Summary of Marine Fisheries Resource Recommendations

for
Municipal Maintenance Hydraulic Dredging Activities on Cape Cod and the Islands

March 2012

RESPONSE TO COMMENTS

INTRODUCTION

A draft of the document was released in April 2010. This draft received one response in May 2010. The draft was updated and released again for comments in March 2011. A consolidation of the comments from at least four working group members comments was received in May 2011. The draft was updated and further discussed at a meeting in November 2011. This document reflects the response of *MarineFisheries* to the changes proposed by the working group over the course of 2011. In addition to incorporating the comments as indicated below, a major rewrite was undertaken to make winter flounder and diadromous linkages more clear and remove some redundancies. Lastly, all tables and maps were updated.

SUMMARY OF MAJOR COMMENTS

1) **Split South Cape Cod into 2 regions (*this change was accepted)***
2) **Make inlet channel boundaries perpendicular to the shortest jetty (not diagonal from shortest to longest) *(this change was accepted)***
3) **Clarify/redefine what a full day of dredging is *(does not include mobilization, does include any amount of dredging in a day – i.e. a ½ day of dredging counts as a full day of TOY waiver)***
4) **Review Appendix A *(this was done, it has been extensively updated)***

RESPONSES TO INDIVIDUAL COMMENTS

The individual comments are listed below with each individual response arranged by each section of the draft document:

General

Comment	**Response**
Stage Harbor lines are arbitrary – work with Town before finalizing	We have not received any boundary modifications from Chatham.
Mill Creek lines are arbitrary – work with Town before finalizing	We have not received any boundary modifications from Chatham.

Exec Summary –

Comment	**Response**
Add language to first bullet, "It should be noted that Inlets and Approach channels are areas of migrating beach sand with high current and/or wave energy and minimal amount of silts."	Captured in definition of inlet channels, Section 3.
Change language in second bullet to an actual example -- e.g. no more than 2 embayments or inlet channels in a given region – no region has a 2	Changed to 3

embayment/inlet channel cap, so use a real example	
In the third bullet point, "state the correlation between mapped diadromous runs and Winter Flounder as it is not obvious that there is any"	Typo fixed. "Diadromous" changed to "winter flounder."
Change language in third bullet to an actual example -- e.g. no more than 2 embayments or inlet channels in a given region – no region has a 2 embayment/inlet channel cap, so use a real example	Changed to 3

Background --eelgrass

Comment	**Response**
Comment was made in eelgrass section "For other reasons, dredging takes place during the winter months when eelgrass and other vegetation is dormant. Furthermore, sedimentation is of short duration with projects on the Cape except perhaps for those using the Carrituck. No concern has been put forth over sedimentation burying the roots too deep. Is that an issue or not?"	Reworded section to clarify that light limitation can adversely impact eelgrass in both the summer and the winter. A general recommendation we make is no dredging eelgrass beds. It is only relevant in locations where there is eelgrass with 25 feet of the dredge location. Note that eelgrass is not dormant in the winter: "Eelgrass is marine flowering plant that grows throughout the year (McRoy 1969; Wium-Andersen and Borum 1984; Evans et al. 1986)." Further, it may be even more light sensitive in the winter since they are already light stressed due to the shorter days.
Add text, "Inlets and Approach channels are areas of migrating beach sand with high current and/or wave energy and minimal amount of silts"	Captured in definition of inlet channels, Section 3.
Comment b was followed by: "Eelgrass also tends not to grow in these areas. Wayne – is this true?"	This is a general recommendation that we make: no dredging eelgrass beds. It's only relevant in locations where there is eelgrass.

Section 3 description of waterbody features

Comment	**Response**

<table>
<tr>
<td>Modify Table 1 (modification provided below)
Table 1: Summary of waterbodies and resources in each region (Modified).
<table>
<tr><th>Sub-basin</th><th># of waterbodies</th><th>30%</th><th># of spawning runs</th><th>30%</th><th># horseshoe crab beaches</th><th>30%</th><th># winter flounder embayments</th><th>30%</th></tr>
<tr><td>Buzzards Bay</td><td>9</td><td>2.7</td><td>6</td><td>1.8</td><td>5</td><td>1.5</td><td>8*</td><td>24</td></tr>
<tr><td>Islands</td><td>18</td><td>5.4</td><td>6</td><td>1.8</td><td>9</td><td>2.7</td><td>17*</td><td>5.1</td></tr>
<tr><td>South Cape Cod</td><td>27</td><td>8.1</td><td>14</td><td>4.2</td><td>15</td><td>4.5</td><td>27</td><td>8.1</td></tr>
<tr><td>North Cape Cod</td><td>14</td><td>4.2</td><td>8</td><td>2.4</td><td>9</td><td>2.7</td><td>14</td><td>4.2</td></tr>
</table>
</td>
<td>I edited the tables to reflect the 30% more clearly in the winter flounder and diadromous sections.</td>
</tr>
<tr>
<td>Under indirect mortality, strike: (“Inlets and Approach channels are areas of migrating beach sand with high current and/or wave energy and minimal amount of silts”.)</td>
<td>I don’t think this was in the original draft, this looks like a commenting error.</td>
</tr>
<tr>
<td>Behavioral modifications – disagreement that dredge blocks passage – “The dredge has a cutter head that is 42” inches in diameter on a hull that is 20 feet wide with a draft of less than 2 feet. The inlet channels vary from 60 feet to 150 feet wide with 5 to 10 feet in depth. The dredge physically blocks very little of the channel.- Please consider changing the approach /inlet limit line to where the channel actually narrows between the jetties”</td>
<td>We modified the jetties to have perpendicular entrances.</td>
</tr>
<tr>
<td>Cumulative impact – clarification requested regarding 30% cap and 3 day cap and how they relate.</td>
<td>Reworded the impact language to better separate the cumulative impact and the single-location total impact.</td>
</tr>
<tr>
<td>Cumulative impact – clarification requested regarding “consecutive inlet channels and embayments. Does it mean adjacent inlets or inlets close to each other?”</td>
<td>Reworded to make it clear that it means within a region, not just adjacent inlets.</td>
</tr>
<tr>
<td>Cumulative impact – it is unlikely that waterbodies will be dredged more than once in a six month period “due to mobilization-demobilization costs which make 3 or less day operations more expensive than larger jobs. The County dredge charges by the cubic yard and does not charge mobilization/demobilization fees”</td>
<td>No change needed.</td>
</tr>
<tr>
<td>Cumulative impact – DMF should change the approach /inlet limit line to where the channel actually narrows between the jetties? Sand builds up along the longest jetty which is considered Inlet Channel on some of the channels! Ex. Allen Harbor, Harwich.</td>
<td>We modified the jetties to have perpendicular entrances. For more information, see the GIS changes section below.</td>
</tr>
</table>

Cumulative impact – "The south shore of Cape Cod is 36 miles long and considered one region! DMF should break this region into at least two, east of Point Gammon and west of Point Gammon."	We broke the South Cape Cod Region into 2, East and West, using Point Gammon as the break. We agree that this better prevents many inlets in a nearby area from being dredged within a TOY. Note: this was also done for Buzzards Bay, since that makes it easier to separate out Barnstable County dredging (east Buzzards Bay) with other dredging activities in west Buzzards Bay.

Section 5.1 diadromous fish

Comment	**Response**
State which fish home to their natal grounds. It matters when you get to dealing with cumulative impact.	Deleted references to homing since it wasn't deemed relevant. Diadromous fish are already granted TOYs and waivers only where they exist.
Add "such as herring" at the end of this sentence: "Some diadromous fish utilize embayments for much of their lifetime while other species pass through embayments and inlet channels primarily to migrate to and from spawning habitat"	Done.
Fix typo in sentence "The degree to which fish migration is impeded by anthropogenic activities varies: sSome…"	No typo apparent.
"There needs to be a refining parameter involving the length of coastline or distance between channels. For example, it is a long way from Chatham to Woods Hole. Dredging in Harwichport or Chatham will have little effect on Falmouth harbors. In Mashpee, Falmouth, and Cotuit, 4 inlets/embayments are in close proximity: Menahaunt, Waquoit, Popponesset, and Cotuit (the western entrance). There is a higher probability of impact if they were all dredged the same year. The south shore of Cape Cod is 36 miles long and considered one region! -DMF should break this region into at least two, east of Point Gammon and west of Point Gammon."	We broke the South Cape Cod Region into 2, East and West, using Point Gammon as the break.

The comment was made, "Embayments on the south side that include Winter Flounder are already ineligible for dredging until June 1 during the TOY for diadromous fish as the toy for winter flounder is from January 15 until May 31"	This was considered a suggestion to better incorporate diadromous and winter flounder, which was done.
Disposal on beaches, fix typo "Disposal on beaches in is not anticipated"	Done.
Recommendations – clarify if the 3 days or less applies for bays too or just for inlets.	Embayments and inlet channels were separated into two separate bullets.

Section 5.3 Horseshoe Crabs

Comment	**Response**
Add definition of instar	Changed language to remove use of instar.
Comment at bottom of section: "Inlet and Approach channels are areas of migrating beach sand with high current and/or wave energy and minimal amount of silts. Embayment's would have the silt material and do not allow TOY waivers"	Captured in definition of inlet channels, Section 3.

Section 8 Other Recommendations

Comment	**Response**
Define multiple features in the sentence, "However, there is potential for confusion particularly regarding projects that extend into multiple features"	Added language to clarify: "more than one waterbody feature, such as an embayment and an inlet channel"
Extensive comments about the statement, "Any amount of dredging occurring within that timeframe counts as a full day."	See individual points below.
Recommend clarifying that "Filling or purging the pipe will not count as dredging."	Done.
"Break the 3 days down to hours (either 30 hours if it is a 10 hour day, or 36 hours if it is a 12 hour day) that would mean that the elapsed time would be a maximum of 5 or 6 days of intermittent operation."	There was a long period of discussion around this point. Since we don't know enough about the timing and behavior associated with migration, we have to assume that any dredging activity will affect the migration for a period of 24 hours. If the dredge operates for the 2 hours the fish "want" to migrate, they may not try again until the next day (when light and tide conditions are right, for example).

"The question that arises is what is the effect on the fish? 6 to 12 hours a day operation leaves 18 to 12 hours respectively of quiet time every day This topic needs to be rethought and details of operation included in the reasoning."	We cannot assume that fish utilize the channels in the same way during the day and at night.

Section 9 Procedures and Reporting

Comment	**Response**
Favorable comment regarding sentence, "During the first few years of this new programmatic approach to TOY waivers, these reports will be assessed by DMF and DEP to verify that the assumptions made herein are reasonable."	No change needed.

Appendix A

Comment	**Response**
"As a general comment, this table needs to be reviewed for consistency. A few, but not all, entries have been flagged because the existing TOY is inconsistent with the species present. For example see Edgartown and Falmouth. Please indicate whether the document will be published while the dredge locations are being mapped."	Table was reviewed and extensively edited. Document will be published now, but is intended to be modified as new information is available.
TOYs in Chatham were delineated as follows: Stage Harbor: HC- 5/1 to 6/30 WF- none Diad- none Mill Creek HC- none WF- 1/15 to 5/31 Diad- none Aunt Lydia's Cove HC- none WF- none Diad- none Outermost Harbor 1/15 to 6/30 (combined TOY for HC and WF)	Will add to the Town Spreadsheet that provides extensive info about specific dredge sites.
"Other restrictions may also be in effect for disposal activities or for other dredge equipment separate from the county dredge."	This is beyond DMF purview.

Table inconsistencies were highlighted as follows (see next page for changes): Chatham Stage Harbor Edgartown Eel Pond Channel and Ramp Falmouth Green Pond Falmouth Waquoit Bay Mashpee Popponessett Bay	Some inconsistencies are expected at this stage. Not all of our fish runs are mapped; most recent information is in the TOY Tech Report, not on the MassGIS maps. Note: these tables were changed to identify the most up-to-date toy recommendation for dredging projects. The resource information for each waterbody is available in DMF Tech Report 47.

DIAGONAL APPROACH/INLET BOUNDARIES ANALYSIS

Diagonal inlets are those inlets channels that have significantly different jetty lengths on each side of the inlet channel (Figure 1). They can also result at an inlet channel with a jetty on one side and a natural feature on the opposite side (Figure 2).

Figure 1. An inlet channel with jetties of different lengths on each side, creating a diagonal inlet.

Figure 2. An inlet channel with a jetty on one side and a natural feature on the opposite side, creating a diagonal inlet.

How to draw the inlet-approach boundaries on these features was the subject of debate. Since it is possible that flow is altered in the area affected by the longer jetty and the longer jetty could limit the mobility of fish in the area, the inlet-approach boundaries were originally drawn on the diagonal, linking the seaward points of the two jetties, or the long jetty and the barrier island.

After considerable discussion, it was determined that a better approach would be to map the thalwegs of the channels since the fish are thought to move toward the deepest part of the channels, and identify those as the inlets. Lacking the resources to do that in the near-term, it was decided that it was risk-averse enough to draw the inlet boundaries on a perpendicular (instead of diagonal), identifying the most constricted section of the channel.

The inlets that were reviewed and edited are:

1. Barnstable Centerville River
2. Barnstable Cotuit Harbor
3. Falmouth Inner Harbor
4. Chatham Mill Creek
5. Dennis Swan River
6. Dennis/Yarmouth, Bass River
7. Eastham/Orleans Rock Harbor
8. Falmouth Eel River
9. Falmouth Great Pond
10. Falmouth Green Pond
11. Falmouth Little Pond
12. Harwich Allen Harbor
13. Harwich Herring River
14. Harwich Wychmere Harbor
15. Tisbury Menemsha Pond
16. Truro Pamet River
17. Yarmouth Parkers River
18. Edgartown Sengekontacket Pond

APPENDIX A CHANGES

These are the edits recommended by the working group on the original "Appendix A"

Town	Dredge Site	Waterbody Name	Watershed	Diad	HC	WF	Existing TOY (Sept 2009)
Chatham	Stage Harbor	Stage Harbor	SOUTH CAPE COD		X	X	HC, 5/1-7/31 Resources on left do not match TOYs
Edgartown	Eel Pond Channel	Eel Pond	ISLANDS			X	WF, HC, 1/15-6/30 But HC not checked
Edgartown	Eel Pond Ramp	Eel Pond	ISLANDS			X	WF, HC, 1/15-6/30 But HC not checked
Falmouth	Green Pond	Green Pond	SOUTH CAPE COD		X	X	WF, alewife, 1/15-6/15 but diadromous fish not checked
Falmouth~~, Mashpee~~	Waquoit Bay	Waquoit Bay	SOUTH CAPE COD	X	X	X	proposed toy of 2/1-5/15
Mashpee	Popponesset Bay ~~Inlet~~ Approach	Popponesset Bay	SOUTH CAPE COD	X	X	X	no TOY
Mashpee	Popponesset Bay Embayment	Popponesset Bay	SOUTH CAPE COD	X	X	X	WF, HC, bluebacks, 1/15-7/31
Mashpee	Popponesset Bay 1916 Channel	Popponesset Bay	SOUTH CAPE COD	X	X	X	WF, HC, bluebacks, 1/15-7/31
Mashpee~~, Falmouth~~	Waquoit Bay	Waquoit Bay	SOUTH CAPE COD	X	X	X	WF, HC, bluebacks, 1/15-7/31

Extensive revisions on Appendix A were completed. In the March 2012 version of the document, it is Appendix B and includes dredging information from the spreadsheet that the Working Group assembled.

- Created tables integrating info from towns about dredge sites with info about waterbodies.
- Provided a table for each Region, instead of one huge table.
- Updated table to include the most recent info from TOY Tech Report.
- Includes all GIS changes made (see next section).
- Once all of the changes were made, all cumulative impact cap calculations were redone. An example of a change: adding Red River, Harwich to Cape Cod West bumped up the number of diadromous inlet channels and embayments that can get waivers from 1 to 2.

MAP (GIS) CHANGES

Extensive revisions on the Geographic Information Systems (GIS) layer were completed. The list below includes the changes made between May 2011 and March 2012 to the GIS layer:

- Layer was merged to include TOY information and be consistent with TOY Tech Report.
- Split Cape Poge and Pocha Pond
- Split Harthaven and Farm Pond; added hand drawn Farm Pond boundary
- Split Inner and Outer New Bedford Harbor
- Fixed some coding errors in New Bedford Harbor and Fairhaven
- Changed Vineyard Haven Harbor to Tisbury (not Vineyard Haven or Oak Bluffs, since all of the dredging is in Tisbury)
- Changed what was labeled as Hyannis Port to Hall's Creek
- Split Short Wharf Creek and Mill Creek, Barnstable/Yarmouth
- Drew in Stewart Creek, Barnstable by hand (feeds into Hyannis Harbor, which is unmapped)
- Drew in Herring Creek Rest, Edgartown by hand
- Took out South Coastal (Plymouth, Marshfield, Duxbury)
- Changed Bucks Channel to Bucks Creek
- Put Elizabeth Islands into Buzzards Bay East (Cuttyhunk is only dredged harbor and it faces Buzzards Bay)
- Fixed topology issues with Buzzards Bay East, repaired northern boundary so it was consistent with watersheds
- Narrowed the inlet channel in Lewis Bay
- Changed diagonal inlet-approach boundaries to perpendicular inlet-approach boundaries
- Accepted changes provided by Chatham with respect to Stage Harbor
- Drew in Red River, Harwich by hand (was previously not mapped)
- Cross-checked all resource information with TOY Tech Report