

Walkkill River

FIBI099



FIBI Ratings

- Excellent (Green circle)
- Fair (Orange circle)
- Good (Yellow circle)
- Poor (Red circle)

— 1st, 2nd and 3rd Order Streams
— 4th Order and Higher Streams



SUMMARY OF RESULTS – FIBI099



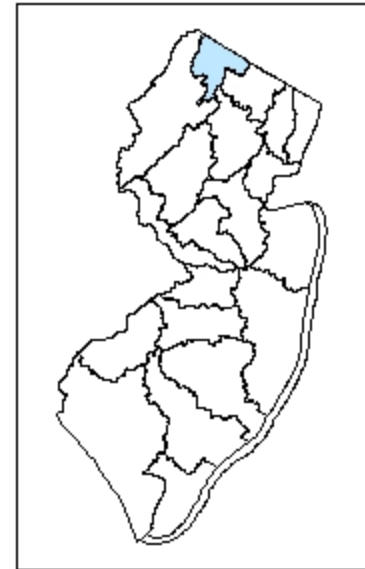
1. Stream Name:	Walkkill River
2. Sampling Date:	10/1/2009
3. Sampling Location:	Route 94
4. Municipality:	Hamburg
5. County:	Sussex
6. Watershed Management Area:	2
7. Contributing Drainage Area (Sq. Mi.):	46.0
8. Electrofishing Gear:	3 backpacks
9. FIBI Score and Rating*:	Round 1 – 46 (Excellent), Round 2 – 44 (Good)
10. Habitat Score and Rating:	Round 1 – 151 (Sub-optimal), Round 2 – 148 (Sub-optimal)
11. Fishable Species Present:	Yes
12. Relevant AMNET ¹ Station Data:	
Proximity of FIBI station to AMNET station:	AN0300
AMNET Rating:	Round 2 – Fair, Round 3 - Good
13. Stream Chemistries:	
Dissolved Oxygen (mg/l)	9.84
Temperature °C.	12.81
pH	8.07
Conductivity (µmhos/cm)	756
14. Length of Stream Sampled:	150m
15. Water Clarity:	Clear
16. Average Open Forest Canopy:	43.7%
17. Discharge:	16.2 cfs
18. Substrate:	20% Gravel/Sand, 55% Cobble, 5% Boulder, 20% Silt
19. Habitat:	40% Riffle, 40% Run, 20% Pool
20. Snags:	Yes
21. Periphyton:	Moderate
22. Submerged Aquatic Vegetation:	No
23. Outfalls:	STP Outfall
24. Number of Fish Species Identified:	17
25. Total Number of Fish Collected:	470
26. Number of Fish With Anomalies:	7

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

* Round 1 data was scored prior to the FIBI metric recalibration.

FIBI099-R2

**WALLKILL RIVER
STATE ROUTE 94
HAMBURG BORO
SUSSEX**



Legend

-  Finish
-  Start
-  Outfall
-  FIBI Reach

FIBI099-Walkkill River @ Route 94
Date Sampled - 10/1/2009

Excellent **Good** Fair Poor

	Score
# of Fish Species	5
# of Benthic Insectivorous Species (BI) (excluding White Suckers and Bullheads)	5
# of Trout and Centrarchid Species (excluding Green Sunfish and Bluegill)	5
# of Intolerant Species (IS)	5
Proportion of Tolerant Individuals	3
Proportion of Individuals as Generalists	3
Proportion of Individuals as Insectivorous Cyprinids	5
Proportion of Individuals as Trout OR Proportion of Individuals as Piscivores (excluding American Eel)*	3
# of Individuals in Sample (excluding Tolerant Species)	5
Proportion of Individuals w/disease/anomalies (excluding blackspot)	5
Total	44

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

	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
1. Epifaunal Substrate /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 <u>not</u> 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; habitat availability less than desirable; substrate frequently disturbed or removed.					Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.					
SCORE 17	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 particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche 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 11	20	19	18	17	16	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 present (slow-deep, slow-shallow, fast-deep, fast-shallow). (slow is <0.3 m/s, deep is >0.5 m)					Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other 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 19	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 11	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 banks, and minimal amount of 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 14	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; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.					
SCORE 16	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 riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.					
SCORE 18	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 each bank) Note: determine left or right side by facing downstream.	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 healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high 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 7 (LB)	Left	10	9			8	7	6			5	4	3			2	1	0			
SCORE 9 (RB)	Right	10	9	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 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 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 has been removed to 5 centimeters or less in average stubble height.					
SCORE 9 (LB)	Left	10	9	9		8	7	6			5	4	3			2	1	0			
SCORE 9 (RB)	Right	10	9	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 3 (LB)	Left	10	9			8	7	6			5	4	3	3		2	1	0			
SCORE 5 (RB)	Right	10	9			8	7	6			5	4	3	5	4	2	1	0			

HABITAT SCORE

148

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

FIBI099-R2

Walkkill River

10/01/2009

Common Name	Scientific Name	Abundance	Size Range (inches)
Longnose Dace	<i>Rhinichthys cataractae</i>	168	-
Tessellated Darter	<i>Etheostoma olmstedii</i>	87	-
Cutlips Minnow	<i>Exoglossum maxillingua</i>	52	-
White Sucker	<i>Catostomus commersoni</i>	51	-
Green Sunfish	<i>Lepomis cyanellus</i>	50	1.4 - 4.8
Smallmouth Bass	<i>Micropterus dolomieu</i>	13	2.3 - 8.5
Redbreast Sunfish	<i>Lepomis auritus</i>	11	1.3 - 4.0
Creek Chub	<i>Semotilus atromaculatus</i>	10	-
Common Shiner	<i>Luxilus cornutus</i>	10	-
American Brook Lamprey	<i>Lampetra appendix</i>	5	-
Brown Trout	<i>Salmo trutta</i>	3	-
Blacknose Dace	<i>Rhinichthys atratulus</i>	3	-
Margined Madtom	<i>Noturus insignis</i>	2	-
Pumpkinseed	<i>Lepomis gibbosus</i>	2	2.6 - 2.7
Banded Killifish	<i>Fundulus diaphanus</i>	1	-
Yellow Bullhead	<i>Ameiurus natalis</i>	1	4.7 - 4.7
Rainbow Trout	<i>Oncorhynchus mykiss</i>	1	-

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Tessellated Darter



Brown Trout



Green Sunfish



Smallmouth Bass



Longnose Dace

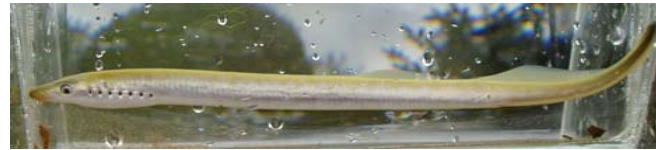


Cutlips Minnow

Walkkill River - FIBI099



White Sucker



American Brook Lamprey



Banded Killifish



Redbreast Sunfish



Common Shiner



Creek Chub

Walkkill River - FIBI099



Blacknose Dace



Yellow Bullhead



Margined Madtom



Rainbow Trout



Pumpkinseed