Longitudinal Distribution of Fishes in the Sawmill River, New York

Study Area:

The Sawmill River is a tributary of the Hudson River, in Westchester County, New York. It flows for approximately 22 river miles, from its' source in the Town of New Castle, to the Hudson River in the City of Yonkers. The mouth of the Sawmill River is tidal and receives an influx of water from the Hudson River. It displays a distinct dendritic drainage pattern in its' upper course and a long narrow drainage basin in its' southern reaches. The Sawmill River Parkway runs along the bank of the river and criss-crosses it at several places along its' length. The northern reaches of the Sawmill River course through densely populated suburban development, eventually reaching the City of Yonkers before flowing into the Hudson River. The Sawmill River is widest, at its' confluence with the Hudson River. Upstream areas are 3-8 meters wide with depth less than 1 meter. The stream follows a typical pattern of alternating pools and riffles. The bottom varies from mud and sand to cobble and boulder.

Materials and Methods:

Ten sites were selected for sampling, based on ease of access from the highway (fig. 1). Station 1 was at the confluence of the Sawmill and Hudson Rivers while Station 10 was located at headwaters of the Sawmill (Town of New Castle).

Each station was sampled using a 1 x 5.5 meter seine, with the exception of Dock Street, which was sampled using a fyke net. The fyke net was placed in position at low tide and retrieved on the following low tide. Sampling was initiated in April 1989 and terminated in August 1989. All specimens collected, were fixed in 10% formalin and later transferred to 70% ethanol. Specimens were identified and counted. Other data such as length, weight, sex and food habits are presently being collected for use in later studies.

Data was quantified, in part, using a graphical method to assess faunal dominance (Guillory, 1977), which is modified from Saunders (1960) and Ono (1960). The ichthyofauna was characterized by plotting an expression of frequency of occurrence vs. an expression of percent abundance. The fish were categorized as abundant, common,

rare or Hudson River.

Results and Discussion:

A total of 1967 specimens were collected representing 12 families and 22 species (Table 1). Figure 1 shows that the most speciose station was Dock Street (Station 1). Fourteen different species were collected at this one site. Of these 14 species, 8 were found only at Dock Street, the other 6 were found at one or more stations along the length of the river. These data show that Hudson River fish utilize the mouth of the Sawmill River. Further, longterm studies are needed however to determine for what purpose these fish utilize the mouth of the Sawmill River. Among the possibilities are feeding, breeding or nursery areas.

Although the Sawmill River appears to be a rather diverse system, there are species, quite common in other Westchester County streams, that may have been eliminated from the Sawmill River i.e., fall fish (Semotilus corporalis) and the cutlips minnow (Exoglossum maxillingua). Schmidt and Samaritan (1984) found a similar situation in the Bronx River. They attributed the loss of these species to poor water quality. One introduced species, the European

bitterling, Rhodeus sericeus, has also disappeared from the Sawmill River, although it is still present in the Bronx River (Schmidt et al, 1981). Early records such as Greely (1936) and later collections (Cornell University 23611; 1951) still listed the species as present. Efforts to collect this species, including my own have proved to no avail.

Three species in the Sawmill River are not native to the northeastern United States: largemouth bass (Micropterus salmaides), carp (Cyprinus carpio) and the rainbow trout (Salmo gairdneri). This represents about 14% of the fish fauna of the river.

The relative abundance of calculations indicated that the blacknose dace (Rhinichthys atratulus) and the white sucker (Catosomus commersoni) were the most abundant species (Fig. 2). Both these species were collected in 8 out of 10 stations. Relative abundance as calculated by the Guillory (1977) method also listed 7 species as common, and 4 species as rare (Fig. 2). Upon examining the graph in figure 2, it became obvious that a fourth cluster of points was evident. I chose to refer to this cluster as the Hudson River group. With the exception

of one species (Esox americanus, redfin pickerel) all the species in this cluster were collected at Dock Street and represent the influence of the Hudson River, upon the Sawmill River.

References

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Figure 1. Distribution of Fishes of the Sawmill River.
1989

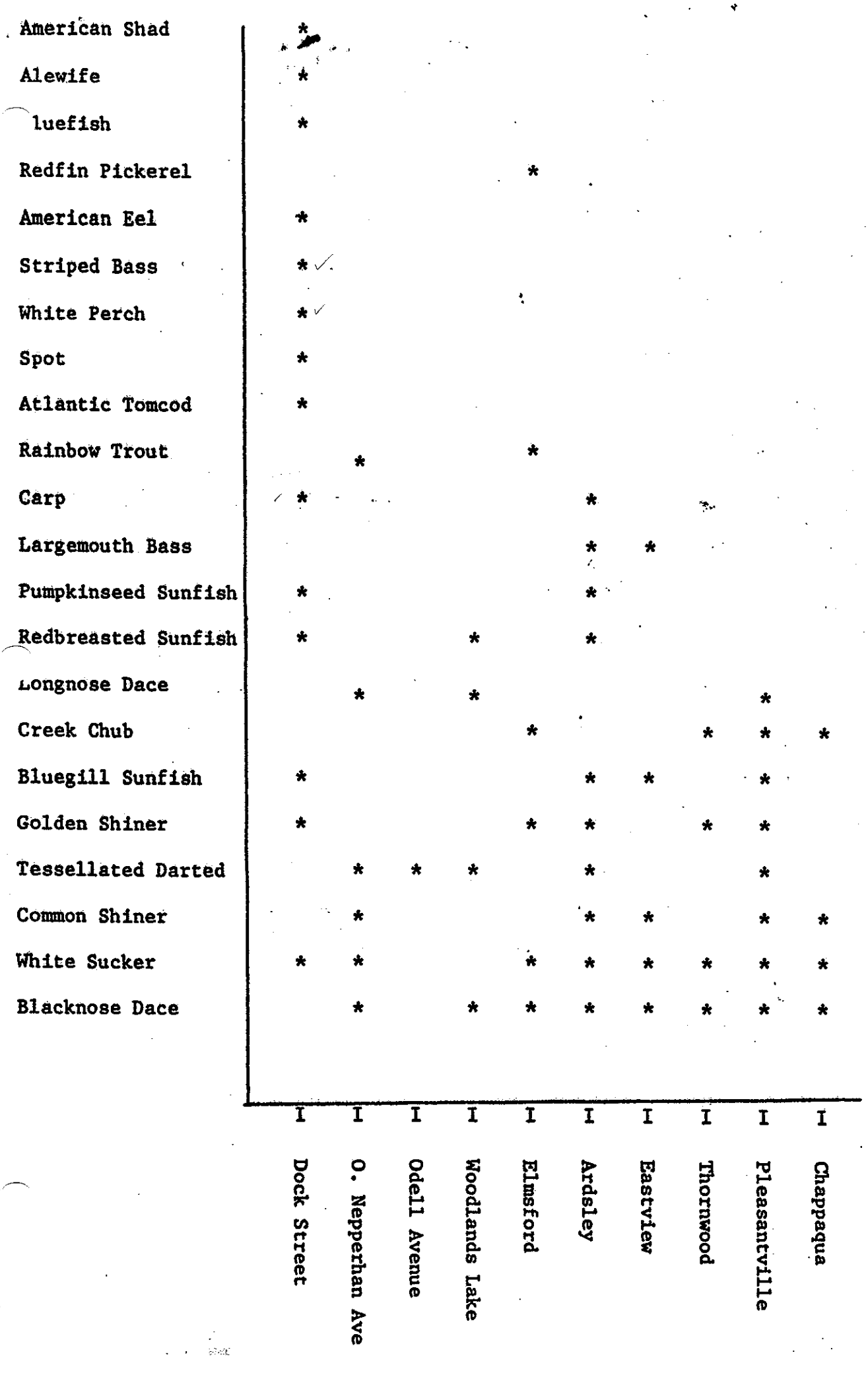
American Shad
Alewife
luefish
Redfin Pickerel
American Eel
Striped Bass
White Perch
Spot
Atlantic Tomcod
Rainbow Trout
Carp
Largemouth Bass
Pumpkinseed Sunfish
Redbreasted Sunfish
Longnose Dace
Creek Chub
Bluegill Sunfish
Golden Shiner
Tessellated Darted
Common Shiner
White Sucker
Blacknose Dace
Dock Street
O. Nepperhan Ave
Odell Avenue
Woodlands Lake
Elmsford
Ardsley
Eastview
Thornwood
Pleasantville
Chappaqua

Table 1. Species of Fish Collected in the Sawmill River (Total Species = 22)

A. Family Cyprinidae (Minnows)

1. Longnose Dace *Rhinichthys cataractae*
2. Blacknose Dace *Rhinichthys atratulus*
3. Common Shiner *Notropis cornutus*
4. Golden Shiner *Notemigonus crysoleucas*
5. Carp *Cyprinus carpio*
6. Creek Chub *Semotilus atromaculatus*

B. Family Cenrarchidae (Sunfishes and Black Basses)

1. Pumpkinseed Sunfish *Lepomis gibbosus*
2. Bluegill Sunfish *Lepomis macrochirus*
3. Redbreasted Sunfish *Lepomis auritus*
4. Largemouth Bass *Micropterus salmoides*

C. Family Moronidae (Temperate Basses)

1. White Perch *Morone americana*
2. Striped Bass *Morone saxatilis*

D. Family Clupeidae (Herrings)

1. American Shad *Alosa sapidissima*
2. Alewife *Alosa pseudoharengus*

E. Family Catostomidae (Suckers)

1. White Sucker *Catostomus commersoni*

Table 1. Continued:

F. Family Salmonidae (Salmon and Trout)

1. Rainbow Trout *Salmo gairdneri*

G. Family Percidae (Perches)

1. Tessellated Darter *Etheostoma olmstedi*

H. Family Gadidae (Codfishes)

1. Atlantic tomcod *Microgadus tomcod*

I. Family Pomatomidae (Bluefishes)

1. Bluefish *Pomatomus saltatrix*

J. Family Anguillidae (Eels)

1. American eel *Anguilla rostrata*

K. Family Sciaenidae (Drums)

1. Spot *Leiostomus xanthurus*

L. Family Esocidae (Pikes)

1. Redfin Pickerel *Esox americanus*

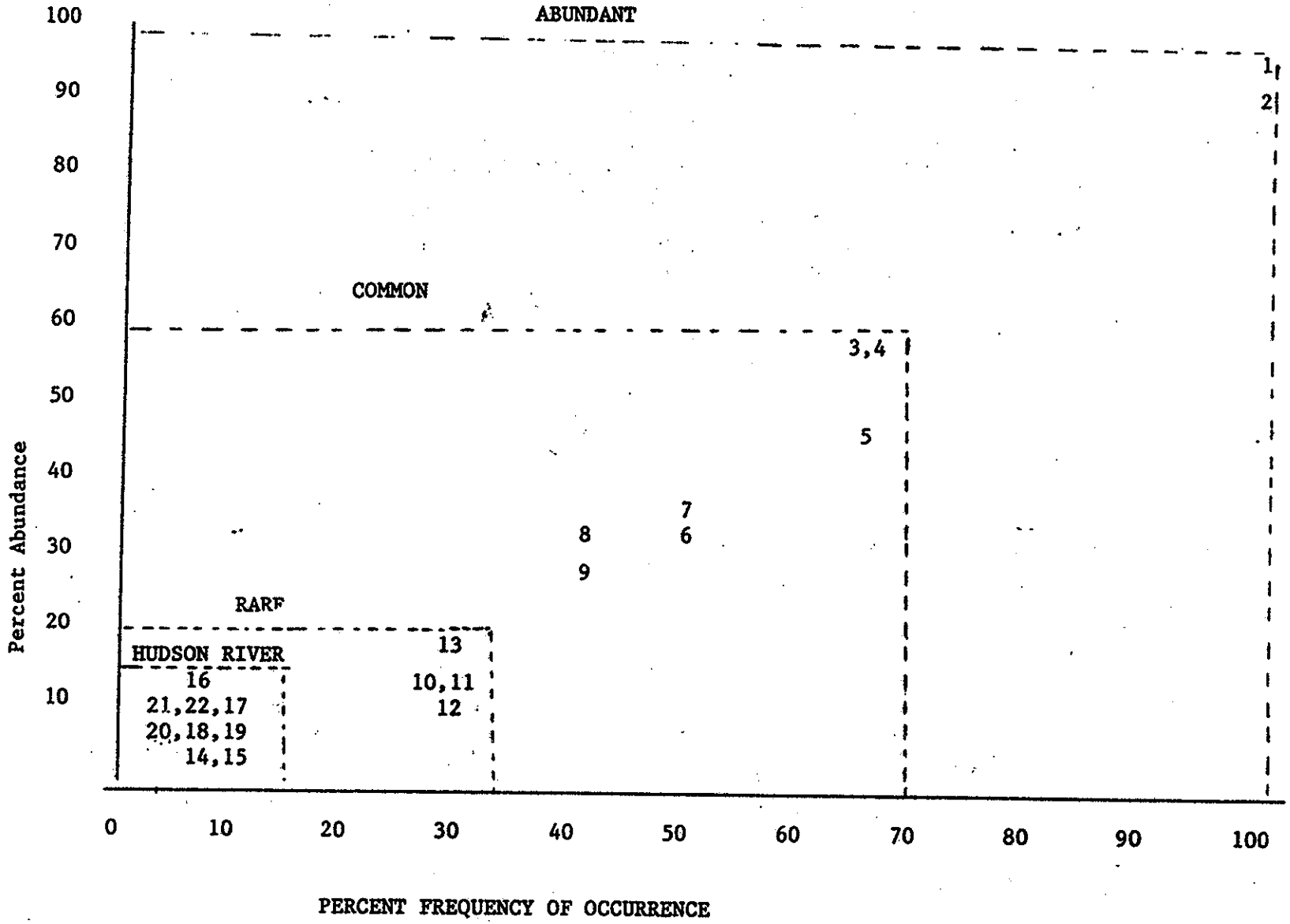

Figure 2. Relative Abundance of Various Species Collected on the Sawmill River (Abundance estimated by method of Guillory, 1977).

KEY TO FISH SPECIES

Abundant

1. Blacknose Dace
2. White Sucker

Common

3. Common Shiner
4. Tessellated Darter
5. Golden Shiner
6. Bluegill Sunfish
7. Creek Chub
8. Longnose Dace
9. Redbreasted Sunfish

Rare

10. Pumpkinseed Sunfish
11. Largemouth Bass
12. Carp
13. Rainbow Trout

Hudson R.

14. Tomcod
15. Spot
16. White Perch
17. Striped Bass
18. American Eel
19. Redfin Pickeral*
20. Bluefish
21. Alewife
22. American Shad

* All fish species labeled HUDSON RIVER were collected at the confluence of the Sawmill and Hudson Rivers, with the exception of the Redfin Pickerel.