Comments to The Clinton Shellfish Commission
Winter 2007 Meeting Discussion
Tuesday, January 9, 2007 – Timothy C. Visel

Restoration or Mitigation of Navigational Dredging Projects

Hammonassett Natural Oyster Beds/ Inner Clinton Harbor

Comments about loss of oyster shell base Hammonassett River and "bulk heading" hardened shorelines - habitat values. Questions were raised about the build up of organic debris, such as leaves, silt, sticks and logs. Impacts upon habitat with references to winter or blackback founder. Navigation projects often removed the organic matter but left unsuitable bottom habitat for demersal species such as shellfish and winter flounder. A suggestion was made that dredged areas be reshelled at 1,000 to 2,000 bushels per acre and monitored for,

(1) Increase oyster or clam sets
(2) Presence/absence surveys for winter or blackback flounder

Comments made by Tim Visel – Historical Review

Anyway, I did learn a great deal from George McNeil and many other retired commercial fishermen who attended my Sea Grant workshops. John Roy, one of our science teachers at Sound School told me the Stonington fishermen have a saying, "You really don't get to understand fish habitat unless your livelihood depends on it." That was certainly true of the oyster growers I came in contact with.

Your comments about the Army Corps are essentially correct. They have been the estuarine "leaf rakers" for decades, George McNeil felt that after every dredging project in the Hammonasset River, the Army Corps would expose more buried oyster shell base than they took away. One of the things he did comment on was the shape of dredged channel. He felt that if the sides were tapered, the impact would last longer. He felt the "box" dredge channel was poor. The sides would slide into the channel just a few weeks after the project finished. He suggested tapering the edges, and putting back oyster shell on the "edges". Oyster shells form a tough matrix when packed. (They used to make roadbeds and driveways from shells) and could he felt, be a

spot where oysters could set again. He felt that was better than the steel sheet piling used so often. The "better" was his recollections about eels and fish using the oyster shell as habitat.

When the West River in Guilford was dredged in 1981-83, we did use crushed oyster and clamshell to stabilize the dredged channel edges and it worked well, I toured the area and it had become a popular blue crab spot. Much better I felt, for habitat than bulkheading.

In 1987, I started to re-shell the lower East River in Guilford– site of an Army Corps project and we were able to photograph the shell base attracting blackback flounder. The shell base also got a great set of oysters. The Army Corps supported these efforts. I was going to try restoring fish habitat in Westbrook when I left Sea Grant in 1990. Several other Connecticut dredged channel areas I believe could support better fish habitats.

I felt that the boating community and fishermen could work together to rebuild fish and shellfish habitats, but I was almost alone in the concept. During Cove and Embayment Board meetings in the 1980's, the concept of finfish and shellfish restoration was constantly tabled. Perhaps now the time is right to openly discuss restoration of finfish and shellfish habitats. We tried to get something done in the early 1980's, but we met with resistance. In 1994, the Cove and Embayment Board tried one last time to get finfish and shellfish restoration policies addressed, but shortly before a key meeting on the topic, the board was dissolved. That was over a decade ago, and we have much better technology and habitat trend information today, which unfortunately isn't that good. As for as the aerial photographs we had the 1934 over flight, 1955, 1974 and the 1980's. It was easy to see changes in the river morphology and built up areas. I hope this answers some of your questions.

Comments to William A. Hubbard and Cori M. Rose 12/13/06
Army Corps of Engineers

It was very nice meeting with you both recently. I thought these comments about the Hammonasset River and about shellfish and finfish habitats might be of interest.

It was George McNeil one of the last Connecticut oyster growers who interested me in dredged channels. He was convinced that they could be “restored” to support shellfish and finfish habitats and if allowed, the oyster industry could maintain the accepted depths. The East River project was to a large extent his idea. Although he had misgivings about dredging active oyster beds, he did notice an improvement in “life” when large amounts of the organic matter was removed from the Hammonasset River. There appears to be resurgence in oyster productivity after each time the dredging occurred. The Dolan Shellfish Company in Guilford also came to the same conclusion although they termed it a “sediment trap” at the mouth of the East River.

If I had stayed at Sea Grant I was looking at two river natural oyster beds that had been dredged in Westbrook, CT. That would have been my next stop! I would welcome any thoughts or comments.

Sincerely,

Tim Visel, Coordinator
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Vocational Aquaculture Center

Appendix To Clinton Shellfish Meeting

January 9, 2007

Journal of Shellfish Research Volume 7, Number 2
October 1988 - Pages 267-270

MITIGATION OF DREDGING IMPACTS TO OYSTER POPULATIONS

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ABSTRACT Maintenance and extensive navigational dredging in coastal areas along the Northeast and Mid-Atlantic coasts have altered the population dynamics of oysters. Crassostrea virginica. In most instances, oyster production has been reduced by removing shell bases and reefs upon which spat could set. One type of mitigation of dredging impacts may be made through a variety of reshelling programs. In Guilford, Connecticut, periodic maintenance dredging since 1957 has been the source of increased mortality of seed oysters and removes the shell base upon which seed oysters set. In 1985, taking into account the Army Corps dredging schedule and seasonal emplacement of private moorings, the Guilford Shellfish Commission acted upon an earlier Sea Grant proposal and made an

agreement with a local oyster company to manage oyster bed restoration in this area. Eight thousand bushels of crushed clamshell were planted in 1985 to form a shell base.

In July 1086, 8,000 bushels of clamshell were planted over the shell base which obtained a set of 0-year oysters. A harvest of several thousand bushels of seed oysters was anticipated in 1987. Mitigation agreements which are small in scale and do not interfere with other coastal activities can be expanded to improve oyster resources

KEY WORDS: Crassostrea virginica, dredging, mitigation, natural shell bed spatfall

Attachment Diver/Video Survey of the Lower Neck River and Lower East River, Guilford, CT

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Report and Video provided to The Army Corps of Engineers
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DIVER/VIDEO SURVEY OF THE LOWER NECK RIVER AND LOWER EAST RIVER, GUILFORD, CONNECTICUT

DATE: 1 September 1988
TIME: 10:00 - 13:00 hours
TIDE: Low slack --- 3 hours into flood
TEMPERATURE: Not taken; estimate 20° C

METHODOLOGY
In situ visual observations and discrete u/w video photography was used to describe the general physiographic features and floral/faunal species present in the area.

Particular emphasis was placed on describing the general condition of the oyster beds.

Divers made visual observations of sediment type (substrate), topography, suspended sediments, vegetation and species present. Discrete video footage was obtained in order to characterize each area surveyed.

TRANSECT #1 Mouth of Neck River

Area surveyed: Proceeded approximately 75 meters downstream from southern most boat dock on river. Divers followed a zig-zag pattern (bank to bank) while proceeding down stream. River is approximately 10 meters wide in this section.

Depth: 1.5 meters at the river back gradually deepening to 2 meters in the center at MLW> Current (1 hour into flood) was estimated at 1/2 Kt.

Topography and sediment type:

The river banks were composed of soft cohesive mud consolidated by vegetation (e.g. Spartina) and descended to the river bed at approximately a 45° slope. The river bed was flat and featureless, sloping slightly form the banks to the center.

The entire river bed was covered by shell debris (oyster) and live oysters. Oyster distribution was patchy but generally more dense (estimate 5-10/m2) near the banks than at the center of the rivers.

The substrate was a firm, compact matrix of shell material and cohesive muds. This substrate could not be penetrated by hand. A thin veneer of fine grained easily suspended, unconsolidated mud occupied interstitial spaces between shells and obscured visibility when suspended by the water current.

Surficial sediments appeared well oxygenated with the redox layer generated evident a –2cm depth.

Biological observations:

River banks were overgrown by the marsh grass Spartina alternoflora. Extensive burrow networks of the fiddler crab Uca dominated the intertidal zone. In the lower intertidal mud snails (Illynassa?) were observed grazing and were relatively abundant. Oysters exhibited a relatively patchy distribution and appeared more abundant near the river banks (approx. 5- 10/m2) than in the center (approx. L5/m2). Oysters ranged in size from 4-5cm shell length to -15cm shell length. Shell configuration varied from relatively wide, rounded well proportioned individuals to narrow, elongated shells. New shell growth was apparent on most individuals observed. Most oysters observed were oriented with the valves in a vertical position and were feeding.

Algae cover over the bottom was relatively sparse and principally dominated by Ulva. We estimated -10% aerial coverage. Detached rockweed, Fucus, was also present along the river banks. Other species observed included: the winter flounder Psendopleuroneates americanus, oyster toadfish, Opsanus tan; oyster drill, Urosalpinx cinerea; barnacles, mud crabs Rithropaneopus sp, hermit crabs, Pagurus longicarpus.

TRANSECT #2 East River - Reclamation area

Area Surveyed: A 25 meter transect in the center of the river downstream from the confluence of the neck river to the northern most boat mooring just south of the state boat launching ramp.

Depth current: Approximately 3 meters. Current was approximately 2 1/2 hours into flood with a velocity of 1/2 kt.

Sediment type topography: These parameters were very similar to those for the Neck River except for the following:

> A slightly stronger current suspend more particulate material, reducing visibility. Shell debris was principally composed of surf clam shells, Spisula.

Biological observations:

Live oysters, 10-15cm shell length were very abundant. Oyster densities were estimated to be >25/m2 over the entire transect. Shells were oriented vertically feeding, and new shell growth was apparent on most individuals. Spisula shell provided settling substrate for juvenile oysters.

Other species observed included: oyster drill Urosalpinx cinerea,
barnacles, shrimp (unidentified), winter flounder.