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Report to the Potomac River Fisheries Commission on  
Hand Scraping and Oyster Culture  
In the Hand Scrape Area.

By

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Solomons, Maryland 20688

May 1982

UMCEES 82-69 CBL

VIMS Marine Resource Report #82-7

## Introduction

Since March 1977, hand scrapes have been used to harvest oysters on an experimental basis from the lower Potomac River. On the Virginia side, Bonums Bar is the upriver limit; on the Maryland side, Tall Timbers is the upriver limit (Figure 1).

The report which follows evaluates, at the request of the Potomac River Fisheries Commission, the impact of hand scraping in this area.

## What is shown in this report

1. Landings of market oysters in the hand scrape area from 1963 to the present for:
  - a. Hand scrapes (started March 1977)
  - b. Oyster tongers
2. Bushels of shell planted in the hand scrape area from 1963 to 1982.
3. Catch of market oysters in the hand scrape area expressed as catch per boat per day for hand scrapes.
4. Setting potential in the hand scrape area and in adjacent upriver areas, based on surveys by the Maryland Department of Natural Resources and the University of Maryland Center for Environmental and Estuarine Studies.
5. Conclusions.

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## Results

Oyster landings from 1963 to 1982 in the hand scrape area are related to quantities of shells planted. From 1963 to 1982 a total of 2,579,322 bushels of shells were planted in the hand scrape area. During this period 167,051 bushels of oysters were harvested. Over 64% of the shells were planted on Great Neck and Hog Island Bar; about 79% of the oysters came from these same two areas (Tables 1 and 2).

There is a positive relation between shell plantings and oyster production in later years (Figure 2; Table A in Appendix). Shell plantings in 1963 and 1964 were followed by an increase in landing of oysters 3-4 years later. Moreover, landings declined later on following the period when shells were not planted. The extensive shell plantings in the years 1973-1975-1975 were followed by a major increase in landings for oyster tongers during the 1976-78 season. The large peak in landings during 1977-78 for hand scrapers was also due in part to the harvest of scattered "wild" oysters that were too far apart for tonging, but which could be caught efficiently with a hand scrape (Figure 2).

Since the end of the 1978-1979 season, oyster landings have declined sharply for hand scrapers and oyster tongers (Figure 2). There was some reduction in the numbers of boats fishing in the Potomac in the hand scrape area after this time. However, decreased landings were not only due to reduced harvest effort. The decline was apparently due to the fact that oyster tongers and hand scrapers were catching progressively fewer oysters per boat per day. This decline is best shown in two areas where most of the oysters were caught (Table 3):

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There is a positive relation between shell plantings and oyster production in later years (Figure 2; Table A in Appendix). Shell plantings in 1963 and 1964 were followed by an increase in landing of oysters 3-4 years later. Moreover, landings declined later on following the period when shells were not planted. The extensive shell plantings in the years 1973-1975-1975 were followed by a major increase in landings for oyster tongers during the 1976-78 season. The large peak in landings during 1977-78 for hand scrapers was also due in part to the harvest of scattered "wild" oysters that were too far apart for tonging, but which could be caught efficiently with a hand scrape (Figure 2).

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- a. The Great Neck area received 1,185,169 bushels of shell since 1963; most of this was applied from 1971 to 1978. Here catch/boat/day declined in 1981-82 to about half the 1978-79 harvest level.
- b. At Hog Island (which was not shelled since 1967 there was a similar (but more drastic) decline.

From the above it is evident that oysters are becoming less available today to harvest and that the natural rate of recruitment (setting-survival-growth) in the hand scrape area is not sufficient to maintain the high level of production noted during 1977-1979.

Two basic elements related to recruitment in the hand scrape area are volumes of shell planted and the volume or magnitude of the annual set. The importance of shell in maintaining production has just been discussed. Recruitment in the hand scrape area during the 1963 to 1982 period has been marginal to good. It has provided some harvests in areas where shell has been planted but the lack of cultch has limited recruitment where none has been planted. Most production has come from bottoms on which where shell was planted (Table 1).

The problem next discussed is how far up the Potomac (above the hand scrape area) is the annual set adequate. The separation between mid and lower Potomac River in Meritt (1977) coincides closely with the upriver limit of the hand scraping area. For the period 1939-1965 the average spat per bushel for the mid-river was 14.2 (Figure 3); for the lower river it was 71.1. During 1966-1975 the mid-river count was 2.8, while the lower river averaged 33.0 spat per bushel (Figure 4). A view

of how much recruitment might be expected under present conditions can be gotten from the post AGNES spat counts (Table 4). The mid-river average for this period was 1.2 spat per bushel; in the lower river it was 85.4.

Spatfall on the mid-river bottoms is thus insufficient to sustain production without the planting of seed. The present upriver hand scraping line is close to the upriver limit of recruitment that is adequate, if cultch is available, to support oyster harvest by this gear.

### Conclusions

1. Oyster harvest by hand scrapes and oyster tongs in the hand scrape area (to a major extent) is related to volume of shells planted by the Potomac River Fisheries Commission.
2. Following periods when shells are not planted, in the Potomac, there is a reduction in catch per boat per day.
3. Certain bars where shells have not been planted are productive today, but to a much lesser extent than the areas where shells have been planted.
4. The hand scrape zone, as it is delimited today, is in an area where annual recruitment is marginal to good. Upriver it is marginal to zero.
5. We conclude that future productivity in the present hand scrape area will largely be limited by volumes of shells planted.
6. Extension of the hand scrape area is not recommended at this time. The reason being that it is most cost effective to plant

shells in the present hand scrape area where a return may be expected. Harvest by hand scrape upriver would result in an immediate but short term gain in production followed by long periods of very low harvest levels.

7. We recommend that seed not be planted in the hand scrape area, however, plantings should be made in the mid and upper sections.
8. We recommend that shell planting activities be increased in the present hand scrape area. In making this last recommendation, we realize that funds for shell plantings are limited; every effort needs to be made to increase monies available to the Potomac River Fisheries Commission for this purpose.

# OYSTER AND CLAM GROUNDS IN THE POTOMAC RIVER

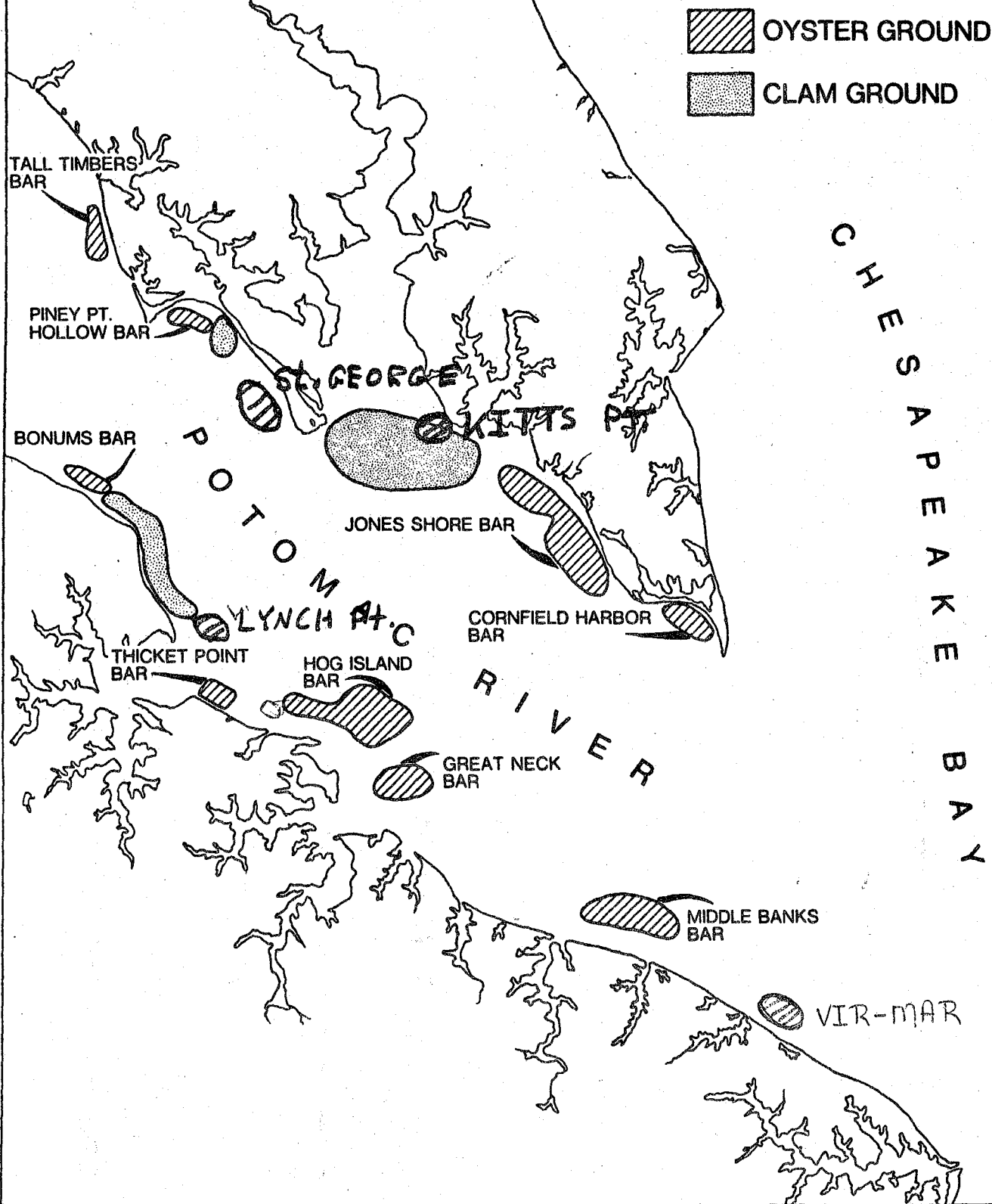


Figure 1. Locations where oysters and soft clams occur in the Lower Potomac River.

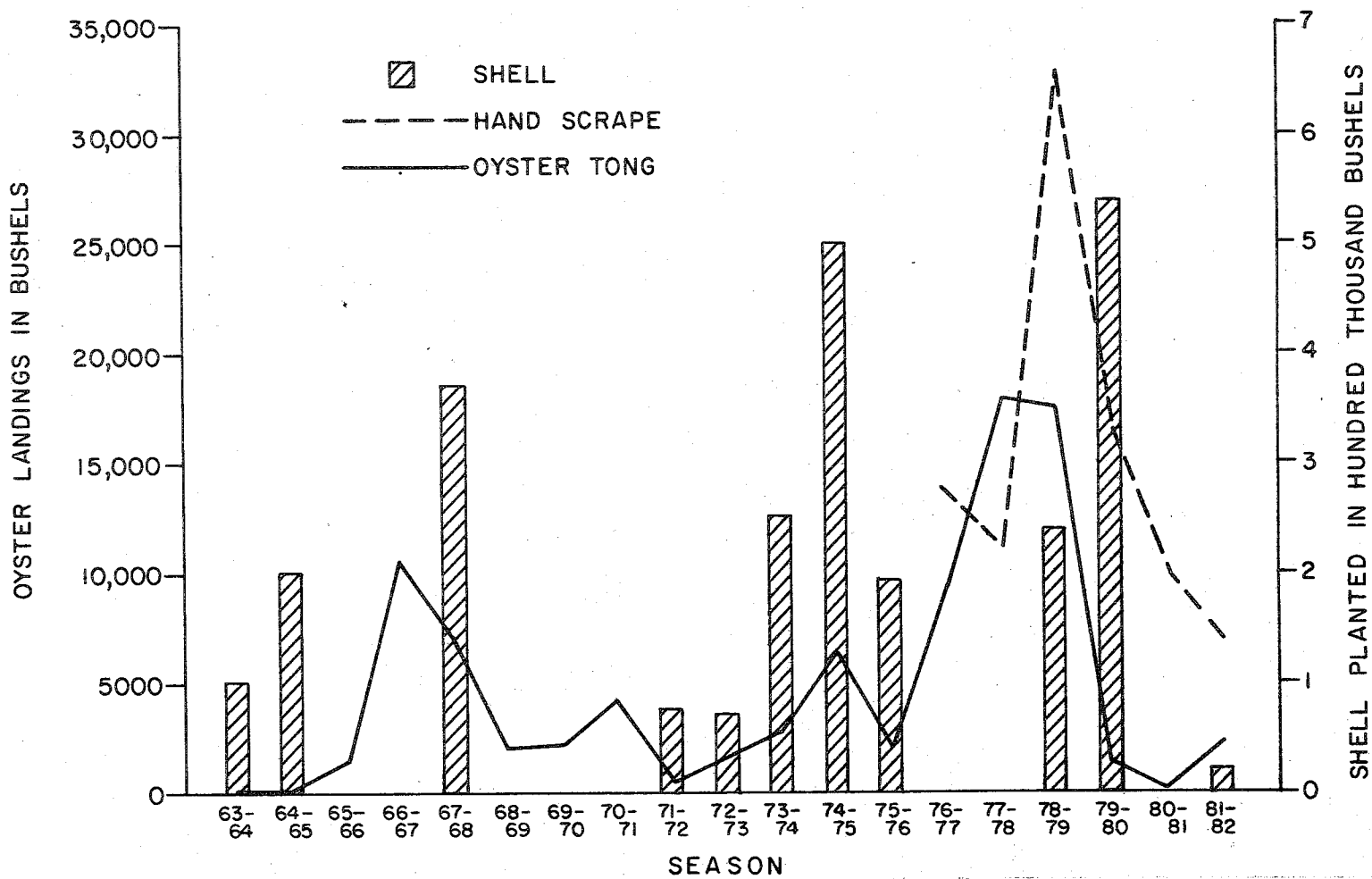


Figure 2. Landings of market oysters and volume of shell planted in Potomac River, 1963-1982.

Table 1

Relation Between Shells Planted and Oyster Production  
Expressed As Percent of Total (1963-1982).

	<u>% Total Shell Planted</u>	<u>% Total Oysters Harvested</u>
Vir-Mar <sup>1</sup>	7.74	0.06
Middle Bank Bar	0.0	0.13
Great Neck Bar	45.95	44.71
Hog Island Bar	18.35	34.66
Thicket Point Bar	7.70	5.36
Lynch Point Bar	5.16	1.10
Bonums Bar	0.0	1.20
Kitts Point Bar <sup>1</sup>	4.85	0.14
St. Georges Bar <sup>1</sup>	10.24	4.83
Piney Pt., Hollow Bar	0.0	4.26
Tall Timbers Bar	0.0	3.53
TOTAL BU.	2,579,322	167,051

<sup>1</sup>Vir-Mar, Kitts Point Bar and St. Georges Bar all planted with shell after 1978-79 period.

Table 2

Total Shells Planted on Various Oyster Bars From  
1963 to 1981 in Hand Scrape Areas.

<u>Location</u>	<u>1963-76</u>	<u>1977-81</u>	<u>Total</u>
Vir-Mar	0	199,713	199,713
Great Neck Bar	993,725	191,444	1,185,169
Hog Island Bar	473,393	0	473,393
Thicket Point Bar	198,632	0	198,632
Lynch Point Bar	21,341	111,800	133,141
Kitts Point Bar	0	125,177	125,177
St. Georges Bar	0	264,097	264,097
TOTAL SHELLS	1,687,091	892,231	2,579,322



Table 3

Average Harvest of Oysters Per Boat Day By Hand Scrapes on  
Two Bars in the Hand Scrape Area. Landings From  
Buyers and Hand Scrape Reports.

HOG Island Bar

<u>Year</u>	<u>Boat Days</u>	Buyer's Report <u>Bu/Boat/Day</u>	Hand Scrape Report <u>Bu/Boat/Day</u>
1976-77	541	16.8	16.8
1977-78	205	14.7	18.0
1978-79	538	18.0	18.1
1979-80	350	13.2	11.8
1980-81	435	15.0	12.5
1981-82	311	7.4	8.1

GREAT NECK BAR

1976-77	122	8.9	8.9 <sup>1</sup>
1977-78	445	12.7 <sup>2</sup>	12.7 <sup>2</sup>
1978-79	834	24.9	25.7
1979-80	767	11.7	17.8
1980-81	505	5.6	9.4
1981-82	482	6.6	7.6

<sup>1</sup>From Buyer's Report.

<sup>2</sup>Estimated.

## APPENDIX

Table A

Total Oysters Harvested (Bushels) in the Potomac River  
By Gear (1963-1981), in the Hand Scrape Area.

	Hand Tong (Buyers Report)											
	<u>64-</u> <u>65</u>	<u>65-</u> <u>66</u>	<u>66-</u> <u>67</u>	<u>67-</u> <u>68</u>	<u>68-</u> <u>69</u>	<u>69-</u> <u>70</u>	<u>70-</u> <u>71</u>	<u>71-</u> <u>72</u>	<u>72-</u> <u>73</u>	<u>73-</u> <u>74</u>	<u>74-</u> <u>75</u>	<u>75-</u> <u>76</u>
Vir-Mar												
Middle Bank Bar												
Great Neck Bar				991	412	623	1,870	10	116	634	1,691	970
Hog Island Bar			9,927	2,044	44	960	596	7	1,502	1,739	4,146	593
Thicket Point Bar			36	50	195	42	73	169			53	214
Lynch Point Bar			247	230	120	88	44	12	12			47
Bonums Bar	15			43	14	2	2			13	20	231
Kitts Point Bar											233	
St. Georges Bar			8	51			368			296	110	
Piney Pt. Hollow Bar					142	637	1,751	397	237		245	11
Tall Timbers Bar			403	3,848	1,216		18		4		15	5
TOTAL BU. OYSTERS	15	0	10,621	7,257	2,144	2,352	4,722	595	1,871	2,682	6,513	2,071

Table A (Contd.)

	HS	OT	HS	OT	HS	OT	HS	OT	HS	OT	HS	OT
	<u>76-</u> <u>77</u>	<u>76-</u> <u>77</u>	<u>77-</u> <u>78</u>	<u>77-</u> <u>78</u>	<u>78-</u> <u>79</u>	<u>78-</u> <u>79</u>	<u>79-</u> <u>80</u>	<u>79-</u> <u>80</u>	<u>80-</u> <u>81</u>	<u>80-</u> <u>81</u>	<u>81-</u> <u>82</u>	<u>81-</u> <u>82</u>
Vir-Mar									3		107	
Middle Bank Bar	19		60		204							
Great Neck Bar	1,082	8,448	5,668 <sup>1</sup>	17,938 <sup>1</sup>	20,771	15,894	9,027	448	2,855	20	3,166	
Hog Island Bar	9,096	89	3,021	0	9,690	868	4,625	108	6,530	12	2,298	
Thicket Point Bar	723	748	2,000	603	2,093	733	940	27	474	21	364	
Lynch Point Bar	184		210				198			3	450	
Bonums Bar	485	97	136		98		404	29	54		378	
Kitts Point Bar	6											
St. Georges Bar	496		500	281	257		460	39			485	4,966
Piney Pt. Hollow Bar	1,666		60			7	1,174	696	71		3	14
Tall Timbers Bar	158		62				75		91			
TOTAL BU. OYSTERS	13,915	9,382	11,717	18,822	33,113	17,502	16,903	1,347	10,078	56	7,251	4,980

<sup>1</sup>Values estimated.

TABLE 4

## POTOMAC RIVER SPATFALL, 1974-1981

Lower  
Mid River

Bar Name	74	75	76	77	78	79	80	81	74-81 Average*
Vir-Mar	-	-	-	-	-	-	336	149	243
Cornfield#	10	0	11	188	13	92	488	290	137
Jones Shore#	160	5	4	201	8	44	1072	290	223
Great Neck	16	3	0	42	0	4	149	122	42
Hog Island	0	0	0	41	0	3	19	160	28
Kitts Point	-	-	-	-	-	42	474	-	258
Thicket Point	0	-	0	12	0	0	3	9	3
St. George's	-	-	-	69	5	18	815	238	229
Lynch Point	-	-	-	-	0	6	128	167	75
Piney Point	-	-	0	48	0	14	80	384	88
Bonum's	-	-	-	-	-	2	-	26	14
Average	37.2	2	2.5	85.8	3.25	22.5	356.4	173.5	

Average for the period = 85.4 spat per bushel

Mid  
Lower River

Red Bar	0	0	0	-	0	0	24	-	4
Ragged Point	0	0	0	0	0	1	5	7	1.63
Coles Point	-	0	-	0	0	0	0	0	0
Peach Orchard	0	0	0	0	0	0	0	2	0.25
Huggins	0	0	2	0	0	0	4	6	4
Kingcopsico	0	0	0	0	0	0	0	0	0
Heron Island	0	0	0	0	0	0	3	22	3.12
Sheepshead	0	0	0	0	0	0	0	2	0.25
Cobb Bar	0	0	0	0	0	0	0	2	0.25
Average	0	0	0.25	0	0	0.11	4	5	

Average for the period = 1.2 spat per bushel

\*Averages are abnormally high for bars sampled only during 1980 and 1981.

#Cornfield Harbor and Jones Shore are in the "lower Potomac River", but they were excluded from the hand scraping zone because of their potential or actual use for seed production.

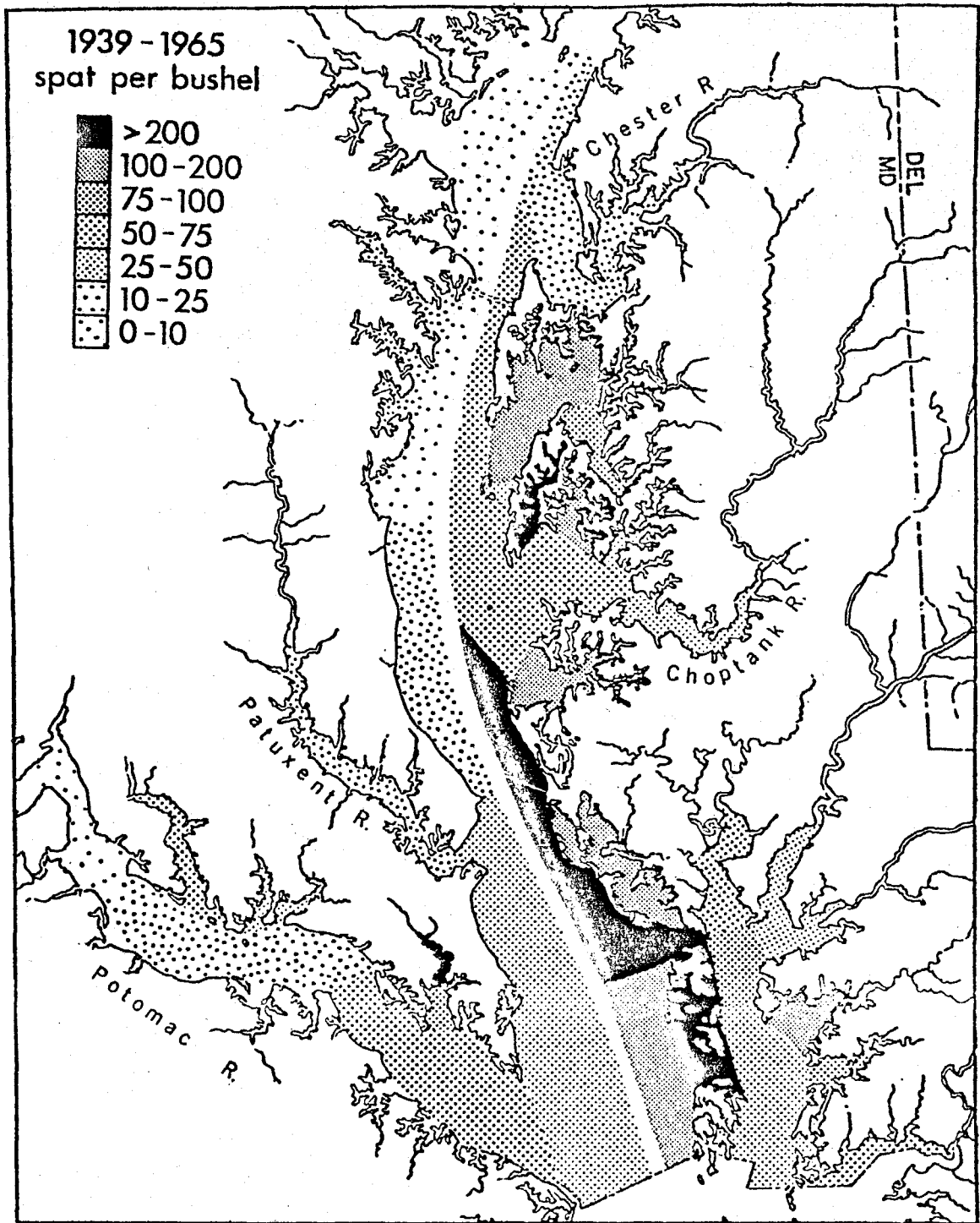


FIGURE 3

From: Meritt (1977), Oyster spat set on natural cultch in the Maryland portion of the Chesapeake Bay 1939-1975.