

Fishes of the Roosevelt-Vanderbilt National Historic Sites, Hyde Park, New York

Final Report

Dr. Robert E. Schmidt

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**Department of the Interior
National Park Service
New England System Support Office**



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INTRODUCTION

The purpose of this project was to document the freshwater fish fauna on the Roosevelt-Vanderbilt National Historic Sites in Hyde Park, New York. These three Sites have a variety of aquatic habitats that support fishes including a small forest stream, impoundments, and a tidal freshwater marsh. The fish fauna present reflects available habitat quality as well as recent human influences and, to the extent that we know it, this history is summarized for each Site and each species.

METHODS

Study Area- The Roosevelt-Vanderbilt National Historic Sites (NHS) includes three properties in the town of Hyde Park, New York. Each property has aquatic habitats that support fishes.

The Fallkill flows through the Eleanor Roosevelt NHS. The Fallkill enters the Hudson River in Poughkeepsie, New York and therefore our study area is in the upper end of the watershed. The Fallkill is impounded on the Eleanor Roosevelt NHS. We sampled the impoundment near the northern park boundary and we sampled the stream downstream of the impoundment adjacent to the Historic Core of the Site.

Crum Elbow Creek flows through the Vanderbilt Mansion NHS. This creek enters the Hudson River about 150 m downstream of the NHS Park boundary. Crum Elbow Creek is impounded at the visitor's entrance to the Site. We sampled these impoundments and most of the free-flowing stream on the Site.

The entire drainage of the Meriches Kill is included in the Home of Franklin D. Roosevelt NHS. We sampled this small stream from the ice pond down to the tidal marsh. We also sampled the tidal marsh (Roosevelt Cove).

Field and Laboratory Procedures- Fishes were sampled with either a backpack electroshocker or with seines. The shocker was used in the unimpounded Crum Elbow Creek and in the Meriches Kill. We used a 10X4' seine with Ace 3/16" knotless nylon mesh to sample the Fallkill and we used a 50' bag seine with the same mesh size to sample the impoundments on Crum Elbow Creek. Both seines were used in Roosevelt Cove. We sampled the upland areas on June 23, 1995 and Roosevelt Cove on June 27, 1995. Effort was made to sample all available habitats at a given Site.

Fishes collected were identified in the field. Two specimens (if possible) of each species were preserved in 10% formalin and all the rest were released. Specimens were transferred to 75% ethanol. A color slide was taken of each species collected and preserved.

RESULTS - SITES

Eleanor Roosevelt NHS-

We collected eight species of fishes from the Fallkill (Table 1). These species are all primarily pond fishes or fishes with wide habitat preferences (white sucker and redbreast

Table 1. Fishes collected in the Fallkill, Eleanor Roosevelt National Historic Site, Hyde Park, New York on June 23, 1995.

Scientific Name	Common Name
Cyprinidae (Minnow family)	
<i>Notemigonus crysoleucas</i>	Golden shiner
Catostomidae (Sucker family)	
<i>Catostomus commersoni</i>	White sucker
Esocidae (Pike family)	
<i>Esox americanus</i>	Redfin pickerel
Centrarchidae (Sunfish family)	
<i>Ambloplites rupestris</i>	Rock bass
<i>Lepomis auritus</i>	Redbreast sunfish
<i>Lepomis gibbosus</i>	Pumpkinseed
<i>Lepomis macrochirus</i>	Bluegill
<i>Micropterus salmoides</i>	Largemouth bass

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sunfish). Although the Fallkill does flow (slowly) downstream of the Upper Val-Kill Pond, the fishes indicate that this area is more of a pond than a stream. The Fallkill is impounded again downstream of the park boundary. This sequence of impoundments has eliminated stream fishes from the area. The pond has dense emergent and submergent plant growth. The Fallkill downstream of the pond has a gravel substrate and a very strong odor of partially decayed plant material when the substrate was disturbed.

A previous study of the Fallkill (Schmidt, 1986) showed a similar concentration of pond fishes south of the Hyde Park border. That study also documented the presence of stream-dwelling minnows. We did not find any brown bullheads (*Ameiurus nebulosus*) at this site although we suspect they are present in the pond.

Vanderbilt Mansion NHS-

We collected eleven species of fishes from Crum Elbow Creek (Table 2). The majority of the species were taken in the impoundments. The impoundments have soft bottoms and substantial submerged plant growth. The free-flowing stream has bedrock substrate and is therefore unsuitable for some stream fishes. Most stream fishes prefer areas with gravel bottoms.

A previous study (Schmidt et al., 1987) reported similar species from Crum Elbow Creek on the Vanderbilt Site but they caught rock bass (which probably wash down from the

Table 2. Fishes collected in Crum Elbow Creek, Vanderbilt National Historic Site, Hyde Park, New York, June 23, 1995. Fishes collected in the stream are indicated by an "s" after the common name and those collected in the ponds are indicated by a "p".

Scientific Name	Common Name
Anguillidae (Freshwater Eel family)	
<i>Anguilla rostrata</i>	American eel (s)
Cyprinidae (Minnow family)	
<i>Exoglossum maxillingua</i>	Cutlips minnow (s)
<i>Notemigonus crysoleucas</i>	Golden shiner (p)
<i>Rhinichthys atratulus</i>	Blacknose dace (s)
Esocidae (Pike family)	
<i>Esox americanus</i>	Redfin pickerel (p)
Centrarchidae (Sunfish family)	
<i>Ambloplites rupestris</i>	Rock bass (p)
<i>Lepomis auritus</i>	Redbreast sunfish (p,s)
<i>Lepomis gibbosus</i>	Pumpkinseed (p)
<i>Lepomis macrochirus</i>	Bluegill (p)
<i>Micropterus salmoides</i>	Largemouth bass (p)
<i>Pomoxis nigromaculatus</i>	Black crappie (p)

ponds) and did not report cutlips minnows. They did report cutlips minnows from upstream of Sherwood Pond, however. Schmidt et al. (1987) observed several fishes in Sherwood Pond (the impoundment upstream of Rt. 9) that we did not see in this survey; chain pickerel (*Esox niger*), yellow perch (*Perca flavescens*), and brown trout (*Salmo trutta*). These species, as well as brown bullheads (*Ameiurus nebulosus*) may appear in the ponds on the Site in the future.

Until 1993, Crum Elbow Creek was used as a drinking water source for Hyde Park. Water removal caused the creek to dry up in especially dry summers and the fish fauna was characterized by low diversity and low numbers downstream of the water treatment plant (Schmidt et al., 1987). Now that water is no longer removed from the creek, we can expect that the fishes are recolonizing the area. The presence of cutlips minnows on the Vanderbilt Site is probably a result of this recolonization. Other species may appear in the future as Crum Elbow Creek returns to its normal flow patterns.

Home of Franklin D. Roosevelt NHS-

There were only two species of fishes found in the Meriches Kill, blacknose dace (*Rhinichthys atratulus*) and American eel (*Anguilla rostrata*). The former species is a typical resident of small forest streams and the latter is found in every stream that opens into tidal water. Given the small size of the Meriches Kill, I would not expect to find any other fishes although some species may enter the stream from the tidal marsh occasionally.

We collected ten species of fishes from the tidal Roosevelt Cove (Table 3). This cove is typical of Hudson River tidal marshes in that it is partially isolated from the main Hudson River by the Amtrak railroad bed. The presence of the railroad bed with a restricted opening to the tidal Hudson insulates the marsh from erosion and may be a significant factor in maintaining the marsh.

There are three studies available on Hudson River tidal marsh fishes that cover several seasons: Tivoli North Bay (Schmidt, 1986), Constitution Island Marsh (Rod and Sramek, 1986), and Manitou Marsh (Schmidt, 1993). From these studies, I can roughly classify fishes as year-round marsh residents, seasonal inhabitants, or strays that occasionally enter the marsh. These classifications are indicated in Table 3.

The previous studies on fishes in Hudson River marshes document substantial variation in the presence or absence of non-resident species from week to week. We cannot expect a single sample in Roosevelt Cove to document more than the presence of the typical resident species. The resident species that we collected are the species I would expect to see in any Hudson River fresh tidal marsh that is not dominated by water chestnut. There is one species that we did not collect that should have been present, the tessellated darter (*Etheostoma olmstedi*). Our efforts were more than adequate to collect this species and I have no explanation for why they were not present.

In general, Roosevelt Cove has the typical marsh fish fauna that we would expect. Roosevelt Cove is fairly easy to sample and would make a good study area for more extensive projects.

Table 3. Fishes collected in Roosevelt Cove, adjacent to the Home of Franklin D. Roosevelt National Historic Site, June 27, 1995. Fishes are classified as residents (r), seasonal inhabitants (s), or occasional visitors (o).

Scientific Name	Common Name
Anguillidae (Freshwater Eel family) <i>Anguilla rostrata</i>	American eel (r) <i>or added</i>
Clupeidae (Herring family) <i>Alosa pseudoharengus</i>	Alewife (s)
Cyprinidae (Minnow family) <i>Cyprinus carpio</i> <i>Notropis hudsonius</i>	Carp (s) ✓ Spottail shiner (r)
Fundulidae (Killifish family) <i>Fundulus diaphanus</i> <i>Fundulus heteroclitus</i>	Banded killifish (r) ✓ Mummichog (r)
Gasterosteidae (Stickleback family) <i>Apeltes quadracus</i>	Fourspine stickleback (r) ✓
Centrarchidae (Sunfish family) <i>Lepomis auritus</i>	Redbreast sunfish (r)
Moronidae (Temperate Bass family) <i>Morone americana</i>	White perch (r) <i>verified</i>
Percidae (Perch family) <i>Perca flavescens</i>	Yellow perch (o) <i>added as for R</i>

RESULTS-FISHES

American eel (*Anguilla rostrata*)-

Eels are the only catadromous fish on the East Coast. Catadromous fishes spawn in the ocean but spend the majority of their lifespan in freshwater. American eels spawn deep in the Sargasso Sea. The small transparent juveniles appear in the Hudson River from the ocean around early June when they enter marshes and ascend tributaries. They may remain in freshwater up to 15 years before returning to the Sargasso Sea to spawn and die. Eels feed on a wide variety of animals.

American eels are a valuable resource and were harvested commercially until the PCB issue surfaced. Eels are a fatty fish and are highly contaminated with PCBs.

Alewife (*Alosa pseudoharengus*)-

Alewives are anadromous, meaning that the adults ascend freshwater rivers to spawn but they spend most of their life in the ocean. Adult alewives spawn in the Hudson and its tributaries from about mid-May to mid-June. The young grow up in the estuary through the summer and then they migrate to the ocean in the fall. The alewives we collected in Roosevelt Cove were small young of the year. Alewives feed on zooplankton.

Alewives are an important forage fish in the Hudson River. Many predators (like striped bass, largemouth bass, and bluefish) feed on the young or adult alewives. In addition, alewives are a valuable commercial resource. They are harvested for sale as bait or as human food (pickled or smoked). Alewives are not significantly contaminated by PCBs (presumably because they spend little time in the Hudson) and are therefore available to commercial or sport harvest.

Carp (*Cyprinus carpio*)-

Carp are an import from Europe. Federal and State agencies released large numbers of carp in many of the rivers in the United States in the middle and late 1800s. Carp are very large (reported up to 50 pounds) bottom-feeding minnows. They are numerous in the Hudson River. Despite their size and abundance, there are virtually no studies available on this species in the Hudson so we really know little about them. They are considered detrimental to sport and food fish populations in many areas where they are abundant.

Carp were spawning in Roosevelt Cove when we were sampling. We saw carp ranging from about 4-10 pounds. Although we caught a couple of them, we did not preserve specimens because of their size nor did we take a photograph which is difficult with live specimens. It is common to see carp spawning in fresh tidal marshes and they seem to like to spawn in water chestnut beds. Although carp are considered a valuable food fish in Europe, there is little market for them in the United States.

Cutlips minnow (*Exoglossum maxillingua*)-

Cutlips minnows are moderate sized stream dwelling fishes. Their name comes from an

unusual trilobed lower lip whose function is not really known. They prefer to live in flowing water around large rocks, so the habitat in Crum Elbow Creek on the Vanderbilt Site is ideal for them. Cutlips do not tolerate poor water quality, so their presence indicates that water quality is good. Spawning males build mound nests out of pebbles in flowing water and eggs and larvae develop in these nests. They feed on benthic aquatic insects and snails.

Cutlips minnows are common in clean water streams in the Hudson Valley. They can be caught on a small hook and people occasionally use them for bait.

Golden shiner (*Notemigonus crysoleucas*)-

Golden shiners are large minnows found primarily in ponds or big rivers. They do not establish breeding populations in flowing streams. Golden shiners lay their eggs on aquatic vegetation. They are omnivorous, feeding on small insects and zooplankton as well as on algae. This species is very common in the Hudson Valley and they are found in virtually every pond and lake as well as in the tidal estuary.

Golden shiners are a valuable bait species. Many bait dealers sell them to bass and pickerel fishers and to ice fishers. They have also been stocked in many areas as forage for larger game fishes.

Spottail shiner (*Notropis hudsonius*)-

Spottail shiners are the most abundant minnow in the Hudson estuary and, in fact, were named for the Hudson River. This moderate sized fish is found in all freshwater tidal habitats and occasionally in rivers and streams distant from the tidal Hudson. There appears to be a spring spawning run of spottail shiners in many Hudson River tributaries. This species feeds on benthic insects and, because of its abundance, is probably a significant forage species in the Hudson estuary.

I am not aware of any commercial value for this species. Spottails are not a hardy fish and they die quickly if handled so they are usually not sold as bait.

Blacknose dace (*Rhinichthys atratulus*)-

This small minnow is very abundant in smaller, high gradient Hudson Valley streams. It prefers fast, cool, rocky habitats and it is often the only fish species in high altitude headwater streams. Blacknose dace feed on small aquatic insects in the riffle areas of streams. They spawn in these riffle areas as well and the spawning males develop an attractive rusty to brick red band on their sides and fins in spawning season.

These small fishes have little commercial value. I have heard of fishermen using them for bait for trout. They are a very attractive and easily kept aquarium species.

White sucker (*Catostomus commersoni*)-

White suckers are a large common fish in virtually all waters in New York State. Only the

smallest streams are not inhabited by this species. White suckers can feed on benthic insects in a wide variety of habitats. They spawn in gravelly riffles in early spring which means that lake and estuarine suckers usually migrate into tributary streams to lay their eggs. Because of their size and abundance, white suckers are significant in aquatic food webs.

White suckers are edible and I have seen them for sale in fish markets. Some people harvest them in winter when it is said that they taste much better than in the summer. They have been used for bait especially for larger pike.

Redfin pickerel (*Esox americanus*)-

Redfin pickerel are the smallest member of the pike family in North America; large adults may be 15 inches long. Redfins prefer slow, dark, vegetation choked water and are frequently found in Hudson Valley streams and marshes that fit that description. Like all pike, they are toothy predators feeding on large insects and crayfish when young and other fishes (including small redfin pickerel) when adult. They spawn in early spring in dense vegetation.

Redfin pickerel are occasionally taken on small lures but are often mistaken for small chain pickerel. Because of their small adult size, there is little sporting value associated with this species.

Banded killifish (*Fundulus diaphanus*)-

Banded killifish are very common in the shallow water in fresh tidal marshes. They feed on small benthic insects and other organisms on the flooded marsh surfaces, following the tide onto the marsh and leaving as the tide recedes. They also spawn on the shallow marsh surfaces. These small fishes are therefore important in transforming and transporting nutrients from the marsh surface into the estuarine food web. Banded killifish are a forage species for many larger estuarine fishes. Banded killifish have been stocked into ponds and lakes scattered around the Hudson Valley.

Banded killifish are commercially harvested and sold as bait. Their populations in the upper Hudson may have declined in the past 20 years.

Mummichog (*Fundulus heteroclitus*)-

Mummichogs are also common shallow water killifish in tidal marshes. This species is exceedingly abundant in saltier marshes south of Roosevelt Cove where banded killifish are less abundant. Mummichogs are the "ecological equivalent" of banded killifish in that their feeding and reproductive biology is very similar. Mummichogs are very tolerant of fluctuations in water quality and can live in very polluted waters. There are occasional landlocked populations of mummichogs, most notably in the Bronx River in New York State.

Mummichogs are harvested and sold as bait in many areas in the Northeast. I do not know

if they are commercially harvested in the Hudson estuary.

Fourspine stickleback (*Apeltes quadracus*)-

Fourspine sticklebacks are abundant in submersed aquatic vegetation in the tidal Hudson River. They have tiny mouths and they feed on small zooplankton. Males build tubular nests out of plant material (algae) generally attached to submersed aquatic plants.

Fourspines are very abundant in water chestnut beds and it may be that the invasion by this plant has increased stickleback populations in the Hudson.

Fourspine sticklebacks have no commercial value. They are attractive fishes but are very difficult to keep in aquaria. Access to living microcrustacea and dense plantings are necessary to keep the fish alive.

Rock bass (*Ambloplites rupestris*)-

Rock bass are moderately large fish that, as their name implies, prefer rocky habitats. They feed on large aquatic animals, concentrating on crayfish and fish as adults. Like most sunfish, the males build and defend nests scooped out of the bottom. We find rock bass scattered all over the Hudson Valley including the tidal waters.

Rock bass are considered a game fish. They can be readily caught on lures and bait. They are generally not large enough to attract many anglers, but the New York State record is almost 2 pounds. It is difficult to tell if a given population is native or stocked since they are easily transported.

Redbreast sunfish (*Lepomis auritus*)-

Redbreast sunfish are a common river and estuarine sunfish. They prefer flowing water and are less common in lakes and ponds. This species is listed as 'rare' by the New York Natural Heritage Program, but I think they are mistaken. Little is known about the biology of this species. The redbreasts in the tidal Hudson feed primarily on terrestrial insects from the water's surface and gastropods that they pick off of submersed plants. A few ingest zebra mussels. Their reproductive biology is typical of sunfish with males building a round nest on the bottom and then defending it.

Redbreast sunfish are readily caught on lures and bait and are large enough to attract the interest of fishers. They are considered a 'panfish' and presumably are good to eat and are often large enough to be edible.

Pumpkinseed (*Lepomis gibbosus*)-

Pumpkinseeds are very common and widespread sunfish in the Hudson Valley. They are found in a wide variety of habitats from small ponds to the tidal Hudson River. They prefer quiet water and therefore are unlikely inhabitants of flowing streams. Pumpkinseeds are a rather small species that feeds on small aquatic insects and other invertebrates. Some populations specialize heavily on snails. Zebra mussels have been found in stomachs of Hudson River individuals. Pumpkinseeds nest in very shallow water and the reproductive

behavior is easy to observe.

Pumpkinseeds are considered 'panfish' and are easily caught on small pieces of bait. They rarely get large enough to eat although individuals over 1 pound are reported from New York State.

Bluegill (*Lepomis macrochirus*)-

Bluegills are probably not native to the Hudson Valley. They have been widely introduced in North America, particularly into lakes and ponds as forage for largemouth bass. In the Hudson Valley, they are now widespread in standing water and in the tidal Hudson River. Bluegills feed on small aquatic animals, primarily insects. Their reproductive behavior is similar to the other sunfish discussed.

Bluegills are considered 'panfish' and are more frequently large enough to eat than pumpkinseeds. They are easily caught using bait or small lures.

Largemouth bass (*Micropterus salmoides*)-

Largemouth bass are not native to the Hudson Valley but were widely stocked in the middle 1800s. Largemouths are large aggressive predators feeding on fishes, crayfish, and any other moving object that will fit in their large mouths. They prefer still water and are commonly encountered in lakes, ponds, and the tidal Hudson. Their reproductive biology is like other sunfish, although they prefer to nest in deeper water than their relatives.

Largemouth bass are a highly prized game fish. Bass fishing tournaments attract thousands of anglers to the Hudson every year. The economic value of bass populations approaches the value of trout in New York State.

Black crappie (*Pomoxis nigromaculatus*)-

Black crappies are moderately large flat-sided fishes with large mouths. They seem to prefer areas with a lot of submersed plants and are intolerant of poor water quality. The adults feed on large insects and fishes. Spawning in this species is typical of other sunfishes. Crappies are not native to the Hudson Valley but have been widely introduced. They prefer larger lakes and ponds and are locally common in spots in the tidal Hudson.

Black crappies are not as sought after by anglers as largemouth bass, but they have a dedicated following of fishers. This species is often large enough to eat.

White perch (*Morone americana*)-

White perch are one of the most common species of fish in the Hudson estuary. They also do well in lakes and ponds and are occasionally seen in lakes in the Hudson Valley. They feed on a variety of small benthic organisms, mostly insects. They lay small adhesive eggs on clean bottoms and there is a spawning run of this species into Hudson River tributaries. Their moderate size and extreme abundance make this species an important part of the Hudson River ecosystem.

White perch are easily caught on hook and line. The Hudson River white perch rarely attain a size that is attractive to fishers (although they get much larger in other Northeastern states). There is no commercial market for this species in the Northeast.

Yellow perch (*Perca flavescens*)-

Yellow perch are common lake inhabitants in the Hudson Valley and are present but less common in the Hudson estuary. They tolerate salty water and can be found quite far down the estuary. Yellow perch feed on a wide variety of small to medium size organisms including fishes. They spawn in early spring and there is a run of yellow perch into Hudson River tributaries.

Yellow perch are a valuable sport fish. Ice fishermen catch them in large numbers. They often are large enough to eat and yellow perch from the Great Lakes are often marketed.

SUMMARY

The ponds and streams on the Roosevelt-Vanderbilt National Historic Sites appear to have good water quality. The fish species observed are those I would expect to find in comparable habitats in Eastern New York.

The ponds on the Eleanor Roosevelt Site and the Vanderbilt Site are rich in sunfish species. People have probably been stocking these ponds for many years. These ponds should be attractive fishing spots. They may not contain very many large fish, but the variety of species is interesting.

The stream fish communities are less diverse than the ponds. The Meriches Kill on the Home of FDR Site is a very small stream and has the fish community that I would expect.

Crum Elbow Creek on the Vanderbilt Site lacks some species that are found upstream in the creek. These species may well establish themselves in the next few years as the stream recovers from the effects of the (now decommissioned) Hyde Park Water Treatment Plant.

The Fallkill on the Eleanor Roosevelt Site is essentially a pond despite its appearance. The fish fauna is a pond community.

Roosevelt Cove has all the species I expected to see in a fresh tidal Hudson River marsh except tessellated darters. A longer term project would document perhaps twice as many species than we collected in this study.

There are no rare or unusual fishes on the National Historic Sites. With twenty species documented, these relatively small areas have a substantial ichthyofauna.

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