

Coastal Fisheries Project at Jamaica Bay Completed

By Bruce Lane and John T. Tanacredi

Of Gateway National Recreation Area's 26,000 acres more than half comprise the open waters and marshlands of Jamaica Bay. The bay has long been known for its extensive bird populations, rookeries and its importance in the Atlantic flyway. More recently however, Resource Managers at the park have been looking at the health, diversity, and distributions of the bay's fish populations.

Geographically located within the boundaries of New York City, Jamaica Bay is part of the larger Hudson/Raritan estuarine system. It is roughly circular in shape and covers an area of approximately 52 kilometers (km). An estimated 40 percent of the fresh water that enters the bay is through surface runoff over the bay's drainage area of 270 km. The remaining 60 percent of fresh water enters from treated wastewater effluent, for a total freshwater input of 420 billion liters/year. The bay contains a number of access channels whose depths range from 6-17m. The average depth is 4m at mean low water. Tidal flushing is limited to the relatively narrow Rockaway Inlet making the residence time of the bay's water about 30 days. The urban development, wastewater effluent, ocean dumping and pollution associated with the New York Metropolitan area has greatly impacted the local waters. Although it is not always apparent to the casual observer, the shores of Jamaica Bay support electrical power plants, petroleum storage facilities, four wastewater treatment plants, three sanitary landfills, an international airport,

and docking space for thousands of boats, all of which can have direct impacts on the water quality of the bay. The waters, marshes, and islands have been manipulated for generations, beginning when the Canarsie Indians collected shellfish on its shores.

Despite the seemingly bad odds, most of the bay appears virtually unspoiled and remains highly productive. Marshes continue to expand, providing spawning grounds and a home for many species of finfish and other marine organisms. A macrobenthic study of Jamaica Bay completed in 1983 by Dr. William Harris and Dr. David Franz, both researchers from Brooklyn College, CUNY, revealed 121 benthic taxa, demonstrating the species richness as comparable to other estuaries in the region.

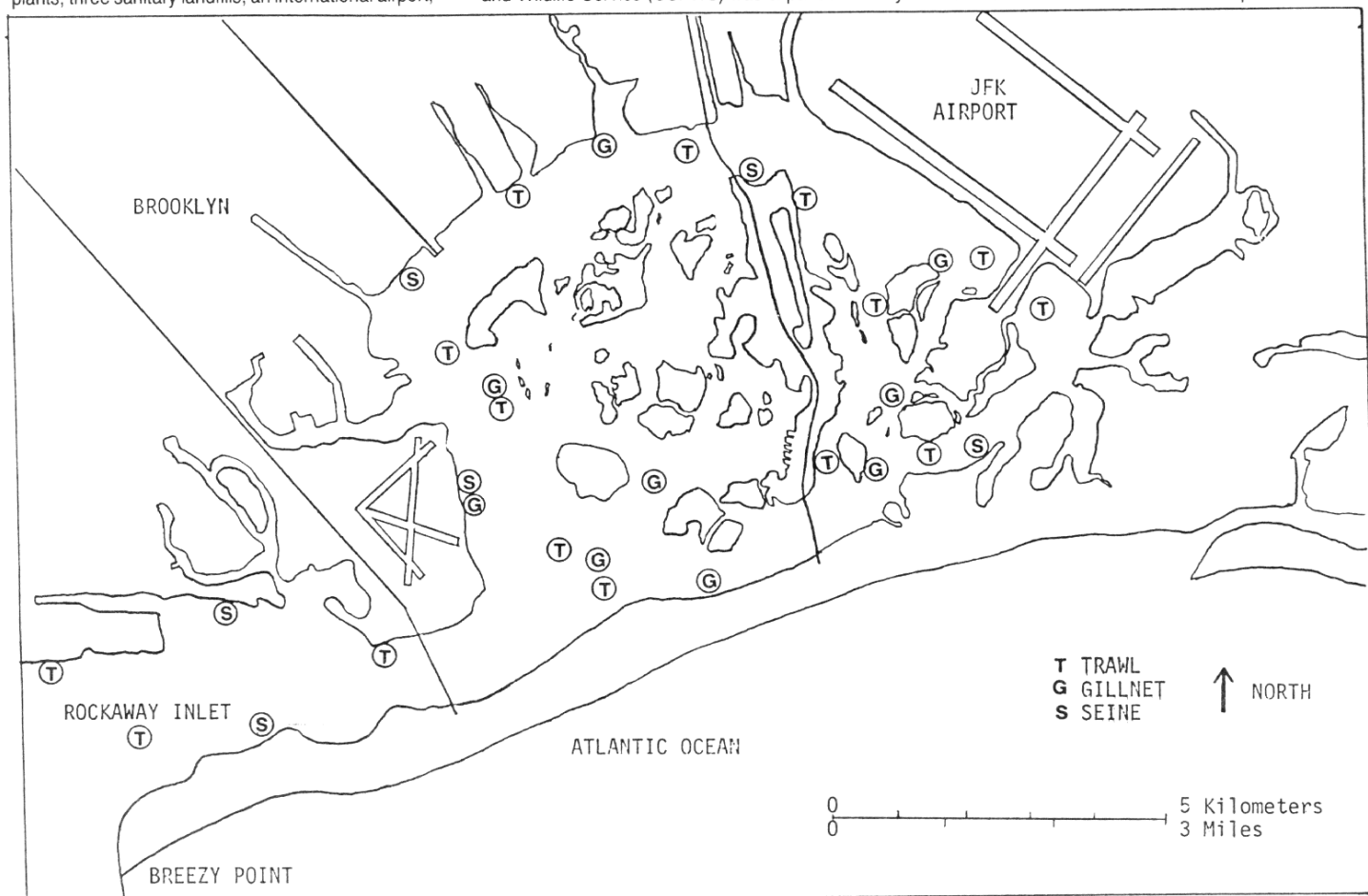
With this vast fisheries resource, fishing for sport and food has long been a favorite recreational activity in the park. Weekend fishermen line the railings of bridges and piers while others venture out in personal boats or charter fishing boats in hopes of a good catch. Continued pressure however, from development on neighboring lands, the possibility of potentially toxic materials leaching from landfills, and scientific studies reporting contaminated fish in adjacent waters raised concern over the environmental quality of the Jamaica Bay fishery and demonstrated the need for a comprehensive fisheries study.

An existing Interagency Agreement between the National Park Service and the United States Fish and Wildlife Service (USFWS) was expanded in July

of 1985 to include a one year finfish inventory of Jamaica Bay. In conjunction with the inventory, fish species were collected for laboratory analysis, and a fishing survey questionnaire was developed. The 25' research vessel utilized in the project is owned by the National Park Service and was specially designed by the USFWS and engineers from the shipbuilder, Boston Whaler, Inc. The open stern has been fitted with an aluminum deck, which keeps the 30' otter trawl net clear from the boat's outdrive. 1000 lb. capacity power winches do most of the work in hauling the trawl net, while radar, a recording depth finder, marine radio, and other accessories aid in navigation. The boat is named after Herbert Johnson who was instrumental in developing the Jamaica Bay Wildlife Refuge in the early 1950s.

The one year finfish inventory on Jamaica Bay was conducted by employees of Gateway's Office of Resource Management and Compliance and a Biologist from the USFWS. The crew sampled the bay once each month throughout the year. Fifteen trawling stations were chosen to reflect an overall geographic distribution as well as the varied sediment types found throughout the bay. The otter trawl was towed for a five minute period into the tidal current. Once the net had been hauled aboard the location was noted, and each fish counted and measured. Other information such as breeding activity and evidence of disease also was recorded. At each sample station the levels of dissolved oxygen, pH, salinity, and temperature were determined.

In order to sample the upper water layer, 100' gill nets were used. Nine gill net stations were selected throughout the bay. Each net contained four 25' panels, which provide a mesh opening ranging from 1/2" to 2 1/2". The nets were held in place with 10 lb.





The research vessel, Herbert Johnson, leaving port for data collection on Jamaica Bay, part of Gateway National Recreation Area in New York City.

anchors, marked with floats, and set perpendicular to the shoreline or shoal bank. They were retrieved after 24 hours, and the data were recorded. A 50-foot, hand-held seine net was used to sample along the shoreline. One sweep was made at each of the six chosen sample stations. Again, water quality parameters and fish data were recorded.

These sample techniques proved effective and netted good catches throughout the year; thus far, 46 different species of finfish have been recorded. Fish specimens numbering 146 and representing 13 different species were sent to a USFWS contract laboratory facility for PCB analysis. In addition to the finfish numerous species of invertebrates were captured. Although not recorded for purposes of this study their presence is important as a food source and demonstrates the diversity and productivity of Jamaica Bay.

The fishing survey questionnaire is the final phase of Gateway's fishery study, and it was designed to identify the recreational catch population of the bay. Five hundred surveys are being conducted by non-uniformed NPS employees at various locations around Jamaica Bay. The questionnaire covers length of time spent fishing, fish caught, the rationale for fishing and choosing a fishing location, and the consumption of fish caught. The last five questions relate to the demographic and social conditions of the fishing population. Once all the surveys are completed, computerized and analyzed, the park will have a picture of who is catching what fish and where the fish are being caught. Coupled with the finfish inventory and PCB lab analysis, this information will tell park managers which people, places, and times to target, should a public health hazard exist. New York State's Department of Environmental Conservation has recognized the public safety issue and has conducted research throughout New York State to determine the contaminant levels in finfish and the risk factors associated with their consumption. The State Department of Health has issued several public health advisories ranging from limited consumption to prohibiting possession. High PCB levels in the

Hudson River striped bass is perhaps the most noted because of its commercial fisheries value and popularity in sport fishing. As pressure for recreational fishing and fish consumption continues, careful consideration will be needed to manage Jamaica Bay's fisheries resource. This project is the first step in that direction. The completed fisheries report will be available early in 1987.

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research notes

In 1984, the Delaware River Basin Commission (DRBC), a federal-interstate agency with jurisdiction throughout the river basin, and the National Park Service initiated a cooperative water monitoring program focusing on the upper and middle sections of the Delaware River – the waterway that forms the boundary between Pennsylvania, New York, and New Jersey.

These two river sections include the Upper Delaware Scenic and Recreational River (UDSRR) and the Delaware Water Gap National Recreation Area (DWGNRA) . . . both parts of the National Wild and Scenic Rivers system. The areas, both administered by the National Park Service, span nearly 120 river miles and serve 300,000 recreationists yearly.

A U.S. Environmental Protection Agency report on the program, describing the program's development, the monitoring parameters, location and frequency of sampling, use of the parameters to screen water quality, determination of monitoring priorities, and program administration, was published in July, 1986, as an EPA Water Quality Program Highlight. Material for the report was furnished by John Karish, NPS Mid-Atlantic Regional Chief Scientist, Richard C. Albert of the Delaware River Basin Commission, and Charles Sapp of U.S. EPA's Region III.

For copies of the report, contact E.F. Drabkowski, EPA, MDSD, WH-553, 401 M Street S.W., Washington DC 20460. (202) 382-7056.

External Development Affecting the National Parks: Preserving "The Best Idea We Ever Had"

By Thomas W. Lucke

Wallace Stegner once described America's national parks as "the best idea we ever had." How to preserve and protect the unique qualities and superlative resource of these parks from adverse impacts caused by development beyond their boundaries was the topic of a Conference conducted from Sept. 14 to 16, 1986 at Aspen Lodge, Colo., which, with its sweeping view of Long's Peak and Rocky Mountain NP, was more than an appropriate setting. Organized by the National Resources Law Center of the University of Colorado School of Law, the Conference was attended by 85 participants, 18 of whom were NPS employees.

During the two days following a keynote address entitled "The Future of the National Parks: Recreating the Alliance Between Commerce and Conservation" by Professor Robin Winks of Yale University, a number of scholars involved with NPS issues gave presentations. They included Alfred Runte, author of *National Parks: the American Experience* and Professor of History at the University of Washington; author and naturalist Robert Cahn of Leesburg, Virginia; T. Destry Jarvis of the National Parks and Conservation Association; Alston Chase, author of *Playing God in Yellowstone*; Professor George Cameron Coggins of the University of Kansas School of Law; and Michael Mantell of the Conservation Foundation.

Congressional activities regarding park protection were detailed by Judy Erickson, Legislative Assistant to Sen. David Durenberger (Minn.); the Department of Interior's position on the question of external threats and adverse peripheral development was given by Steve Gleason, Deputy to the Under Secretary, and Allan Fitzsimmons, Special Assistant to the Assistant Secretary for Fish, Wildlife and Parks. NPS speakers included Molly Ross of the Air Quality Division, Supt. James Thompson of Rocky Mountain NP, and John Varley, Chief of Research at Yellowstone NP.

Two case studies concerning development activities outside park boundaries that hold potential for significantly affecting water and wildlife resources and values within park boundaries were presented and discussed. They were "Challenges of the Greater Yellowstone" by Bill Bryan, Board Member of the Greater Yellowstone Coalition, and "Restoring the Biological Integrity of Everglades National Park" by Estus Whitfield, Senior Analyst with the Office of the Governor of Florida.

The Conference purpose was to explore park values requiring protection, to examine possible threats to those values posed by external activities, to identify and weigh the legal and management issues involved, and to suggest possible approaches for improving park protection. Judging from the response of many of the participants, that purpose was achieved.

As to weaknesses in the Conference, several participants felt it would have been helpful if private developers or representatives of extraction and developmental interests had been present to put forth their concerns and perspectives on the concept of park protection.

The handbook developed for the course is available for \$30.00, and audio tapes of all the sessions are available for \$75.00. They can be obtained by writing to Katherine Taylor, Natural Resources Law Center, University of Colorado School of Law, Campus Box 401, Boulder, Colorado 80309-0401.