8-1-1983

Report to the Potomac River Fisheries Commission on Hand Scraping and Oyster Culture in the Lower Potomac River

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REPORT TO THE POTOMAC RIVER FISHERIES COMMISSION ON HAND SCRAPING AND OYSTER CULTURE IN THE LOWER POTOMAC RIVER

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August 1983

UMCEES Ref. # 83-80 CBL

VIMS Marine Resource Report # 83-5

INTRODUCTION

Since March 1977, small dredges called hand scrapes that are towed by powered vessels have been used to harvest oysters on an experimental basis from a designated area in the lower Potomac River. On the Virginia side, Bonums Bar is the upper limit for use of this gear; on the Maryland side, Tall Timbers is the upper 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 and the suitability of upriver areas for this harvest method.

What is presented in this report

1. Landings of market oysters in the hand scrape area from 1963 to the present for hand scrapes and oyster tongers (shaft tongs).
2. Bushels of shells planted in the hand scrape area from 1963 to 1983.
3. Catch of market oysters in the hand scrape area expressed as bushels 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. Discussion of data presented in tables and figures.
6. Conclusions.

DISCUSSION

Oyster landings from 1963 to 1983 in the hand scrape area are related to quantities of shells planted. From 1963 to 1983 a total of 2,788,947 bushels of shells were planted in the hand scrape area. During this period a harvest of 223,627 bushels of oysters was reported. Over 62% of the shells were planted on Great Neck and Hog Island Bars; about 71% of the oysters harvested came from these same two areas (Tables 1 and 2).

There is a positive relationship 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 landings 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 were followed by a major increase in landings for oyster tongers during the 1977-1978 season. The large peak in landings during 1978-1979 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). These oysters were widely separated because of the scarcity of cultch, and this cultch was not replaced after the oysters were harvested, thus production from the bottoms they occupied decreased considerably after the initial spurt.

From the end of the 1978-1979 season through the 1980-1981 season, oyster landings 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 during this period (Table 3). However decreased landings were not only due to reduced harvest effort. The decline apparently occurred because 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):

a. The Great Neck area received 1,184,169 bushels of shell since 1963: most of this was applied from 1971 to 1978. Here catch per boat per day in 1980-1981 was about one-third the 1978-1979 harvest level.

b. At Hog Island, which was not shelled since 1967, there was a similar decline.

The increased harvests for 1982-1983 are the result of the 1978 and 1979 shell plantings and the ensuing excellent spatfall (Figure 2; Table 4; Table A).

Hand scrape catch per boat per day has remained low through 1983 however, indicating that some effort is still being expended on sparsely populated areas (Table 3).

From the above it is evident that on the unshelled bottoms oysters have become less available to harvest, and that the "natural" rate of recruitment in the hand scrape area is not sufficient to maintain the high level of production noted during 1978-1979.

Two basic elements related to recruitment in the hand scrape area are volumes of shell planted and the magnitude of the annual oyster set. The importance of shell in maintaining production has been shown. Spatfall in the hand scrape area during the 1963 to 1983 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. After the initial peak harvest of scattered "wild" oysters, most production has come from bottoms on which shell was planted (Table 1).

How far up the Potomac (above the hand scrape area) is the annual oyster 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 100 spat per bushel.

In the lower river spatfall is adequate to sustain recruitment on shells planted and left in place for the oysters to mature (set-and-grow). However,

because of the very light and sporadic spatfall on the mid-river bars, reasonable harvest pressure can only be supported by the planting of seed. It is thus apparent that the present upriver hand scraping line is close to the upriver limit of natural recruitment that is adequate, if cultch is available, to support oyster harvest by this more efficient gear.

A comparison of setting and planting records with harvests indicates that the number of harvestable oysters that are available depends more closely on the planting program than it does on the quantity of annual set. Carefully planned shell and seed planting can yield sizable harvests even after years of relatively poor spatfall. On the other hand, a good set can be unproductive if cultch is not planted at the right time, in sufficient quantity -- or if seed is not transplanted to growing bottoms after spatfall. The majority of oysters now are caught from managed bottoms, rather than from set on natural cultch -- Potomac oystering is now in a "put-and-take" mode. Only a rare (every 15-20 years) river wide general set could significantly increase harvests without management assistance.

The financial resources available to the Potomac River Fisheries Commission are not nearly adequate to realize the potential oyster productivity of the Potomac. It is, therefore, essential that the best use be made of these limited funds to preserve and enhance oyster production throughout the oyster growing portion of the river. It costs more to plant shells, produce seed, and transplant it to growing areas than it does to make a "set-and-grow" shell planting. Therefore, wherever production can be sustained by shell planting alone it should be done that way. Seed planting should only be done in the mid and upper river areas where this more expensive method is necessary to maintain production.

CONCLUSIONS

1. Oyster harvest by hand scrapes and oyster tongs in the hand scrape area is (to a major extent) presently related to the volume of shells planted by the Potomac River Fisheries Commission.
2. Following periods when shells are not planted in the hand scrape area, there is a reduction in catch per boat per day.
3. The hand scrape zone, as it is delimited today, is in an area where annual recruitment is marginal to good. Upriver from that zone, recruitment is marginal to zero.
4. Further productivity in the present hand scrape area will largely be limited by the volume of shells planted.
5. Continued oyster production in the mid-river area, is dependent upon the planting of seed. Setting potential in that area is too low for "set-and-grow" shell planting to be effective.
6. Further extension of the hand scrape zone is not recommended at this time. Present rehabilitation resources are insufficient to plant the quantity of seed in the mid-river area that would be required to sustain the added harvest pressure of this efficient gear. At current seeding levels, hand scraping in the mid-river area would result in an immediate but short term gain in production followed by long periods of very low harvests.
7. In order to maintain production throughout as much of the oyster growing portion of the Potomac as possible the expenditure of limited resources must be balanced between the requirement for seed in the mid and upper river and shell planting in the lower river. Therefore, we recommend that seed plantings be continued in the mid and upper river, but that seed not be planted in the hand scrape area. We further recommend that shell planting be increased in the hand scrape area.

We recognize that this will require additional funds and we hope that more monies can be made available to the Potomac River Fisheries Commission for this purpose.

LITERATURE CITED

Meritt, D. W. 1977. Oyster spat set on natural cultch in Maryland portion of the Chesapeake Bay (1939-1975). Univ. Md. Center for Environmental and Estuarine Studies Special Report Nov. 7: 30 pp.

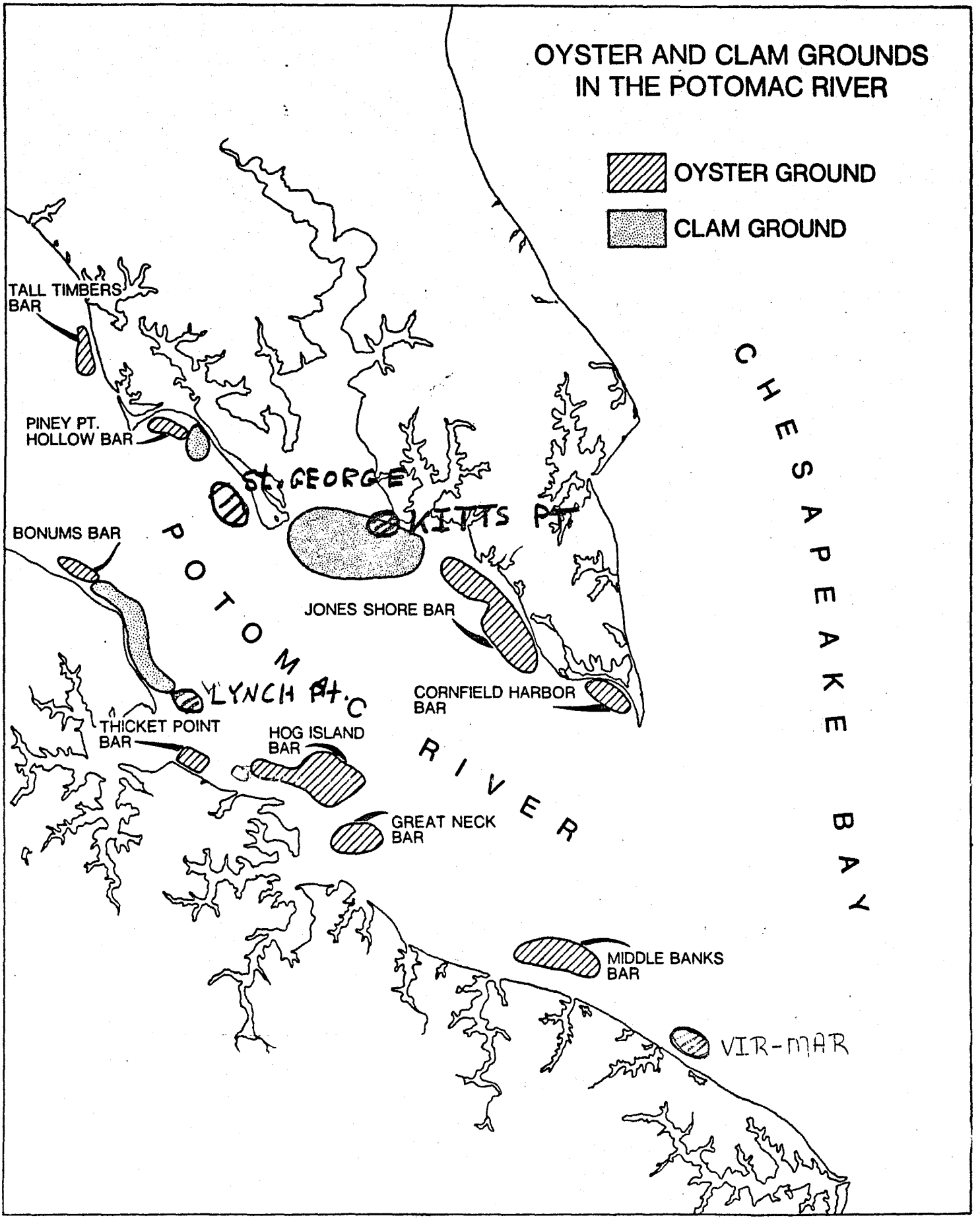

Figure 1. Locations where oysters and soft clams occur in the Lower Potomac River.

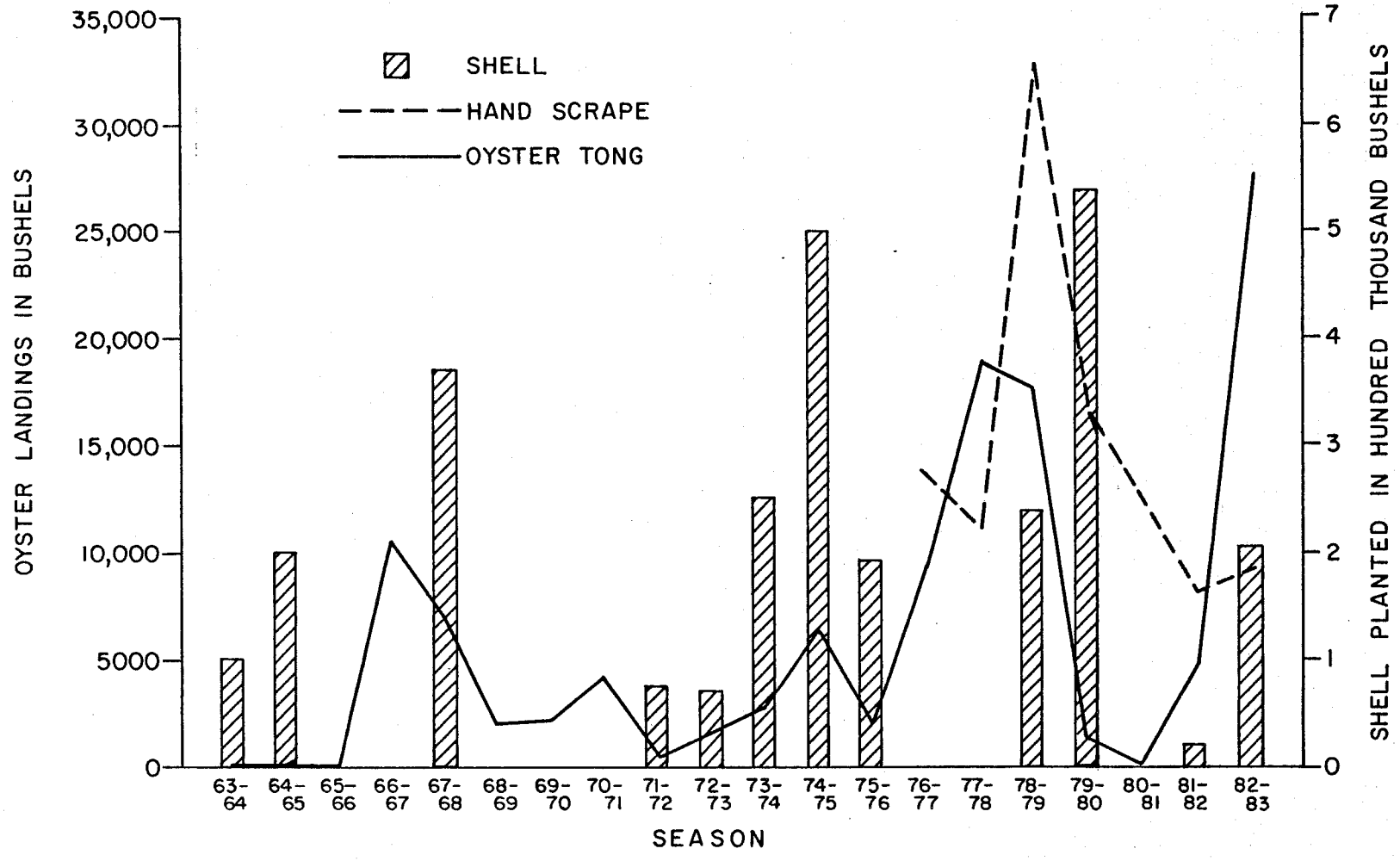

Figure 2. Landings of market oysters and volume of shell planted in the hand scraping area of the Potomac River, 1963-1983.

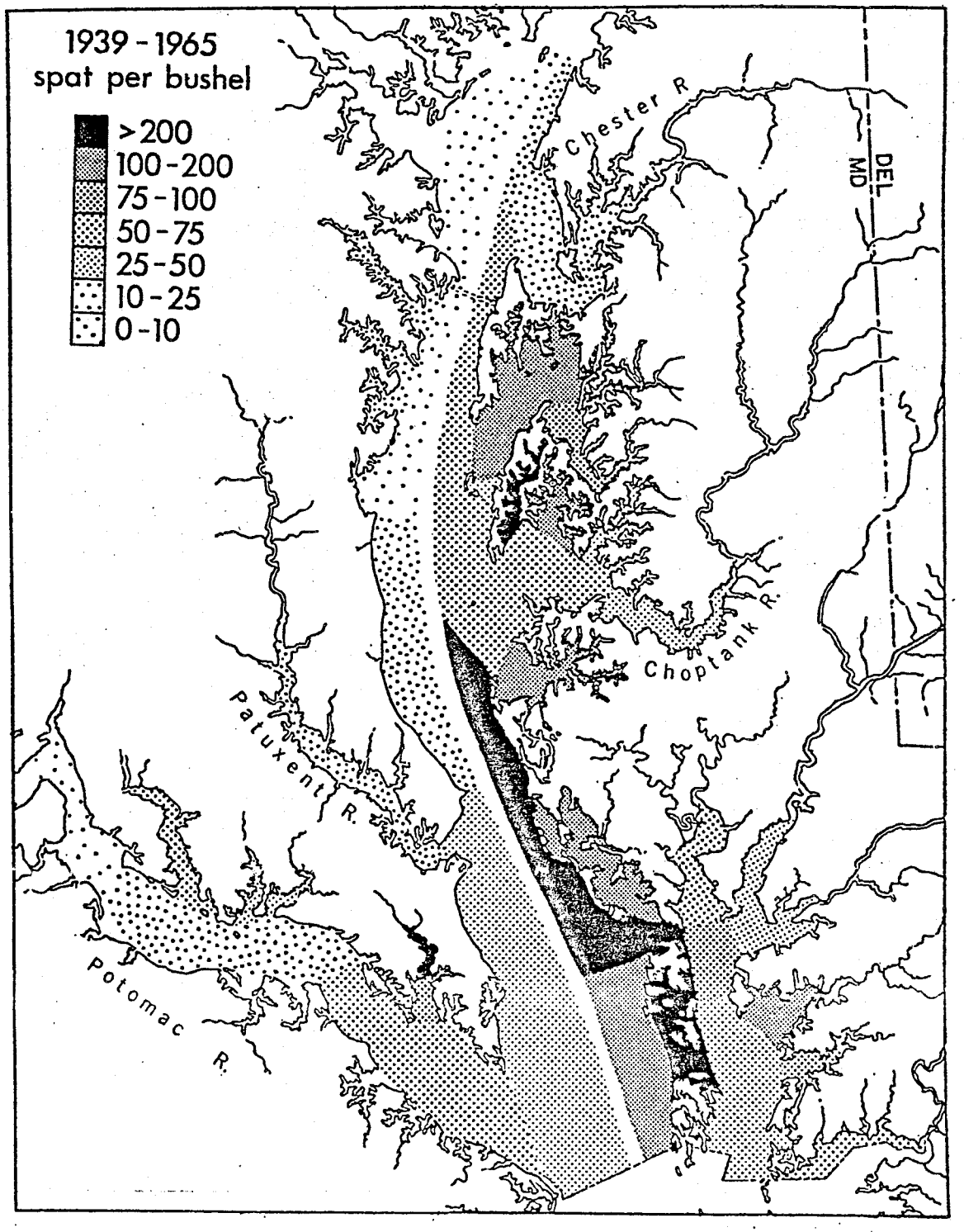

FIGURE 3

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

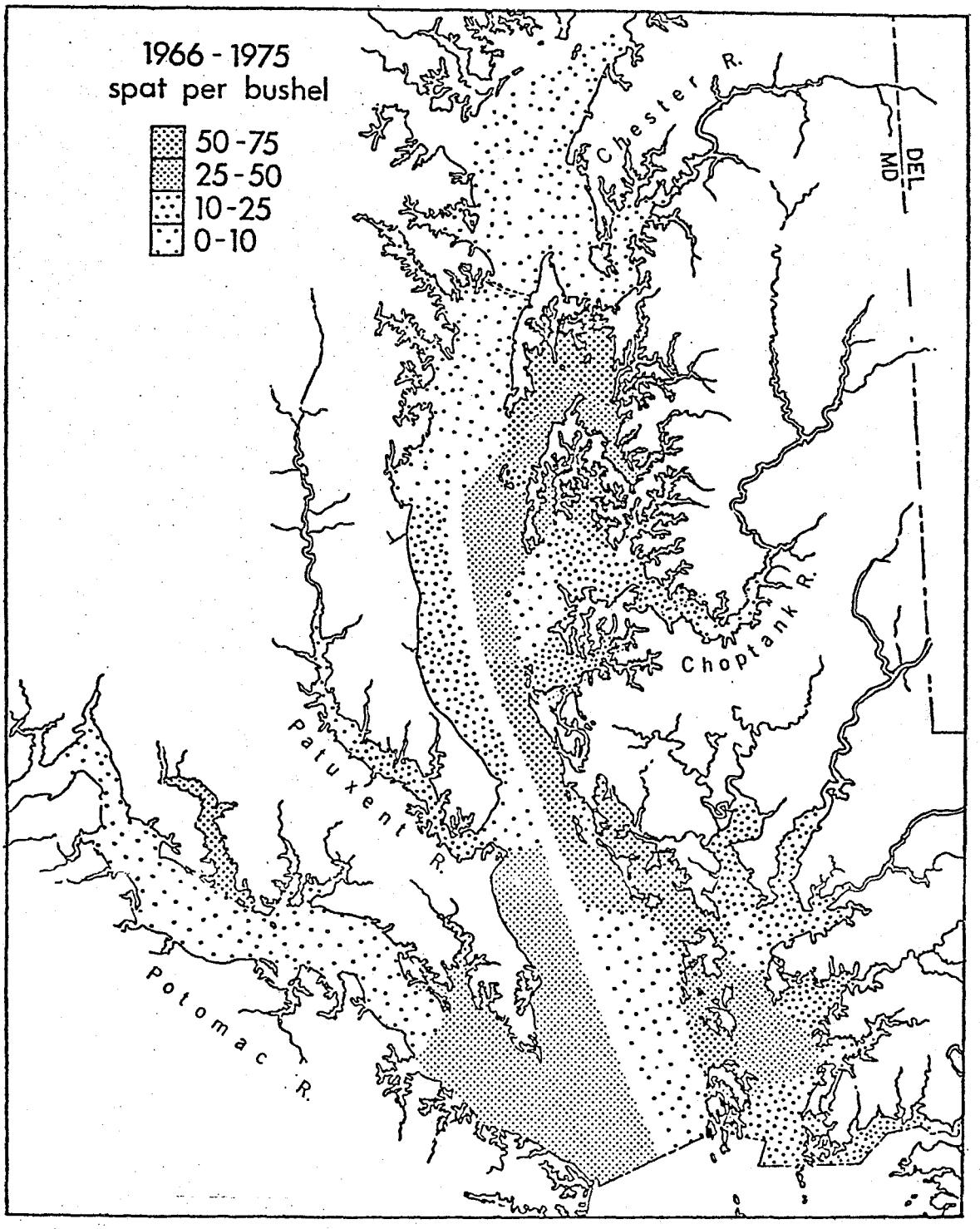

FIGURE 4

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

TABLE 1

Comparison of Proportions of Harvest from Various Bars in the Hand Scraping Area with Proportions of Shell Planted on Those Bars (1963-1983)

Location	% Total Shell Planted	% Total Oysters Harvested
Vir-Mar[1]	7.16	0.16
Middle Bank	0	0.13
Great Neck	42.50	44.30
Hog Island	20.33	26.67
Thicket Point	7.12	4.55
Lynch Point	4.77	1.15
Bonums	2.34	0.93
Kitts Point[1]	4.49	4.34
St. Georges[1]	11.29	11.91
Piney Pt. Hollow	0	3.20
Tall Timbers	0	2.65
TOTAL BUSHELS	2,788,947	223,627

[1]Vir-Mar, Bonums Bar, Kitts Point Bar, and St. Georges Bar were all planted with shell after 1978-79 period.

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TABLE 2

Total Shells Planted on Various Oyster Bars From 1963 to 1982 in Hand Scrape Areas

Location	1963-76	1977-82	Total
Vir-Mar	0	199,713	199,713
Great Neck	993,725	191,444	1,185,169
Hog Island	473,393	93,555	566,948
Thicket Point	198,632	0	198,632
Lynch Point	21,341	111,800	133,141
Kitts Point	0	125,177	125,177
St. Georges	0	314,807	314,807
Bonums	0	65,360	65,360
TOTAL SHELLS	1,687,091	1,101,856	2,788,947

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TABLE 4

POTOMAC RIVER SPATFALL, 1974-1982
(Spat per Md. Oyster Bushel)

LOWER RIVER

Bar Name	74	75	76	77	78	79	80	81	82	74-82 Average*
Vir-Mar	-	-	-	-	-	-	336	149	230	238
Cornfield#	10	0	11	188	13	92	488	290	715	200
Jones Shore#	160	5	4	201	8	44	1072	290	969	306
Great Neck	16	3	0	42	0	4	149	122	8	38
Hog Island	0	0	0	41	0	3	19	160	98	36
Kitts Point	-	-	-	-	-	42	474	-	-	258
Thicket Point	0	-	0	12	0	0	3	9	17	5
St. Georges	-	-	-	69	5	18	815	238	74	203
Lynch Point	-	-	-	-	0	6	128	167	235	107
Piney Point	-	-	0	48	0	14	80	384	-	88
Bonums	-	-	-	-	-	2	-	26	40	23
Average	37.2	2	2.5	85.8	3.25	22.5	356.4	173.5	216.9	

Average for the period = 100 spat per bushel

MID RIVER

Red Bar	0	0	0	-	0	0	24	-	-	4
Ragged Point	0	0	0	0	0	1	5	7	11	3
Coles Point	-	0	-	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	2	2
Kingcopsico	0	0	0	0	0	0	0	0	0	0
Heron Island	0	0	0	0	0	0	3	22	0	3
Sheepshead	0	0	0	0	0	0	0	2	0	0.22
Cobb Bar	0	0	0	0	0	0	0	2	-	0.25
Average	0	0	0.25	0	0	0.11	4	5	1.4	

Average for the period = 1.2 spat per bushel

*Averages may be abnormally high for bars sampled only during recent high setting years.

#Cornfield 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. Cornfield was opened to hand scraping in November 1982.

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APPENDIX

TABLE A

Total Oysters Harvested (Bushels) in the Potomac River
By Gear (1963-1982), in the Hand Scrape Area

	Hand Tong (Buyer's Report)											
Bar Name	64-65	65-66	66-67	67-68	68-69	69-70	70-71	71-72	72-73	73-74	74-75	75-76
Vir-Mar												
Middle Bank												
Great Neck				991	412	623	1,870	10	116	634	1,691	970
Hog Island			9,927	2,044	44	960	596	7	1,502	1,739	4,146	593
Thicket Point			36	50	195	42	73	169			53	214
Lynch Point			247	230	120	88	44	12	12			47
Bonums	15			43	14	2	2			13	20	231
Kitts Point											233	
St. Georges			8	51			368			296	110	
Piney Pt. Hollow					142	637	1,751	397	237		245	11
Tall Timbers			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

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TABLE A (contd.)

Hand Scrape (HS) and Hand Tong (OT) (Buyer's Report)

Bar Name	HS 76-77	OT 76-77	HS 77-78	OT 77-78	HS 78-79	OT 78-79	HS 79-80	OT 79-80	HS 80-81	OT 80-81	HS 81-82	OT 81-82	HS 82-83	OT 82-83
Vir-Mar									3		348		12	
Middle Bank	19		60		204									
Great Neck	1,082	8,448	5,668[1]	17,938[1]	20,771	15,894	9,027	448	2,855	20	3,572		5,076	951
Hog Island	9,096	89	3,021	0	9,690	868	4,625	108	6,530	12	2,373		1,665	14
Thicket Point	723	748	2,000	603	2,093	733	940	27	474	21	364		623	
Lynch Point	184		210				198			3	450		731	
Bonums	485	97	136		98		404	29	54		396		45	
Kitts Point	6											5		9,471
St. Georges	496		500	281	257		460	39			502	4,966	1,174	17,130
Piney Pt. Hollow	1,666		60			7	1,174	696	71		3	14	20	16
Tall Timbers	158		62				75		91		29			
TOTAL BU. OYSTERS	13,915	9,382	11,717	18,822	33,113	17,502	16,903	1,347	10,078	56	8,037	4,985	9,346	27,582

[1]Values estimated.

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