

FIBI Sampling Location
Small Streams (1st and 2nd Order)
Large Streams (3rd Order and Above)





#### **SUMMARY OF RESULTS - FIBI031**



North Branch Raritan River 1. Stream Name: 08/01/2001 2. Sampling Date: Easton Tpk. (40 36 00N; 74 40 24W) 3. Sampling Location: Bridgewater Twp. 4. Municipality Somerset 5. County: 6. Watershed Management Area: 7. Contributing Drainage Area (Sq. Mi.): 172.7 FW2-NT 8. Stream Water Quality Class: 9. FIBI Rating: Good (42) (See Appendix 3) Optimal (160) (See Appendix 3) 10. Habitat Assessment Rating: Yes 11. Fishable Species Present: 12. Relevant AMNET<sup>1</sup> Station Data: Proximity of FIBI station to AMNET station: 2.47 mi. upstream of AN0374 1990-Non-Impaired; 1999-Non-Impaired AMNET Rating: 13. Stream Chemistries: Dissolved Oxygen (mg/l) 9.4 Temperature <sup>0</sup>C. 21.3 7.9 pН Conductivity (µmhos/cm) 281 14. Number of Fish With Anomalies: 150 meters (492 feet) 15. Length of Stream Segment Sampled 16. Water Clarity: Clear 43% 17. Average Forest Open Canopy: 39.2 18. Discharge (ft.<sup>3</sup>/sec.): 30% Gravel/Sand, 50% Cobble, 20% Silt 19. Substrate: (qualitative) 10% Riffle, 60% Run, 30% Pool 20. Habitat Type: (qualitative) N/A 21. Other observations:

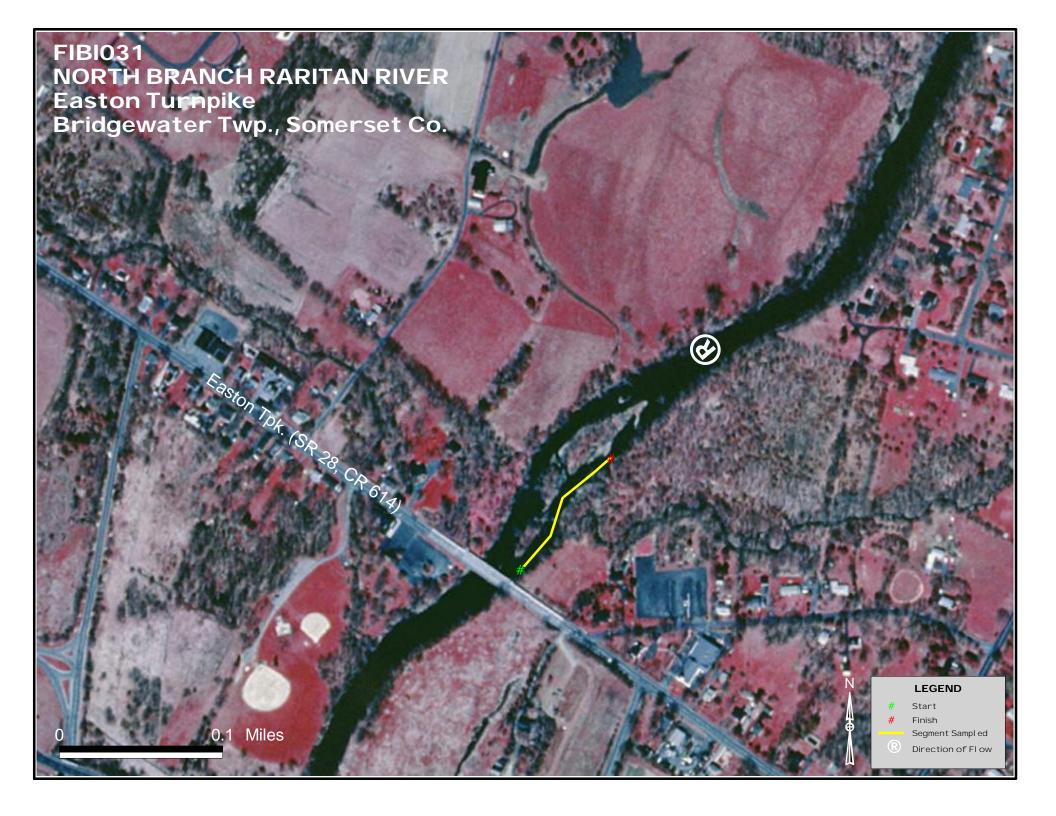
22. Number of Fish Species Identified: (see next page)

23. Total Number of Fish Collected:

23

813

<sup>&</sup>lt;sup>1</sup> AMNET is the acronym for the DEP's ambient benthic macroinvertebrate monitoring network – a series of 820 monitoring stations located throughout the state's waterways that collects data on the health of bottom dwelling stream fauna which in turn is used to assess general water quality.



| FIBI031 - N. Branch Raritan River @ Cl<br>Date Sampled - 8/01/2001                   | R 614                   | Excellent         | Good     | Fair  | Poor |
|--|-------------------------|-------------------|----------|-------|------|
|  |                         |                   |          | Score | _    |
| # of Fish Species  |                         |                   |          | 5     |      |
| # of Benthic Insectivorous Species (BI)  |                         |                   |          | 5     |      |
| # of Trout and Centrarchid Species (trout  | t, bass, sunfish,       | , crappie)        |          | 5     | ]    |
| # of Intolerant Species (IS)   |                         |                   |          | 5     | ]    |
| Proportion of Individuals as White Sucke   | rs                      |                   |          | 3     | ]    |
| Proportion of Individuals as Generalists (   | carp, creek chub, b     | oanded killifish, |          | 5     | ]    |
| goldfish, fathead minnow, green sunfish)  Proportion of Individuals as Insectivorous | s <b>Cyprinids</b> (I a | and BI)           |          | 3     | ]    |
| Proportion of Individuals as Trout OR  | *whicheve               | er gives bette    | er score |       |      |
| Proportion of Individuals as Pisciviores (E  | Excluding Amer          | ican Eel)*        |          | 1     |      |
| Number of Individuals in Sample  |                         |                   |          | 5     |      |
| Proportion of Individuals w/disease/anom   | nalies (excludinç       | g blackspot)      |          | 5     |      |
| Total  |                         |                   |          | 42    |      |
|  |                         |                   |          |       |      |

#### **Stream Rating**

45-50 Excellent37-44 Good29-36 Fair10-28 Poor

#### HABITAT ASSESSMENT FOR *HIGH* GRADIENT STREAMS North Branch Raritan River (FIBI031) – 8/1/01

|  |   | Condition  | Category  |   |
|--|---|--|---|---|
|  | Optimal   | Suboptimal   | Marginal  | Poor  |
| 1. Epifaunal Substrate<br>/Available Cover   | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).         | 40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).                | 20-40% mix of stable habitat;<br>habitat availability less than<br>desirable; substrate frequently<br>disturbed or removed.   | Less than 20% stable habitat; laci<br>of habitat is obvious; substrate<br>unstable or lacking.  |
| SCORE 18   | 20 19 18 17 16  | 15 14 13 12 11   | 10 9 8 7 6  | 5 4 3 2 1 0   |
| 2. Embeddedness  | Gravel, cobble, and boulder<br>particles are 0-25% surrounded<br>by fine sediment. Layering of<br>cobble provides diversity of niche<br>space   | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.  | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.   | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.  |
| SCORE 16   | 20 19 18 17 <b>16</b>   | 15 14 13 12 11   | 10 9 8 7 6  | 5 4 3 2 1 0   |
| 3. Velocity/Depth Regimes  | All 4 velocity/depth regimes<br>present (slow-deep, slow-shallow,<br>fast-deep, fast-shallow).<br>(slow is <0.3 m/s, deep is >0.5 m)  | Only 3 of the 4 regimes present<br>(if fast-shallow is missing, score<br>lower than if missing other<br>regimes).  | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).   | Dominated by 1 velocity / depth regime (usually slow-deep).   |
| SCORE 14   | 20 19 18 17 16  | 15 14 13 12 11   | 10 9 8 7 6  | 5 4 3 2 1 0   |
| 4. Sediment Deposition   | Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.   | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.                     |
| SCORE 17   | 20 19 18 17 16  | 15 14 13 12 11   | 10 9 8 7 6  | 5 4 3 2 1 0   |
| 5. Channel Flow Status   | Water reaches base of both lower<br>banks, and minimal amount of<br>channel substrate is exposed.   | Water fills >75% of the available channel; or <25% of channel substrate is exposed.  | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.  |
| SCORE 15   | 20 19 18 17 16  | 15 14 13 12 11   | 10 9 8 7 6  | 5 4 3 2 1 0   |
| 6. Channel Alteration  | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.  | Channelization may be extensive;<br>embankments or shoring<br>structures present on both banks;<br>and 40 to 80% of stream reach<br>channelized and disrupted.  | Banks shored with gabion or<br>cement; over 80% of the stream<br>reach channelized and disrupted.<br>In stream habitat greatly altered<br>or removed entirely.  |
| SCORE 17   | 20 19 18 17 16  | 15 14 13 12 11   | 10 9 8 7 6  | 5 4 3 2 1 0   |
| 7. Frequency of Riffles (or bends)   | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.      | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.  | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.   | Generally all flat water or shallow<br>riffles; poor habitat; distance<br>between riffles divided by the<br>width of the stream is a ratio of<br>>25.   |
| SCORE 15   | 20 19 18 17 16  | 15 14 13 12 11   | 10 9 8 7 6  | 5 4 3 2 1 0   |
| 8. Bank Stability (score<br>each bank)<br>Note: determine left<br>or right side by facing<br>downstream. | Banks stable; evidence of erosion<br>or bank failure absent or minimal;<br>little potential for future<br>problems. <5% of bank affected.   | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   | Moderately unstable; 30-60% of<br>bank in reach has areas of<br>erosion; high erosion potential<br>during floods.   | Unstable; many eroded areas;<br>"raw" areas frequent along<br>straight sections and bends;<br>obvious bank sloughing; 60-<br>100% of bank has erosional scars   |
| SCORE5 (LB)<br>SCORE5 (RB)   | Left Bank 10 9<br>Right Bank 10 9   | 8 7 6<br>8 7 6   | 4 3 4 3   | 2 1 0<br>2 1 0  |
| 9. Bank Vegetative Protection (score each bank)  | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, under story shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank<br>surfaces covered by vegetation;<br>disruption obvious; patches of<br>bare soil or closely cropped<br>vegetation common; less than<br>one-half of the potential plant<br>stubble height remaining.               | Less than 50% of the streambank<br>surfaces covered by vegetation;<br>disruption of streambank<br>vegetation is very high;<br>vegetation has been removed to<br>5 centimeters or less in average<br>stubble height. |
| SCORE10 (LB)   | Left Bank 0 9   | 8 7 6  | 5 4 3   | 2 1 0   |
| SCORE10(RB)  10. Riparian Vegetative Zone Width (score each bank riparian                                | Right Bank 9  Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not  | 8 7 6 Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   | 5 4 3 Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.   | 2 1 0 Width of riparian zone <6 meters little or no riparian vegetation du to human activities.   |
| zone)  | impacted zone.  |  | 5 4 3   | 2 1 0   |
| SCORE8 (LB)  | Left Bank 10 9  | 8 7 6  |   | 2 1 0   |

HABITAT SCORE

160

| HABITAT SCORES | VALUE     |
|----------------|-----------|
| OPTIMAL        | 160 C 200 |
| SUB-OPTIMAL    | 110 C 159 |
| MARGINAL       | 60 C 109  |
| POOR           | < 60      |

# FIBI031 08/01/01 NORTH BRANCH RARITAN RIVER

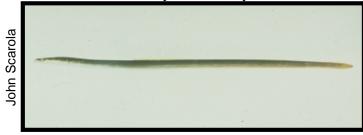
#### LISTED IN ORDER OF ABUNDANCE FOUND

| COMMON NAME            | SCIENTIFIC NAME        | # FOUND | SIZE RANGE<br>(INCHES) |
|------------------------|------------------------|---------|------------------------|
| Longnose Dace          | Rhinichthys cataractae | 296     |                        |
| Tesselated Darter      | Etheostoma olmstedi    | 181     |                        |
| White Sucker*          | Catostomus commersoni  | 147     |                        |
| Spottail Shiner        | Notropis hudsonius     | 45      |                        |
| American Eel*          | Anguilla rostrata      | 39      |                        |
| Redbreast Sunfish*     | Lepomis auritus        | 33      | 2.4 - 7.1              |
| Margined Madtom        | Noturus insignis       | 15      |                        |
| Shield Darter          | Percina peltata        | 14      |                        |
| Rock Bass*             | Ambloplites rupestris  | 11      | 3.9 - 6.3              |
| Smallmouth Bass*       | Micropterus dolomieu   | 9       | 2.6 - 9.8              |
| Green Sunfish*         | Lepomis cyanellus      | 4       | 2.5 - 3.8              |
| Yellow Bullhead*       | Ameiurus natalis       | 3       | 8.3 - 9.8              |
| Pumpkinseed*           | Lepomis gibbosus       | 3       |                        |
| Spotfin Shiner         | Cyprinella spiloptera  | 3       |                        |
| Common Shiner          | Luxilus cornutus       | 2       |                        |
| Comely Shiner          | Notropis amoenus       | 1       |                        |
| Blacknose Dace         | Rhinichthys atratulus  | 1       |                        |
| American Brook Lamprey | Lampetra appendix      | 1       |                        |
| Yellow Perch*          | Perca flavescens       | 1       | 2.2                    |
| Largemouth Bass*       | Micropterus salmoides  | 1       | 3.9                    |
| Swallowtail Shiner     | Notropis procne        | 1       |                        |
| Carp*                  | Cyprinus carpio        | 1       |                        |
| Banded Killifish       | Fundulus diaphanus     | 1       |                        |

<sup>\*</sup> Regulated as a fishable species under current New Jersey Fish and Wildlife codes

FIGURE 1.1 (Not To Scale)





**Blacknose Dace** 

John Scarola

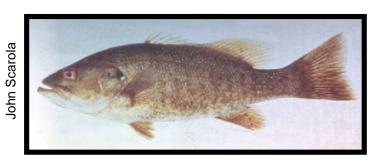
**American Eel** 



**White Sucker** 



**Spotfin Shiner** 



**Smallmouth Bass** 

### FIGURE 1.1 (Not To Scale)



**Pumpkinseed** 



**Redbreast Sunfish** 



**Shield Darter** 



**Green Sunfish** 



**Comely Shiner** 



**Common Shiner** 

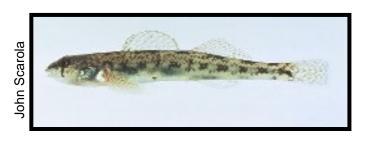
## FIGURE 1.1 (Not To Scale)



**Rock Bass** 



Yellow Bullhead



**Tesselated Darter** 



**Spottail Shiner** 



**Margined Madtom** 



**Longnose Dace** 

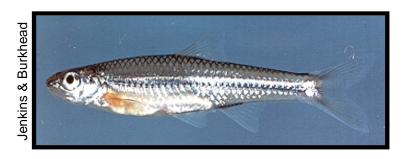
### FIGURE 1.1 (Not To Scale)



**Yellow Perch** 



Largemouth Bass



**Swallowtail Shiner** 



**American Brook Lamprey** 



**Banded Killifish**