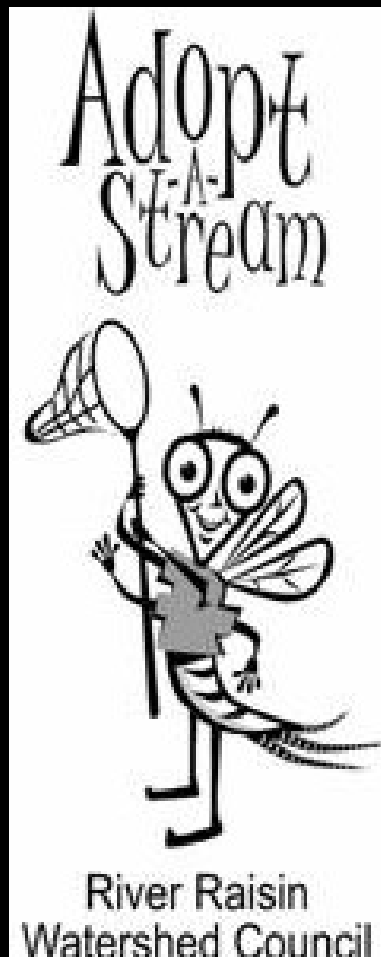
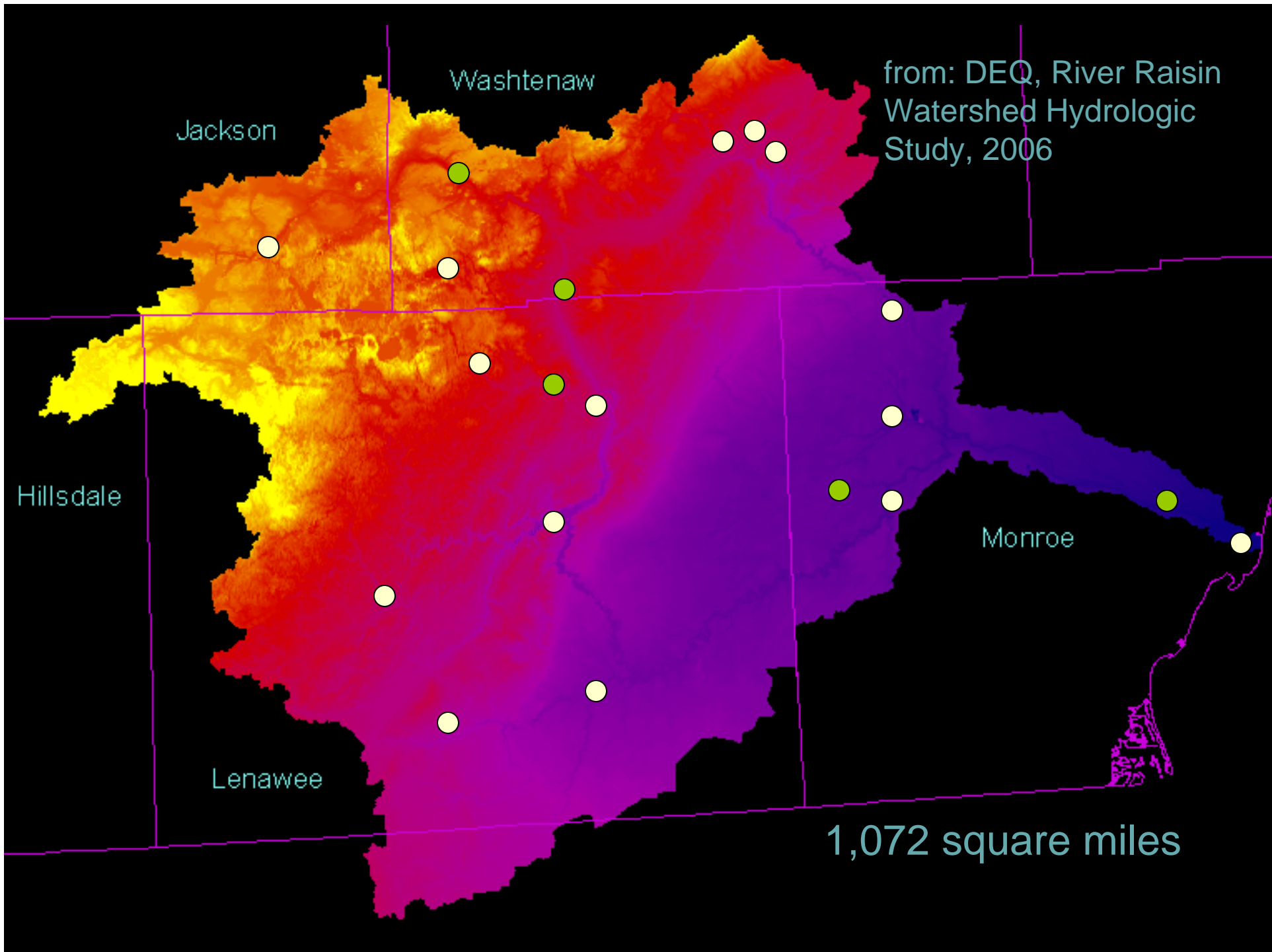




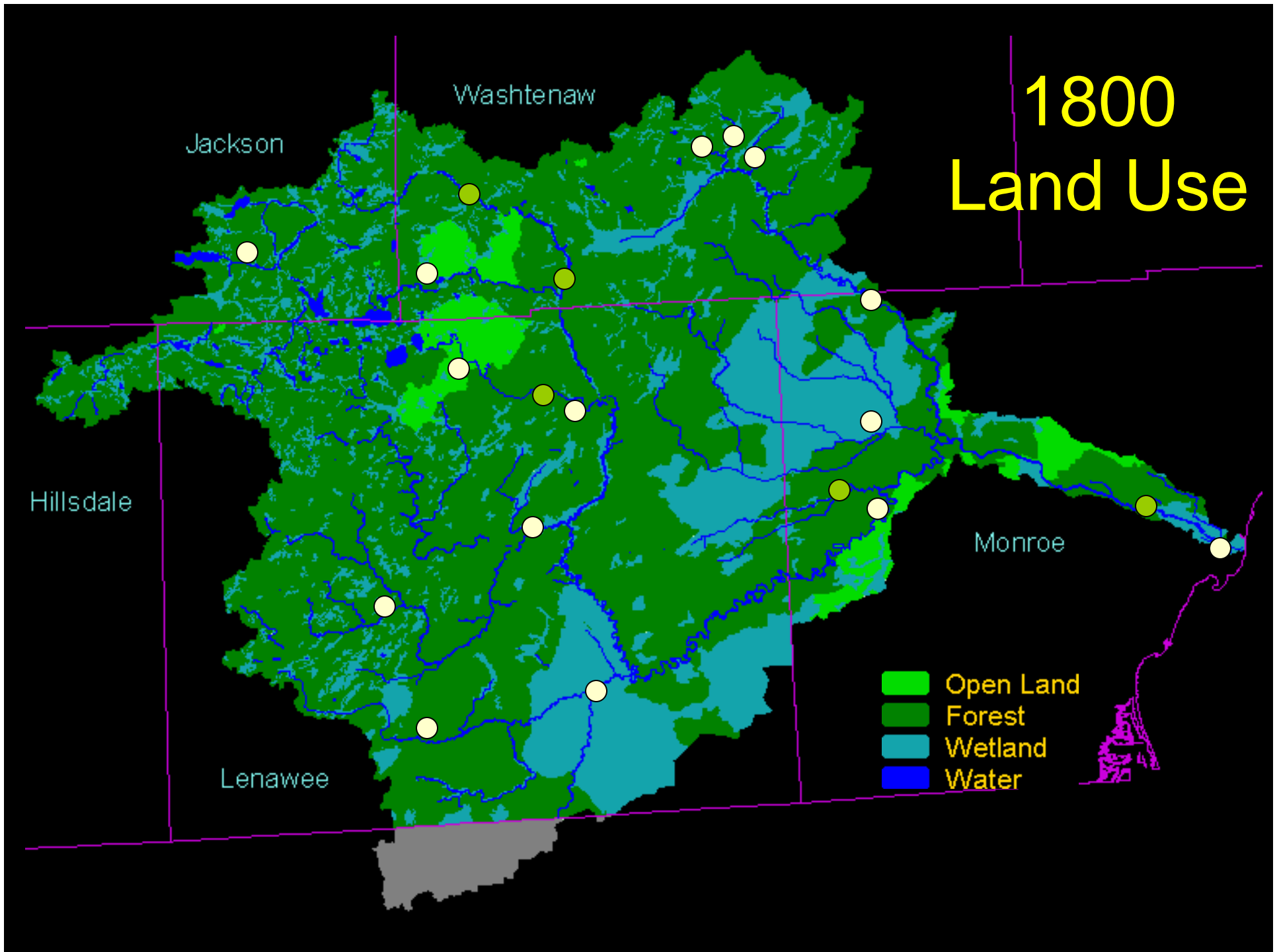
River Raisin Stream Invertebrate Results 2002-2008

Jim Martin
Associate Professor
Biology Department, Adrian College
Adopt-A-Stream Director
River Raisin Watershed

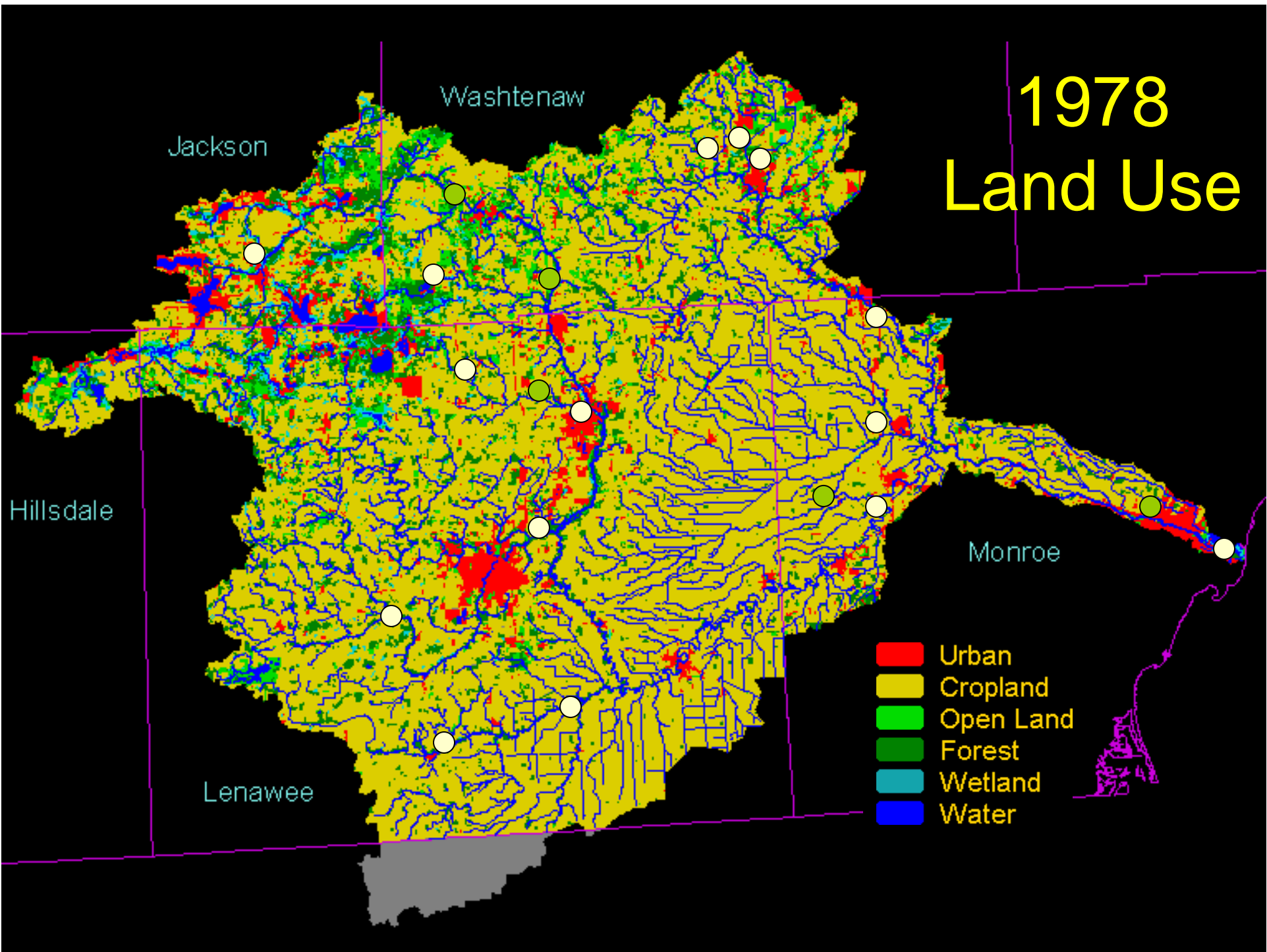




1800 Land Use



1978 Land Use



MiCorps Site ID #: _____



Family Level IDs since 2002

IDENTIFICATION AND ASSESSMENT

Use letter codes [R (rare) = 1-10, C (common) = 11 or more] to record the approximate numbers of organisms in each taxa found in the stream reach.

**** Do NOT count empty shells, pupae, or terrestrial macroinvertebrates****

Group 1: Sensitive

- ___ Caddisfly larvae (Trichoptera)
EXCEPT Net-spinning caddis
- ___ Hellgrammites (Megaloptera)
- ___ Mayfly nymphs (Ephemeroptera)
- ___ Gilled (right-handed) snails (Gastropoda)
- ___ Stonefly nymphs (Plecoptera)
- ___ Water penny (Coleoptera)
- ___ Water snipe fly (Diptera)

Group 2: Somewhat-Sensitive

- ___ Alderfly larvae (Megaloptera)
- ___ Beetle adults (Coleoptera)
- ___ Beetle larvae (Coleoptera)
- ___ Black fly larvae (Diptera)
- ___ Clams (Pelecypoda)
- ___ Crane fly larvae (Diptera)
- ___ Crayfish (Decapoda)
- ___ Damselfly nymphs (Odonata)
- ___ Dragonfly nymphs (Odonata)
- ___ Net-spinning caddisfly larvae (Hydropsychidae; Trichoptera)
- ___ Scuds (Amphipoda)
- ___ Sowbugs (Isopoda)

Group 3: Tolerant

- ___ Aquatic worms (Oligochaeta)
- ___ Leeches (Hirudinea)
- ___ Midge larvae (Diptera)
- ___ Pouch snails (Gastropoda)
- ___ True bugs (Hemiptera)
- ___ Other true flies (Diptera)

Identifications made by: _____

Rate your confidence in these identifications: Quite confident 5 4 3 Not very confident 2 1

STREAM QUALITY SCORE

Group 1:
 ___ # of R's * 5.0 = ____
 ___ # of C's * 5.3 = ____
 Group 1 Total = ____

Group 2:
 ___ # of R's * 3.0 = ____
 ___ # of C's * 3.2 = ____
 Group 2 Total = ____

Group 3:
 ___ # of R's * 1.1 = ____
 ___ # of C's * 1.0 = ____
 Group 3 Total = ____

Total Stream Quality Score = ____
(Sum of totals for groups 1-3; round to nearest whole number)

Check one:
 ___ Excellent (>48)
 ___ Good (34-48)
 ___ Fair (19-33)
 ___ Poor (<19)



Datasheet checked for completeness by: _____ Datasheet version 10
 Data entered into MiCorps database by: _____ Date: _____

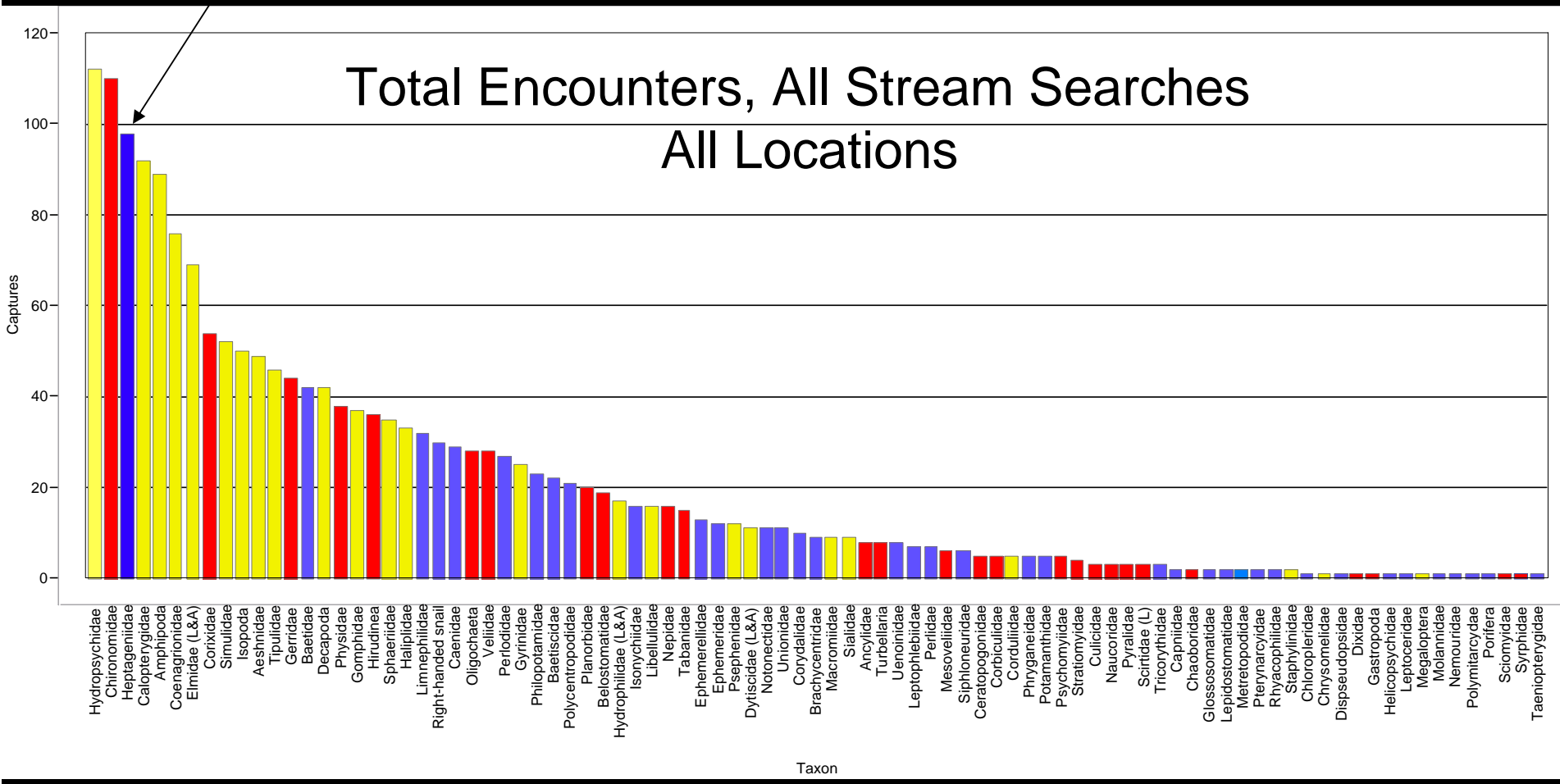
■ Sensitive

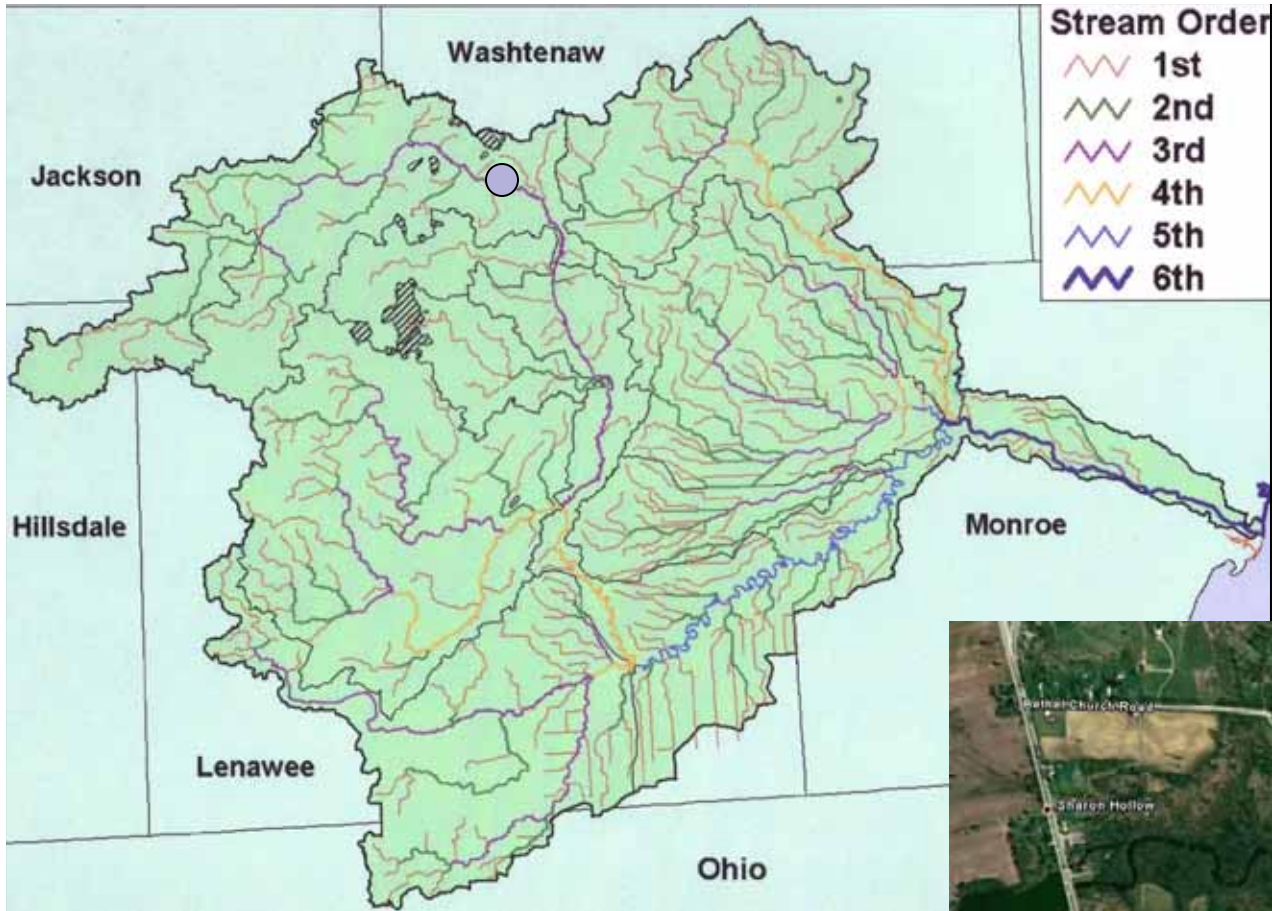
■ Some-what Sensitive

■ Tolerant

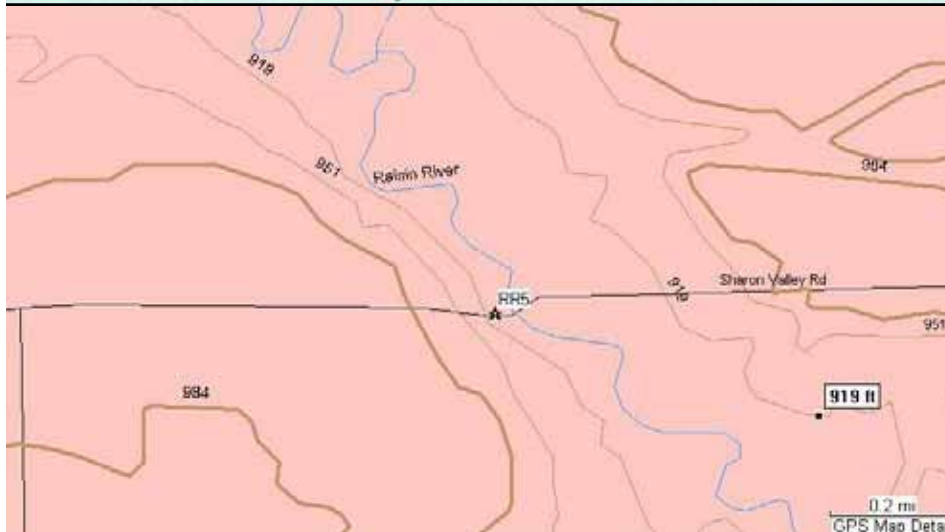
Richness and Diversity

Not all things are equally common





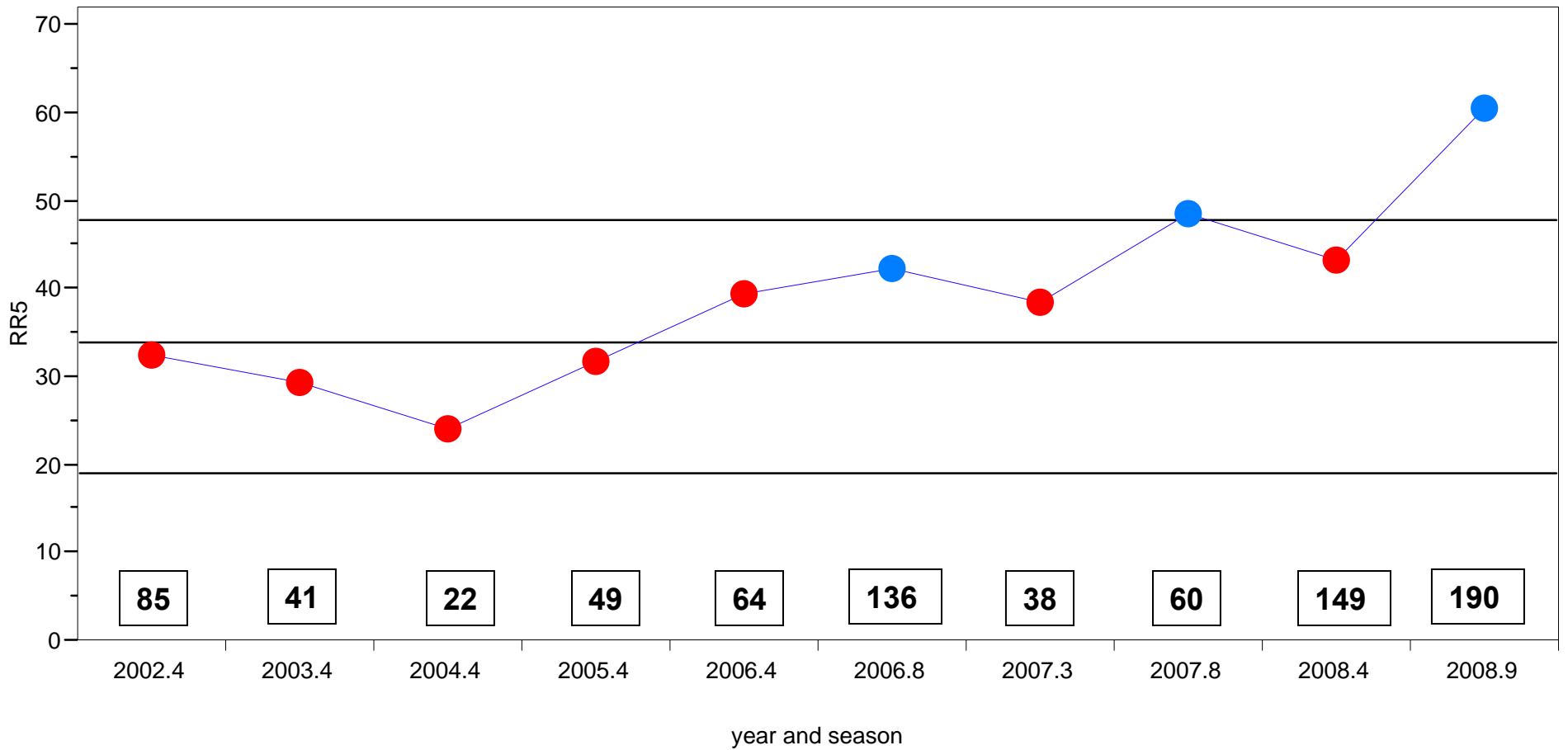
RR5



Google

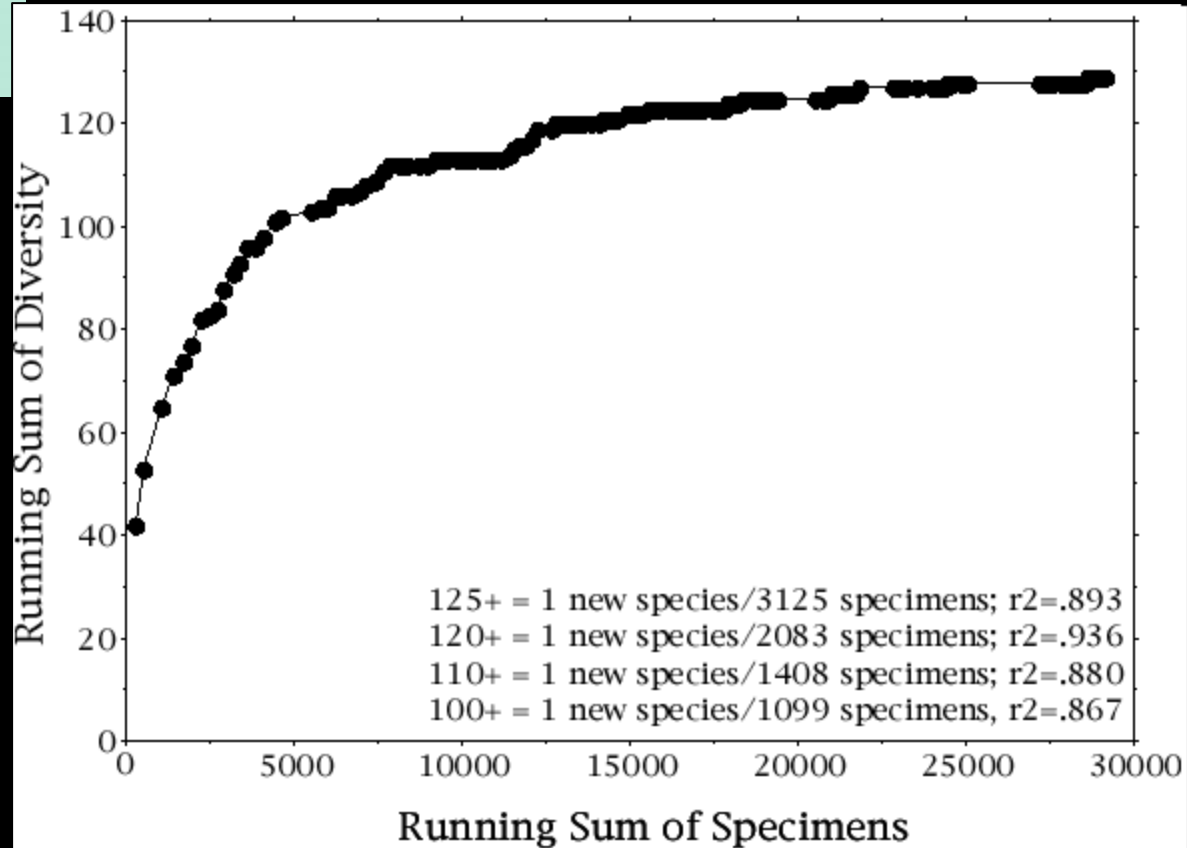
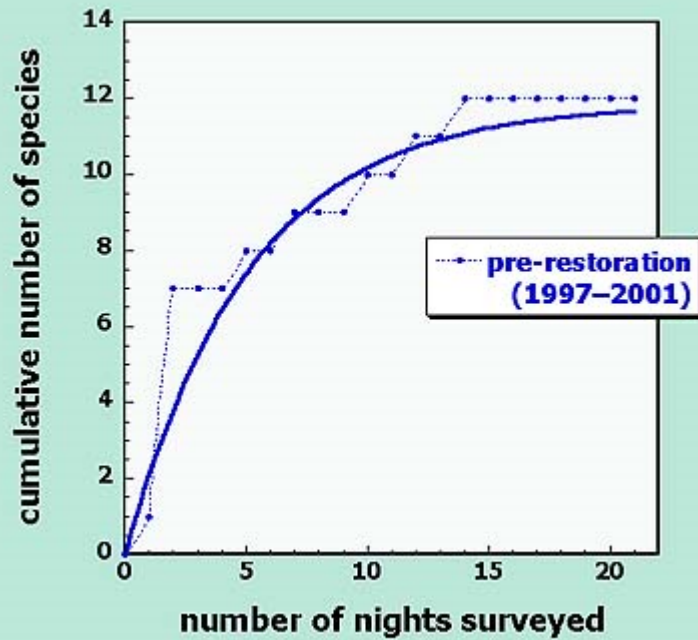


MiCorps Results RR5

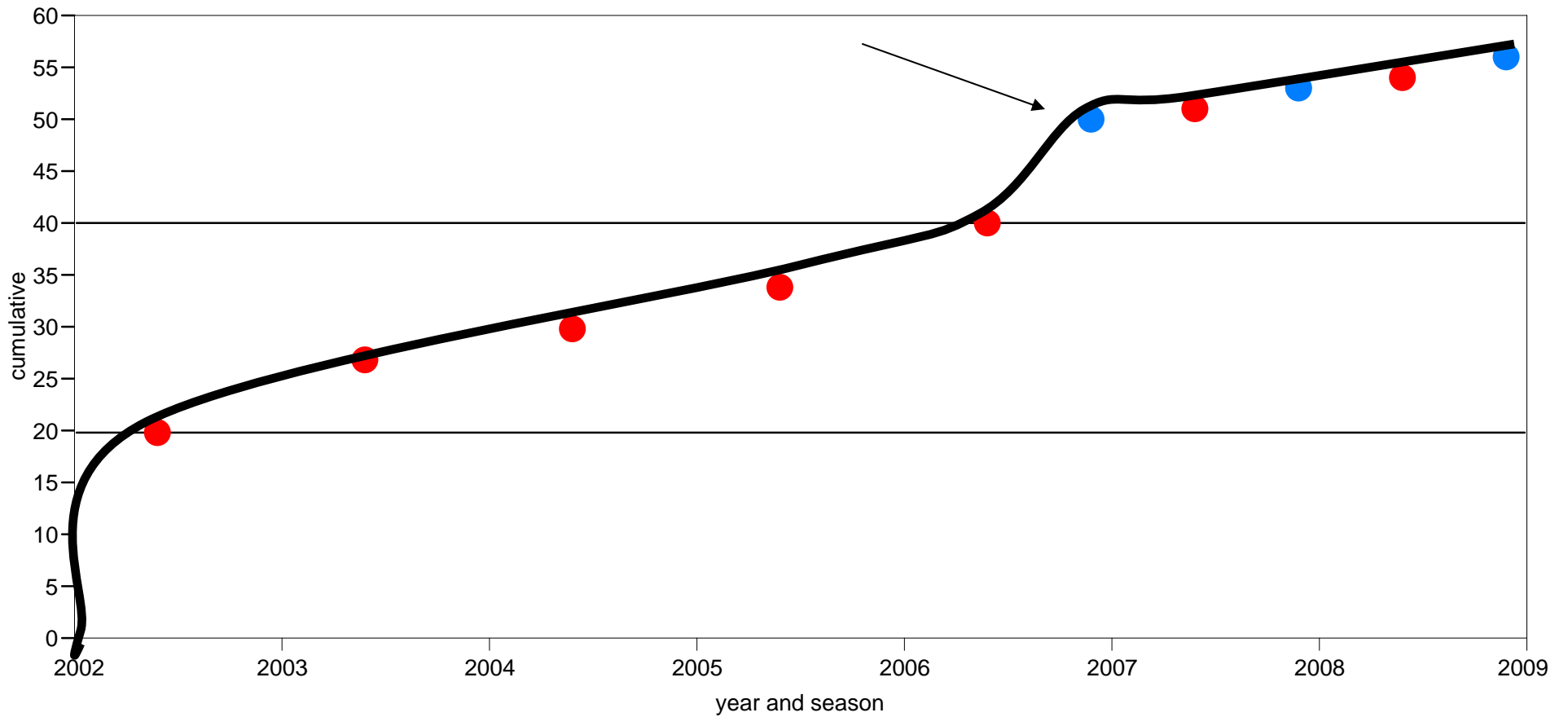


Richness and Diversity

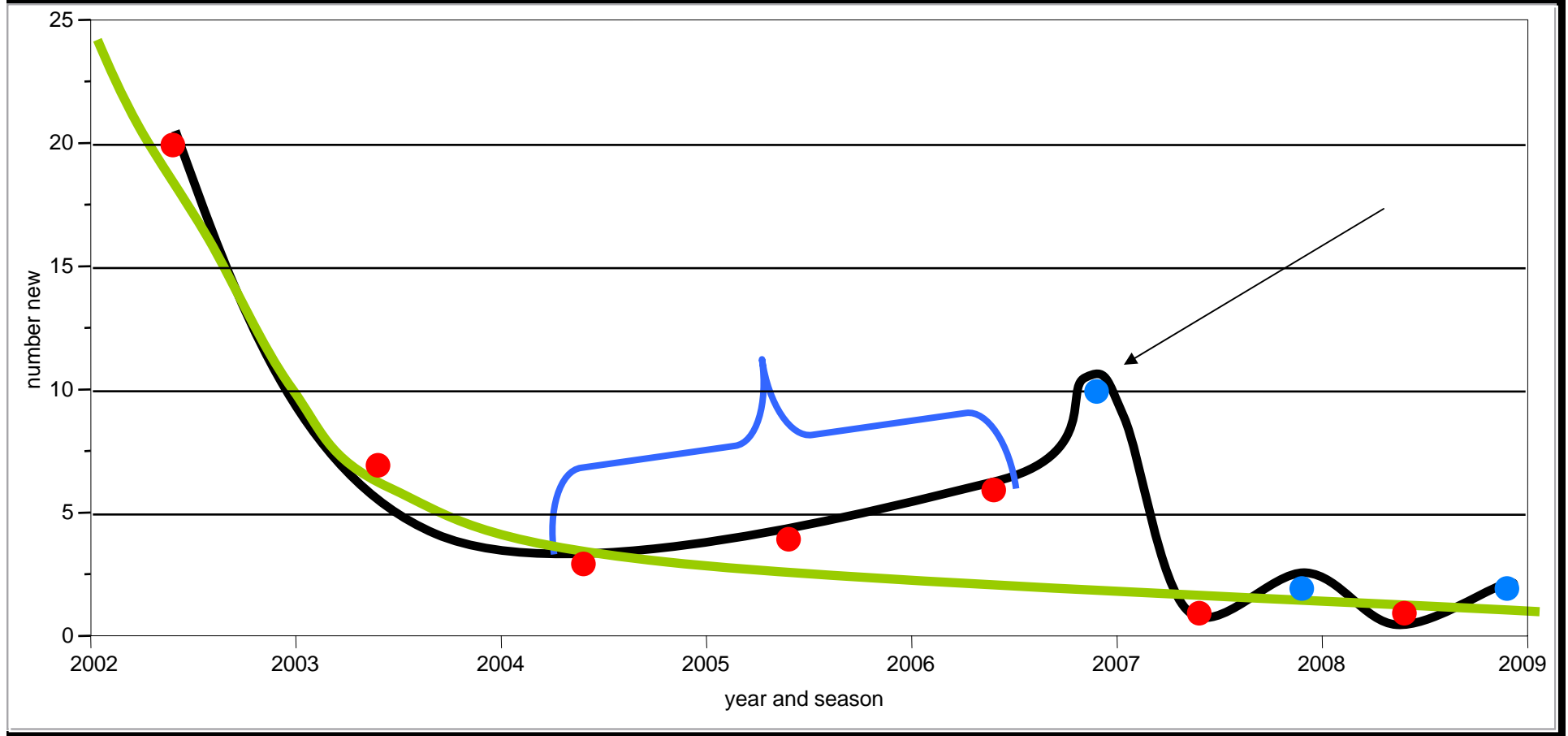
Not all things are equally common



RR5 taxa accumulation curve



RR5 inverse taxa curve
Number new taxa (count)
= new discoveries

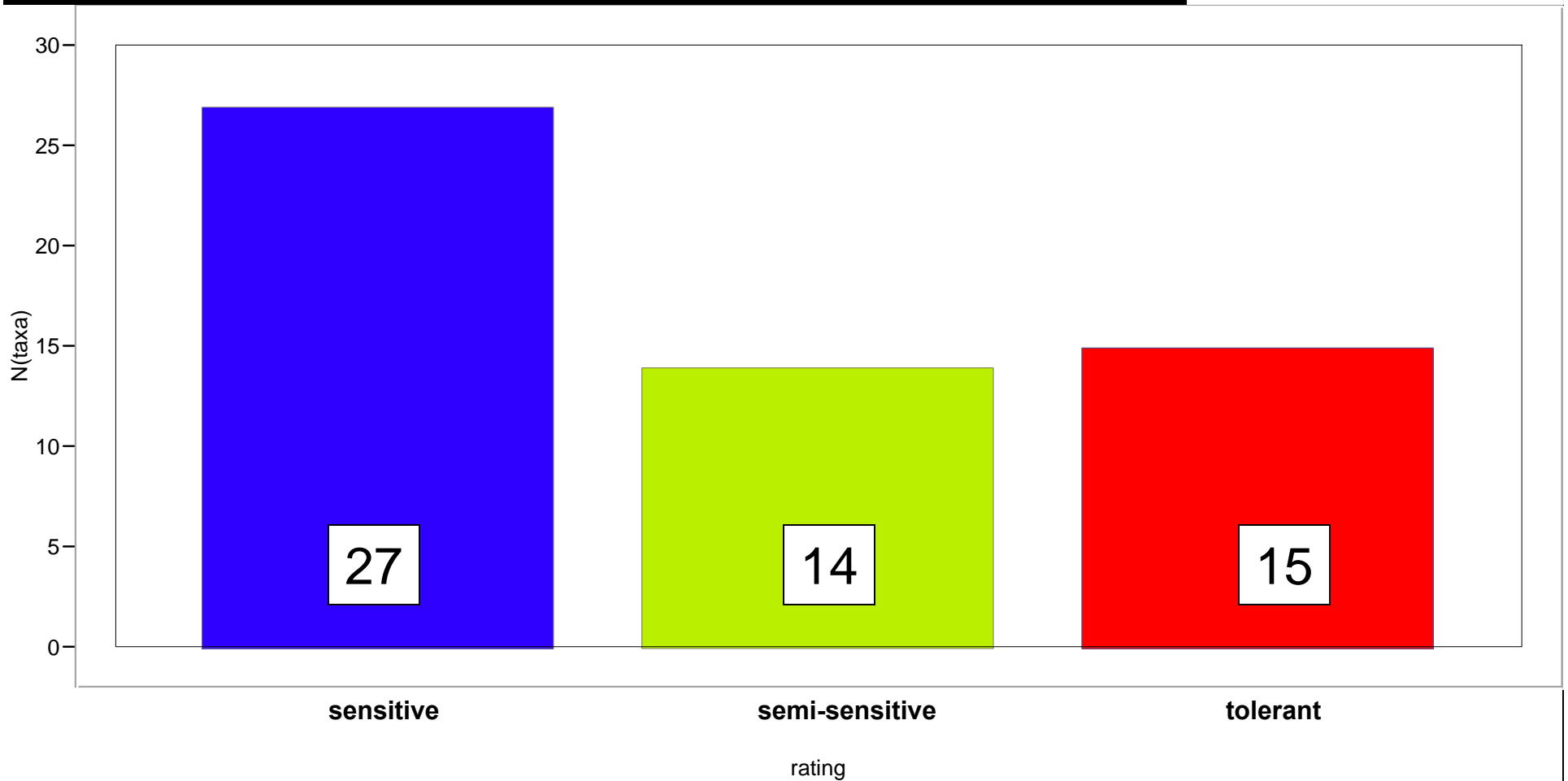


RR5

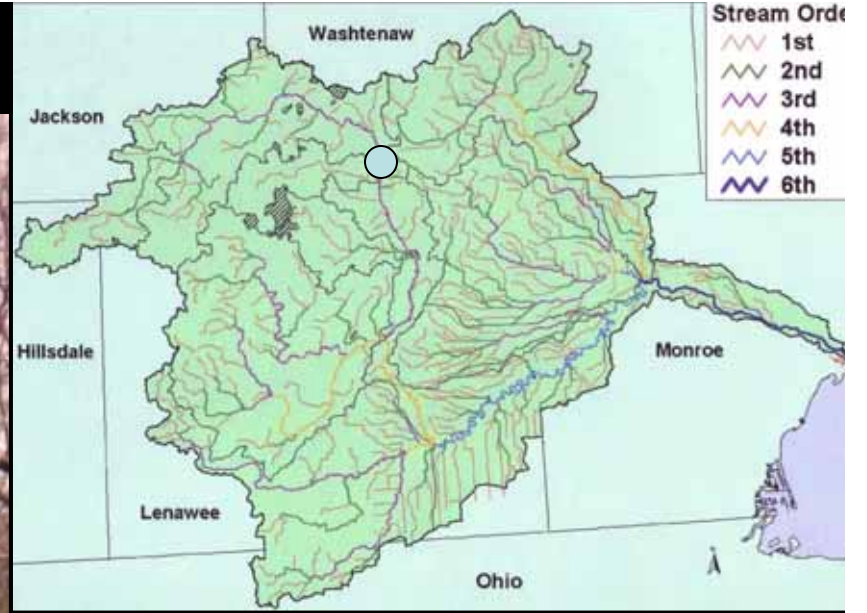
Date	MiCorps rating	# Taxa	# Insect taxa	# EPT	# 'Sensitive' taxa	Total number of invertebrates
4/2002	32.5	20	17	8	2	85
4/2003	29.4	20	18	7	2	41
4/2004	24.2	12	11	4	2	22
4/2005	31.7	16	15	8	3	49
4/2006	39.6	21	18	8	3	64
9/2006	42.4	26	22	9	5	136
4/2007	38.5	17	13	3	1	38
9/2007	48.5	20	15	5	3	60
4/2008	43.4	23	16	7	3	149
9/2008	60.5	28	22	9	5	190

RR5 recoveries: all collections

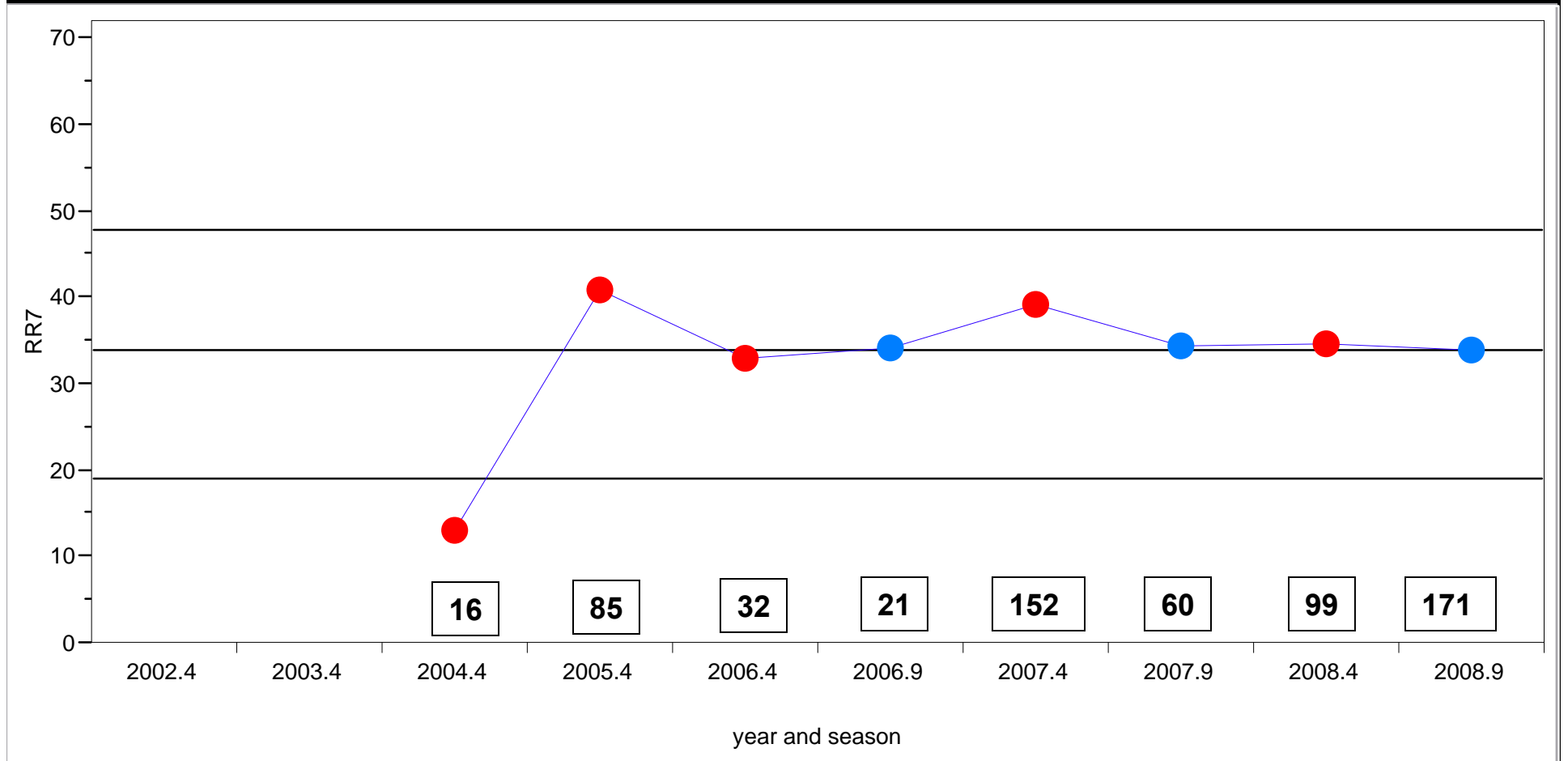
56 taxa total



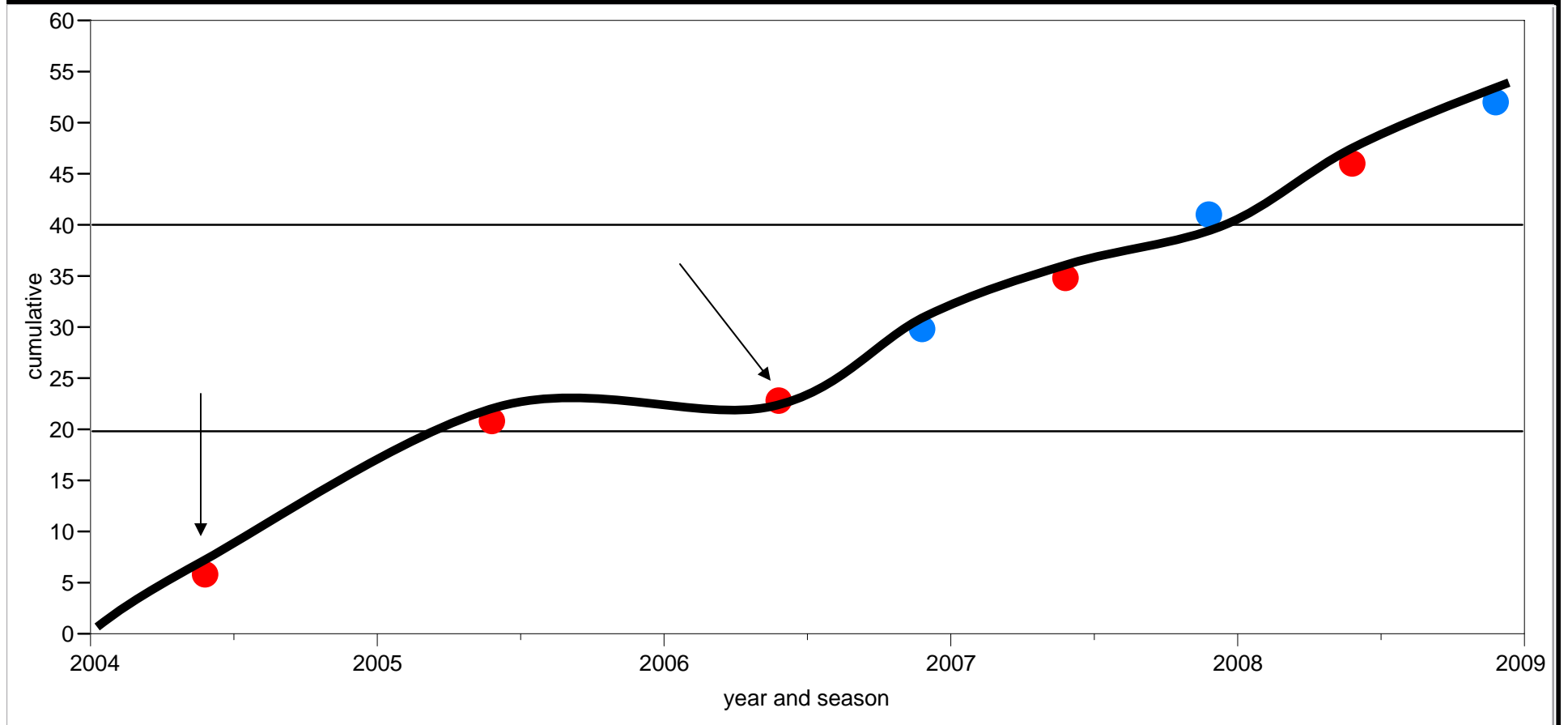
RR7



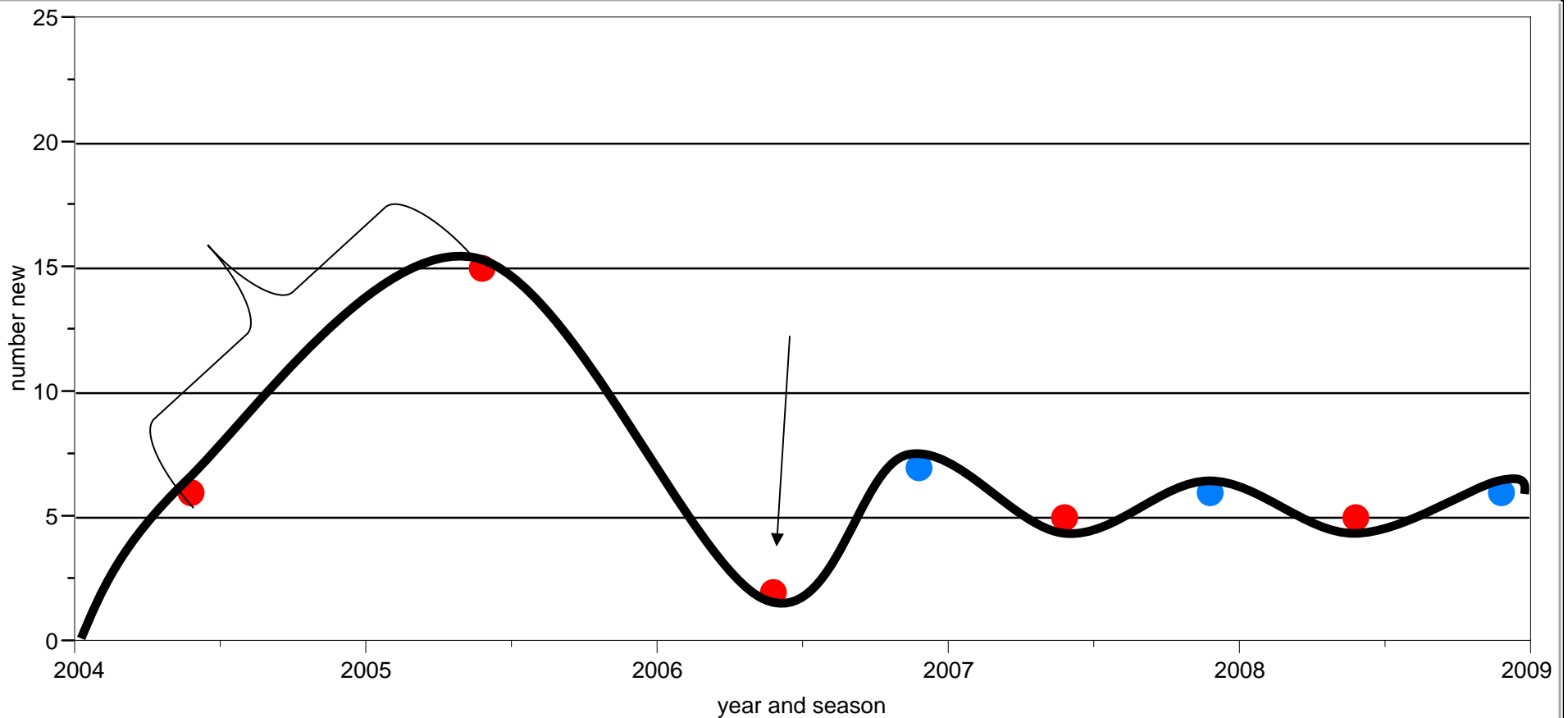
MiCorps Results RR7



RR7 taxa accumulation curve



RR7 inverse taxa curve
Number new taxa (count)
= new discoveries

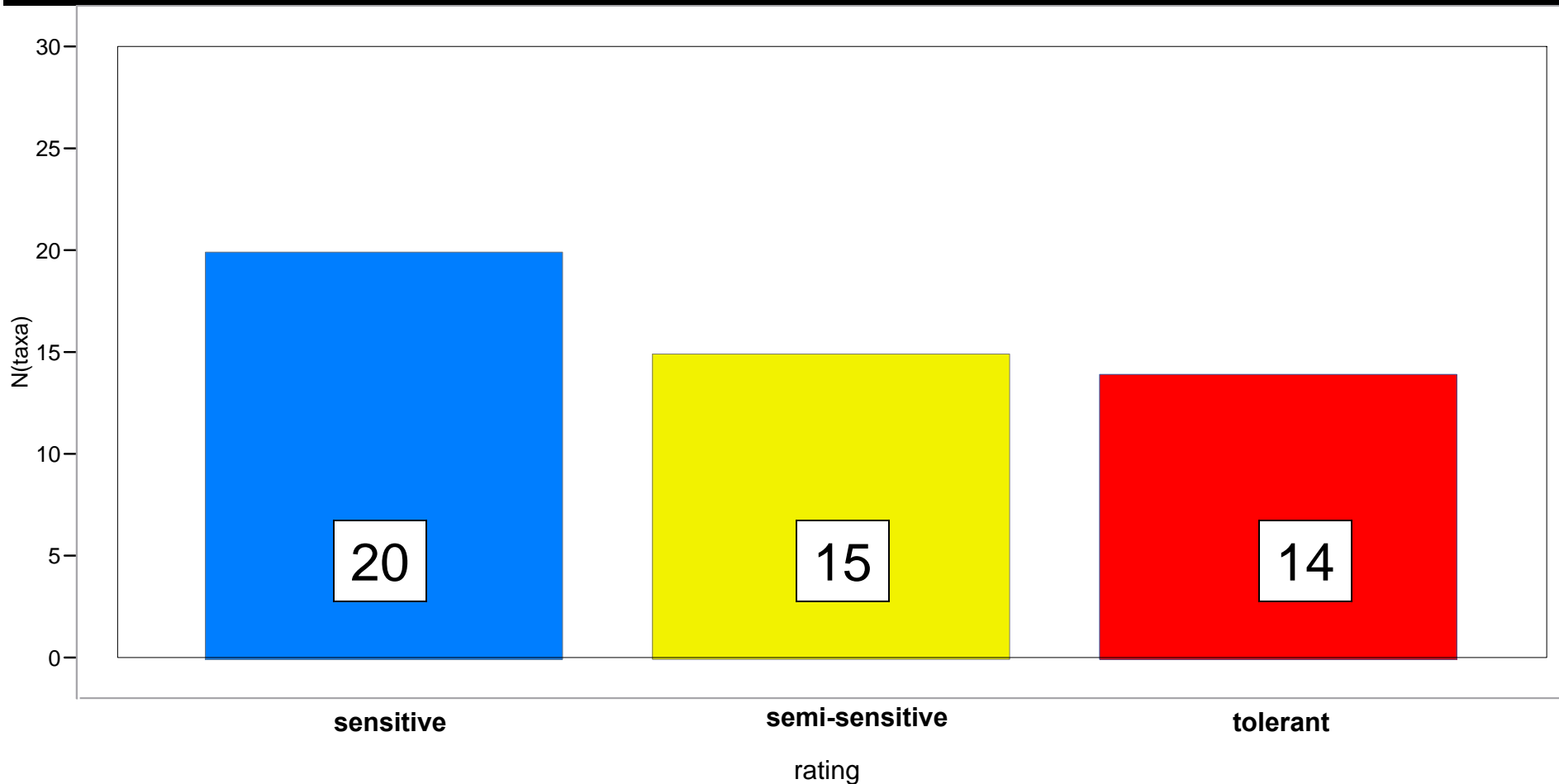


RR7

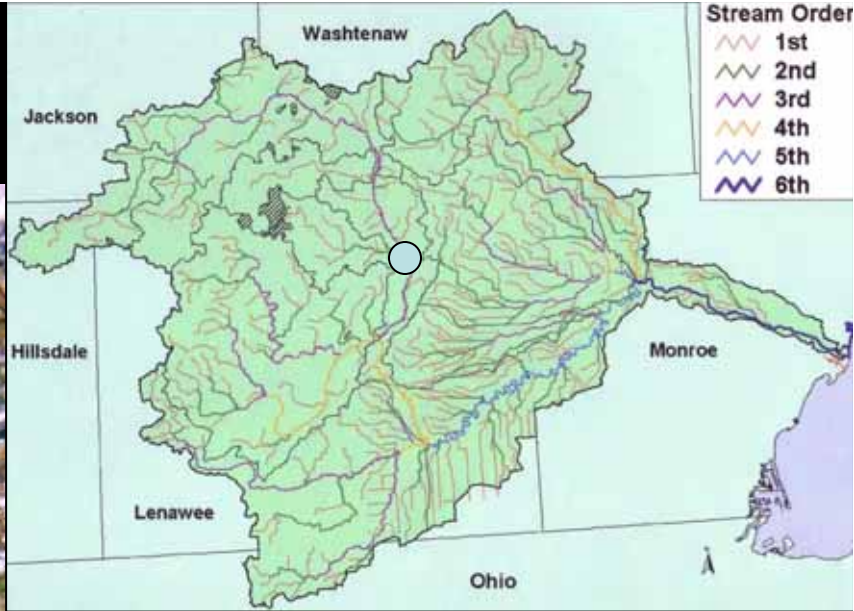
Date	MiCorps rating	# Taxa	# Insect taxa	# EPT	# 'Sensitive' taxa	Total number of invertebrates
4/2002	-	-	-	-	-	-
4/2003	-	-	-	-	-	-
4/2004	13.2	6	6	1	1	16
4/2005	41	19	16	8	1	85
4/2006	31.1	13	11	7	3	32
9/2006	34.3	14	11	4	3	23
4/2007	39.3	17	14	8	3	152
9/2007	34.5	19	15	4	1	60
4/2008	34.7	20	19	9	3	98
9/2008	34.0	24	22	5	3	171

RR7 recoveries: all collections

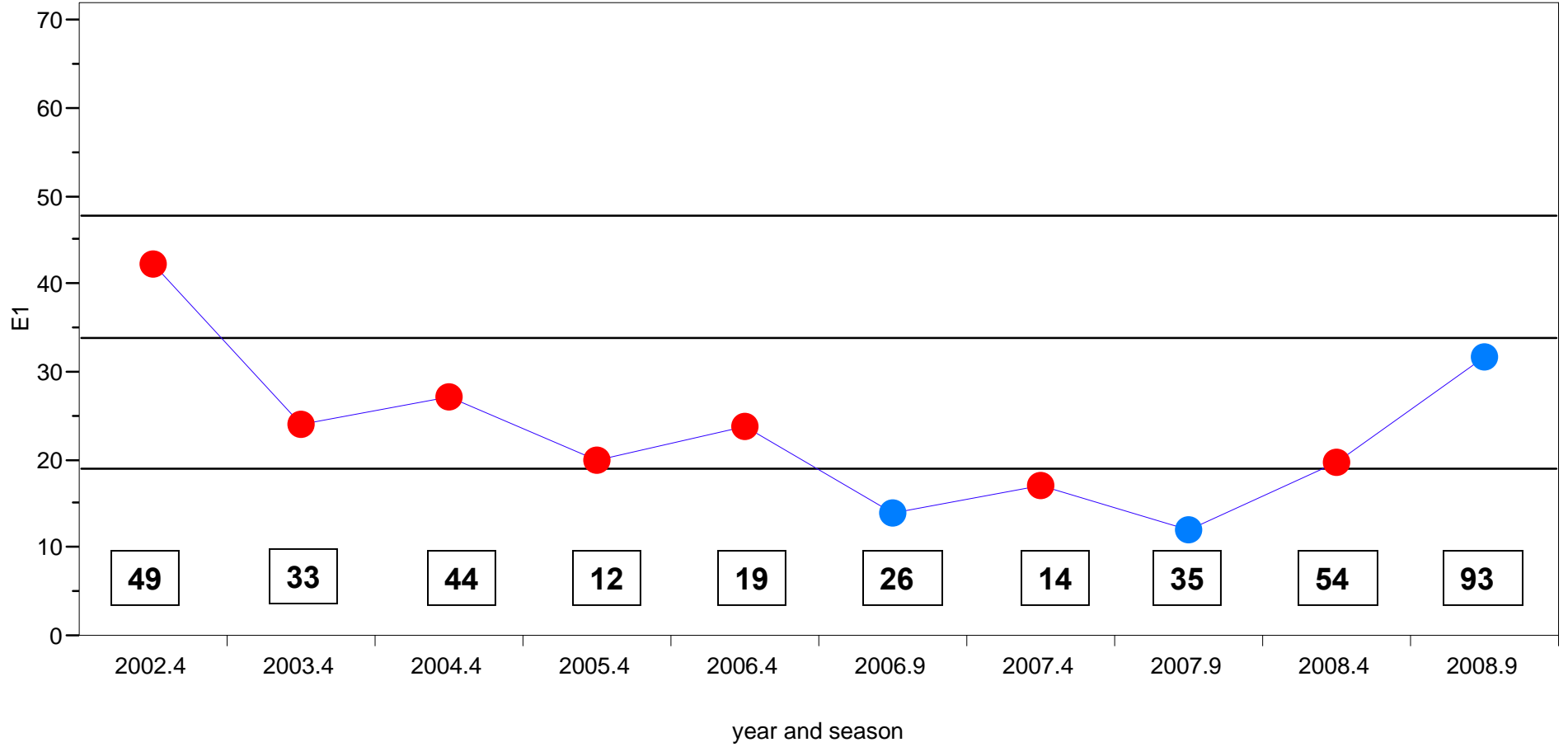
49 taxa total



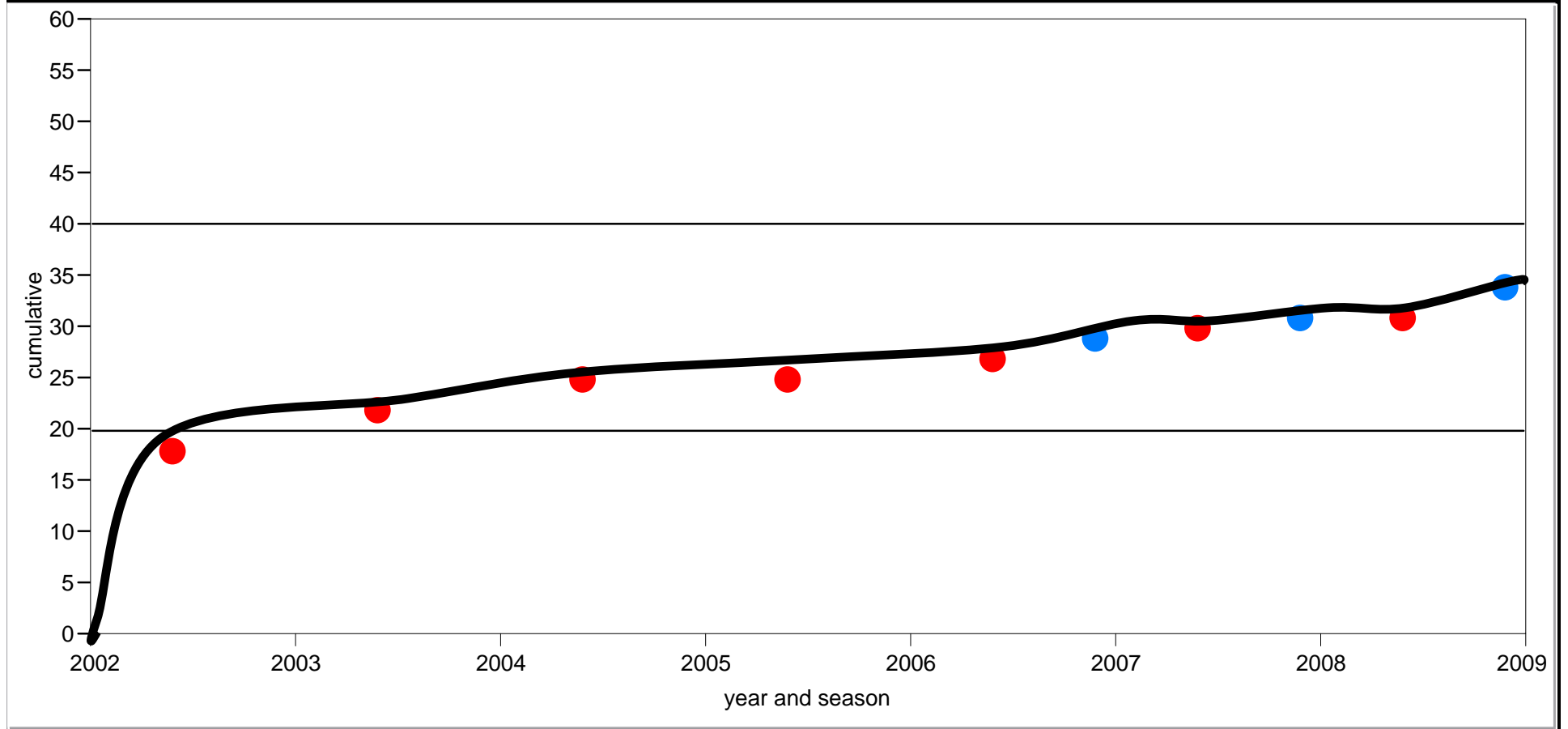
E1



MiCorps Results E1

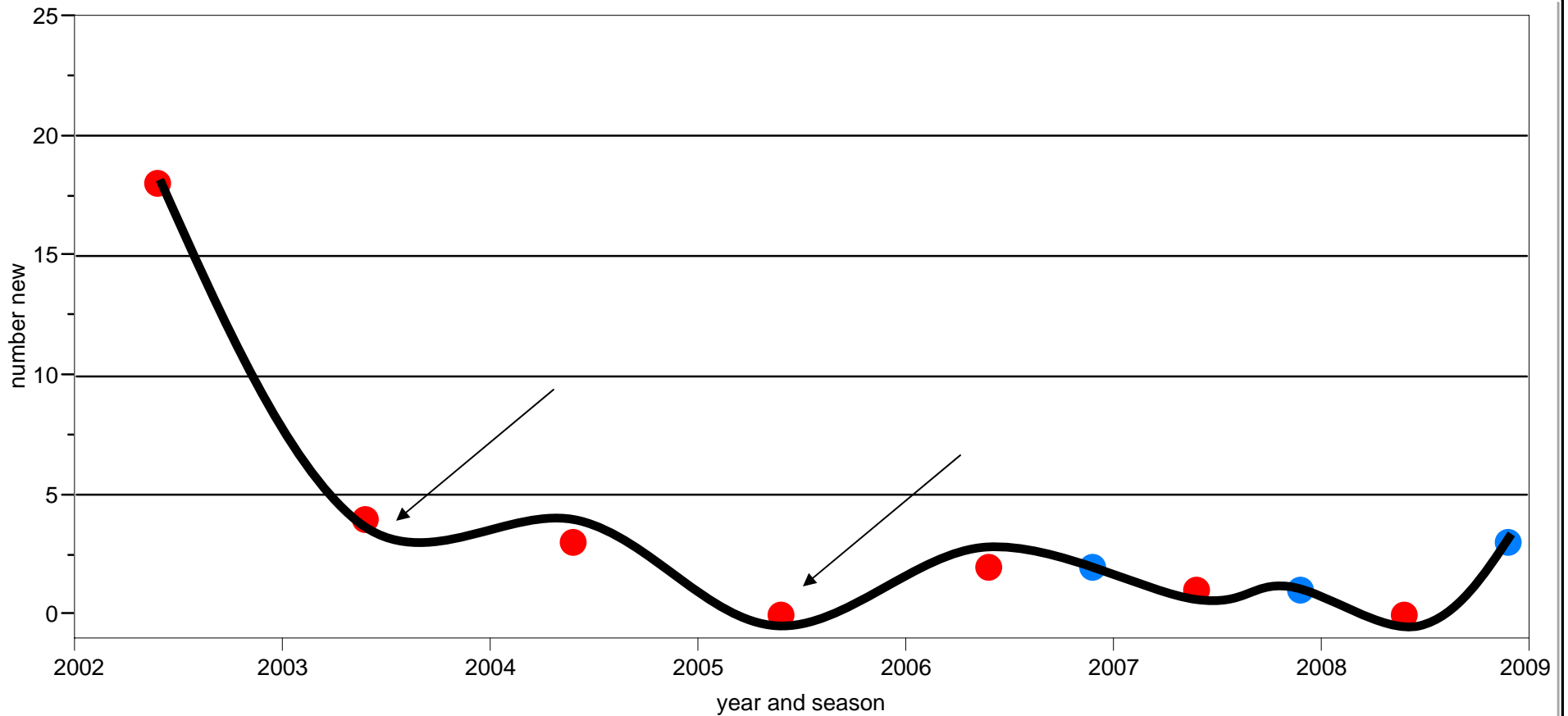


E1 taxa accumulation curve



E1 inverse taxa curve

Number new taxa (count)
= new discoveries

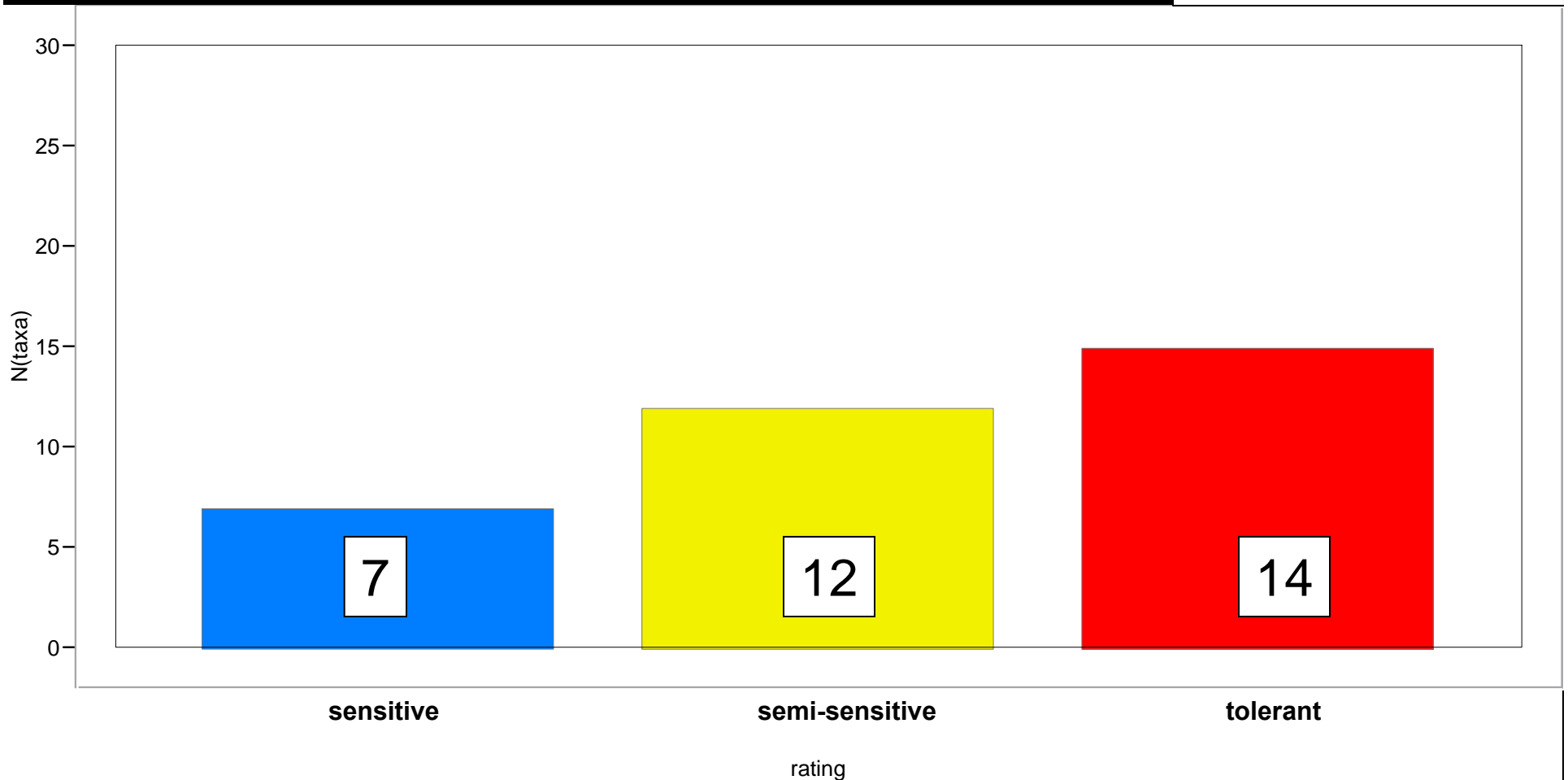


E1

Date	MiCorps rating	# Taxa	# Insect taxa	# EPT	# 'Sensitive' taxa	Total number of invertebrates
4/2002	42.3	18	13	5	2	49
4/2003	24.1	11	9	3	0	33
4/2004	27.3	14	11	2	0	44
4/2005	20.1	7	7	2	0	12
4/2006	24	9	7	1	0	19
9/2006	22	9	8	2	1	26
4/2007	15	8	8	1	0	14
9/2007	13	6	6	2	0	34
4/2008	19.7	7	6	1	0	54
9/2008	31.7	15	11	4	1	93

E1 recoveries: all collections

34 taxa total



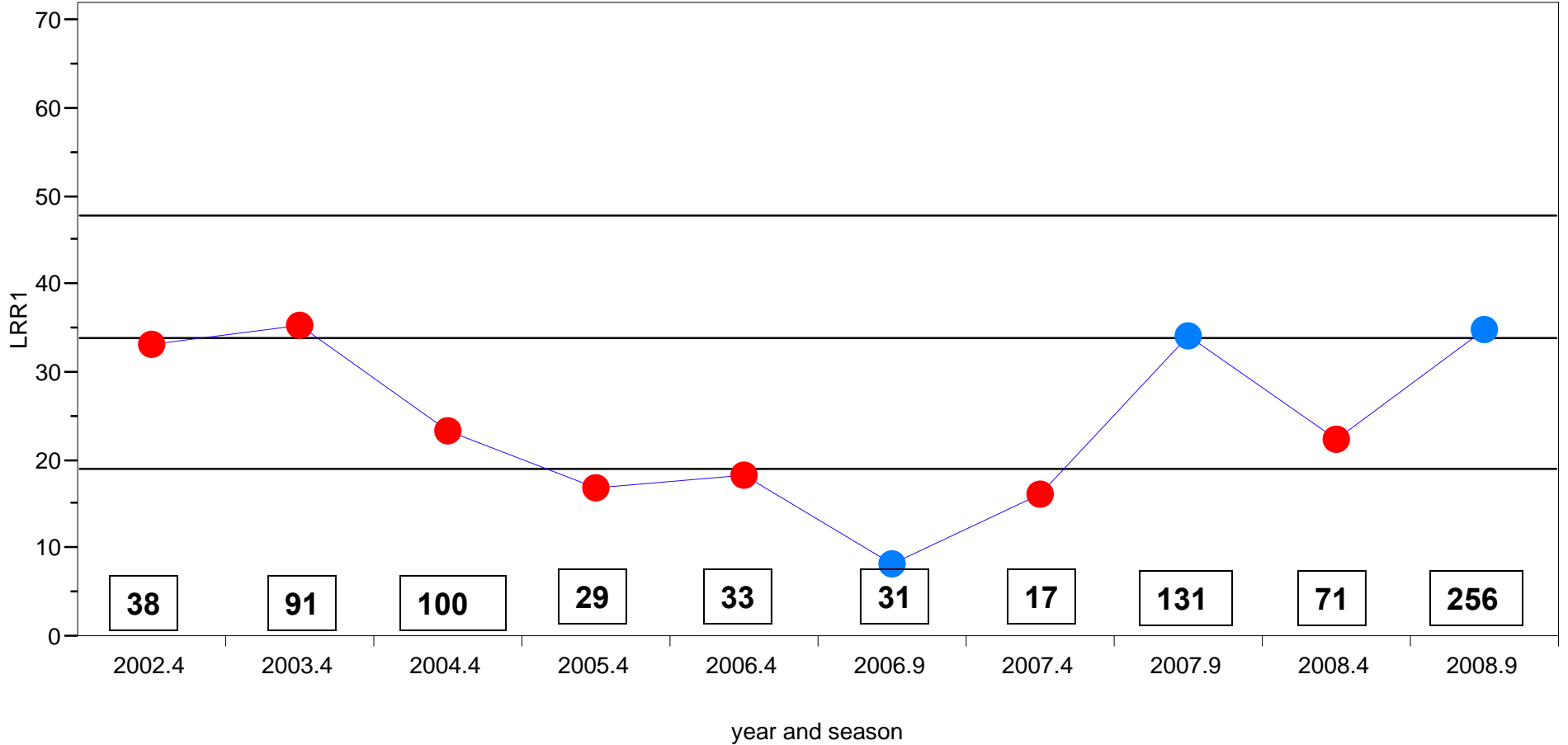


LRR1

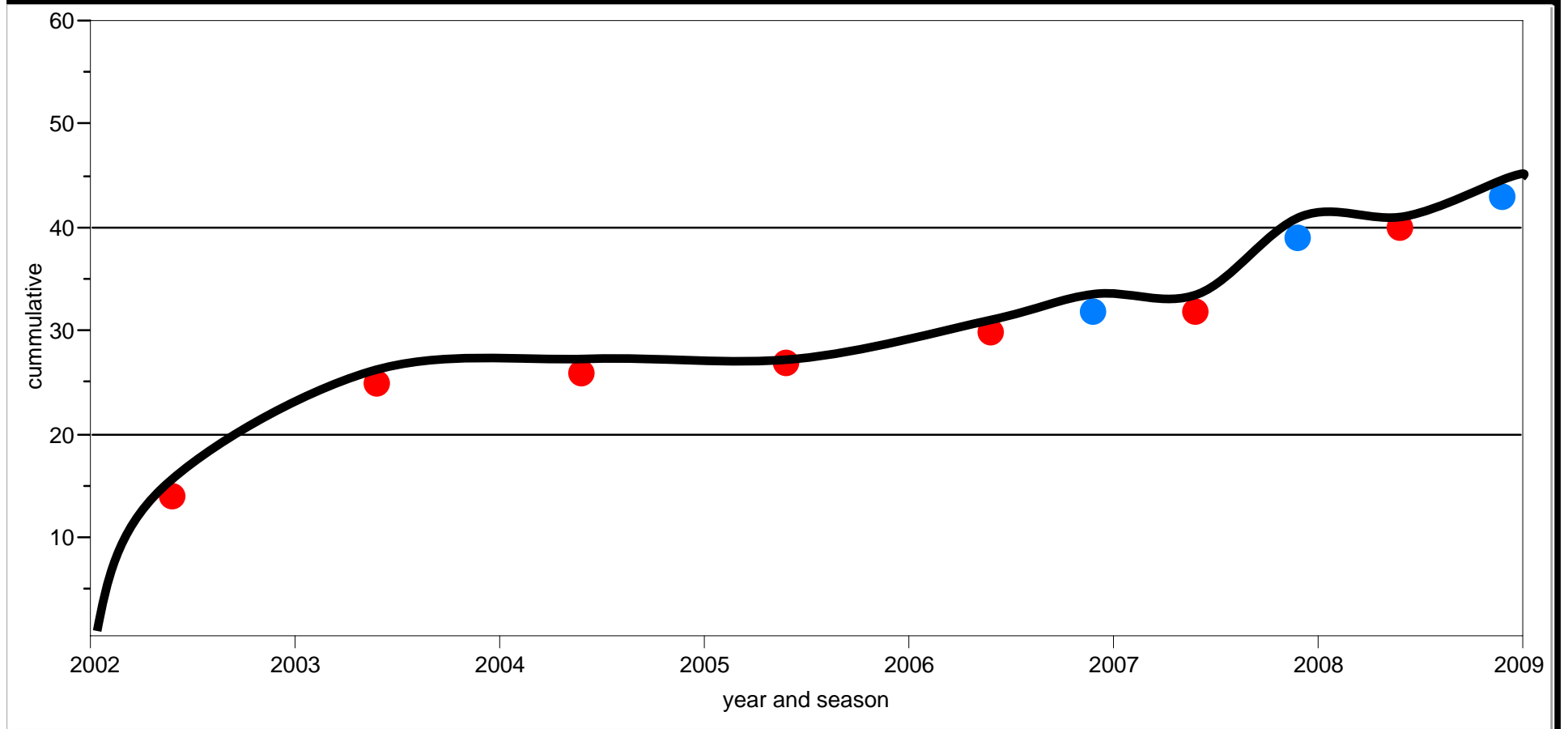




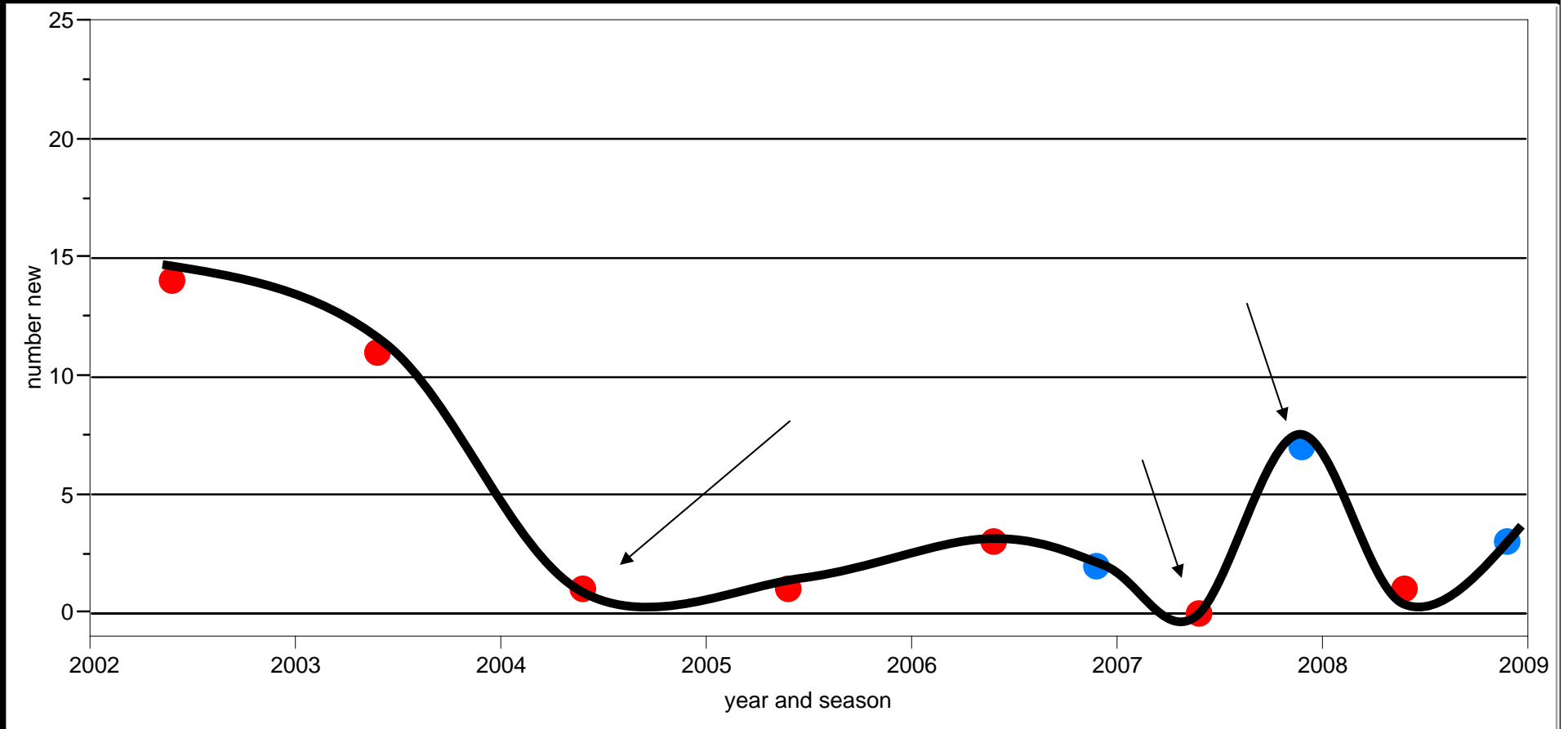
MiCorps Results LRR1



LRR1 taxa accumulation curve



LRR1 inverse taxa curve
Number new taxa (count)
= new discoveries

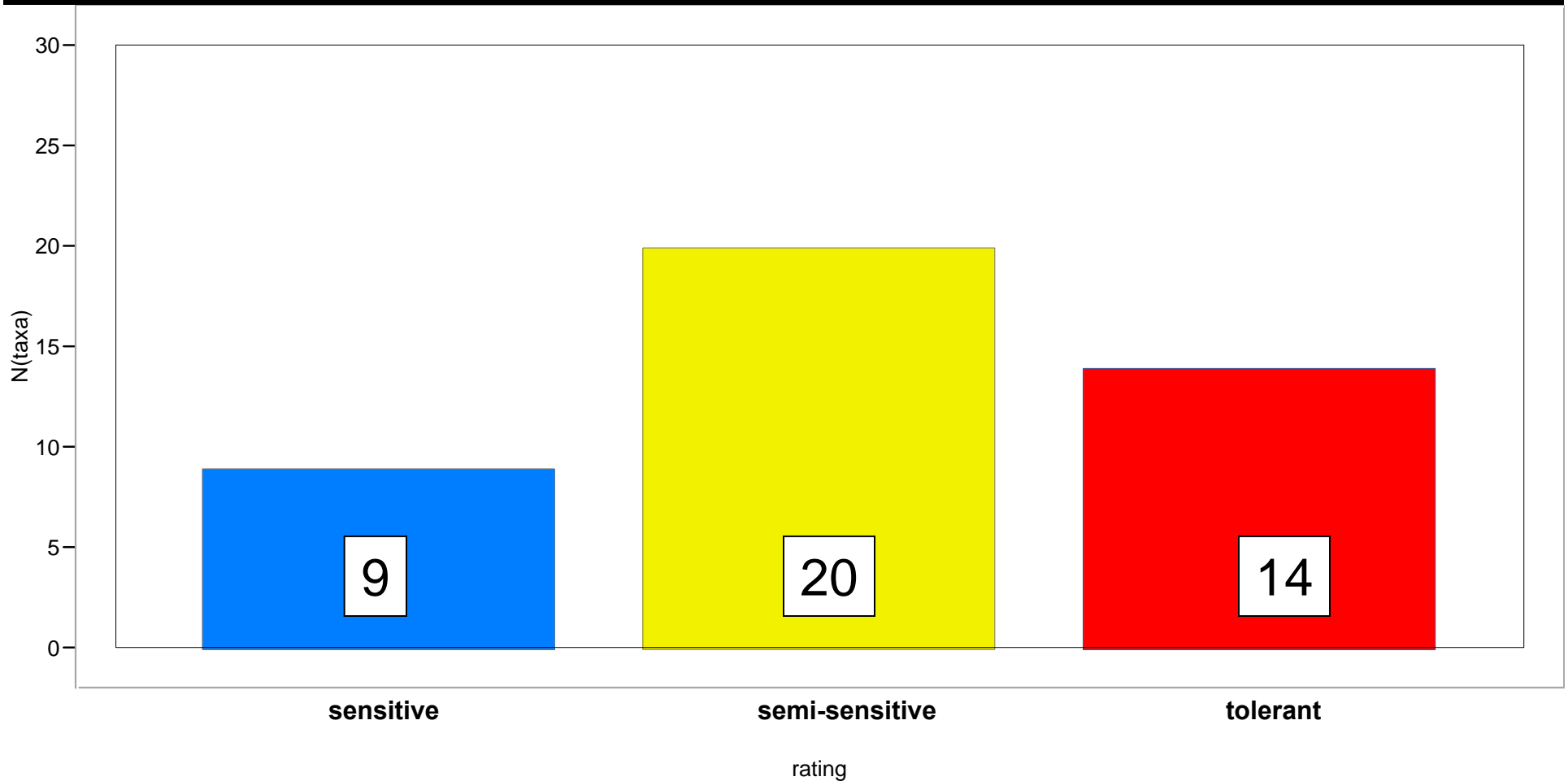


LRR1

Date	MiCorps rating	# Taxa	# Insect taxa	# EPT	# 'Sensitive' taxa	Total number of invertebrates
4/2002	33.2	14	11	3	2	38
4/2003	35.4	19	16	6	1	91
4/2004	23.3	11	9	1	1	100
4/2005	17	10	7	0	0	29
4/2006	18.4	8	5	1	0	33
9/2006	12.1	7	6	0	0	31
4/2007	16.3	7	5	1	0	17
9/2007	34.2	22	18	5	1	131
4/2008	22.5	11	9	3	1	71
9/2008	34.9	29	23	5	1	256

LRR1 recoveries: all collections

43 taxa total

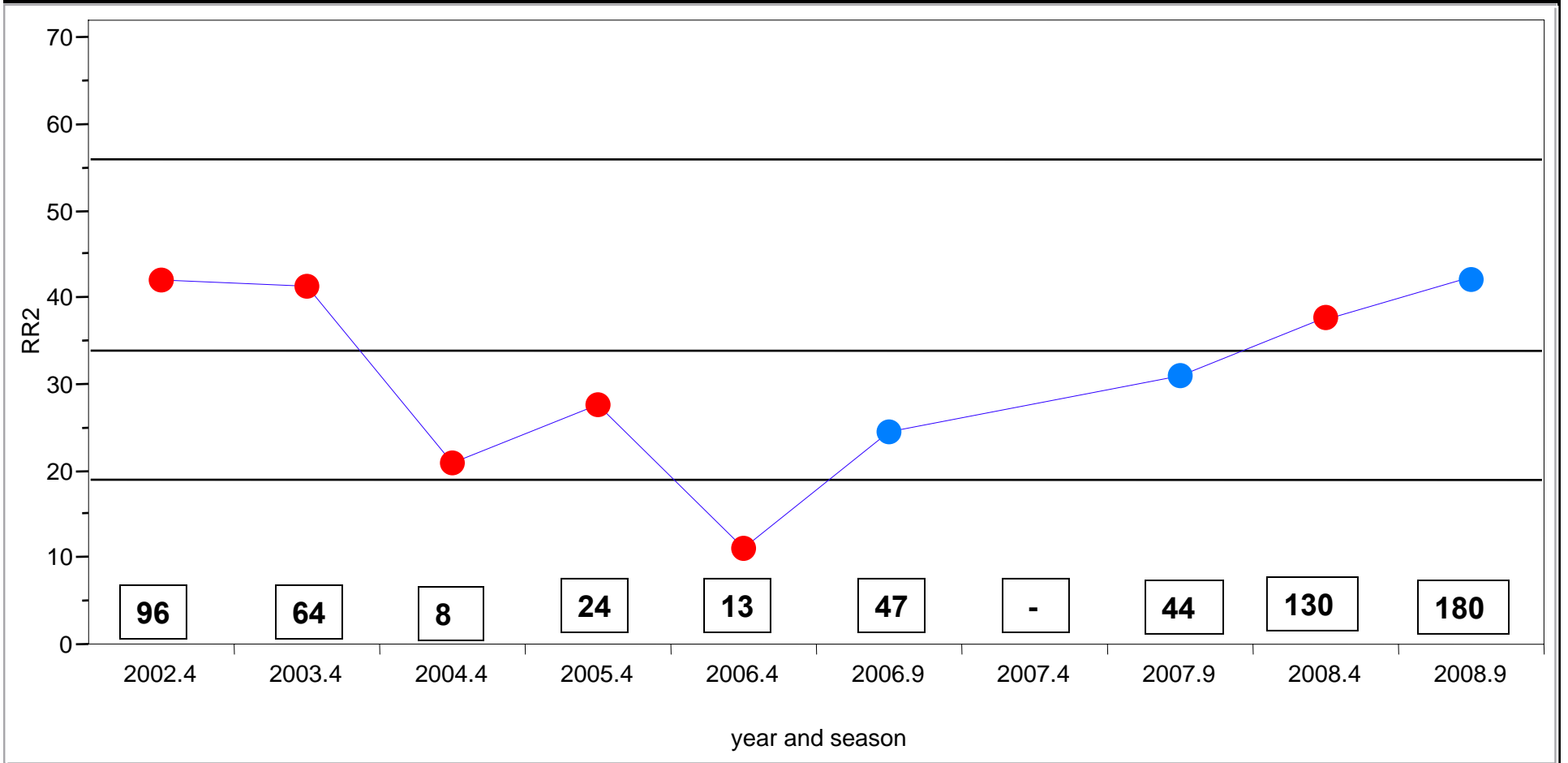




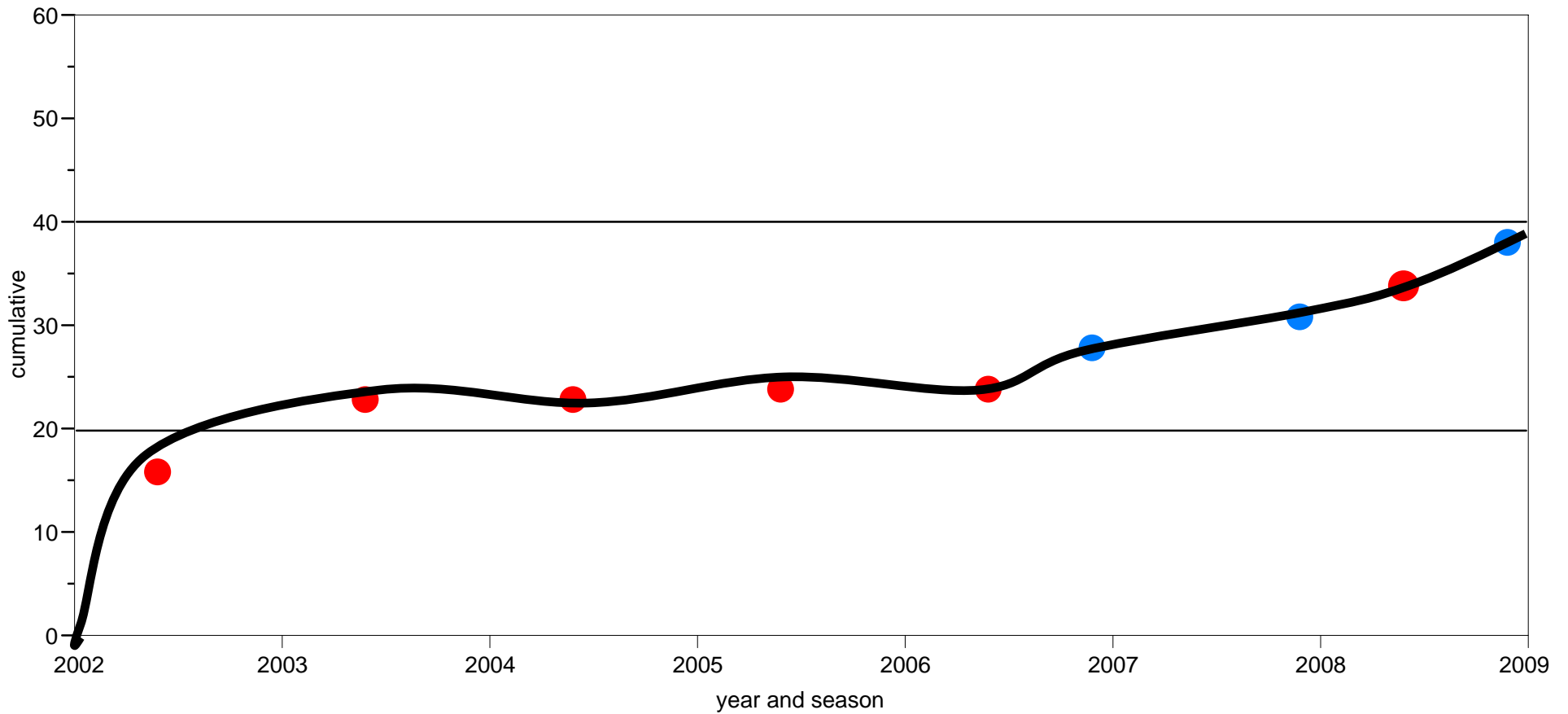
RR2



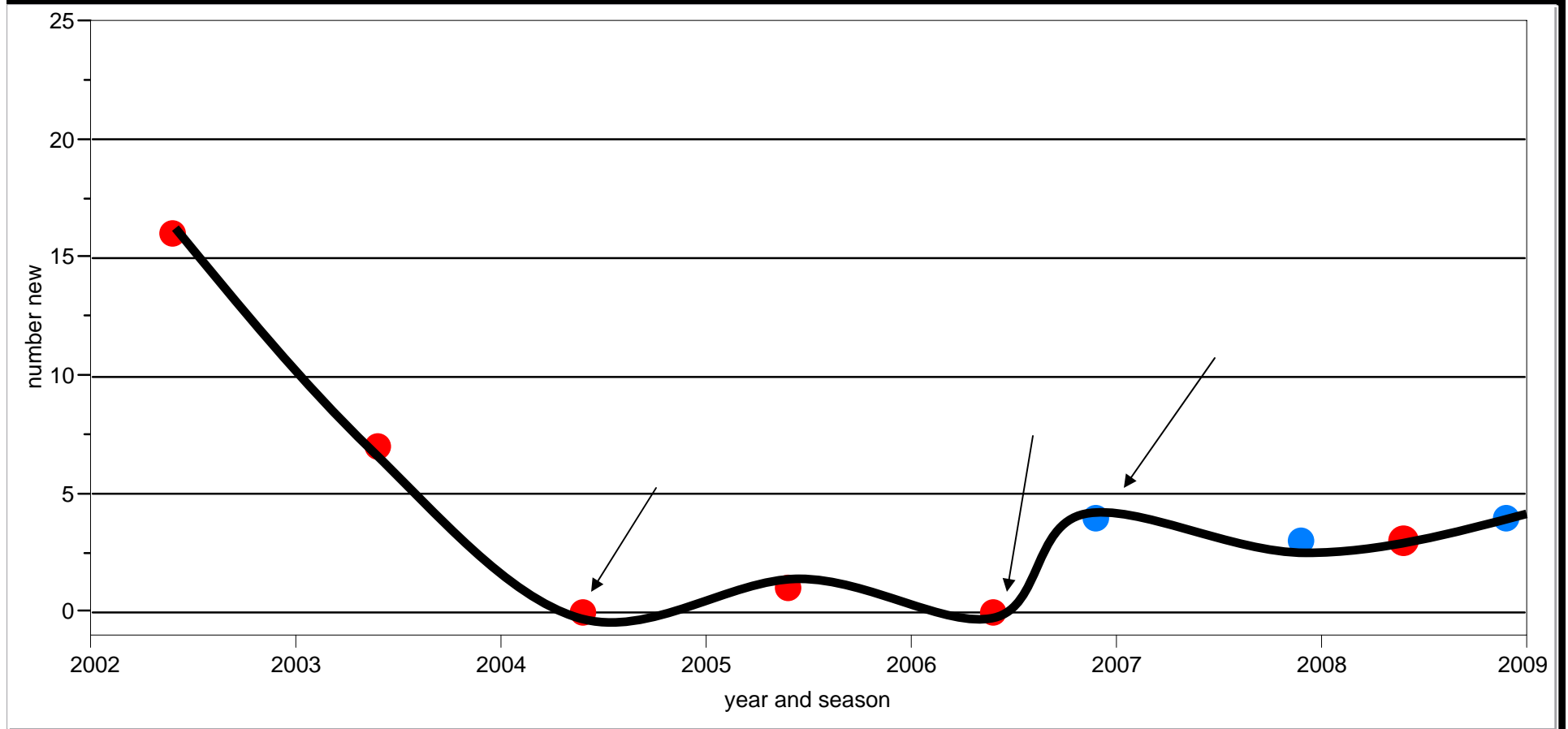
MiCorps Results RR2



RR2 taxa accumulation curve



RR2 inverse taxa curve
Number new taxa (count)
= new discoveries

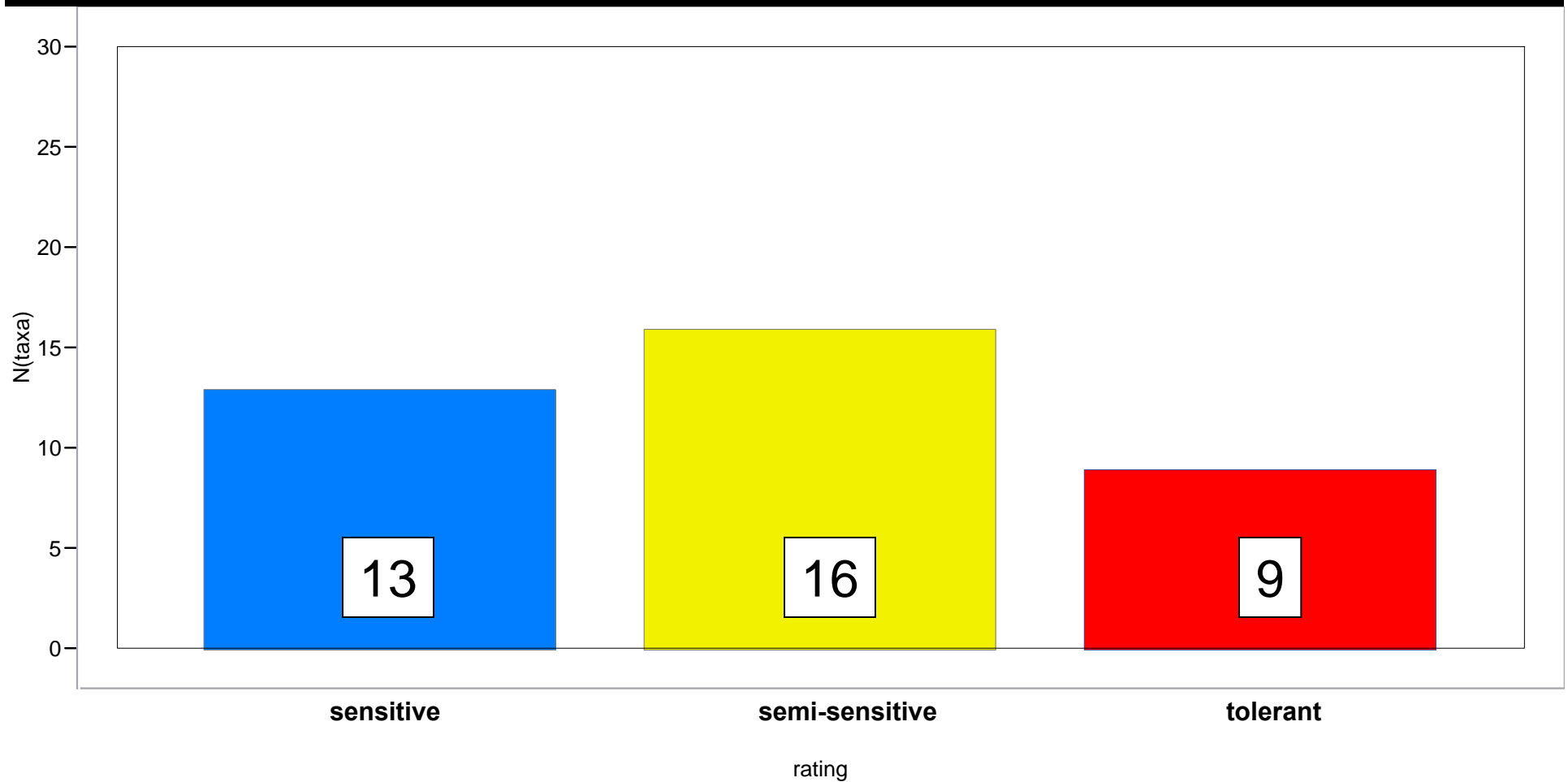


RR2

Date	MiCorps rating	# Taxa	# Insect taxa	# EPT	# 'Sensitive' taxa	Total number of invertebrates
4/2002	42.1	16	10	3	0	96
4/2003	41.3	16	11	3	1	64
4/2004	21.1	8	5	2	0	8
4/2005	27.8	11	7	4	0	24
4/2006	11.2	5	2	0	0	13
9/2006	24.5	13	9	5	1	47
4/2007	-	-	-	-	-	-
9/2007	31.2	16	13	5	1	44
4/2008	37.9	14	11	6	2	130
9/2008	40.5	20	14	8	2	180

RR2 recoveries: all collections

38 taxa total



<u>Taxon</u>	<u>number recovered</u>
Plecoptera	
† Perlidae	2
Ephemeroptera	
Heptageniidae	13
† Isonychiidae	2
Trichoptera	
† Brachycentridae	1
Hydropsychidae	3
† Phyganeidae	4
Hemiptera	
Gerridae	8
† Nepidae	1
† Notonectidae	1
Odonata	
† Aeshnidae	1
Gomphidae	2
Macromiidae	1
Calopterygidae	1
Megaloptera	
Corydalidae	1
Coleoptera	
Elmidae	5
Gyrinidae	9
† Hydrophilidae	6
Psephenidae	2
Diptera	
† Chironomidae	3
Gastropoda	
† 'right handed snail'	1
Crustacea	
Amphipoda	8
† Isopoda	1

Collector 1

N=76;

22 taxa;

19 insect families;

5 'sensitive' taxa;

MiCorps Rating 48.7

(just inside excellent)

11 unique taxa

(not found by other collection)

Collector 2
 N=34;
 17 taxa;
 15 insect families;
 3 'sensitive' taxa';
 MiCorps Rating 26.2 (fair)
 7 unique taxa
 (not found by other collection)

<u>Taxon</u>	<u>number recovered</u>
Ephemeroptera	
† Caenidae	1
Heptageniidae	1
† Polymitarcidae	8
Trichoptera	
† Goeridae	4
† Polycentropidae	1
Hemiptera	
Gerridae	3
† Veliidae	1
Odonata	
Gomphidae	1
Macromiidae	1
Caloptyrigidae	1
† Coenagrionidae	1
Megaloptera	
Corydalidae	2
Coleoptera	
Elmidae	2
Gyrinidae	2
Psephenidae	1
Crustacea	
Amphipoda	3
Annelida	
† Oligochaeta	1

<u>Taxon</u>	<u>number recovered</u>
Plecoptera	
† Perlidae	2
Ephemeroptera	
Heptageniidae	13
† Isonychiidae	2
Trichoptera	
† Brachycentridae	1
Hydropsychidae	3
† Phyrganeidae	4
Hemiptera	
Gerridae	8
† Nepidae	1
† Notonectidae	1
Odonata	
† Aeshnidae	1
Gomphidae	2
Macromiidae	1
Calopterygidae	1
Megaloptera	
Corydalidae	1
Coleoptera	
Elmidae	5
Gyrinidae	9
† Hydrophilidae	6
Psephenidae	2
Diptera	
† Chironomidae	3
Gastropoda	
† 'right handed snail'	1
Crustacea	
Amphipoda	8
† Isopoda	1

<u>Taxon</u>	<u>number recovered</u>
Ephemeroptera	
† Caenidae	1
Heptageniidae	1
† Polymitarcidae	8
Trichoptera	
† Goeridae	4
† Polycentropidae	1
Hemiptera	
Gerridae	3
† Veliidae	1
Odonata	
Gomphidae	1
Macromiidae	1
Calopterygidae	1
† Coenagrionidae	1
Megaloptera	
Corydalidae	2
Coleoptera	
Elmidae	2
Gyrinidae	2
Psephenidae	1
Crustacea	
Amphipoda	3
Annelida	
† Oligochaeta	1

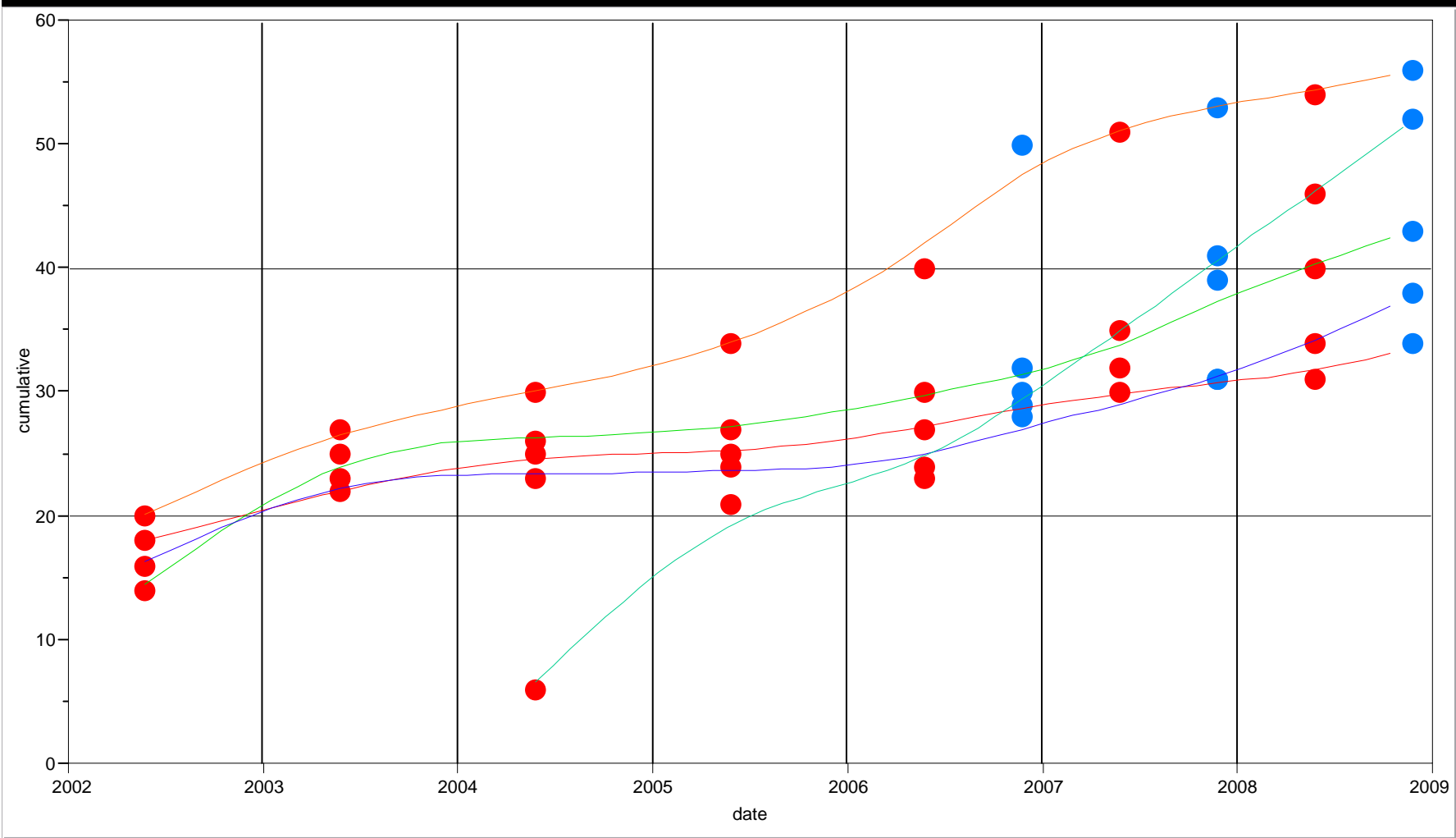
Combined Data: N = 110

29 taxa; 24 insect families; 6 'sensitive' taxa

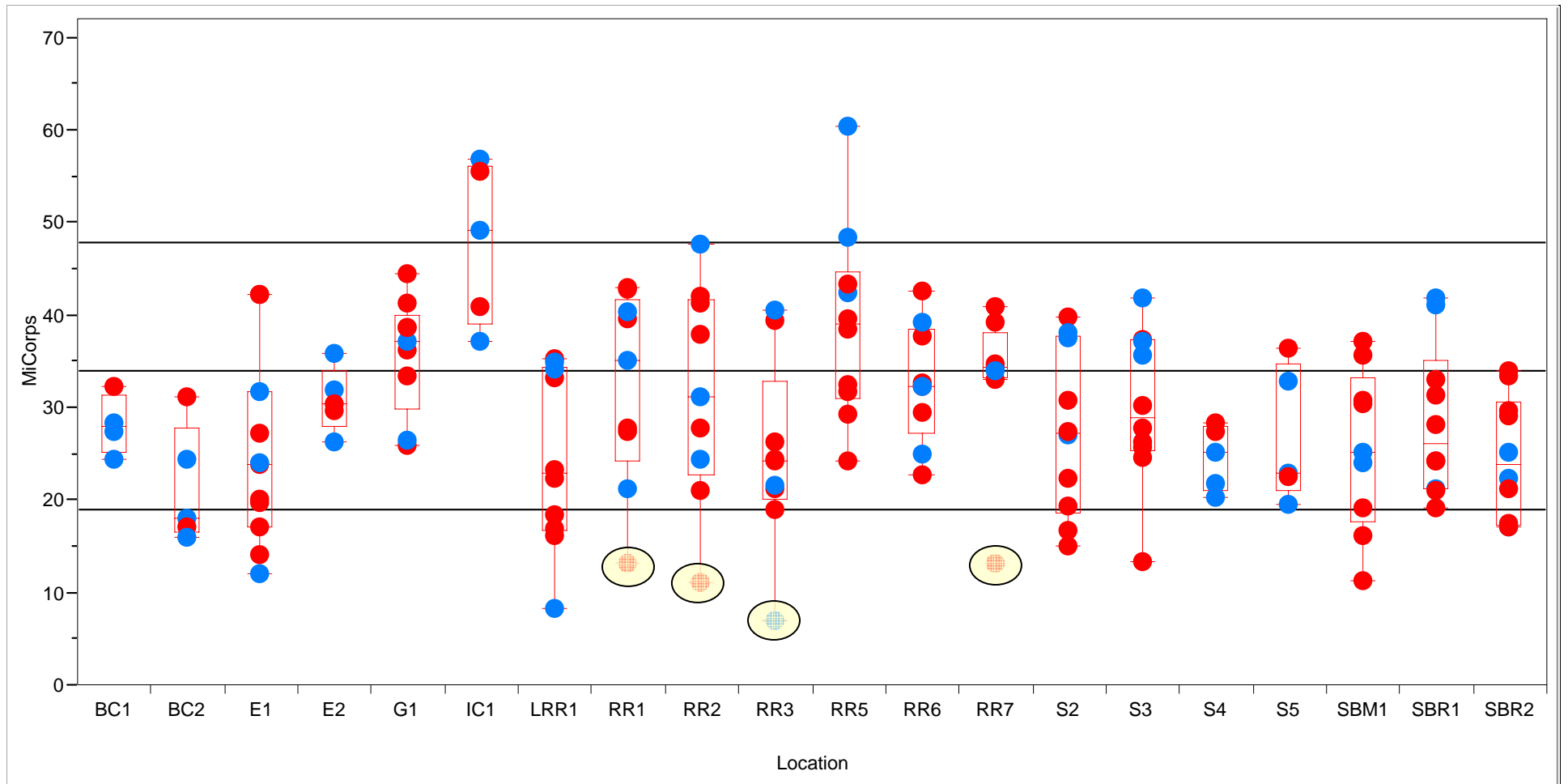
MiCorps Rating 54.9 – well into 'excellent' category

Summary points

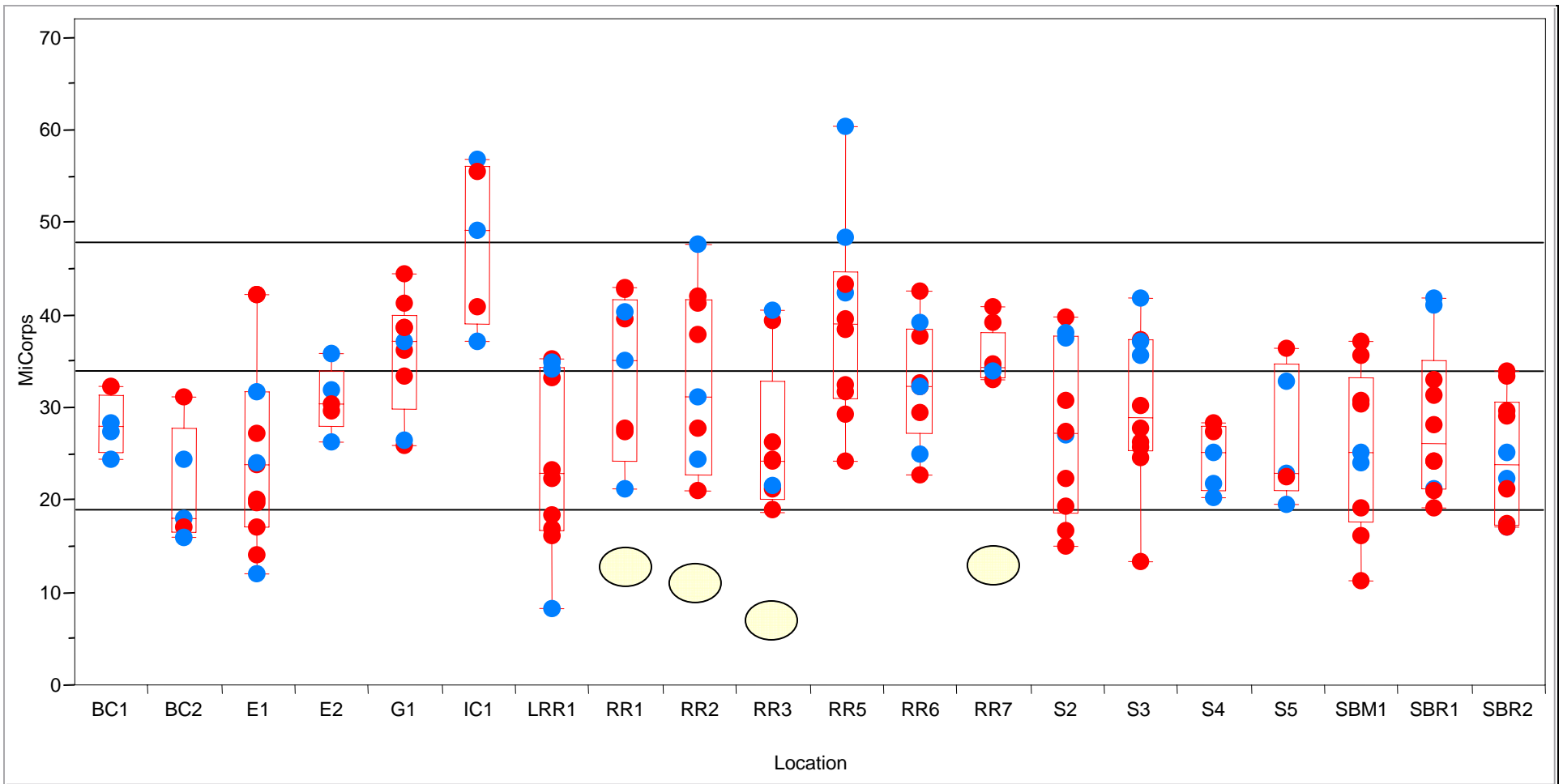
- Build comprehensive invertebrate taxonomic presence listings for sites through time
- MiCorps metrics & others
- Be conscious of sampling bias:
 - Two samplers lessen variability
 - Detect sampling thoroughness w/ accumulation curves, taxa and total body counts through time
 - Report back to your volunteers: they will collect better if they know what you are looking for



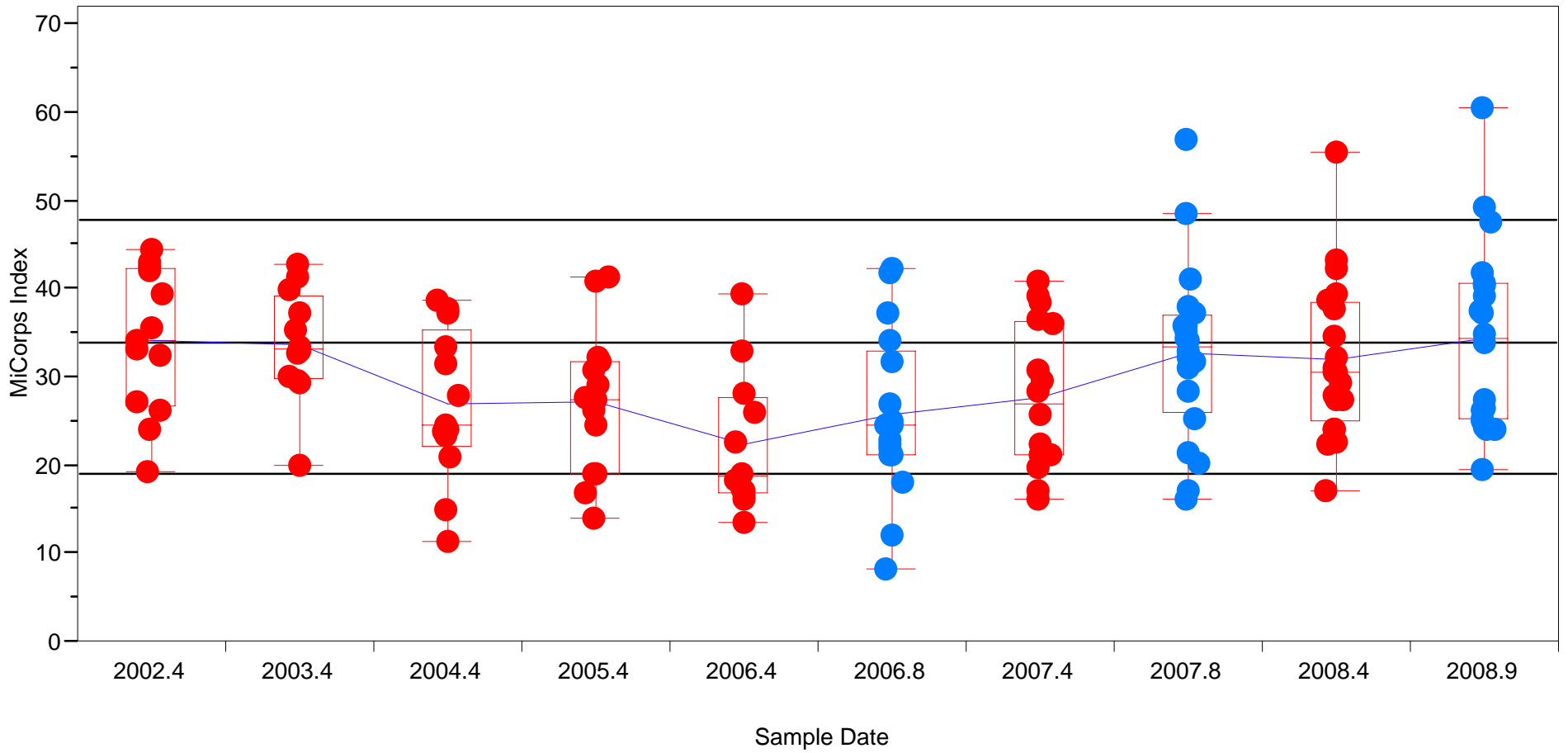
RR5
 RR7
 LRR1
 RR2
 E1



All locations through time



All locations through time

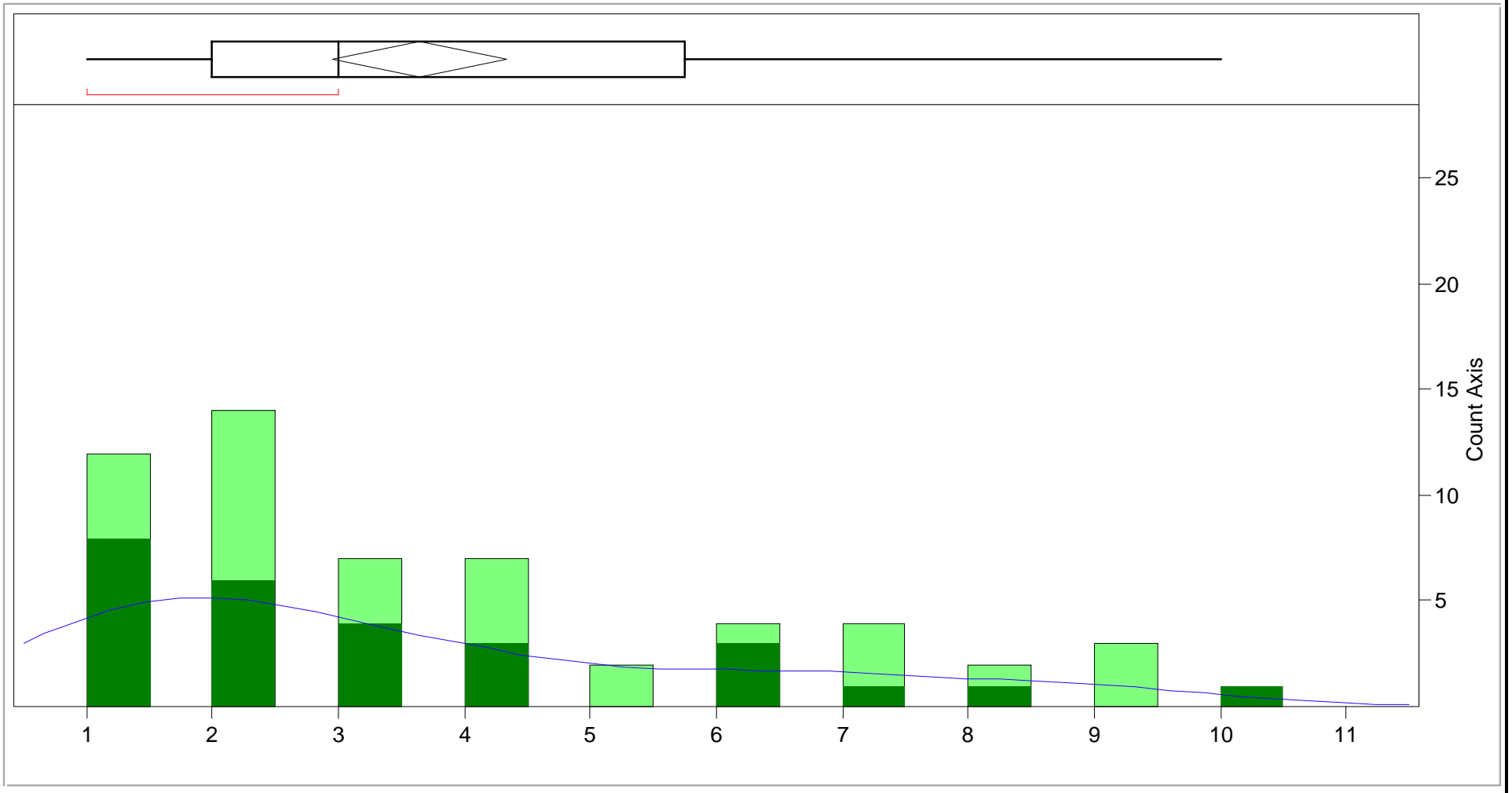


Through time, all locations

RR5 Distribution through time

Mean = 3.6, std. dev = 2.5

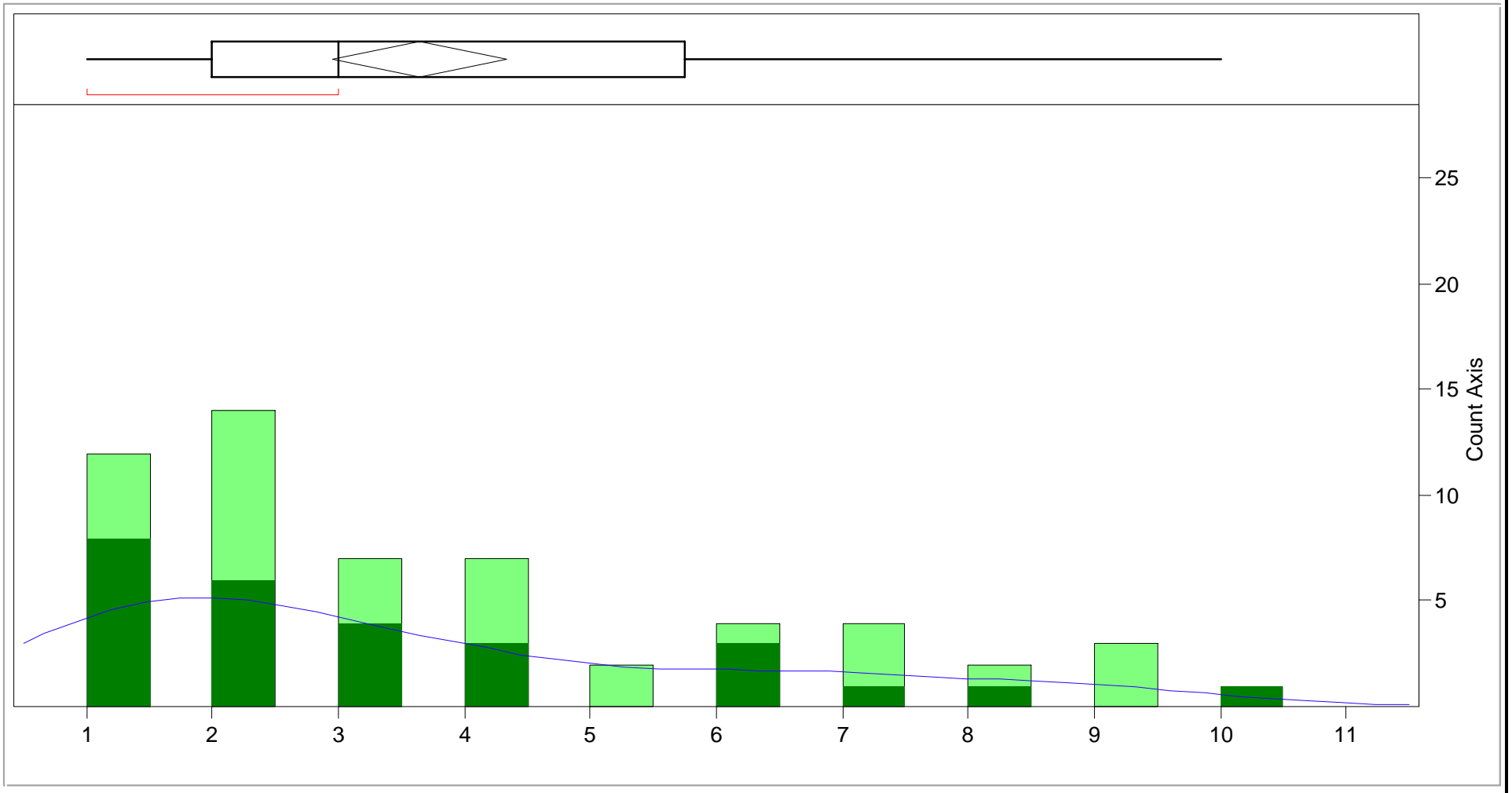
N=56, Sum = 204



RR7 Distribution through time

Mean = 2.6, std. dev = 2.0

N=49, Sum = 131



E1 Distribution through time

Mean = 3.0, std. dev = 2.6

N=34, Sum = 104

