

STREAM SITE: Ramapo River, Station 0  
 LOCATION: Harriman, New York, below River Road bridge  
 DATE: August 25, 1998  
 SAMPLE TYPE: Kick sample  
 SUBSAMPLE: 100 individuals

ANNELIDA			
OLIGOCHAETA	Tubificidae	Undet. Tubificidae w/o cap. setae	2
ARTHROPODA			
CRUSTACEA			
ISOPODA	Asellidae	Caecidotea communis	22
AMPHIPODA	Gammaridae	Gammarus sp.	16
DECAPODA	Cambaridae	Orconectes rusticus	11
INSECTA			
EPHEMEROPTERA	Baetidae	Baetis flavistriga	3
COLEOPTERA	Elmidae	Stenelmis crenata	8
TRICHOPTERA	Philopotamidae	Chimarra sp.	4
	Hydropsychidae	Cheumatopsyche sp.	14
		Hydropsyche betteni	2
DIPTERA	Empididae	Hemerodromia sp.	2
	Chironomidae	Thienemannimyia gr. spp.	1
		Polypedilum convictum	15

SPECIES RICHNESS 12 (fair)  
 BIOTIC INDEX 6.16 (good)  
 EPT RICHNESS 4 (fair)  
 MODEL AFFINITY 49 (fair)  
 ASSESSMENT moderately impacted

DESCRIPTION The kick sample was taken 20 meters downstream of the River Road bridge in Harriman, at the Mary Harriman Park. The sample had low invertebrate biomass, and appeared dominated by crayfish, riffle beetles, scuds, sowbugs, caddisflies, and midges. Water quality was clearly moderately impacted, based on both the field assessment and the indices.

STREAM SITE: Ramapo River, Station 3  
 LOCATION: Harriman, New York, at Nepera plant bridge  
 DATE: August 25, 1998  
 SAMPLE TYPE: Kick sample  
 SUBSAMPLE: 100 individuals

MOLLUSCA			
PELECYPODA	Sphaeriidae	Undetermined Sphaeriidae	7
ARTHROPODA			
CRUSTACEA			
ISOPODA	Asellidae	Caecidotea communis	7
INSECTA			
COLEOPTERA	Elmidae	Stenelmis crenata	12
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	54
		Hydropsyche betteni	1
DIPTERA	Simuliidae	Simulium vittatum	3
	Empididae	Hemerodromia sp.	1
	Muscidae	Undetermined Muscidae	1
	Chironomidae	Cardiocladius obscurus	1
		Nanocladius distinctus	1
		Polypedilum convictum	6
		Rheotanytarsus exiguus gr.	4
		Tanytarsus guerlus gr.	2

SPECIES RICHNESS 13 (fair)  
 BIOTIC INDEX 5.51 (good)  
 EPT RICHNESS 2 (fair)  
 MODEL AFFINITY 44 (fair)  
 ASSESSMENT moderately impacted

DESCRIPTION The only suitable riffle was under and downstream of the Nepera Road bridge. Compared to Station 0, the dissolved oxygen level had dropped and specific conductance had increased. The invertebrate fauna appeared dominated by caddisflies and crayfish. Water quality was assessed as moderately impacted, as at Station 0.

STREAM SITE: Ramapo River, Station 4  
 LOCATION: Arden, New York, 0.2 miles south of Arden bridge, end of Water St.  
 DATE: August 25, 1998  
 SAMPLE TYPE: Kick sample  
 SUBSAMPLE: 100 individuals

MOLLUSCA			
PELECYPODA	Sphaeriidae	Undetermined Sphaeriidae	2
ARTHROPODA			
INSECTA			
EPHEMEROPTERA	Isonychiidae	Isonychia bicolor	1
	Baetidae	Baetis flavistriga	4
		Baetis sp.	2
COLEOPTERA	Elmidae	Microcylloepus pusillus	1
		Stenelmis crenata	14
MEGALOPTERA	Corydalidae	Corydalis cornutus	2
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	22
		Hydropsyche betteni	1
DIPTERA	Simuliidae	Simulium venustum	1
		Simulium vittatum	1
	Empididae	Hemerodromia sp.	1
	Chironomidae	Cricotopus bicinctus	6
		Parametriocnemus lundbecki	1
		Tvetenia bavarica gr.	2
		Polypedilum convictum	36
		Rheotanytarsus exiguus gr.	2
		Tanytarsus guerlus gr.	1

SPECIES RICHNESS 18 (fair)  
 BIOTIC INDEX 5.46 (good)  
 EPT RICHNESS 5 (fair)  
 MODEL AFFINITY 54 (good)  
 ASSESSMENT slightly impacted

DESCRIPTION The sampling site was moved approximately 200 meters downstream of the site used in previous years, because a better riffle was located, at the end of Water Street in Arden, opposite a cemetery. Caddisflies, midges, and crayfish were numerous, as at upstream sites, but mayflies and hellgrammites were present in the sample. Based on the field assessment and the indices, overall water quality was assessed as slightly impacted.

STREAM SITE: Ramapo River, Station 6  
 LOCATION: Tuxedo Park, New York, downstream of East Village Road  
 DATE: August 25, 1998  
 SAMPLE TYPE: Kick sample  
 SUBSAMPLE: 100 individuals

MOLLUSCA			
PELECYPODA	Sphaeriidae	Undetermined Sphaeriidae	3
ARTHROPODA			
INSECTA			
EPTHEMEROPTERA	Isonychiidae	Isonychia bicolor	8
	Baetidae	Baetis flavistriga	12
	Heptageniidae	Undetermined Heptageniidae	1
	Caenidae	Caenis anceps	26
COLEOPTERA	Elmidae	Stenelmis crenata	7
MEGALOPTERA	Corydalidae	Corydalis cornutus	4
NEUROPTERA	Sisyridae	Climacia sp.	1
TRICHOPTERA	Hydropsychidae	Cheumatopsyche sp.	13
		Hydropsyche sp.	2
	Hydroptilidae	Leucotrichia sp.	3
DIPTERA	Simuliidae	Simulium vittatum	2
	Chironomidae	Thienemannimyia gr. spp.	1
		Polypedilum convictum	11
		Rheotanytarsus exiguus gr.	6

SPECIES RICHNESS 15 (fair)  
 BIOTIC INDEX 5.10 (good)  
 EPT RICHNESS 7 (good)  
 MODEL AFFINITY 85 (excellent)  
 ASSESSMENT slightly impacted

DESCRIPTION The riffle sampled at this site had the appearance of a "swimmers' dam", located 100 meters downstream of the East Village Road bridge in Tuxedo Park. The dissolved oxygen level had increased compared to the upstream site. The invertebrate fauna was similar to that found at Station 4, with many mayflies, caddisflies, and hellgrammites. Water quality was clearly in the slightly impacted range.

STREAM SITE: Ramapo River, Station 7  
 LOCATION: Hillburn, New York, above 4th Street bridge  
 DATE: August 25, 1998  
 SAMPLE TYPE: Kick sample  
 SUBSAMPLE: 100 individuals

PLATYHELMINTHES			
	TURBELLARIA	Undetermined Turbellaria	4
ARTHROPODA			
INSECTA			
EPHEMEROPTERA	Isonychiidae	Isonychia bicolor	8
	Baetidae	Baetis flavistriga	17
		Baetis sp.	5
	Heptageniidae	Leucrocuta sp.	4
	Caenidae	Caenis anceps	7
COLEOPTERA	Elmidae	Optioservus trivittatus	1
		Stenelmis sp.	1
MEGALOPTERA	Corydalidae	Corydalus cornutus	2
TRICHOPTERA	Philopotamidae	Chimarra sp.	2
	Hydropsychidae	Cheumatopsyche sp.	2
		Hydropsyche bronta	21
	Hydroptilidae	Leucotrichia sp.	1
DIPTERA	Tipulidae	Antocha sp.	1
	Simuliidae	Simulium sp.	9
	Chironomidae	Cardiocladius obscurus	2
		Eukiefferiella claripennis gr.	1
		Rheocricotopus robacki	1
		Polypedilum convictum	8
		Polypedilum illinoense	1
		Rheotanytarsus exiguus gr.	2

SPECIES RICHNESS 21 (good)  
 BIOTIC INDEX 4.88 (good)  
 EPT RICHNESS 9 (good)  
 MODEL AFFINITY 77 (excellent)  
 ASSESSMENT slightly impacted

DESCRIPTION The sampling location was 50 meters upstream of the 4th Street bridge in Hillburn. This reach was an area of extended riffles, and there was a dam 200 meters above the site. The specific conductance had decreased substantially from upstream levels. The invertebrate fauna appeared improved from Station 6, with the addition of stoneflies and more mayfly species. Water quality however remained within the slightly impacted category.

LABORATORY DATA SUMMARY

STREAM NAME Ramapo River  
 DATE SAMPLED 08/25/98  
 SAMPLING METHOD Traveling kick

DRAINAGE 15  
 COUNTY Orange  
 Rockland

STATION	00	03	04	06
LOCATION	Harriman - River Rd.	Harriman - Nepera road	Arden - Water St.	Tuxedo Park E.Vill. Rd.
DOMINANT SPECIES\% CONTRIBUTION\TOLERANCE\COMMON NAME				
Genus and species names are abbreviated here to accommodate format. Complete names are reported elsewhere in this report.  Intolerant = not tolerant of poor water quality; Facultative = occurring over a wide range of water quality; Tolerant = tolerant of poor water quality.	1. Caecidotea communis 22 tolerant sowbug	Cheumatopsy sp. 54 facultative caddisfly	Polypedilum convict 36 facultative midge	Caenis anceps 26 facultative mayfly
	2. Gammarus sp. 16 facultative scud	Stenelmis crenata 12 facultative beetle	Cheumatopsy sp. 22 facultative caddisfly	Cheumatopsy sp. 13 facultative caddisfly
	3. Polypedilum convict 15 facultative midge	Undeterm. Sphaeri 7 facultative clam	Stenelmis crenata 14 facultative beetle	Baetis flavistr 12 intolerant mayfly
	4. Cheumatopsy sp. 14 facultative caddisfly	Caecidotea communis 7 tolerant sowbug	Cricotopus bicinct 6 tolerant midge	Polypedilum convict 11 facultative midge
	5. Orconectes rusticus 11 facultative crayfish	Polypedilum convict 6 facultative midge	Baetis flavistr 4 intolerant mayfly	Isonychia bicolor 8 intolerant mayfly
% CONTRIBUTION OF MAJOR GROUPS (NUMBER OF TAXA IN PARENTHESES)				
Chironomidae (midges)	16 ( 2 )	14 ( 5 )	48 ( 6 )	18 ( 3 )
Trichoptera (caddisflies)	20 ( 3 )	55 ( 2 )	23 ( 2 )	18 ( 3 )
Ephemeroptera (mayflies)	3 ( 1 )	0 ( 0 )	7 ( 3 )	47 ( 4 )
Plecoptera (stoneflies)	0 ( 0 )	0 ( 0 )	0 ( 0 )	0 ( 0 )
Coleoptera (beetles)	8 ( 1 )	12 ( 1 )	15 ( 2 )	7 ( 1 )
Oligochaeta (worms)	2 ( 1 )	0 ( 0 )	0 ( 0 )	0 ( 0 )
Others (**)	51 ( 4 )	19 ( 5 )	7 ( 5 )	10 ( 4 )
TOTAL	100 (12)	100 (13)	100 (18)	100 (15)
SPECIES RICHNESS	12	13	18	15
HBI INDEX	6.16	5.51	5.46	5.10
EPT VALUE	4	2	5	7
PMA VALUE	49	44	54	85
FIELD ASSESSMENT	mod impact	mod impact	slt impact	slt impact
OVERALL ASSESSMENT	moderately impacted	moderately impacted	slightly impacted	slightly impacted

\*\* sowbugs (Sta.0,3); scuds (Sta.0); crayfish (Sta.0); fingernail clams (Sta.3,4,6)

LABORATORY DATA SUMMARY

STREAM NAME Ramapo River  
 DATE SAMPLED 08/25/98  
 SAMPLING METHOD Traveling kick

DRAINAGE 15  
 COUNTY Orange  
 Rockland

STATION	07			
LOCATION	Hillburn - 4th St.			
DOMINANT SPECIES\% CONTRIBUTION\TOLERANCE\COMMON NAME				
Genus and species names are abbreviated here to accommodate format. Complete names are reported elsewhere in this report.  Intolerant = not tolerant of poor water quality; Facultative = occurring over a wide range of water quality; Tolerant = tolerant of poor water quality.	1. Hydropsyche bronta 21 facultative caddisfly  2. Baetis flavistr 17 intolerant mayfly  3. Simulium sp. 9 facultative black fly  4. Polypedilum convict 8 facultative midge  5. Isonychia bicolor 8 intolerant mayfly			
% CONTRIBUTION OF MAJOR GROUPS (NUMBER OF TAXA IN PARENTHESES)				
Chironomidae (midges)	15 ( 6)			
Trichoptera (caddisflies)	26 ( 4)			
Ephemeroptera (mayflies)	41 ( 5)			
Plecoptera (stoneflies)	0 ( 0)			
Coleoptera (beetles)	2 ( 2)			
Oligochaeta (worms)	0 ( 0)			
Others (**)	16 ( 4)			
TOTAL	100 (21)			
SPECIES RICHNESS	21			
HBI INDEX	4.88			
EPT VALUE	9			
PMA VALUE	77			
FIELD ASSESSMENT	slt impact			
OVERALL ASSESSMENT	slightly impacted			

\*\* black flies; hellgrammites; flatworms; crane flies

FIELD DATA SUMMARY SHEET

STREAM NAME: Ramapo River  
 REACH: Harriman to Hillburn DATE SAMPLED: 08-25-98  
 FIELD PERSONNEL INVOLVED: Abele, Bode

STATION	00	03	04	06
ARRIVAL TIME AT STATION	10:00	11:05	11:35	12:25
LOCATION	Harriman River Rd.	Harriman Nepera	Arden Water St.	Tuxedo Park
<b>PHYSICAL CHARACTERISTICS</b>				
Width (meters)	4	5	4	20
Depth (meters)	0.1	0.2	0.2	0.2
Current speed (cm per sec)	65	120	100	85
Substrate (%)				
rock (> 10 in. or bedrock)	10	10		10
rubble (2.5-10 in.)	30	40	30	30
gravel (0.08-2.5 in.)	30	20	30	20
sand (0.06-2.0 mm)	10	10	20	20
silt (0.004-0.06 mm)	20	20	20	20
clay (less than 0.004 mm)				
Embeddedness (%)	40	30	40	20
<b>CHEMICAL MEASUREMENTS</b>				
Temperature (oC)	23.4	23.4	22.4	24.1
Specific conductance (umhos)	847	1003	964	692
Dissolved Oxygen (mg per l)	7.7	6.0	6.5	10.1
pH	7.8	7.4	7.4	8.4
<b>BIOLOGICAL ATTRIBUTES</b>				
Canopy (%)	50	90	80	10
Aquatic Vegetation				
algae - water column				
algae - filamentous				
algae - diatoms		present	present	
macrophytes; moss		moss		
Occurrence of Macroinvertebrates				
Chironomidae (midges)	X		X	X
Trichoptera (caddisflies)	X	X	X	X
Ephemeroptera (mayflies)			X	X
Plecoptera (stoneflies)				
Coleoptera (beetles)	X	X	X	X
Oligochaeta (worms)	X			X
Other (**)	X	X	X	X
ESTIMATED BIOMASS	-	-	-	-
FIELD ESTIMATE OF WATER QUALITY	mod	mod	slt	slt
FIELD COMMENTS				

\*\* crayfish (Sta. 0,3,4); scuds (Sta. 0,3,4); hellgrammites (Sta. 4,6);  
 leeches (Sta. 3,4,6); fingernail clams (Sta. 3)

FIELD DATA SUMMARY SHEET

STREAM NAME: Ramapo River  
 REACH: Harriman to Hillburn DATE SAMPLED: 08-25-98  
 FIELD PERSONNEL INVOLVED: Abele, Bode

STATION	07			
ARRIVAL TIME AT STATION	12:55			
LOCATION	Hillburn 4th St.			
PHYSICAL CHARACTERISTICS				
Width (meters)	20			
Depth (meters)	0.2			
Current speed (cm per sec)	120			
Substrate (%)				
rock (> 10 in. or bedrock)				
rubble (2.5-10 in.)	30			
gravel (0.08-2.5 in.)	30			
sand (0.06-2.0 mm)	30			
silt (0.004-0.06 mm)	10			
clay (less than 0.004 mm)				
Embeddedness (%)	20			
CHEMICAL MEASUREMENTS				
Temperature (oC)	23.1			
Specific conductance (umhos)	395			
Dissolved Oxygen (mg per l)	8.8			
pH	8.0			
BIOLOGICAL ATTRIBUTES				
Canopy (%)	10			
Aquatic Vegetation				
algae - water column				
algae - filamentous				
algae - diatoms	present			
macrophytes; moss				
Occurrence of Macroinvertebrates				
Chironomidae (midges)	X			
Trichoptera (caddisflies)	X			
Ephemeroptera (mayflies)	X			
Plecoptera (stoneflies)	X			
Coleoptera (beetles)				
Oligochaeta (worms)				
Other (**)	X			
ESTIMATED BIOMASS	-			
FIELD ESTIMATE OF WATER QUALITY	slt			
FIELD COMMENTS				

\*\* flatworms; crayfish; black flies; hellgrammites