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A study of the Present State of Oyster Statistics in Chesapeake Bay and Suggested Remedial Measure

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A STUDY OF THE PRESENT STATE OF OYSTER STATISTICS IN CHESAPEAKE BAY AND SUGGESTED REMEDIAL MEASURES

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INTRODUCTION

Accurate, detailed and timely information on oyster landings are essential to the efficient management of the oyster resources of Chesapeake Bay. Basic types of information needed are volumes of oysters harvested on: a) designated public beds; b) unassigned bottoms; and c) leased areas. These data need to be as site specific as possible and include the type of harvest gear. Moreover, it is essential to know the portion of harvest which results from state repletion activities (planted shells or seed) and that part originating from natural production. Price, method of harvest, the buyers and sellers identification, and other similar data are also needed. However, there are today several major problems in the collections of accurate oyster statistics in the Chesapeake Bay region. Accurate oyster statistics are not being collected. Part of the reason for this is that the data base is oriented toward tax collection rather than the collection of biological statistics about the oyster population.

Both Maryland and Virginia have agencies that collect and tabulate information on oyster statistics. In both states statistical data are based on taxes levied on oysters harvested from various types of areas, sale price, or oyster size, area harvested, season, boat days, etc. (Table 1). Regulations or laws related to the collection of these taxes are printed by the Commonwealth and State and are readily available on request in both states. Detailed in these publications are the persons responsible for collecting the tax, who will pay, how forms must be submitted and to whom, etc. Standardized forms are designated which must be filled

out. In both Maryland and Virginia, it is the last buyer who must pay the tax on harvested oysters.

In Maryland, oyster tax forms and individual watermen landing reports are submitted directly to the Maryland Department of Natural Resources and entered into an IBM computer system for data analysis by SAS software. Maryland oyster harvest statistics for 1979 through 1981 are presently stored on IBM computer tape in SAS language and could be made available for a regional bay-wide recovery system. Data for 1961 to 1974 are being processed. In Virginia, tax forms are first collected by law enforcement district inspectors who tabulate the data in a preliminary way. Later, this information is forwarded to the VMRC for entering into a central data storage system which at present has limited analytical capabilities. This system, as will be discussed later, is outdated and inadequate. A completely new system compatible with that of Maryland is badly needed. With the present equipment and personnel, data retrieval is difficult; verification of accurate tax payments is virtually impossible.

When oyster statistics were collected in Maryland earlier than 1965, Federal statistic clerks obtained their data from small sub-samples they collected from specific packers or buyers of oysters. This sub-sample was expanded to be equal to the total number of operators in the fishery. Very little effort was made to substantiate if the harvest ratio among all participants was equal. The conversions of meat and dollars per bushels were made again on a small sub-sample, and many of these conversions were artifically biased by the market of a given packer at that point in time.

In Virginia, prior to 1975, Federal personnel examined tax receipts and other data and estimated bushels landed on this basis. In 1975, Virginia (Marine Resources Commission - VMRC), with federal assistance, took over the programs.

In summary, both states have oyster statistic programs; both have a matrix of laws and regulations which regulate the collection of tax and other management data. Moreover, both states provide for penalties if data are not correctly submitted by responsible persons or companies. However, while existing laws and regulations may seem adequate they are in reality badly in need of a complete revision. Many regulations are poorly worded or ambiguous. Moreoever, for reasons stated later in this report, there appears to be widespread tax evasion, and a preponderance of improperly completed forms especially those portions which give volumes landed, price, and the specific locations where the

oysters were harvested.

Oyster management biologists in both states rely more heavily on field data they collect annually on the oyster spat fall (recruitment), oyster bar density, oyster growth and health, oyster mortality and associated fouling organisms, than they do on harvest statistics when reaching management decisions (Krantz and Meritt 1977, Haven et al., 1978). Exchange of these ecological data with other scientists, watermen, legislators, and the general public, has been increased during the past five years through the efforts of Maryland and Virginia Sea Grant (Krantz et al., 1978, 79, 80, 81; and Haven et al., 1982). There have been investigators who have correlated oyster harvest data with these and other biological phenomena without correcting for inherent errors in the collection of oyster harvest statistics (Ulanowicz et al., 1980; Hydroqual, Inc., 1981; EPA Bay Program 1982). Further manipulation of oyster harvest statistics without measuring or resolving the errors in the data base can only be of detriment to our understanding of the dynamics of Chesapeake Bay.

THE PROBLEMS

MARYLAND

In Maryland there are several large sources of unreported oyster harvest. Private lease operators often sell small daily lots of oysters to buyers in urban areas without reporting sales. A recent management decision to have the leaseholders report some level of activity on their leases in a three to five-year period will create an increase flow of illegally documented harvest to preserve their leases. Oyster divers have recently entered the Maryland oyster fishery. Presently divers in two river systems are harvesting oysters, placing them in baskets aboard the boats, and personally hauling them to urban areas for direct sale. Our personal evaluation is that only a small portion of the harvest by the divers is now entering Maryland statistics. One of the river systems where this occurred is the Patuxent. A large oyster rehabilitation program is planned for the Patuxent River, yet we see no way of documenting the success of this program through harvest statistics until a more accurate way of monitoring harvest is obtained.

Individual watermen in Maryland are still permitted to make individual sales of their daily catch without filling out a mandatory tax form. During the

last three to four seasons, certain watermen in Maryland have been extremely successful in catching high-priced oysters. During a time of high market value, many of these individuals are making double landings, either in two different counties, at two different wharves or in some cases, in Maryland and in Virginia. It is commonplace in the lower portion of the Tangier Sound to land oysters in Virginia at certain times of the year. None of these landing statistics appear in Maryland, even though the oysters were obtained from Maryland waters.

A significant hand scrape fishery exists in Maryland in waters of the Potomac River, St. Mary's tributaries, Tangier Sound, Dorchester County, and parts of Talbot County. Some of the more successful Maryland oystermen only work one or two days. However, their style of living indicates that they have been making significant catches of oysters by some technique. The hand scrape fishery is a relatively open way of business and buyers continue to operate through the months of May, June, July and August. None of these oyster landings are included in the Maryland statistics.

Several attempts have been made by Department of Natural Resources and University of Maryland biologists to correlate Maryland oyster harvests with the management activities that places shell or seed in specific bars in specific river systems on the Bay. Attempts to do this are very disappointing; in fact, there appears to be a negative correlation between management activity and subsequent harvest. Some of this is understandable since the watermen view the mandatory harvest report as a mechanism by which the management agency will in some way penalize them for having the seed oysters on a given bar. Therefore, the local group uses the name of another bar when they are working on their prized seed planting. Additionally, watermen fear the the proper identification of the bar may in some way be used by the Health Department to close the bar if contaminated oysters are found in a sample. Therefore, a name of a poor-producing bar is frequently placed on the buy ticket. Remember, selection of the name of the bar where oysters are caught is on a volunteer basis. In an attempt to "defuse" this anxiety the Maryland Management Agency is planning to drop the requirement for reporting individual bar locations and report the name of the subestuary where the oysters were harvested. These reporting subunits correspond closely to biological subunits characterized by spat fall, turbidity, oyster growth, and fouling. The subunits relate well to present management activities (shell planting, seed areas, polluted zones, marginal growth areas).

We feel that Maryland harvest statistics may represent 60-65% of the total oysters that were really landed. In fact, management personnel in Maryland frequently refer to the harvest statistics as the "number of bushels on which tax was paid". This common jargon phrase is used throughout the private sector of the Maryland oyster industry in the same context. Essentially, any attempt to use sophisticated fisheries model to look at optimum sustained yield, optimum economic yield or to make management predictions based on mathematical manipulation of present harvest statistics will be totally erroneous.

VIRGINIA

Many of the problems outlined for Maryland are common to Virginia. Harvest of oysters by divers is occurring and this practice will probably increase. Moreover, those landed by the hand scrape are said to be under-reported. A major problem also exists in collecting adequate data on oyster harvest from management areas where shell or seed is planted.

Emphasis needs to be given to improving the collection of landings from private leased bottoms, especially seed oyster production. It is quite probable that both are largely under-reported.

More specifically, in Virginia tax evasion may take place in the following way. When oysters are first sold by a harvester to a buyer, Form 53 must be filled out. This form is the basis for Virginia oyster statistics program. It records the buyer, seller, oyster size (seed, soup, or shucking), area caught, price, volume, ticket number and date. One copy is kept by the seller, another by the buyer, a third copy eventually ends up at the VMRC along with the appropriate tax which the buyer pays. Tax evasion occurs as follows:

1. Form 53 may be agreement between the seller and buyer, not be filled out, or only a portion of the sales may be recorded.
2. The oysters may be sold by the harvester directly to a small restaurant or similar outlet without a Form 53 being filled out (no tax).
3. Other forms which record sales from one buyer to another (Form 55) which may be used to cross check information on Form 53 may be treated as above (1-2).

Other techniques undoubtedly exist; however, they will not be discussed since those outlined above are sufficient to demonstrate our point.

In addition to the lack of landing data, other discrepancies exist. For example, for the purpose of recording where oysters are caught the VMRC has a coded river-bay segmentation chart, which designates 76 areas where oysters may originate (public and private) bottoms. This information is required on Form 53. Often this information is incorrectly entered or missing entirely. Other discrepancies also exist.

One major problem in reporting accurate statistics is in converting bushels of oysters landed to pounds of meats as required by the Federal statistical program. At present, conversion factors are arrived at for each area of the Bay by obtaining information on yields from shucking house operators. Clearly, a uniform, Bay-wide system is needed.

As stated previously, Virginia has the need of a modern computerized system for processing, storage, cross checking and validating statistical information. Additional personnel are also needed to operate this system.

RECOMMENDATIONS

It is clearly indicated that an improvement is needed in the Bay-wide collection of oyster statistics. We recommend that action be taken toward this end immediately. Some of the needed remedial means are common to both states; some are unique to one or the other regions.

Our recommendations follow:

1. The blame for non-reporting of tax information should not be attributed to any single group, i.e., watermen, buyers, growers, or leaseholders, enforcement or management personnel; all seem to be equally responsible. It is a common problem for all groups. It is a problem which must be addressed by those responsible in a much more vigorous way than formerly. If the laws of either state are inadequate to accomplish this goal, then such laws must be revised through legislative action. This latter aspect is one of the several basic reforms needed immediately that will upgrade Bay-wide statistics.
2. We strongly recommend increased surveillance of harvest on the part of the marine police in Maryland and by oyster inspectors in Virginia. Spot checks in the field and at landing sites are needed to validate landing reports. Moreover, when non-payment of tax is detected, then prompt and effective legal action must be taken.

3. We suggest instituting a Bay-wide system whereby each boat fishing must display (in large letters) a boat identification number. This number should be issued to individual watermen when they apply each year for a tonging, dredging or patent tong license. Boats can be identified at a distance when they are unloading at a given dock. This identification number should be entered on the reporting form along with other pertinent information. Data can be correlated to the statistics reported on the buyer's record. This procedure will undoubtedly require increased expenditure of manpower and initially may develop some problems between the management agency and the industry.
4. Both states should consider designated landing sites for oysters harvested from public rocks.
5. Both states should increase the amount of auditing and cross checking within existing reporting systems. When minor discrepancies are found, then immediate action needs to be taken to notify those responsible, and to obtain correct data. If evidence of deliberate tax evasion is discovered, then prompt legal action must be taken.
6. Maryland plans to modify the oyster harvest statistics reporting system by not requiring the catch records to be filled out on an individual basis. Instead, they are going to rely on a tally sheet kept by the buyer who will record the "catchers" identification number. This identification number will be displayed on the boat in a highly visible location.
7. It is entirely conceivable that all individuals who wish to individually market oysters can be obligated to buy a selling license and be included in this surveillance. This would eliminate some of the unreported harvest for salted oysters, half-shell oysters, and oysters collected by divers. With a reasonable amount of effort, management personnel can check these statistics with the surveillance and field observations made by marine police by use of existing computer hardware. The same computer program data will be generating a measure of fishing effort. This fishing effort can be utilized to calibrate the former statistics on catch-per-unit effort within the oyster fishery. Additionally, spot checks throughout the state should give an idea of the percentage of illegal harvests that is conducted by comparing the statistics collected

when surveillance was not being imposed.

8. We recommend that standardized methods be developed to convert bushels of oysters into pounds of meats.
9. A much needed improvement in Virginia is the updating and modernization of the VMRC data processing system to serve Virginia's needs and designed to permit communication with the Maryland data system.
10. We recommend that a bistate sub-committee be formed from this group to implement the preceding recommendations.

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TABLE 1. TYPES OF DATA COLLECTED ON CHESAPEAKE OYSTER LANDINGS

OYSTER HARVEST INFORMATION	MARYLAND	VIRGINIA
Waterman's License # and Type (OYD or tonges)	+	0
Buyer's License #	+	0
Buyer's Name	+	+
Seller's Name	0	+
Date	+	+
# Bushels Landed	+	+
# Bushels Landed Over Limit	+	0
Total Bushels	+	+
Name of Bar	+	area only (Form 76)
Lease Identification	+	+
Total Money to Sellers	+	+
Price Per Bushel	+	+
Boat #	+	0
County Where Caught	+	0
Gear		
Patent single	+	+
Patent double	+	+
Shaft	+	+
Dredge	+	+
Other - Diver	+	0
License of other catchers	+	0
Public Ground	+	+
Type of Oysters (Seed-Soup-Shucking-Export)	0	+
Boat Name	0	+