Chesapeake Bay Oyster Metrics Team
Draft Report Summary

Presented by
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with thanks
and some apologies to the rest of the team

Background

Executive Order 13508: Strategy for Protecting and Restoring the Chesapeake Bay Watershed

Oyster Outcome: *Restore native oyster habitats and populations in 20 tributaries by 2025*

Oyster Metrics Team convened by Chesapeake Bay Program Sustainable Fisheries Goal Implementation Team

Membership: NOAA, MD DNR, VMRC, ACOE, PRFC, VIMS, UMCES; plus consulting scientists

Charge to the Team
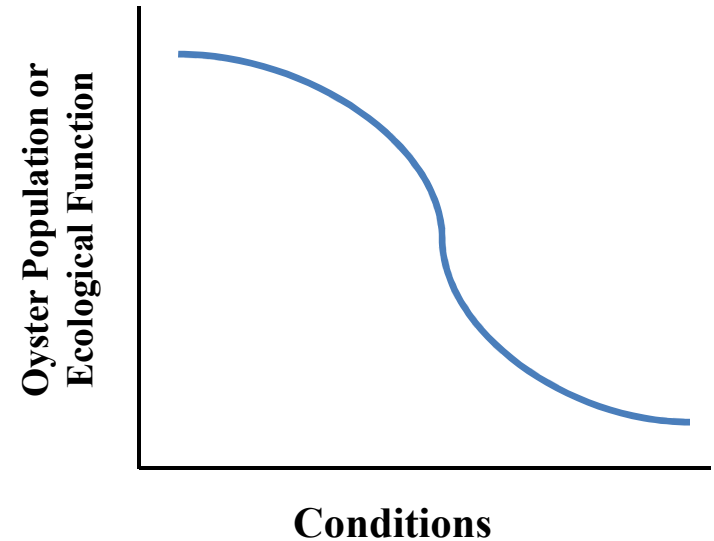
The specific charge to the group was to:

to develop common bay-wide restoration goals, success metrics and monitoring and assessment protocols,

that include progress toward achieving a sustainable oyster population that ultimately will provide increased levels of ecosystem services.

However, we were to do this only for <u>sanctuary reefs</u>; our charge specifically excluded reefs under other forms of management and fisheries-specific metrics.

Setting Goals or Targets

Overarching goal: Restore a large oyster population, capable of supporting a sustainable fishery and providing valued ecosystem services throughout much the Chesapeake Bay.

Oyster Population or Ecological Function

Conditions

The crucial fact remains, however, that oyster populations in the Bay have undergone a dramatic regime shift.

Implicit in the goal of restoring 20 tributaries is the notion that working on a tributary scale will be necessary to achieve sufficiently large changes in oyster populations.

Good idea. Seems to make sense.
However, it is untested and not entirely consistent with existing data.

What constitutes a restored reef?

How many oysters?

What size oysters?

How many year classes?

How long must it persist?

How much of the bar must be covered in oysters?

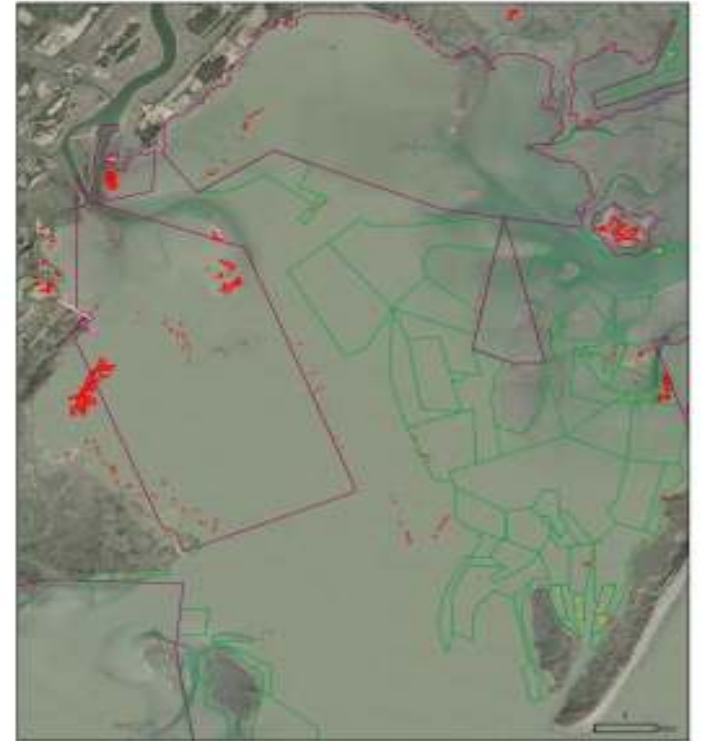We know this value cannot be 100%, but how much should it be?

What constitutes a restored tributary?

Contains a restored reef or two?

A given percentage of historical oyster bars has been restored?

We've done all we can do?

Or, does it mean that we have actually affected a state change and that oyster populations have been restored to historical abundances in that tributary?

What is the timeframe for judging success?

Months, years, decades?

In the lower Bay recruitment varies dramatically from year-to-year. So, does disease pressure.

In tributaries where hatchery oysters are used for restoration, how long do we wait to observe enhanced natural recruitment?

The difficulty here is that true success can only be judged over longer periods of time, but shorter-term assessments are required.

Functional vs Operational Goals?

The ultimate goals of oyster restoration are *functional*
- a greatly enhanced oyster population
- increased ecosystem services
- a sustainable fishery

Practical constraints of oyster restoration require that we define *operational* goals
- how much shell or spat-on-shell to plant in an area
- how many reefs in an tributary
- oyster abundance after a few years

How well the *operational goals* work to meet the *functional goals* will have to be evaluated over time.

Reef level targets

A firm basis for establishing density and age structure targets is lacking.

The workgroup tentatively recommends that a density of 50 adult oysters/m² and 50 grams dry weight /m² containing at least 2 year classes, and covering at least 30% of the reef area provides a reasonable operational target for reef-level restoration.

The *workgroup recommends a <u>minimum</u> threshold for a successful reef as 15 grams dry weight/m² containing at least two year classes, and covering a <u>minimum</u> 30% of the reef area.*

Tributary-level targets

We lack both a theoretical and empirical basis for determining the operational target that would achieve our functional goals.

The workgroup suggests that an operational target of restoring a 50 -100% of <u>currently restorable </u>oyster habitat represents a reasonable target for tributary-level restoration.

We recommend that this be pursued in tributaries for which currently restorable bottom minimally meets the ACOE targets related to the percent of historical bottom.

Assessment protocols

We were charged with developing consistent, bay-wide monitoring and assessment protocols, but note that different restoration approaches can have different monitoring needs.

Our recommendations include quantitative estimates of oyster density, size and shell accretion/degradation.

- where current, high resolution maps of the bottom are available, a stratified random sampling scheme is most efficient ($$?)

- where not, a simple random sampling is equally as good
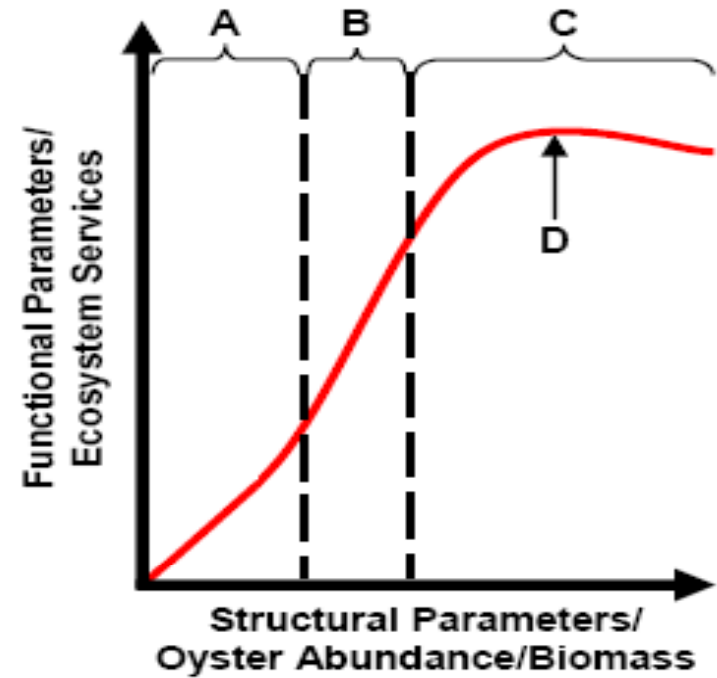
Assessment protocols

Minimally, assessments of the oysters on restored reefs should occur <u>prior to restoration</u> and at 1, 3 & 6 years post restoration.

Where possible, monitoring should be conducted to answer specific questions relevant to adaptive management decisions.

Assessment protocols

Assessing the ecological function and ecosystem services provided by restored oyster reefs <u>should not</u> *be accomplished through monitoring other ecosystem components on the reef, but through the development of experimentally-derived relationships with oyster abundance.*

Editorial comments   (Luckenbach only)

1. The overall goal of "restoring" oyster populations in 20 tributaries by 2025 is a political, not a science-based, goal.

2. The concept that sufficient restoration within a tributary can result in a regime shift in the oyster population is a reasonable hypothesis, but it is untested.

Editorial comments (Luckenbach only)

3. I don't know whether the restriction of considering only sanctuary reefs in tributary-level restoration evaluation is simply a limitation of our charge or represents a corner into which you have been boxed.

   But, other management options are available (e.g, fishing restrictions [rotational harvest, catch shares] and private aquaculture) that could contribute to regional increases in oyster populations.

Editorial comments   (Luckenbach only)

4. If we really knew how to do this, it would already be done.

- We will need to learn as we go

    - If anyone tells you that they have all of the answers about how to accomplish this goal, I would suggest that you remain skeptical.

    - True adaptive management will work better than flying by the seat of our pants.