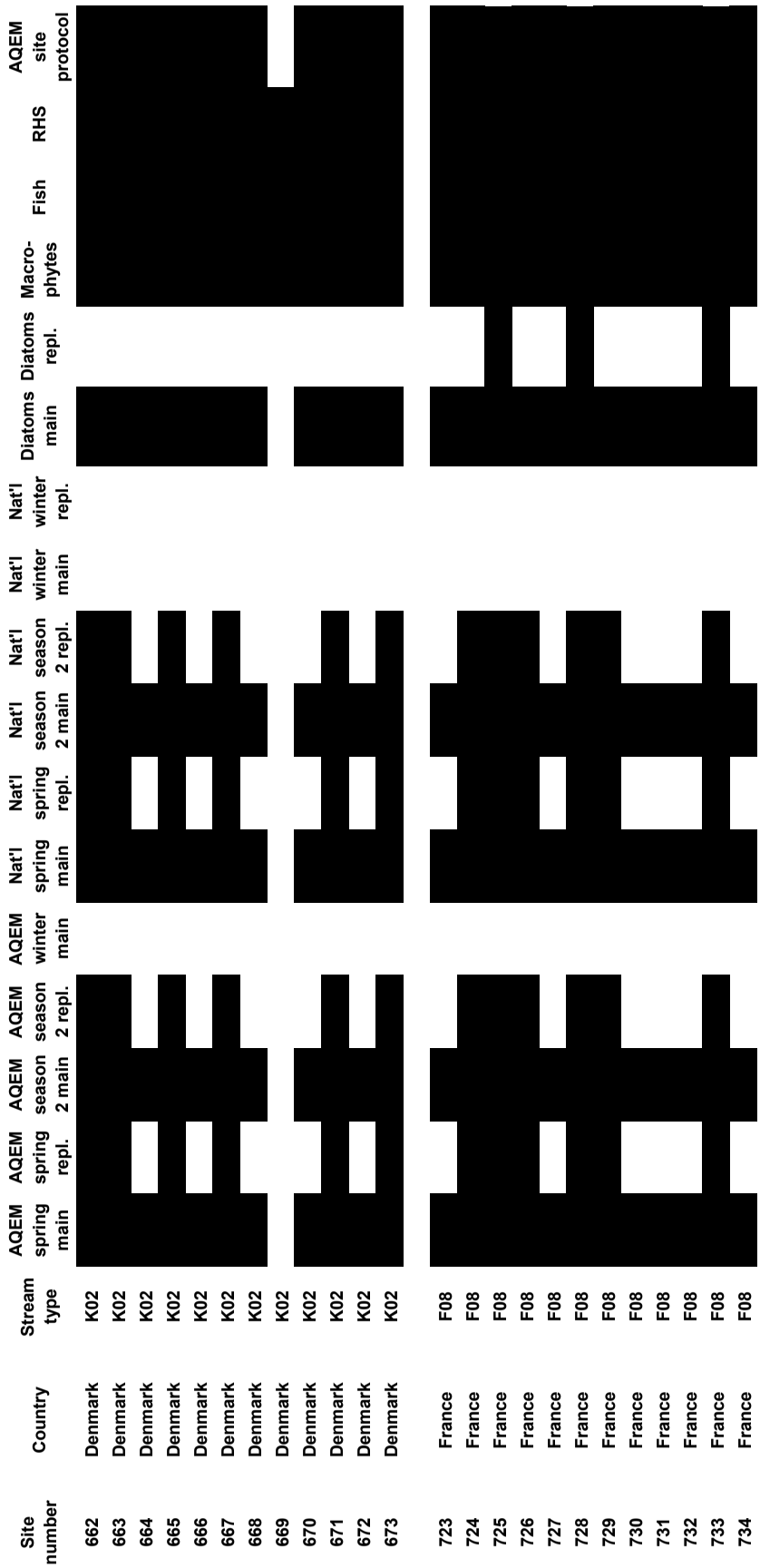
Site number
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Stream type
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Nat'l winter repl.
Diatoms main
Diatoms repl.
Macro-phytes
Fish
RHS
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662 Denmark K02
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670 Denmark K02
671 Denmark K02
672 Denmark K02
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723 France F08
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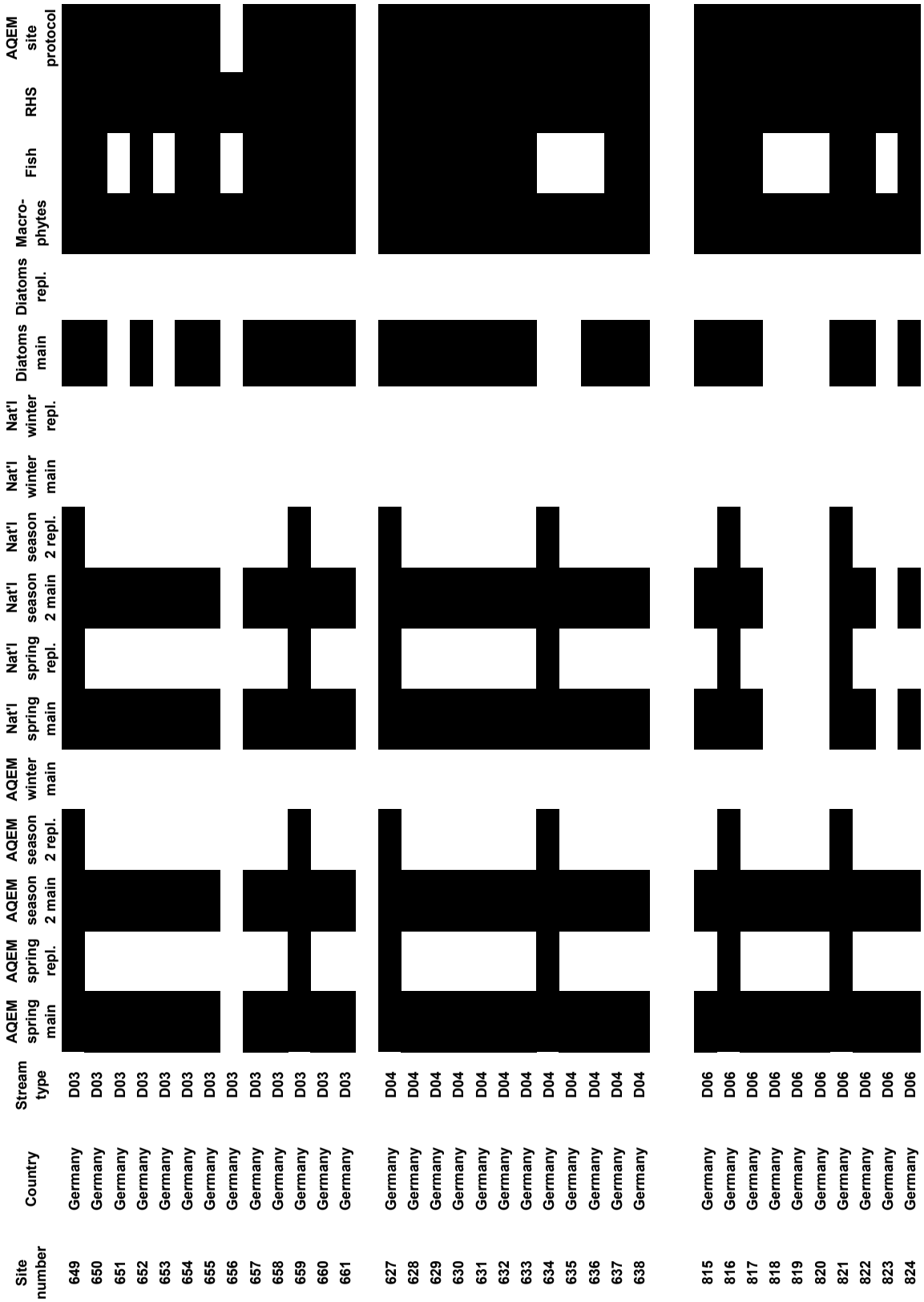
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Diatoms main
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Macro-phytes
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RHS
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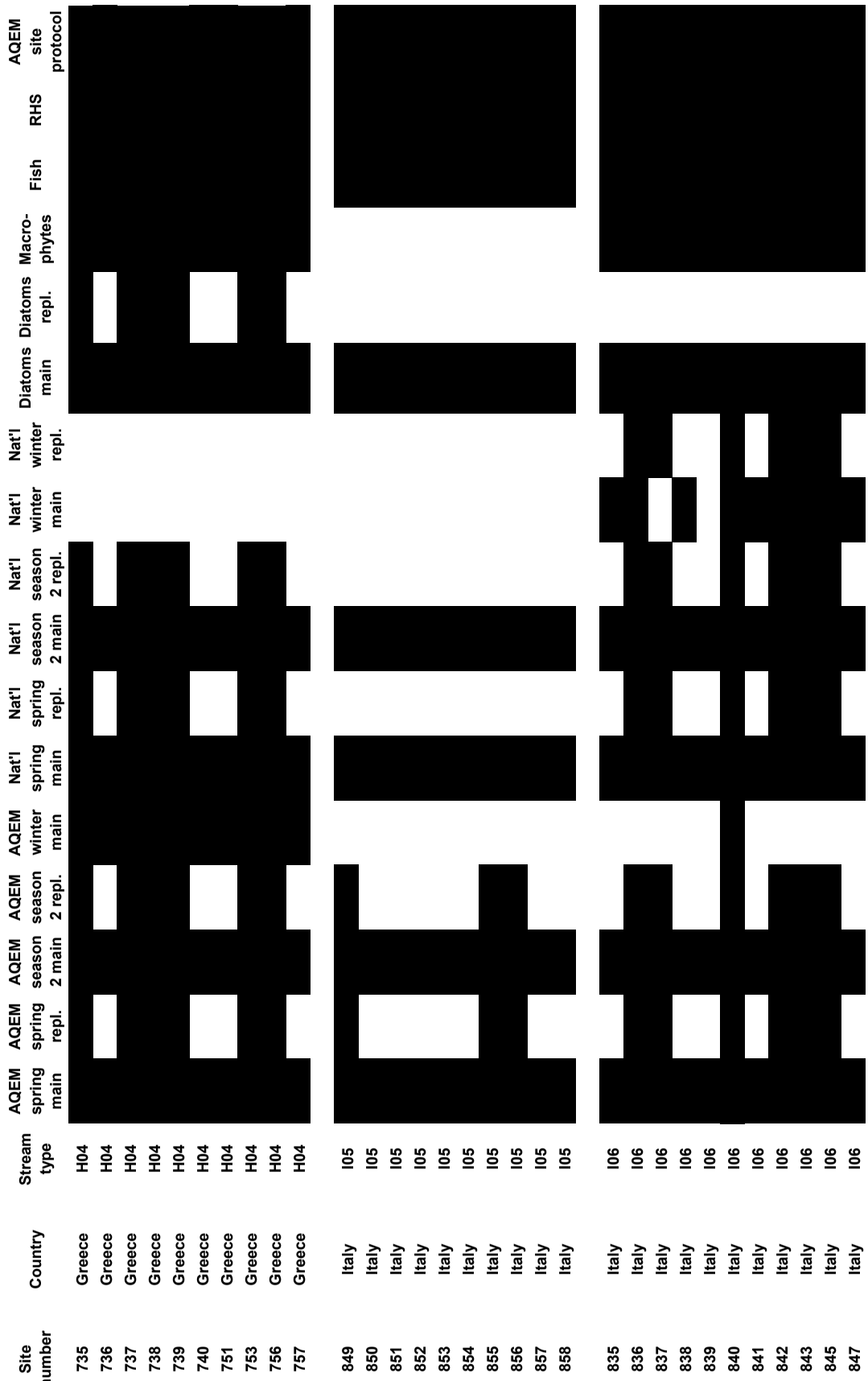
Site number
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AQEM winter main
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Diatoms main
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AQEM site protocol
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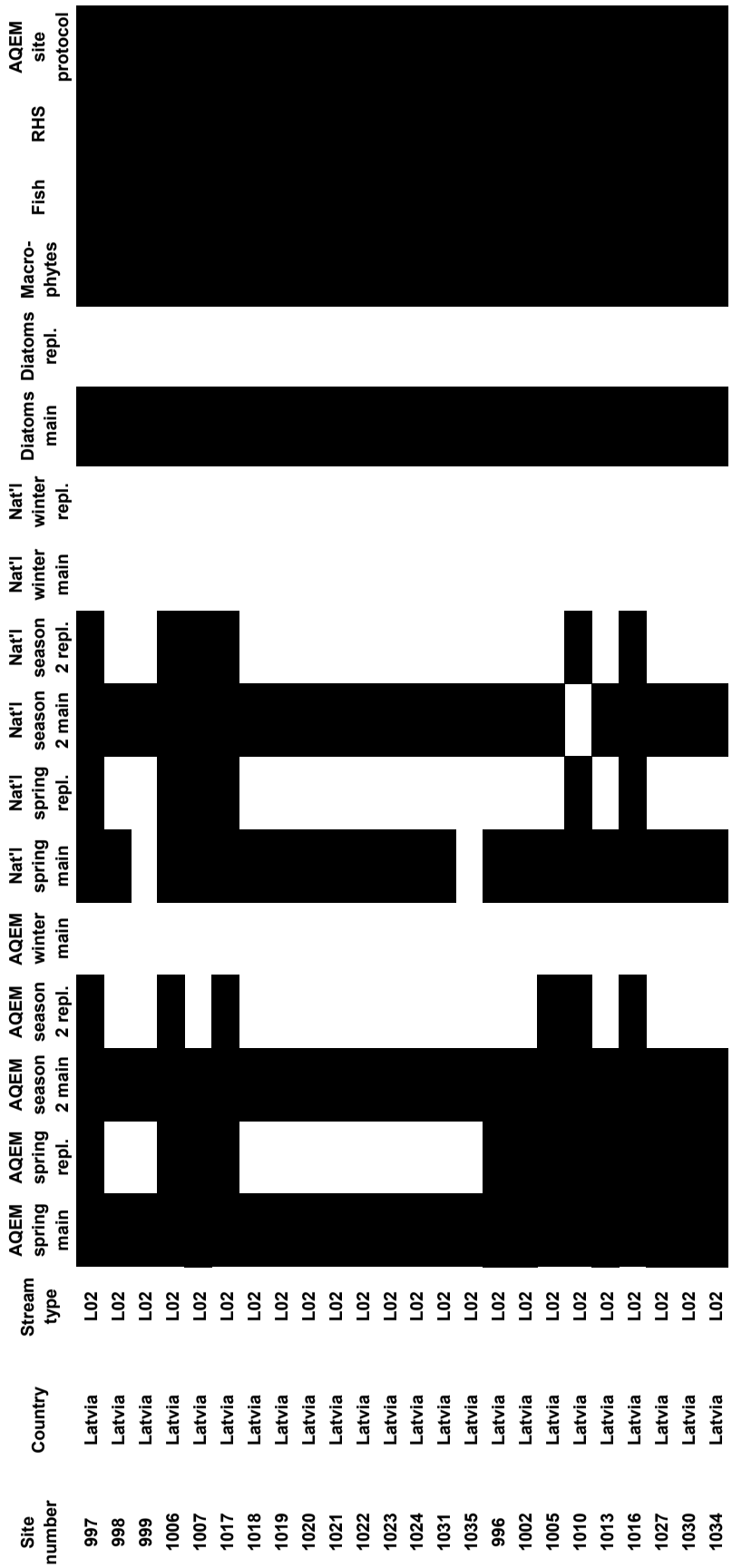
847 Italy I06


Site number
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Stream type
AQEM spring main
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AQEM winter main
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Diatoms main
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997 Latvia L02
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1018 Latvia L02
1019 Latvia L02
1020 Latvia L02
1021 Latvia L02
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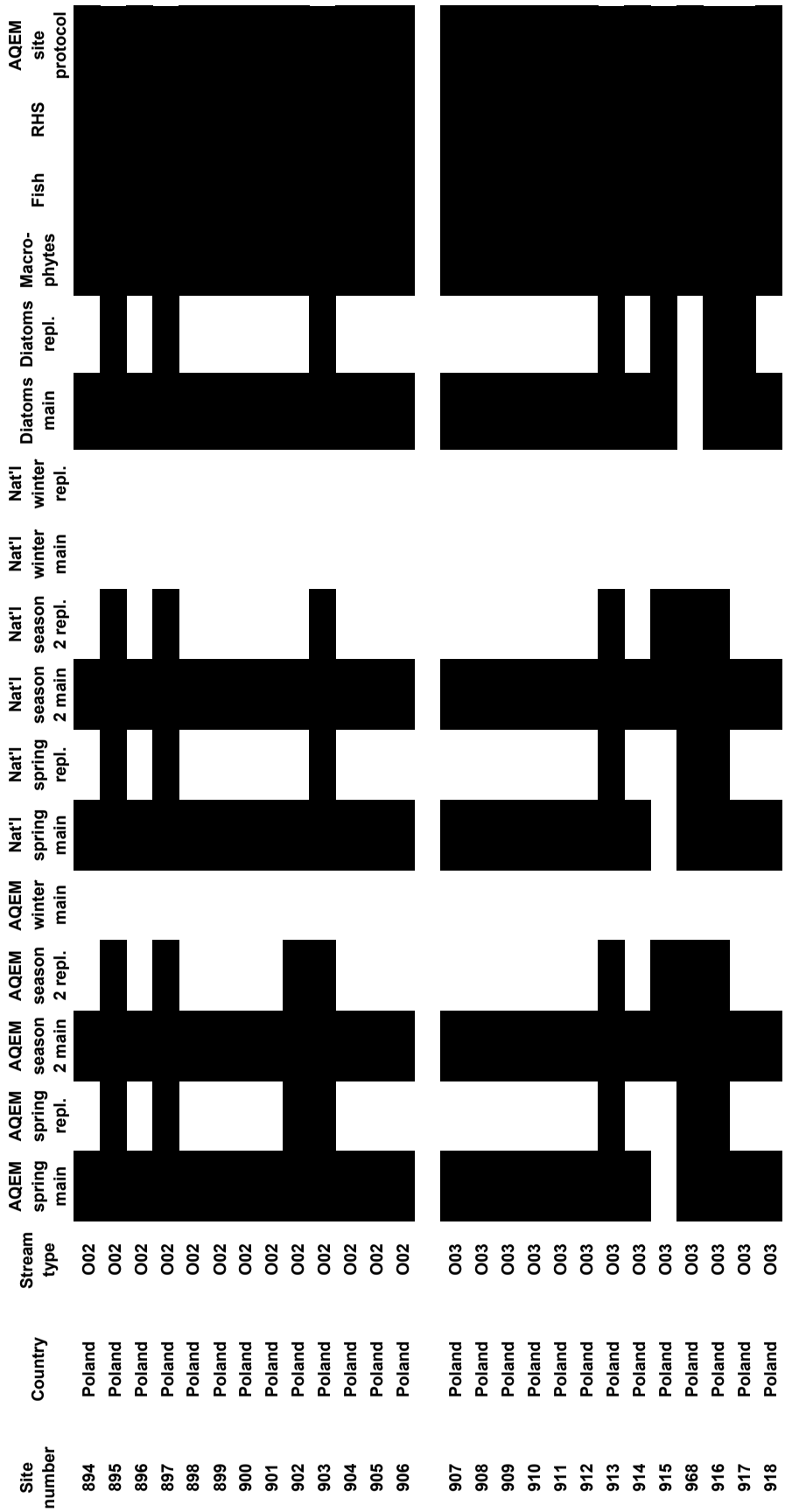
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AQEM winter main
Nat'l spring main
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Nat'l season 2 repl.
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Diatoms repl.
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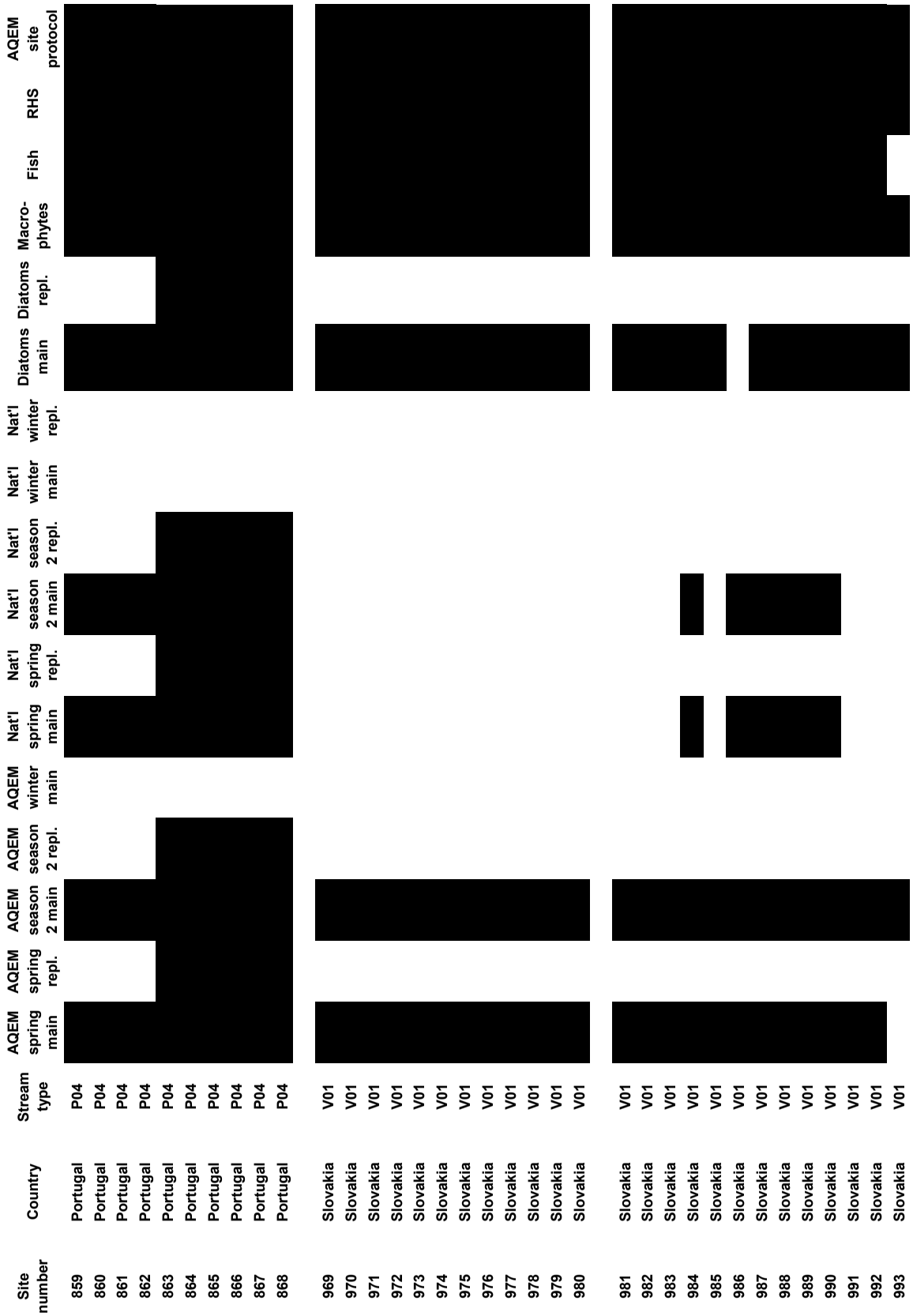
Site number
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AQEM season 2 main
AQEM season 2 repl.
AQEM winter main
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Nat'l spring repl.
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Diatoms main
Diatoms repl.
Macro-phytes
Fish
RHS
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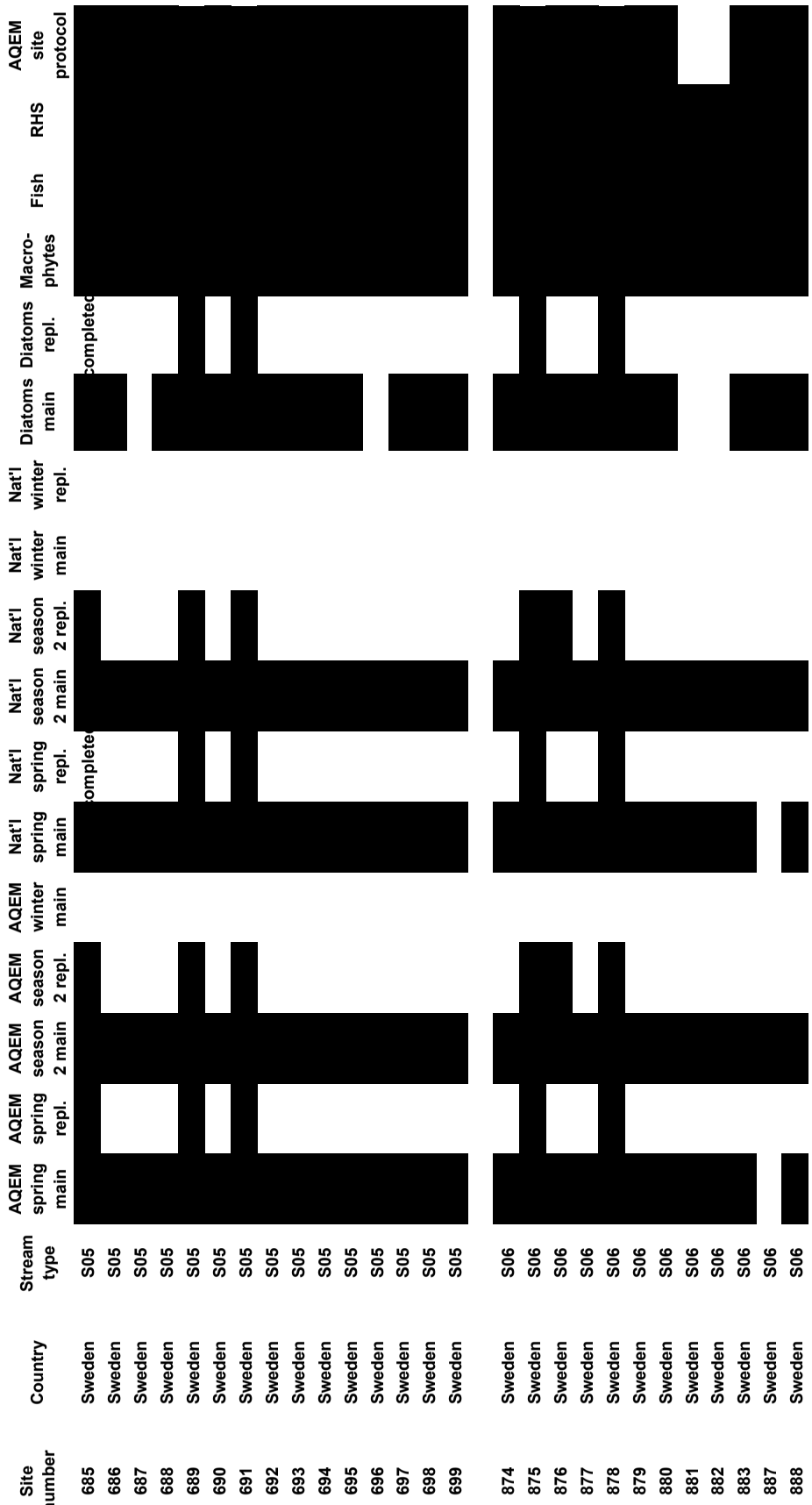
Site number
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Stream type
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AQEM season 2 main
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Nat'l season 2 repl.
Nat'l winter main
Nat'l winter repl.
Diatoms main
Diatoms repl.
Macro-phytes
Fish
RHS
AQEM site protocol
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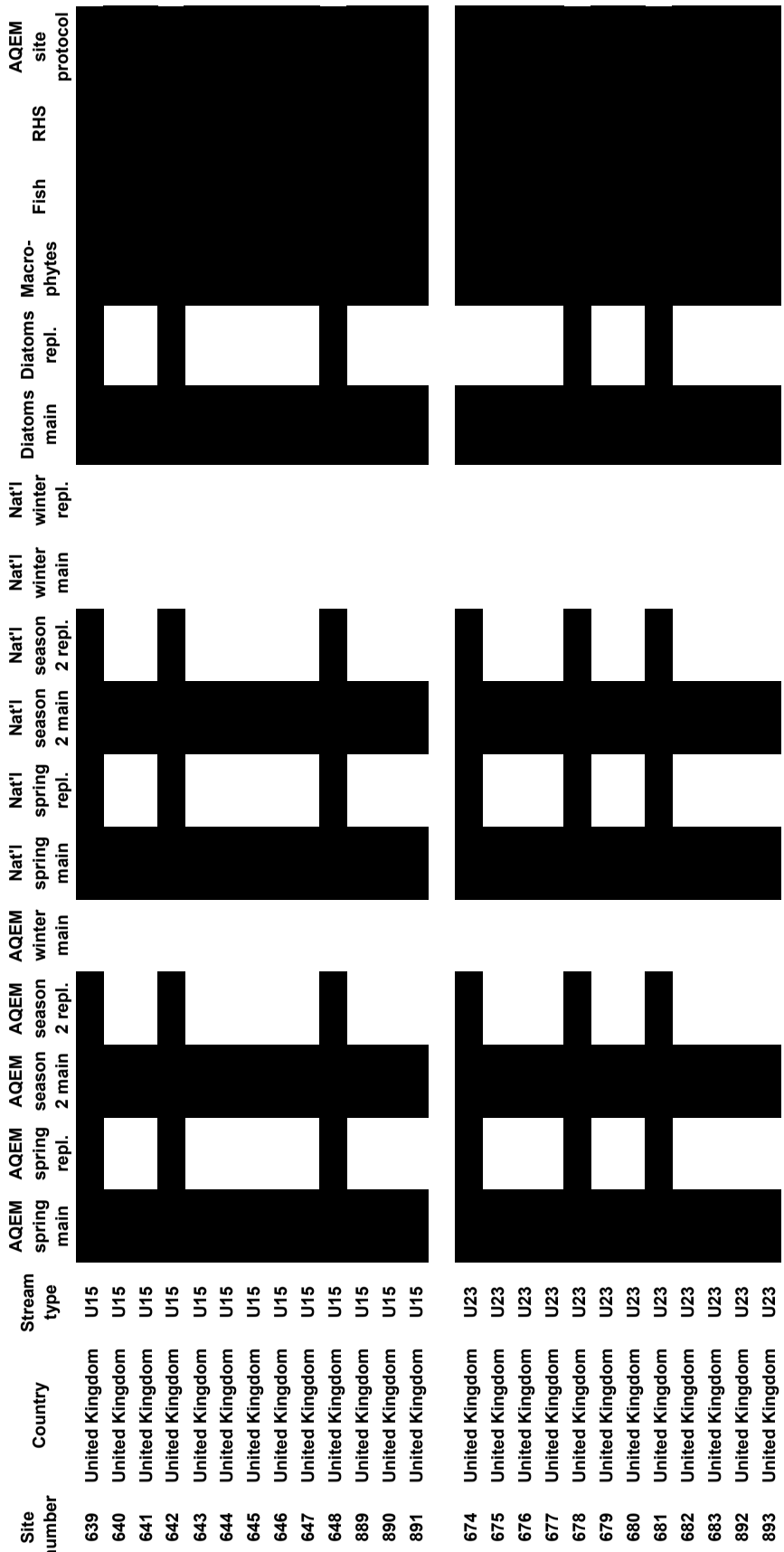
Site number
Country
Stream type
AQEM spring main
AQEM spring repl.
AQEM season 2 main
AQEM season 2 repl.
AQEM winter main
Nat'l spring main
Nat'l spring repl.
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Nat'l season 2 repl.
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Diatoms main
Diatoms repl.
Macro-phytes
Fish
RHS
AQEM site protocol
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Appendix IV The AQEMDIP V2.6 User Manual (23-07-2004)

Manual for the AQEM data-input program (AQEM*DIP*) Version 2.6

Installation and first run

- Installation of the AQEM*dip* starts by running the setup.exe.
- The setup is installing the program to a folder of your choice and automatically creates two subfolders, one for the databases, one for pictures.
- Start the AQEM*dip*.
- Login (see below)
- Select the menu **Extras** and subsequently the submenu **Options**.
- The program automatically sets the paths to the databases.
- Press **Connect** and a progress-bar shows that the program is connecting to its databases.
- Close the program and restart it again.
- During the following program start, the user is asked to enter a country for future data input.
- Once the country is entered, automatically
  - → the organisation structure 'AQEM – country' will be initialised and
  - → the corresponding taxalist is loaded into the program.

***Note**: You cannot change the country after the first start. To change the country the program must be installed again.*

Login

For login enter 'Aqem' in the field 'User' and 'AQEM' in the field 'Password' (please notice that the password has to be written in capital letters).
The login-password can not be changed in the current program-version.

Backup of your data

It is recommended to make backups of your data on a regular base. The data you have entered into AQEM*dip* are stored in the subfolder '*installation directory*\database'. There are 8 files with the extension '*.mdb' that you should backup (with the exception of 'ep_db.mdb' and 'ep_adb.mdb', which **do not** contain any user entered data).

Main menu

The main program menu bar contains the following menus:

- File
- Edit
- Taxalist
- Data input/display
- Lists
- Export
- Extras
- ?

File menu

Printer options ..... options for the standard printer
Close window..... closes the opened window or form
Exit ..... ends the AQEM*dip*

Edit menu

Cut..... deletes the marked element and copies it into the clip board
Copy ..... copies the marked element into the clip board
Paste..... inserts the element from the clip board at the cursor position
Delete ..... deletes the marked element
Find ..... searches for family, genus, species or author in the opened taxalist

Taxalist menu

Macro-invertebrates ..... opens either the complete European or the country specific taxalist of benthic macro-invertebrates. Opens also the synonym section of benthic macro-invertebrates.
Diatoms..... opens the complete European taxalist of diatoms. Opens also the synonym section of diatoms.

Data input/display menu

Site & Sample Input ..... opens the general data structure, that also serves for data input

Stream characteristics ..... opens the window for stream characteristics data input (site protocol) either according to the AQEM or according to the STAR protocol

Lists menu

Sampling Instruments & Area...opens the window for defining and editing sampled areas and sampling instruments

Export menu

Export ..... opens the window for exporting the data to Excel and Access

Extras menu

Options ..... opens the window for setting program options

? menu

Use help ..... opens a window for help information

Info..... information about the program

How to handle existing data – AQEM database

AQEM*dip* 1.3. and 2.6 can be used parallelly.

If you have already entered data in an earlier version of AQEM*dip* and you want to use these data together with newly entered STAR data, the existing database has to be adapted.

Please comply with the following steps:

- open your current AQEM*dip*
- select **Extras** in the menu and subsequently select **Options** in the sub-menu
- note the directory of the 'ProjectDB' database
- open your Windows-Explorer (or any other similar program)
- open the directory of your 'ProjectDB'
- copy the file 'ep_prj.mdb'
- send this file via email to ecoprof@irv-software.at

When you get back the file please comply with the following steps:

- install AQEM*dip* 2.6 (for instructions see above)
- after the first run close AQEM*dip* 2.6 once again
- copy the file 'ep_prj.mdb' that you got with email into the installation directory of AQEM*dip* 2.6 (usually c:/program/AQEMdip20; attention if you changed the standard directory during setup !!!!!)
- open AQEM*dip* 2.6
- select **Extras** in the menu and subsequently select **Options** in the sub-menu
- press **Connect**
- when the procedure is finished close the window with the help of the **Close** button
- start working

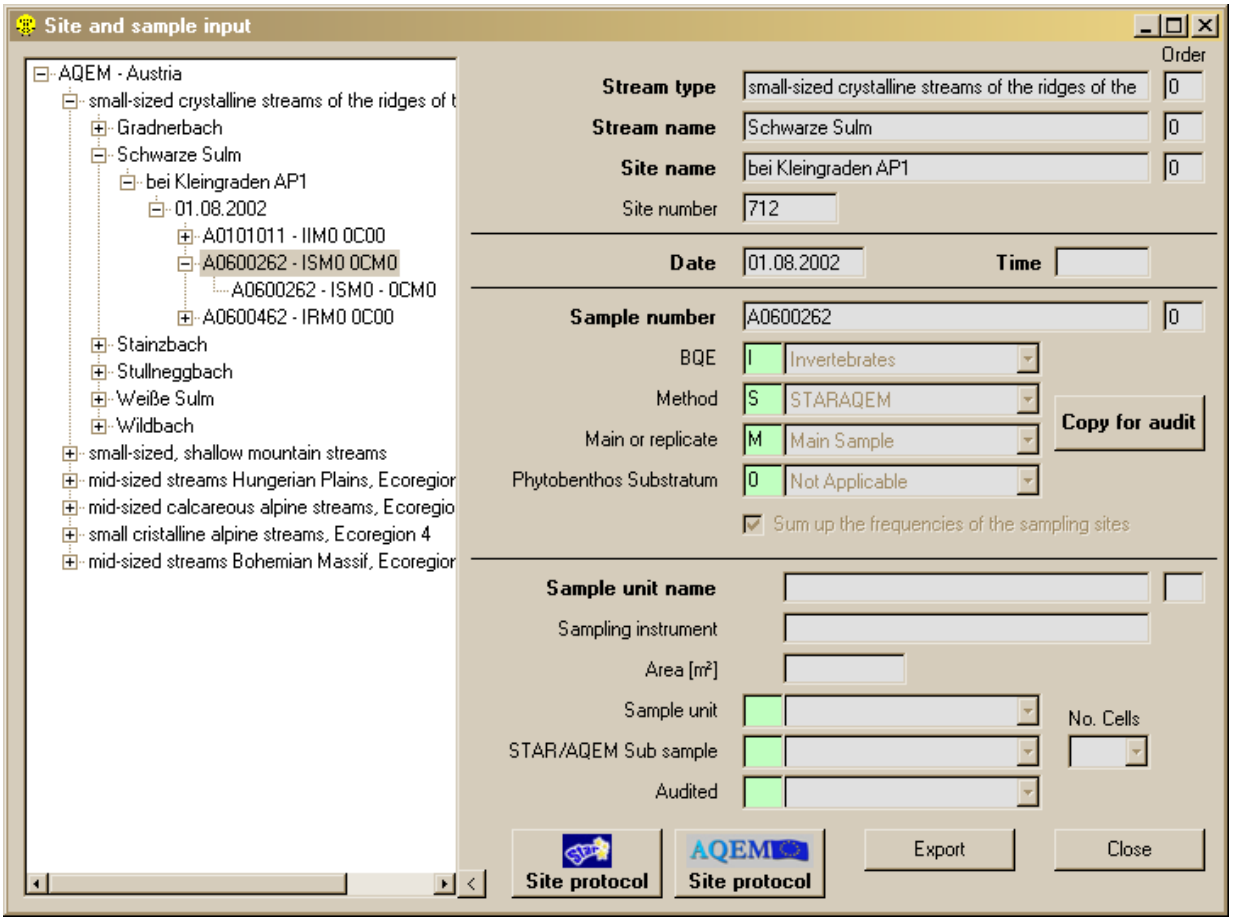
Site & sample input - window

The 'Site & Sample Input' window to begin entering the organisation structure is opened by selecting **Data input/display** in the menu and subsequently selecting **Site & Sample Input** in the submenu.
The menu bar is equivalent to the main menu bar.

The 'Site & Sample Input' window is divided into two sections

- the left window shows the organisation structure with sampling sites, for which data have already been entered
- the right window serves to show and edit data input (data input window)

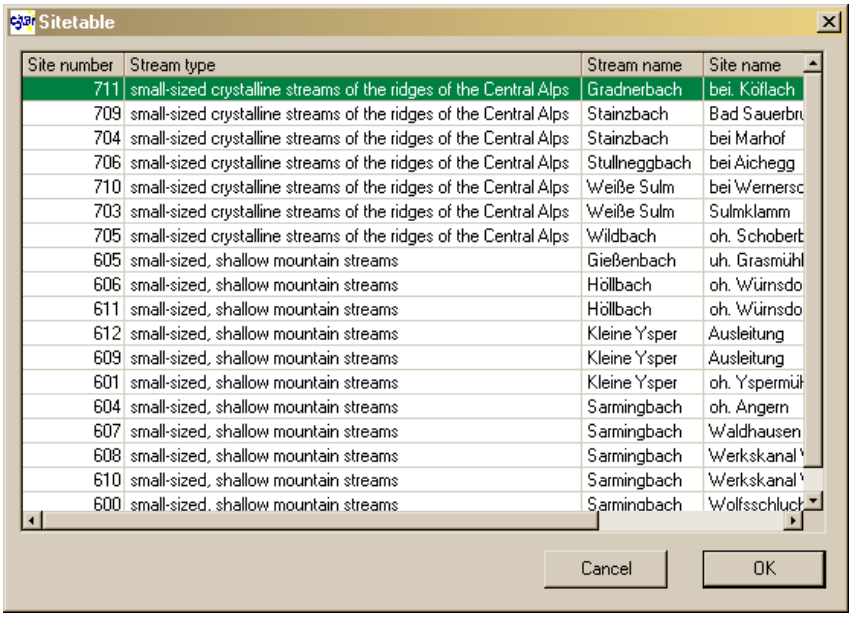
***Note**: The first line of the organisation structure automatically displays the 'AQEM – country'.*



***General note**: Data input/edit is managed by the use of the right mouse-button and is to be done level by level. Select the favoured level in the left window, then press the right mouse-button and make your choice. To finish input/edit of the selected level please press 'accept' to save the data or 'cancel' to quit without saving.*

Entering new STAR sites

- go to AQEM - country in the left window and click the right mouse button
- select **New STAR site** with the left mouse button
- the following table - containing all STAR sites - opens



- select site (including stream type and stream name)
- press the **OK** button
- the information of the site table will automatically be transferred into the 'Site & Sample Input' window
- if you do not want to make any further corrections press the **Accept** button

---

Entering new sites not sampled in STAR

- go to AQEM - country in the left window and click the right mouse button
- select **New stream type/name** with the left mouse button
- a blinking cursor will now appear in the field 'stream type' in the right data input window: enter the appropriate stream type here
- enter the stream name in the proceeding field
- press the **Accept** button
- to enter a second stream type/name: select first stream type/name or AQEM - country in the left window with the right mouse button
- select **New stream type/name**
- enter the second stream type/name on the right side of the window
- press the **Accept** button
- all further stream types/names should be entered in the same manner

Entering the site name

- click the appropriate **stream name** with the right mouse button in the left window
- select **New site name** with the left mouse button
- a blinking cursor will now appear in the field 'site name' in the right data input window: enter the appropriate site name here
- press the **Accept** button
- to enter a second site name: select first site or stream name with the right mouse button
- select **New site name**
- enter the second site name on the right side of the window
- press the **Accept** button
- all further site names should be entered in the same manner

***Note**: The field 'Site number' will stay empty because your site is not a STAR site.*

Entering the sampling date

- click the appropriate **site name** with the right mouse button in the left window
- select **New date**
- a blinking cursor will now appear in the field 'date' in the right data input window: enter the appropriate sampling date and time (optional) here
- press the **Accept** button
- to enter a second sampling date: select first date (or the site name) with the right mouse button
- select **New date**
- enter the second sampling date on the right side of the window
- press the **Accept** button
- all further sampling dates should be entered in the same manner

***Note**: The input of date and time format should correspond to your regional setting properties.*

Entering the sample number

- click the appropriate **sampling date** with the right mouse button in the left window
- select **New sample number**
- a blinking cursor will now appear in the field 'sample number' in the right data input window: enter the appropriate sample number here
- choose a 'Biological Quality Element' (BQE) from the selection list
- choose a 'Method' from the selection list
- choose an option for 'Main or Replicate' from the selection list
- choose a 'Phytobenthos Substratum' from the selection list

***Note**: If you make your choice from the first/second/third selection list, the following selection lists will only comprise those options that are possible regarding your first/second/third choice.*

- The 'sum up the frequencies of the sampling sites' field, will be ticked or not according to your choices from the selection lists. Change this status, if necessary.

***Note**: If you want to have the frequencies of the samples units within this sample number summed up tick the check box, otherwise the program will calculate the mean values !!*

- press the **Accept** button
- to enter a second sample number: select first sample number or the date with the right mouse button
- select **New sample number**
- enter the second sample number, the BQE, the method, the main or replicate and the phytobenthos substratum on the right side of the window
- press the **Accept** button
- all further sample numbers should be entered in the same manner

Entering the sample unit

- click the appropriate sample number with the right mouse button in the left window
- select **New sample unit** with the left mouse button
- a blinking cursor will now appear in the field 'sampling unit name' in the right data input window: enter a name of the sampling unit here
- choose a 'Sampling instrument' (including sampling area) from the selection list or fill in a 'Time relation'
- choose a 'Sample unit' from the selection list
- choose a 'STAR/AQEM Sub sample' and the number of processed cells from the selection lists
- choose an option for 'Audited'

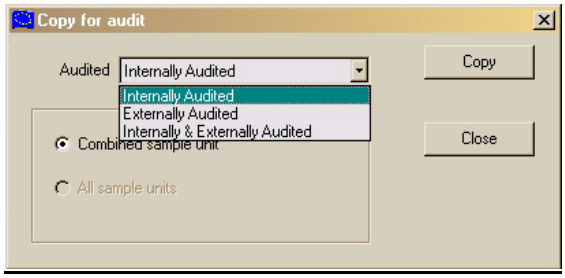
***Note**: If you make your choice from the first/second/third selection list, the following selection lists will only comprise those options that are possible regarding your first/second/third choice.*

***Note**: If you have sampled riffles and pools (or other sample units) separately you have to enter them as different "sampling units" (e.g. Unit 1 to 20). Please tick the check-box "sum up the frequencies" according to your choice (mark the 'sum up the frequencies of the sampling sites' field if you want to have the frequencies of the sample units within the sample number summed up, otherwise the program will calculate the mean values !!)*

Copy for audit

To facilitate the input process of audit data, it is possible to copy an already entered sample so that you do not have to enter all taxa again.

- click on the sample number that you want to copy in the left window
- click on the **Copy for audit** button
- choose one of the three audit options (internal, external or internal & external audit)
- press the **Copy** button



- the program will copy all data of the selected sample number and insert them into a new sample number
- the new/changed sampling code will be set automatically
- click the appropriate sample number with the right mouse button in the left window
- select **Edit** with the left mouse button
- make the corrections of taxa and number of individuals according to the audit results

***Note**: It is only possible to copy combined samples for audit.*

Options within the 'Site & Sample Input' window

- The **order** of stream types/stream names/site names/sample numbers and sample sites can be altered or fixed by changing the numbers in the small fields on the right of the appropriate layer.
- To **delete** a stream type/stream name/site name/date/sample number or sample site click the appropriate layer with the right mouse button in the left window and subsequently choose 'Delete'.
- To **edit** a stream type/stream name/site name/date/sample number or sample site for changing your entries click the appropriate layer with the right mouse button in the left window and subsequently choose 'Edit'.

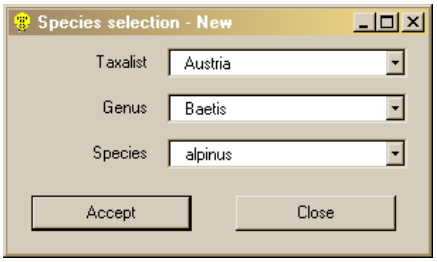
***Note**: Once a STAR sample code is entered, it is not possible to change it any more. You can only change it by deleting the old sample code and creating a new one.*

Data input - biological data – benthic invertebrates

- click the appropriate sampling unit with the right mouse button in the left window
- select **Edit** with the left mouse button
- a data input window according to your preceding choice opens (explanation of different available columns see below)
- to enter a taxon click on the button **New**
- the window 'Species selection – New' opens
- select the 'Taxalist' from the selection list; the country list is loaded as the default setting, however the complete European taxalist may be selected alternatively
- select a 'Genus' and a 'Species' in the second and third field from the respective selection lists

***Note**: Once the genus is selected, only the possible species names according to the selected genus and taxalist appear in the species list.*

By typing the first characters of the genus or species name, the process can be accelerated; the tabulator allows you to switch between the fields; using Alt and the cursor buttons, you can scroll up and down in the selection lists.



***Note**: If you cannot find a certain taxon neither in the taxalist of your country nor in the European taxalist, please open the synonym table (Menu Taxalist) and select the current name of the taxon. If the taxon is not listed there please inform Armin Lorenz (armin.lorenz@uni-essen.de) or Astrid Schmidt-Kloiber (astrid.schmidt-kloiber@boku.ac.at).*

- click the **Accept** button or press the enter key to finish this taxon input
- the species is loaded into the sampling site window
- the cursor is now automatically placed in the first available field
- enter the frequency of the taxon
- the input is finished by pressing the enter key
- the taxa input window 'Species selection – New' opens again automatically
- all further taxa entries are performed in the same manner
- after taxa input, click the **Close** button to finish data input

Options

- If the taxon was not securely determined, the 'cf' box can be marked.
- Juveniles can be identified by marking the 'juv' box.
- If the taxon is additional to the taxalist or sampling site, the box 'add' can be marked.
  (e.g. *Hydropsyche* sp.: if a second *Hydropsyche* sp. is found, that is surely different to another already entered *Hydropsyche* sp., then the 'add' box must be marked)

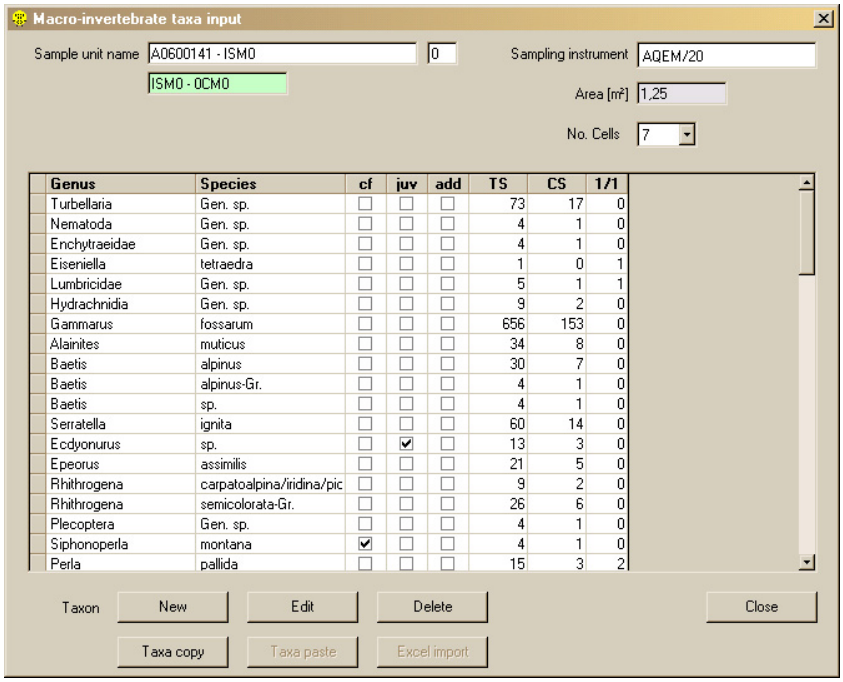
***Note**: If you want mark one of these options in addition to an already entered taxon you have to enter the one with the addition first (e.g. if you want to enter Baetis alpinus and Baetis alpinus juv. you have to start with Baetis alpinus juv.).*

- If you wish to change a species, place the cursor in the respective field and press the **edit** button.
- To delete a species from the list, place the cursor in the row to be deleted and press the **delete** button.

STAR/AQEM data input

The following columns are available:

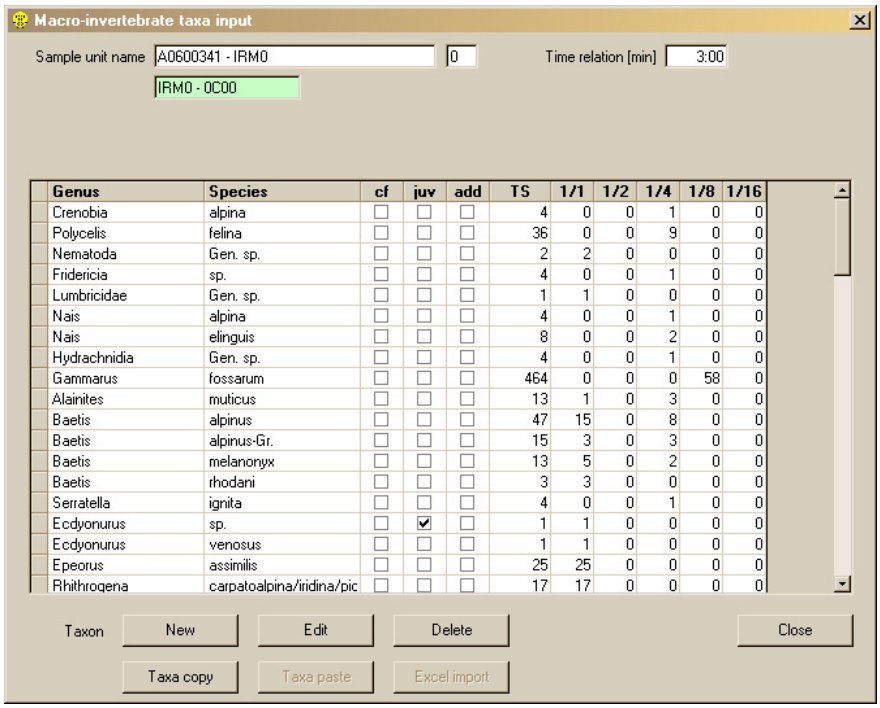
- TS = total sample: frequency of the taxon within the total sample (is calculated automatically according to the number of processed cells and the 1/1-column)
- CS = cells sample: frequency within the processed cells
- 1/1 = 1/1-fraction: input column for pre-picked taxa



RIVPACS data input

The following columns are available:

- TS = total sample: frequency of the taxon within the total sample (is calculated automatically according to entries of the fraction-columns)
- 1/1: input column for the 1/1 vial
- 1/2: input column for the 1/2 vial
- 1/4: input column for the 1/4 vial
- 1/8: input column for the 1/8 vial
- 1/16: input column for the 1/16 vial



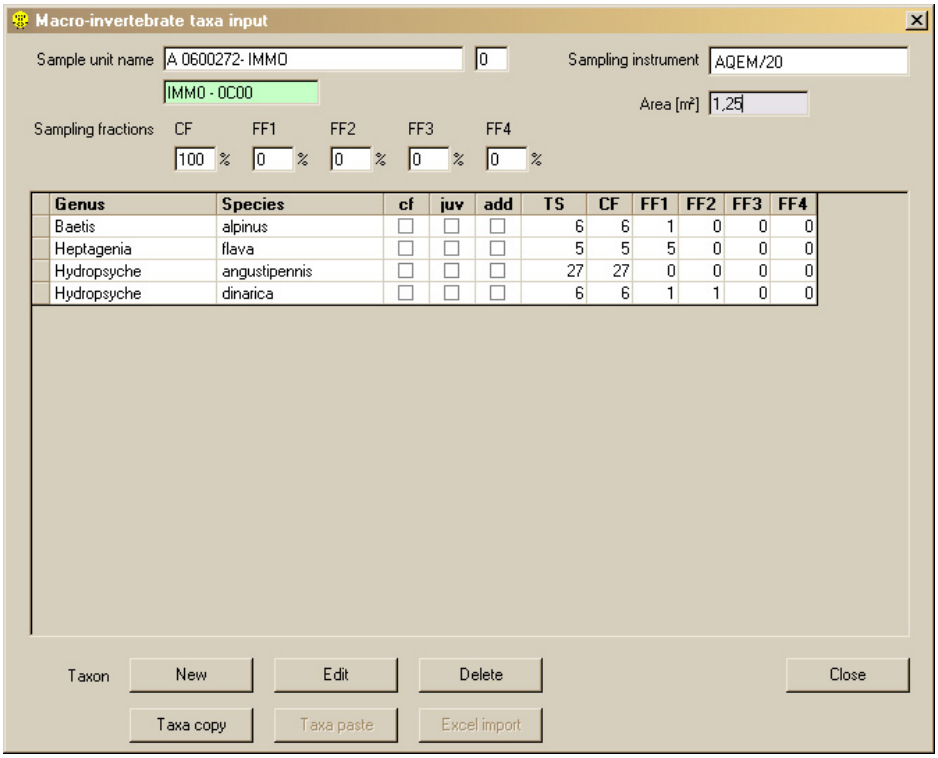
Original AQEM data input

First of all the fractions have to be specified.

- Sampling fractions: enter the percentage of the aliquot used for determination of the coarse fraction in the field 'CF' (if subsampling was performed); default is 100 %
- enter the percentage of the aliquot used for determination of the fine fraction in the fields 'FF1' to 'FF4' (if subsampling was performed)

The following columns are available:

- TS = total sample: frequency of the taxon within the total sample (is calculated by summing up the specific fractions multiplied with the specific percentage values)
- CF = coarse fraction: frequency within the coarse fraction
- FFx = fine fraction: frequency within the fine fraction(s)



***Note**: For the "Original AQEM Method" the sampling area should be 1.25 m² for all 20 replicates. Alterations may be necessary if you want to put in riffles and pools (or all replicates) separately. In this case the sampling area selection list can be used. This list can be modified in the menu 'lists'. Please notice that the sum of your areas for a specific sample number must be 1.25 m² !!*

Other data input

The windows of all other methods were adapted according to your specifications and are to be used in the same way.

Taxa copy/Taxa paste

In AQEM*dip* 2.6 you can copy taxa from one sample unit to another. Only the taxa names without frequencies will be copied.

- click the appropriate sampling unit with the right mouse button in the left window
- select **Edit** with the left mouse button
- the data input window opens
- mark a taxon with the mouse
- add other taxa by keeping the shift-button pressed
- press the **Taxa copy** button
- edit another sample unit
- press the **Taxa paste** button
- add the frequencies of the new taxa

***Note**: To avoid double entries of the same taxon, it is only possible to copy taxa into an empty sample unit.*

Macro-invertebrate data import

Existing macro-invertebrate data files can be imported into AQEM*dip* 2.6 via an import-interface for MS Excel data-files. Before the data-import can be started, it is necessary to create the whole sample structure (i.e. it is necessary to enter a stream type, a stream name, a site name, a sampling date, a sample number, a sample unit name).

After this is done

- click the appropriate sampling site with the right mouse button in the left window
- select **Edit** with the left mouse button
- a data input window according to your preceding choices opens
- to import an Excel file click the button **Excel import** at the lower end of the form

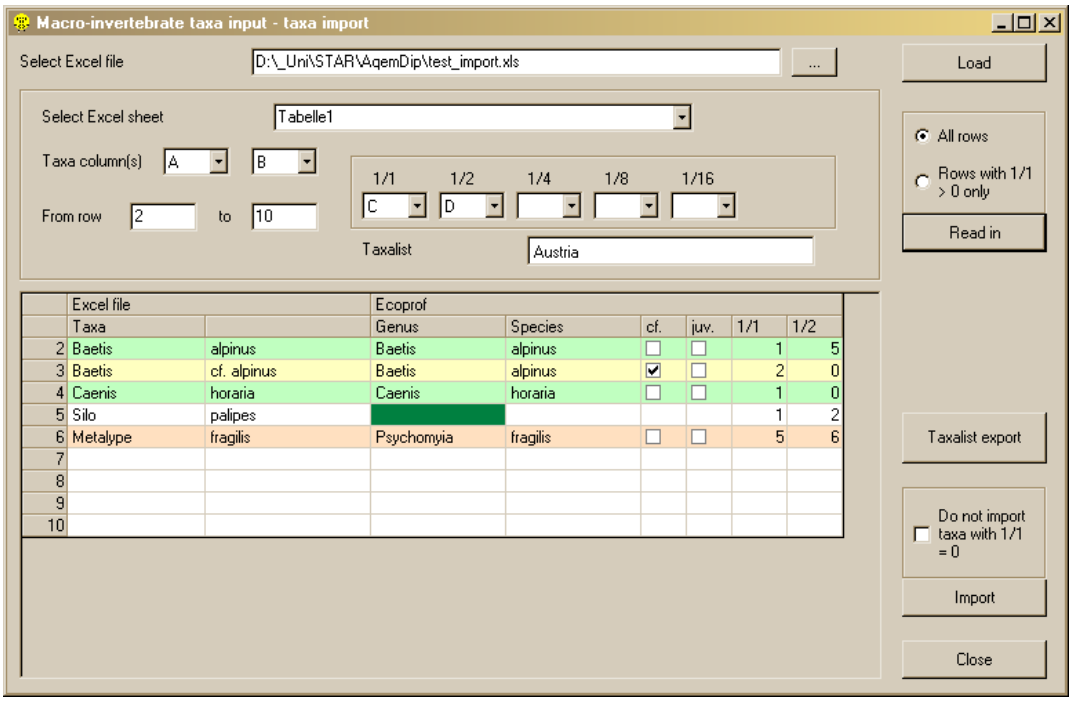
The 'macro-invertebrate taxa input – taxa import'-window opens.

- click on the button '**...**' and select an Excel file from your hard disk
- press the **Load** button to load the file
- select an Excel sheet within the loaded file
- define the columns in which the taxa names are stored in your Excel file
- define the rows that should be imported
- define the columns in which the number of individuals are stored

***Note**: The selection lists and names of the columns change according to the method defined when creating the sample unit.*

- choose if you only want to import rows with values greater than 0
- press the **Read in** button

The imported file can be seen in the lower window. The first two columns contain the original entries of your Excel-file, column 3 and 4 contain the values that will be imported by AQEM*dip*.



The following colour codes are possible:

- green: the taxon was identified by the AQEM*dip* taxa-database and read in correctly
- yellow: the taxon was identified by the AQEM*dip* taxa-database and basically read in correctly; the status of the taxon (e.g. juv., cf.) was automatically adapted by AQEM*dip*, a check is therefore reasonable
- orange: the taxon was identified as synonym by the AQEM*dip* taxa-database; the suggested taxon for import can be seen in column 3 and 4
- white: the taxon was not identified by the AQEM*dip* taxa-database (e.g. because of a spelling mistake) and could not be read in; if another taxon should be entered instead, click into the field in column 3 and choose a taxon form the selection list

If all changes and specifications are done click on the **Import** button and the file will be read in into your sample unit form.

***Note**: The numbers on the left side of the import-window correspond to the row-numbers of your original Excel-file.*

*If you press the button **Taxalist export** a documentation of the import is exported to Excel.*

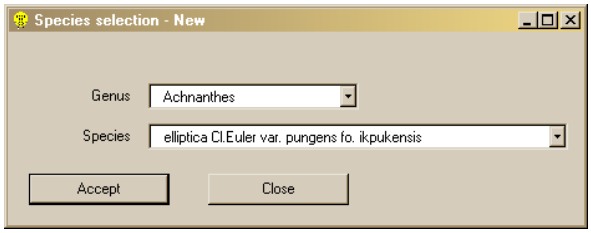
It is only possible to import an Excel-file into an empty sample unit form.

Data input - biological data - diatoms

- click the appropriate sampling unit with the right mouse button in the left window
- select **Edit** with the left mouse button
- a data input window opens
- to enter a taxon click on the button **New**
- the window 'Species selection – New' opens
- select a 'Genus' and a 'Species' from the respective selection lists

***Note**: Once the genus is selected, only the possible species names according to the selected genus and taxalist appear in the species list.*

By typing the first characters of the genus or species name, the process can be accelerated; the tabulator allows you to switch between the fields; using Alt and the cursor buttons, you can scroll up and down in the selection lists.



***Note**: If you cannot find a certain taxon in the taxalist, please open the synonym table (Menu Taxalist) and select the current name of the taxon. If the taxon is not listed there please inform Piet Verdonschot (P.F.M.Verdonschot@Alterra.wag-ur.nl).*

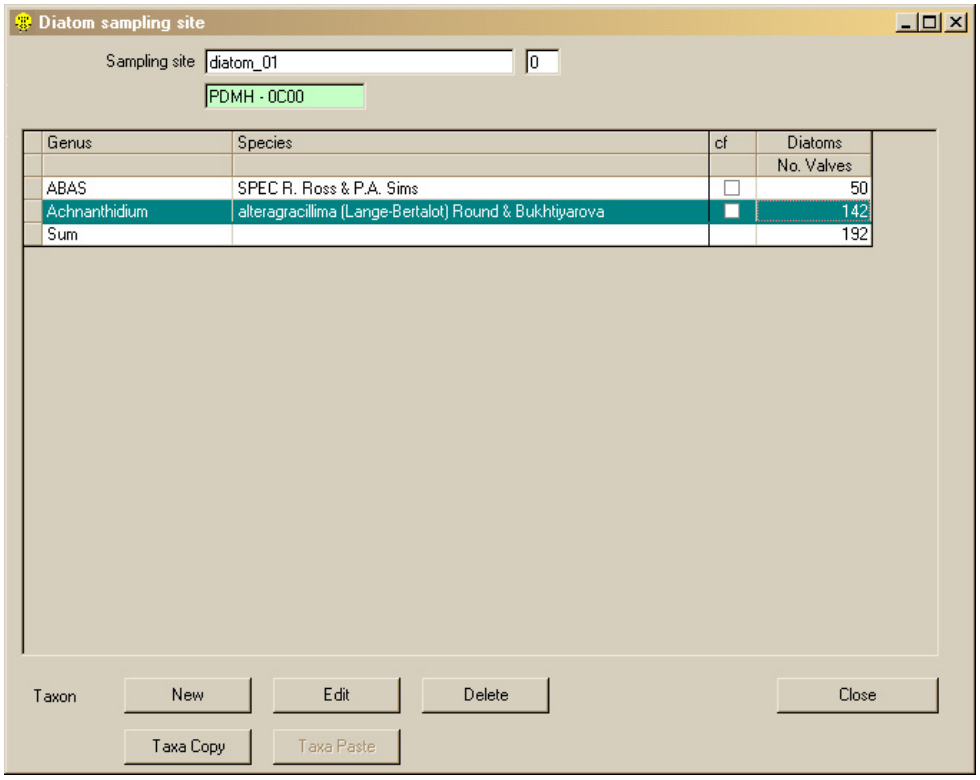
- click the **Accept** button or press the enter key to finish this taxon input
- the species is loaded into the sampling site window
- the cursor is now automatically placed in the first available field
- enter the number of valves for the taxon into the 'no. valves' column
- the input is finished by pressing the enter key
- the taxa input window 'Species selection – New' opens again automatically
- all further taxa entries are performed in the same manner
- after taxa input, click the **Close** button to finish data input

Options

- If the taxon was not securely determined, the 'cf' box can be marked.

***Note**: If you want mark this option in addition to an already entered taxon you have to enter the one with the addition first (e.g. if you want to enter Achnanthes arctica and Achnanthes cf. arctica you have to start with Achnanthes cf. arctica).*

- If you wish to change a species, place the cursor in the respective field and press the **edit** button.
- To delete a species from the list, place the cursor in the row to be deleted and press the **delete** button.



Taxa copy/Taxa paste

In AQEM*dip* 2.6 you can copy taxa from one sample unit to another. Only the taxa names without number of valves will be copied.

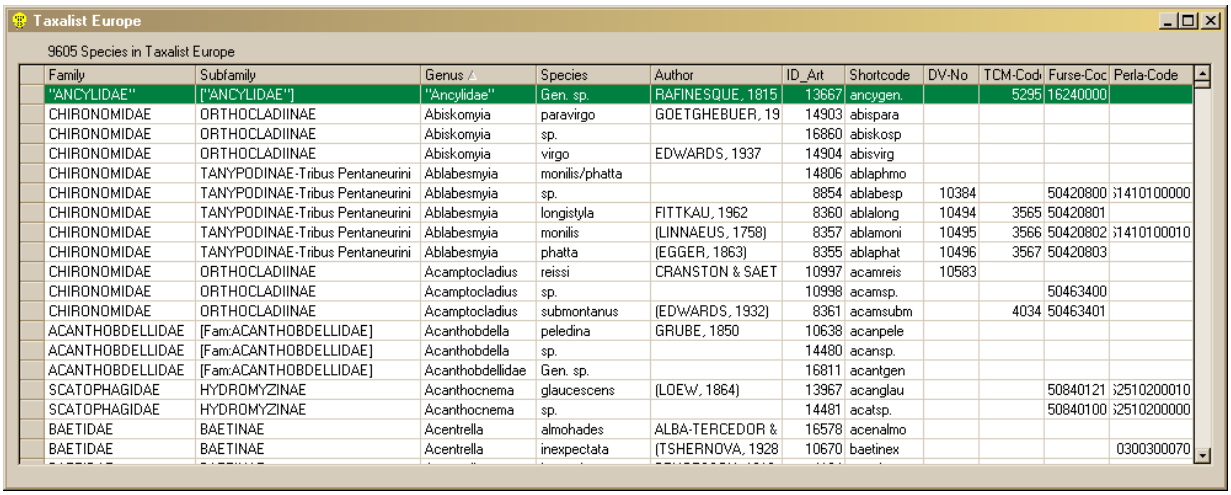
- click the appropriate sampling unit with the right mouse button in the left window
- select **Edit** with the left mouse button
- the data input window opens
- mark a taxon with the mouse
- add other taxa by keeping the shift-button pressed
- press the **Taxa copy** button
- edit another sample unit
- press the **Taxa paste** button
- add the number of valves of the new taxa

***Note**: To avoid double entries of the same taxon, it is only possible to copy taxa into an empty sample unit.*

Taxalists

The taxalists for macro-invertebrates or diatoms are opened by choosing **Taxalist** in the menu and subsequently opening **Macro-invertebrates** and **Diatoms** respectively in the submenu. For macro-invertebrates the options 'Taxalist Europe' and 'Taxalist country' as well as 'Synonyms' can be chosen. For diatoms the options 'Taxalist' and 'Synonyms' can be chosen.

The taxalists serve as a compendium. The columns can be ordered alphabetically by pressing on the column's heading. The synonym sections serve to consult the current name of a taxon.



Family	Subfamily	Genus	Species	Author	ID_Art	Shortcode	DV-No	TCM-Cod	Furse-Coc	Perla-Code
"ANCYLIDAE"	["ANCYLIDAE"]	"Ancylidae"	Gen. sp.	RAFINESQUE, 1815	13667	ancygen.		5295	16240000	
CHIRONOMIDAE	ORTHOCLADIINAE	Abiskomyia	paravirgo	GOETGHEBUER, 19	14903	abispara				
CHIRONOMIDAE	ORTHOCLADIINAE	Abiskomyia	sp.		16860	abiskosp				
CHIRONOMIDAE	ORTHOCLADIINAE	Abiskomyia	virgo	EDWARDS, 1937	14904	abisvirg				
CHIRONOMIDAE	TANYPODINAE-Tribus Pentaneurini	Ablabesmyia	monilis/phatta		14806	ablaphmo				
CHIRONOMIDAE	TANYPODINAE-Tribus Pentaneurini	Ablabesmyia	sp.		8854	ablabesp	10384		50420800	51410100000
CHIRONOMIDAE	TANYPODINAE-Tribus Pentaneurini	Ablabesmyia	longistyla	FITTKAU, 1962	8360	ablalong	10494	3565	50420801	
CHIRONOMIDAE	TANYPODINAE-Tribus Pentaneurini	Ablabesmyia	monilis	(LINNAEUS, 1758)	8357	ablamoni	10495	3566	50420802	51410100010
CHIRONOMIDAE	TANYPODINAE-Tribus Pentaneurini	Ablabesmyia	phatta	(EGGER, 1863)	8355	ablaphat	10496	3567	50420803	
CHIRONOMIDAE	ORTHOCLADIINAE	Acamptocladius	reissi	CRANSTON & SAET	10997	acamreis	10583			
CHIRONOMIDAE	ORTHOCLADIINAE	Acamptocladius	sp.		10998	acamsp.			50463400	
CHIRONOMIDAE	ORTHOCLADIINAE	Acamptocladius	submontanus	(EDWARDS, 1932)	8361	acamsubm		4034	50463401	
ACANTHOBDELLIDAE	[Fam:ACANTHOBDELLIDAE]	Acanthobdella	peledina	GRUBE, 1850	10638	acanpele				
ACANTHOBDELLIDAE	[Fam:ACANTHOBDELLIDAE]	Acanthobdella	sp.		14480	acansp.				
ACANTHOBDELLIDAE	[Fam:ACANTHOBDELLIDAE]	Acanthobdellidae	Gen. sp.		16811	acantgen				
SCATOPHAGIDAE	HYDROMYZINAE	Acanthocnema	glaucescens	(LOEW, 1864)	13967	acanglau			50840121	52510200010
SCATOPHAGIDAE	HYDROMYZINAE	Acanthocnema	sp.		14481	acatsp.			50840100	52510200000
BAETIDAE	BAETINAE	Acentrella	almohades	ALBA-TERCEDOR &	16578	acenalmo				
BAETIDAE	BAETINAE	Acentrella	inexpectata	(TSHERNOVA, 1928	10670	baetinex				0300300070

***Note**: If taxa are missing or if you note spelling/taxonomic mistakes please contact Armin Lorenz (armin.lorenz@uni-essen.de) or Astrid Schmidt-Kloiber (astrid.schmidt-kloiber@boku.ac.at) regarding benthic invertebrates and Piet Verdonschot (Piet.Verdonschot@wur.nl) regarding diatoms.*

Lists menu

The menu for changing the sampling area is opened by choosing **Lists** in the menu and subsequently opening **Sampling instruments & area** in the submenu.

Entering a new sampling area

- press **Add new**
- enter a new area in m² in the field 'Area'
- enter a sampling instrument in the field 'Sampling instrument'
- chose a value from the selection list, if you want to define the sampling instrument & area as default for a certain method (optional)
- enter a description in the field 'Description' (optional)
- press **Close**

Data input – stream characteristics

At the lower end of the 'Data input' window two buttons are available

AQEM Site Protocol ..... opens the window for entering stream characteristics data (site protocol) according to the AQEM Manual

STAR Site Protocol ..... opens the window for entering stream characteristics data (site protocol) according to the STAR Manual

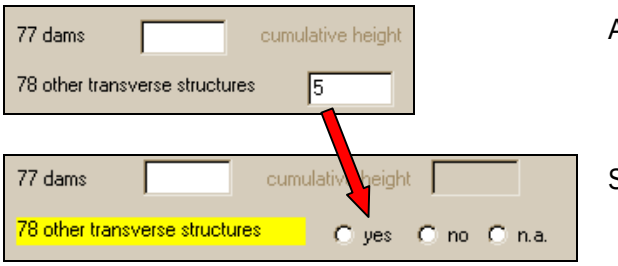
The 'Stream Characteristics' window is opened by clicking the one of the **Site Protocol** buttons in the 'Site & Sample Input' window or by selecting **Data input / display** in the menu and subsequently selecting **Stream characteristics** (either STAR Site Protocol or AQEM Site Protocol) in the submenu.

The input of stream characteristics data is based on the site protocol. Specific comments concerning contents of the data can be taken from the manual for completing the site protocol.

General information

The STAR and the AQEM site protocol differ in several terms. It is possible to enter data into the STAR protocol and to open the same data in the AQEM protocol and vice versa. Parameter in the AQEM protocol will be labelled in yellow if there are data filled in the STAR protocol and vice versa. For details see '**Comments on some individual parameters**' (below), the site protocols and manuals.

***Example**: Data was entered in the AQEM protocol and re-opend in the STAR protocol.*



AQEM Site Protocol

STAR Site Protocol

For details see 'Comments on some individual parameters' (below), the site protocols and manuals.

- In addition to the possibilities of the site protocol, the option 'not available' ('n.a.') was added, for parameters which were not or could not be collected.
- Values in tables can be edited after being double clicked.
- The tabulator key selects the input fields in numerical order.
- In tables, the correctness of input is checked (5 %/10 % steps, Sum = 100 %). A correct sum is marked green, an incorrect one is marked red.

Error check

Data can be checked for correctness by pressing the button **Error check**. Incorrect or empty fields will be labelled in red, a window will open and will show the results of the error check.

The following parameters are checked:

- whether the fields are empty or not,
- whether fields contain letters instead of digits,
- whether data correspond with selection list entries,
- whether values were selected in optional fields,
- whether the sum of tables add up to 100 %

***Note**: The program **cannot** check whether or not the values entered are reasonable or not. When you open the site protocol display, all values are noted as missing in the database and more than 150 errors occur if the input window is closed without data entry. Please perform the error check **before** closing the site protocol and correct any possible errors, otherwise data can be lost if an error occurs during saving data to the database.*

Comments on some individual parameters

No. 9/10 Longitude and latitude are now entered in decimal values, the old data are shown in the fields above, but cannot be changed. Enter the coordinates as simple decimal coordinates, 2 digits before and 7 digits after decimal (e.g. longitude: 13.2064925; latitude: 52.2152457), Date WGS 84. Use negative values for coordinates west of Greenwich. This makes data entry as simple as possible and enables to export coordinates as decimal numbers to GIS. Other systems, such as UTM, may need to re-format the data for analysis.

Table 18/No.18	Data coming from STAR are marked with a yellow 'x' in AQEM.
Table 19	In the STAR protocol a field for 'others' was added. If the sum of 100 % is reached with filling in this 'others'-field you will get less than 100 % in the AQEM protocol.
No. 25	'Artificial' and 'reservoir' were added in the STAR protocol, in AQEM you will get a yellow label if these points were filled in STAR.
No. 26b	New in STAR; d) is equivalent to AQEM 105; e) is equivalent to AQEM 117 and f) is equivalent to AQEM 118.
Table 30	See table 19.
No. 74/75	Instead of numbers you have to enter 'none', 'few', 'several', 'many' in STAR; a yellow label is displayed in AQEM, if there are data in STAR and vice versa.
No. 78	In STAR you have to mark 'yes', 'no', 'n.a.', in AQEM you can fill in numbers; a yellow label is displayed in AQEM, if there are data in STAR and vice versa.
Table 79/80	In the STAR protocol a text field for 'others' was added; a yellow label is displayed in AQEM, if there are data in STAR and vice versa.
No. 91	In STAR you only can enter 'yes', 'no', 'n.a.'; a yellow label is displayed in AQEM, if there are data in STAR and vice versa.
Table 103/104	The tables were changed for STAR, a yellow label is displayed in AQEM, if there is data in STAR and vice versa.
No. 105a	relation 'lentic/lotic' in STAR, 'pools/riffles' in AQEM
No. 106	discharge is an estimated value in STAR, in AQEM it is calculated from No.106; a yellow label is displayed in AQEM, if there is data in STAR and vice versa.
No.119/120	optional in STAR, in AQEM it is calculated from tab. 116

- 'Picture/Map' on page 1 is not saved, only the path is saved (minimises the database in size); only *.jpg files can be inserted (size limitation: 1200 x 1000 pixel).
  path: \installation path\pics
  filename: sample_no_map.jpg (recommended filename)
  sample_no_pic.jpg (recommended filename)
- Tables 103 & 104 automatically write values into table 116. The values are only transmitted when the values in table 103 & 104 equal the sum of 100 % or 20 replicates respectively. Otherwise all entries in table 116 are deleted.
- Table 116 is restricted in parts; microhabitats can only be altered in table 103 & 104.
- Table 106 ('Kreps'): all values must be entered, otherwise the calculation cannot be performed correctly. The calculation is activated manually by pressing the **calculate** button; the table is also saved for further checking (AQEM site protocol only).

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NATURAL ENVIRONMENT RESEARCH COUNCIL

The STAR Macrophyte Database Fact Sheet

The EU Framework 5 project STAR has created a new project database of macrophyte data from 295 stream sites in 13 European Union member states. The STAR macrophyte database contains new survey data collected by the STAR project consortium during 2002, 2003 and 2004 using Mean Trophic Rank[1] methodology.

This fact sheet briefly describes what the database contains, its installation requirements, how to use the database and where to obtain further information.

What the database contains

The STAR macrophyte database contains Mean Trophic Rank survey data. Mean Trophic Rank is a comprehensive survey system for assessing the aquatic macrophyte structure of streams, and also includes physical assessments such as substrate type, flow patterns and water depth. The database also calculates a version of the Mean Trophic Rank scoring system. This allows an assessment to be made of the degree to which a stream is impacted by organic pollution or enrichment based on its macrophyte flora.

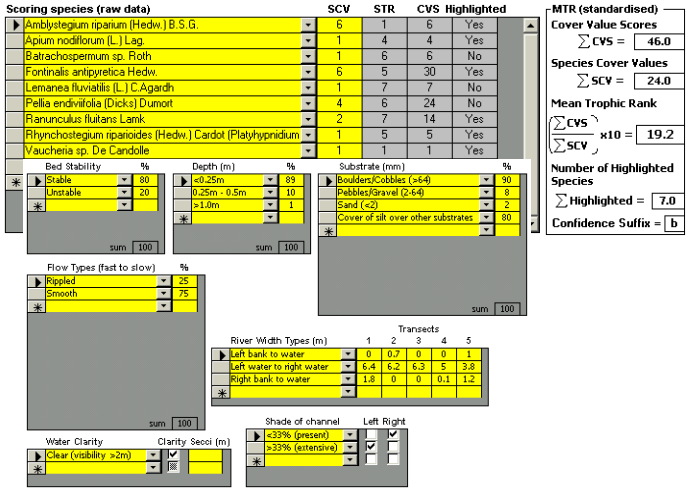
The database also allows exports of raw data and index values to Microsoft® Excel.

Installation & Technical Considerations

To use the database you will need a computer with Microsoft® Access 2000. The database is a single user-system and is not designed for simultaneous multi-users. The database will run fastest when placed on a local (C:\) drive rather than on a network. We recommend that wherever the database is placed, the directory should have at least 300Mb of storage capacity because when closing down the database it will automatically compact itself causing it to temporarily double its file size.

Using the database

The database has an intuitive design, and includes many help forms to guide the user.



Further Information

For further information about the STAR macrophyte database contact:

The River Communities Research Group
Centre for Ecology & Hydrology
Winfrith Technology Centre, Dorchester,
Dorset, DT1 1LF, UK. Tel +44 (0)1305 213 500

For further information about the STAR project visit the STAR web site at:

www.eu-star.at

[1]Dawson F. H. Newman J. R, Gravelle M. J. Rouen K. J, Henville P. (1999) Assessment of the trophic status of rivers using macrophytes. Environment Agency R & D Technical Report E39, Environment Agency, Bristol, United Kingdom.

Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

The STAR Hydromorphology Database Fact Sheet

The EU Framework 5 project STAR has created a new project database of hydromorphological data from 324 stream sites in 13 European Union member states. The STAR hydromorphology database contains new survey data collected by the STAR consortium during 2001, 2002 and 2003 using River Habitat Survey[1] methodology.

This fact sheet briefly describes what the database contains, its installation requirements, how to use the database and where to obtain further information.

What the database contains

The STAR hydromorphology database contains River Habitat Survey data. River Habitat Survey is a comprehensive survey system for assessing the hydromorphological structure of streams, including the nature of the stream substrate, the banks, and all common forms of human modifications. The database is designed to hold data for 4 different versions of RHS form (1997, 2001, 2001 Southern European, and 2003 versions) and also calculates the 1997 version of 2 RHS hydromorphological indices:

- Habitat Quality Score (HQS)
- Habitat Modification Score (HMS)

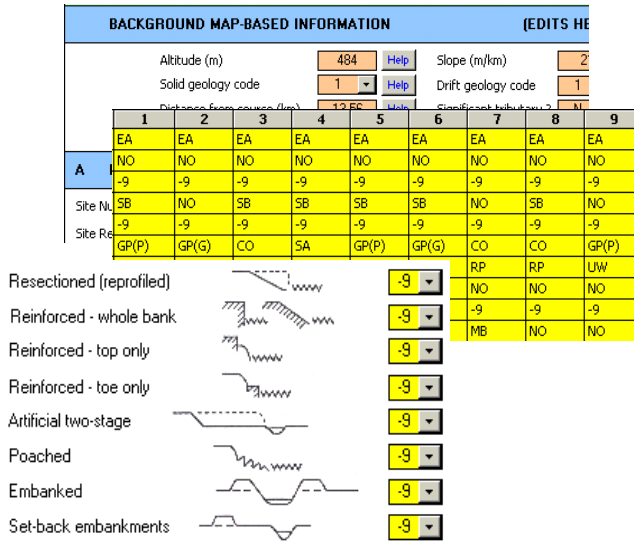
The database also allows exports of raw data and index values to Microsoft® Excel.

Installation & Technical Considerations

To use the database you will need a computer with Microsoft® Access 2000. It is also recommended that you use a fairly high specification computer. The database is a single user-system and is not designed for simultaneous multi-users. The database will run fastest when placed on a local (C:\) drive rather than on a network. We recommend that wherever the database is placed, the directory should have at least 300Mb of storage capacity because when closing down the database it will automatically compact itself causing it to temporarily double its file size.

Using the database

The database has an intuitive design, and includes many help forms to guide the user.



Further Information

For further information about the STAR hydromorphology database contact:

The River Communities Research Group
Centre for Ecology & Hydrology
Winfrith Technology Centre, Dorchester,
Dorset, DT1 1LF, UK. Tel +44 (0)1305 213 500

For further information about the STAR project visit the STAR web site at:

www.eu-star.at

[1]Raven P.J., Holmes N.T.H., Dawson F.H., Fox P.J.A, Everard M., Fozzard I.R. & Rouen K.J. (1998). River Habitat Quality: the physical character of rivers and streams in the UK and Isle of Man. Environment Agency, Bristol, United Kingdom.

Appendix VII	**The FAME project FIDES User Manual. Kindly supplied to STAR by the FAME project for the purposes of this report only. Not to be circulated to any third partner by any authorised (RE) recipient of this report.**

Data input to the ACCESS-2000© database FIDES (Fish Database of European Streams). The FAME project. 2002-06-04

Ulrika Beier, Erik Degerman, Herbert Wirlöf
National Board of Fisheries, Institute of Freshwater Research
Drottningholm, Sweden

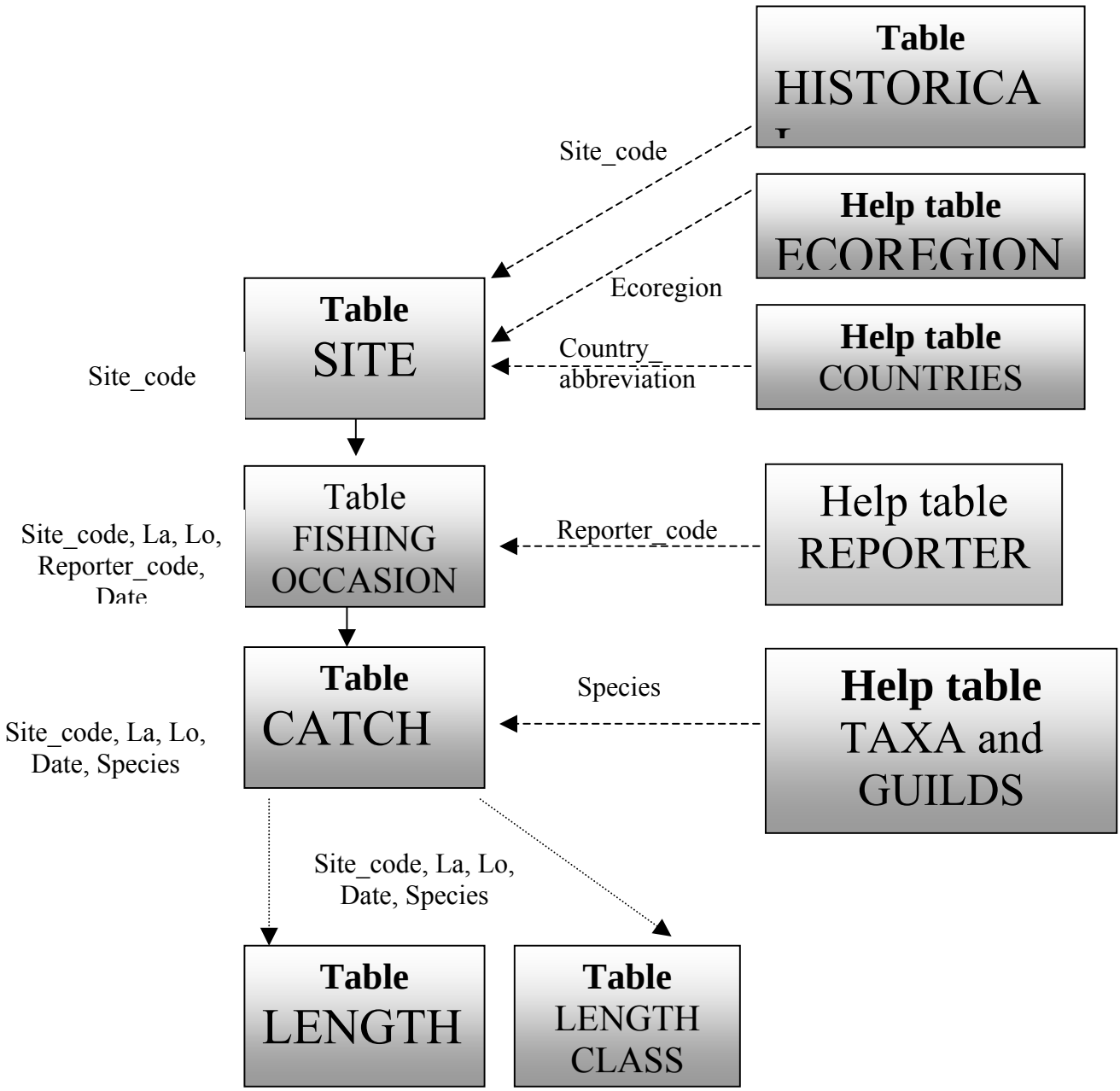


Figure 1. Overview of table structure of the FIDES Access input file.

Index

Note: variables given in **boldface** are obligatory, whereas variables in *italics* are optional.

Comments to included variables

For each table you will find a description of the variables, definitions and precision required. **Note:** variables given in **boldface** are obligatory, whereas variables in *italics* are optional.

The table **REPORTER** (page 15) holds information about the person who is responsible for the reporting of data from each country. It is not the person who actually fished, it is the person for us to mail if there are questions regarding the data.

Table **SITE** (pages 16-26) refers to the location sampled and the physical characteristics of the site. The information included is such that it does not change within or even between years. The Site_code is unique for each site, as well as Latitude and Longitude are. So the Latitude-Longitude should be redundant data in the other tables. But we are rather safe than sorry and therefore include both the Site_code and Lat-Long in all tables.

There has been some confusion about the coordinates (Lat-Long). Please, check that you understand the format. It is a string (text), not a numerical value. First you give the degrees, then add a decimal point, then the minutes (two digits) directly followed by the seconds (rounded to two digits). Finally, the direction is given as N, E or W (no space in between).

So for a site with a latitude of 54 degrees, 4 minutes and 12 seconds North, the correct input is "54.0412N". Notice the zero (0) ahead of 4.

And for a site with a longitude of 1 degrees, 12 minutes and 6 seconds West, the correct input is "1.1206W". Notice the zero (0) ahead of 6.

For some variables you are supposed to provide the absolute values. It has been stressed as very important for the modelling to provide as many cases as possible with absolute values. If you only have access to classified data we suggest that you use the class mid-point as input. Due to the great importance for modelling, we anticipate that absolute values are available for almost all obligatory data. If some country has to use class midpoints for an obligatory variable, let us know this.

Always try to give the marine confluence area (Main_river_region) for all smaller rivers, i.e. those without English name.

Please, notice that four new variables have been added:

1. Site_name is included as an optional variable for countries where this variable is useful for identifying sites. (This was earlier called Locality_name).
2. Distance_to_mouth_class has been added since this is important for typology, but absolute data was a problem for several countries.
3. Also notice that a new variable River_type has been added. This refers to typology and we do not know at present what the data input is supposed to be. We will have to come back to you about this. Hopefully, the typology can be concluded from the other data that you provide and this variable will not be needed. However, to be sure it is included in this version of FIDES.
4. Other_zonation is the river zonation scheme used nationally (if you have one). This is optional but please provide it if available.

Table **FISHING OCCASION** (pages 27-42) refers to changeable environmental characteristics, the sampling procedure and assessment of the anthropogenic impact. It is understood that each site is sampled only once each day. Should you have several subsamples from a specific site at the same day, you will have to pool the data before adding them to the database.

Notice that five new variables have been added, all these new variables are optional. They are; Day_night (time of sampling during the 24 hours of a day), Conductivity (absolute value), Wattage_used (effect in watt used when fishing), Flora_impact_site (unnatural increase in water vegetation), Weed_cutting_site (if cutting of weeds occur).

To assess anthropogenic impact, 23 variables have been included in the FISHING OCCASION table. The six last variables describing anthropogenic impact are optional, as well as Natural_flow_pattern_site and Natural_flow_quantity_site. The others are obligatory.

One variable was omitted (Water_level) and Maximum_depth_class has been turned into optional due to lack of data in several countries.

Please observe that conductivity is measured in mS/m. This corresponds to μS/cm divided by 10.

The table **HISTORICAL** (page 43) is unaltered from the draft version. In this table all occurrence of species in the past can be recorded. Notice that occurrence of a species can be stated as certain or probable and on different spatial levels (river basin, segment, site) in accordance with the description of reference conditions and impact.

The table **CATCH** (pages 44-46) is used to report the catch in each run, the estimated abundance and the estimated biomass of each species. Note that these data refers to

abundance and biomass per hectares. For species of special interest (indicator species) also the catch of 0+ in each run should be given if possible.

Two tables are included for the optional reporting of lengths, **LENGTH** (individual lengths of different species) and **LENGTH CLASS** (number of individuals of each species in each length class). Be sure to clearly state what kind of length data that is provided, i.e. total length or fork length and if the whole catch or a subsample was measured. If length frequencies are reported the length classes (upper and lower limit in mm) must be defined. This will be a laborious work, but we suspect that pre-defined length-classes will not be possible to use due to the variation in data between countries.

Finally, there are some help tables included, most important is **TAXA and GUILDS**. You are not supposed to alter or input data in these help tables. They are there to facilitate data input, almost like a dictionary. The help table TAXA and GUILDS at present just consists of fish species names, pending the finalisation of WP1b.

Scale of variables included in FIDES

There are five levels of scale in FIDES:

Site The sampled site in the stream.
Segment A river segment is defined as:
1 km for small rivers (catchment <100 km^2)
5 km for medium-sized rivers (100-1000 km^2)
10 km for large rivers (>1000 km^2)
A segment for a small river will thus be 500 m up- and 500 m downstream of the sampling site.
Catchment The whole catchment (watershed) upstream of the site.
River basin The river basin up- and downstream of the site.
The river basin stretches down to the sea or a confluence in an equally sized or larger river.
This scale is only used for the variables Land_use_river and Urbanisation_river (in table Fishing occasion).
Whole river basin The river basin up- and downstream of the site. The whole river basin stretches down to the sea.
This scale is only used for the variable Connectivity_river (in table Fishing occasion).

Varible:	Table	Refers to SCALE:
Size_of_catchment	Site	Catchment
Size_of_catchment_class	Site	-"-
Geological_typology	Site	-"-
Geological_formation	Site	-"-
Width_flooded_area	Site	Segment
Gradient_slope	Site	Segment
Huet_zonation	Site	Segment
Other_zonation	Site	Segment
Mean_air_temperature	Site	Site (as close as possible)
Mean_Jan_temperature	Site	Site (as close as possible)
Mean_July_temperature	Site	Site (as close as possible)
Stream_order	Site	Site
Water_source_type	Site	Site (as close as possible, but can be judged from catchment, e.g. glaciers)

Varible:	Table	Refers to SCALE:
Land_use_river	Fishing occasion	River basin
Urbanisation_river	Fishing occasion	River basin
Connectivity_river	Fishing occasion	Whole river basin, i.e. down to confluence with the sea
Land_use_segment	Fishing occasion	Segment of river
Urbanisation_river	Fishing occasion	Segment of river
Riparian_zone_segment	Fishing occasion	Segment of river
Floodplain_lateral…	Fishing occasion	Segment of river
Sediment_load_segment	Fishing occasion	Segment of river
Hydrological_regime_site	Fishing occasion	Site
Natural_flow_pattern_site	Fishing occasion	Site
Natural_flow_quantity_site	Fishing occasion	Site
Upstream_dam_site	Fishing occasion	Site, segment and catchment upstream, distance depending on influence
Morphological_condition_site	Fishing occasion	Site
Salinity_site	Fishing occasion	Site
Toxic_acidification_site	Fishing occasion	Site
Nutrients_organic_input_site	**Fishing occasion**	**Site**
Introduction_fish_site	Fishing occasion	Site
Impact_of_stocking_site	Fishing occasion	Site
Exploitation_site	Fishing occasion	Site
Fauna_impact_site	Fishing occasion	Site
Flora_impact_site	Fishing occasion	Site
Weed_cutting_site	Fishing occasion	Site

Instructions

Unfortunately there has been no time to give a live demonstration of the data input procedures. We trust that you have national competence in the matter. If problems occur or if you have questions, please mail us.

Character encoding: First of all, we emphasise that you follow some instructions to enable use of all national characters for FIDES. Many of the TrueType fonts included in Microsoft Office 2000 supports a number of languages with different characters. **Arial Unicode MS** included in the Office package is a complete font containing all of the 40 000 alphabetic characters, ideograph characters and symbols which are defined in the Unicode standard 2.1. The empty FIDES Access database will be prepared using this font. If you did not install the font **Arial Unicode MS** when you installed Microsoft Office 2000 or another Office program, you can **reinstall Office** and choose add/remove functions. Press the plus sign (+) beside Office tools and then on the plus sign beside International support. After that, click the icon at Universal fonts and finally choose the alternative you wish. Reinstall Microsoft Office. To follow this procedure is necessary, as we understand it, for all who are putting in data in the national contributions to FIDES. This is most important for the final FIDES in MS SQL 2000 version to be accessed through Internet later this year.

Possible import methods: This short input manual is not an Access-2000 database manual. We have tried to facilitate for inexperienced users by making a menu which guides you through the data input. For the more advanced users it is also possible to work directly with the tables or to import data from other programs. Additionally we provide you with the opportunity to import data via formatted Excel spreadsheets.

Thus, you have four ways to input the data:
1. Via keyboard using the menu (the form).
2. Via keyboard directly into the data tables.
3. Via keyboard to Excel spread sheets, which are then imported to Access.
4. Directly import files from other applications.

If you are an novice Access user and do not have the data in files already we suggest route 1 above, i.e. keyboard input with the help of the menu, help tables, validity checks and adjusted formats. In this way also all links between tables are established automatically and the risk of input errors are reduced.

If you are a more experienced user and prefer to input data from the keyboard directly into the tables, route 2 is possible, but route 1 is still suggested.

If you choose route 3, the data input into the Excel tables is quite easy, but the import to FIDES is difficult and will have to be performed by a professional database manager.

To import data directly into FIDES, i.e. route 4, will be common among those of you that have the data in digital form already and have a computer wizard at the department.

Definitions

Field	The smallest piece of data in a table.
Record	A collection of all fields occupying a single row of a table.
Table	The “spreadsheet” where the data are stored.
Forms	A method of entering, displaying, and searching data in other than the spreadsheet-like environment of tables and queries (a graphical user interface).
Reports	Summarizes and formats data in the "look" that you want for either table or query data.
Object	Components that make up a database (i.e., tables, forms, queries, reports, macros, & modules).

In FIDES:
The input is made in a form named Site
Subform to the Site form is the form Fishing occasion.
Subform to the Fishing occasion form is the form Catches.
Subforms to Catches are Length and Length class.

The linking of forms and subforms allows you to just put in e.g. Latitude once, but still to have it stored in each table. This way the number of errors are reduced and the tables are directly linked together.

Navigation and essential key combinations

There are numerous ways to maneuver through an Access table. If you want to just look through the table without moving the cursor/highlight, use the scroll bar on the right side of the table. However, if you want to move the highlight as you move down the table, you can use the down arrow <Dn> or the page down <PgDn> keys. The same is true if you are moving up the table - use the up arrow <Up> or the page up <PgUp> keys.

If you want to move the highlight to the very first cell of the table (A1), press <Ctrl-Home>. Conversely, if you want to move the highlight to the very last cell of the table, press <Ctrl-End>. To move the highlight from field to field, use either the <Tab> or <Enter> keys.

To copy a field's value from the previous record to the current record, press <Ctrl-'> [the Ctrl key + the apostrophe key].

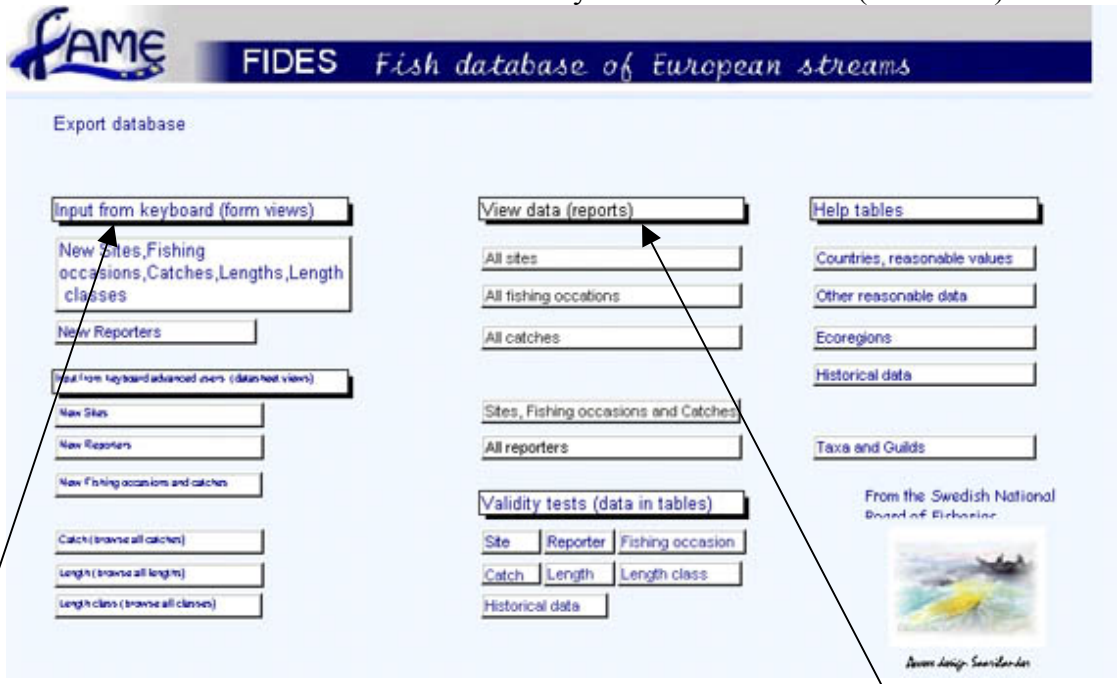
To save instantly, press <Shift-Enter>.

Before you start

Make a copy of the database for training purposes!!
Continue to make back-up copies through out!

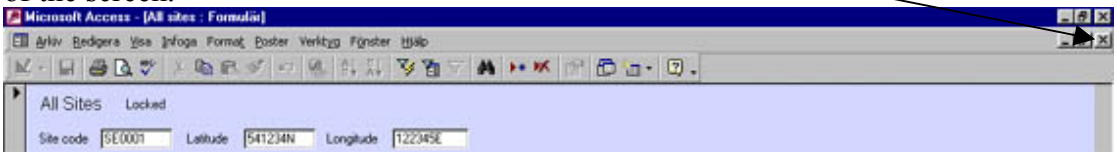
1. Input from keyboard (form view)

Start the program with the file FIDES.mdb. This can be done in many ways, all familiar to the Windows© user. Automatically the menu will show (see below).



This is a form that acts like an interface between you and the tables where data are stored. In the left column are the data input section. Be sure to use the upper left part (input from Keyboard).

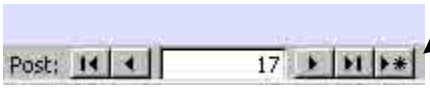
If You want to look at data go to the middle column (upper part) under "View data (reports)". When you push the buttons below each table will be displayed. You can choose between different kinds of views (input view or spreadsheet view). When you are finished looking leave the report by clicking on the lower of the two of the upper x of the screen.



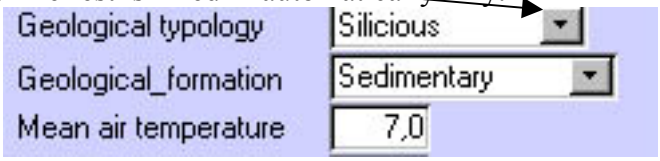
Finally, there is an option to do some validity checking of the data that are in the tables. Try these buttons after the initial data input sessions. You'll find them in the lower part of the middle column.

Adding new data

All the tables that will be displayed are connected. When you open your database for the very first time it will be empty. Now it is easy to just start to add data.
The next time you are putting in data you will see the old data in the input form when you start. To add new data then you must tell the program that new data are coming (New records). The easiest way to do this is to click on the asterisk in the lower part of each screen.



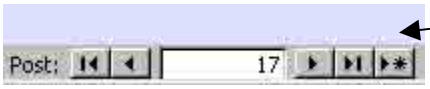
Note that for several variables you will have help list available if you click on the arrow of the right part of the field. In such fields data can also be added by just typing the first letter of the word. The rest is filled in automatically. Try.



Reporter

At the start of the first session begin with adding you as the reporters using the form 'New reporters'.

1. Push the button 'New reporters'
2. If the table is empty (it should be) just start to add data.
3. If data are already present indicate that new data is to be put in by clicking on

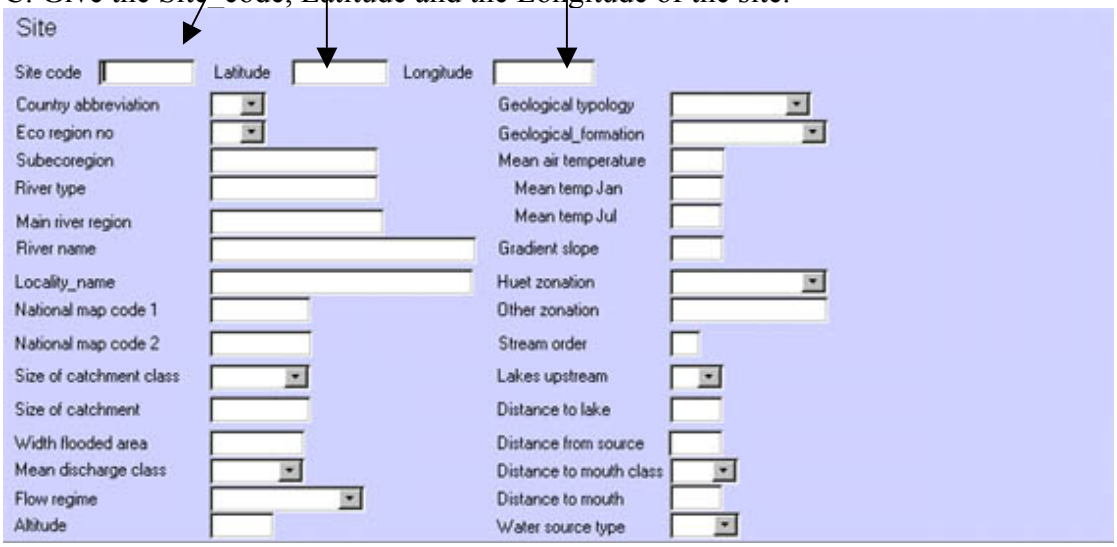


New Sites & Fishing occasions (etc)

A. After you have added yourself as a reporter it is time to open 'New Sites, Fishing occasions, Catches…..' by simply pushing that button.

B. You will start in the upper purple part of the window, i.e with information that will be stored in the Site table. If the table is empty just start to add data. If data are already present (later sessions) indicate that new data are to be put in by clicking on (new record)

C. Give the Site_code, Latitude and the Longitude of the site.

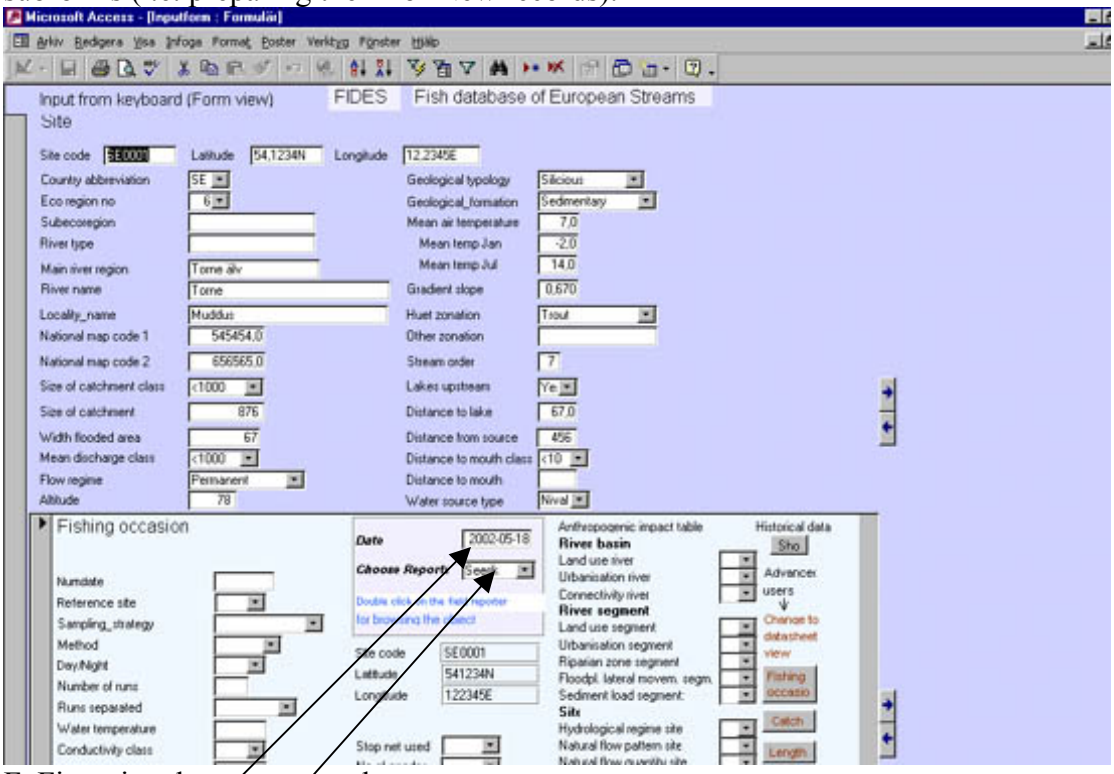


The latter two fields are preformatted. Be sure to be in the very left position before you start to type in data.

D. Continue to add data in all the fields displayed in the site section (upper purple part of the window – See above), from Country abbreviation to Water source type.

E. You are now ready to add data of the Fishing occasion in the mid-section of the window (light blue). If the site has been visited on several occasion it is most convenient to add them all one after another.

If the table is empty is just to add the data. If you have previous data start by clicking on the asterisk (button) indicating "New record". This will also empty subforms (i.e. preparing them for New records).



F. First give the reporter code.

G. Fill in the Date. The format is "YYYY-MM-DD". This is preformatted. Be sure to be in the very left position before you start to type.

H. Now you can fill in the data about the Fishing occasion. Don't be surprised by the fact that you are first obliged to give the date in numerical format (YYYYMMDD). This is just a precaution (see page 27).

Catches

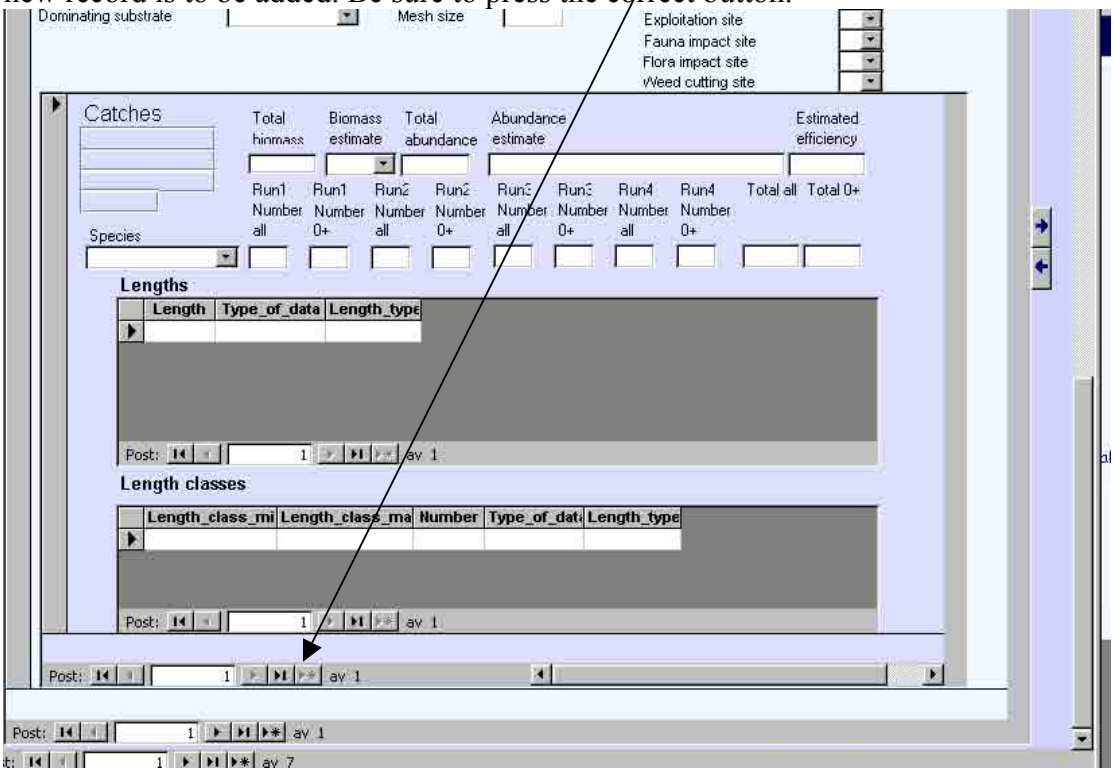
After all data about the fishing occasion has been added (in the light blue region) it is time to put in the catch data for that fishing occasion. Catch is recorded in the lower part (colour light purple) of the input window. As the catch is given species by species you will have to push the asterisk indicating "New record" after the first species is entered.

A. Choose a Species.

B. Now just fill in the data about the catch of that species.

The Id for the Catch (Site_code, Latitude, Longitude, Date and Species) will be transformed automatically to the subforms Length and Length classes.

C. If you have more species caught at that site that day you will have to indicate that a new record is to be added. Be sure to press the correct button.



Length

Adding length data is optional. In the data table one length is stored per record (row). This will produce long tables if you have much data. Be sure to put in the lengths directly when you are adding the species to the catch.

Always give Type of data (All, Subsample, Minmax, Other) and Length type (Total, Fork) before each individual length. It is enough to just write the initial letter in the fields for Type of data and Length type, the rest is filled in automatically. Otherwise you can use Ctrl+' or copy the correct data (whole columns if you want to) or use the help list displayed when you click on the arrow to the right of the input field.

Length class

This table is, although simple, laborious to store data in from the keyboard.

A. You will create a new record Length class by clicking on a line marked with a sign (*) (new record).
B. You fill in all the Lengths classes and number for the species in question.

Check the input!

When you have managed to input the data from the first site and fishing occasion it is important that you leave the input forms and look at the data in the tables- "View data (reports)". This way you can see if things worked out the way they were meant to.

If everything in the tables looks fine you might even try to perform a validity test. Please observe that the validity check just verifies that data has been put in where necessary, that values are reasonable (some fields) and that classes presented are allowed. There are still many possible error-possibilities left!

Deleting a Fishing Occasion

It is not always that data stored are correct. Perhaps you will make some initial mistakes using this programme. That is why there is a way to erase such bad records. If you want to delete a whole fishing occasion:

You will have to delete records in following order:

1. Length and Length class (mark the record/s and Delete)
2. Catches (put the cursor on the field Species, and Delete)
3. Finally the Fishing occasion (Edit, Delete record)

You'll have to close and open the form after a deletion or move to another record and then come back or Refresh the form.

Deleting a Site

You will have to delete records in the following order.

1. Length and Length class (mark the records for the length or/and the Length classes, and Delete).
2. Catches (put the cursor on the Species field, Edit (Topline) and Delete the record).
3. Fishing occasion (put the cursor on any field on the form, Edit, Delete record).
4. Finally the Site (put the cursor on any field on the form, Edit, Delete record).

Note:

1. To repeat the data from a previous field go to the empty field below and type Ctrl + " (or Ctrl + ').
2. You can copy and paste a whole row.

3. Be sure to save a back-up copy of the database after each session. Save the database under a different name. Normally you should have several back-up copies saved. Keep track of what date you saved the copy and how far the data input had advanced.

4. If a problem occurs when recording data using the form Fishing occasion close the form and then open it again. Before you start over check that no erroneous data were stored.

2. Input from keyboard (datasheet views)

(More advanced users)

You will view and edit related records in subdatasheets. When you open a table in datasheet view you will find a + sign at the beginning of the record. If you click on the + sign you will see the records in the subsheet.

To close the table click on the –sign.

Definitions

The Site table is a sheet.

Subsheet to the Site table is the sheetview for the table Fishing Occasion.

Subsheet to Fishing occasion table is the sheetview for the table Catch.

Subsheets to Catch are the sheetviews for the tables Length and Length class.

3. Importing from Excel

(Advanced users)

We assume you have entered your data in the enclosed empty Excel files.

You must then import to FIDES in the following order:

1. Site.xls
2. Reporter.xls
3. Historical_data.xls
4. Fishing_occasion.xls
5. Catch.xls
6. Length.xls
7. Length_classes.xls

Steps to take:
From the main menu choose

1. File
2. Get external data
3. Import
4. Look in the folder where the file is that you will import
5. Choose file of type 'Microsoft Excel (*.xls)
6. Mark the file to import
7. Import
8. Mark "First Row Contains Column Headings"
9. Next
10. In an existing file
11. Choose the file
12. Next
13. Finish
14. You will get the note :'Finished importing file….."
15. OK

If anything goes wrong you will have a note and sometimes you will have an error table in the receiving folder.

Table REPORTER

VARIABLE	**EXPLANATION**	**TYPE, PRECISION**	**USED FOR**	EXAMPLE
Reporter_code	Your own code, always started with the two letters indicating country. E.g. FR001 or FRUdL could both be Université de Lyon in France.	String, 10 positions, always the first two letters capital, the rest as You prefer.	Database QA	**SEerik**
Responsible_person	Name of person responsible for data supply, and also responsible for QC & QA.	String, 50 positions, First name followed by last name.	Database QA	**Erik Degerman**
Company_University	If applicable.	String, 50 positions.	QA	**National Board of Fisheries**
Institute_Agency	Name of Your institute or governmental agency.	String, 50 positions.	QA	**Institute of Freshwater Research**
Street_POB	Street address or post box number if applicable.	String, 50 positions.	QA	
City	Name of city.	String, 30 positions.	QA	**Drottningholm**
State_province	If applicable.	String, 30 positions.	QA	
Postal_code	Zip or postal code including country abbreviation	String, 20 positions.	QA	**SE 178 93**
Country	Name of the country in English	String, 20 positions.	QA	**Sweden**
Email	Email address of the responsible person.	String, 50 positions.	QA	**erik.degerman@ fiskeriverket.se**

Table SITE

VARIABLE	**EXPLANATION**	**TYPE, PRECISION**	**USED FOR**	EXAMPLE
Site_code	Country abbreviation + your own code of the site, e.g. GE0001 could be site 1 in Germany. GEBA001 could instead be used and would perhaps mean site number 1 in Bavaria, Germany.	String, 15 positions, first two letters always capital.	Database	GEBA0001
Site_name	Your national name identifying the site. Optional.	String, 30 positions.	Database	
Latitude	Latitude in Degrees.MinutesSeconds. Degrees followed by decimal point and then Minutes and Seconds, two digits each, written after one another as decimals. Note: if more than four decimals (i.e. decimals of Seconds), the number should be rounded to four decimals. Latitude is always followed by N (no space in between). Measure preferably from the downstream beginning of the site.	String, 8 positions	Database	54.3501N
Longitude	Latitude in Degrees.MinutesSeconds. Degrees followed by decimal point and then Minutes and Seconds, two digits each, written after one another as decimals. Note: if more than four decimals (i.e. decimals of Seconds), the number should be rounded to four decimals. Longitude is followed by E or W (no space in between). Measure preferably from the downstream beginning of the site.	String, 8 positions	Database	10.0445E
Country_abbreviation	Country abbreviation, e.g. PL = Poland, PT = Portugal. All available in the menu. Look in help table.	String, 2 positions.	Database, QA	GE

Table SITE

Eco_region_no	Ecoregion according to Illies, from 1 to 25. 1 = Iberian peninsula…25 = Caspic depression. Complete list in Appendix 1.	Numeric, integer, 2 positions, ##	Typology Displaying results	9
Subecoregion	National ecoregions. A free text field for your national codes. Optional.	String, 50 positions, Initial capital letter and then lower-case letters.	Typology	Bayern Tanneregione
River_type	To be completed following WP1a.	String, 50 positions, Initial capital, then lower-case letters.	Typology	
Main_river_region	English name of river system or marine confluence, i.e. marine area where the river ends (meets the sea). It is suggested that river names be used only for rivers basins larger than 25 000 km^2. For smaller basins the marine confluence area should be used as name. Suggested names of marine regions are according to ICES sea area list (see Appendix 2 below). Do not use the numeric code, use the full name.	String, 50 positions, Initial capital letter and then lower-case letters.	Database, Typology, Displaying results	Danube
River_name	National name of the river. For transboundary, small rivers use the name from the country where it confluences, i.e. Semois, Belgium – Semoy – France.	String, 50 positions, Initial capital letter and then lower-case letters.	Matching national data Database	Iller

Table SITE

National_map_code_1	Your national map grid coordinates, first direction (e.g. North-South).	Numeric, decimal point, 13 positions, ######.######	Database, QA	656578.0
National_map_code_2	Your national map grid coordinates, second direction (e.g. East-West).	Numeric, decimal point, 13 positions, ######.######	Database, QA	143567.0
Size_of_catchment_class	Size of the catchment (watershed) upstream of the sampling site. Classes; <u>≤10, <100, <1000, <10000, >10000</u> km^2. (i.e. 0-9, 10-99, 100-999, 1000-9999, 10000-). Obligatory.	String, 6 positions.	Typology	<1000
Size_of_catchment	Absolute size of the catchment <u>upstream</u> of sampling site, given in km^2. Optional, but the goal must be to provide data **for at least 50% of sites**.	Numeric, integer, 7 positions, #######	Model	768
Width_flooded_area	The width of the active floodplain area in metres. Should refer to natural conditions. The area flooded in 50 years intervals should be included. Optional, but important for lowland sections of larger rivers (>10 000 km^2).	Numeric, integer, 5 positions, #####	Model	140
Mean_discharge_class	Average annual water discharge at site. Could be deduced from maps or from similar or nearby stations. Optional. Classes; <u><1, <10, <100, <1000, >1000</u> m^3/s, (i.e. 0-0.9, 1-9.9, 10-99.9, 100-999.9, 1000-).	String, 5 positions.	Typology	<100

Table SITE

Flow_regime	Normal flow pattern for the river. Divided into four classes: Permanent = Never (or extremely rarely) having zero water velocity or low flow. Never drying out. Summer dry = In normal years having extreme summer low flow with no water velocity or even dry conditions. (Mediterranean regime). Winter dry = In normal years having extreme winter low flow with no water velocity or even dry conditions. Episodic = Having extreme low flow with no water velocity (or even dry conditions) at intervals. The timing and length of intervals is unpredictable.	String, 10 positions, Initial capital letter and then lower-case letters.	Typology	Permanent
Altitude	The altitude of the site in metres above average sea level. If the altitude is only available in classes, use class midpoint value.	Numeric, integer, four positions, ####	Model, Typology	345
Geological_typology	According to WFD. Classes: siliceous, calcareous, organic. The definition of organic is still unclear.	String, 15 positions.	Typology	Siliceous
Geological_formation	Additional information on the geology of the catchment upstream of the sampling site. Classes: Igneous, Sedimentary, Metamorphic. See Appendix 3. Optional.	String, 20 positions, Initial capital letter and then lower-case letters.	Typology, Model	Metamorphic

Mean_air_temperature	Yearly average air temperature measured for at least 10 years during the period 1960-2002. Given in degrees Celcius (^{o}C). If the temperature is only available in classes, use class midpoint value.	Numeric, decimal point, five positions, ###.#	Model, Typology	12.3
Mean_Jan_temperature	Average air temperature in January measured for over 10 years during the period 1960-2002. Given in degrees Celcius (^{o}C). If the temperature is only available in classes, use class midpoint value. Optional.	Numeric, decimal point, five positions, ###.#	Model, Typology	-0.1
Mean_Jul_temperature	Average air temperature in July measured for over 10 years during the period 1960-2002. Given in degrees Celcius (^{o}C). If the temperature is only available in classes, use class midpoint value. Optional.	Numeric, decimal point, five positions, ###.#	Model, Typology	18.4
Gradient_slope	Slope of stream bed along stream expressed as per mil (o/oo). Slope is drop of altitude divided by stream segment length. If possible the stream segment should be as close as possible to 1 km for small streams, 5 km for intermediate streams and 10 km for large streams (see definitions in Table Fishing occasion). Preferably the slope is measured from a map (scale 1:50 000 or 1:100 000). If the slope is only available in classes, use class midpoint value.	Numeric, decimal point, 7 positions, ###.###	Model, Typology	6.780

Table SITE

Huet_zonation	River zonation according to Huet (1949), Classification scheme enclosed below. (Appendix 4). Classes: Trout, Grayling, Barbel, Bream. Optional.	String, 10 positions, Initial capital letter and then lower-case letters.	Typology, QA	Trout
Other_zonation	Zonation used within your country. Optional.	String, 50 positions.	Typology Further work	Epi-/Metapotamal
Stream_order	Strahler system of stream classification based on confluent points. Classification from map (scale 1:50 000). Headwater (smallest blue line) = 1, two headwaters joined together = 2 etc. Optional.	Numeric, integer, 1 position.	Typology, QA	4
Lakes_upstream	Are there natural lakes present upstream in the river continuum? Answer Yes or No. Only applicable if the lake affects the site, e.g. by altering thermal regime, flow regime or providing seston. Use national definition of what is a lake. Obligatory.	String, 3 positions, Initial capital letter and then lower-case letters.	Model	Yes
Distance_to_lake	Distance to natural lake upstream affecting site. Given in km. Optional.	Numeric, decimal point, 4 positions, ##.#	Model	1.2

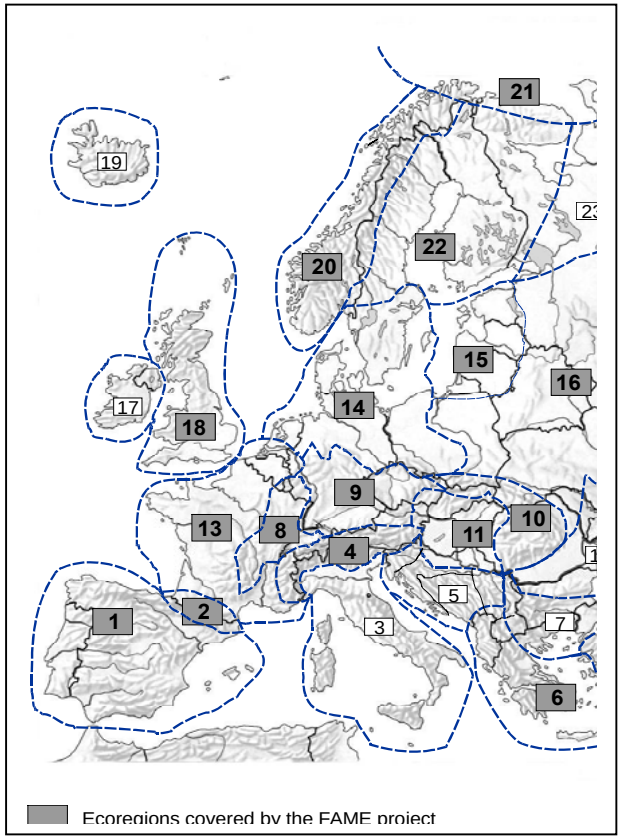
Table SITE

Distance_from_source	Distance (in km) from source (headwater) to the sampling site measured along the river. Measurement shall be made to the furthest away (most distant) upstream source. Obligatory.	Numeric, integer, 5 positions, #####	Model	235
Distance_to_mouth_class	Distance (in km classes) from the sampling site to the sea measured along the river. Classes <10, <50, <100, <500, <1000, >1000 km. Obligatory.	String, 5 positions.	Typology	>1000
Distance_to_mouth	Distance (in km) from the sampling site to the sea measured along the river. Optional.	Numeric, integer, 5 positions, #####	Typology	2345
Water_source_type	The source of the river water should be assigned to one of three classes; glacial, nival, and pluvial. Glacial = >15% glaciated area in the catchment, maximum monthly mean flow during summer. Nival = Yearly flow regime dominated by snowmelt in spring, with spring maximum flow. Pluvial = Yearly flow regime dominated by rainfall, maximum flow often during spring, autumn/winter. Mediterranean areas will fall under pluvial (but often with Flow_regime "summer dry" or "episodic"). If national experts have good reasons for doing so, it is also possible to give combinations Pluvio-nival, Pluvio-glacial, Glacio-nival, Nivo-pluvial etc.	String, 15 positions, Initial capital letter and then lower-case letters.	Typology	Nival

Appendix 1. Ecoregions according to Illies and WFD (Annex XI).

Eco-region according to WFD	*Participating country*
1 Iberian Peninsula	Portugal
2 Pyrenees	France
3 Italy	
4 Alps	Austria, Germany
5 Dinarian Western Balkan	
6 Hellenic Western Balkan	Greece
7 Eastern Balkan	
8 Western Highlands	Germany, France
9 Central Highlands	Germany, Austria, Poland
10 The Carpathians	Poland
11 Hungarian Lowlands	Austria
12 Pontic Province	
13 Western Plains	France, Belgium, The Netherlands

Eco-region according to WFD	*Participating country*
14 Central Plains	The Netherlands, Germany, Sweden, Poland
15 Baltic Province	Lithuania, Poland
16 Eastern Plains	Poland
17 Ireland	
18 Great Britain	United Kingdom
19 Iceland	
20 Borealic Uplands	Sweden
21 Tundra	Sweden
22 Fenno-Scandian Shield	Sweden
23 Taiga	
24 The Caucasus	
25 Caspic Depression	



Appendix 2. Sea areas according to ICES (www.ices.dk/ocean)

Code	Sea area according to ICES (IHB)		Code	Sea area according to ICES (IHB)
1	Baltic Sea		28	Mediterranean Sea
01a	Gulf of Bothnia		28a	Mediterranean Sea, Western Basin
01b	Gulf of Finland		28b	Mediterranean Sea, Eastern Basin
01c	Gulf of Riga		28c	Strait of Gibraltar
2	Kattegat Sound and Belts		28d	Alboran Sea
3	Skagerrak		28e	Balearic Sea (or Iberian Sea)
4	North Sea		28f	Ligurian Sea
5	Greenland Sea		28g	Tyrrhenian Sea
6	Norwegian Sea		28h	Ionian Sea
7	Barents Sea		28i	Adriatic Sea
8	White Sea		28j	Aegean Sea
18	Inland Sea off the West Coast of Scotland		29	Sea of Marmara
19	Irish Sea and the St. George's Channel		30	Black Sea
20	Bristol Channel		31	Sea of Azov
21	English Channel			
21a	Celtic Sea			
22	Bay of Biscay			
23	North Atlantic Ocean			
23a	NE Atlantic Ocean (Limit 40W)			

Appendix 3. Criteria to define geology of catchment bedrock (variable geological_formation).

The bedrock could be characterised from origin (formation processes) and acid/base content.
We could distinguish between three major formation processes:

Igneous — Igneous rocks formed by direct crystallization of minerals from a magma melt. Intrusive (plutonic) rocks crystallize at depth, whereas extrusive (volcanic and pyroclastic rocks) rocks crystallize after the magma reaches the earth's surface. In general, extrusive rocks have a finer grained texture than intrusive rocks.

Sedimentary rocks — Sedimentary rocks are those rocks which form at or near the earth's surface at relatively low temperatures and pressures by either: deposition (by water, wind or ice) or precipitation from solution (may be biologically mediated); and /or growth in position by organic processes (e.g. limestone formed from carbonate reefs).

Metamorphic rocks — Metamorphic rocks form from other rocks by changes in mineralogy and/or texture as a result of a change in chemical and/or physical environment.

Out of the classes required by the WFD, calcareous is found in the sedimentary rocks, whereas siliceous may be present in all the formation processes. Hence, it is necessary to also define the acid/base status or the proportion of SiO_2 in the mineral to decide the classification according to WFD typology.

Igneous_siliceous — A percentage (in weight) of SiO_2 above or equal to 63% would refer to a siliceous (acid) rock. This would include for instance granite, granodiorite, rhyolite and dacite.

Igneous_basic — A percentage (in weight) of SiO_2 less than 63% would refer to a basic rock. This would include for instance gabbro, basalt, komatiite, peridotite, andesite, diorite.

Sedimentary_acid — Siliciclastics (silicicate-rich breccias, sandstones, mudrocks)

Sedimentary_basic — Precipitates and allochems (limestone = Calcareous, dolostones, cherts)

Metamorphic-acid — E.g. gneisses

Metamorphic-basic — E.g. several slates.

But! When the WFD typology is used (obligatory) it is sufficient to just state the formation process of the bedrock. By combining the variables geological_typology and geological_formation a more precise definition of the bedrock is achieved. Hence three classes are suggested; **Igneous, Sedimentary, Metamorphic.**

Appendix 4. Criteria to define the river zonation according to Huet 1949.

Stream width (m)	Slope ‰	zone	Slope ‰	zone	Slope ‰	zone	Slope ‰	zone
≥ 100	<0.25	bream	≥ 0.25	barbel	<4.5	grayling	≥4.5	trout
≥60	<0.33	bream	<1.25	barbel	<4.5	grayling	≥4.5	trout
≥30	<0.45	bream	<1.5	barbel	<5	grayling	≥5	trout
≥25	<0.5	bream	<1.75	barbel	<5.5	grayling	≥5.5	trout
≥20	<0.5	bream	<2	barbel	<5.7	grayling	≥5.7	trout
≥15	<0.6	bream	<2	barbel	<6	grayling	≥6	trout
≥10	<0.7	bream	<2.3	barbel	<6.5	grayling	≥6.5	trout
>4.5	<1	bream	<2.7	barbel	<7	grayling	≥7	trout
≤4.5	<1	bream	<3	barbel	≥3	upstream *	≥7	trout

* Includes trout and grayling zone

Table FISHING OCCASION

VARIABLE	**EXPLANATION**	**TYPE, PRECISION**	**USED FOR**	EXAMPLE
Reporter_code	See Table REPORTER			
Site_code	See Table SITE			
Reference_site	On a national basis by FAME partners considered as a reference site at time of sampling. Yes or No. Definite selection of reference sites to be decided later.	String, 3 positions.	Database, Model	No
Latitude	See Table SITE	String, 8 positions.	Database	54.3501N
Longitude	See Table SITE	String, 8 positions.	Database	10.0445E
Date	Date of sampling given as Microsoft date format. Format YYYY-MM-DD.	Date format, 10 positions.	Database	2002-05-14
Numdate	Date of sampling given as a numeric integer. Format YYYYMMDD. For safety until we are sure that date format (previous variable) works.	Numeric, Integer, 8 positions.	Database	20020514
Sampling_strategy	Definition of how the section was sampled. Whole river width or partial, and if partial adopted sampling strategy. Codes: Whole = Whole river width and section. Partial1bank = Partial, one bank Partial2banks = Partial, both banks Partialrandom = Partial, random sites Partialprop = Partial, each habitat type proportionally sampled Other = Unknown or other strategy.	String, 15 positions, Initial capital letter and then numbers or lower-case letters.	Sampling	Whole

Method	Electric fishing by Wading or Boat.	String, 6 pos., Initial capital letter then lower-case letters.	Sampling	Wading
Day_night	Sampling period Day (daylight) or Night (darkness). Optional.	String, 6 pos., Initial capital letter then lower-case letters.	Sampling	Day
Number_of_runs	Number of runs (passages, removals) carried out.	Numeric, integer, 1 position, #	Sampling	3
Runs_separated	Is the catch reported separately for each run or as a total (cumulative) for all runs? Answer Separated or Total. If only one passage has been carried out the answer must be Total.	String, 6 positions, Initial capital letter and then lower-case letters.	Database	Separated
Water_temperature	The temperature of the water (depth 0.2-2 m) at sampling given in degrees Celcius (^{o}C). Optional.	Numeric, decimal point, 5 positions, ###.#	Sampling	19.4

Conductivity_class	Specific conductivity of the water at sampling. Given as **mS/m**. Classes: <10, <50, <500, >500 (i.e. 0-9.9, 10-49.9, 50-499.9, 500-). **Note:** 1 mS/m = 10 µS/cm.	String, 5 positions.	Sampling Typology	<50
Conductivity	Specific conductivity value of the water at sampling. Given as **mS/m**. **Note:** 1 mS/m = 10 µS/cm.	Numeric, decimal point, 4 positions, ####.#	Sampling Typology Model	18.5
Locality_length	Fished length (sampled length) of the stream in metres.	Numeric, decimal point, 6 positions, ####.#	Database	140.0
Locality_width	Estimated fished width of sampled locality given in metres. Could be derived from the previous and the following variable and is therefore Optional.	Numeric, decimal point, 6 positions, ####.#	Sampling	10.0
Fished_area	Area of the section that has been sampled (locality_length * locality_width) given in m^2.	Numeric, integer, 6 positions, ######	Sampling Database	1400
Wetted_width	The wetted width of the stream (representative width of the section) given in metres. Wetted width is normally calculated as the average of several transects across the stream. Wetted_width = Locality_width if the whole stream section was sampled. Could be replaced by average width if only such data are available.	Numeric, decimal point, six positions, ####.#	Sampling Typology Model	10.0

Average_depth	The average depth is given in metres for the **sampled** area. Note that the precision is down to centimetres. Same as average depth of site if whole length and width of site was sampled.	Numeric, decimal point, six positions, ###.##	Sampling	0.56
Maximum_depth_class	The maximum depth in metres is given for the **surveyed river section**, i.e. the deepest spot even if this was not sampled. Note, not the segment. Classes: <1, <2, <5, >5 m. Optional.	String, 3 positions.	Sampling Model	<1
Dominating_substrate	The dominating substrate type at the sampled area of the stream. Classes; Silt, Sand, Gravel, Pebble, Cobble, Boulder, Rock and FineSand, GravelPebble, PebbleCobbble, CobbleRock and BoulderRock. See definitions in Appendix 1. Optional.	String, 20 positions, Initial capital letter and then lower-case letters.	Model Typology Sampling	Sand

Stop_nets_used	State if stop nets (block nets) were used to delimit the sampling site. Codes: Yes = Both up- and downstream Up = Only upstream Down = Only downstream No = No nets used.	String, 4 positions, Initial capital letter and then lower-case letters.	Sampling	No
No_of_anodes	Number of anodes used. One, Two, Three, Four,…., Multiple.	String, 10 positions, Initial capital letter and then lower-case letters.	Sampling	One
Type_of_anode	Ring, Rectangular, Boom, Other.	String, 6 positions, Initial capital letter and then lower-case letters.	Sampling	Ring
Size_of_anode	Obligatory if applicable. For ring (circular) anodes the ring diametre is given in metres. For boom anodes the maximum length of the active anode. Otherwise the maximum length of the anode.	Numeric, decimal point, six positions, (precision centimetres), ###.##	Sampling	0.25
Type_of_current	The type of current used for fish sampling; AC = Alternating current (God forbid!) DC = Dead current (rippled) PDC = Pulsed dead current.	String, 3 positions, all letters capital.	Sampling	PDC
Voltage_used	The voltage used given in Volt. Optional.	Numeric, Integer, 4 positions.	Sampling	400
Wattage_used	The wattage used given in Watt. Optional.	Numeric, Integer, 5 positions.	Sampling	1200

Mesh_size	Mesh size (not stretched net) of the net used for sampling fish given in mm. If possible given as a single digit, e.g. 4 (mm), but interval is also acceptable, e.g. 4-6 (mm). The interval should be given using minimum and maximum mesh size separated by "-", i.e. 4-6.	String, 5 positions, #####	Sampling	4-6
Land_use_river	Impact of agriculture & silviculture on the river basin level, i.e. whole catchment also downstream of segment. Down to confluence with other river or the sea. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	2
Urbanisation_river	Impact of urbanisation on river basin level. Down to confluence with other river or the sea. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	3
Connectivity_river	Impact of artificial migration barriers within river basin preventing diadromous fish from accessing river segment. Down to confluence with the sea. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	4
Land_use_segment	Impact of agriculture & silviculture on the river segment level. Classes 1 to 5. Segments are defined as: 1 km in streams <100 km^2. 5 km in streams 100-1000 km^2. 10 km in streams >1000 km^2. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	2
Urbanisation_segment	Impact of urbanisation on river segment level. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	2

Table FISHING OCCASION

Riparian_zone_segment	Deviation from natural state of riparian zone of the river segment (vegetation zone adjacent to stream). Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	3
Floodplain_lateral_ movements_segmen t	Deviation from natural possibilities for movements of biota and water within active floodplain on the segment scale. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	5
Sediment_load_segment	Deviation from natural sediment load (both transported in water column and deposited in stream bed) on the segment scale. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	1
Hydrological_regime_site	Deviation from natural hydrological state (both flow pattern and quantity) of the investigated site. This variable is obligatory, whereas the next two are optional and would ideally be a more precise description of the present variable. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	1
Natural_flow_pattern_ site	Deviation from natural flow pattern of the investigated site. Classes 1 to 5. See Appendix 2. Optional.	Numeric, integer, #	Reference cond. Assessment	1
Natural_flow_quantity_ site	Deviation from natural flow quantity of the investigated site. Classes 1 to 5. See Appendix 2. Optional.	Numeric, integer, #	Reference cond. Assessment	1
Upstream_dam_site	Artificial lenthic water body upstream of the investigated site affecting the site. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	1
Morphological_condition _site	Deviation from natural state of stream bed and banks of the investigated site. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	3
Salinity_site	Deviation from natural saline state of the investigated site. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	1

Toxic_acidification_site	Deviation from natural state of the investigated site. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	1
Nutrients_organic_input_site	Deviation from natural state of P, N and TOC of the investigated site. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	4
Introduction_of_fish_site	Impact on natural fish populations by species new to the river basin on the investigated site. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	2
Impact_of_stocking_site	Impact of stocked fish, i.e. already present within river basin, on natural fish fauna on the investigated site. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	2
Exploitation_site	Impact of human exploitation, e.g. fishing, on the investigated site. Classes 1 to 5. See Appendix 2.	Numeric, integer, #	Reference cond. Assessment	4
Fauna_impact_site	Effects on fish fauna on the investigated site from introduced species, invasive species or rapidly increasing species (not fish), e.g. predation, parasitism, competition. Classes 1 to 5. Appendix 2.	Numeric, integer, #	Reference cond. Assessment	1
Flora_impact_site	Unnatural increase in water vegetation including helophytes (reeds) and submerged macrophytes on the investigated site. Classes 1 to 5. Appendix 2.	Numeric, integer, #	Reference cond. Assessment	2
Weed_cutting_site	Cutting of weeds on the investigated site. Classes 1 to 5. Appendix 2.	Numeric, integer, #	Reference cond. Assessment	1

Appendix 1. The lowest common particle denominator, or how to classify substrate FAMEwise.

All measurements are in mm and refer to particle diameter. The suggestion for FAME is in boldface below.

Note that apart from the simple classes as “Sand” or “Rock” it is also permitted to use compound classes, e.g. PebbleCobble. Allowed classes are in **boldface** below.

Class	CEN	Baden-Württenberg	Sweden	AQEM	U.S. Colorado	U.S. Indiana
Organic	Text definition	Not defined	Not defined	Not defined	Not defined	Not defined
Clay	Text definition	Not defined	Not defined	Not defined	<0.004	<0.002
Silt	Text definition	Not defined	<0.2		0.004-0.06	0.002-0.02
Sand	<2	<2	0.2-2	<2	0.06-2	0.02-4.8
Gravel	2-16	2-20	2-20	2-20	2-20	4.8-75
Pebble	16-64	20-63	20-100	20-60	20-64	Not defined
Cobble	64-256	63-500	100-200	60-200	64-256	75-300
Boulder	>256	>500	200-2000	200-400	>256	>300
Rock	Continuos		>2000	>400		
	rock					

FAME

Classes		Note:
Fine	<0.2	Or as close as national standard permits
Sand	0.2-2	Or as close as national standard permits
Gravel	2-20	Or as close as national standard permits
Pebble	20-60	Or as close as national standard permits
Cobble	60-200	Or as close as national standard permits
Boulder	>200	Or as close as national standard permits
Rock	Continuos	Or as close as national standard permits
	rock	

Additional classes allowed	
FineSand	<2
GravelPebble	2-60
PebbleCobble	20-200
CobbleRock	>60
BoulderRock	>200

Appendix 2. Suggestion for classification of impact variables.

Impact classes:
5 – bad status: severe impact on fish fauna
4 – poor status: strong impact on fish fauna
3 – moderate status: moderate impact on fish fauna
2 – good status: slight impact on the fish fauna
1 – high status = reference conditions: only minor, negligible alterations

Guidance for classification of impact follows each variable.

River basin The whole river basin, also downstream of the site. All the way down to the confluence in another river or the sea.

1. **Land_use_river** – impact of agriculture/silviculture on the river basin level.
Agriculture:
>40% cultivated land (intensive, crops), severe impact – impact class 5
>40% cultivated land, strong impact – impact class 4
<40% moderate impact – impact class 3
<40% low impact – impact class 2
<10% – impact class 1

Silviculture: must be assessed on a national level. As a suggestion, if more than 30% of the available forested area is used for commercial forestry, the impact class should be 4 or 5. Extent of clear cutting and whether natural tree species composition is altered should also be taken into consideration.
Combined impact of agriculture and silviculture should be assessed with expert judgement.

2. **Urbanisation_river** – impact of urbanisation on the river basin level (down to confluence).
>15% urban land, severe impact – impact class 5
>15% urban land, strong impact – impact class 4
<15% moderate impact – impact class 3
<15% low impact – impact class 2
<1% – impact class 1

3. **Connectivity_river** – migration barriers within the river basin (down to confluence in another river or the sea) preventing access for diadromous species to river segment (segment is defined below).
Definite artificial barrier – impact class 5
Passage for single species occasionally – impact class 4
Passage for certain species or certain years – impact class 3
Passage for most species most years – impact class 2
No barriers or functioning bypass/similar device – impact class 1

River segment
A river segment is defined as: 1 km for small rivers (catchment <100 km^2)
5 km for medium-sized rivers (100-1000 km^2)
10 km for large rivers (>1000 km^2).
A segment for a small river will thus be 500 m up- and 500 m downstream of the sampling site.

4. **Land_use_segment** – impact of agriculture/silviculture on the river segment level, in this case referring to the catchment upstream.
Agriculture:
>40% cultivated land, (intensive, crops), severe impact – impact class 5
>40% cultivated land, strong impact – impact class 4
<40% moderate impact – impact class 3
<40% low impact – impact class 2
<10% – impact class 1
Silviculture: must be assessed on a national level. As a suggestion, if more than 30% of the available forested area is used for commercial forestry, the impact class should be 4 or 5. Extent of clear cutting and whether natural tree species composition is altered should also be taken into consideration. Impact should increase with proximity of forestry activities to the river segment.
Combined impact of agriculture and silviculture should be assessed with expert judgement.

5. **Urbanisation_segment** – impact of urbanisation on the river segment level, in this case referring to catchment upstream.

>15% urban land, severe impact – impact class 5
>15% urban land, strong impact – impact class 4
<15% moderate impact – impact class 3
<15% low impact – impact class 2
<1% – impact class 1

6. **Riparian_zone_segment** – deviation from natural state (adjacent vegetation zone, normally 30-50 m on each shore) of the segment.

<25% of shore length (both sides) in natural state – impact class 5
<50% of shore length (both sides) in natural state – impact class 4
<75% of shore length (both sides) in natural state – impact class 3
<90% of shore length (both sides) in natural state – impact class 2
>90% of shore length (both sides) in natural state – impact class 1

7. **Connectivity_segment** – migration barriers preventing free migration of potadromous species to segment.

Definite artificial barrier – impact class 5
Passage for single species occasionally – impact class 4
Passage for certain species or certain years – impact class 3
Passage for most species most years – impact class 2
No barriers or functioning bypass/similar device – impact class 1

8. **Floodplain_lateral_movements_segment** – deviation from natural floodplain/river-system and possibilities for movements of biota and water to and within floodplain water body types (only for floodplain rivers).

no floodplains – impact class 5
<10% in natural state, most types missing – impact class 4
<25% in natural state, some types missing – impact class 3
>50% in natural state, all types present – impact class 2
>90% in natural state, all types present – impact class 1

9. **Sediment_load_segment** – deviations from natural sediment load (increase) in the segment.
Expert judgement.

Site, i.e the investigated section, where the samples are taken, of the stream/river.

10. **Hydrological_regime_site** – deviation from natural state at the site (obligatory).
Expert judgement.
Use highest value of impact from variables 11. **Natural_flow_pattern_site** and 12. **Natural_flow_quantity_site**, if available.

11. **Natural_flow_pattern_site** – deviation from natural flow pattern (optional).
<50% level and strong deviation from natural yearly
variation in flow regime – impact class 5
<50% level and deviation from natural yearly
variation in flow regime – impact class 4
>50% level and near–natural duration of flooding periods – impact class 3
>75% level and near–natural duration of flooding periods – impact class 2
>90% level and natural duration of flooding periods – impact class 1

12. **Natural_flow_quantity_site** – deviation from natural flow quantity (optional).
<10% of mean annual discharge – impact class 5
<15% of mean annual discharge – impact class 4
>15% of mean annual discharge – impact class 3
>30% of mean annual discharge – impact class 2
>90% of mean annual discharge – impact class 1

13. **Upstream_dam_site** –Artificial (man-made) lenthic water body upstream affecting the site with respect to e.g. altered thermal regime, decreased sediment load etc.
Expert judgement.

14. **Morphological_condition_site** – deviation from natural state of river channel and banks, e.g. channelization, at the site.

canal – impact class 5
channelized, most natural habitat types missing – impact class 4
channelized, some natural habitat types missing – impact class 3
most of natural channel form maintained,
all habitat types present – impact class 2
negligible morphological alteration – impact class 1

15. **Salinity_site** – deviation from natural state at the site.

Constant or long periods (months) of strong deviations from normal
salinity range – impact class 5
– impact class 4
Occasional deviations (single measurements) from normal
salinity range – impact class 3
– impact class 2
Salinity range within normal variation – impact class 1

16. **Toxic_acidification_site** – deviations from natural state of toxic conditions including acidification and oxygen levels at the site.

Constant/long periods (months) or frequent reoccurrence of strong deviations from normal
undisturbed conditions (e.g. pH<5.0) – impact class 5
(e.g. pH<5.5) – impact class 4
Occasional deviations (single measurements, episodes) from normal
undisturbed conditions (e.g. single pH <5.5) – impact class 3
(e.g. single pH <6.0) – impact class 2
Conditions within normal variation – impact class 1

Suggestions regarding oxygen levels **applicable for at least grayling and trout zones**:

<2 mg/l O_2 or lowest measured oxygen saturation <70% – impact class 5
2-5 mg/l O_2 or lowest measured oxygen saturation 70-80% – impact class 4
<5 mg/l O_2 or lowest measured oxygen saturation >80%) – impact class 3
<7 mg/l O_2 or lowest measured oxygen saturation 80-90% – impact class 2
>7 mg/l O_2 or lowest measured oxygen saturation >90% – impact class 1

17. **Nutrients_organic_input_site** – deviations from natural state (including humic substances, fish farming etc.) at the site.
Conditions deviate more than 300% of established national background levels
of P, N and TOC concentrations – impact class 5
Occasional deviations more than 300% – impact class 4
Conditions within 150–300% of established national background levels
of P, N and TOC concentrations – impact class 3
Occasional deviations more than 150% – impact class 2
Conditions within 150% of established national background levels
of P, N and TOC concentrations – impact class 1

18. **Introduction_of_fish_site** – impact from species new to river basin at the site. Optional.
Expert judgement (assessment of impact on natural fish fauna).
Self-reproducing populations with high numbers (impact 4 or 5) should be compared to not reproducing species in low numbers (impact = 2 or 3).

19. **Impact_of_stocking_site** – impact of species already present in river basin at the site. Optional.
Expert judgement (assessment of impact on natural fish fauna, genetic effects not considered).

20. **Exploitation_site** – impact of human exploitation, e.g. fishing, at the site. Optional.
Expert judgement (assessment of impact on present fish fauna).

21. **Fauna_impact_site** – Effects on fish fauna at the site from introduced species, invasive species or rapidly increasing species (not fish), e.g. predation, parasitism, competition. Classes 1 to 5. Expert judgement (assessment of impact on present fish fauna). Optional.

22. **Flora_impact_site** –Unnatural increase in water vegetation at the site including helophytes (reeds) and submerged macrophytes. Classes 1 to 5. Expert judgement. Optional.

23. **Weed_cutting_site** – Cutting of weeds at the site. Classes 1 to 5. Expert judgement. Optional.

Performed several times a year – impact class 5
Performed on average once a year or every second year – impact class 4
Has been performed within the last five years – impact class 3
Has been performed more than five years ago – impact class 2
Never performed – impact class 1

Table HISTORICAL

VARIABLE	**EXPLANATION**	**TYPE, PRECISION**	**USED FOR**	EXAMPLE
Site_code	See Table SITE.			
Period_start	Starting year of specific period from which data originate.	Numeric, integer, 4 positions, ####	Database Model	1600
Period_end	Ending year of specific period from which data originate.	Numeric, integer, 4 positions, ####	Database Model	1699
Period_string	More specific definition of period. Optional.	String, 25 positions	Database Model	1650's to 1680's
Species	Scientific name of species (see Table TAXA AND GUILDS).	String, 30 positions, first letter of genus name always capital, remaining letters normally in lower-case letters.	Database Model	Salmo salar
Status_scale_class	0 = not found 1 = probably present in river basin 2 = present in river basin 3 = probably present in river segment 4 = present in river segment 5 = probably present at site 6 = present at site	Numeric, integer, 1 position. #	Database Model	5
Abundance_class	Optional. 3 = high abundance 2 = medium abundance 1 = low abundance	Numeric, integer, 1 position. #	Database Model	2

Table CATCH

VARIABLE	**EXPLANATION**	**TYPE, PRECISION**	**USED FOR**	EXAMPLE
Site_code	See Table SITE.			
Latitude	See Table SITE.			
Longitude	See Table SITE.			
Date	Date of sampling given as Microsoft date format. Format YYYY-MM-DD.	Date format, 10 positions.	Database	2002-05-14
Species	Scientific name of species (see Table TAXA AND GUILDS).	String, 30 positions, first letter of genus name always capital, remaining letters normally in lower case letters.	Database Model	Atherina boyeri
Run1_number_all	All caught individuals (incl 0+) of the species in run 1.	Numeric, integer, 5 positions, #####.	Database Model Sampling	12
Run1_number_ 0_plus	All caught 0+ of the species in run 1. **Note:** Only used for species of special interest.	Numeric, integer, 5 positions, #####.	Database Model Sampling	5
Run2_number_all	All caught individuals (incl 0+) of the species in run 2.	Numeric, integer, 5 positions, #####.	Database Model Sampling	6
Run2_number_ 0_plus	All caught 0+ of the species in run 2.	Numeric, integer, 5 positions, #####.	Database Model Sampling	1

Run3_number_all	All caught individuals (incl 0+) of the species in run 3.	Numeric, integer, 5 positions, #####.	Database Model, Sampling	3
Run3_number_ 0_plus	All caught 0+ of the species in run 3.	Numeric, integer, 5 positions, #####.	Database Model Sampling	0
Run4_number_all	All caught individuals (incl 0+) of the species in run 4.	Numeric, integer, 5 positions, #####.	Database Model Sampling	
Run4_number_ 0_plus	All caught 0+ of the species in run 4.	Numeric, integer, 5 positions, #####.	Database Model Sampling	
Total_number_all	All caught individuals (incl 0+) of the species in all runs (cumulative total).	Numeric, integer, 5 positions, #####.	Database Model Sampling	21
Total_number_ 0_plus	All caught 0+ of the species in all runs (cumulative total).	Numeric, integer, 5 positions, #####.	Database Model Sampling	6

Total_biomass	Estimated biomass of the species in kg per hectare (=10 000 m^2). It is understood that the biomass is calculated from the estimated abundance. E.g. 3 kg was caught in the sampling of the species and the number of caught individuals was 10. The estimated abundance was calculated to 100 individuals/ha. Then the Total_biomass should be 30 kg/ha.	Numeric, decimal point, 9 positions, #####.###, Note that allowed precision is down to gram.	Database Model	32.450
Biomass estimate	Define if biomass was estimated by weighing or length-weight-conversion. Code: WE or LW. Optional.	String, 2 positions, use only capital letters.	Sampling	WE
Total_abundance	Estimated abundance (no. of individuals) of the species per hectare (=10 000 m^2).	Numeric, integer, 6 positions, ######.	Database Model	1200
Abundance_estimate	Method used for the abundance estimation. When successive removal (multiple runs) has been carried out you should preferably give a short reference (e.g. Zippin 1958, Carle & Strub 1978, Bohlin et al. 1979, Junge & Liboswarsky 1965, Higgins 1985, Gerdeaux 1987, de Lury 1958). When only one passage (one run) was carried out state if just an average p-value (catch efficiency) was used (Average p). All references used should be given in full to the Swedish partner to allow for a help table with this information to be produced. Optional.	String, 50 positions.	Sampling	Zippin 1958
Estimated_efficiency	State the catch efficiency (p-value) calculated (successive removal) or used (one run). Should refer to the proportion of estimated abundance caught at the first passage (p1). Optional.	Numeric, decimal point, 4 positions, #.##	Sampling	0.51

Table LENGTH – TABLE is OPTIONAL (to be used if individual lengths are available)

VARIABLE	**EXPLANATION**	**TYPE, PRECISION**	**USED FOR**	EXAMPLE
Site_code	See Table SITE.	String, 8 positions, first two letters always capital.	Database	LT001
Latitude	See Table SITE.	String, 8 positions.	Database	55.3501N
Longitude	See Table SITE.	String, 8 positions.	Database	24.0445E
Date	Date of sampling given as Microsoft date format. Format YYYY-MM-DD.	Date format, 10 positions.	Database	2002-05-14
Species	Scientific name of species (see Table TAXA AND GUILDS).	String, 30 positions, first letter of genus name always capital, remaining letters normally in lower case letters.	Database Model	Aspius aspius
Type_of_data	Indicate if the whole catch or a subsample was measured. Codes: All, Subsample, Minmax, Other.	String, 10 positions, first letter always capital and the rest in lower case.	Further work	All
Length_type	Total length or Fork length.	String, 5 positions, first letter always capital and the rest in lower case.	Further work	Total
Length	Length of individual in mm.	Numeric, integer, 4 positions.	Further work	345

Table LENGTH – TABLE is OPTIONAL (to be used if individual lengths are available)

VARIABLE	**EXPLANATION**	**TYPE, PRECISION**	**USED FOR**	EXAMPLE
Site_code	See Table SITE.	String, 8 positions, first two letters always capital.	Database	LT001
Latitude	See Table SITE.	String, 8 positions.	Database	55.3501N
Longitude	See Table SITE.	String, 8 positions.	Database	24.0445E
Date	Date of sampling given as Microsoft date format. Format YYYY-MM-DD.	Date format, 10 positions.	Database	2002-05-14
Species	See Table CATCH			
Type_of_data	Indicate if the whole catch or a subsample was measured. Codes: All, Subsample, Minmax, Other.	String, 10 positions, first letter always capital and the rest in lower case.	Further work	All
Length_type	Total length or Fork length.	String, 5 positions, first letter always capital and the rest in lower case.	Further work	Total
Length_class_min	Give length class lower limit in mm.	Numeric, integer, 4 positions.	Further work	50
Length_class_max	Give length class upper limit in mm.	Numeric, integer, 4 positions.	Further work	99
Number	Number of individuals in this length class.	Numeric, integer, 4 positions.	Further work	2

Appendix VII Contributors to the data collection programme for WP7 and WP8

Partner	Name	Role
Centre for Ecology and Hydrology (CEH)	Nick Kneebone	Sampling, sorting, identification (diatoms, inverts), data input
Centre for Ecology and Hydrology (CEH)	Martin Neale	Sampling, sorting, identification (inverts)
Centre for Ecology and Hydrology (CEH)	Helen Vincent	Sampling, sorting, identification (diatoms, inverts), data input
Centre for Ecology and Hydrology (CEH)	Tracy Corbin	Sampling, sorting, identification (inverts), data input
Centre for Ecology and Hydrology (CEH)	Mike Furse	Sampling
CEH (visiting scientist, University of Granada)	Jose Poquet	Sampling
Centre for Ecology and Hydrology (CEH)	Rick Gunn	Sorting, identification (Oligochaeta)
Centre for Ecology and Hydrology (CEH)	John Blackburn	Sorting, identification (Chironomidae)
Centre for Ecology and Hydrology (CEH)	John Murphy	Sorting, identification (inverts)
CEH (visiting scientist, UDE [see below]	Marta Wenikajtys	Sorting, data input
Centre for Ecology and Hydrology (CEH)	Paul Henville	Surveying
Centre for Ecology and Hydrology (CEH)	Pete Scarlett	Surveying, data management
Centre for Ecology and Hydrology (CEH)	John Davy-Bowker	Database construction, data management
Centre for Ecology and Hydrology (CEH)	Cynthia Davies	Data management
Centre for Ecology and Hydrology (CEH)	Stewart Welton	Fishing
Centre for Ecology and Hydrology (CEH)	Bill Beaumont	Fishing
Centre for Ecology and Hydrology (CEH)	Adrian Pinder	Fishing, data management
Centre for Ecology and Hydrology (CEH)	Rudi Gozlan	Fishing
Centre for Ecology and Hydrology (CEH)	Will Beaumont	Fishing
University of Duisburg Essen (UDE)	Not yet supplied	
BOKU	M. Car	Identification
BOKU	C. Frangez	Field sampling
BOKU	W. Graf	Field sampling, identification
BOKU	U. Grasser	Identification

BOKU	M. Hinterhofer	Field sampling
BOKU	M. Horzak	Identification
BOKU	C. Hörl	Laboratory processing
BOKU	T. Huber	Field sampling, laboratory processing
BOKU	B. Janecek	Identification
BOKU	J. Kodada	Identification
BOKU	H. Kummer	Field sampling
BOKU	P. Leitner	Field sampling, laboratory processing
BOKU	A. Melcher	Data input
BOKU	O. Moog	Field sampling
BOKU	H. Nesemann	Identification
BOKU	T. Ofenböck	Field sampling
BOKU	K. Pall	Identification
BOKU	A. Schmidt-Kloiber	Field sampling
BOKU	M. Seebacher	Data input
BOKU	F. Sporka	Identification
BOKU	G. Unfer	Field sampling
BOKU	G. Wassermann	Identification
BOKU	P. Wenzl	Field sampling, laboratory processing
BOKU	C. Wiesner	Field sampling, data input
Donabaum&Wolfram (sub-contractor BOKU)	R. Mutschlechner	Laboratory processing
Donabaum&Wolfram (sub-contractor BOKU)	J. Römer	Field sampling, laboratory processing
Donabaum&Wolfram (sub-contractor BOKU)	T. Schuh	Field sampling
Department of Environmental Assessment (SLU)	Berta Andersson	Macrophyte identification
Department of Environmental Assessment (SLU)	Oskar Andersson	Field work, laboratory processing
Department of Environmental Assessment (SLU)	Jenny Bergfur	Field work, data input
Department of Environmental Assessment (SLU)	Therese Carlsson	Field work, data input
Department of Environmental Assessment (SLU)	Joakim Dahl	Field work

Department of Environmental Assessment (SLU)	Lars Eriksson	Field work, macroinvertebrate identification
Department of Environmental Assessment (SLU)	Jens Fölster	Field work
Department of Environmental Assessment (SLU)	Willem Goedkoop	Field work
Department of Environmental Assessment (SLU)	Amelie Jarlman	Phytobentos identification
Department of Environmental Assessment (SLU)	Richard K. Johnson	Field work
Department of Environmental Assessment (SLU)	Jakob Nisell	Field work
Department of Environmental Assessment (SLU)	Daniel Larsson	Field work
Department of Environmental Assessment (SLU)	Putte Olsson	Laboratory processing
Department of Environmental Assessment (SLU)	Leonard Sandin	Field work, data input
Department of Environmental Assessment (SLU)	Sonja Stendera	Field work
Department of Environmental Assessment (SLU)	Anneli Widenfalk	Field work
Department of Environmental Assessment (SLU)	Björn Wiklund	Field work, laboratory processing
Department of Environmental Assessment (SLU)	Mikael Östlund	Field work
Department of Environmental Assessment (SLU)	Erik Eriksson	Laboratory processing
Masaryk University	Karel Brabec	Field sampling, identification
Masaryk University	Libuse Opatrilova	Field sampling, laboratory processing, data input
Masaryk University	Petr Paril	Field sampling, identification
Masaryk University	Marcela Ruzickova	Field sampling
Masaryk University	Vit Syrovatka	Field sampling, laboratory processing
Masaryk University	Katerina Sumberova	Macrophyte identification
Masaryk University	Svatava Kubesova	Macrophyte identification
Hellenic Centre for Marine Research (HCMR-IIW)	K. C. Gritzalis	RHS, sampling, sorting, identification (m/i & m/ph), data input
Hellenic Centre for Marine Research (HCMR-IIW)	N. T. Skoulikidis	Hydrochemistry, geology, typology, field work
Hellenic Centre for Marine Research (HCMR-IIW)	I. Karaouzas	Sampling, sorting, identification (m/i), data input
Hellenic Centre for Marine Research (HCMR-IIW)	T. S. Koussouris	Land uses, pressures, data acquisition, field work
Hellenic Centre for Marine Research (HCMR-IIW)	T. Kouvarda	Sampling, sorting
Hellenic Centre for Marine Research (HCMR-IIW)	A. Economou	Electrofishing sampling, fish fauna data process & acquisition

Hellenic Centre for Marine Research (HCMR-IIW)	M. Stoumpoudi	Electrofishing sampling, fish fauna data process & acquisition
Hellenic Centre for Marine Research (HCMR-IIW)	R. Barbieri	Electrofishing sampling, fish fauna data process & acquisition
Hellenic Centre for Marine Research (HCMR-IIW)	S. Laschou	Chemical analysis & hydrochemistry, field work
Hellenic Centre for Marine Research (HCMR-IIW)	E. Kaloghianni	Electrofishing sampling, fish fauna data process
Hellenic Centre for Marine Research (HCMR-IIW)	N. Mpellou	Sampling, sorting, identification (EPT taxa)
Hellenic Centre for Marine Research (HCMR-IIW)	A. Papadaki	Sampling, sorting
Hellenic Centre for Marine Research (HCMR-IIW)	K. G. Piniotis	Sampling, sorting, hydrochemistry
Hellenic Centre for Marine Research (HCMR-IIW)	I. Bertahas	Chemical analysis, & hydrochemistry
Hellenic Centre for Marine Research (HCMR-IIW)	A. Diapoulis	Data acquisition processing & input
Hellenic Centre for Marine Research (HCMR-IIW)	K. Bogdanos	Data acquisition processing & input
Hellenic Centre for Marine Research (HCMR-IIW)	S. Zoggaris	Electrofishing sampling, fish fauna data process
National & Kapodistrian University of Athens (*S/C*)	B. Montesantou	Diatoms identification
National & Kapodistrian University of Athens (*S/C*)	L. Koumpli	Macrophytes identification
Consiglio Nazionale delle Richerche (CNR-IRSA)	Not yet supplied	
University of Evora	Joana Rosado	Macroinvertebrate sampling, identification and input
University of Evora	Elsa Mourinha	Macroinvertebrate sampling, identification and input
University of Evora	Rita Ramalhinho	Macroinvertebrate sampling, identification and input
University of Evora	Helena Novais	Diatom sampling, identification and input
University of Evora	Susana Nunes	Diatom sampling, identification and input
University of Evora	Manuela Morais	RHS
University of Evora	João Pádua	RHS
University of Evora	Ana Sofia Pedro	RHS
University of Evora	Santiago del Ser	fish sampling, identification and imput
University of Evora	Maria Ilhéu	fish sampling, identification and imput
University of Evora	Silvia Fernandes	fish sampling, identification and imput
University of Evora / Agronomical Institute	Francisca Aguiar	Macrophytes sampling, identification
University of Evora / Agronomical Institute	António Albuquerque	Macrophytes sampling, identification

University of Evora / Agronomical Institute	Patrícia Gonzalez	Macrophytes sampling, identification
National Environment Research Institute (NERI)	Jens Skriver	Field sampling, macroinvertebrate ID
National Environment Research Institute (NERI)	Johnny Nielsen	Field sampling, sorting, macroinvertebrate ID
National Environment Research Institute (NERI)	Dorte Nedergaard	Field sampling, chemical analysis
National Environment Research Institute (NERI)	Louise Korsgaard	Field sampling, diatom ID
National Environment Research Institute (NERI)	Silke S. Johannsen	Field sampling, diatom ID
National Environment Research Institute (NERI)	Morten L. Pedersen	Field sampling, hydromorphology
National Environment Research Institute (NERI)	Annette Baattrup-Pedersen	Field sampling, macrophyte ID
National Environment Research Institute (NERI)	Torben L. Lauridsen	Field sampling, macrophyte ID
National Environment Research Institute (NERI)	Marianne Pedersen	Data input and handling
National Environment Research Institute (NERI)	Søren E. Larsen	Data handling
National Environment Research Institute (NERI)	Carsten Fjorback	Field sampling
National Environment Research Institute (NERI)	Hans O. Hansen	Field sampling
National Environment Research Institute (NERI)	Nikolai Friberg	Field sampling, fish ID
Vyzkumny ustav vodohospodarsky T G Masaryka	Jiri Kokes	Field sampling
Vyzkumny ustav vodohospodarsky T G Masaryka	Bohdana Stefelova	Field sampling, data input
Vyzkumny ustav vodohospodarsky T G Masaryka	Eva Strasakova	Laboratory processing
LIMNI Ltd.	Blazena Brabcova	Data input
University of South Bohemia	Zdenek Adamek	Field sampling
LABBIO, Autonomous Province of Bolzano	Stefania Covi	Laboratory processing and data imput
University of Metz	Not yet supplied	
Research Institute Senckenberg	Peter Haase	Sampling, identification (invertebrates)
Research Institute Senckenberg	Susanne Lohse	Sampling, identification (invertebrates), data input

Research Institute Senckenberg	Thomas Michl	Sampling (macrophytes), identification (macrophytes)
Research Institute Senckenberg	Steffen Pauls	Sampling, identification (Invertebrates), data input
Research Institute Senckenberg	Karin Schindehuette	Sampling, identification (Invertebrates), data input
Research Institute Senckenberg	Andrea Sundermann	Sampling, identification (Invertebrates), data input
Research Institute Senckenberg	Andrea Acker	Sorting, laboratory processing
Research Institute Senckenberg	Hedwig Bluemel	Sorting, laboratory processing
Research Institute Senckenberg	Britta Gehenio	Sorting, data input
Research Institute Senckenberg	Anke Peppmüller	Sorting
Research Institute Senckenberg	Julia Ehrenberg	Sorting
EcoRing, Hardegsen	Eckhard Coring	Identification (diatoms)
Limares, Essen	Christian Frenz	Fishing
University of Duisburg Essen (UDE)	Sandra Kramm	Identification (invertebrates)
University of Łódź	Bis Barbara	Site selection, sampling and data management; macroinvertebrate field sampling (spring); data processing (FIDES; STAR, PP Protocols); environmental data input
University of Łódź	Sicinski Jacek	Laboratory processing management
University of Łódź	Jakubowski Marek	Field sampling (spring, autumn); laboratory processing, sorting
University of Łódź	Burchard-Sosnowska Dorota	Field sampling (autumn); laboratory processing; sorting, faunal data input
University of Łódź	Laskowski Zbigniew	Field sampling (spring, autumn); sorting
University of Łódź	Jozefowicz Patrycja	Field sampling (spring)
University of Łódź	Chaniecka Karolina	Sorting
University of Łódź	Presler Ewa	Sorting
University of Łódź	Janowska Ewa	Sorting
University of Łódź	Piotrowska Ola	Sorting
University of Łódź	Bacela Karolina	Sorting
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University of Łódź	Pietruszka Dorota	Sorting
University of Łódź	Latoszek Joanna	Sorting
University of Łódź	Grohnert Wiktor	Sorting
University of Łódź	Michalak Agnieszka	Sorting
University of Łódź	Pawlikowska Magda	Sorting; environmental data input
University of Łódź	Slabiak Malgorzata	Audit; environmental data input
August Cieszkowski Agricultural University, Poznan	Krzysztof Szoszkiewicz	Field sampling
August Cieszkowski Agricultural University, Poznan	Ryszard Staniszewski	Field sampling
August Cieszkowski Agricultural University, Poznan	Dominik Mendyk	Field sampling, data input, laboratory processing
August Cieszkowski Agricultural University, Poznan	Jerzy Kupiec	Field sampling, data input, laboratory processing
August Cieszkowski Agricultural University, Poznan	Szymon Jusik	Field sampling
August Cieszkowski Agricultural University, Poznan	Tomasz Zgoła	Field sampling
August Cieszkowski Agricultural University, Poznan	Justyna Urbaniak	Laboratory processing
August Cieszkowski Agricultural University, Poznan	Klaudia Borowiak	Field sampling, data input, laboratory processing
University of Latvia, Institute of Biology (LUBI)	Elga Parele	Field sampling, laboratory processing
University of Latvia, Institute of Biology (LUBI)	Agnija Skuja	Field sampling, laboratory processing, data input
University of Latvia, Institute of Biology (LUBI)	Martins Mazurs	Field sampling, laboratory processing, data input
University of Latvia, Institute of Biology (LUBI)	Vjaceslavs Kulikovs	Data input
University of Latvia, Institute of Biology (LUBI)	Ilze Zilvere	Laboratory processing
University of Latvia, Institute of Biology (LUBI)	Vita Salavejus	Laboratory processing
University of Latvia, Institute of Biology (LUBI)	Kristine Evalde	Laboratory processing
University of Latvia, Institute of Biology (LUBI)	Aiva Eindorfa	Laboratory processing

University of Latvia, Institute of Biology (LUBI)	Agrita Briede	Field sampling, data input
University of Latvia, Institute of Biology (LUBI)	Andris Urtans	Field sampling, data input
University of Latvia, Institute of Biology (LUBI)	Lelde Engele	Field sampling
University of Latvia, Institute of Biology (LUBI)	Gunta Springe	Field sampling, data input
University of Latvia, Institute of Biology (LUBI)	Ivars Druvietis	Field sampling
University of Latvia, Institute of Biology (LUBI)	Linda Eglite	Field sampling, laboratory processing
University of Latvia, Institute of Biology (LUBI)	Mara Dzene	Laboratory processing
University of Latvia, Institute of Biology (LUBI)	Janis Birzaks	Field sampling, data input
Slovak Academy of Sciences (SAS-IZ)	Ferdinand Sporka	Field sampling, macroinvertebrate identification
Slovak Academy of Sciences (SAS-IZ)	Elena Stefkova	Field sampling, diatom identification
Slovak Academy of Sciences (SAS-IZ)	Ladislav Hamerlik	Field sampling, macroinvertebrate identification
Slovak Academy of Sciences (SAS-IZ)	Zuzana Zatovicova	Field sampling, macroinvertebrate identification
Slovak Academy of Sciences (SAS-IZ)	Zuzana Pastuchova	Field sampling, data input
Slovak Academy of Sciences (SAS-IZ)	Maria Gudabova	Sorting
Slovak Academy of Sciences (SAS-IZ)	Maria Nagyova	Laboratory processing
Slovak Academy of Sciences (SAS-IZ)	Silvia Kubalova	Field sampling, macrophyte identification
Slovak Academy of Sciences (SAS-IZ)	Daniela Illesova	Field sampling, macroinvertebrate identification
Slovak Academy of Sciences (SAS-IZ)	Tomas Cejka	Macroinvertebrate identification
Comenius University Bratislava (DE-CUB)	Eva Bulánková	Field sampling, macroinvertebrate identification (other flies - various Diptera, dragonflies), RHS
Comenius University Bratislava (DE-CUB)	Oľga Michalíková	Sorting
Comenius University Bratislava (DE-CUB)	Andrea Rodriguez	Sorting
Comenius University Bratislava (DE-CUB)	Beata Slezáková	Field sampling
Comenius University Bratislava (DE-CUB)	Vladimír Kováč	Fishing, data management
Comenius University Bratislava (DE-CUB)	Iľja Krno	Field sampling, macroinvertebrate identification (stoneflies), data input
Comenius University Bratislava (DE-CUB	Tomáš Derka	Field sampling, laboratory processing, macroinvertebrate

		identification (mayflies)

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