NRAB-Harbor Management Plan 2020

**Introduction**

Wellfleet’s Marina is a busy center of activity in the Town, as has always been the case since colonial times.

Wellfleet Harbor is a shoaling harbor. At no time did deep-water vessels have full access to the harbor. Smaller ships did come into the Duck Creek harbor at high tides, before the RR dike was finished (about 1875).

It follows that periodic dredging of Wellfleet Harbor is crucial to maintain harbor utility. A navigable harbor is essential for numerous economic and recreational reasons including the marina, commercial fishing, aquaculture, tourism, boating safety (and others ). However, due to costs and permitting issues, it is not certain that the current system can be relied upon in the future.

Dredging spoils have usually been deposited in deep water of Cape Cod Bay well away from the harbor. This has been seen to be the most efficient, economical , and presumably the safest way of dealing with the dredged material. Dredge spoils have been used to in the past for wetlands replenishment – for example in Chipman’s Cove – but this now prohibited by wetlands regulations. (see HMP 1, page 79)

However, spoils can be used in other ways. The Town of Truro uses dredged material from Payomet Harbor to replenish the Town Beach erosion. In Wellfleet, spoils from Keller’s Corner that are deposited at the L-shaped pier are regularly moved back to their initial location.

There are potential options for using spoils for marsh replenishment. To this end, NRAB sponsored research at the CCS about the nature of “black mayonnaise:

<https://www.wellfleet-ma.gov/sites/g/files/vyhlif5166/f/uploads/ccs_wellfleet_blackmayo_2020.pdf>

Agnes Mitermyer was the primary author of the report. Funding was agreed to by the Town at the Annual Town Meeting in 2016.

(NB: The CCS report asks that we use the term “black mustard” rather than “black mayonnaise”. Evidently, elsewhere, the latter can be a harmful material.)

An analysis of this material has been completed by the CCS . No toxic organic or inorganic ingredients were found so that it is possible that some of this material could be used for beach or marsh replenishment. The odor was shown to be the result of hydrogen sulfide, a normal marsh gas produced due to oxygen deprivation.

The obvious targets are the marshes of Duck Creek and Mayo Creek, as these were the natural historical sites for tidal sediment depositions before development of the marina.

Restoration of Mayo Creek would be a first step in the use of north channel sediments. It would be also useful to confirm if the elevation history of the Duck Creek marshes had been impeded following the marina development in the mid-1950s. A method using Pb-210 isotopes is in use elsewhere (WHOI report)

Additional sediment transfer modelling would be a necessary, as originally suggested in the report by G.Geise at al in the 1995 Harbor Plan.

While difficult, it is reasonable to suppose that a natural solution to sediment in the north marina channel should be possible. The flow into the north channel is only a small proportion of the the total flow during flood tide into Duck Creek

A second option for inner harbor dredge spoils would be “Thin Layer Placement” (TLP) , a system of spraying a slurry of dredged material over marshes. As mentioned in the salt marsh chapter, this has been used to restore marshland in a number of southern and Atlantic Coast states. Extensive review of the current status of this method is available in Army Corps of Engineering websites. However, this is a new technology, needing significant developments, both for engineering and permitting. An advantage of the Duck/Mayo Creek estuary is that it would be possible to use the natural tidal cycle for deposition.

Spoils from immediately south of the marina – into Chipman’s Cove – have not been studied in detail. They are likely to be very similar to those in the north channel and could be used for salt marsh elevation in the Cove.

Further south in the harbor – such as Blackfish Creek – the use of TLD or other similar technologies is not obvious. It is critical there that

the way for marsh migration inland be preserved.

From the main channel, south of the breakwater out towards the bay, the spoils are mainly sand. (See the Bourne Engineering report:

<https://www.wellfleet-ma.gov/sites/g/files/vyhlif5166/f/file/file/report_wellfleet_dredging.pdf>).

These spoils could be used for sandy shoreline restorations, as already

used in Truro.

Of course, maintenance dredging and spoils transport is always a possibility with a Town owned or shared dredge if these other options are not practical.

Recommendations:

> Provide a grant to study feasibility of using dredge spoils from Wellfleet harbor to replenish marsh erosion, either directly or by using Thin Layer Deposition (TLD). Modelling will be required. Follow developments of TLD technology.

Action by: Dredging Task Force, NRAB

>Work with Center for Coastal Studies (CCS) and Association to Preserve Cape Cod (APCC), in evaluating potential cost/benefit of removing the old railroad bridge and other infrastructure modifications.

Action by: NRAB

>Work with Dredge Task Force in reviewing feasibility of maintenance dredging, including possible purchase or sharing of a dredge, training, permitting, etc.

Action by: Selectboard