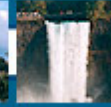




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Stakeholders' Advisory Working Group Environmental Group Meeting #5, November 29, 2007


The Transit Mode Analysis Environmental SAWG meeting #5 on the topics of Transit Mode Analysis and River Ecology was held on October 29th, 2007 at Holiday Inn, Suffern, NY. View minutes of the meeting [here](#) (PDF, 45KB).

The presentation can be viewed in the following formats:

- [PDF format](#) (1.2MB)
- View the slides below with text narration




Bob Lavarie (NYSDOT) stated that this SAWG, the fifth of this group, is – like all the others – intended to foster two-way communications. He then introduced Jim Coyle (ET), who made the first presentation.




Agenda


- Purpose of the Analysis
- Alternatives/Options to be Studied
- Evaluation Criteria



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The presentation addressed the reason for conducting a transit mode analysis, the alternatives studies and the evaluation criteria used in the transit mode analysis.




Purpose of Analysis


- Compilation of criteria to help select mode or modes
- Update analyses from Stage 1
 - 2035 vs 2025
 - Other projects like ARC
- Test some new options based on public comments
- Alternatives/options to be studied



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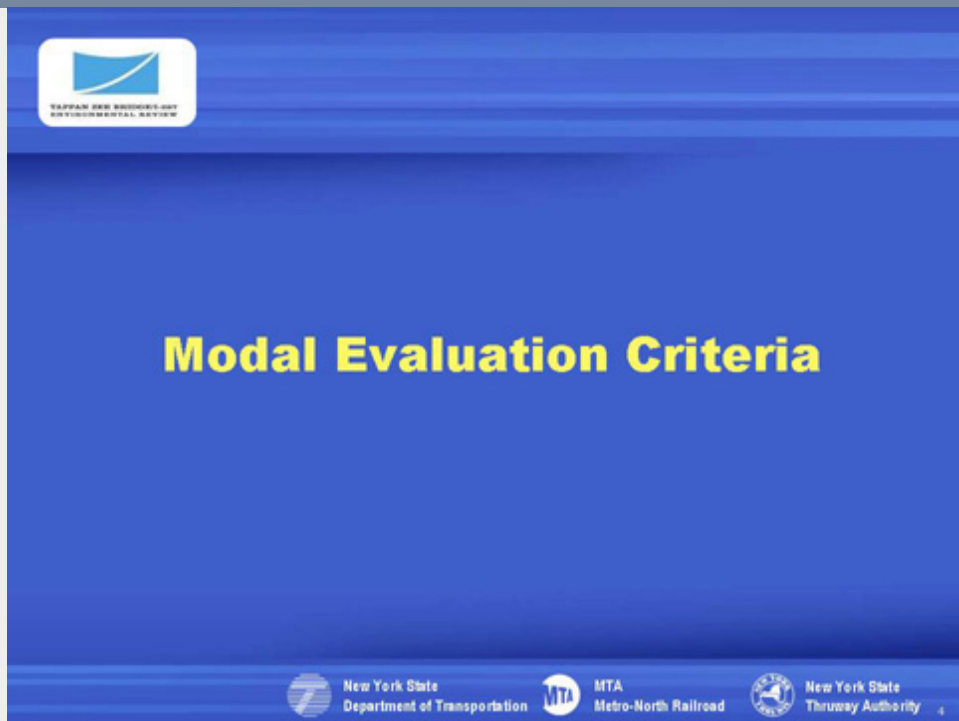


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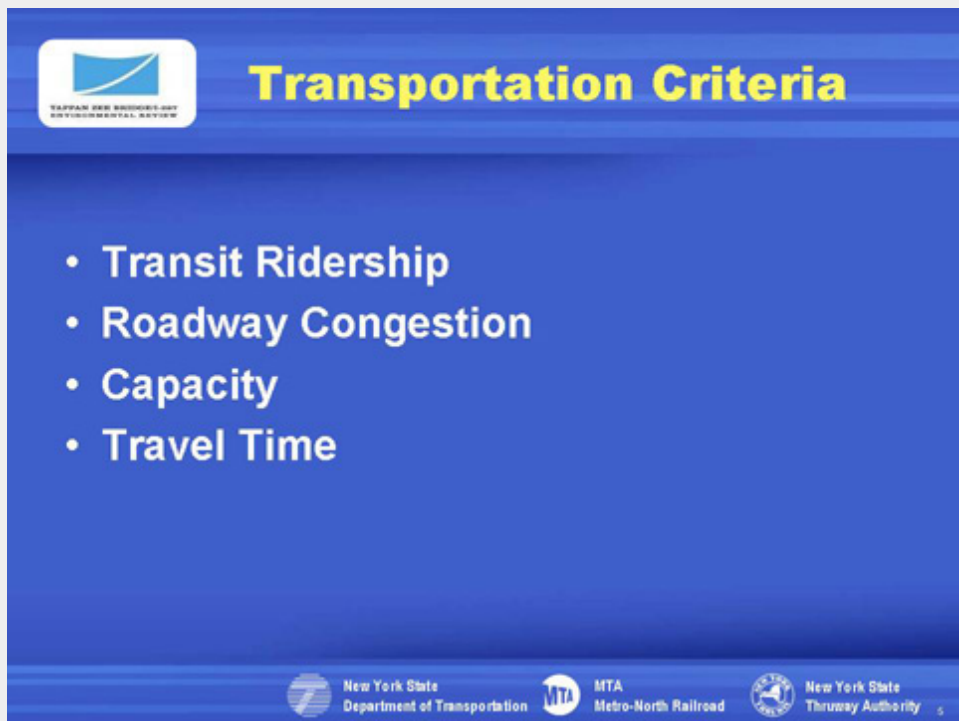


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The study began with identification of the criteria to be used. The analysis performed in Stage 1 was updated to extend the study period to 2035 from the original end date of 2025. New options identified by the public were also added.



The modal evaluation criteria are intended to focus on the travel behavior of each alternative.



The transportation criteria are grouped into four categories: ridership, congestion, roadway capacity and travel times.



Environmental Criteria

- Consistency with land use plans
- Residential and commercial acquisitions/displacements
- Transit oriented development (TOD) potential

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Environmental criteria look at whether the alternatives would be consistent with land use plans, the need to acquire land or relocate existing uses and the potential for transit oriented development.




Environmental Criteria

- Wetlands
- Parklands
- Historic and Archaeological Resources


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The measures are not just the number of each of these criteria, but some assessment of the relative significance of each. For instance, some wetlands are less significant than others, some historic structures are more important. So, these criteria are both qualitative and quantitative.




Environmental Criteria


- Hudson River Habitat Disturbance
- Energy



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One of the key criteria is the Hudson River habitat, which relates to the construction impacts as well as longer term impacts. The energy impacts in terms of energy savings or lack of savings will also be measured.




Cost Criteria


- Capital Cost
- Annual Operating Costs
- Fare Revenue
- Net Cost Per Passenger and Per Passenger-Mile
- Travel Time Benefits



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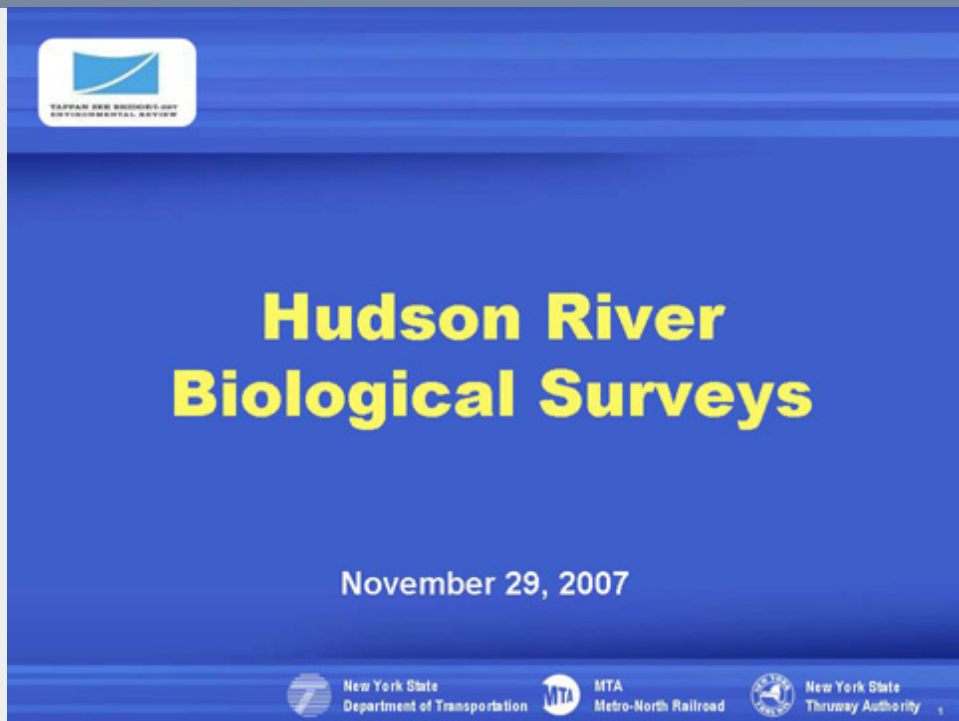


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The cost criteria include not just capital and operating costs but revenues. A key measure to the FTA is the cost per passenger and passenger mile. Overall travel time benefits are also included in these criteria.



Jim Coyle introduced Mark Moese (ET) after the previous slide. This presentation focused on providing an overview of the Hudson River biological sampling program. Mark Moese reviewed each of the individual sampling programs as well as presented some preliminary results.



The objective of the sampling program is to gather data to describe the existing environment, provide data to analyze impacts and for use in future permit applications.



Data Needs

- TZ program focuses on:
 - Vicinity of existing bridge
 - Potential rehab/new bridge alignments
 - River shorelines
 - Reference locations
- Other sampling programs provide regional data



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The current sampling program focuses on the areas near the existing bridge and uses data from other programs, including:

- electric utility fish surveys since 1974
- NYSDEC Bio-criteria program
- work by LDEO and others



Sampling Program


- Ecological Surveys
 - Benthic community
 - Submerged aquatic vegetation (SAV)
 - Fish
 - Birds
 - Mammals
 - Video and sampling of pier surfaces


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The ecological sampling program consists of six major efforts:


- Sample the organisms that live on or near the river bottom

- SAV, which is an important river habitat type
- Fish
- Birds
- Mammals
- Organisms living on the existing piers




Agencies Involved with Surveys


- New York State Department of Environmental Conservation
- National Marine Fisheries (National Oceanic and Atmospheric Administration)
 - Gloucester, MA
 - Milford, CT
 - Silver Springs, MD
- US Environmental Protection Agency
- US Fish and Wildlife Service
- US Army Corps of Engineers
- New York State Department of State



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Meetings were held with various regulatory agencies to discuss the sampling program and develop the protocols that are now being used in the program.



Permits

- NOAA Endangered Species Incidental Take Permit
- NYSDEC Endangered Species Permit
- NYSDEC Scientific Collectors Permit



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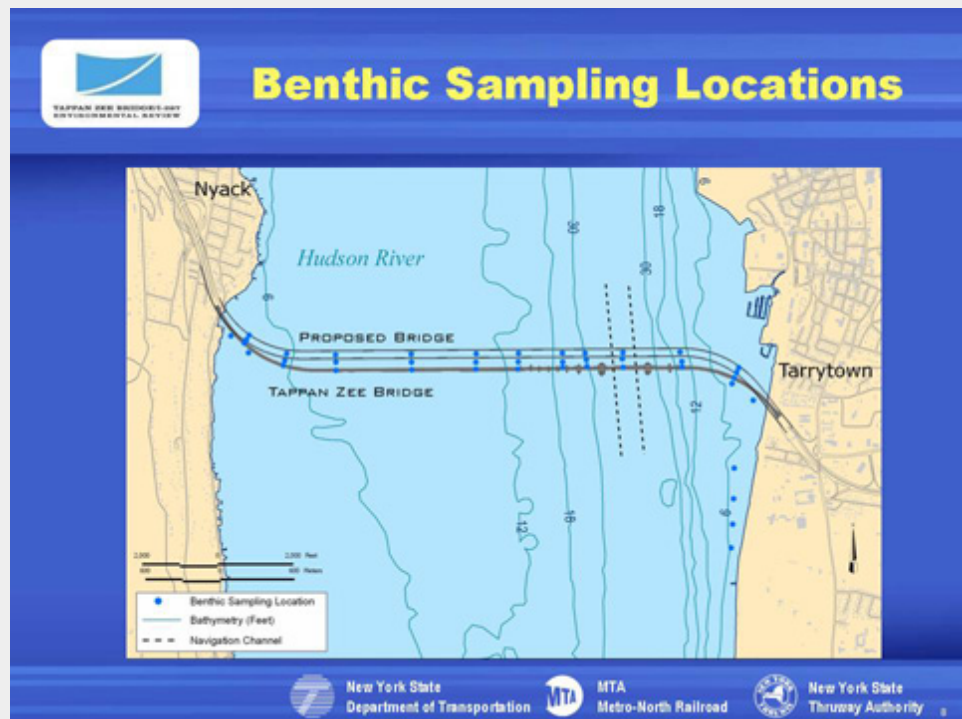


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The fish sampling work is guided by three permits, two of which deal with the handling of the endangered shortnose sturgeon.



The benthic community consists of organisms that live on or near the bottom of the river, which are important food organisms for fish.







The benthic organisms are sampled using a Van Veen Grab, pictured here.




The sediment samples are then sieved in the field; what remains on the screen is placed in a sample jar, preserved and then shipped to a laboratory for identification.




What Are Benthic Organisms?




Amphipod






Worm



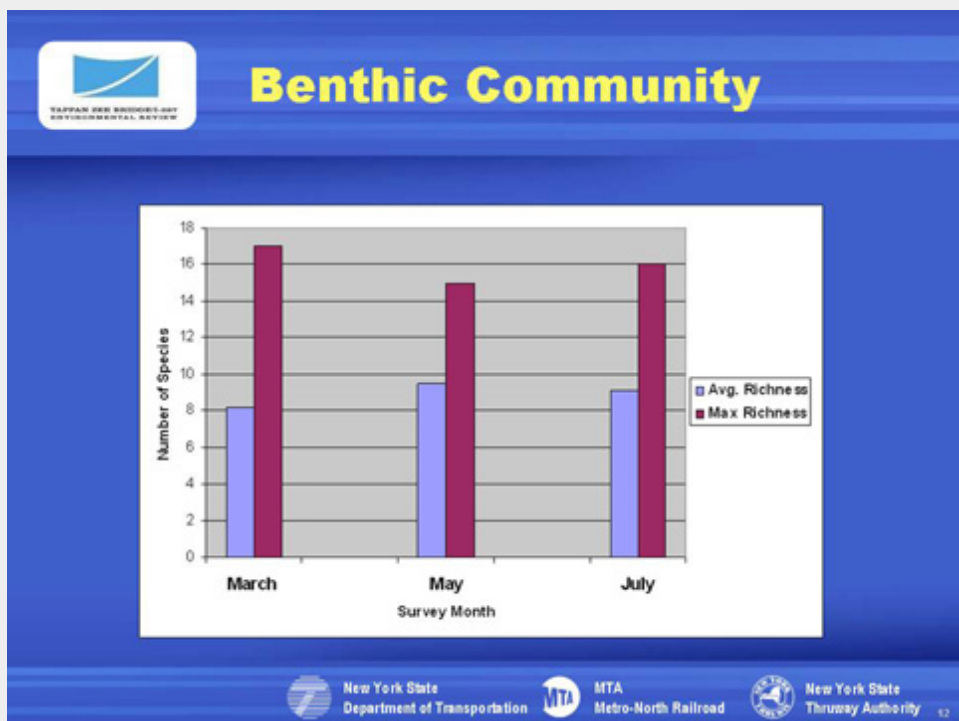
May Fly Larvae



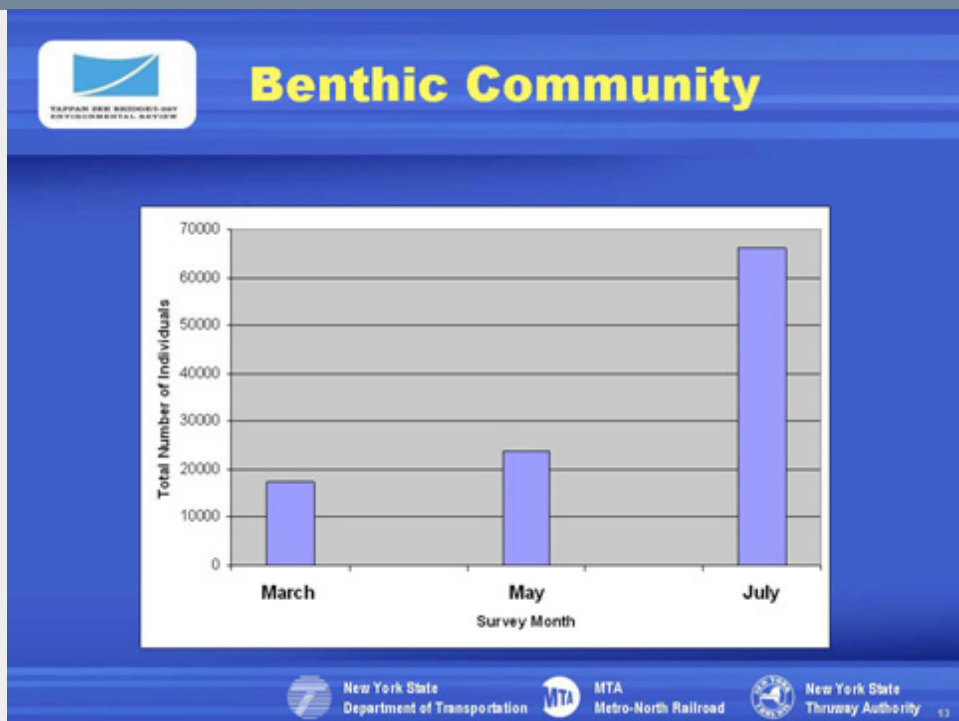
Oyster


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This slide shows typical benthic organisms: a worm, amphipod (shrimp-like); May fly larvae; and oysters.



For the first three sampling periods, March, May and July, the average and maximum “numbers” of benthic species has remained the same.



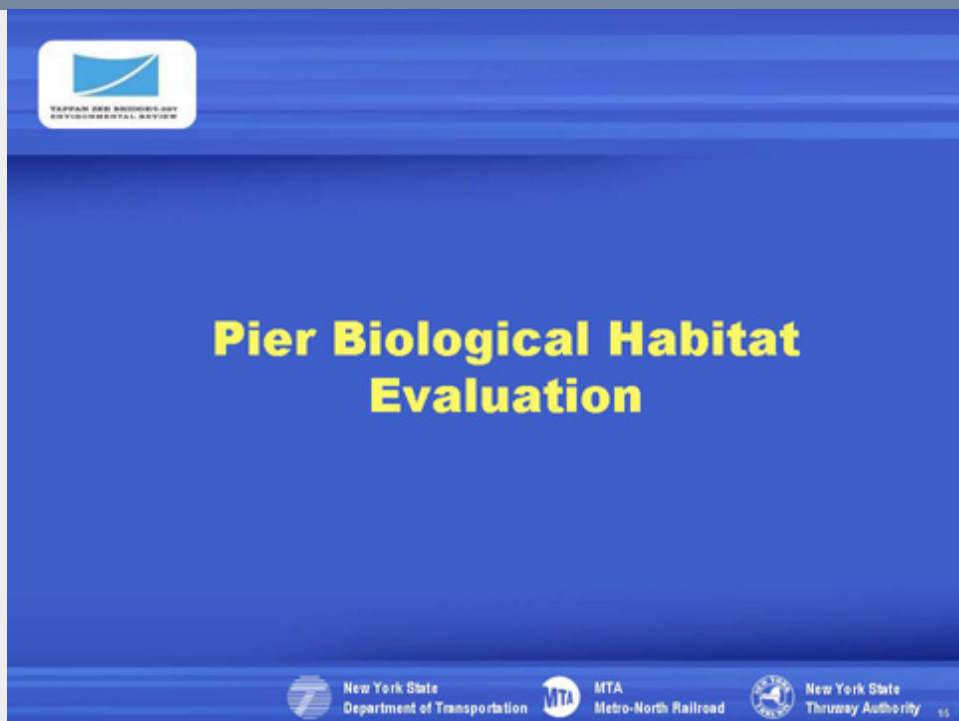
This illustration, however illustrates that the numbers of individual organisms increase due to increases in reproduction over the same three sampling periods.

Blue Claw Crabs

- Crab surveys conducted from April to November
- Crab pots and hand traps deployed across the River
- Gill nets
- Crabs are found from bank to bank
- 80 percent above legal size

Logos at the bottom: New York State Department of Transportation, MTA Metro-North Railroad, New York State Thruway Authority.

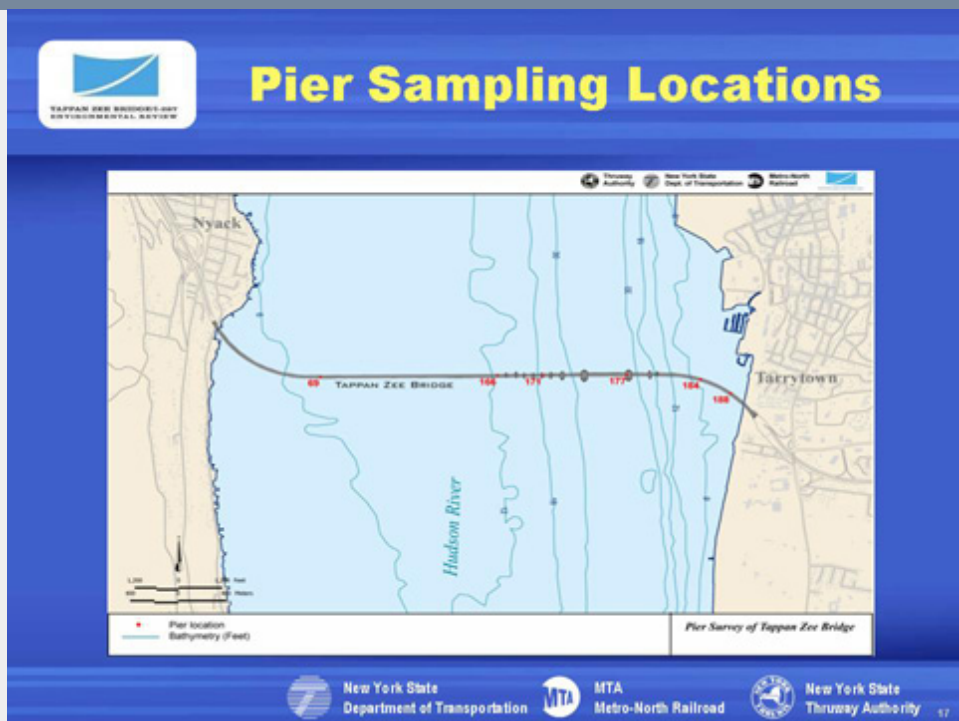
The sampling program targeted the blue claw crabs. We used baited traps, hand lines and our gill nets were effective in collecting crabs. Crabs are found throughout all water depths, and 80 percent are of legal size.



This pier evaluation was not a structural evaluation but was performed to evaluate the level of marine growth on the piers and to determine if this is valuable habitat.



The pier was video taped and the surface sampled by a diver.



Six pier locations for the video and sampling were selected based on depth; the type of pier structure, and the construction material of the pier. The whole perimeter of each pier was examined to determine the extent of biological growth on each pier.

The map shows the Tappan Zee Bridge spanning the Hudson River between Nyack, NY and Tarrytown, NY. Six sampling locations are marked with red dots along the bridge. Bathymetry is shown in blue lines with depth values. The map includes logos for the New York State Department of Transportation, MTA Metro-North Railroad, and New York State Thruway Authority. A scale bar indicates 0 to 1.00 mile. The title 'Pier Sampling Locations' is in yellow text on a blue background.

Pier Sampling Results

- One time Sampling event
 - 10 species attached to piers
 - Green and red algae
 - Ribbed mussels, barnacles, oysters
 - Mud crab
 - Common shore shrimp
 - Clam worm
 - Amphipod
 - One invasive species (Asian Isopod)



The image shows a close-up of an Asian Isopod, a small, segmented, brownish-orange crustacean with multiple pairs of legs.

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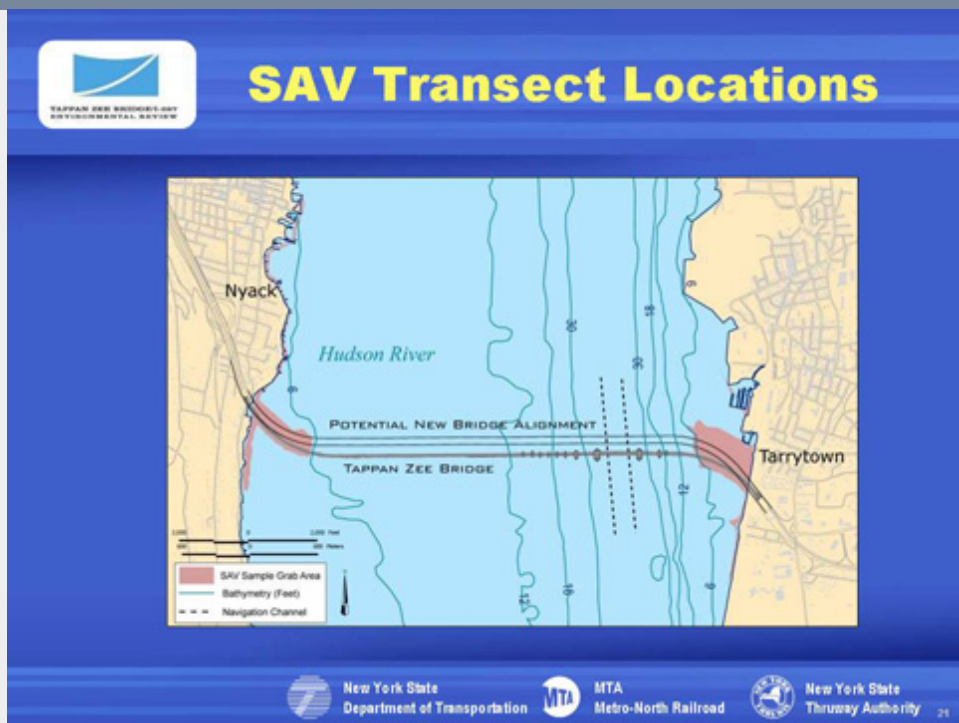
The species listed here are typical of what one would expect to see, except for the invasive Asian isopod. The oysters were found in deeper areas of the river.



Submerged aquatic vegetation is an important type of habitat for fish in the near shore waters, providing food and protection for young fish.



This was a one-time sampling event along the shoreline and in and around the existing bridge out to the 6-foot contour.



This slide shows the areas sampled. The only SAV found was inside the Tarrytown marina and just south of the Nyack marina. Both locations the size of the SAV bed were less than 20 x 20 feet.



The largest sampling program is the fish survey effort.



Fish Surveys

- Bi-monthly Sampling (April, June, August, October, December, February)
 - Acoustic fish surveys
 - Uses acoustic measurement to locate fish
 - Gill nets
 - Traps



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The surveys are performed bi-monthly using acoustic methods, gill nets, and traps. The acoustic sampling method allows scientists to examine the pier areas in a level of detail that could not be accomplished with gill nets or traps.



Acoustic Fish Survey



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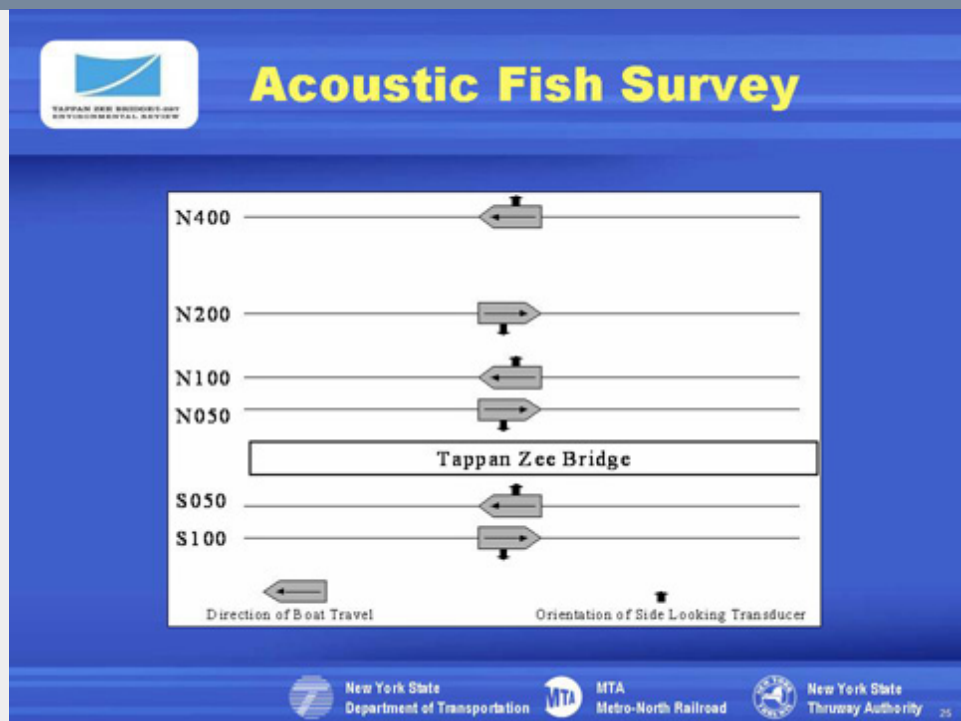
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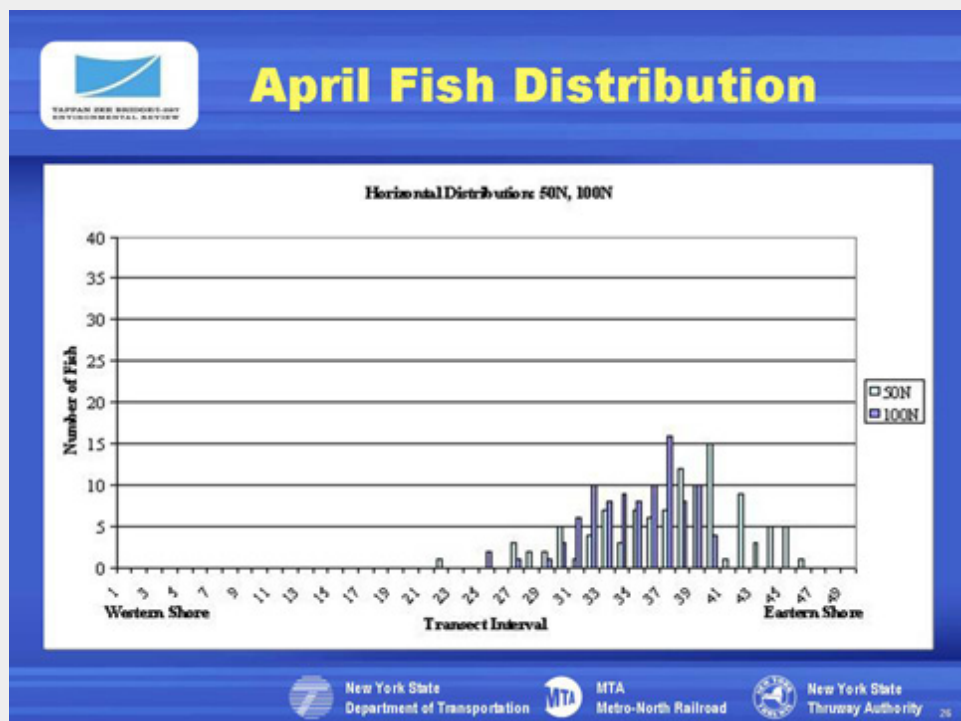
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The slide shows a typical vessel used to conduct a bathymetric survey. Bathymetric surveys measure the depths of a body of water.





This slide shows the acoustic survey lines as well as the direction the transducer faced.






The April acoustic results indicate that the fish were congregated in the deeper areas of the river with the largest number in the navigation channel.




Gill Net Surveys



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This slide shows the field crew performing the gill nest sampling and measuring the fish caught in the net. The nets are 125 ft long by 8 ft high with panels of different mesh sizes. The nets were in the water for different times depending on water temp = 2+ hours to 1 hour.



Gill Net Results

- 20 Species
 - Dominated by white perch
 - Increasing fish numbers
 - April – 70
 - June – 305
 - August – 585
 - October - 539

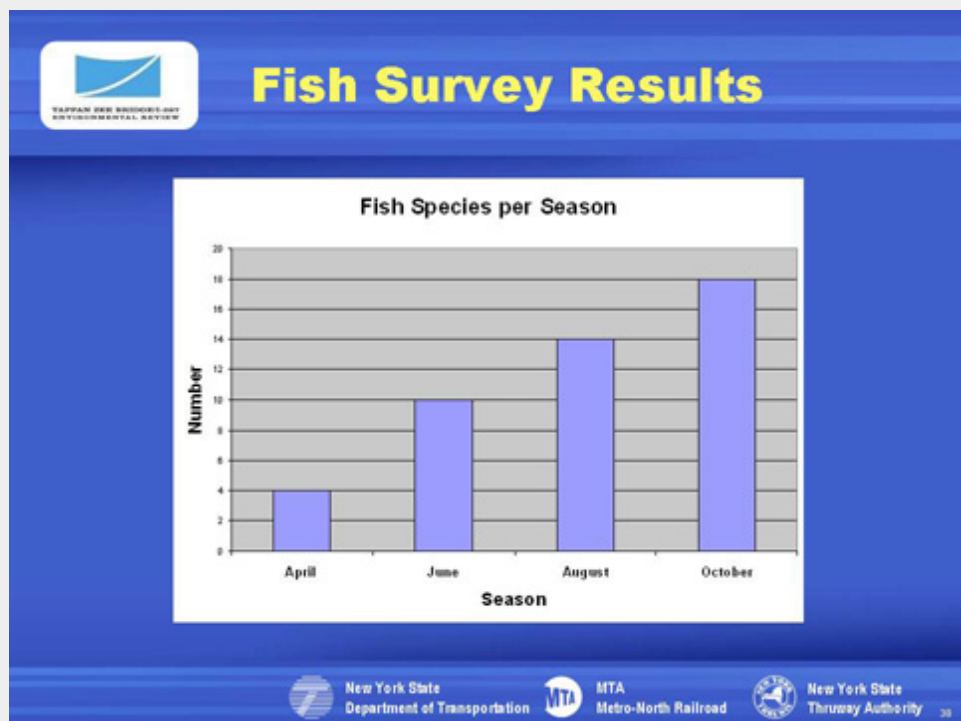



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20 species of fish have been caught in the first four sampling rounds with increasing numbers from April through October.



This slide shows the numbers and species caught which are typical of the river. Ten shortnose sturgeon were caught, all of which were returned unharmed back into the river.



This slide shows the increasing number of fish species caught in the surveys from the low in April to the high of October. This is primarily due to the increases in migratory fish entering the river to spawn.



Shortnose Sturgeon



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This slide shows a picture of a shortnose sturgeon.

- Listed as endangered in 1967 before ESA
- NY and federal listing
- Maximum length = 4 feet
- Bottom feeder
- Spawns up river in fresh water near Esopus Meadows
- Overwinters in fresh and saline waters
- File report with NYSDEC within two weeks of capture
- Caught in all depths



Fish Traps

- Fish traps have yielded low fish numbers
 - Naked Goby, American Eel, and Oyster Toadfish



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The fish traps are deployed, both baited and un-baited. Few small fish have been trapped and are primarily composed of these three species:


- Naked Goby
- American Eel
- Oyster Toadfish




Avian Surveys



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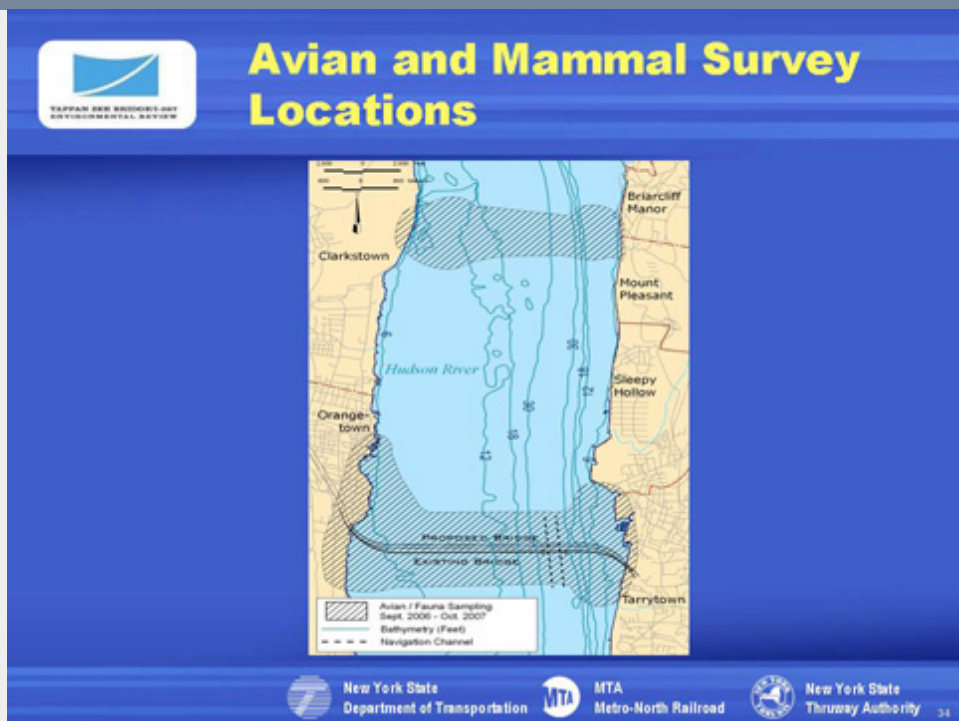
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The avian surveys have been completed. The work was conducted over four seasons.



The avian and mammal surveys were conducted in the vicinity of the existing bridge and at a reference area north of the bridge.



As mentioned the avian surveys were conducted during all four seasons, resulting in over 22,000 sitings of 92 species, including New York State species of concern and state threatened species.




Mammal Surveys


- Surveys cover 4 seasons
- Day and night surveys
- Bridge area
 - Species common to urban environment (e.g. squirrels etc.)
 - Larger species along Hudson Line Corridor and reference areas (e.g. white tailed deer)



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The mammal surveys were conducted over the same time frame as the avian surveys, including night-time surveys. Nothing unexpected was found. All species were typical of urban environments.




Questions?



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End slide.



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