HUDSON (HOOSIC) RIVER WATERSHED
2007 FISH POPULATION DATA

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February 2014

CN 287.4

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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Massachusetts Department of Environmental Protection
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Introduction

In late summer and early fall of 2007, fish population surveys were conducted in the Hudson (Hoosic) River Watershed at six stations using techniques similar to Rapid Bioassessment Protocol V as described originally by Plafkin et al. (1989) and later by Barbour et al. (1999) (See Table 1). Standard Operating Procedures are described in MassDEP Method CN 075.1 *Fish Collection Procedures for Resident Fish Populations* (MassDEP 2006). Fish surveys also included a habitat assessment component modified from that described in Barbour et al. (1999).

Methods

Fish Collections

Fish collections were conducted by electrofishing using a Smith Root Model 12 battery-powered backpack electrofisher. A reach of between 70m and 100m was sampled by passing one or more pole mounted anode ring(s) side to side through the stream channel and in and around likely fish holding cover. All fish shocked were netted and held in buckets. Sampling proceeded from an obstruction or constriction, such as a waterfall or shallow riffle, upstream to an endpoint at another obstruction or constriction. Following completion of a sampling run, all fish were identified to species and a sub-sample were measured and weighed, after which all fish were released.

Habitat Assessment

An evaluation of physical habitat quality is critical to any assessment of ecological integrity (Karr et al. 1986; Barbour et al. 1999). Habitat assessment helps to support understanding of the relationship between physical habitat quality and biological conditions, identifies obvious constraints on the attainable potential of a site, assists in the selection of appropriate sampling stations, and provides basic information for interpreting biosurvey results (US EPA 1995). Before leaving the sample reach during the 2007 fish population surveys, habitat qualities were scored using a modification of the evaluation procedure in Barbour et al. (1999). The matrices used to assess habitat quality are based on stream flow, key physical characteristics of the water body, and riparian area. Most parameters evaluated are instream physical attributes often related to overall land use and are potential sources of limitation to the aquatic biota (Barbour et al. 1999). The ten habitat parameters for moderate to high gradient streams are as follows: instream cover for fish, epifaunal substrate, embeddedness, sediment deposition, channel alteration, velocity/depth combinations, channel flow status, right and left bank vegetative protection, right and left bank stability, and, right and left bank riparian vegetative zone width. For moderate to low gradient streams, instream cover for fish is replaced with bottom substrate/available cover, epifaunal substrate is replaced with pool substrate characterization, embeddedness is replaced with pool variability, and velocity-depth combinations is replaced with channel sinuosity. Habitat parameters are scored, totaled, and when appropriate compared to a reference station to provide relative habitat ranking.

Results

Results of the fish population surveys can be found in Table 2. A total of eight species were collected. It should be noted that young of the year (yoy) fish from most species (with the exception of salmonids) were not targeted for collection. Young of the year fishes that were collected, intentionally or not, are noted in Table 2. Scientific names of fishes are taken from American Fisheries Society Special Publication 29 (Nelson et.al. 2004). Seven of the eight species collected were “fluvial species” and one was an unidentified minnow (*Cyprinidae*) which was taken as a voucher for subsequent identification. Unfortunately, it appears that the vouchered minnow was lost or inadvertently discarded. Fish sampling efficiency at GN01A.5 was noted as being only fair, due to the presence of bedrock and ledge, which made the netting of slimy sculpin, *Cottus cognatus*, and dace, *Rhinichthyes* sp., problematic. Results of the habitat assessment can be found in Table 3. All stations were evaluated using moderate to high gradient scoring criteria.

The RBP V protocol (Plafkin et al. 1989 and Barbour et al. 1999) calls for the analysis of the data generated from fish collections using an established Index of Biotic Integrity (IBI) similar to that described by Karr et al. (1986). Since no formal IBI for Massachusetts currently exists, the data provided by this sampling effort may be used to qualitatively assess the general condition of the resident fish population as a function of the overall abundance (number of species or richness, as well as individuals) and species composition (classifications listed below).

Tolerance Classification - Classification of tolerance to environmental stressors similar to that provided in Plafkin et al. (1989), Barbour et al. (1999), and Halliwell et al. (1999). Final tolerance classes are those provided by Halliwell et al. (1999).

Macrohabitat Classification – Classification by common macrohabitat use as presented by Bain and Meixler (2000) modified regionally following discussions between MassDEP and Massachusetts Department of Fish and Game (MA DFG) fishery biologists.

Literature Cited

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Table 1. List of biomonitoring stations sampled for fish during the 2007 Hudson (Hoosic) River Watershed biomonitoring survey including selected watershed and flow characteristics determined from USGS StreamStats (USGS 2013).

Station ID	Unique ID	Drainage Area (mi^2)	Waterbody Name	Site Description	Sampling Date	7-Day 10-Year Low Flow (cfs)	Forest (%)
KB00	P0112	3.36	Kitchen Brook	upstream from West Mountain Road, Cheshire	9-Aug-2007	0.18	94.3
BB00	P0119	2.85	Bassett Brook	upstream from Fred Mason Road, Cheshire	9-Aug 2007	0.15	97.8
MB0.68	P0117	1.3	Millers Brook	downstream of corner East Road and East Hoosac Road in Adams	6-Sept-2007	0.05	76.8
NBH02A	P0121	41.1	North Branch Hoosic River	150 m. upstream of Route 8 bridge, North Adams	6-Sept-2007	3.26	83.3
GN01A.5	P0120	41.4	Green River	upstream of Eastlawn Cemetary bridge, Williamstown	6-Sept-2007	5.59	78.8
GE0.02	P0118	3.93	East Branch Green River	upstream from confluence with Green River in New Ashford	6-Sept-2007	0.23	97.46

Table 2. Species and counts for fish collected during the 2007 Hudson (Hoosic) River Watershed biomonitoring survey. Refer to Table 1 for a listing and description of sampling stations. The number in parentheses indicates the number of young of the year and is included in the total count.

Common Name	Scientific Name	Tolerance[1]	Macrohab. Class.[2]	Station					
				KB00	BB00	MB0.68	NBH02A	GN01A.5	GE0.02
blacknose dace	*Rhinichthyes atratulus*	T	FS				112	32(6)	
longnose dace	*Rhinichthyes cataractae*	M	FS				34(3)	126	
unidentified shiner	*Cyprinidae*	--	--				2(1)		
longnose sucker	*Catostomus catostomus*	M	FD				43(2)		
white sucker	*Catostomus commersonii*	T	FD						
brown trout	*Salmo trutta*	I	FS	21(5)			3	19	37(6)
brook trout	*Salvelinus fontinalis*	I	FS	62(3)	142(17)	30(7)			
slimy sculpin	*Cottus cognatus*	I	FS	135(1)		35(9)	12	43	

[1]Tolerance Classification from Halliwell et al. (1999).

T = tolerant
M = moderately tolerant
I = intolerant

[2] Macrohabitat Classification from Bain and Meixler (2000).

FS = fluvial specialist
FD = fluvial dependant
MHG = macrohabitat generalist

Table 3: Moderate to high gradient habitat assessment summary for fish population stations sampled during the 2007 Hudson (Hoosic) River Watershed biomonitoring survey. For primary parameters, scores ranging from 16-20 = optimal; 11-15 = suboptimal; 6-10 = marginal; 0-5 = poor. For secondary parameters, scores ranging from 9-10 = optimal; 6-8 = suboptimal; 3-5 = marginal; 0-2 = poor. Refer to Table 1 for a listing and description of sampling stations.

Stations		KB00	BB00	MB0.68	NBH02A	GN01A.5	GE0.02
Primary Habitat Parameters In-stream							
INSTREAM COVER (for Fish)		18	18	16	18	18	17
EPIFAUNAL SUBSTRATE		20	20	17	18	16	19
EMBEDDEDNESS		20	19	18	19	20	19
CHANNEL ALTERATION		18	15	14	15	15	18
SEDIMENT DEPOSITION		19	20	17	19	19	18
VELOCITY-DEPTH COMBINATIONS		17	18	13	18	18	14
CHANNEL FLOW STATUS		15	15	7	10	9	10
Secondary Habitat Parameters Riparian							
BANK VEGETATIVE PROTECTION	left	9	10	8	9	2	8
	right	9	10	5	9	8	8
BANK STABILITY	left	8	9	8	10	9	9
	right	8	9	6	10	8	8
RIPARIAN VEGETATIVE ZONE WIDTH	left	2	10	7	10	3	9
	right	0	10	1	4	9	5
Total Score		**163**	**183**	**137**	**169**	**154**	**162**