What do we do with all this data???

- Assess waterbodies in accordance with State standards to determine designated use attainment or impairment
  - 305(b) list + 303(d) list = "**Integrated Report**"
- Prioritize watersheds to address issues
  - TMDL development
  - State NPS working group every 5 years; focuses on issues that can be addressed by NPS program to achieve potential delistings

Integrated Report:
Who, What, When, and Why?

- **"Who"** State, municipal, tribal and other agencies. OCC and OWRB are primary contributors
- **"What"** Compile and assess water quality and related data
- **"When"** Biennially on the even year
- **"Why"** National mandate

Fish and Wildlife Propagation Use (FWP):

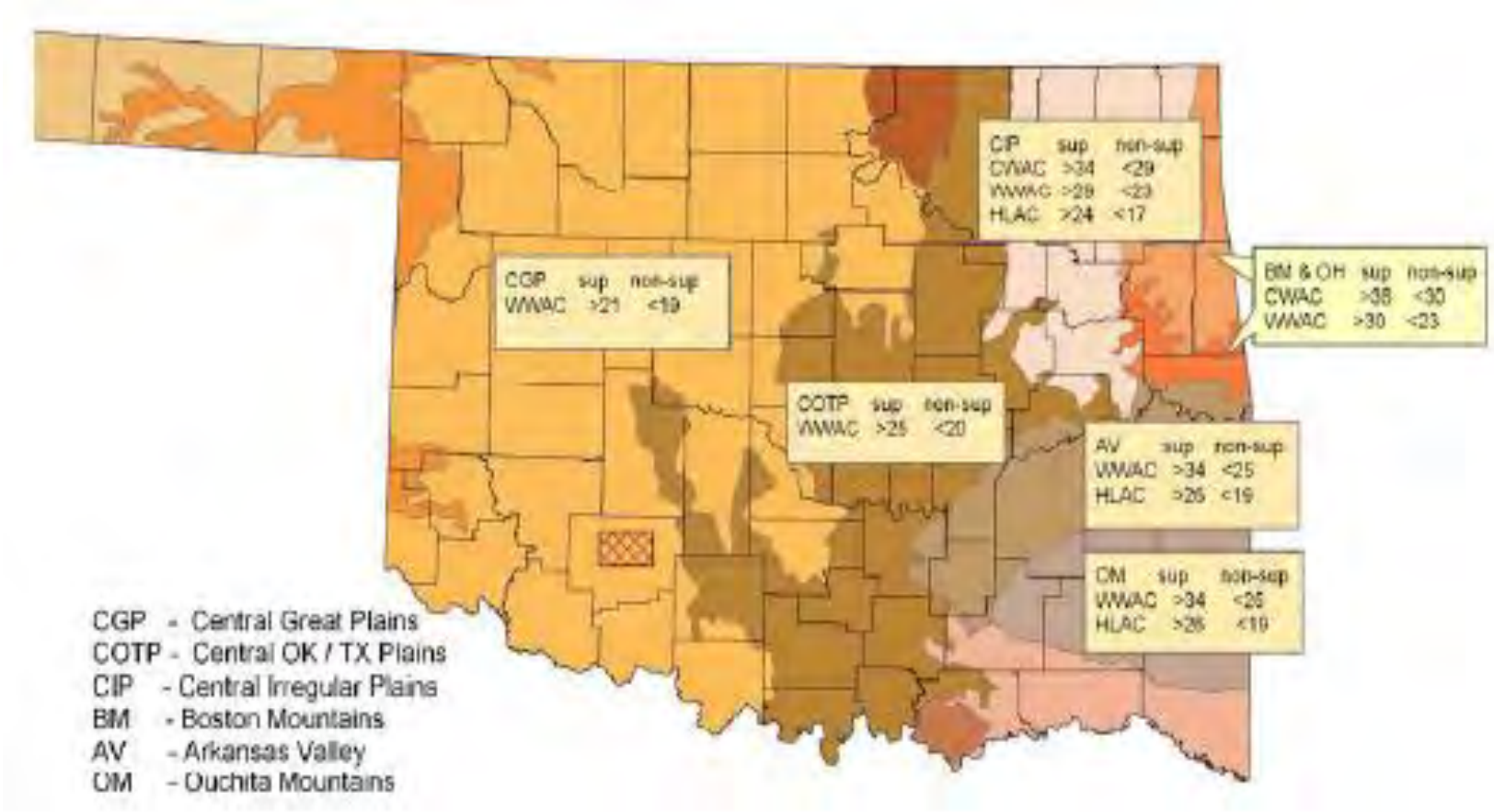
Warm Water Aquatic Community (WWAC)

Cool Water Aquatic Community (CWAC)—can support smallmouth bass, certain darters, stoneflies

Habitat Limited Aquatic Community (HLAC)—water chemistry and habitat not adequate to support WWAC or CWAC; may be due to natural or manmade causes that can't be remedied

Biological Assessment – Fish

Criteria have been set for some ecoregions:



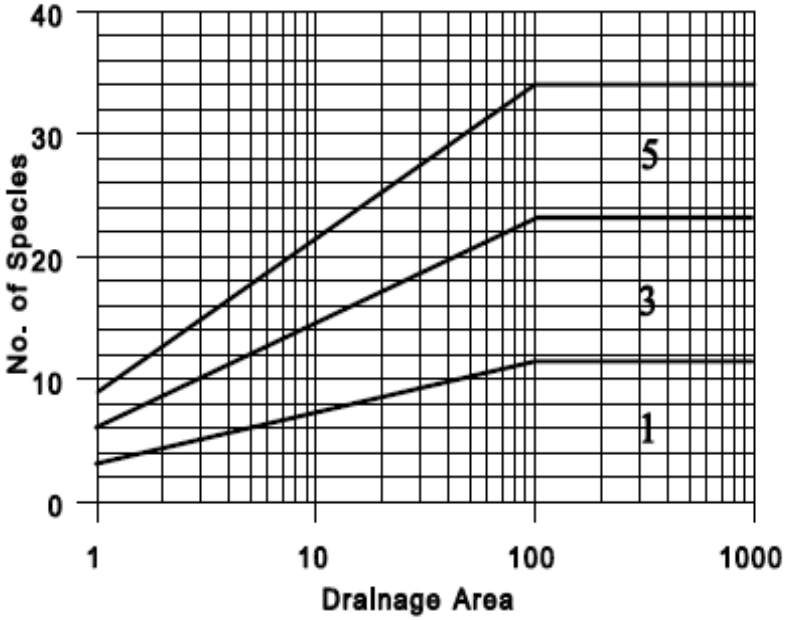
APPENDIX C. INDEX OF BIOLOGICAL INTEGRITY

		5	3	1	S
Sample Composition	Total no. of species	See figure 1			
	Shannon's diversity* based upon numbers	>2.50	2.49-1.50	<1.50	
	No. of sunfish species	>3	2-3	<2	
	No. of species comprising 75% of sample	>5	4-3	<3	
	No. of intolerant species	>5	3-5	<3	
	<100mi^2 area >100mi^2 area	See figure 2			
	Percentage of tolerant species	See figure 3			
Fish Condition	Percentage of lithophils	>36	18-36	<18	
	Percentage of DELT anomalies**	<0.1	0.1-1.3	>1.3	
	Fish numbers (total individuals)	>200	200-75	<75	

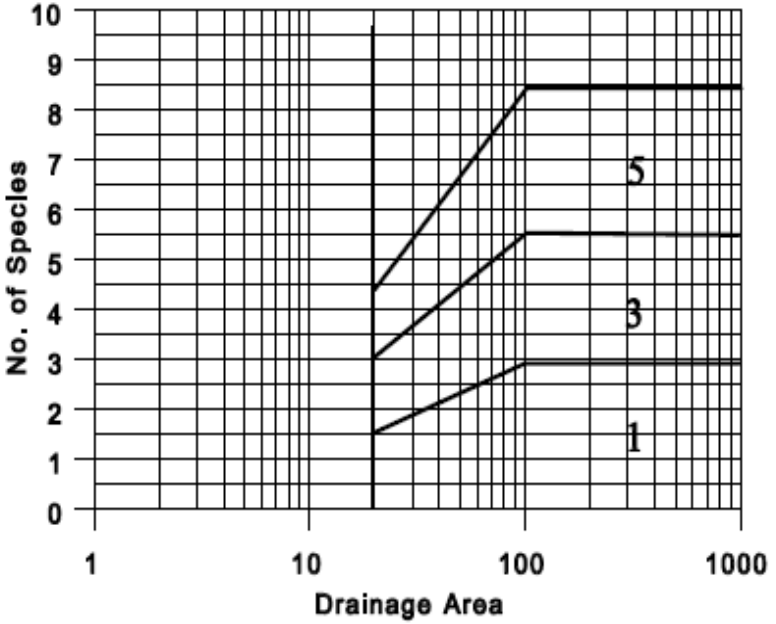
* $d = -\sum \frac{n_i}{N} \ln \frac{n_i}{N}$

** DELT = deformities, eroded fins, lesions, tumors

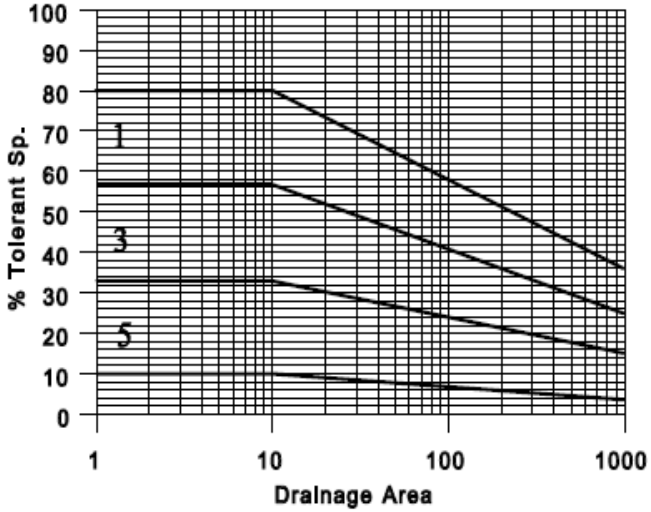
Total No. of Species



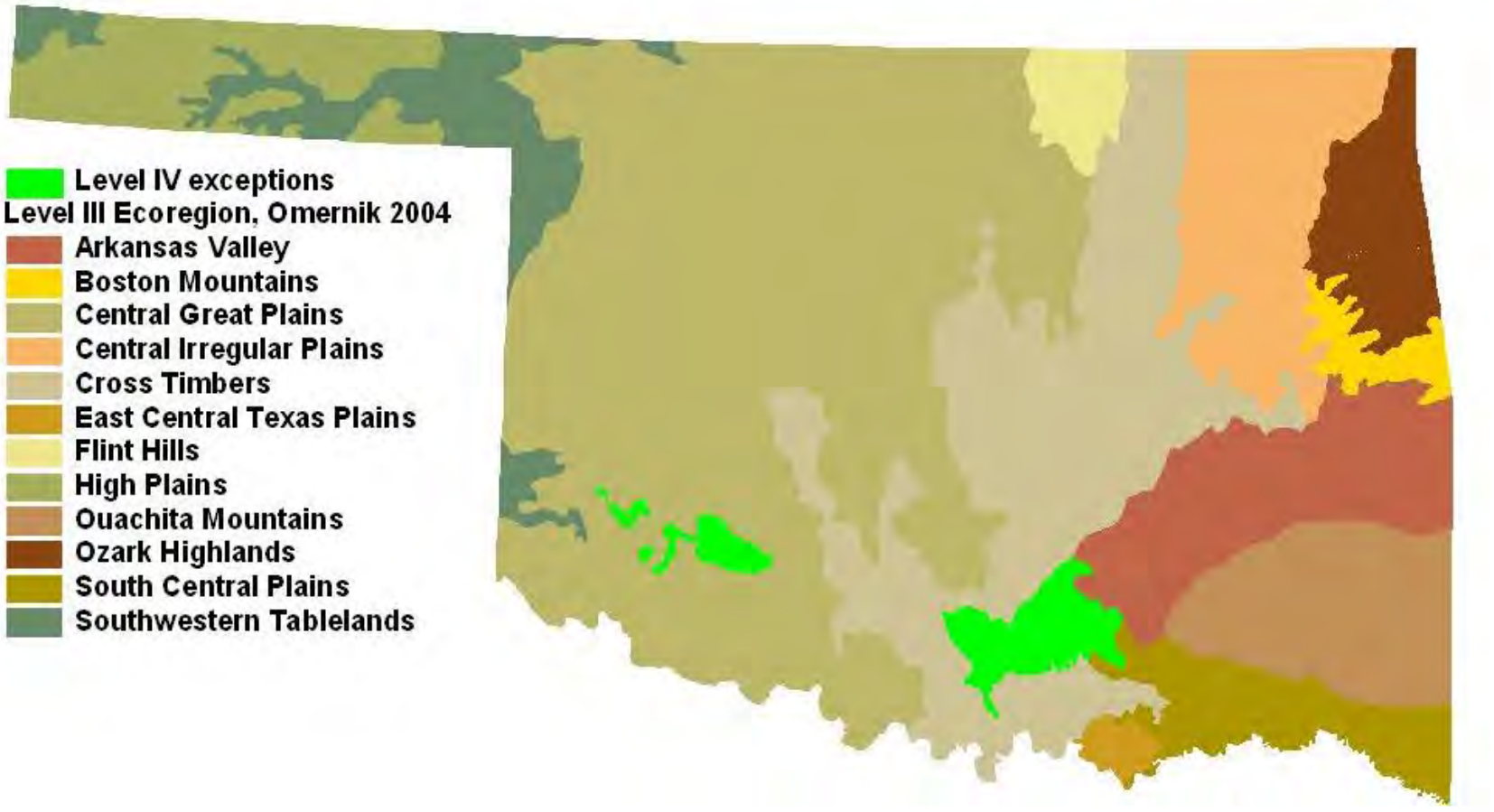
No. of Intolerant Species



Percent Tolerant Species



Alternative: OK IBI Assessment



OK Biological Assessment – Fish

Metrics	5	3	1
Number of species*	>67%	33-67%	<33%
Number of sensitive benthic species*	>67%	33-67%	<33%
Number of sunfish species*	>67%	33-67%	<33%
Number of intolerant species*	>67%	33-67%	<33%
Proportion tolerant individuals**	<10%	10-25%	>25%
Proportion insectivorous cyprinid individuals**	>45%	20-45%	<20%
Proportion individuals as lithophilic spawners**	>36%	18-36%	<18%

* Sample metric divided by the reference metric for the applicable ecoregion

** Score based on actual value

OK Biological Assessment – Fish

% of Reference OKIBI score	Biological Condition Category	Sample Support Status
>80%	Not impaired	Attaining
50-80%	Possible impairment to no impairment	Undetermined
<50	Impaired	Not Attaining

2. Overall fish support status for the OKIBI is determined considering support status of all collections obtained within the reporting period as follows:

   a. If only one sample was collected - support status stands as called

   b. If two or more samples were collected:

      - Determine support status based on majority
      - In instances when no majority exists, the final result is undetermined

- **For boatables and some large wadeables use NRSA index and reference conditions**

Biological Assessment – Macroinvertebrates

Minimum of 4 samples over at least a 2-year period required

For boatables and some large wadeables use NRSA index and reference conditions

Metrics	*6*	*4*	*2*	*0*
Taxa Richness*	>80%	60-80%	40-60%	<40%
Modified HBI**	>85%	70-85%	50-70%	<50%
EPT/Total***	>30%	20-30%	10-20%	<10%
EPT Taxa*	>90%	80-90%	70-80%	<70%
% Dominant 2 Taxa***	<20%	20-30%	30-40%	>40%
Shannon-Weaver***	>3.5	2.5-3.5	1.5-2.5	<1.5

* sample metric divided by the reference metric for the applicable ecoregion

** reference metric value for the applicable ecoregion divided by the sample metric value

***score based on actual value

Biological Assessment – Macroinvertebrates

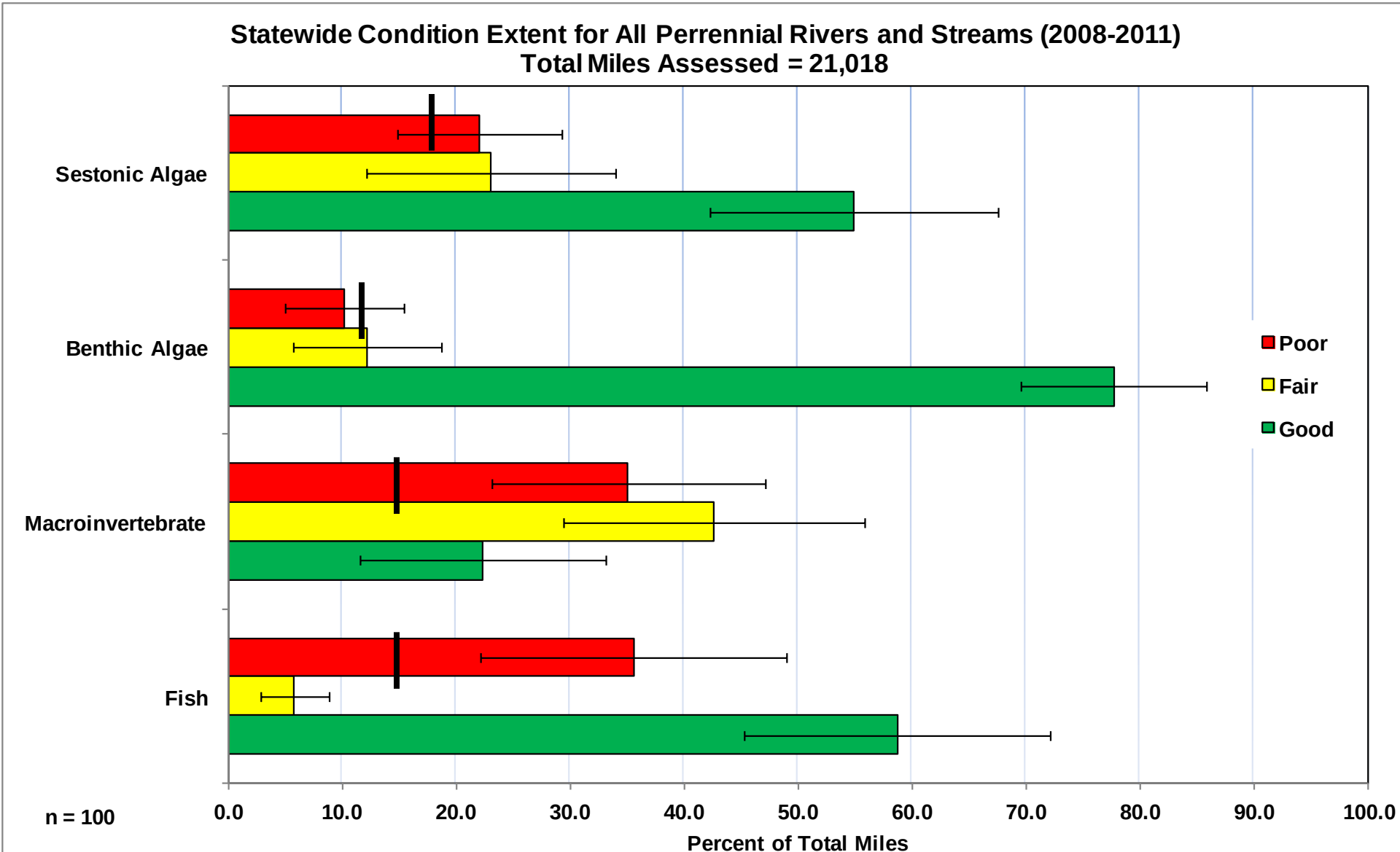
% of Reference IBI score	Biological Condition Category	Sample Attainment Status
>80%	Non-impaired	Attaining
50-80%	Possible impairment to no impairment	Undetermined
<50	Impaired	Not attaining

Final FWP Use Attainment for Macros:

Minimum number of "Attaining" collections	Number of "Undetermined" collections	Number of "Not Attaining" collections	Final Macroinvertebrate Assessment
2	any	0	Attaining
any	any	1	Undetermined
any	any	2 or more	not attaining

Condition Extent for All Perennial Stream Miles

(Black line represents 2005-2007 study.)



Extent of Perennial Stream Miles in Poor Condition Comparing Large/Small and Sample Periods Bio-indicator Results

Indicator/Stressor	2008-09 %Poor	2010-11 %Poor	Trend	Large %Poor	Small %Poor	Change
Fish	43.9%	21.7%	↓**	50.1%	30.4%	**
Macroinvertebrate	40.6%	25.7%	↓	62.3%	24.7%	**
Benthic Algae	3.7%	21.3%	↑**	21.7%	5.9%	**
Sestonic Algae	18.2%	28.3%	↑	60.6%	6.8%	**