Florida Fish and Wildlife Conservation Commission

Invertebrate Communities

as Tools for Establishing

Minimum Flows and Levels

in Florida Streams

Florida's Minimum Flows and Levels Statute (373.042 FS)

- Charges water management districts with establishing MFLs for water bodies within their boundaries.

- Defines MFLs as "the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area."

- Calculated using "best available information."

The Role of FWC in the Determining Minimum Flows and Levels

- Charged with protecting biological integrity of fish and wildlife communities in aquatic ecosystems.

- Present role is to advise and provide data.

- Developing science to enable us to provide "best available information" and propose specific flow regimes in specific systems.

Invertebrate Instream Flow Group Working Definition of "Significant Harm"

- Two Components

  - <u>Organismal</u>: measured deviation in species composition, population densities, or relative abundance of species outside the range of natural and seasonal variability.

  - <u>Habitat</u>: measured deviation of the areal extent or density of habitat outside the range of natural and seasonal variation.

The Role of Invertebrates in Freshwater Ecosystems

- **Food Web**: Essential to the transfer of energy from primary producers to tertiary consumers.

- **Ecosystem Processes**: Metabolic activities vital to decomposition and nutrient cycling.

- **Ecological Indicators**: Invertebrate community structure is indicative of past and present habitat conditions and overall environmental health.

Why Use Invertebrate Communities?

- **<u>Sessile</u>:** unable to escape disturbance; community structure reflective of prevailing environmental conditions.

- **<u>Long-lived</u>:** life cycles usually one year or more; given suitable environmental conditions, communities survive at a location indefinitely.

- **<u>Flow sensitive</u>:** invertebrate communities require greater current velocities than fish communities.

- **<u>Easily sampled</u>:** habitat-specific, quantitative.

Flow Sensitive Invertebrates
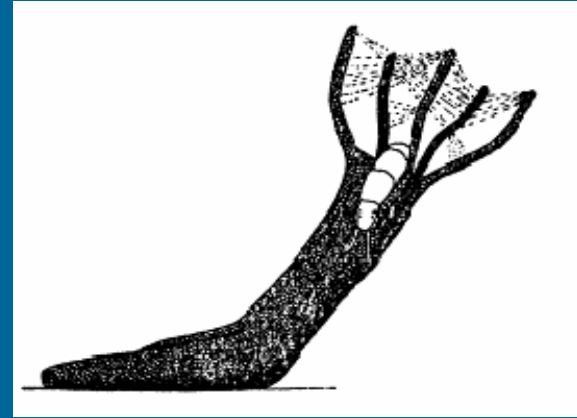
Objectives

- Document existing (baseline) structure of invertebrate assemblages for the Santa Fe, Withlacoochee, and Ichetucknee Rivers.

- Assemble a database suitable for comparison with future data collections.

- Determine flow sensitive invertebrate taxa and their responses to changes in flow.

Objectives

- Integrate biological and physical data to develop habitat suitability curves.

- Utilize methods of "Instream Flow Incremental Methodology" (IFIM) and Physical Habitat Simulation (PHABSIM) to quantify habitat availability as a function of discharge.

- Determine optimum flow conditions to maintain suitable lotic habitats for invertebrate communities.