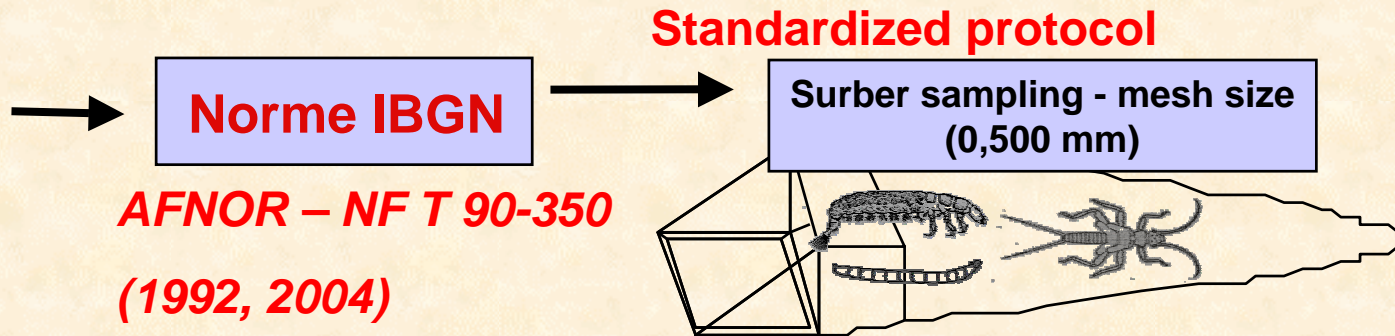


Sampling protocol (1):

Ecological
Status
evaluation



Macrobenthic
invertebrates

Indicator group ?



Sampling protocol (2):

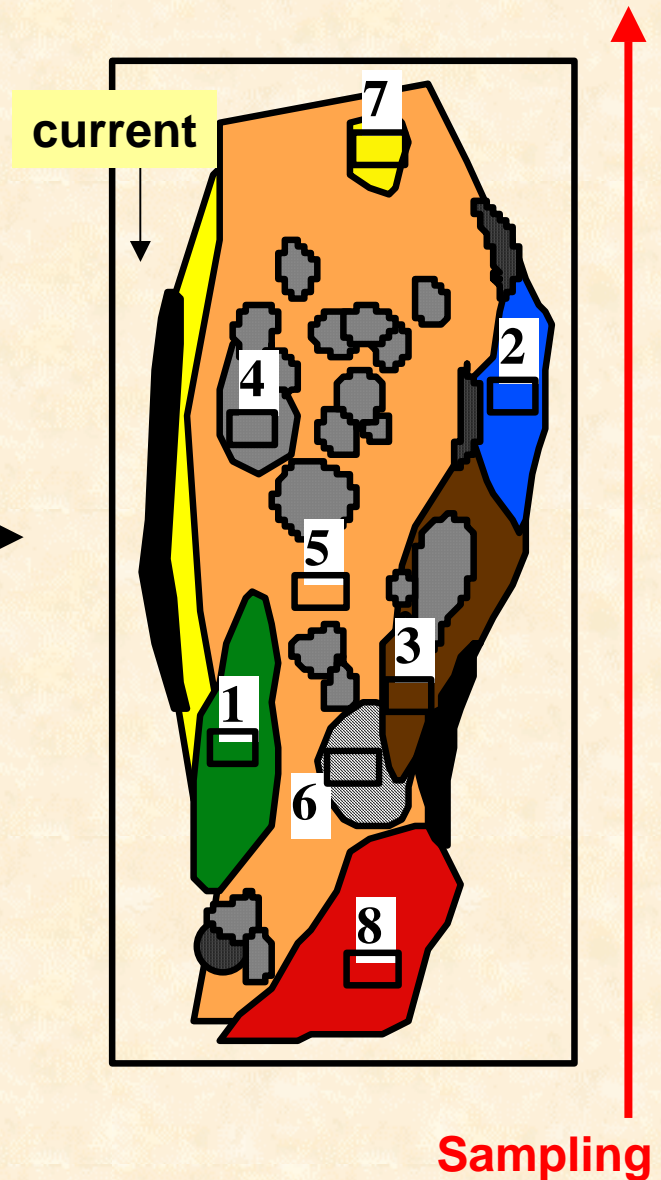
River bottom = substrate mosaic

Site
ecological
Status
evaluation

Norme IBGN

Surber
(8 sampling units
- each of 0,05 m²)

« Site » = river section
(length = 10 to 20 x river width)



Sampling protocol (3):

If 8 different substrate types are not simultaneously available in the substrate mosaic, the dominant substrate is sampled a second times, in a different velocity class (if possible)

Example

To sample in priority

Mesohabitats have to be sampled in a given 'substrate type' order (fixed by the norm), selecting the site-dominant current velocity class



Current velocity class (cm/s)

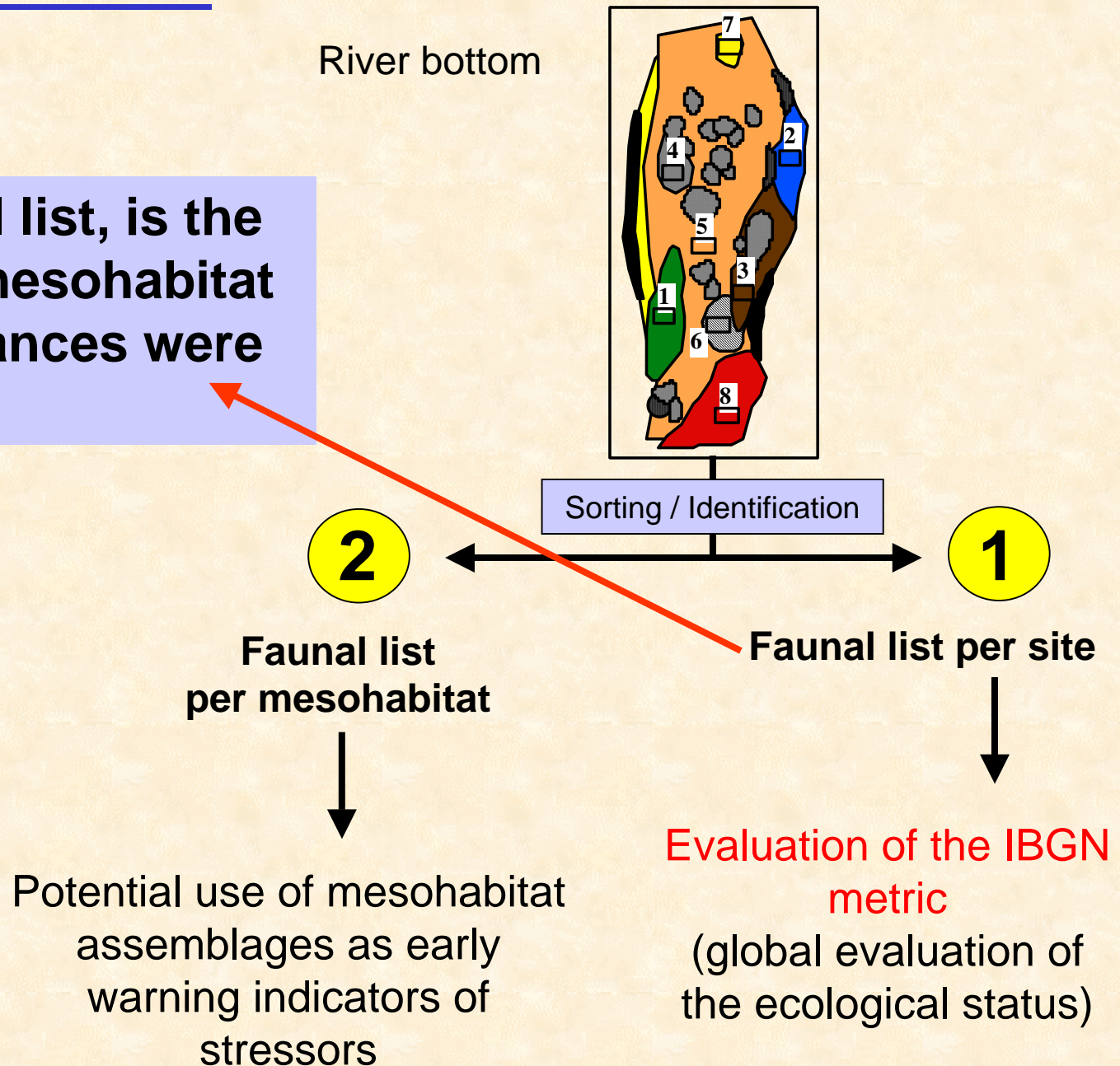
Substrate	Current velocity class (cm/s)				
	[150 - inf)	[75 - 150[[25 - 75[[5 - 25[[0 - 5[
9 - Bryophytes		1			
8 - Hydrophytes				1	
7 - Roots, Litter, Branchs					
6 - Cobbles/ pebbles - [25mm - 250mm[1	1		
5 - Gravel - [2.5 - 25 mm[1		
4 - Helophytes				1	
3 - Fine organic sediment (mud) -]0 - 0.1 mm]					1
2 - Sand, silt -]0 - 2.5 mm[
1 - Artificial and natural surfaces (e.g. bedrock, blocks, rocks É) - (> 250 mm)			1		
0 - Algae, clay, marl					

8 sample units of 0,05 m²

Two observation scales:

Important !

The site faunal list, is the sum of eight mesohabitat lists (if abundances were evaluated)



Sorting (stereomicroscope):

3 options:



3 (or 10) individuals for taxa belonging to « indicators groups » - only one individual for other taxa



Semi-quantitative evaluation of abundances (classes)



Quantitative evaluation of abundances

Identification level:

(152 in the last version of the norm
(april 2004) - this version takes into
account recent invasive taxa)

138 potential taxa (norm 1992)

Insecta (Trichoptera, Plecoptera, Ephemeroptera,
Coleoptera, Odonata, Heteroptera, Planipennia,
Megaloptera, Lepidoptera)

Crustacea

Mollusca (Bivalvia, Gasteropoda)

Achaeta

Turbellaria

**Porifera, Cnidaria, Bryozoa,
Oligochaeta, Nematomorpha,
Nemertea, Hydracarina**

Family

**Order,
Class
ou
Phylum**

IBGN Index evaluation:

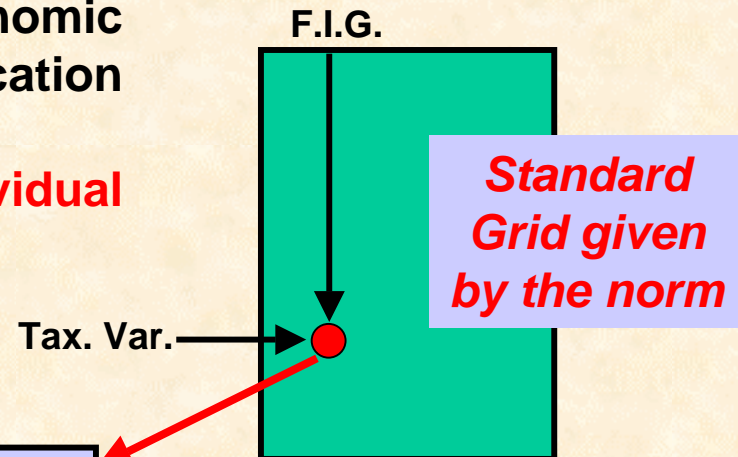
Step 1 : identification of the « **Faunal Indicateur Group** » (for a given site sample)

- 9 indicator groups were defined
- Each indicator group is composed of **4 or 5 taxonomic families**
- Indicator groups correspond to a **increasing gradient of polluo-sensitivity** from group **1** to group **9**
- A **minimal number of individuals** (3 or 10) of a given family is necessary to consider the corresponding group as the F.I.G of a site.

Step 2 : identification of the « **Taxonomic Variety class** » (for a given site sample)

- « taxonomic variety » = « taxonomic richness » at the IBGN identification level (**14 classes were defined**).
- All the taxa with at least **1 individual** contribute to the Tax. Var.

Step 3 : identification of the **IBGN Index score** (for a given site sample)



score IBGN = score/20

Faunal indicator group identification:

To examine
from FIG 9 to
FIG 1

FIG 9 - Chloroperlidae (P); Perlidae (P); Perlodidae (P);
Taeniopterygidae (P) (*if n > 2*)

FIG 8 - Capniidae (P); Brachycentridae (T); Odontoceridae (T);
Philopotamidae (T) (*if n > 2*)

FIG 7 - Leuctridae (P); Glossosomatidae (T); Beraeidae
(T); Goeridae (T); Leptophlebiidae (E) - (*if n > 2*)

FIG 6 - Nermouridae (P); Lepidostomatidae (T);
Sericostomatidae (T); Ephemeridae (E) - (*if n > 2*)

FIG 5 - Hydroptilidae (T); Polymitarcidae (E);
Potamanthidae (E); Heptageniidae (E) - (*if n > 2*)

FIG 4 - Leptoceridae (T); Polycentropodidae (T);
Psychomyiidae (T), Rhyacophilidae (T) (*if n > 2*)

FIG 3 - Limnephilidae (T) ; Ephemerellidae (E) (*if n > 9*)
Hydropsychidae (T); or Aphelocheiridae (H) (*if n > 2*)

FIG 2 - Baetidae (E); Caenidae (E); Elmidae (C);
Gammaridae (M) (*if n > 9*) or Mollusca (*if n > 2*)

FIG 1 - Chironomidae (D), Asellidae (C),
Achaeta (*if n > 2*) or Oligochaeta (*if n > 9*)

Decreasing
polluosensitivity

For example, if 4 individuals of Chloroperlidae were catch in a given site, the **FIG 9 must be selected.**

But if 1 ind. of Chloroperlidae, 2 ind. of Perlidae and 2 ind. of Taeniopterygidae were catch in an other site, the **FIG 9 cannot be selected** (because $n < 3$ for all the families of this group). The following groups must be examined

IBGN score identification:

Standard Grid

Nota: I detailed the « standard grid » in order to have the possibility to directly evaluate the IBGN score with the taxonomic richness (i.e. without the necessity to calculate the « taxonomic variety »)

← **FIG**
As an indicator of « **water quality** »

Taxonomic Richness → **30**
As an indicator of « **habitat quality** »

	1	2	3	4	5	6	8	
1	1	2	3	4	5	6	7	9
2	1	2	3	4	5	6	7	9
3	1	2	3	4	5	6	7	9
4	2	3	4	5	6	7	8	10
5	2	3	4	5	6	7	8	10
6	2	3	4	5	6	7	8	10
7	3	4	5	6	7	8	9	11
8	3	4	5	6	7	8	9	11
9	3	4	5	6	7	8	9	11
10	4	5	6	7	8	9	10	12
11	4	5	6	7	8	9	10	12
12	4	5	6	7	8	9	10	12
13	5	6	7	8	9	10	11	13
14	5	6	7	8	9	10	11	13
15	5	6	7	8	9	10	11	13
16	5	6	7	8	9	10	11	13
17	6	7	8	9	10	11	12	14
18	6	7	8	9	10	11	12	14
19	6	7	8	9	10	11	12	14
20	6	7	8	9	10	11	12	14
21	7	8	9	10	11	12	13	15
22	7	8	9	10	11	12	13	15
23	7	8	9	10	11	12	13	15
24	7	8	9	10	11	12	13	15
25	8	9	10	11	12	13	14	16
26	8	9	10	11	12	13	14	16
27	8	9	10	11	12	13	14	16
28	8	9	10	11	12	13	14	16
29	10	11	12	13	14	15	16	17
30	10	11	12	13	14	15	16	17
31	10	11	12	13	14	15	16	17
32	9	10	11	12	13	14	15	17
33	10	11	12	13	14	15	16	18
34	10	11	12	13	14	15	16	18
35	10	11	12	13	14	15	16	18
36	10	11	12	13	14	15	16	18
37	11	12	13	14	15	16	17	19
38	11	12	13	14	15	16	17	19
39	11	12	13	14	15	16	17	19
40	11	12	13	14	15	16	17	19
41	12	13	14	15	16	17	18	20
42	12	13	14	15	16	17	18	20
43	12	13	14	15	16	17	18	20
44	12	13	14	15	16	17	18	20
45	13	14	15	16	17	18	19	20
46	13	14	15	16	17	18	19	20
47	13	14	15	16	17	18	19	20
48	13	14	15	16	17	18	19	20
49	13	14	15	16	17	18	19	20
50	14	15	16	17	18	19	20	20

IBGN Score = 16/20

Ecological interpretation:

16/20 = ? (in terms of « ecological quality »)

