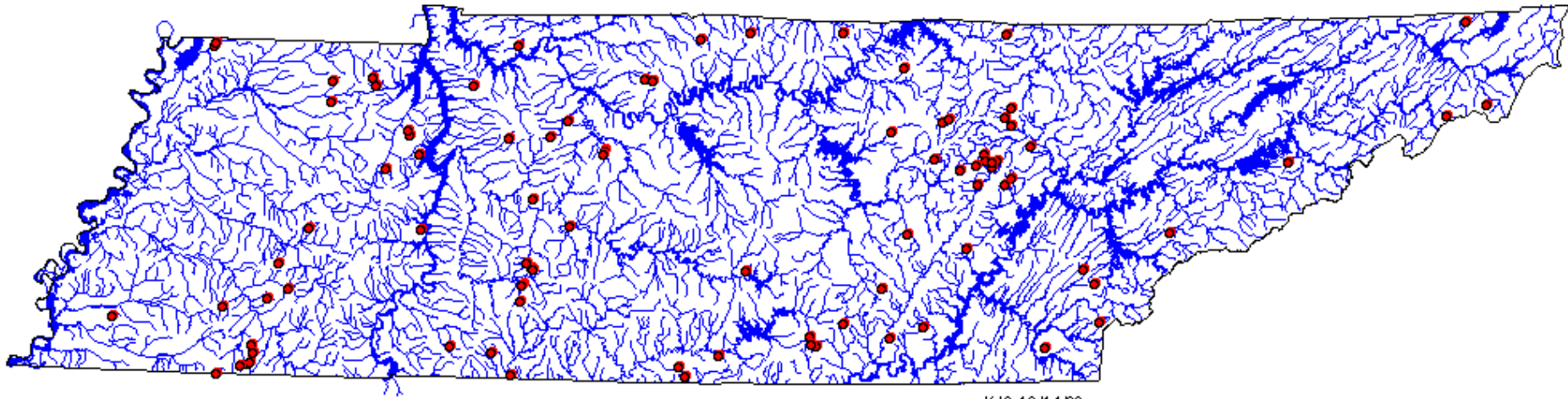


# 75 Sites Randomly Selected for the Study



KJS 10/14/03

• Final site selection

# Suitable habitat to use TDEC's semi-quantitative protocols

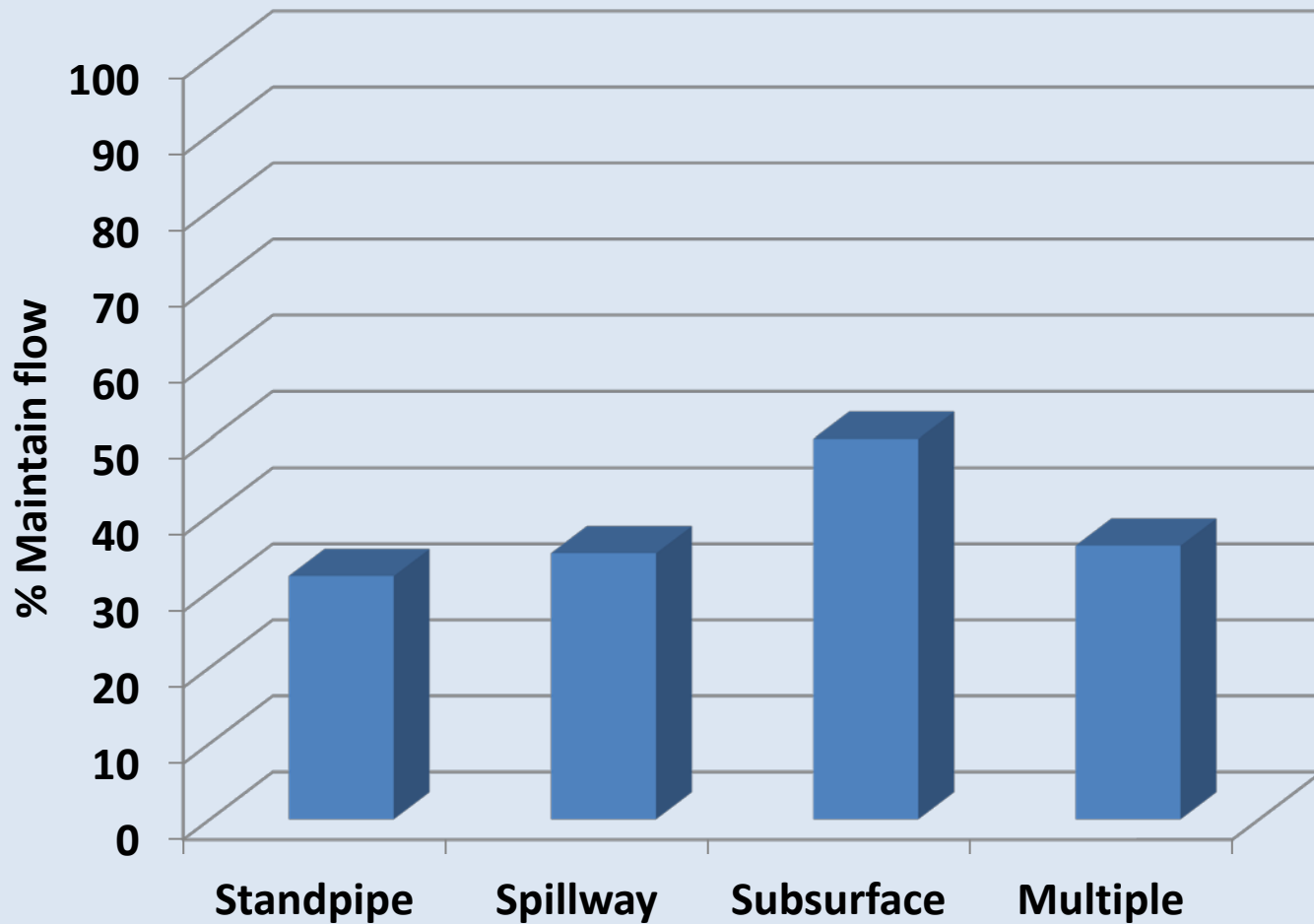


**Riffle Kicks**

**Rooted Bank Habitat**



# Comparison of discharge types

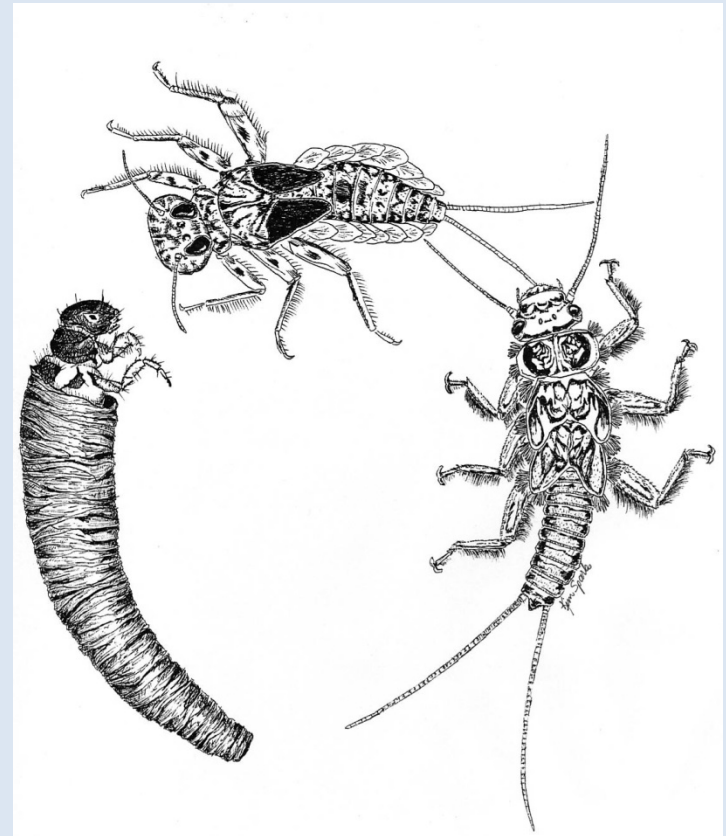


# Macroinvertebrate Samples

Semi-quantitative Single Habitat Spring and Fall

Tennessee Macroinvertebrate Index (TMI)

- Taxa Richness
- EPT Richness
- %EPT
- %OC
- NCBI
- %Dominant
- %Clingers
- **Ky % Nutrient Tolerant**





# Field Parameters

---

- Flow
- Dissolved Oxygen
- Temperature
- pH



# Chemical Analysis

---

- Total Suspended Solids (TSS)
- Nutrients
  - Total Phosphorus
  - Total Ammonia
  - Total Kjeldahl Nitrogen
  - Nitrate+nitrite
- Metals
  - Iron
  - Manganese



# Iron and Manganese

**61% of sites  
above  
recommended  
iron criterion of  
1000  $\mu\text{g}/\text{L}$**

**93% of sites  
above reference  
levels for  
manganese**





# Benthic Community Structure

---

- 96% failed # distinct EPT taxa
- 86% failed %EPT
- 87% failed taxa richness
- 76% failed NCBI
- 58% failed %OC
- 67% failed %Cling
- 43% failed %Dom
  - Fall Trichopteran *Cheumatopsyche*
  - Spring Chironomid *Parametriocnemus*





# Flow

---

- Seasonality
  - 52% insufficient flow for FAL at least one season
  - 25% no flow at least one season
- Stream Order
  - 1<sup>st</sup> Order 43% insufficient flow
  - 2<sup>nd</sup> Order 38% insufficient flow
  - Larger Order 21% insufficient flow



# Nutrients

---

- Total Phosphorus
  - 75% exceeded guidelines
- Total Ammonia
  - 81% exceeded Ref Data
- Total Kjeldahl Nitrogen
  - 65% exceeded Ref Data
- Nitrate+nitrite
  - 41% exceeded guidelines