



**CHESAPEAKE BAY FOUNDATION**  
*Saving a National Treasure*

December 7, 2016

Mark Belton, Secretary  
Mr. Scott Egleseder and Ms. Kelley Cox, Co-chairs  
Oyster Advisory Commission  
Department of Natural Resources  
Tawes State Office Building, C-4  
580 Taylor Avenue  
Annapolis, MD 21401

Dear Secretary Belton, Mr. Egleseder and Ms. Cox:

Thank you for the opportunity to provide input on the application of rotational oyster harvesting to Maryland waters. On November 4<sup>th</sup> the Department of Natural Resources (DNR) held a briefing for local watershed and Marylanders Grow Oysters (MGO) groups on how to submit proposals on rotational harvesting. Several groups do plan to make submittals specific to their waters, but a strong consensus also emerged from the meeting that local groups should join together to provide their collective thoughts. This letter responds to that consensus and represents the viewpoint of the undersigned groups on oyster management matters under consideration by DNR and the Oyster Advisory Commission (OAC). These 29 groups collectively represent 113,453 citizens in Maryland.

### **Ecological Benefits of Oysters**

First and foremost is the need to emphasize why these groups, who represent the interests of the citizens of Maryland, care so much about oysters: **we care about oysters because ecologically they are the most important species in Chesapeake Bay, and the Bay's health depends on their health.** The oyster's ecological value has been referenced in OAC materials, but statements by state officials and the deliberations of the heavily industry-weighted commission give a clear impression that it is considered of secondary importance.

We strongly disagree with this suggestion and wish to make it clear that we believe it is at least as important as the economic benefits of the public fishery. In fact, permanently protected oyster reefs are probably the best insurance for the long term viability of the public fishery through a strengthened genepool and a much improved pattern of spatset. Historically, short term economic gain through harvest has been the driving force for oyster depletion that left us with one percent or less of this critical resource.<sup>1,2</sup> We should not fall back into the pattern that led us to this point.

The ecological benefits of oysters that are important to all Marylanders include:

- **Habitat** – It is no accident that fishermen prefer to fish on live oyster bars - they hold more fish, because they provide food and shelter. In 1877 renowned biologist Karl Möbius wrote, “I

<sup>1</sup> Kennedy, V. S. and L. L. Breisch 1983. Sixteen Decades of Political Management of the Oyster Fishery in Maryland's Chesapeake Bay. Journal of Environmental Management, volume 164, pp. 153-171.

<sup>2</sup> Newell, R. I. E. 1988. Ecological Changes in Chesapeake Bay: Are They the Result of Overharvesting the American Oyster? Horn Point Environmental Laboratories, University of Maryland.

have observed that the oyster beds are richer in all kinds of animal life than any other portion of the sea bottom.”<sup>3</sup> And a recent comprehensive analysis reflected on how the current depleted state of the country’s oyster reefs affects fish by saying, “...the availability of this habitat likely limits the productivity of many fish species.”<sup>4</sup> The habitat function of mature oyster reefs is the temperate equivalent to tropical coral reefs, which are fully protected because of the benefits they provide.

- **Filtering** – Adult oysters can filter over fifty gallons of Bay water per day. The oysters in the Bay in 1870 could have filtered the Bay’s volume in 3-4 days whereas today’s oysters take over a year to accomplish that task.<sup>5</sup> This filtering potential is capable of markedly improving water clarity and boosting our diminished underwater grass beds, another key Bay habitat. Moreover, the pollutant nitrogen taken up by oyster filtering is not just recycled back into the system. Much of it is actually converted to a benign form and removed from the system. A restored oyster reef can remove as much as ten times the nitrogen as an unrestored site.<sup>6</sup>
- **Structure** – Three-dimensional oyster reefs, once common in the Bay but destroyed by historical harvesting, affect the aquatic environment in much the same way that mountain ranges affect weather patterns – they interrupt currents, speeding them up and creating turbulence behind the reef, potentially mixing oxygen into deeper waters. Many reef organisms have evolved to take advantage of such currents and are less abundant or non-existent in flatter habitats, and oysters are known to thrive when growing on 3-D reefs. Scientists have called 3-D oyster reefs “an organizing force for the estuarine system.”<sup>7</sup>
- **Spawning** – Oysters are broadcast spawners whose eggs are fertilized in the water column. Studies have shown that closer proximity of male and female oysters greatly increases fertilization rates. Oysters occurring at the target restoration density of fifty per square meter have a tenfold higher fertilization rate than oysters at the typical harvest bar density of two per square meter.<sup>8</sup> Multiply that by the increased number of potential pairs at this density, and the production of oyster larvae could be as much as 250 times greater per area for a restored reef.
- **Genetics** – Harvesting by definition removes oysters that have survived to reach minimum legal size, and very few are allowed to grow much larger on harvest bars. Any reproductive output is from smaller oysters on average with a higher percentage of weaker individuals who would not have survived to older ages. On protected reefs oysters with a hardy makeup are left to grow large and continue reproducing. Not only are many more eggs produced, but a preponderance of them are from “survivor” oysters well-adapted to local waters and physiological stresses like disease. Thus, sanctuary reefs over time help strengthen the genepool to the benefit of the broader area where its larvae distribute, including adjoining harvest areas.

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<sup>3</sup> Report of the U.S. Commission of Fisheries 1880, pp. 683-751.

<sup>4</sup> zu Ermgassen, P.S.E. et al., 2016. Quantifying fish and mobile invertebrate production from a threatened nursery habitat. *Journal of Applied Ecology* 53, pp. 596-606.

<sup>5</sup> Newell, R. I. E. 1988.

<sup>6</sup> Kellogg, M.L. 2013. Denitrification and nutrient assimilation on a restored oyster reef. *Mar. Ecol. Prog. Ser.* 480: 1-19.

<sup>7</sup> McCormick-Ray, J. 2005. Historical oyster reef connections to Chesapeake Bay: a framework for consideration. *Estuarine, Coastal and Shelf Science* 64: 119-134.

<sup>8</sup> Based on data from Dr. Ken Paynter, UMCES.

In summary, we, the undersigned groups, feel that these and other ecological benefits that oysters provide are essential to the health of Chesapeake Bay and its fisheries and that rebuilding and maintaining them should be a top priority for the DNR and the OAC. Our specific recommendations for how to address this goal are as follows:

### **Sanctuaries**

After five years under Maryland's Oyster Restoration and Aquaculture Development Plan there is twice as much relative oyster biomass in sanctuaries as there is in harvest areas.<sup>9</sup> This is truly phenomenal given the Secretary's guidance to the OAC:

*Given the relatively long life of the local oyster and the dynamic habitat of Chesapeake Bay, five years is insufficient time to determine substantial or durable change to oyster populations in any given area.<sup>10</sup>*

The reality that oyster restoration is a long term challenge is put in sharper focus by considering how long it took the resource to develop naturally and how long it has been heavily harvested. Professor Emeritus of the Virginia Institute of Marine Science, the late Dr. William Hargis, put it this way in 1999:<sup>11</sup>

*Today, destruction of the oyster's prime habitat in the Chesapeake, the natural, self-renewing upthrusting oyster reefs, is nearing completion. When they are gone it will have taken somewhat less than two centuries to destroy some 6,000 to 7,000 years of nature's works.*

Nevertheless, progress is still evident in the sanctuaries after only five years.

The guidance provided to the OAC by the Secretary calls for maintaining sanctuary acreage between 20% and 30% of viable oyster bottom. It has been 24% since the Plan was adopted in 2010. During the five seasons since Plan adoption, public oyster harvest has more than tripled even with 24% of Maryland's oyster grounds closed to harvest. Good spat sets in 2010 and 2012 drove the increase. From this experience it is clear that the limiting factor for harvests is spatset. Continuing to accumulate concentrations of mature oysters in sanctuaries, in combination with substrate management, is the best way to stimulate more regular spatsets.

Sanctuaries from harvest, also called marine reserves, are increasingly considered important tools for maintaining ecosystem function and providing ancillary benefits to adjoining harvest areas. Gell and Roberts (2003) evaluated the concept and concluded:

*By integrating large-scale networks of marine reserves into fishery management, we could reverse global fishery declines and provide urgently needed protection for marine species and their habitats.<sup>12</sup>*

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<sup>9</sup> Oyster Management Review: 2010-2015. MD DNR. Figure 5-1, pg 87.

<sup>10</sup> Letter to OAC from Sec. Belton. July 11, 2016.

<sup>11</sup> Hargis, W.J., Jr. 1999. The evolution of the Chesapeake oyster reef system during the Holocene Epoch. In: Luckenbach, M.W. et al., ed. Oyster reef habitat restoration: a synopsis and synthesis of approaches. VIMS Press. P. 5.

<sup>12</sup> Gell, F.R. and C.M. Roberts 2003. Benefits beyond boundaries: the fishery effects of marine reserves. Trends in Ecology and Evolution, Vol.18 No.9.

Furthermore, they evaluated forty different studies to look at the recommended percentage of habitat that should be placed in reserves - the mean was 32.25%; the median was 30%; and the mode was 30%.

- **We believe that the benefits of sanctuaries to the Bay, to the Bay's oysters and to the Bay's fisheries warrant increasing sanctuary acreage to 30%.**

This position is consistent with the Oyster Outcome in the Chesapeake Watershed Agreement, which commits the states to:

*Continually increase finfish and shellfish habitat and water quality benefits from restored oyster populations.*<sup>13</sup>

### **Rotational Harvest**

Rotational harvest has shown great promise in Virginia as a method of maintaining viable harvest bars and stable harvests. Dr. Jim Wesson's presentation on October 17 provided solid guidance for the OAC on fundamental principles for applying rotational harvest. The main difference that must be factored in is the lower average spatset of Maryland's waters. Virginia's program depends on a regular spatset. To compensate, Maryland's rotational system will need to include seed planting, except perhaps in the few places of dependable set. This need will make rotational harvest more expensive in Maryland waters.

Dr. Wesson also advised that shells must be in good condition to receive a natural set. In other words, they must not be buried in sediment. Shells may also be necessary simply to maintain an emergent substrate on which to plant seed oysters. Regular surveys before and after periods when rotational areas are open for harvest are essential to know what's there and whether a supplement of shell and/or seed is necessary. The limited availability of shell obviously is a constraint on this approach especially given the need to maintain a supply of fresh shell for the production of spat-on-shell for the fishery and for restoration. While the dredging of fossil shell may be a viable source, that issue requires further discussion. Other options that should be considered include shell from outside the Bay, clam or other shell, and alternative materials suitable for harvest scenarios.

It must not be assumed, as some do, that power dredging will provide clean shell. The Virginia data clearly shows this is not the case and that, in Jim Wesson's words, harvest by dredging "always reduces the quantity and quality of shell available for future spatset." And in part because of the destructive nature of harvesting, Dr. Wesson recommends at least a three year rotation to provide enough "rest" from the gear.

Finally, Dr. Wesson provided very important and compelling information about managing effort in the oyster fishery. The number of people licensed to harvest oysters in Virginia has grown from 661 to 1124 in the last few years. Maryland's fishery has grown similarly from 570 to 1146 licenses since 2008. Dr. Wesson's agency, the Virginia Marine Resources Commission, views that level of participation as unsustainable, and after exhausting more routine effort control measures such as bushel limits and day or season lengths, they put in place a system to gradually reduce license

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<sup>13</sup> Chesapeake Bay Program 2014. Chesapeake Watershed Agreement. Pg 4.

numbers to 600. Maryland needs to take similar action. Otherwise, when rotational areas are opened, they will be exhausted in a matter of weeks. The bottom line is if the number of participants in the fishery is not limited, no one will make a reasonable living, and the resource will be exhausted.

Notwithstanding the challenges, we support applying rotational harvest to the Maryland public fishery, but it should not be considered a quick fix. It will take continued investment, patience and vigilance to succeed. We recommend the following as guidelines for the fishery:

- 1. Rotational harvest plans should use existing harvest grounds with emphasis on rehabilitating unproductive historic oyster bars.**
- 2. The State should invest in rebuilding the fishery by helping fund the establishment of a science-based rotational harvest system with the goal of making the system self-supporting after five years. This investment must be in addition to the ongoing investment in restoring targeted sanctuary areas.**
- 3. Rotational harvest areas should not be considered equivalent to sanctuaries during their closure period, because even intermittent harvesting decimates the clusters of oysters that over time form natural reefs.**
- 4. The State should work with the industry to develop a process for reducing participation in the fishery to sustainable levels.**
- 5. Rotational harvest plans should require that a minimal level of investment be made to re-shell and/or re-seed an area in the year after harvesting.**
- 6. Rotational harvest plans must include data collection as necessary for evaluating success.**
- 7. Enforcement of closed areas must be a priority for the watermen's community working in collaboration with the State. Sanctuaries must be maintained as "geographically distinct" and separate from harvest areas as possible to facilitate enforcement**

Thank you for the opportunity to provide input to DNR and OAC. We the undersigned are dedicated to restoring the Bay's oyster resource to address both economic and ecological needs and stand ready to assist in any way we can.

Sincerely,

**Asbury Solomons Retirement Community**

Sue Hue, Go Green Committee Chair  
Representing 450 Maryland Citizens

**Assateague Coastal Trust**

Kathy Phillips, Executive Director/Assateague Coastkeeper  
Representing 2,500 Maryland Citizens

**Cecil Land Use Association**

Nancy Valentine, Secretary  
Representing 40 Maryland Citizens

**Chesapeake Bay Foundation**

Alison Prost, Maryland Executive Director  
Representing 85,932 Maryland Citizens

**Chesapeake Beach Oyster Cultivation Society**

John Bacon, Chairman  
Representing 120 Maryland Citizens

**Chesapeake Wildlife Heritage**

Ned Gerber, Director  
Representing 1,000 Maryland Citizens

**Chester River Association**

Isabel Hardesty, Chester Riverkeeper  
Representing 500 Maryland Citizens and 100 MGO Volunteers

**Corsica River Conservancy**

Frank DiGialleonardo, Vice President  
Representing 500 Maryland Residents

**Dorchester Citizens for Planned Growth**

Fred Pomeroy, President  
Representing 120 Maryland Residents

**Friends of the Bohemia River**

Chuck Foster, President  
Representing 53 Maryland Citizens

**Friends of the Nanticoke River**

Eugene Williams, President  
Representing 150 Maryland Citizens

**Friends of Wicomico River**

Charles Denton, President  
Representing 25 Maryland Citizens

**Mattawoman Watershed Society**

Jim Long, President  
Representing 2,000 Maryland Citizens

**Midshore Riverkeeper Conservancy**

Jeff Horstman, Director, Miles/Wye Riverkeeper  
Matt Pluta, Choptank Riverkeeper  
Representing 1,000 Maryland Citizens and 196 MGO Volunteers

**Nanticoke Watershed Alliance**

Shelly Baird, Executive Director  
Representing 119 Maryland Citizens and Partner Groups

**Oyster Bay Community - Dowell, MD**

Bill Wright, President  
Representing 160 Maryland Citizens

**Oyster Creek Association**

Christopher Harman, President  
Representing 25 Maryland Citizens

**Pickering Creek Audubon Center**

Mark Scallion, Director  
Representing 1,200 Maryland Citizens

**Potomac Riverkeeper Network**

Dean Naujoks, Potomac Riverkeeper  
Phillip Museguas Vice President of Litigation  
Representing 2,500 Maryland Citizens

**Queen Anne's Conservation Association**

Jay Falstad, Executive Director

**Sassafras River Association**

Captain Emmett Duke, Riverkeeper  
Representing 700 Maryland Citizens

**Save Our Sanctuaries**

Suellen Keiner, President  
Representing 17 Maryland Citizens

**Severn River Association**

Bob Whitcomb, Oyster Committee Chair  
Representing 400 Maryland Citizens

**Sierra Club, Maryland Chapter**

Josh Tulkin, Chapter Director  
Representing 12,000 Maryland Citizens

**South River Federation**

Jesse Iliff, South Riverkeeper  
Representing 280 Maryland Citizens

**St. Mary's River Watershed Association**

Joe Anderson, President  
Representing 1,262 Maryland Citizens and 235 MGO Volunteers

**Talbot Preservation Alliance**

Eileen Deymier, President

**Waterkeepers Chesapeake**

Betsy Nicholas, Executive Director

**Wicomico Environmental Trust**

Barry Johnson, Executive Director  
Representing 400 Maryland Citizens

Cc: David Blazer, DNR Fisheries and Boating Service  
Chris Judy, DNR Shellfish Division