NRAB-Harbor Management Plan 2020

 **Shellfishing**

 Shellfishing has been and remains an important part of Wellfleet’s social and economic life. Continued success of the enterprise demands good management and a sound harbor environment.

 As the historical work in the “Belding” report shows, management has failed in the past. Strong continuing leadership from the Shellfish Advisory Board and Shellfish Constable will continue to be needed.

 Much of what NRAB could contribute to this discussion was already anticipated by a Climate Change Working Group Report, authored by Dr Seth Tuler, 2015, already referenced in the Introduction. It is still a key reference, which NRAB supports.

 Climate change will result in several changes in the harbor environment that may affect shellfishing:

 > warmer harbor waters

 > more acidic harbor waters, due to increased CO2 dissolving in the harbor to

 create higher carbonic acid (H2CO3) levels

 > sea level rise itself with a risk of deeper waters for shellfish access

 > new species entering the harbor that may compete with the current fauna

 > increased precipitation could lead to an increase in contaminants from road run-off and septics.

Warmer Waters.

 Climate change will lead to gradually warmer waters in the harbor. Shellfish can well adapt to these conditions: there is an important shellfish business on the south shore of Cape Cod, in Long Island sound and in Chesapeake Bay. Historically, these bays have been the source forWellfleet shellfish. It is important that our seed stocks continue to reflect this diversity, allowing normal biological processes to compensate for climate change.

 Another warm water effect may be “phenology” a mis-match in the timing of shellfish breeding and spat release phyto-plankton blooms. We recommend monitoring of these blooms

As part of monitoring harbor health.

Harbor Acidity

 Shellfish shells are basically calcium carbonate, which dissolves in acid waters. This leads to thinner, fragile shells. Increasing atmospheric carbon dioxide dissolved in harbor water will lead to increasing acidity due to the formation of carbonic acid.

 Genetic diversity is again needed, to allow Wellfleet oysters to adapt and make strong enough shells.

Sea Level Rise.

 Especially when the shoreline is dominated by revetments, sea level rise may lead to deeper average tidal depths. Shellfishing harvesting directly from boats may then become more important.

New Species

 Not all changes will be harmful. Blood & Razor Clams, Blue-claw Crabs and increases in Bay Scallops can open new markets.

 Apart from climate change, there are several other important topics to be addressed:

Upland water run-off.

 Climate change predicts increased rain fall in the north-east. This will lead to an increased ground-water levels and road run-off. The rise in ground water levels may also impact performance of even Title V septics.

 All of these effects could lead to contamination of harbor waters with a consequent risk to shellfish. . An overall review and plan to respond to these issues is needed.

Inner Harbor

 Water quality in the inner harbor is also diminished by high nitrogen levels. Completion of te comprehensive waste-water program is essential.

Bay Scallops

 Bay Scallops is a very profitable business. In the 1995 Harbor Plan, results of an experiment to enhance bay scallops was reported. For three years, dragging was prohibited in an area of the lower harbor. The result reported was an increase in Bay Scallops and their habitat, eelgrass.

 This experiment should be repeated with a longer-term point of view, both for the scallops and for overall harbor health.

“Curley” report

 We need to monitor the health of Wellfleet shellfish populations on a long term, regular basis. The last time this was done was in 1975.

 NRAB is working with partners to re-start this program. The sites for sampling will need to be distanced from aquaculture locations to be sure that it is broad harbor health that is measured.

Plastics

 Wellfleet shellfishers are properly worried about micro-plastics contamination of products. This has not been observed in Wellfleet harbor; it is a future risk.

 As part of a harbor and cleanliness project, the shellfish department and board are

undertaking a project to reduce the use of plastic in shellfishing operations. However, should microplastics be found in local shellfish, obtaining a clean product for market would require

a new technology.

Shellfish Reefs

 A concern for Wellfleet harbor is that a combination of sea level rise and wind speeds

would threaten salt marshes. A possible solution, in part, would be the establishment of a reef

barrier that would protect a marsh. In fact, “oyster reefs” have themselves been used as protective barriers. There have even been trials on Cape Cod sites, in Bourne.

 IF barriers of either sort be deemed necessary, the shellfish department would have to be closely involved in design, permitting and use.

Chapter 4 – Shellfishing

> Continue to ensure genetic diversity in Wellfleet shellfish, in response to warmer and more acidic waters

Action by: Shellfish Advisory Board (SAB), Shellfish Department

 > Prioritize programs to reduce risk to harbor water quality due to sea level rise and increased rainfall negatively affecting road run-off and septic performance

Action by: Board of Health, Comprehensive Waste-water Committee

> Take advantage of positive trends such as Blood Clams & increased Bay Scallop opportunities

Action by: SAB, Shellfish Department