Chapter 5 “Curley” report Draft

A major goal of NRAB is to help ensure that Wellfleet harbor remains a clean and productive site for residents and those who earn their living directly from harbor waters.

Monitoring of harbor waters and biology is an important part of achieving this goal.

Back in 1972, the Division of Marine Fisheries produced a comprehensive report to this end entitled “A Study of the Marine Resources of Wellfleet Harbor”. The lead author was John R. Curley, so we refer to the “Curley Report”. A copy can be accessed on the NRAB web-page:

<https://www.wellfleet-ma.gov/sites/g/files/vyhlif5166/f/uploads/study_of_the_marine_resources_of_wellfleet_harbor_curley_report.pdf>

One of the recommendations of the report was that the survey be repeated every 10 years. This was clearly not done. We recommend a renewal of the report, which would provide a guide for an action plan based on nearly 50 years of changes.

The Curley report has a number of sections:

> harbor morphology

> water quality: temperature, oxygen, pH

> Finfish, both bait and sport

> Shellfish

> Marine and Marsh vegetation

> Other harbor monitoring,

Harbor Morphology.

The original report has a basic but still useful depth contour map of the harbor.

(attach here). A more detailed study of the benthic harbor habitat was issued in 2019 by the

Center for coastal studies (ref here). This report can also be found on the NRAB web-page.

An action item is to review and compare both reports. The newest report also contains

benthic related biological information, useful for planning.

Water Quality

Much more extensive water quality testing is on-going, lead by Amy Costa at

The Center for Coastal Studies. A link to this data is: xxx. Crucially, this data also contains

information on harbor nitrogen and phosphorous, the importance of which has become

better understood in recent years.

Finfish

Nine finfish stations were established in 1975 (map attached). Sampling used a 60’ beach seine and an otter trawl in deeper water. Data was taken monthly.

Key baitfish were Silversides, Mummichog and Striped Killifish. Winter Flounder, Alewife, and Menhaden were also significant among the larger fish. Interestingly, neither Bluefish nor Striped Bass were found.

Work on finfish populations is already well underway. The Center for Coastal Studies (CCS), Owen Nichols as lead scientist, has completed field work for a study of baitfish. A final rrport is being written. This work was funded by a Palladino Fellowship from the Friends of Herring River.

A follow-up proposal has been prepared, also by CCS, for a larger project to sample the harbor for commercial and sport fish.

Finally, for many years the Friends of Herring River has sponsored a volunteer count of the Spring herring run in the river. A summary of data follows:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ***Wellfleet Herring Count Summary*** | | | | ***2020*** |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **Year** | **Fish** | **Count** | **Statistical** | **First** | **Last** | **Peak** | **Peak** |  |
|  | **Counted** | **Sessions** | **Estimate** | **Sighting** | **Sighting** | **Count** | **Date** |  |
|  |  |  |  |  |  |  |  |  |
| **2009** | **1663** | **235** | **22,000** | **7-Apr** | **25-May** | **131** | **18-Apr** |  |
| **2010** | **744** | **265** | **12,500** | **4-Apr** | **30-May** | **61** | **7-Apr** |  |
| **2011** | **645** | **340** | **9,500** | **9-Apr** | **26-May** | **111** | **27-Apr** |  |
| **2012** | **1192** | **465** | **11,700** | **19-Mar** | **24-May** | **122** | **9-Apr** |  |
| **2013** | **2035** | **383** | **25,000** | **6-Apr** | **26-May** | **220** | **26-Apr** |  |
| **2014** | **4903** | **325** | **60,000** | **9-Apr** | **26-May** | **320** | **14-Apr** |  |
| **2015** | **1561** | **303** | **18,000** | **11-Apr** | **25-May** | **208** | **26-Apr** |  |
| **2016** | **1379** | **347** | **12,900** | **28-Mar** | **18-May** | **143** | **26-Apr** |  |
| **2017** | **673** | **284** | **8,000** | **7-Apr** | **18-May** | **177** | **11-Apr** |  |
| **2018** | **2426** | **304** | **27,000** | **11-Apr** | **25-May** | **288** | **29-Apr** |  |
| 2019 | 3244 | 318 | 46,000 | 7-Apr | 27-May | 214 | 8-May |  |
| **2020** | 1591 | 485 | 13,200 | 27-Mar | 21-May | 81 | 30-Apr |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

Restoration of the Herring River will provide a major opportunity for change: data from that project will continue to be important.

Shellfish.

There is extensive shellfish data in the Curley report, especially for Quahog and Oyster.

We also have data from the early 1900’s due to the research of Dr. David Belding. Very useful commercial data is compiled annually by the Shellfish Constable.

However, a direct comparison with modern data for the purpose of monitoring overall harbor health will be difficult. There have been two significant changes in the intervening 45 years:

> the use of aquaculture for commercial shellfishing has become a key part of the shellfishing business. Many of the test sites in the earlier study are now used for aquaculture.

Sites will need to be identified that are wild growth only: the Fresh Brook estuary, west side location along Great Island south to Jeremy Point, and parts of the Gut.

> clutching has become a widely used and effective tool to encourage shellfish propagation. The study could compare clutched and native sites that are adjacent or nearly so: Chipmans Cove and the Gut are possibilities.

These changes have benefitted shellfish populations in the harbor. Aquaculture provides a source for “spat” – young oysters and clams. Cultching provides habitat for oyster spat to adhere and grow.

However, in order to use shellfish information to monitor long term general harbor quality, we will need to effectively start over. Therefore, comparisons back to Curley (or even David Belding’s works will be difficult. Probably, we will need more repetitions of shellfish data.

Co-operation with the Shellfish Constable and SAB will be essential.

Sampling decisions that need to be considered are:

> cultched versus totally wild sampling sites;

> harbor east (here most of the marshes are located) versus harbor west (fewer marshes) and harbor north (protected waters) versus harbor south (open waters)

> The Curley report took no mid-harbor samples. Dragging for shellfish is an important

tool for the shellfish business in Wellfleet. For mid-harbor data to be useful, some short- term designation of dragging sanctuaries would be needed.

Marine and Marsh Vegetation

Shellfish live on phytoplankton. The abundance of these microscopic algae is critical to the populations of shellfish. In addition, the blooms of phytoplankton relative to spat release by

breeding shellfish is important. This is the phenomenon called “phenology”. So, measures

of phtytoplankton blooms compared to shellfish spat release could be a critical measure

of the health of the harbor.

Monitoring salt marsh vegetation changes is discussed under a “Climate change” chapter.

> Other harbor monitoring.

There is already underway various harbor monitoring projects, of great value, which deserve support:

- Diamond-backed Terrapins, Horseshoe Crabs : MassAudubon

Note: Horseshoe Crab populations in the harbor are greatly reduced; these crabs

greatly benefit shellfishing beds. We need to work further with the Division of Marine Fisheries on a strategy to build populations in Wellfleet harbor.

- Eels ; MassAudubon

Note: there is a spring migration monitoring site at the Wellfleet Bay Sanctuary. This monitoring should be expanded; for example to Hawes Pond

and the Herring River

- Birds : perhaps the most interesting data could be obtained in the winter;

for examples, Eider eat small shellfish; Loons and Merganser eat small fish.