

June 2021

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Recommended Citation

George A. Menold, *Saving the Upper Chesapeake Bay Oyster Fishery*, 26 Ocean & Coastal L.J. 95 (2021).
Available at: <https://digitalcommons.minelaw.maine.edu/oclj/vol26/iss2/2>

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SAVING THE UPPER CHESAPEAKE BAY OYSTER FISHERY

George A. Menold

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*George A. Menold**

This article examines the evolution of the laws and practices governing the oyster fishery in Maryland's portion of the Chesapeake Bay. Specifically, this note focuses on poaching and the mismanagement of the resource. Currently, the Bay's oyster beds in Maryland are treated as a common resource, open to all license holders to exploit at their will. This has led to overfishing and an unsustainable depletion of the oyster fishery to the detriment of Maryland's oystermen and the shellfish market overall. To alleviate the problem, this note recommends that Maryland concentrate its courts that adjudicate natural resource violations and create a semi-private leasehold system to better ensure the health of the bay and the continued productivity of the fishery. These solutions will increase the expertise of the bench dealing with oyster related violations and simultaneously introduce incentives for oystermen to sustainably manage Maryland's oyster resources.

I. INTRODUCTION

Oystermen and law enforcement have long clashed over the fruitful oyster beds of Maryland's Chesapeake Bay. Oftentimes these clashes have become violent, as documented by the New York Times as early as 1888:

As I backed out one [bullet] came in the pilothouse and struck Mate Charles W. Frazier, who was assisting me in steering. He said: 'Captain Tom, I'm shot! I'm done for! I can't help you anymore!' I said: 'Old boy, I hope not seriously! Lay back in the corner.' I backed out, got Frazier down into the cabin, saw the extent of his wound, which was not fatal, bandaged his arm, and took [another member of the Oyster Navy] into the pilothouse, ran to the windward of the dredgers, and hauled dead for them and struck the J.C. Mahoney on her port quarter, and hung up and

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could not back out. I went ahead on her with full force and turned the Mahoney on her beam ends and come back with full steam and cleared her. In the meantime the Jones had sunk while we hung on the hull of the Mahoney. It was the hottest time of the fight. The dredgers, about eight boats, were pouring broadsides into us, and my crew were returning the fire as fast as possible.¹

Maryland's Chesapeake Bay oyster fishery has historically been extensive and immensely productive, but it requires an updated management strategy in order to protect its health and productivity in the short term and for future generations.² Currently, the Chesapeake oyster population is widely unprotected from poaching, a major threat to the health of the bay and the livelihood of many of its watermen. This note will provide an overview of oyster poaching on the Maryland portion of the Chesapeake Bay, current oyster bed protections and uses, enforcement efforts, shortcomings of those efforts, and recommendations to improve enforcement and oyster health in the Bay.

This article proposes a three-pronged solution to Maryland's oyster problem. First, Maryland should convert its Chesapeake Bay oyster fishery management regime from a commons, open to all oystermen holding a license to harvest from any open bed, into a semi-privatized model where discrete areas are leased for the exclusive cultivation and harvest of the leaseholder. This will create proper incentives to maintain the health, productivity, and sustainability of the fishery. Second, Maryland should consolidate their natural resources dockets in two to three regional centers to increase the expertise of the judges dealing with oyster poaching violations and lower the chance of biases in judgements based on social connections of judges and violators. Third, Maryland's oyster violation fine schedule needs to be revised to impose higher and more lasting fines and punishments for violations involving the oyster fishery.

1. *Maryland's Oyster War; Capt. Howard's Story of the Battle of Monday. A Desperate Fight with the Illegal Dredgers Which Was Settled by the Oyster Navy's Cannon*, N.Y. TIMES, Dec. 13, 1888, at 1.

2. Oyster Data Request from Frank P. Marengi, Natural Resource Biologist V, Shellfish Division, Maryland Department of Natural Resources (frank.marengi@maryland.gov) (June 21, 2019) (on file with author) (Table 2 below details Maryland's oyster landings by body of water. Overall, the 2013-2014 season was the most productive with over 400,000 bushels of oysters landed but the harvest levels have steadily decreased since then and the most recent data from the 2017-2018 season producing only 158,212 bushels.).

If implemented, the solution proposed by this note will result in increased incentives for oystermen to sustainably harvest their catch, better enforcement of fishery violations, and more effective handling of habitual violators in the court system. This note will outline oyster harvesting processes, the current state of Maryland oyster laws, the extent of fishery violations, and detail the proposed solution and its expected outcomes.

II. BACKGROUND

Oyster³ poaching⁴ has long been a problem in the Chesapeake and has been addressed in a variety of ways in Maryland.⁵ The state created the first statewide environmental police force in the 1860s to combat poaching, sometimes violently.⁶ Enforcement efforts evolved over time to incorporate state-of-the-art technology and a system of oyster sanctuaries, aquaculture leases, and public harvesting grounds.⁷ These efforts have realized some success in restoring and maintaining oyster beds in the Chesapeake but leave much to be desired.

3. While the word “oyster” generally refers to “any of several edible, marine, bivalve mollusks of the family *Ostreidae*, having an irregularly shaped shell, occurring on the bottom or adhering to rocks or other objects in shallow water,” Definition of Oyster, DICTIONARY.COM, <https://www.dictionary.com/browse/oyster?s=t> (last visited Jan. 20, 2020), the Chesapeake contains only *Crassostrea virginica*, commonly known as the Atlantic, Wellfleet, or Eastern oyster [<https://perma.cc/WB45-T6Z4>]. NOAA, NON-NATIVE OYSTERS, <https://chesapeakebay.noaa.gov/oysters/non-native-oysters> (last visited Jan. 20, 2020) [<https://perma.cc/DY5Q-UHC8>]. This note, focusing on the Chesapeake, in referring to oysters will only be referring to *Crassostrea virginica*.

4. For the purposes of this note, “poaching” shall refer to the harvesting of oysters without a license, on a suspended license, from a sanctuary or other restricted area such as another’s leasehold, outside of oyster season, outside of allowable times of day to harvest, or harvesting oysters that are undersized or uncultured.

5. See Alison Rieser, *Oysters, Ecosystems, and Persuasion*, 18 YALE J.L. & HUMAN. 49, 51, 53-54 (2006); MD. DEP’T OF NAT. RES., MD. NAT. RES. POLICE – HIST. 1-6, https://dnr.maryland.gov/Documents/MD_NRP_History.pdf (last visited Mar. 28, 2021) [<https://perma.cc/38UX-YZWX>].

6. MD. DEP’T OF NAT. RES., MD. NAT. RES. POLICE – HIST., *supra* note 5 at 1.

7. See generally MD. DEP’T OF NAT. RES., FINAL DRAFT OYSTER MGMT. PLAN (2019), <https://dnr.maryland.gov/fisheries/Pages/FMP.aspx> [<https://perma.cc/9UBD-38Y9>]. See also Rona Kobell, *Poachers Aren’t Smiling for New Bay Cameras*, BAY JOURNAL (updated July 14, 2020), https://www.bayjournal.com/news/fisheries/poachers-aren-t-smiling-for-new-bay-cameras/article_3003585a-d6bb-579b-b5fa-e8926bcaaa52.html [<https://perma.cc/8RBA-GDMC>].

A. Oyster Lifecycle, Cultivation, and Harvest

The oyster industry is distinct from other fishing industries in that oysters are sedentary whereas finfish and crustaceans are able to move freely around their habitat. This distinction necessitates different approaches to the treatment of these two types of fisheries.⁸ Because an oyster's lifecycle is completely immobile, oysters are more readily analogized to corn than to grouper or salmon, for instance.⁹ A defined area in which an individual leaseholder has the exclusive right to harvest is more sensible for oysters and other mollusks than the same set-up would be for fishermen who catch free-moving finfish, or crabbers who set their crab pots up where they please and wait for crabs to trap themselves.¹⁰

Oysters reproduce by releasing eggs and sperm into the water. Once fertilization begins, the fertilized eggs drift in the water column and begin growing in the open water.¹¹ These free-floating larva move according to the tides and currents of the water they are in until they have grown large enough to land on and secure themselves to something solid, usually an old shell on an existing oyster bed.¹² Once the larva has attached itself to what will become its permanent home, it begins removing calcium from the water column and growing its shell.¹³ Oysters less than a year old are referred to as "spat," and are too young to harvest. Harvesting can begin once they reach a size of three inches wide; generally at three years old.¹⁴

There are two main oyster designations, wild and farm-raised. Both can be harvested in a variety of ways including dredging,¹⁵ hand tonging,¹⁶

8. See *Martin v. Lessee of Waddell*, 41 U.S. 367, 420-21 (1842) (discussing the distinction between oysters and "floating fish" with regards to fishery management).

9. See *McCready v. Virginia*, 94 U.S. 391, 396 (1876) (finding that states have the right to regulate oyster beds under state waters in the same way that states can regulate crop planting and leasing of state-owned dry land).

10. See *Martin* 41 U.S. at 420-21.

11. *Oyster Life Cycle*, UNIV. OF MD. CTR. FOR ENV'T SCI. (last visited Jan. 20, 2020), <http://hatchery.hpl.umces.edu/oysters/oysters-life-cycle/> [<https://perma.cc/N8FT-EMRE>].

12. *Id.*

13. *Id.*

14. *Id.*

15. A process in which a large metal rake like apparatus with chain netting behind it is dragged along the floor of the body of water in order to collect oysters. After dragging along the oyster bed, the dredge is winched or otherwise pulled onto the boat and emptied so the oystermen can cull undersized oysters and other, non-oyster materials brought up. this culling is supposed to occur on the bed from which the oysters were dredged.

16. "'Tong' means any pincers, nippers, tongs, or similar device operated entirely by hand and consisting of two shafts or handles and a metal body composed of two opposable and complementary baskets used in catching oysters and clams." MD. CODE ANN., NAT. RES. § 4-1101(l) (West 2019).

and diving.¹⁷ In Maryland, wild oysters can be harvested on any public oyster bed that is not in a sanctuary, though there are certain restrictions on the equipment that can be used for certain beds. This leads to fierce competition between oystermen for scarce resources that are open to all permitted harvesters. On the other hand, aquaculture¹⁸ leases are leases sold by the state for the exclusive use of well-defined areas of the soil under the water, or a column of water from the surface, extending down to but not including the soil, for the cultivation of oysters.¹⁹

Aquaculture of oysters involves buying spat from oyster hatcheries to use as seed, spreading the spat on some sort of hard substrate or in a cage on the bottom of the water for submerged land leases, or in the case of water column leases, placing the spat in floating (but secured to an anchor or pilon) cages. If cages are being used, the aquaculturist will occasionally agitate the cages to promote certain kinds of shell growth and to check on the health of their crop. After a certain amount of time the oysters are removed from the cages or gathered from the bed and brought to market.²⁰ Farmed oysters are generally bred to be infertile (in a process similar to growing seedless watermelons, another way in which oysters are more of a “crop” than other fish) and because they do not expend any energy on breeding, they grow more quickly than their wild counterparts and can be harvested in about half the time it takes for a wild oyster to reach the proper size.²¹ Their shorter time in the water also makes them less susceptible to disease, adding to their efficiency over wild catches.²² Additionally, because the state does not sell aquaculture leases in polluted waters, there is little chance of eating an oyster from a contaminated site, which is not the case with wild oysters where oystermen have been known to lie about their harvest location.²³

17. Harvesting oysters by hand with diving equipment on.

18. Definition of Aquaculture “The cultivation of aquatic animals and plants, especially fish, shellfish, and seaweed, in natural or controlled marine or freshwater environments; underwater agriculture.” <https://www.dictionary.com/browse/aquaculture?s=t> (last visited Jan. 20, 2020) [<https://perma.cc/A7B9-HDVX>].

19. MD. CODE ANN., NAT. RES. § 4-11A-01 (West 2012).

20. Referred to as “landing,” e.g., “more bushels of oysters were landed from the mouth of the Rappahannock River this year than last.”

21. Dennis Hollier, *Tasty Mutants: The Invention of the Modern Oyster*, THE ATLANTIC, (Sept. 29, 2014), <https://www.theatlantic.com/technology/archive/2014/09/todays-oysters-are-mutants/380858/> [<https://perma.cc/VSK7-YSYL>].

22. *Id.*

23. Eugene F. Deems, Jr., Public Information Act Coordinator, Public Information Act Request #062119a, Office of Communications, Maryland Department of Natural Resources (pia.dnr@maryland.gov) (August 30, 2019) (on file with author).

B. Sanctuaries, Aquaculture, and Public Oyster Beds

Nearly a quarter of historic oyster beds in Maryland are protected as sanctuaries, which restricts harvesting on them to small aquaculture leases.²⁴ This leaves the vast majority of oyster beds in the Maryland Chesapeake unprotected and open to overharvesting. Compare this to Virginia, where oyster landings from aquaculture leases are steadily increasing their market share, as more oystering areas are converted from public harvest to private leases.²⁵ If the trend continues, aquaculture landings will eventually become more valuable than wild harvests, which fluctuate from year to year in response to environmental changes, previous harvests, and the success of the oyster mating season.²⁶

As of 2018, 24% of oyster bars charted in the 1906-1912 Yates Oyster Survey and its amendments are in oyster sanctuaries.²⁷ This translates into nearly 80,000 surface acres²⁸ of historic oyster bars under sanctuary protection and a total protected area of over 250,000 surface acres.²⁹ With 24% of historic oyster bars being protected in sanctuaries, more than three quarters of oyster bars are open to the public fishery for commercial and recreational activity, totaling more than 175,000 surface acres of historic oyster bars.³⁰

Recreational oyster harvesting is allowed in both Maryland and Virginia's Chesapeake, though there are some key differences between the states.³¹ In Maryland, any resident can harvest up to one bushel of oysters

24. MD. DEP'T OF NAT. RES., *supra* note 7 at 26.

25. Oyster Data Request from Stephanie R. Iverson, Data Supervisor, Virginia Marine Resources Commission (stephanie.iverson@mrc.virginia.gov) (August 1, 2019) (on file with author).

26. *Id.*

27. See MD. DEP'T OF NAT. RES., *supra* note 7 at 26. The Yates survey was the first comprehensive survey of Maryland's oyster beds.

28. Surface acreage is measured at the surface of the water instead of the area on the bed of a body of water, which is the customary method of measuring the area of bodies of water.

29. MD. DEP'T OF NAT. RES., *supra* note 7 at 26.

30. MD. DEP'T OF NAT. RES., OYSTER MANAGEMENT REVIEW: 2010-2015 20-21 (2016), <https://dnr.maryland.gov/fisheries/Documents/FiveYearOysterReport.pdf> [<https://perma.cc/DD32-UMAC>]; 2015 MARYLAND FMP REPORT (SEPT. 2016) § 14. EASTERN OYSTER 1 (2016), https://dnr.maryland.gov/fisheries/Documents/Section_14_Oyster.pdf [<https://perma.cc/D7CS-XAUU>].

31. Compare MD. CODE ANN., NAT. RES. § 08.02.04.02 (West 2019) with VA. MARINE RES. COMM'N., RECREATIONAL FISHING AND CRABBING IN TIDAL WATERS, <https://www.mrc.virginia.gov/regulations/recfish&crabrules.shtm> (last visited July 8, 2019).

per day without paying any fees or obtaining a license if the oysters will be for personal consumption and not for sale.³² Those recreationally harvesting oysters in Maryland can do so anytime during oyster season (October through March) from sunrise until 3:00 pm on weekdays and sunrise until 12:00 pm on Saturdays; there is an oystering prohibition on Sundays.³³ Harvesting can be done by hand, rake, shaft tong, or diving in any public oyster bed not restricted from harvest as a sanctuary or reserve, or otherwise prohibited as a result of pollution or other restrictions.³⁴

Virginia, on the other hand, requires that recreational oyster harvesters obtain nontransferable licenses for the gear that they will use which expire at the end of each calendar year.³⁵ Those only taking up to one bushel of oysters daily by hand or ordinary tongs from open rocks (the Virginia statutory language equivalent to Maryland's "public beds") are exempt from the licensing requirements.³⁶ Given the more relaxed nature of recreational oystering in both states and the lack of any reporting requirements, there is no information about the size of recreational harvests in either state.

Public oyster harvesting is prohibited in sanctuaries except for leased areas, which may not exceed 10% of the total area of any individual sanctuary and must not be within 150 feet of a Yates bar (Yates created the original chart of Maryland's oyster beds and much of today's oyster regulation refers to these recognized historical beds).³⁷ The oyster sanctuary in the St. Mary's River is the sole exception to this provision.³⁸

32. § 08.02.04.02.

33. *Id.*

34. *Id.*

35. VA. MARINE RES. COMM'N., RECREATIONAL FISHING AND CRABBING IN TIDAL WATERS, <https://www.mrc.virginia.gov/regulations/recfish&crabrules.shtm> (last visited July 8, 2019) [<https://web.archive.org/web/20190618010102/https://www.mrc.virginia.gov/regulations/recfish&crabrules.shtm>].

36. *Id.*

37. § 08.02.04.15(C)(4); Gary F. Smith, *Maryland's Historic Oyster Bottom A Geographic Representation of the Traditional Named Oyster Bars* 1 (Maryland DNR 1997), https://dnr.maryland.gov/fisheries/Documents/maryland_historic_oyster_bottom.pdf (explaining the history of mapping Maryland's oyster bars, including the importance of the Yates survey) [<https://perma.cc/2HEW-6BZ9>].

38. § 08.02.04.15(C)(5)(c); 2010 MD. DEP'T OF NAT. RES., OYSTER SANCTUARIES OF THE CHESAPEAKE BAY AND ITS TIDAL TRIBUTARIES 13 (SEPT. 2019), https://dnr.maryland.gov/fisheries/Documents/Oyster_Sanctuaries_of_the_Cheapeake_Bay_and_Its_Tidal_Tributaries_September_2010.pdf [<https://perma.cc/9D7Z-QVBM>].

Based on Maryland's 2010 geological survey, up to 25% of the area contained therein may be leased for aquaculture purposes.³⁹

As of May 2018, there were 420 shellfish leases covering 6,803 surface acres of the Bay, both within and outside of sanctuaries.⁴⁰ 6,420 of these acres (nearly 95%) are bottom leases, the remaining 383 acres are water column leases, within which cages, floats, or other oyster containment systems are used rather than farming oysters on the bed of the Bay.⁴¹ Since the overhaul of aquaculture leases in 2009, the annual harvest has steadily and dramatically increased with the initial 2012 harvest bringing in just over 3,000 bushels and the most recent recorded harvest of almost 75,000 bushels in 2017.⁴² Aquaculture leaseholders also commonly harvest from the public fishery with 44% of leaseholders holding Tidal Fish Licenses as of 2018.⁴³

While aquaculture may be rapidly expanding and is likely to eventually overtake harvests from the public fishery in market share, it is still nascent and overshadowed in number and value by the harvests from the public fishery.⁴⁴ The public fishery harvest suffered dramatic declines in the 1990s and the early 2000s, but since then it rapidly increased in size from under 150,000 bushels in the 2011-12 season to 383,534 bushels in the 2015-16 season, again declining in 2016-17 to 224,758 bushels.⁴⁵

C. Historical Background

Maryland has a long history of regulating the Chesapeake oyster fishery through legislation. In an 1829 law, the state gave Eastern Shore citizens the right to use one acre of submerged land to cultivate oysters and other shellfish.⁴⁶ Shortly thereafter, this law was amended to include the entire Maryland portion of the Chesapeake, and again in 1865 to

39. *Id.*

40. MD. AQUACULTURE COORDINATING COUNCIL, ANNUAL REPORT 5 (2018), <http://www.msa.md.gov/megafile/msa/speccol/sc5300/sc5339/000113/024000/024059/20190438e.pdf>

[<https://perma.cc/SJ5R-JKZU>].

41. *Id.*

42. *Id.* at 6.

43. *Id.* at 5.

44. *Compare Id. with* MD. DEP'T OF NAT. RES., MDNR PUBL. NO. 17-080218-87, MD. OYSTER POPULATION STATUS REPORT: FALL 2017 SURVEY (2018), <https://dnr.maryland.gov/fisheries/pages/shellfish-monitoring/reports.aspx> [<https://perma.cc/4G4D-B4VM>].

45. MD. DEP'T OF NAT. RES., *supra* note 44 at 20.

46. Garrett Power, *More About Oysters Than You Wanted to Know*, 30 MD. L. REV. 199, 204, 211 (1970) (outlining evolution of oyster laws in Maryland).

increase the area to up to five acres of submerged land.⁴⁷ While dredging was initially banned in Maryland waters, it was legalized as a harvest method in 1865.⁴⁸

Throughout the history of Maryland's oyster regulation, a push for privatization has been continually opposed by oystermen and state assembly representatives from Maryland's coastal communities.⁴⁹ This distaste for private oyster aquaculture is not unique to Maryland. Virginian oystermen also fought efforts to remove oyster beds from the commons.⁵⁰ In Virginia, however, the state started with relatively few oyster leases, and over time the relative success of private aquaculture enticed more oystermen to participate.⁵¹ During the time that Virginia's privatization experiment has been expanding, the Virginia oyster fishery landing has steadily increased year over year, whereas Maryland oyster landings have no discernable pattern over time.⁵² Over the same time period the Virginia harvest has significantly outpaced that of Maryland, in both volume of oysters landed and market value of landings.⁵³

The poaching of oysters in the Maryland Chesapeake by out of state watermen and Marylanders alike has long been a problem.⁵⁴ Laws around the harvesting of oysters have been difficult to enforce and in 1868, Maryland took the first step in reducing oyster poaching by creating and arming the Oyster Police and giving them a fleet to patrol the Bay.⁵⁵ The modern Maryland Department of Natural Resources (DNR) police force evolved from the early Oyster Police.⁵⁶

D. Modern Day

The Maryland DNR, General Assembly, and courts have moved toward successful policies and enforcement efforts with new, military-grade technology monitoring boat traffic around sanctuaries;⁵⁷ specialized

47. *Id.* at 211.

48. *Id.* at 208.

49. Rieser, *supra* note 5 at 50-52.

50. *Id.* at 51.

51. *Id.*

52. COMMERCIAL LANDINGS DATA, NOAA, https://foss.nmfs.noaa.gov/apexfoss/f?p=215:200:15547781886503:::P200_GEO_LOV:1025 (set parameters to "commercial," "Maryland," "Virginia," "2006-2017", and "oyster, eastern" and click Run Report) [<https://perma.cc/VC8B-Q2NW>].

53. *Id.*

54. MD. DEP'T OF NAT. RES., *supra* note 5 at 1.

55. *Id.*

56. *Id.* at 4.

57. Kobell, *supra* note 7.

DNR dockets in 18 Maryland District Courts;⁵⁸ and laws severely limiting the amount of power dredging that can take place in Maryland waters.⁵⁹ While these efforts are laudable, they are ineffective for a number of reasons. More manpower is needed on the water to police sanctuaries and enforce power dredging restrictions, and the courts with DNR dockets often do nothing to remove incentives for watermen to poach oysters.⁶⁰

Currently, oyster poaching from sanctuaries is monitored and enforced by a high-tech system known as the Maritime Law Enforcement Information Network (MLEIN).⁶¹ This system tracks boats on the Bay with cameras and radar, alerting Natural Resources Police (NRP) when boats have entered an oyster sanctuary at dredging speeds so that NRP can investigate.⁶² This system is a powerful tool in reducing oyster poaching but is limited by the amount of NRP officers available to monitor the sanctuaries and respond to alerts of possible harvesting. Since 2013, the year before MLEIN was implemented, the NRP officer roster has increased from 306 to 340 in total, though the increase in field officers has been less dramatic, with an increase from 233 in 2013 to only 241 positions being approved for 2019.⁶³ Though a more significant increase may come in the future with the allowance for field officer positions for 2020 being increased to 254.⁶⁴ During that time, operating expenses have decreased from \$9 million in 2013 to \$8.6 million in actual expenditure in

58. MD. DEP'T OF NAT. RES., MD. JURISDICTIONS WITH NAT. RES. COURT DATES, <http://dnr.maryland.gov/nrp/Documents/NRPStandAloneCourtDates.pdf> (last visited June 21, 2019) [https://perma.cc/F2HW-DQ85]; MD. DEP'T OF NAT. RES., MD. NAT. RES. POLICE LEVEL OF SERV. STANDARDS 13 (2012), http://dlslibrary.state.md.us/publications/JCR/2012/2012_46-47.pdf [https://perma.cc/2TGS-LXDU]. These concentrate hearings for violations of DNR regulations to specific days to be heard by a single judge, ideally with expertise in the area.

59. See, e.g., MD. CODE ANN., NAT. RES. § 08.02.04.08 (West 2019); MD. CODE ANN., NAT. RES. § 08.02.04.10 (West 2019); MD. CODE ANN., NAT. RES. § 08.02.04.12 (West 2019).

60. Deems, *supra* note 23 (on file with author).

61. Kobell, *supra* note 7.

62. Kobell, *supra* note 7; Tim Prudente, *Military-Grade Radar Network Watching for Oyster Poachers*, CAPITAL GAZETTE (Sept. 25, 2014) <https://www.capitalgazette.com/news/ph-ac-cn-oyster-radar-0927-20140925-story.html> [https://perma.cc/A5FM-DC92].

63. MD. DEP'T. OF BUDGET AND MGMT, HIST. OPERATING BUDGET DOCUMENTS, FISCAL YEARS 2004-2020, <https://dbm.maryland.gov/budget/Pages/operbudget/historical-operbud-docs.aspx> (last visited July 8, 2019) [https://perma.cc/RTP7-CZSQ].

64. *Id.*

2018.⁶⁵ There is a modest increase in appropriations for 2019 to \$10.3 million, but that dips back to \$8.5 million in allowance for 2020.⁶⁶

Dredging as a harvest method has been restricted over the years since its legalization and with some exception is only allowed by harvesters whose boats are powered by sail, not engines in certain areas of the Bay.⁶⁷ Areas that allow power dredging are limited to leased aquaculture areas, certain designated zones, and study areas.⁶⁸ Within areas where power dredging is allowed, the lengths and weights of dredges allowed are limited to 42 inches and 200 pounds.⁶⁹

DNR, the Office of the Attorney General, and the District Court of Maryland have created natural resource dockets in the district courts of 18 of Maryland's 24 counties which has made enforcement of natural resource violations, including oyster poaching violations, marginally more effective.⁷⁰ In theory, designating one judge to preside over natural resource violations in each jurisdiction allows them to understand the frequency and severity of the violations occurring in that region, ideally leading to more uniform and appropriate enforcement.⁷¹

E. Geography of Oyster Poaching and Related Violations

In Maryland, oyster poaching in the Chesapeake Bay is generally concentrated on the Eastern Shore, with the lower Western Shore and Potomac seeing some activity as well.⁷² These areas of the state have historically been the epicenter of the Maryland oyster industry; it is not surprising that most poaching activity occurs here.⁷³ This section details the rates of violation and compares different geographies based on violations, harvests, and population.

The DNR periodically publishes a list of individuals who are at least thirty days late on reporting their oyster landings. While this is not a

65. *Id.*

66. *Id.*

67. *See* MD. CODE ANN., *supra* note 59.

68. MD. CODE ANN. § 08.02.04.12, *supra* note 59.

69. *Id.*

70. MD. DEP'T OF NAT. RES., MARYLAND JURISDICTIONS WITH NATURAL RESOURCE COURT DATES, *supra* note 58.

71. *See* MD. DEP'T OF NAT. RES., MD. NAT. RES. POLICE LEVEL OF SERV. STANDARDS, DEC. 2012, *supra* note 58, at 13.

72. Frank P. Marengi, Natural Resource Biologist V, Oyster Data Request, Shellfish Division, Maryland Department of Natural Resources (frank.marengi@maryland.gov) (June 21, 2019) (on file with author).

73. *Id.*

perfect indicator of more serious violations, it acts as more of an indicator than simply analyzing oyster landings on a county-by-county basis. This list from the end of the 2019 season was used to determine the counties with the most violations.⁷⁴ The list details the name, city, and state of the individuals not in compliance with the reporting regulation.⁷⁵ Because many watermen's activities are not necessarily in the county in which they reside, nor are activities restricted to one county, this is an imperfect indicator. However, this can still serve as a general estimate of the locations where people are more likely to disregard regulation which can serve as an indicator of a willingness to commit more serious, substantive fishery violations, up to and including poaching.

Mapping the thirty day reporting violations and license revocations to date visually demonstrates geographies where regulatory disregard is concentrated.⁷⁶ Two thirds of technical reporting violations at the close of the 2018-19 oyster season were committed by people living in, or registering their license in four counties along the Eastern Shore.⁷⁷ In descending order of total violations those are Dorchester (eighty-eight violations), Talbot (eighty-four violations), Queen Anne's (sixty-five violations), and Somerset (sixty-four violations).⁷⁸ These four counties have the highest concentrations of regulatory disregard per capita given their high rate of violations and their low populations.⁷⁹ The only county on the Western Shore with any significant level of reporting violations is St. Mary's, with forty-five such violations.⁸⁰ If St. Mary's County is included with the Eastern Shore Counties, they represent over three quarters of total reporting violations from the oyster season ending in 2019.⁸¹

Historically, Dorchester, Talbot, Queen Anne's, and Somerset counties have seen the highest issuance of all types of citations; ranging from technical violations to substantive violations such as poaching and

74. *See generally*, MD. DEP'T OF NAT. RES., MISSING OYSTER REPORTS (Mar. 2019) <http://dnr.maryland.gov/fisheries/LateReporting30/Oyster.pdf> (last visited January 25, 2020) [<https://perma.cc/HB2V-EXXQ>].

75. *Id.*

76. GEORGE MENOLD, MAP OF OYSTER POACHERS, https://www.google.com/maps/d/u/0/embed?mid=1FwcJq-LkcsKDXT-KSD_W7c2L38ryntNZ (last visited June 21, 2019) [<https://perma.cc/UEL2-MRXX>].

77. *See generally* MD. DEP'T OF NAT. RES., *supra* note 74.

78. *Id.*

79. *Id.*

80. *Id.*

81. *See infra* Chart 3.

harvesting in polluted waters.⁸² Of these, Talbot and Dorchester counties have significantly higher levels of citation.⁸³ Talbot further stands out among jurisdictions as that with the highest absolute and relative rate of not guilty verdicts, with over twice the amount as the jurisdiction with the next highest rate of not guilty verdicts, Dorchester.⁸⁴ Dorchester similarly stands out as the jurisdiction with the highest absolute number of dismissed or not prosecuted violations, whereas St. Mary's has the highest relative rate of such dispositions.⁸⁵

Three of these same counties, Somerset, Talbot, and Dorchester similarly rank as the highest in absolute and per capita commercial fishing license revocations.⁸⁶ Somerset has had 10 total licenses registered in the county revoked, with a rate of 39 revocations per 100,000 in population, Talbot has 12, representing 32.5 per 100,000, and Dorchester has 9, with a rate of 28 per 100,000.⁸⁷ These three counties represent 61% of statewide license revocations but only contain 1.5% of the state's population.⁸⁸ The Bay Hundred peninsula which includes Tilghman Island, St. Michaels, and eight other small fishing villages within a six mile radius in western Talbot County has the highest concentration of reporting violations and license revocations of any location in the state, with 54 violations and 11 revocations.⁸⁹

Unsurprisingly, the counties with the highest historical numbers of oyster landings are the same that issue the most citations and revoke the most licenses.⁹⁰ The Tangier Sound in Somerset, Fishing Bay and the Honga River in Dorchester, Broad and Harris Creeks and Choptank River in Talbot, and Eastern Bay and Chester River in Queen Anne's are the most productive waters in the Maryland portion of the Bay for oystermen,

82. Cynthia J. Bashore et al., *Analysis of Marine Police Citations and Judicial Decisions for Illegal Harvesting of Eastern Oysters (Crassostrea Virginica, Gmelin 1791) in the Maryland Portion of the Chesapeake Bay, United States, from 1959 to 2010*, 31 JOURNAL OF SHELLFISH RESEARCH 591, 596 (2012).

83. *Id.* at 595.

84. *Id.* at 596.

85. *Id.*

86. MD. DEP'T OF NAT. RES., COMMERCIAL FISHING SUSPENSIONS/REVOCATIONS AND AQUACULTURE SUSPENSIONS (2019); MD. DEP'T OF NAT. RES., MISSING OYSTER REPORTS (Mar. 2019), <http://dnr.maryland.gov/fisheries/LateReporting30/Oyster.pdf> (last visited January 25, 2020) [<https://perma.cc/XL2F-LYW2>].

87. *Id.*; MD. DEP'T OF NAT. RES., *supra* note 74; U.S. CENSUS BUREAU, QUICKFACTS <https://www.census.gov/quickfacts/fact/table/US/PST045219> (search by county name and choose population data) [<https://perma.cc/6Q3D-M7X9>]; *see infra* Table 1.

88. U.S. CENSUS BUREAU, QUICKFACTS, *supra* note 87.

89. MENOLD, *supra* note 76.

90. Marenghi, *supra* note 72 (on file with author).

year after year landing two thirds or more of Maryland's Chesapeake oysters.⁹¹

III. DISCUSSION

“The principles of private right and of public convenience require that this species of property should be protected. The oysters on the open beds are nearly exhausted; the rakers have become so numerous that oysters are not permitted to attain any maturity; they are small and worthless--hence the price of those fit for use is greatly enhanced; but if this reasonable use of a man's own soil is permitted and protected, every land owner on the shores of our bays and salt rivers will have an oyster-bed; the quantity brought into market will bring down the price, so that the poor as well as rich may eat and be glad.”⁹²

Currently, the Maryland code, the NRP, and Maryland District Courts are underperforming in their protection of the Bay. Targets for the number of licenses allowing oyster harvesting are too high and not responsive to changes in the Bay, courts are not appropriately punishing habitual violators of fishery laws,⁹³ and sanctuaries are neither widespread enough nor adequately monitored in ways that would lead to successful restoration of oyster habitats.

A. Sustainable Oyster Population Goals

In 2016, the Maryland General Assembly passed the Sustainable Oyster Population and Fishery Act of 2016, which required DNR to benchmark the current oyster population and its health by the end of 2018 to better understand and identify best practices in oyster fishery management for Maryland.⁹⁴ Among other things, the resulting study recommends surveying the fishery directly before and after the season to better understand exploitation rates, verifying SONAR data to have a more accurate determination of the locations and sizes of oyster habitats,

91. *Id.*; See Table 2 in appendix.

92. *Arnold v. Mundy*, 6 N.J.L. 1, 49 (N.J. S. Ct. 1821) (Ultimately finding that there is no private right to oyster beds in waters below the mean high water line nor can one be granted, rather, the state holds right to these lands for the benefit of the public).

93. Deems, *supra* note 23 (on file with author).

94. MD. DEP'T OF NAT. RES., 2018 OYSTER STOCK ASSESSMENT, https://dnr.maryland.gov/fisheries/Pages/oysters/Oyster_Stock_Assess.aspx (last visited July 8, 2019) [<https://perma.cc/95DS-DVBE>].

develop ways to better understand how shell plantings and different harvest gear affect habitats, and developing a way to track plantings, stocks, and harvests of aquaculture leases in order to understand the impact that aquaculture has on oyster populations.⁹⁵

Many of the study's recommendations focus on collecting better data or creating a better framework to use that data. The most significant concrete takeaway from the research is that there should be an upper limit on the proportion of oysters able to be harvested from each body of water, ranging anywhere from 22% to 45%.⁹⁶ Such a limit, if properly enforced would allow steady restoration of Maryland's Chesapeake oyster population and its health.⁹⁷ This would mean that maximum absolute harvests would increase over time even as maximum harvest rates remain the same.⁹⁸

Of the additional recommendations from the peer review panel, the one most likely to aid efforts to reduce oyster poaching is creating a dockside monitoring program to track the number of undersized oysters being landed in each body of water.⁹⁹ Data from a monitoring program like this could inform the NRP of where they could best deploy their resources to enforce oystering regulations. If oystermen who regularly disregard the law start to be regularly fined, hopefully the fines will become a disincentive to poach and no longer be seen simply as a cost of business. Given the recent publication of this study it is likely too early to see any effects on oyster health or population stemming from any action resulting from the recommendations of the study.¹⁰⁰

B. Licensing, Revocations, and Suspensions

Commercial fishing licenses allowing oyster harvesting in the Bay are not being effectively capped in response to overfishing, oyster population and health goals, or other environmental factors. To better enforce laws around natural resources, DNR and the courts set up specific days each

95. MD. DEP'T OF NAT. RES., A STOCK ASSESSMENT OF THE EASTERN OYSTER, *CRASSOSTREA VIRGINICA*, IN THE MARYLAND WATERS OF CHESAPEAKE BAY 80-82 (2018), https://dnr.maryland.gov/fisheries/Documents/StockAssessment_EasternOysterMD.pdf [<https://perma.cc/W5MV-VCQB>].

96. *Id.* at 12-13.

97. *Id.* at 21, 101.

98. *Id.* at iv, 16-17.

99. *Id.* at xix, xxxi.

100. MD. DEP'T OF NAT. RES., *supra* note 95.

month to hear natural resource violation cases.¹⁰¹ On paper, this is a good policy, but it has yet to produce any noticeable change in oyster poaching as courts are slow to revoke licenses or penalize repeat offenders.¹⁰²

Maryland set the target amount of Tidal Fish Licenses to the number of authorizations issued during the 1998-99 oyster season.¹⁰³ This capped licensing system was implemented when a moratorium on the issuance of commercial fishing licenses was lifted.¹⁰⁴ While this statute allows for adjustments to be made based on the recommendations of the Tidal Fisheries Advisory Commission, DNR, the Chesapeake Bay Program, the Atlantic State Marine Fisheries Commission, the Mid-Atlantic Fisheries Management Council, or “any other appropriate management body,” affecting the populations of certain species, the targets have not been appropriately modified to reflect the reality of the oyster fishery.¹⁰⁵ Currently, the targets for oyster related licenses are 705 for Oyster Harvester (OYH), 32 for Oyster Dredge Boat (ODB), and 2,091 for Unlimited Tidal Fish (TFL).¹⁰⁶

Though commercial fishing licenses can last for years, each season, oystermen are required to pay an annual surcharge of \$300 to harvest in the fishery, making this a clear bellwether of the number of active oystermen in a given season.¹⁰⁷ Surcharge receipts between the 2008-09 and 2018-19 seasons have ranged from a low of 587 in 2008-09 to a high of 1,134 in 2014-15 (Chart 1).¹⁰⁸ Since the peak between 2013-17, receipts have fallen to 749 in the 2018-19 season.¹⁰⁹

Recently, the courts have started to revoke oyster privileges and commercial fishing licenses for violating regulations, but not with the frequency, efficiency, or speed that the health of the oyster stock and

101. MD. DEP’T OF NAT. RES., MD. JURISDICTIONS WITH NAT. RES. COURT DATES, *supra* note 58; MD. DEP’T OF NAT. RES., MD. NAT. RES. POLICE LEVEL OF SERV. STANDARDS, *supra* note 58 at 13. These concentrate hearings for violations of DNR regulations to specific days to be heard by a single judge, ideally with expertise in the area.

102. Deems, *supra* note 23 (on file with author).

103. MD. CODE ANN., NAT. RES. § 08.02.01.05(A) (West 2019).

104. MD. DEP’T OF NAT. RES., COM. FISHING LICENSES & FEES, <http://dnr.maryland.gov/fisheries/pages/commercial-license.aspx> (last visited June 21, 2019)

[<https://web.archive.org/web/20201104152934/http://dnr.maryland.gov/fisheries/pages/commercial-license.aspx>].

105. § 08.02.01.05.

106. *Id.*

107. MD. CODE ANN., NAT. RES. § 4-701(g)(1)(i)(2) (West 2019).

108. Marengi, *supra* note 72 (on file with author).

109. *Id.*

continued health of the Bay requires.¹¹⁰ To date, there have been 53 partial or complete revocations of commercial fishing licenses or oyster entitlements under TFLs since 2003.¹¹¹ More than half of these revocations became effective in 2016, 2017, or 2018, with two to date in 2019 and 2020 (Chart 2).¹¹² Since 2017, there have been twenty suspensions of commercial fishing and aquaculture licenses, ranging in length from two months to three full oyster seasons.¹¹³

While the idea of a natural resources dockets in Maryland district courts appears on its face to be an innovative solution to the oyster poaching problem in the Maryland Chesapeake, at best, its inconsistency and local nature undermine its efficacy.¹¹⁴ In the worst-case scenario, it is possible that the character of the specialized dockets encourages further oyster poaching by allowing others to influence the designated assistant state's attorney or judge in a jurisdiction, making them more lenient in their enforcement. Adding to these concerns is the general rural quality of the counties with the most violations, revocations, poachers, and oyster landings.¹¹⁵ With significantly fewer residents in these counties, relative to the rest of the state, it is much more likely that an offender will have a connection with the court or prosecution, which could be personal, business, or otherwise, and could lead to inconsistent judgments.¹¹⁶

C. Penalties and Enforcement

Enforcement of poaching violations breaks down into two main areas. First, the fines assessed against poachers and fishery violators are not severe enough to deter future illegal harvesting.¹¹⁷ Second, the courts are given broad discretion to penalize watermen, who may be neighbors,

110. MD. DEP'T OF NAT. RES., COMMERCIAL FISHING SUSPENSIONS/REVOCATIONS AND AQUACULTURE SUSPENSIONS, *supra* note 86.

111. *Id.*

112. *Id.*

113. *Id.*

114. Deems, *supra* note 23 (on file with author).

115. MD. DEP'T OF NAT. RES., *supra* note 74; Marengi, *supra* note 72 (on file with author); *see* MD. DEP'T OF NAT. RES., MISSING OYSTER REPORTS, *supra* note 86; *see generally* U.S. CENSUS BUREAU, GEOGRAPHY PROGRAM – URBAN AND RURAL, <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html> (last visited June 20, 2019) [<https://perma.cc/ZJQ5-CKNC>].

116. U.S. CENSUS BUREAU, QUICKFACTS, *supra* note 87.

117. Deems, *supra* note 23 (on file with author).

acquaintances, or otherwise known by the judge or prosecution, opening the door to bias that informs final decisions.¹¹⁸

Even if NRP had the resources to more thoroughly patrol the Chesapeake's oyster sanctuaries, it would still not be enough to secure the future of healthy and productive oyster beds in Maryland's Bay waters. Fines and punishments of oyster violations are neither severe enough, nor applied early enough, in a habitual violator's poaching career. The average fine in 2010 was \$179 (2010 USD) and has been declining in real terms since the 1960s.¹¹⁹ The last known average fine was \$197 in 2014, as reported by the Baltimore Sun, which was only an increase of \$1 after adjusting for inflation (\$180 in 2010 USD).¹²⁰

In addition to fines currently not making significant, if any, impact on incentives to poach oysters, Maryland laws for license revocations and suspensions grant judges broad discretion, and allow watermen with long records of infractions to continue fishing the oyster beds and waters of the Chesapeake.¹²¹ Maryland code states that an oyster harvesting license *may* be revoked if certain violations occur, such as taking oysters more than 200 feet within a prohibited area, using prohibited gear, harvesting during a restricted time of day or season, or stealing from an area leased by another.¹²² The low number of license revocations and low fine amount indicate that *may* effectively means *will not*.¹²³

An example of a particularly lax penalty for illegal oyster harvesting can be found in Maryland's commercial fishing license Point Assignment Schedule, which only assigns five points to a license when the holder is

118. MD. CODE REGS. 08.02.13.03 (2021); *see* DIST. CT. OF MD., NATURAL RESOURCES FINE SCHEDULE, <https://www.courts.state.md.us/sites/default/files/court-forms/dnr.pdf> (last visited June 21, 2019) [<https://perma.cc/TZR8-FSU3>].

119. Bashore et al., *supra* note 82, at 594-95.

120. Catherine Rentz & Timothy B. Wheeler, *Oyster Poaching Continues on Bay Despite Enforcement Efforts*, BALT. SUN (Apr. 4, 2019), <https://www.baltimoresun.com/maryland/bs-md-oyster-enforcement-20150404-story.html> [<https://perma.cc/8UJK-CXKV>];

U.S. BUREAU OF LABOR STATISTICS, CONSUMER PRICE INDEX INFLATION CALCULATOR, https://www.bls.gov/data/inflation_calculator.htm (set parameters to "197." "January 2014," "January 2010") (last visited June 21, 2019) [<https://perma.cc/KF2T-9QDL>].

121. MD. CODE ANN., NAT. RES. § 4-701(n)(5)(v) (West 2019); MD. CODE ANN., NAT. RES. § 4-1210(a)(2) (West 2018).

122. § 4-1210(a)(2) (emphasis added).

123. *See, e.g.,* Rentz, *supra* note 120; U.S. BUREAU OF LABOR STATISTICS, CONSUMER PRICE INDEX INFLATION CALCULATOR, *supra* note 120; DEP'T OF NAT. RES., *supra* note 86.

found to be using an illegal dredge or harvesting within 150 feet of a prohibited or polluted area.¹²⁴ At a minimum, ten points are needed within a two year period to trigger a suspension and at the threshold level the suspension is only for a *maximum* of 30 days.¹²⁵ Compare this to the penalty for harvesting oysters 250 or more feet within a restricted area, which ostensibly carries a penalty of 35 points, triggering a license revocation, but requires a court appearance, which is unlikely to result in an actual revocation.¹²⁶ The purpose of the point system is to “deter future wrongdoing and conserve fisheries.”¹²⁷ Given that many watermen habitually disregard the law and often continue their operations while their licenses are suspended or revoked, it is clear that the point system is an ineffective method of enforcing commercial fishery regulations.¹²⁸

Additionally, the Maryland code states that enhanced suspension and revocation penalties shall be adopted regarding species in need of protection.¹²⁹ While there may be differences between penalties that vary from species to species, these differences are hardly discernable, much less stringent enough to actually discourage oyster poaching.

IV. PROPOSED SOLUTION

After analyzing the available data and statutes pertaining to the region’s oyster fishery, this note recommends a three-part solution to Maryland’s oyster poaching. First, privatizing oyster beds by simultaneously expanding sanctuary designations and aquaculture leases will allow the state to remotely monitor more oyster beds while allowing watermen to continue to benefit from the oyster fishery. This will incentivize watermen to maintain the health of their leased oyster habitats in order to realize sustainable harvests year after year. Second, further centralizing the courts hearing fishery cases into two or three regional courts, instead of twenty-four county level courts would increase the presiding judges’ understanding of the scope of the problem and reduce the chance of bias informing court decisions. These two changes should be implemented simultaneously to maximize the benefit to the Chesapeake. Third, the creation of a new, effective fine schedule for

124. MD. CODE REGS. 08.02.13.03.

125. MD. CODE REGS. 08.02.13.02 (2021).

126. MD. CODE REGS. 08.02.13.03; DIST. CT. OF MD., *supra* note 118.

127. DIST. CT. OF MD., *supra* note 118.

128. Deems, *supra* note 23 (on file with author).

129. MD. CODE ANN., NAT. RES. § 4-701(n)(5)(v) (West 2019).

poaching violations will help to disincentivize poaching and other practices that are detrimental to the Chesapeake Bay's oyster fishery.

Privatization of Maryland's oyster fishery would likely help restoration goals and reduce poaching. Such a change could come in the form of an expanded sanctuary program via legislation, thus putting the vast majority of oyster beds under state protection and increasing acreage under aquaculture leases to mitigate the market effects of a reduction of harvests from the public fishery. The benefit would be realized in two ways: (1) the use of MLEIN could be expanded to cover most, if not all, oyster beds in the Maryland Chesapeake; and (2) private leaseholders will have a financial interest in keeping poachers out of their acreage.

In addition to increasing private oyster aquaculture, concentrating oyster poaching dockets into significantly fewer regional courthouses with dedicated judges would reduce the chance of a defendant receiving favorable treatment due to a personal connection with either the presiding judge or prosecutor. As it stands now, the low populations of the counties in which oyster poaching is concentrated means that there is a significantly higher chance of a personal connection between alleged poachers and judges adjudicating their cases.¹³⁰ This increases the likelihood of intentional or unintentional bias creeping into case dispositions. Increasing the population that each judge serves by decreasing the number of judges hearing fishery cases would lessen the chance of bias being present in courts' decisions. While some may see the idea of distant judges rendering judgements about localized issues as unpalatable, in this matter distance between the bench and the accused supports the ideal that justice should be administered evenly and without bias.

Creating two to three specialized courts in key oyster regions (e.g., one on the lower Western shore of the Chesapeake and either one in Cambridge, Maryland or both an upper and a lower eastern shore location) would also allow the dedicated fishery judges to better understand the extent of the oyster poaching problem on the Bay. This expertise in natural resource violations was one of the initial goals of creating specialized dockets with assigned judges in eighteen Maryland district courts, but this goal remains largely unrealized.¹³¹ Having a select few judges handle all

130. U.S. CENSUS BUREAU, QUICKFACTS, *supra* note 87; Deems, *supra* note 23 (on file with author).

131. MD. DEP'T OF NAT. RES., MD. JURISDICTIONS WITH NAT. RES. COURT DATES, *supra* note 58; MD. DEP'T OF NAT. RES., MD. NAT. RES. POLICE LEVEL OF SERV. STANDARDS, DEC. 2012, *supra* note 58, at 13.

of the fishery cases before Maryland courts would achieve what was intended by the initial creation of natural resource dockets.¹³²

The last prong of this solution is to create a more stringent fine schedule for poaching and poaching adjacent violations. This would be significantly easier than the alternative of the courts compelling the NRP to better police the sanctuaries and enforce the laws. Requiring more officers or resources be put toward poaching enforcement is expensive and may meet with backlash as an unnecessary or ineffective drain of taxpayer dollars. Rather, increasing the minimum fine amounts for certain offenses would not only be easily done but it would also likely create more income to the state.¹³³

V. CONCLUSION

To conclude, the Maryland section of the Chesapeake Bay is home to an incredibly valuable, and renewable resource which is being left open for poachers to pillage as they see fit with little to no consequence. There is a sensible three-part approach to this problem which will allow a larger harvest, healthier oysters in the market, and improved incentives to responsibly harvest from the oyster fishery. First, oyster harvests should be privatized through a leasehold system similar to the system that Virginia has implemented; second, the courts that handle fishery violations should be centralized into two to three locations; third, fines for oyster related violations should be increased across the board. Without implementing this solution, it is likely that Maryland will realize lower returns on its oyster fishery year over year and continue to allow unchecked poaching of a valuable natural resource.

132. MD. DEP'T OF NAT. RES., MD. NAT. RES. POLICE LEVEL OF SERV. STANDARDS, *supra* Note 58 at 13.

133. Fine schedules are created by the judiciary and updated in memorandum format from time to time.

APPENDIX: CHARTS AND TABLES

Chart 1:

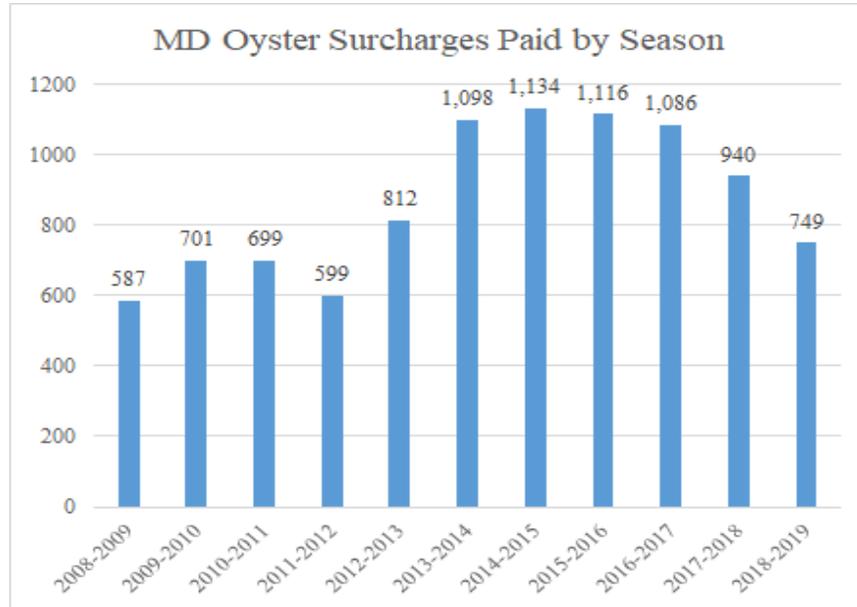


Chart 2:

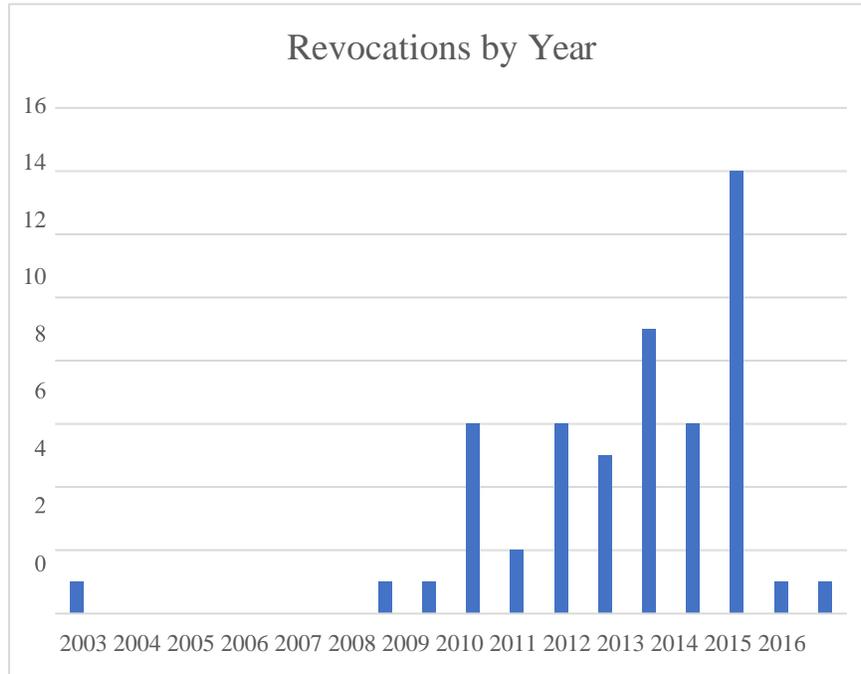


Chart 3:

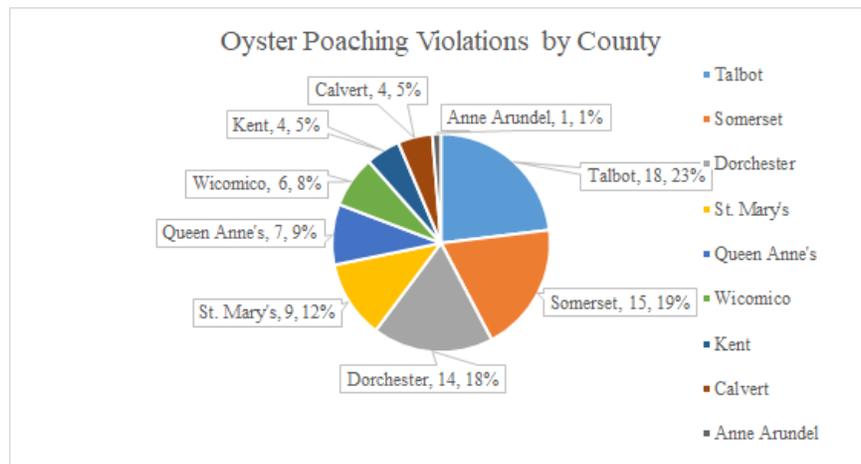


Table 1:

COUNTY OF REGISTRATION	COUNT OF REVOCATIONS	POPULATION	PER 100K
OUT OF STATE	1	n/a	n/a
SOMERSET	10	25,675	38.95
TALBOT	12	36,968	32.46
DORCHESTER	9	31,998	28.13
KENT	4	19,383	20.64
QUEEN ANNE'S	3	50,251	5.97
ST. MARY'S	5	112,664	4.44
CAROLINE	1	33,304	3.00
WICOMICO	3	103,195	2.91
WORCESTER	1	51,823	1.93
ANNE ARUNDEL	1	576,031	0.17
BALTIMORE COUNTY	1	828,431	0.12

Table 2:

AREA NAME	BUSHEL HARVESTED			
	2009-2010	2010-2011	2011-2012	2012-2013
BIG ANNEMESSEX RIVER	370	415	206	816
BROAD CREEK (CHOPTANK RIVER TRIBUTARY)	2,694	7,666	10,778	59,342
CHESAPEAKE BAY NORTH OF BRIDGE AND SOUTH OF WORTON POINT	6,491	6,454	297	5
CHESAPEAKE BAY NORTH OF COVE POINT TO AREA 127	1,006	634	243	1,247

CHESAPEAKE BAY SOUTH OF BRIDGE AND NORTH OF LINE BETWEEN FAIRHAVEN AND KENT POINT	4,437	1,598	140	443
CHESAPEAKE BAY SOUTH OF COVE POINT AND EAST OF SHIP CHANNEL	163	69	296	419
CHESAPEAKE BAY SOUTH OF COVE POINT AND WEST OF SHIP CHANNEL	2,243	2,843	1,553	1,732
CHESTER RIVER BELOW QUEENSTOWN CREEK	856	1,496	51	15
CHESTER RIVER NORTH OF SPANIARD POINT	80	1,672	-	-
CHESTER RIVER SOUTH OF SPANIARD POINT TO QUEENSTOWN CREEK	882	1,726	12	77

(Continued on next page.)

AREA NAME	BUSHEL HARVESTED				
	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
BIG ANNEMESSEX RIVER	713	280	4,624	265	1,823
BROAD CREEK (CHOPTANK RIVER TRIBUTARY)	58,234	51,706	54,206	29,143	26,291
CHESAPEAKE BAY NORTH OF BRIDGE AND SOUTH OF WORTON POINT	191	1,587	6,116	7,927	1,796
CHESAPEAKE BAY NORTH OF COVE POINT TO AREA 127	3,587	5,623	11,028	6,324	1,054
CHESAPEAKE BAY SOUTH OF BRIDGE AND NORTH OF LINE BETWEEN FAIRHAVEN AND KENT POINT	459	96	933	2,719	1,086
CHESAPEAKE BAY SOUTH OF COVE POINT AND EAST OF SHIP CHANNEL	222	669	1,858	127	3,891
CHESAPEAKE BAY SOUTH OF COVE POINT AND WEST OF SHIP CHANNEL	4,398	4,268	2,491	3,351	5,272
CHESTER RIVER BELOW QUEENSTOWN CREEK	460	1,205	946	297	2,075

CHESTER RIVER NORTH OF SPANIARD POINT	-	-	-	-	215
CHESTER RIVER SOUTH OF SPANIARD POINT TO QUEENSTOWN CREEK	-	1,121	272	166	1,651