Macroinvertebrate Sampling Program

Greater Lake Washington and

Green-Duwamish River Watersheds

2002 Results

Benthic Macroinvertebrates

- Freshwater:
  - Insects
  - Crustaceans
  - Worms
  - Snails
  - Bivalves

Why Sample Bugs?

- Mostly sedentary - local conditions
- Long-term exposure (life cycle)
- Critical component of ecosystem
- Good indicator of biological health
- Relatively inexpensive to monitor

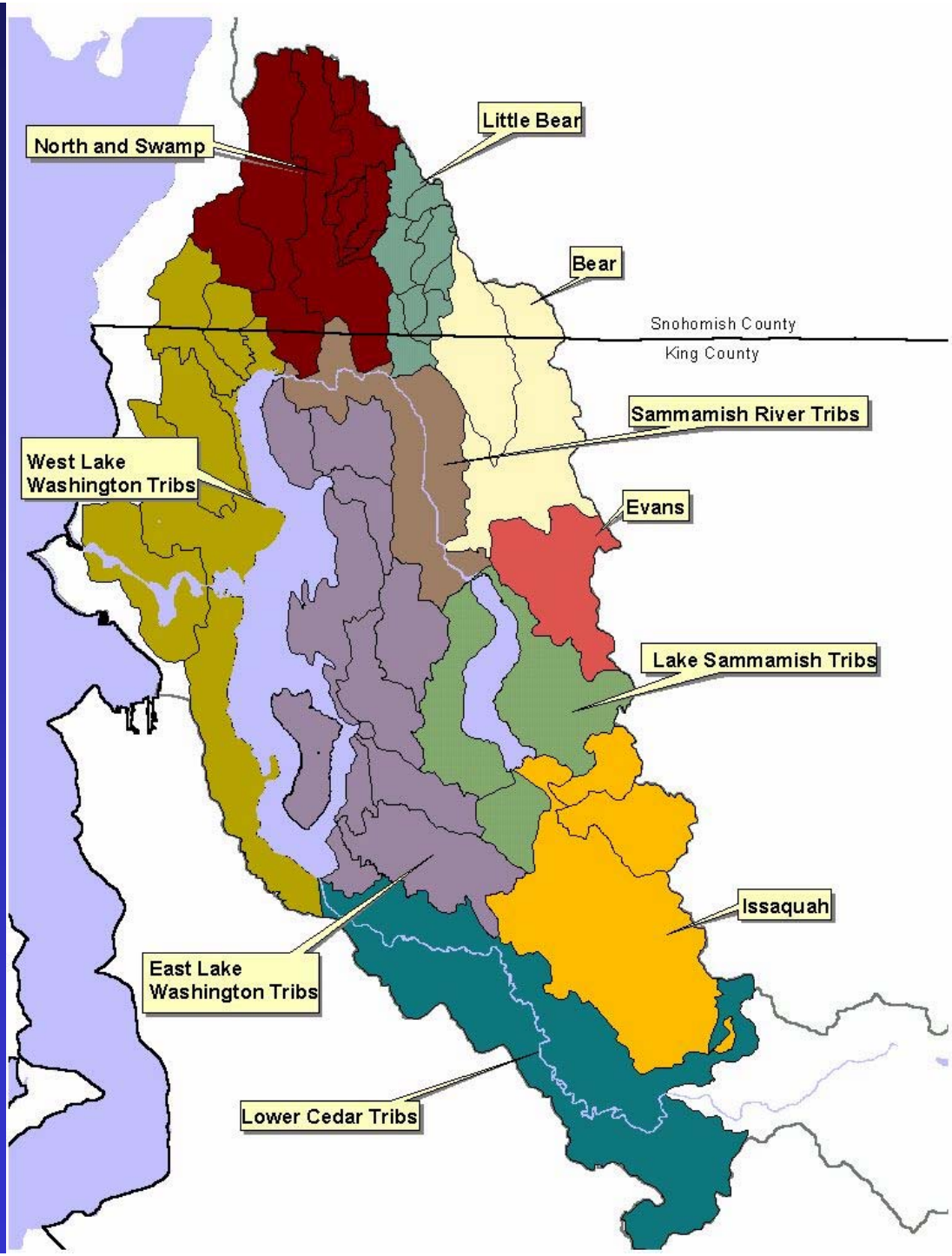
Historical Sampling

- Wastewater related
  - streams potentially impacted by operations
  - conducted by Metro/KCEL since 1970s
- BMEP
  - to measure success; since 1995
- Other: Roads, Biosolids, Fish & Ditch, etc.

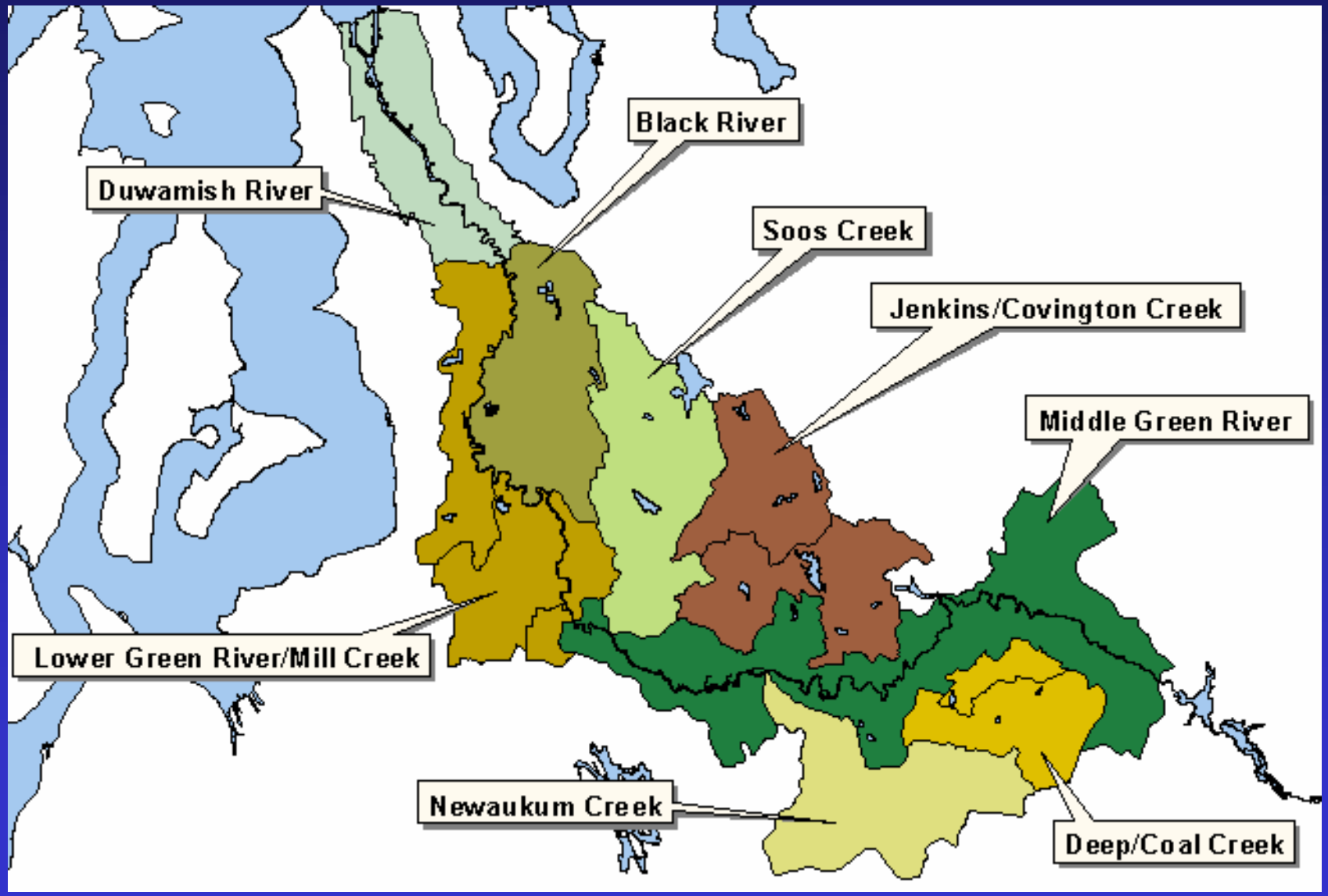
New Program

- WWC funded (Freshwater) for 2 years:
  - Consolidate Wastewater and BMEP
  - Establish baseline conditions
  - Identify differences in subbasins
  - Design program for long-term trends
  - Look for correlation w/ land use

Greater Lake Washington Watershed

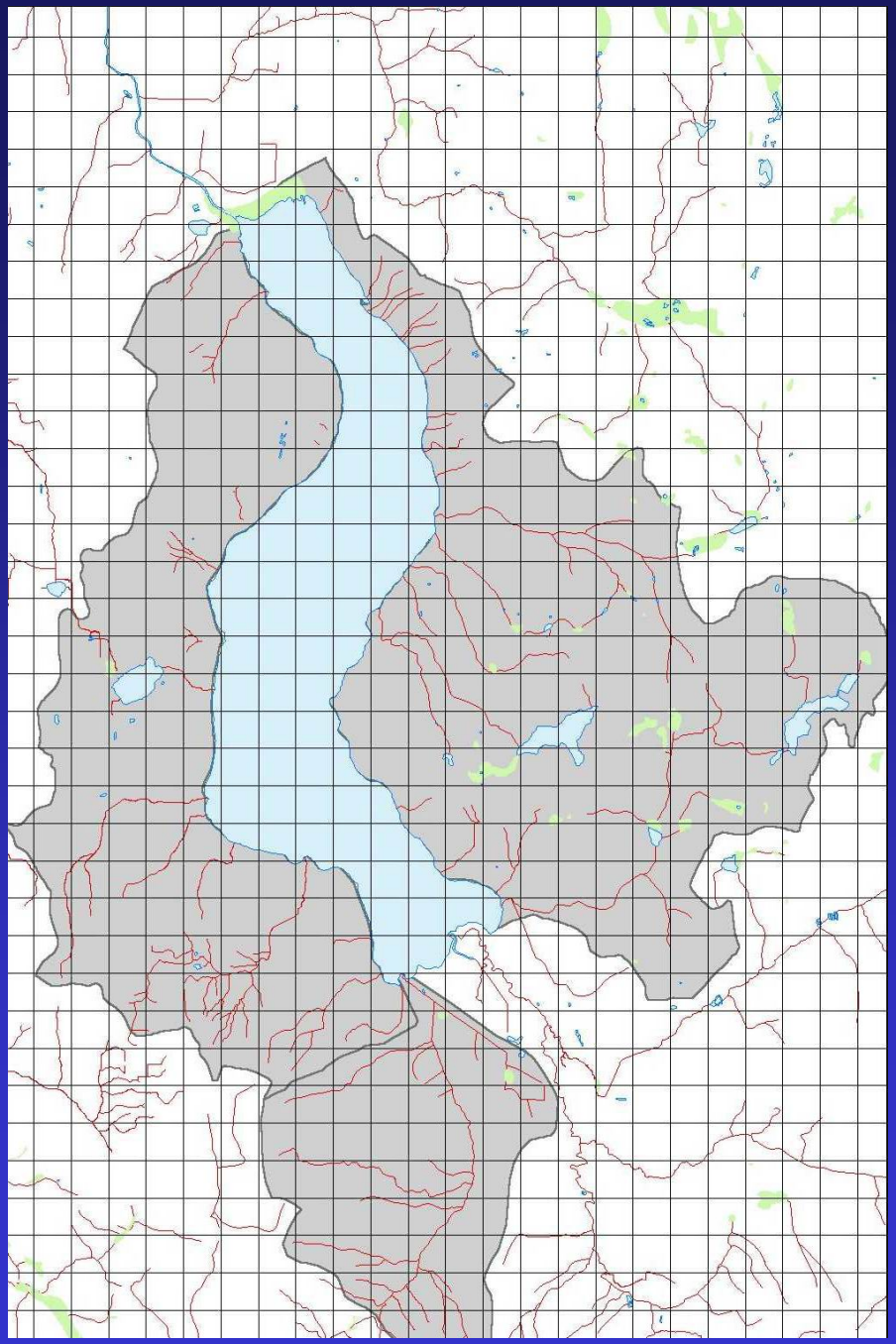


Green-Duwamish River Watershed



Methods

- Site Selection
  - GIS: 0.33 mi^2 grid
  - Random # generator
  - Target: 10 per basin
  - Constrants:
    - riffle
    - access
  - ~150 sites



Field Methods

- Aug - Sep
- Surber sampler
- 3 grabs composited
- Preserve in ETOH
- Habitat notes

Taxonomic ID

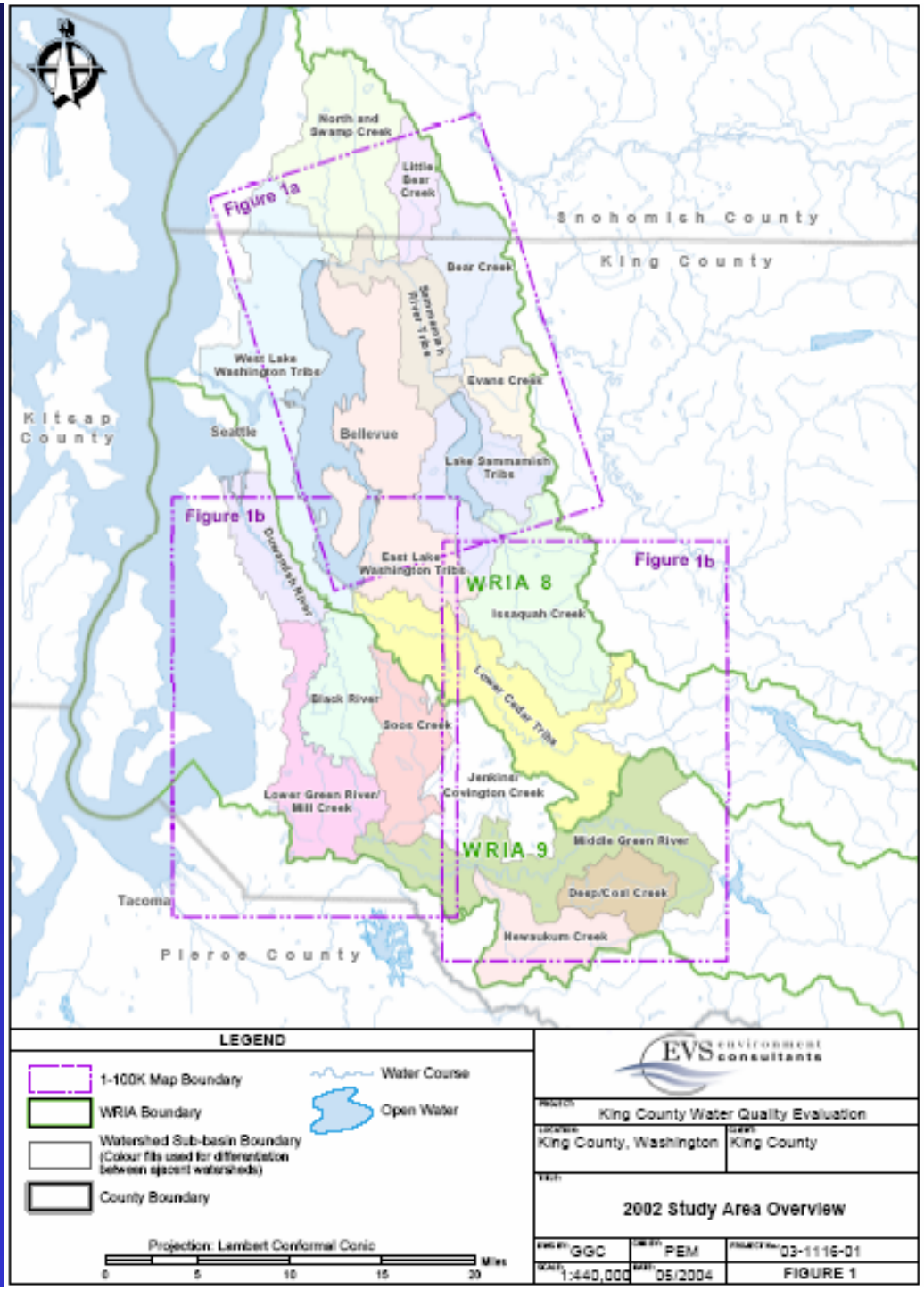
- Rithron Associates
- Lowest practical level
- Metrics (B-IBI)

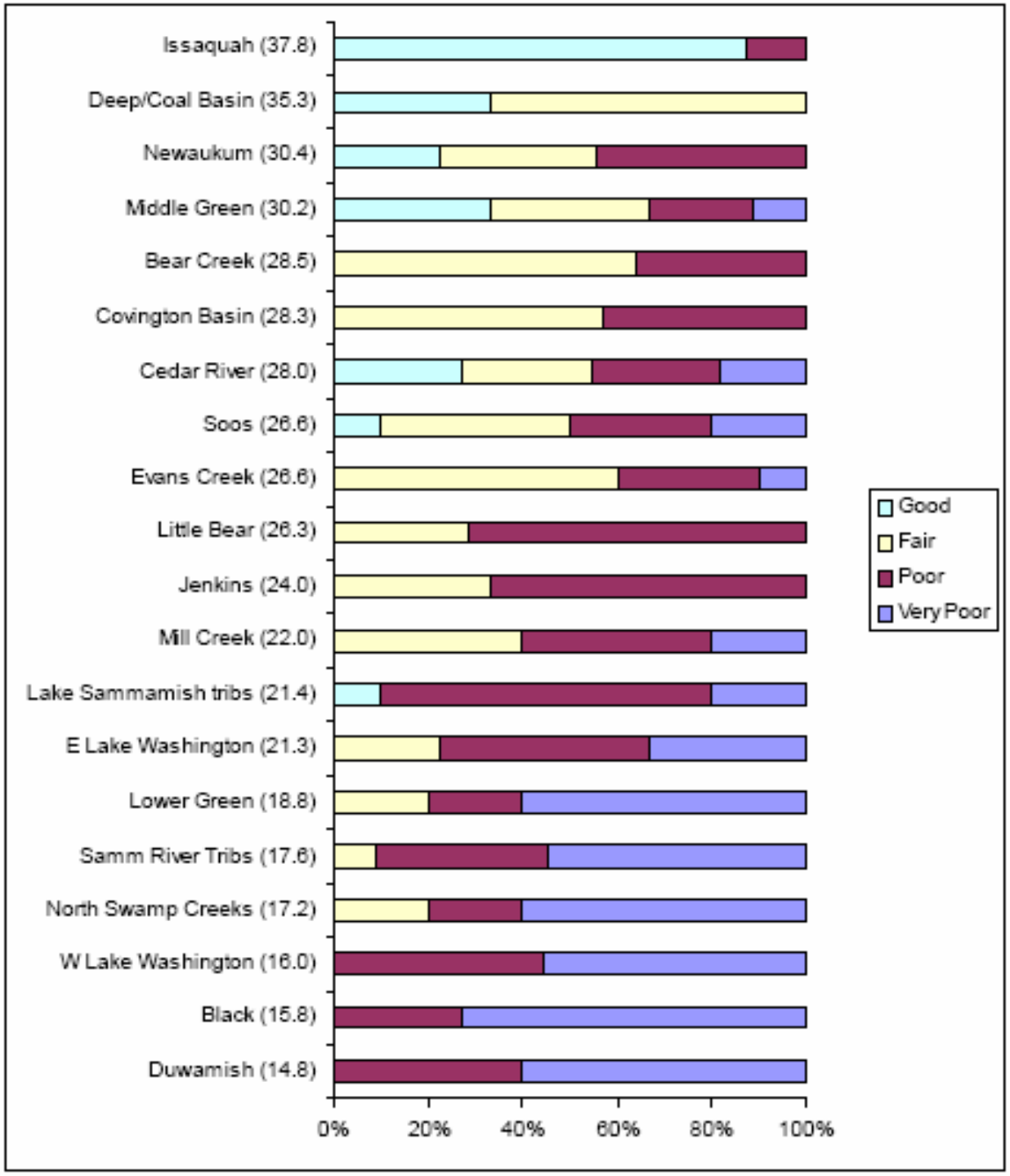
B-IBI

B-IBI Score	Condition of Biological Integrity
46-50	Excellent
38-44	Good
28-36	Fair
18-26	Poor
10-16	Very Poor

Analysis

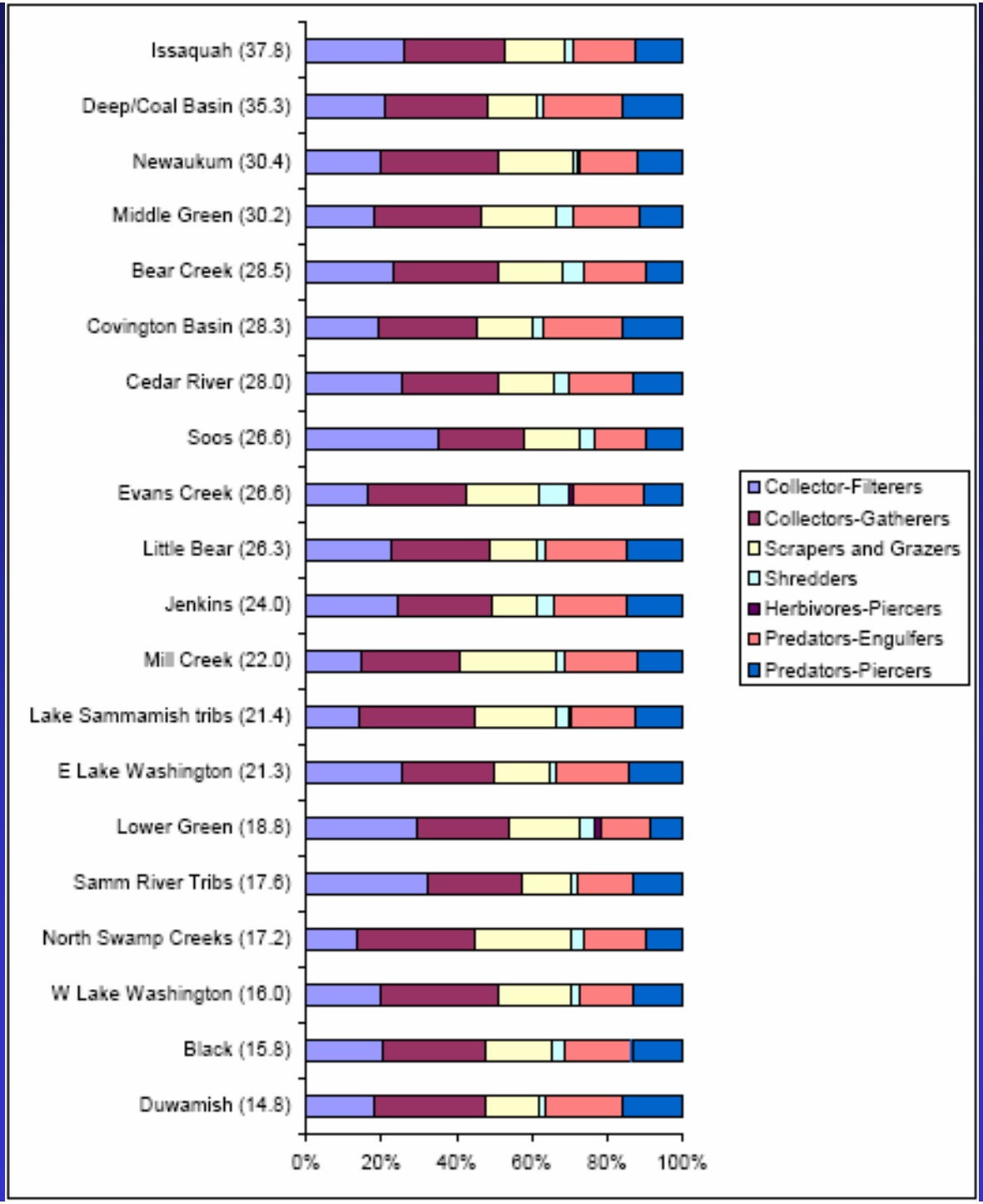
- EVS Consultants
  - B-IBI by basin
  - Other indices
  - Correlations w/
    - Land use
    - Water quality
    - Habitat
    - Flow



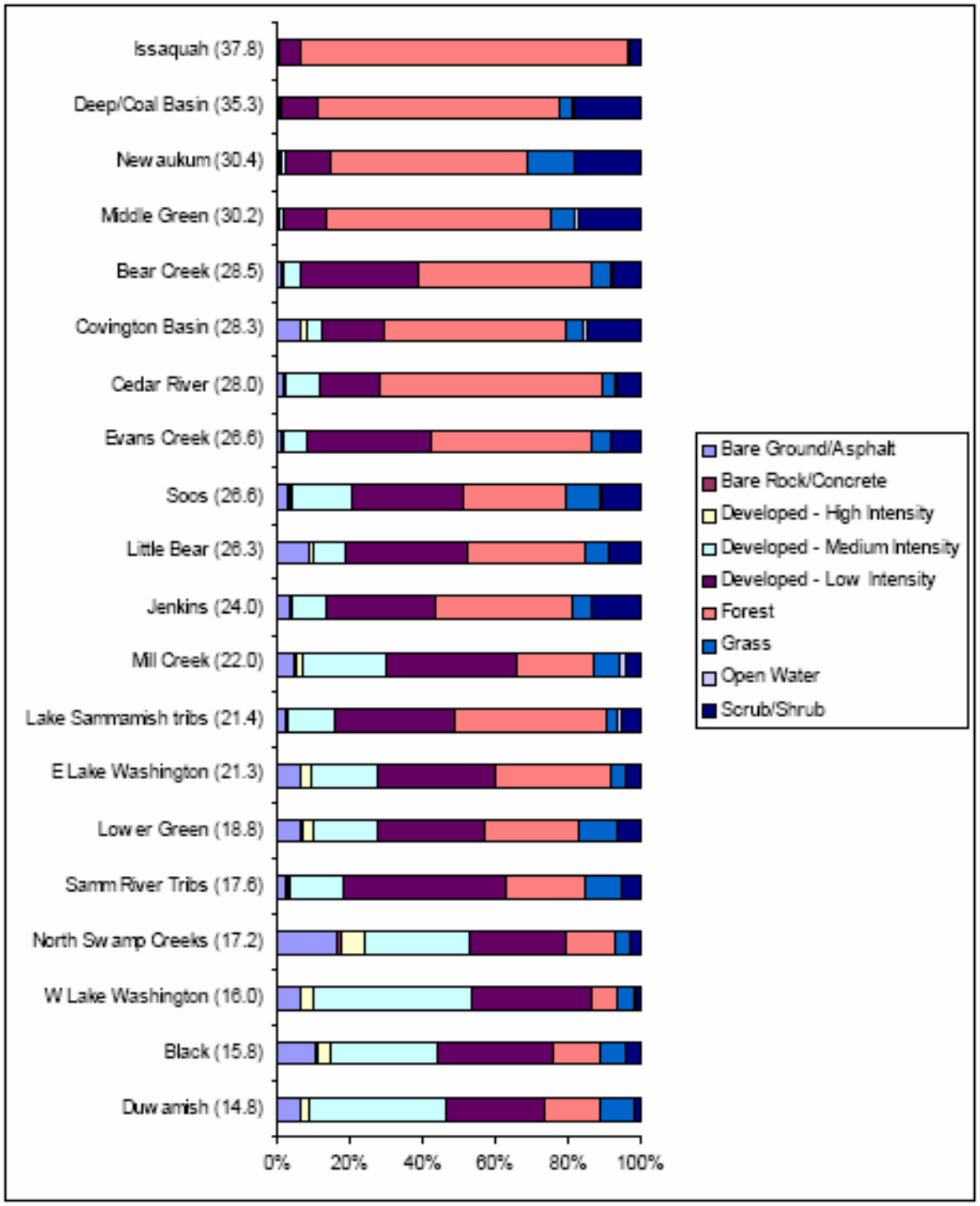


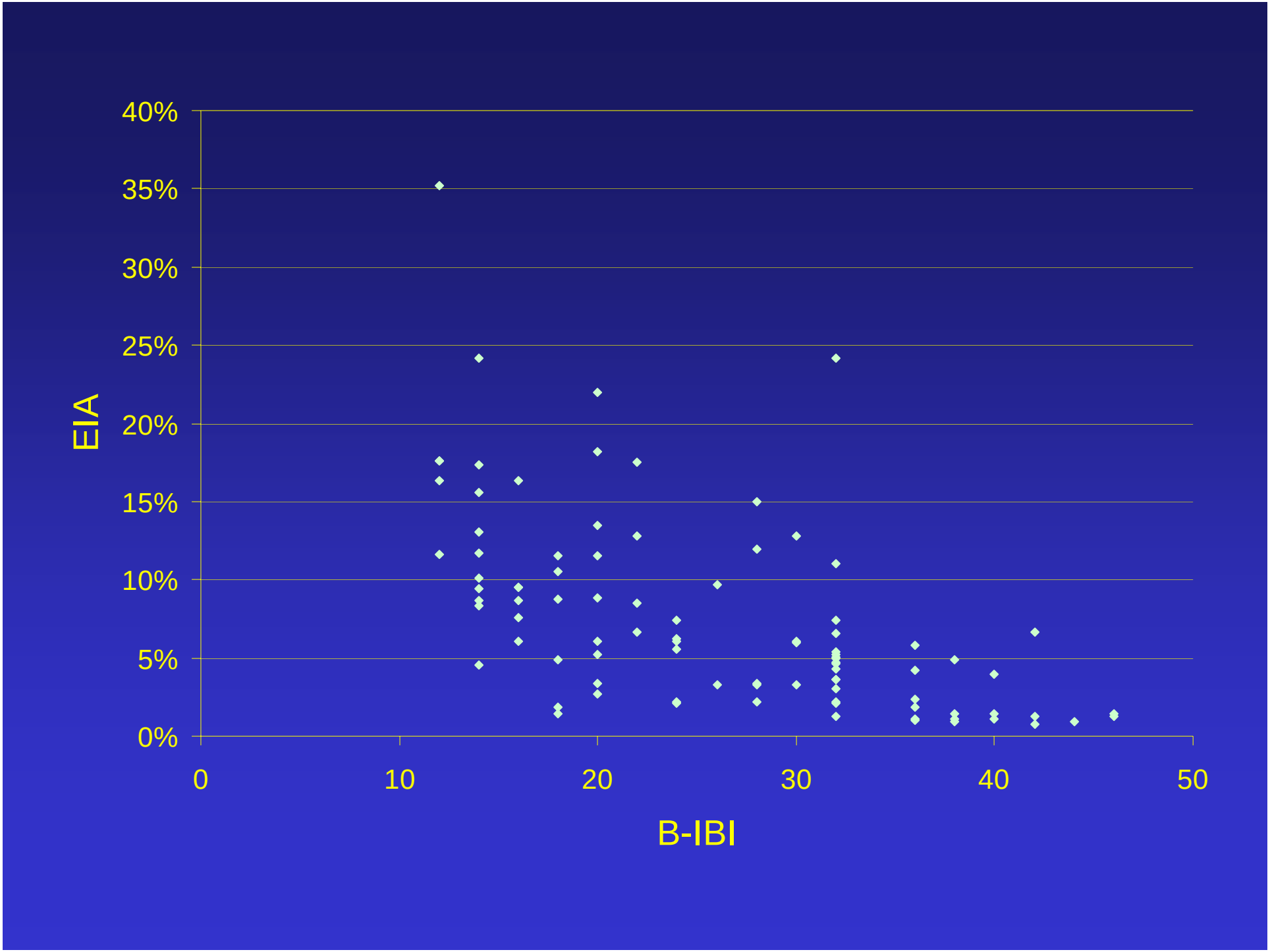
Mean Percentage Rankings

Functional Feeding Groups



Land Use


Issaquah (37.8)
Deep/Coal Basin (35.3)
Newaukum (30.4)
Middle Green (30.2)
Bear Creek (28.5)
Covington Basin (28.3)
Cedar River (28.0)
Evans Creek (26.6)
Soos (26.6)
Little Bear (26.3)
Jenkins (24.0)
Mill Creek (22.0)
Lake Sammamish tribs (21.4)
E Lake Washington (21.3)
Lower Green (18.8)
Samm River Tribs (17.6)
North Swamp Creeks (17.2)
W Lake Washington (16.0)
Black (15.8)
Duwamish (14.8)
0%
20%
40%
60%
80%
100%
Bare Ground/Asphalt
Bare Rock/Concrete
Developed - High Intensity
Developed - Medium Intensity
Developed - Low Intensity
Forest
Grass
Open Water
Scrub/Shrub


40%
35%
30%
25%
20%
15%
10%
5%
0%
EIA
0
10
20
30
40
50
B-IBI

Future Work

- Finish 2002 report
- Prepare 2003 report
- Continue monitoring - new design
  - randomly selected sites
  - ~10 sites per subbasin
- Alternate watersheds by year
- Add Snoqualmie watershed?

In Memoriam

Policy ⟷ Environment ⟷ Biology

Stormwater		Water Quality		Bugs
Development	⟷	Flow	⟷	Fish
CAO		Habitat		Wildlife
Etc.		Etc.		Etc.