

# The Forgotten Many: Status of the "Other" Fish in the Hudson River Estuary

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**Wallace Conference Center**  
**September 29-30, 2009**

## Purpose & Objectives

- Trends in abundance of Hudson River fish species other than those "charismatic" species previously discussed over the past 34 years
- What can be said about the overall "health" of the "other" fish community
- Focus on tidal freshwater areas of the Estuary within most productive seasons and locations – summer in the littoral zone.

## Beach Seine Sampling



Photo Courtesy of Normandeau Associates

## Sampling Design



Tidal  
Freshwater  
Zone

### Seasons Included

- Mid – July through mid-September

### Time Periods for Comparison

- 1<sup>st</sup> Decade 1974 – 1983  
– 2,049 samples
- Last Decade 1998 – 2007  
– 2,460 samples

## What's Changed Over the Last 34 Years That Could Affect the Fish?

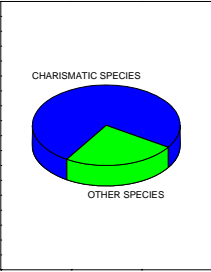
- Fisheries management
- Freshwater flow
- Zebra mussels
- Other exotic species
- Aquatic vegetation
- Industrial/municipal use
- Climate change
- Others?

## Methods to Identify Species Trends

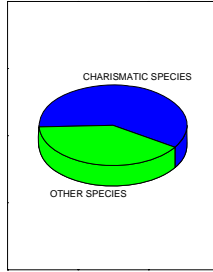
- Compared first decade to most recent decade
- Looked for consistency in change
  - Frequency of years in most recent decade with annual abundance greater than median value in first decade
- Calculated relative magnitude of change
  - Ratio of higher to lower median abundance
- Important to remember: estuaries highly variable environments

## Dominance of "Charismatic" Species

1974 - 1983

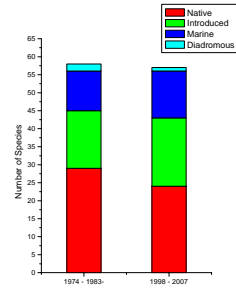


1998 - 2007

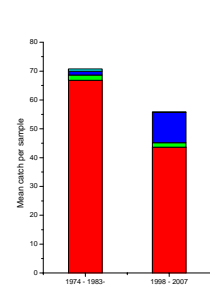


## Overall Patterns in "Other" Species

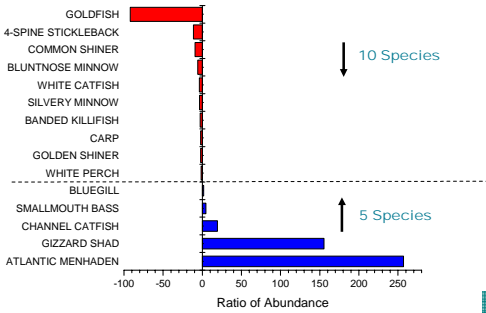
Species Richness



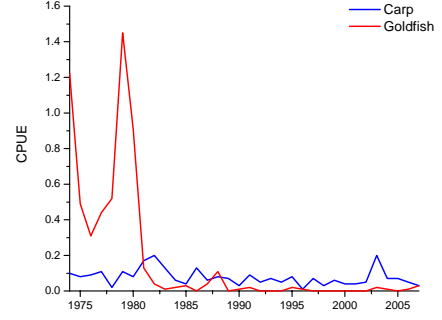
Mean Catch



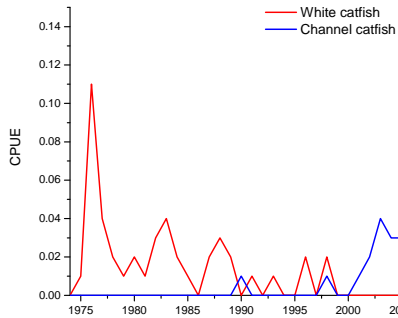
## Which Species Have Changed?



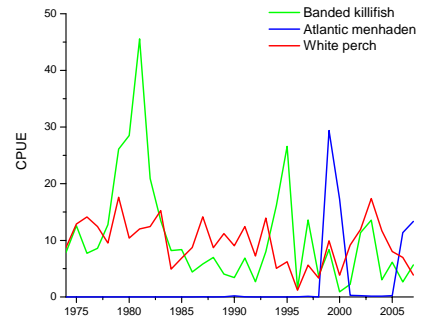
## Selected Species Trends Goldfish and Carp



## Selected Species Trends Catfish



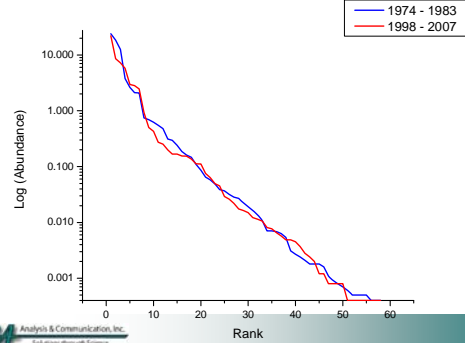
## Selected Species Trends Some Others



## Is the Fish Community Healthy?

- Clean Water Act – "...to restore and maintain the chemical, physical, and biological integrity of the Nation's waters".
- Biological integrity = health.
- What is biological integrity?
  - "the capability of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitats of the region." (USEPA).

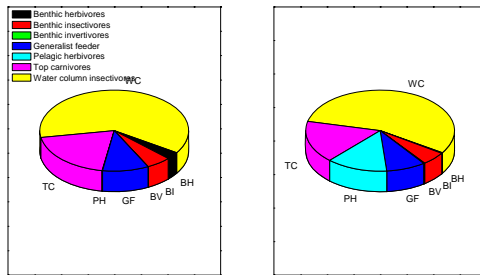
## Species Diversity



## Functional Guilds

1974 - 1983

1998 - 2007



## Summary for "Other" Species

Question	Answer
Are the species the same?	Not exactly – some species replacement.
Is species richness the same?	Yes.
Is species evenness the same?	Yes.
Is overall abundance the same?	Generally yes.
Are all functional groups adequately represented?	Yes.
Is the fish community able to adequately support beneficial (human) uses?	Yes

## So... Is the "Other" Fish Community in the Hudson River Estuary Healthy?

- There have been changes in species.
- Most changes observed consistent with those observed in other nearby tidal rivers (e.g., Delaware, Connecticut).
- Nothing really unique to Hudson.
- Changes small compared to some other systems (e.g., Great Lakes, Sacramento-San Joaquin).
- Generally consistent over 34 year in terms of community structure and function.