Congaree Swamp Survey

Species Diversity and Condition of the Fish Community in the Congaree Swamp National Monument

Leo Rose
Project Goals

• Inventory the fish in the COSW
• Determine the relative health of the fish community
• Assemble a permanent collection of fish and link this to a public display
• Develop a GIS-based database
Electrofishing Gear
Electrofishing Shank’s Creek
Collected Species

- American eel
- Banded pygmy sunfish
- Banded sunfish
- Blackbanded sunfish
- Bluegill
- Bluehead chub
- Bluespotted sunfish
- Brook silverside
- Chain pickerel
- Coastal shiner
- Creek chubsucker
- Dollar sunfish
- Dusky shiner
- Eastern mudminnow
- Flier
- Golden shiner
- Green sunfish
- Largemouth bass
- Lined topminnow
- Longnose gar
- Margined madtom
- Mosquitofish
- Mud sunfish
- Pirate perch
- Redbreast sunfish
- Redear sunfish
- Redfin pickerel
- Sailfin shiner
- Sawcheek darter
- Seagreen darter
- Spotted sucker
- Spotted sunfish
- Swampfish
- Tadpole madtom
- Tessellated darter
- Warmouth
- Whitefin shiner
- Yellow bullhead
- Yellow perch
- Yellowfin shiner
Determining Relative Health

• Develop an Index of Biotic Integrity (IBI)
  – A method that uses key biological metrics to compare fish communities
  – Metrics need to be eco-region specific

IBI Metrics
- Number of Species
- Number of Darter Species
- Number of Sunfish Species
- Number of Sucker Species
- Number of Intolerant Species
- Number of Individuals
- Percent Green Sunfish
- Percent Omnivores
- Percent Insectivorous cyprinids
- Percent Piscivores
- Percent Hybrids
- Percent with Anomalies
Hypothetical range of sensitivity to degradation for each metric included in the IBI
Scoring The IBI

• 1, 3, or 5 for each metric
• Scores are totaled to give one index number for each stream (IBI)
• IBI relates to stream class

<table>
<thead>
<tr>
<th>Stream Class</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>53 - 60</td>
</tr>
<tr>
<td>Good</td>
<td>45 - 52</td>
</tr>
<tr>
<td>Fair</td>
<td>36 - 44</td>
</tr>
<tr>
<td>Poor</td>
<td>23 - 35</td>
</tr>
<tr>
<td>Very Poor</td>
<td>12 - 23</td>
</tr>
</tbody>
</table>
Species Richness Metric Data

Species No.
Darters Spp.
Sunfish Spp.

MYERS CR | SHANKS CR | TAVERN CR | TOMS CR
Species No. | Species No. | Species No. | Species No.
Database Relationships

- **Stream Data**
  - Stream_Index
  - PNAME
  - Rch_code
  - County
  - Quadrangle
  - Access_Road
  - Access_Creek
  - Access_Location
  - Contact_Name
  - Contact_Number
  - Access_Notes
  - Latitude
  - Longitude
  - Habitat_Condition
  - Habitat_Assessment_Value
  - Habitat_Notes
  - Stream_Class
  - River_Basin
  - Substrate
  - Depth
  - Width
  - Date
  - Notes
  - Photo_1
  - Within_COSW
  - Selected
  - Sampled
  - Photo_2
  - Photo_3

- **Site Data**
  - Site_Index
  - Stream_Index
  - Form_name
  - Present
  - Date
  - Method
  - Block_nets
  - Pass_number
  - Start_time
  - End_time
  - Shock_time
  - Distance
  - Riffles
  - Pools
  - Runs
  - Snags
  - Submerged_Macrophytes
  - Other
  - Conductivity
  - Specific_Conductivity
  - Temperature
  - Dissolved_Oxygen
  - Percent_DO
  - pH
  - FINS
  - Valid
  - Notes

- **Collection Data**
  - Collection_Index
  - Date_Added
  - Jar_Location
  - Who_ID
  - Notes

- **Fish Data**
  - Site_Index
  - Species_Code
  - Length
  - Collection_Index
  - ID_Pending
  - Anomalie_Code

- **SC Freshwater Fish**
  - Num
  - Family_Name
  - Scientific_Name
  - Common_Name
  - Species_Code
  - Trophic
  - Tolerance
  - YOY_Max_Length
  - Introduced
  - Type
  - Photo01
  - Photo02
  - Photo03
  - Photo04

- **Anomalies**
  - Anomalie_Code
  - Anomalie
## COSW Database Tables

<table>
<thead>
<tr>
<th>Stream_Index</th>
<th>Location</th>
<th>Rch_code</th>
<th>County</th>
<th>Quadrangle</th>
<th>Access_Rd</th>
<th>Access_Creek</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUCKHEAD CR</td>
<td>Calhoun</td>
<td>03050110000338</td>
<td>Wateree, S.C.</td>
<td>paved</td>
<td>easy</td>
<td>Lang Syne Rd bridge</td>
</tr>
<tr>
<td>MYERS CR</td>
<td>Richland</td>
<td>03050110001019</td>
<td>Gadsden, S.C.</td>
<td>paved</td>
<td>moderate</td>
<td>Old Bluff Hwy bridge</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Site_Index</th>
<th>Form_name</th>
<th>Present</th>
<th>Date</th>
<th>Method</th>
<th>Block</th>
<th>Pass</th>
<th>Start_time</th>
<th>End_time</th>
<th>Shock_time</th>
<th>Distance</th>
<th>Riffles</th>
<th>Pol</th>
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<tbody>
<tr>
<td>17</td>
<td>Leo Rose</td>
<td>LR; JB; JMB</td>
<td>11/3/2000</td>
<td>Back Pack</td>
<td>both</td>
<td>1</td>
<td>12:20:00 PM</td>
<td>12:45:00 PM</td>
<td>1546</td>
<td>100</td>
<td>0%</td>
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<tr>
<td>18</td>
<td>Leo Rose</td>
<td>LR; JB; JMB</td>
<td>11/3/2000</td>
<td>Back Pack</td>
<td>both</td>
<td>2</td>
<td>1:40:00 PM</td>
<td>2:00:00 PM</td>
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<td>19</td>
<td>Leo Rose</td>
<td>LR; JB; JMB</td>
<td>11/3/2000</td>
<td>Back Pack</td>
<td>both</td>
<td>3</td>
<td>2:25:00 PM</td>
<td>3:00:00 PM</td>
<td>1145</td>
<td>100</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>

| TAVERN CR  | Sumter       | 03050110000162 | Lone Star, South Carolina | dirt (4wd) | difficult | Behind Milford |
| SHANKS CR  | Sumter       | 03050110000821 | Poinsett State Park, S.C. | dirt (4wd) | moderate | Poinsette State Pa |
| BOGGY GUT  | Richland    | 03050110000716 | Fort Jackson South, S.C. | dirt | moderate | Millaree Hunt Club |
| CATES CR   | Richland    | 03050110000893 | Eastover, S.C. | dirt | difficult | 200 to 300m downstream |
| BATES MILL CR  | Calhoun | 03050110000331 | St. Matthews, South Carolina | paved | moderate | Old Belleville Rd bridge |
| TOMS CR    | Richland    | 0305011000036  | Wateree, S.C. | dirt (4wd) | moderate | Kingville Hunt Club |

| 9           | Leo Rose    | LR; JB; JC     | 10/25/2000  | Back Pack | both | 1    | 10:45:00 AM | 11:34:00 AM | 2026       | 100      | 0%      |
| 10          | Leo Rose    | LR; JB; JC     | 10/25/2000  | Back Pack | both | 2    | 12:06:00 PM | 12:40:00 PM | 1832       | 100      | 0%      |
| 11          | Leo Rose    | LR; JB; JC     | 10/25/2000  | Back Pack | both | 3    | 1:01:00 PM  | 1:30:00 PM  | 1213       | 100      | 0%      |

| BIG BEAVER CR | Calhoun     | 030501100000323 | Saylors Lake, S.C. | paved | moderate | 176 bridge |

| 14          | Leo Rose    | LR; JB; JML    | 11/1/2000   | Back Pack | both | 1    | 12:15:00 PM | 12:40:00 PM | 2503       | 100      | 15%     |
| 15          | Leo Rose    | LR; JB; JML    | 11/1/2000   | Back Pack | both | 2    | 1:25:00 PM  | 1:48:00 PM  | 860        | 100      | 15%     |
| 16          | Leo Rose    | LR; JB; JML    | 11/1/2000   | Back Pack | both | 3    | 2:20:00 PM  | 2:40:00 PM  | 909        | 80      | 15%     |

| WESTON LAKE (upper) | Richland | 03050110000081 | Gadsden, S.C. | dirt | easy | Within COSW |
| TAVERN CR      | Sumter    | 0305011000162  | Poinsett State Park, S.C. | dirt | easy | Milford Plantation P |
| FULLERS EARTH CR | Sumter    | 0305011000163  | Poinsett State Park, S.C. | dirt | difficult | Milford Plantation P |
| CONGAREE SPRING BR | Calhoun | 03050110000342 | Gadsden, S.C. | paved | easy | Great Circle Rd bridge |
| LITTLE BEAVER CR | Calhoun   | 03050110000346 | Saylors Lake, S.C. | paved | difficult | 176 bridge |
Database Queries
Database Reports

Buckhead Creek

13th October 2000

<table>
<thead>
<tr>
<th>Fish #</th>
<th>188</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species #</td>
<td>24</td>
</tr>
</tbody>
</table>

- % Catfish: 2.68%
- % Darters: 3.19%
- % Suckers: 3.72%
- % Sunfish: 54.79%

- % Centrarchidae: 55.85%
- % Pisivores: 4.26%
- % Omnivores: 9.57%
- % Insectivores: 72.34%
- % Spec Insec: 13.83%
- % Tolerant: 19.15%
- % Moderate: 80.85%
- % Intolerant: 0%

**Fish Tolerance Resistance**
-Moderate: 81%
-Tolerant: 19%

**Trophic Composition**
-Insectivore: 14%
-Omnivore: 4%
-Piscivore: 10%
-Spec Insect: 72%

**Species Composition**
-Darter: 54%
-Madtom: 3%
-Other: 3%
-Shiner: 27%
-Sucker: 9%
-Sunfish: 4%

**Catch Numbers**
-Fish #: 188
-Species #: 24
Congaree Swamp National Monument
Fish Inventory Sample Sites
Congaree Swamp National Monument
Fish Inventory Sample Sites
2001 Sampling Objectives

• Initiate sampling mid June
• Complete sampling in September (weather permitting)
• 30 sites have been selected
• Full-time summer assistant will be hired
• At least one public sampling day (Late July)
• Continue to develop database, GIS and fish reference collection
2001 Sampling Logistics

- 2001 Sampling Permit
- Access Concerns
- Possible sampling assistance from park staff
Summary

• 2000 Sampling objectives met
  – Stream sampling successful
  – Database developed
  – GIS developed and sites geo-referenced to database
  – Reference collection developed and linked to database

• 2001 Sampling plan developed
  – Sites selected
  – Sampling will begin mid June
Cedar Creek