

SUMMARY OF RESULTS – FIBI017a



1. Stream Name:	South Branch Rahway River
2. Sampling Date:	9/28/05
3. Sampling Location:	Merill Park
4. Municipality:	Woodbridge Twp.
5. County:	Middlesex
6. Watershed Management Area:	7
7. Contributing Drainage Area (Sq. Mi.):	7.6
8. Electrofishing Gear:	2 Backpacks
9. FIBI Score and Rating:	Round 1 N/A; Round 2 Poor (24)
10. Habitat Score and Rating:	Round 1 N/A; Round 2 Marginal (77)
11. Fishable Species Present:	
12. Relevant AMNET ¹ Station Data:	
Proximity of FIBI station to AMNET station:	140m upstream AN0201
AMNET Rating:	1999 – Moderate 2004-Moderate
13. Stream Chemistries:	
Dissolved Oxygen (mg/l)	7.71
Temperature ⁶ C.	16.26
PH	7.54
Conductivity (µmhos/cm)	605
14. Length of Stream Sampled:	150m
15. Water Clarity:	Slightly Turbid
16. Average Open Forest Canopy:	31.5%
17. Discharge:	1.3 cfs
18. Substrate:	62% Gravel/Sand, 10% Cobble, 1% Boulder, 5% Mud, 22% Silt
19. Habitat:	15% Riffle, 50% Run, 35% Pool
20. Snags:	Yes
21. Periphyton:	Slight
22. Submerged Aquatic Vegetation	No
23. Outfalls:	1
24. Number of Fish Species Identified:	11
25. Total Number of Fish Collected:	566
26. Number of Fish With Anomalies:	19
27 Other Observations:	

27. Other Observations:

¹ 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.



FIBI017a-S.B. Rahway River @ Merill Park Date Sampled - 9/28/2005	K	Excellent	Good	Fair	Poor
# of Fish Species				Score 3	ן
# of Benthic Insectivorous Species (BI) (excluding White Suckers and Bullheads)				3]
# of Trout and Centrarchid Species (excluding Green Sunfish and Bluegill)				3]
# of Intolerant Species (IS)				1	ן
Proportion of Tolerant Individuals				1	נ
Proportion of Individuals as Generalists				1	נ
Proportion of Individuals as Insectivorous Cy	/prinids			1	נ
Proportion of Individuals as Trout OR	*whichever	gives better	score		
Proportion of Individuals as Piscivores (exclu	uding America	an Eel)*		3	ן
# of Individuals in Sample (excluding Tolerant Species)				5]
Proportion of Individuals w/disease/anomalie (excluding blackspot)	es			3]
Tatal				24	

Total

24

Stream Rating		
45-50	Excellent	
37-44	Good	
29-36	Fair	
10-28	Poor	

HABITAT ASSESSMENT FOR *HIGH* GRADIENT STREAMS S. B. Rahway River (FIBI017a) – 9/28/05

Optimal Subportial Marginal Parameter 1. refammed baberier Convert for 70% refammed for 20% refammed			Condition	Category	
I. Japimous Available Contraints weak states for aprillable and states for apping and s		Optimal		0.	Poor
2. Embodedness cmcd. colds. and boaldar particles are 25-78 surrounded by fine sediment. Grand- colds. and boaldar particles are 25-78 surrounded by fine sediment. Grand- colds. and boaldar particles are 25-78 surrounded by fine sediment. Grand- colds. and boaldar particles are 25-78 surrounded by fine sediment. Grand- colds. and boaldar particles are 25-78 surrounded Grand- colds. and boaldar particles are 25-78 surrounded by fine sediment. Grand- colds. and boaldar particles are 25-78 surrounded SCORE 13 30 18 17 16 14 11 10 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 <t< td=""><td></td><td>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 <u>not</u> new</td><td>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</td><td>habitat availability less than desirable; substrate frequently</td><td>of habitat is obvious; substrate</td></t<>		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 <u>not</u> new	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	habitat availability less than desirable; substrate frequently	of habitat is obvious; substrate
2. Dublodiedness puricies are 0.2% wirrunded by fine scalance Layving of anche by fine scalance Layving of anche low revises diverse low rev	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 <mark>6</mark>	5 4 3 2 1 0
3. Velocity/Depth Regime A. Velocity/Depth Regime A. Velocity/Depth Regime A. Velocity/Depth Regime A. Sediment Deposition Only 2 of the 4 briting regime bins with a missing occur by a first ballow or missing. score tows ballow are missing. score tows and or fine schemer; 5.5W (6.05.0% for low gradient) of the bottom affectal by schemer deposition in post. Deminant by 1 wheely. depth are missing. score tows ballow are missing. score tows and or fine schemer; 5.5W (6.05.0% for low gradient) of the bottom affectal by schemer deposition in post. Deminant by 1 wheely. depth are missing. score tows and of fine schemer; 5.5W (6.05.0% for low gradient) of the bottom affectal by schemer deposition in post. Deminant by 1 wheely. depth are missing. score tows and of fine schemer; 5.5W (6.05.0% for low gradient) of the bottom affectal by schemer deposition in post. Deminant affectal by schemer deposition. Deminant with a weet on the schemer; 5.5W (6.05.0% for low gradient) of the bottom affectal by schemer deposition in post. Deminant weet are mostly exposed. Deminant weet are missing score for the schemer deposition. SCORE 10 20 19 18 7 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 0 SCORE 11 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0	2. Embeddedness	particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche	particles are 25-50% surrounded	particles are 50-75% surrounded	particles are more than 75%
3. Velocity/Depth Regime fast deep, fast dealer, and up and the shallow set of an index decision. (if fast shallow in missing other regime). regime (mailing and missing other regimailing and missing other regime). regime (mailing	SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition Life or no calagement of islands or point kars and leads in the sedimetry of the submarks of the sedimetry of the sedimetry of the sedimetry of the point affects is shown of the sedimetry of the point affects is shown of the sedimetry of the point affects is shown of the sedimetry of the point affects is shown of the sedimetry of the point affects is shown of the sedimetry of the point affects is shown of the poin		present (slow-deep, slow-shallow, fast-deep, fast-shallow). (slow is <0.3 m/s, deep is >0.5 m)	(if fast-shallow is missing, score lower than if missing other regimes).	present (if fast-shallow or slow- shallow are missing, score low).	regime (usually slow-deep).
4. Sediment Deposition sistands or point brave and less than framation, mously from gradient) gradient of the scalinger less of the scalinger le	SCORE 13				
S. Channel Flow StatusWater reaches base of both lower banks, and minimal amount of channel abbarrate is exposed.Water fills $25-75\%$ of the available channel, and or riftle available channel, and riftle $25-75\%$ of the available channel, and or riftle available channel, and riftle available channel, and riftle $25-75\%$ of the available channel, and riftle $25-75\%$ of	4. Sediment Deposition	islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected	formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight	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.	increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment
5. Channel Flow Status banks, and minimal anound of status available channel, and or riffie. nordly present as standing pools. SCORE 11 20 19 18 17 10 15 14 13 12 10 10 9 8 7 6 5 4 3 2 1 0 6. Channel Alteration Channelization or dredging about or minimal, strum with normal pattern. Some channelization results of present, as stabilization results of present, as the result of present, a	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 <mark>6</mark>	5 4 3 2 1 0
Channel Atteration Channelization or dredging absent or minimal; stream with anter set of bridge absent or minimal; stream with anter set of bridge absent or minimal; stream with a pattern. Some channelization present, usually in areas of bridge absent or minimal; stream with a pattern. Some channelization resent, usually in areas of bridge absent or minimal; stream with a pattern. Banks shord with gabion or cement; over 80% of the stream banks is channelization present, usually in areas of bridge absent or minimal; stream with of the stream of the stream set of boulders or other large, natural observen riftes divided by the width of the stream is briven 7:1 (generally 5:1 to 15. Constant and the stream is briven rifts divided by the width of the stream is briven 7:1 (generally 5:1 to 15. Constant and the stream is briven rifts divided by the width of the stream is a ratio of stream reach fash divided by the width of the stream is a ratio of boulders or other large, natural observen rifts divided by the width of the stream is a ratio of stream babitar; distance between rifts divided by the width of the stream is a ratio of stream set of rosion. The portion the portion the portion of prime portion. Description of the stream is a ratio of stream reach fash divided by the width of the stream is a ratio of stream reach fash divided by the width of the stream is a ratio of stream reach fash divided by the width of the stream is a ratio of stream set of stream babitar; distance between riftes divided by the width of the stream is a ratio of stream reach fash divided by the width of the stream is a ratio of stream reach fash divided by the width of the stream is a ratio of stream babatar. Description the stream		banks, and minimal amount of channel substrate is exposed.	channel; or <25% of channel substrate is exposed.	available channel, and/or riffle substrates are mostly exposed.	mostly present as standing pools.
6. Channel Alteration absent or minimal; stream with normal pattern. usually in areas of bridge and threats: withenesis: without copy range by present, but recent channelization, i.e., dredging, thanelization, i.e., dredging, that water of shallow is the stream. To its is the stream of its strane. Image: the stream of its stream of its stream habitary dredge and the stream is a ratio of stream habitary dredge and the stream is a ratio of stream habitary dredge and the stream of the stream. SCORE 6 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Score 5 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Score 5 19 18 17 15 14	SCORE 11				
SCORE 18 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 infrequent; tidio of istance between riffles divided by with distance between riffles divided by the width of the stream is between 17 to 15. Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 17 to 25. Generally all flat water or shallow contarys provides some habitat; distance between riffles divided by the width of the stream is between 17 to 25. Generally all flat water or shallow contarys provides some habitat; by the width of the stream is a ratio of >25. SCORE 6 20 19 18 16 15 14 13 12 10 0 9. 7 6 5 4 3 2 1 0 SCORE 6 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 10 10 <	6. Channel Alteration	absent or minimal; stream with	usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization	embankments or shoring structures present on both banks; and 40 to 80% of stream reach	cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered
7. Frequency of Riffles (or berween riffles divided by with of the stream is by the with of the stream is a ratio of by the with of the stream is by the with of the stream is between riffles divided by with with of the stream is a ratio of 25. inffles spon habitat; distance between riffles divided by with with of the stream is a ratio of 25. SCORE 6 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 SCORE 6 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 SCORE 6 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Score 12 (B) 10 9 8 7 6 5 4 3 2 1 0 Score 2 (B) 10 9 8 7 6 5	SCORE 18	20 19 18 17 16		10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. Moderately stable; infrequent, small areas of erosion mostly headed over. 5-30% of bank in reach has areas of erosion; high erosion; high erosion potential during floods. Unstable; 30-60% of bank in reach has areas of erosion potential during floods. Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars. SCORE 2 (RB) Left 10 9 8 7 6 5 4 3 2 1 0 9. Bank Vegetative bank) More than 90% of the streambank surfaces covered by native vegetation, including trees, under vegetation, including trees, under wegetation (ling trees, under moving minimal or not evident; almost all plants allowed to grow naturally. To-90% of the streambank surfaces covered by native vegetation is not well-represented; distruption obvious; patches of bank areas of erosion one-half of the potential plant subble height remaining. Less than 50% of the streambank vegetation; disruption obvious; patches of bar streambank surfaces covered by native vegetation is never high; vegetation is never high; vegetation; disruption obvious; patches of bar streambank vegetation; disruption obvious; patches of bar streambank vegetation; disruption option; patches data and the potential plant subble height remaining. So 70% of the streambank surfaces covered by native vegetation; disruption obvious; patches of bar streambank vegetation; disruption obvious; patches of bar anore-half of the potential plant subble height re	bends)	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.	distance between riffles divided by the width of the stream is between 7 to 15.	contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
8. Bank Stability (score each bank) or bank failure absent or minimal; life potential for future problems. <5% of bank affected.	SCORE 6				
SCORE 2 (RB) Right 10 9 8 7 6 5 4 3 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 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 exident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height maters (10 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation all plants allowed to grow naturally. SCORE 2 (LB) Left 10 9 8 7 6 5 4 3 2 1 0 10. Riparian Vegetative each bank riparian zone) Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, impacted zone. Width of riparian zone lot bave impacted	each bank) Note: determine left or right side by facing	or bank failure absent or minimal; little potential for future	small areas of erosion mostly healed over. 5-30% of bank in	bank in reach has areas of erosion; high erosion potential	"raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-
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 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 surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation normoo; less than one-half of the potential plant stubble height remaining. Less than 50% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. Less than 50% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. Less than 50% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. Less than 50% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. Less than 50% of the streambank surfaces covered by vegetation; disruption obvious; patches of score is soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. 10. Riparian Vegetative each bank riparian zone) Vidth of					
SCORE 3 (RB) Right 10 9 8 7 6 5 4 3 2 1 0 10. Riparian Vegetative Zone Width (score each bank riparian zone) Width of riparian zone >18 meters; human activities have impacted zone only minimally. Width of riparian zone 6-12 meters; human activities have impacted zone only minimally. Width of riparian zone 6-12 meters; human activities have impacted zone only minimally. Width of riparian zone 6-12 meters; human activities. Width of riparian z	9. Bank Vegetative Protection (score each	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	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	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average
10. Riparian Vegetative Zone Width (score each bank riparian zone) Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, impacted zone. Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. Width of riparian zone <6 meters: hitle or no riparian vegetation due to human activities. SCORE 1 (LB) Left 10 9 8 7 6 5 4 3 2 1 0					
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE 1 (LB)				

habitat score 77

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

FIBI017a-R2 South Branch Rahway River

09/28/2005

Common Name	Scientific Name	Abundance	Size Range (inches)
Pumpkinseed	Lepomis gibbosus	209	2.4 - 4.7
White Sucker	Catostomus commersoni	119	-
Banded Killifish	Fundulus diaphanus	115	-
Tessellated Darter	Etheostoma olmstedi	36	-
Largemouth Bass	Micropterus salmoides	27	-
American Eel	Anguilla rostrata	17	-
Spottail Shiner	Notropis hudsonius	15	-
Golden Shiner	Notemigonus crysoleucas	11	-
Blacknose Dace	Rhinichthys atratulus	8	-
Mummichog	Fundulus heteroclitus	8	-
Brown Bullhead	Ameiurus nebulosus	1	9.8 - 9.8

Species Identified at S.B. Rahway (FIBI017a) (Not to Scale)



White Sucker



Blacknose Dace



Pumpkinseed Sunfish



Brown Bullhead



Banded Killifish



Golden Shiner

Species Identified at S.B. Rahway (FIBI017a) (Not to Scale)



American Eel



Spottail Shiner



Largemouth Bass



Tessellated Darter



Mummichog