



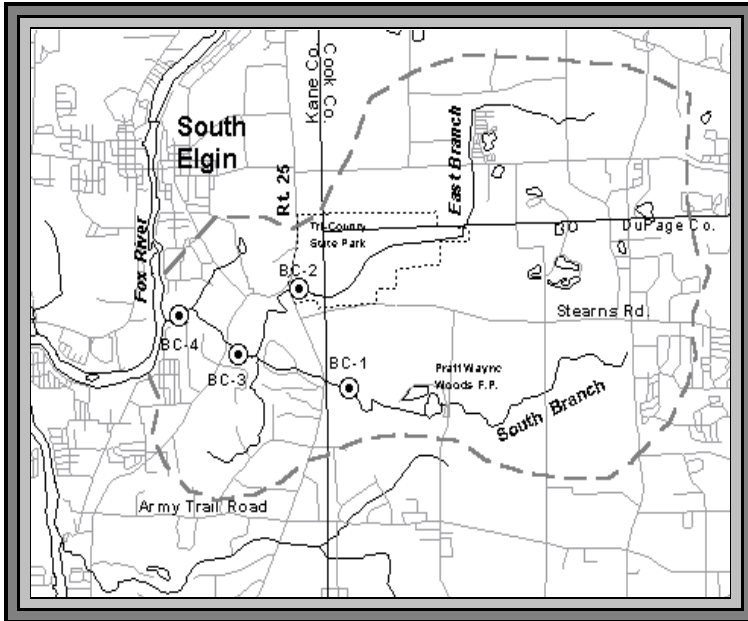
BREWSTER CREEK BIOLOGICAL SURVEY

Division of Fisheries, September 1998

Brewster Creek is a small tributary entering the Fox River near South Elgin. The watershed covers 18 square miles including parts of Cook, DuPage and Kane counties. A total of 5 Illinois Natural Inventory Sites have been established within the watershed to protect threatened and endangered species. Two large preserves, Tri-County State Park and Pratt-Wayne Woods Forest Preserve (DuPage Co.) are located along Brewster Creek.

habitat conditions yielding scores ranging from 208 (best) to 16 (worst).

For all stations combined, 621 fish representing 26 species were collected. Composition of the fish community varied at individual stations primarily in response to differences in habitat and proximity to the Fox River. A summary of conditions at each individual station is given below:



Station BC-1

The fish sample at BC-1 located on the South Branch, was dominated by carp and green sunfish, very tolerant species which generally indicate degraded conditions. The habitat at BC-1 rated very poor, with a low SHAP score. The MBI (6.65) indicated fair water quality conditions. The stream at this location is low gradient, increasing vulnerability to sedimentation and channel instability from previous channelization. These conditions resulted in a fish community composed of slow water, tolerant species with very wide preference of food types (omnivores) yielding an IBI score of 32 out of a possible 60 points.

During 1998, a biological survey of Brewster Creek was conducted to determine the current status of the stream ecosystem. The condition of biological communities can provide clues to existing problems within the stream and the watershed as a whole. In addition to providing useful information for restoration efforts in the watershed, this data will serve as a baseline for evaluating the effectiveness of management practices.

	BC-1	BC-2	BC-3	BC-4
# species	13	7	20	13
# intol spp	0	1	4	3
IBI	32	32	46	38
BSC	C	C	B	C
MBI	6.7	4.7	4.9	5.5
SHAP	57	163	124	110

Four locations were selected (see map) on the major branches of Brewster Creek, representing the range of existing stream habitats. All sites were sampled for fish, macroinvertebrates and habitat quality. At each station stream conditions were evaluated using the Index of Biotic Integrity (IBI), the Macroinvertebrate Biotic Index (MBI) and the Stream Habitat Assessment Procedure (SHAP). The IBI is a widely-used stream quality measurement based on the fish community taking into account, the number and types of species present, their tolerance to degradation, food and habitat preferences and condition. IBI scores range from 12-60 with higher scores indicating better quality. The IBI is the basis for determining the letter-based BSC rating system which ranges from A-E. The MBI is a rating based on the macroinvertebrate sample (bugs and other small critters) used primarily for water quality evaluation. This Index ranges from 0 to 11 with lower scores indicating better quality. SHAP is used to evaluate stream

Station BC-2

In contrast to BC-1, BC-2 was found to have good water quality (MBI= 4.65), and excellent habitat (SHAP=163). However, BC-2 still rated low, with an IBI of 32. The productivity at this station was poor with only 31 fish collected from 7 species. Unlike the stream segment at BC-1, this area of the East Branch at BC-2, has not been channelized and retains good habitat characteristics. However, as indicated by the IBI, this section suffers from activities elsewhere in the watershed. Upstream of this location there has been extensive channelization, which together with recent urban development has dramatically increased downstream flow rates. The increase in flows has a flushing effect downstream, displacing fish and their food organisms. The channel also reponds by widening or deepening, increasing sedimentation and habitat degradation. Equally as important, two downstream dams cut off this section of the

stream from the Fox River which serves as a fish



Grass pickerel *Esox americanus*

recolonization source. A small stream requires a continuous connection to a larger stream to remain healthy due to both natural (drought, floods etc.) and man made perturbations. Despite the poor IBI, BC-2 shows potential for recovery as indicated by the presence of several stream species.

Station BC-3

The importance of connection to the Fox River is demonstrated at Station BC-3 which has all the critical components for a healthy stream, and received the highest rating on Brewster Creek. Like BC-2, BC-3 had good habitat and water quality; however it is located downstream of the two dams. As a result, a very diverse fish community was found at this station with 20 species represented. Many stream species were present, 4 of which are considered intolerant. Also present were smallmouth bass which typically use small tributary streams for spawning and nursery areas. Removal of the dams may also restore this popular sport species to Brewster Creek. Suckers and other tributary-spawning species would also benefit from dam removal.

Station BC-4

Despite close proximity to the Fox River and good habitat features, the IBI at BC-4 was lower than BC-3. This stream segment was affected by local land use, with low vegetative cover and bank stability in the immediate stream corridor. This section was also lower gradient resulting in deposition of eroded material and some backwater effect from the Fox River. The presence of a concrete retaining wall and instream culverts also had a negative impact on local habitat conditions.

In summary, the condition of biological communities of Brewster Creek depends on a variety of factors both within the stream and in the watershed as a whole. Based on MBI values, water quality does not appear to be a limiting factor in the stream system. Habitat quality and connection to the Fox River are more important considerations particularly on the East and South Branches which are both rated in the low “C” range. Removal of the dams near the confluence of the East and South Branches is currently under consideration and is a critical step in the restoration of the upper watershed. Remeandering of previously channelized sections and installation of in stream structures such as stone riffles would improve habitat. These activities combined

with wetland creation and enhancement of off stream water storage could moderate peak flows. Some of these activities are already under way at Pratt Wayne Woods and Tri-County State Park. Downstream of the confluence of the major branches, Brewster Creek is rated in the “B” range. Extension of streamside buffer and vegetative/soft bank stabilization would most appropriate in this area of the stream. Cooperation by all property owners in a watershed-based approach will help preserve and improve the biological communities of Brewster Creek.

BREWSTER CREEK FISH SURVEY

	BC-1	BC-2	BC-3	BC-4	total
COMMON NAME					
Central mudminnow	0	4	0	1	5
Grass pickerel	1	0	0	0	1
Goldfish	1	0	0	0	1
Carp	86	0	6	12	104
Golden shiner	5	0	1	0	6
Creek chub	0	3	15	0	18
Hornyhead chub	0	0	23	3	26
Central stoneroller	0	0	3	0	3
Striped shiner	0	0	2	0	2
Spotfin shiner	0	0	6	11	17
Fathead minnow	4	0	0	0	4
Bluntnose minnow	0	4	32	13	49
White sucker	0	0	12	1	13
Northern hogsucker	0	0	3	0	3
Channel catfish	1	0	1	8	10
Yellow bullhead	1	4	21	3	29
Black bullhead	3	0	12	0	15
Stonecat	0	0	63	1	64
Black crappie	4	0	20	2	26
Largemouth bass	18	0	1	0	19
Smallmouth bass	0	0	11	1	12
Green sunfish	44	1	51	8	104
Sunfish hybrid	5	0	0	0	5
Bluegill	23	0	20	0	43
Pumpkinseed	23	0	3	0	26
Johnny darter	0	1	0	1	2
Fantail darter	0	14	0	0	14
	219	31	306	65	621



Smallmouth bass *Micropterus dolomieu*

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