WORK ASSIGNMENT NO. 23, TASK B

EPA CONTRACT NO. 68-03-3319

FINAL REPORT

ON

RATIOS OF EDIBLE TISSUE TO WHOLE BODY PCB CONCENTRATIONS IN FLOUNDER AND LOBSTER FROM NEW BEDFORD HARBOR

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to

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Marine and Estuarine Protection

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by

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INTRODUCTION

The Acushnet River estuary, which in its middle and lower reaches forms New Bedford Harbor, Massachusetts, is heavily contaminated with, among other substances, polychlorinated biphenyls (PCBs). It is believed that much of the PCBs are derived from two electronics components manufacturers who apparently discharged PCB-laden wastewater directly into the harbor and the municipal sewer system from the 1940s to the mid-1970s.

Elevated concentrations of PCBs, usually measured as Aroclor 1254, were first reported in sediments of New Bedford Harbor in 1975. Since then, many investigations have documented the widespread PCB contamination of sediments and marine biota of the Acushnet River, New Bedford Harbor, and adjacent Buzzards Bay. PCB concentrations in sediments of the upper Acushnet estuary, near the site of one of the electronics companies, frequently exceed 500 mg/kg, or parts per million (ppm) dry weight and occasional samples contain in excess of 10,000 to 100,000 ppm (1 to 10 percent). Of the local estuarine biota, eels (Anguilla rostrata) appear to be most heavily contaminated, with body burdens occasionally exceeding 500 ppm. The Food and Drug Administration (FDA) action level for the edible portion of fish and shellfish is 2 ppm. Lobsters (Homarus americanus) also appear to be heavily contaminated, with concentrations in muscle tissue occasionally exceeding 50 ppm.

Because of the high level of PCB contamination of some commercially important finfish and shellfish, the Massachusetts Department of Public Health (DPH) issued a warning in March 1977 that demersal finfish from New Bedford Harbor should not be consumed. In June 1977, a second warning was issued relative to consumption of lobsters from the area. New Bedford Harbor was formally closed to fishing for human consumption on September 25, 1979. The closed area was divided into three sections (Figure 1). Area 1 is closed to the taking of all finfish, shellfish, and lobsters; Area 2 is closed to the taking of demersal finfish (i.e., eels, scup, flounder, and tautog) and lobsters; and Area 3 is closed to the taking of lobsters. Area 4 is outside

the closure limits.

In 1980, the Massachusetts Department of Environmental Quality Engineering designated the New Bedford Harbor PCB problem as a priority in the 1980 State-EPA agreement. In 1982, the Acushnet River estuary , New Bedford Harbor, and adjacent Buzzards Bay were designated a U.S. Superfund hazardous waste site, and remedial action planning was initiated. More recently, the U.S. Justice Department filed litigation against the electronics components manufacturers seeking damages for the loss of natural resources in the region because of PCB contamination of fishery products and habitat.

Under contract to Ebasco, EPA's Zone Superfund contractor, Battelle Ocean Sciences is currently conducting a Remedial Investigation/Feasibility Study (RI/FS) to evaluate alternative actions for decreasing some of the environmental contamination in the harbor. This program is based on a linked hydrodynamic/sediment transport/food-chain model which will allow mathematical simulation of various mitigation scenarios. As a first step toward addressing these problems, a three-dimensional sediment transport and hydrodynamic model is being adapted to the harbor and adjoining areas of Buzzards Bay. After calibration, this model will be used to simulate a 10-year period following three or four treatment alternatives and will show patterns of contaminant flux in the area during that time.

The results of the hydrodynamic/sediment transport model will serve as input to the food-chain model. Using projected levels of contaminants in water, sediments, and suspended particulates, the food-chain model will follow mathematically the movement of contaminants through local food webs and will determine ultimate contamination levels in three species eaten by humans: winter flounder (Pseudopleuronectes americanus), lobster (Homarus americanus), and quahog (Mercenaria mercenaria). Because consumption of contaminated fish and shellfish is probably the most important pathway by which the contaminants reach humans, the model results will be of extreme importance in evaluating action alternatives.

One important aspect of the food-chain model is the question of partitioning of contaminants between edible and non-edible body tissues.

Whole body burdens were specified for the ongoing analyses because the food-chain model calculates whole body concentrations since the equations were formulated from bioenergetic relationships for respiration, growth, and food consumption of the animal as a whole.

Although determination of whole body burdens is reasonable in terms of the model, it creates obvious problems in assessing the last link in the pathway, i.e., dose received by humans eating these species. This problem pertains to the flounder and lobster only, since clams are usually consumed whole. The purpose of this study was to develop some basic information on the ratio of contamination in whole body versus edible tissue. This information will allow site-specific corrections to be applied to the food-chain model output so that the final dose to humans may be more accurately determined. Further, the present FDA action level for these contaminants is expressed in terms of edible tissue. Thus, development of these ratios will allow better definition of potential problem areas in the harbor.

METHODS AND MATERIALS

Collection of Specimens

Winter flounder and lobster were collected during June 1985 from the various fishery closure areas. Winter flounder were collected with a standard Wilcox scientific otter trawl with untreated nylon mesh. Lobsters were obtained by a local lobsterman under contract to Battelle.

Collections were made first in Area 4, the least-contaminated area (Figure 1), and progressed sequentially into the more contaminated areas. This sampling design was adopted to minimize the potential for cross-contamination of samples via the sampling gear.

Flounder and lobsters were collected in three size classes, small, medium, and large (Table 1), from each of the four closure areas, thus providing 12 distinct classes of specimens.

Following collection, all specimens were rinsed with site seawater, double-wrapped in acid-washed aluminum foil and polyethylene bags and immediately frozen with dry ice. Samples were stored frozen pending analysis. Field processing on both the trawler and lobster boat was conducted by qualified chemists.

Laboratory Analysis

Analyses of PCB concentrations were conducted by Aquatec Inc. on edible muscle and whole body tissues of the flounder and on edible muscle, hepatopancreas, and whole body tissues of lobster. A complete quality control audit of all analytical data was carried out by NUS corporation.

Sample Preparation

While still partially frozen, each flounder was rinsed with distilled water. A piece of skin was removed from an area near the midline just dorsal to the gill rakers, and a 2-g aliquot of muscle tissue removed for the edible muscle analysis. The rest of the fish was homogenized for whole body analysis.

For lobster analyses, each individual was split longitudinally. Half of the body was homogenized to provide the whole body sample. For the edible portions of the lobster, aliquots of tail muscle and hepatopancreas were removed from the remaining half. The two aliquots were analyzed separately.

PCB Extraction

Tissues from individual species were homogenized with a Tekmar homogenizer. Distilled water and potassium hydroxide pellets were added and the sample rehomogenized. After the tissue mixture was transferred to a Teflon jar, internal standards were added and the jar was sealed. The mixture was then heated at $80^{o}C$ for 4 hours.

After cooling, the digestate was acidified with hydrochloric acid, diluted with distilled water, and extracted repeatedly with methylene chloride. The

combined extracts were washed with water, dried, and concentrated. The extract was then further cleaned with sulfuric acid and/or 7 percent deactivated alumina before analysis.

PCB samples were analyzed on a Finnigan 4530 quadrupole GC/MS equipped with a Finnigan 9610 capillary gas chromatograph, and a Data General Nova^4 computer and Incos data system. The instrument was equipped with a 30-m x 0.25-mm DB-5 fused silica capillary column (J&W Scientific) that was threaded directly into the ion source. For analysis of PCBs, the gas chromatograph was operated in the splitless mode. The mass spectrometer was operated in the multiple ion detection (MID) mode that selectively monitors target mass ($m/_c$) ranges to afford sensitivity similar to that obtained with a gas chromatograph equipped with an electron capture detector.

Cl_3-, Cl_4-, Cl_5-, and Cl_6-PCB congeners and total PCBs were quantified on a wet weight basis using an internal standard method of quantification recommended by EPA-Cincinnati. The method specified the addition of d_{12}-chrysene internal standard to be added just prior to GC/MS analysis and quantification to be performed on selected parent ion masses ($^m/_e$) characteristic of PCBs and d_{12}-chrysene. The method further specified frequent (2 to 3 times per day) calibration of the instrument with EPA-supplied calibration solutions.

RESULTS

Flounder

PCB concentrations (ppb) in whole body and edible muscle tissues of winter flounder from Areas 1, 2, 3, and 4 are shown in Tables 2 and 3, respectively. The median total PCB concentration in each tissue type is given in Table 4.

PCB concentrations in both whole body and edible muscle were variable throughout the sampling area, but tended to be higher in the smaller fish, especially in the edible tissue (Tables 2 and 3). Concentrations in whole bodies of fish from Area 1 ranged from about 13,600 ppb to 4,600 ppb. In Area

2, the highest whole body concentration was about 11,700 ppb and the lowest was 1,150 ppb. Whole body PCB concentrations in Area 3 ranged from 5,000 ppb to 800 ppb, and in Area 4, the range was from 26,800 ppb to about 200 ppb, with both extremes of the range being in medium-sized fish.

Total concentrations generally decreased in whole body tissue from Area 1 through Area 4, although one of the two medium-sized fish from Area 2 had a PCB concentration (approximately 26,800 ppb) of over 30 times the median concentration for Area 2.

Total PCB concentrations in edible muscle were less than those in whole bodies of the same fish. Total PCBs tended to increase in edible muscle from Area 1 to Area 2, and then drop sharply through Areas 3 and 4 (Table 4). The median PCB concentration in edible tissue of fish in Area 2 was higher than that in Area 1 (Table 4), and only one of the six fish sampled from Area 2 had a total PCB concentration lower than any of the five fish sampled from Area 1 (Table 3).

Ratios of PCB concentration in flounder edible muscle to the concentration in flounder whole body tissue for each congener and in total are shown in Table 5. The median ratios of total PCBs in edible muscle to total PCBs in whole body tissue for each area and for New Bedford Harbor as a whole are shown in Table 6 and plotted in Figure 2. The median ratio for each congener in each area is plotted in Figure 3. Median values, rather than mean values, are generally used throughout this report because the ranges in values are broad and the number of data points are relatively few.

In Areas 1 and 3, the total PCB ratios varied within a relatively narrow range of 0.09 to 0.17, with both extremes being in Area 3 (Table 5). The range of ratios of total PCBs in edible muscle to total PCBs in whole body tissue was considerably broader in Area 2, extending from 0.05 to 0.41. In Area 4, the range was narrower, between 0.16 and 0.41, but the median was considerably higher than the median for the other three areas (Table 6; Figure 3). The ratios for most of the low chlorine congeners tended to increase from Area 1 through Area 4, with the lowest ratios being for the 5-, 6-, and 7-chlorine congeners (Figure 3).

Most of the PCBs in whole body and edible tissue of New Bedford Harbor flounder were comprised of congeners with 4, 5, and 6 chlorines (Tables 2 and 3), although the percentage of each congener varied with location (Tables 7 and 8; Figure 4). In Area 1, 5-chlorine congeners constituted 36 to 43 percent of total PCBs in flounder whole body tissue, with 4-chlorine congeners making up 21 to 34 percent, and 6-chlorine congeners comprising about 15 to 25 percent. Congeners with 2, 3, and 4 chlorines tended to be in higher percentage in the smaller fish, and 5-, 6-, 7-, and 8-chlorine congeners in higher percentage in the larger fish.

The 5- and 6-chlorine congener percentages increased consistently in whole body tissue through Areas 2 and 3 to where 5-chlorine congeners constituted about 43 to 45 percent of the total PCB concentration, and 6-chlorine congeners were about 30 percent. There was also a consistent increase in 7-chlorine congeners, although the percentage of PCBs represented by those congeners was relatively low. These increases in percentage were accompanied by consistent decreases in percentages of the 2-, 3-, and 4-chlorine congeners.

The various congeners in fish captured in Area 4 tend to reflect the trend set in Areas 1 through 3 (Table 7). The median percentages of 3- and 4-chlorine congeners increased and the median percentages of 5- and 6-chlorine congeners decreased in Area 4, however (Figure 4). This apparent change in the trends was brought about by unusually high PCB concentrations in the two medium-sized fish captured in Area 4. The PCB distribution patterns of those two fish appear to be more reflective of fish captured in Areas 1 or 2 than in Area 4.

A pattern of congener distribution from Area 1 to Area 4, similar to that shown by whole body tissues, was also evident in flounder edible muscle (Table 8; Figure 4), although the percentages of the various congeners in the edible tissue were slightly lower.

Lobster

PCB concentrations in whole bodies, edible muscle, and hepatopancreas of

lobsters from Areas 1, 2, 3, and 4 are shown in Tables 9, 10, and 11, respectively. The median total PCB concentration in each tissue from each area is shown in Table 12.

PCB concentrations in each tissue varied considerably but tended to decrease in all tissues from Area 1 through Area 4. The ranges in concentration, however, were very broad, and in whole body tissue (Table 9) tended to overlap from area to area. Whole body data are available only from a single lobster from Area 1, that had a PCB concentration of about 1100 ppb. In Area 2, concentrations ranged from about 700 to 100 ppb, and in Area 3, they ranged from about 280 to 30 ppb. In Area 4, PCB concentrations extended from approximately 150 ppb to about 20 ppb. No similar overlap was shown in edible muscle and hepatopancreas, in which the decline in PCB concentration from Area 1 through Area 4 was clearly delineated (Tables 10 and 11), and in which the concentration ranges were much narrower.

PCB concentrations were highest in hepatopancreas, extending from a high of over 90,000 ppb in Area 1 to a low of about 1800 ppb in Area 4. Both hepatopancreas and edible muscle had higher concentrations of PCBs than whole bodies of the same lobsters from which all three tissues were analyzed.

The ratios of PCB concentration in lobster edible muscle to whole body tissue, and in hepatopancreas to whole body are given in Tables 13 and 14, respectively. The median ratios of total PCBs for each tissue type are shown in Table 15 and plotted in Figure 5. The median ratios for each congener are plotted in Figures 6 and 7.

There was a considerable range in the ratios for each tissue type (Tables 13 and 14), but both sets of ratios appear to increase from Area 1 through Area 3 and then drop in Area 4 (Table 15). The median edible muscle to whole body ratio was less than 1 in Areas 1 and 4. The highest median ratio, about 7.5, was in Area 3. The hepatopancreas to whole body ratios were much higher than those of the edible tissue to whole body, with median ratios ranging from a low of about 59.5 in Area 1 to a high of 366.5 in Area 3.

The percentages of each PCB congener in lobster whole body, edible muscle,

and hepatopancreas are shown in Tables 16, 17, and 18, respectively. The median percentage of each congener in each tissue type is given in Table 19.

Regardless of concentration, most PCBs in lobster whole body were represented by congeners with 4, 5, and 6 chlorines (Table 15), with 5-chlorine congeners accounting for about 43 percent of the total PCB concentration in Area 1, 6-chlorine congeners about 29 percent, and 4-chlorine congeners about 17 percent (Table 18).

The percentage of 5-chlorine congeners in lobster whole body tissue remained relatively constant from area to area, but 6-chlorine congeners were nearly equal in percentage (37 to 39 percent) in Area 4. Four-chlorine congeners generally decreased from Area 1 through Area 4 to about 14 percent of the total.

In Areas 1 and 2, 5-chlorine congeners constituted about 44 to 45 percent of the total PCBs in edible muscle. In Area 1, 4- and 6-chlorine congeners represented 21 to 22 percent each of the total concentration. Four-chlorine congeners decreased to about 13 percent through Area 4, whereas 6-chlorine congeners increased to about 35 percent of the total. There was also an increase in 7-chlorine congeners and a concurrent decrease in 3-chlorine congeners in edible muscle from Area 1 through Area 4.

The distribution pattern of the various congeners in hepatopancreas (Table 18) was somewhat different from that in whole body and edible muscle (Tables 16 and 17). In Area 1, 5-chlorine PCBs accounted for only about 30 percent of the total, with 3- and 4-chlorine congeners representing about 22 to 24 percent, and 6-chlorine congeners constituting about 17 percent of the total. There was a sharp increase in 6-chlorine congeners, and equally sharp decreases in 3- and 4-chlorine congeners from Area 1 through Area 4. Five-chlorine congeners increased slightly, so that in Areas 3 and 4, the 5- and 6-chlorine congeners alone represented about 80 percent of the total PCB concentration, and 3-chlorine congeners were reduced to less than 5 percent.

DISCUSSION

The reported data are from a relatively small number of organisms and therefore suggest rather than affirm conditions relative to PCB concentrations in flounder and lobster in New Bedford Harbor. Nevertheless, edible tissue to whole body PCB concentration ratios were determined, and certain trends in PCB distribution in the tissues of flounder and lobster from the various fishery closure areas were identified.

As expected, there was a general decrease in tissue levels of PCBs in both flounder and lobster from the heavily contaminated Area 1, which is closed to all fishing, through Area 4 in which catching fish and digging shellfish for human consumption is permitted.

Of the 30 flounder examined for whole body concentrations of PCBs, 21 had levels of PCBs above the level of 2000 ppb. This included all eight fish collected in Area 1, eight of nine fish from Area 2, three of seven fish from Area 3, and two of six fish from Area 4. Only one flounder, a medium-sized fish from Area 4, had edible tissues that contained PCB levels above 2000 ppb. The congener distribution pattern resembled that of a fish from Area 1. There was no way of knowing how long the fish had been in Area 4 prior to its capture.

At no time did the total PCB levels in edible tissue of any flounder examined exceed those in the whole bodies, and concentrations of PCBs tended to be higher in the smaller fish than in the larger fish from the same area.

The data also indicate that ratios of PCB concentrations in flounder edible tissue to concentrations in whole bodies can vary from area to area, probably depending upon the environmental history of both the area and the fish. Ratios of edible to whole body tissue PCB concentrations in flounder increased slightly from Area 1 to Area 2, decreased in Area 3, and rose sharply in Area 4.

The narrowing of the difference in PCB concentration between edible and

whole body tissues in flounder is a reflection of the greater rate of decrease in PCB concentration in whole body tissues from Area 1 through Area 4 relative to the much slower rate of PCB decrease in edible tissues over the same areas. In addition, the PCB concentrations in Areas 3 and 4 represent more of the 5- and 6-chlorine congeners than the concentrations in Areas 1 and 2. The median edible muscle to whole body ratio for flounder was 0.13. That ratio is probably most reflective not only of the variation in total PCBs from area to area, but of the congener distribution as well. For the purposes of the food-chain model, that median edible muscle to whole body ratio of 0.13 may be used for total PCBs.

None of the lobsters examined had either whole body or edible muscle levels of PCBs that exceeded the FDA action level. However, 11 of 12 had excessive levels of PCBs in the hepatopancreas, and the PCB concentration in the hepatopancreas of the remaining lobster was only about 150 ppb below the action level. In Area 1, PCB concentrations in the hepatopancreas were as much as 45 times the FDA action level. There was no apparent size differentiation with respect to PCB levels in lobster tissue.

Both the edible muscle/whole body and hepatopancreas/whole body ratios in lobster showed a different pattern than that shown by the flounder. The edible muscle/whole body ratios were close to unity in Areas 1 and 4. In Area 2, there was almost twice the PCB concentration in edible muscle than in whole body tissues, and in Area 3, the edible tissue concentration rose to over 7 times the level in whole body tissues. The median edible/whole body tissue ratio for the four areas combined was 1.04. Either this approximately 1:1 ratio or the individual ratios for each area may be used in the food chain model.

There were always more PCBs in hepatopancreas than in whole body tissue, with the lowest ratio being 12.6, or about 13 times more PCB in hepatopancreas than in lobster whole body. The maximum ratio was over 600. For the food-chain model, either the median hepatopancreas/whole body ratio of about 81 or the individual area ratios may be used.

The PCB congener distribution pattern differed somewhat between flounder

and lobster, although there was an increase in the percentage of some congeners, and a decrease in the percentage of others from Area 1 through Area 4. Thus, a change in the ratio of edible to whole body tissue PCB concentrations from one area to another reflects not just a change in concentration, but a change in the type of chlorinated component in the tissues.

The percentage of 5-, 6-, and 7-chlorine congeners in both whole body and edible tissue of the flounder tended to increase from Area 1 through Area 4, with a concomitant decrease in 2-, 3-, and 4-chlorine congeners. This pattern follows a similar pattern of natural dechlorination of PCBs over time, but sediment data from New Bedford Harbor are not yet available with which to compare the relevant tissue data. It seems, however, that the pattern is consistent enough to indicate the general area in the harbor where a particular fish is captured. This is not always true, however, as two fish with high PCB levels representative of Area 1 were collected in Area 4. It is reasonable to assume that they were recent migrants from Area 1.

In lobster whole body tissue, the percentage of 5-chlorine congeners remained relatively constant from area to area, but 6-chlorine congeners increased to where they were nearly equal in percentage to the 5-chlorine congeners in Area 4. In hepatopancreas, the lobster tissue that most readily takes up PCBs, 6-chlorine congeners represented about 17 percent of the total PCB concentration in Area 1. The percentage of 5-chlorine congeners increased only slightly from Area 1 through Area 4, while the percentage of 6-chlorine congeners increased sharply to where they and the 5-chlorine congeners represented about 80 percent of all PCBs in the hepatopancreas.

The congener distribution patterns in flounder and lobster tissues are similar enough to suggest a reflection of the sediment concentrations, but are different enough to indicate possible metabolic differences within species from area to area, and between species and tissues in the uptake and metabolism of PCBs.

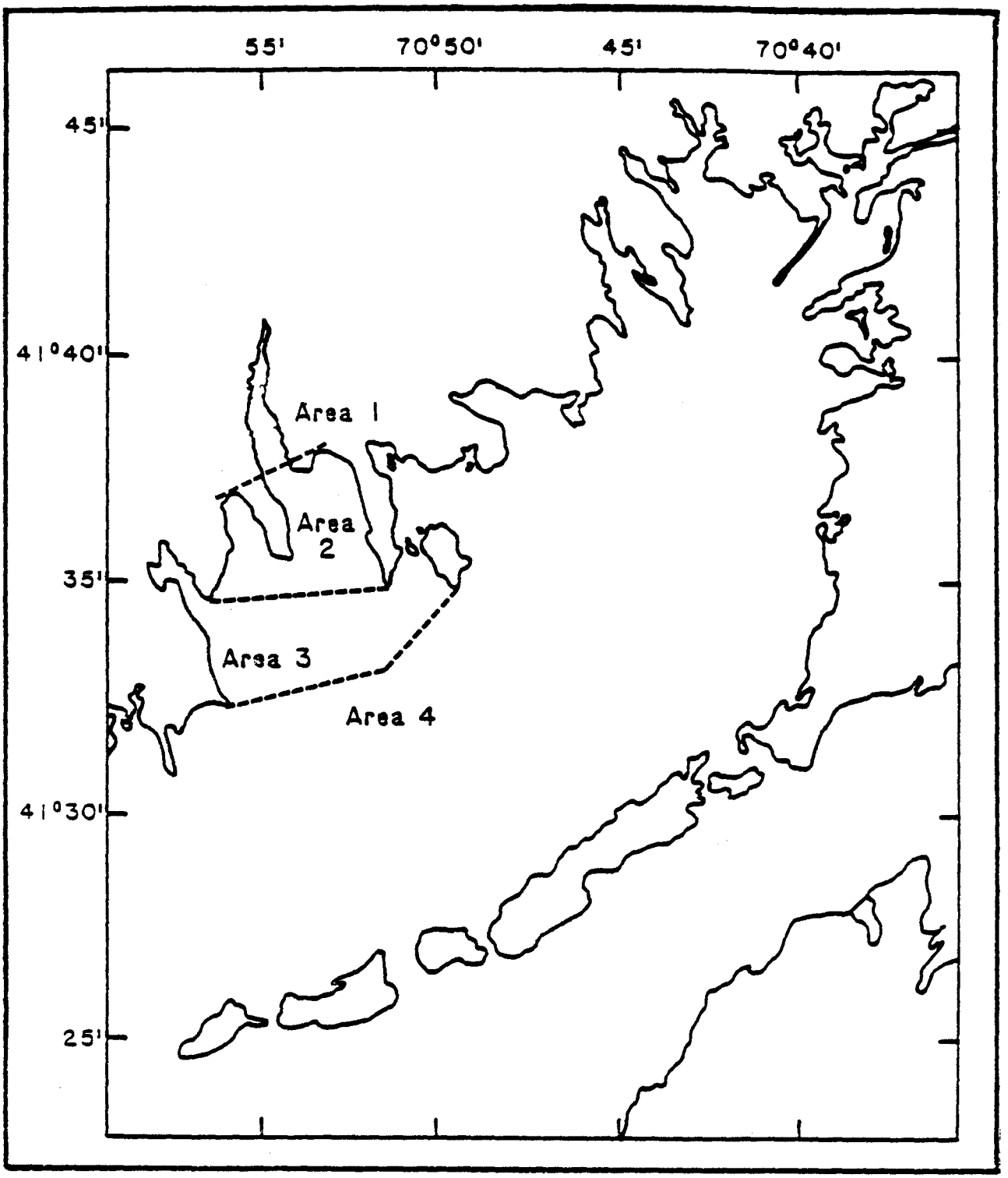

FIGURE 1. FISHERY CLOSURE AREAS USED FOR SAMPLING FLOUNDER AND LOBSTER FOR EDIBLE TISSUE TO WHOLE BODY PCB RATIOS.

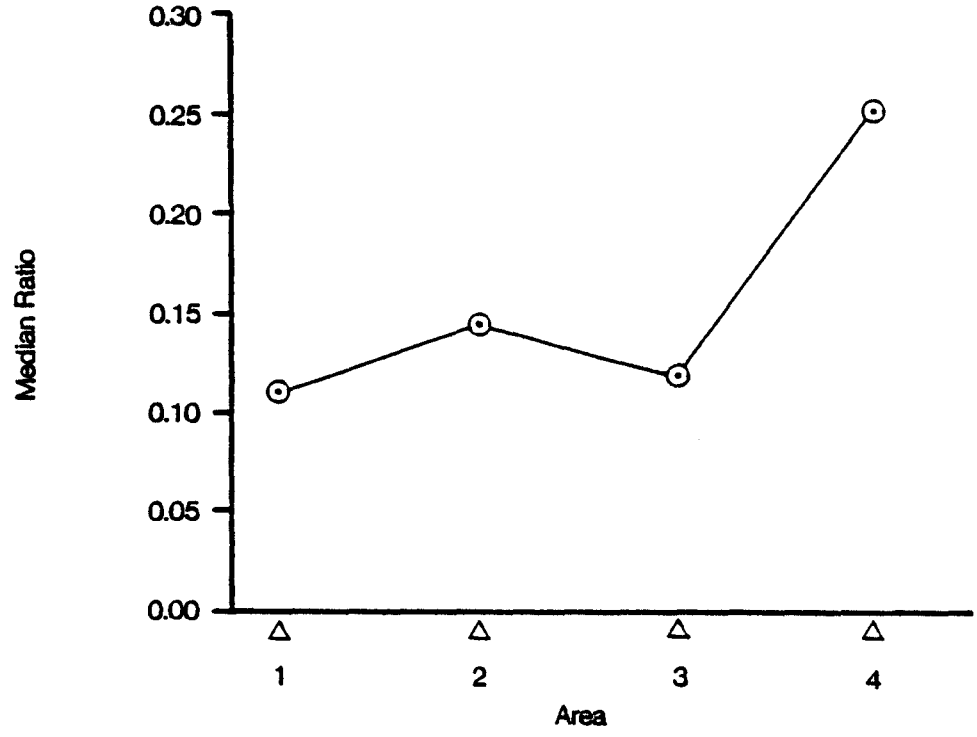

FIGURE 2. MEDIAN EDIBLE MUSCLE TO WHOLE BODY RATIOS OF TOTAL PCB CONCENTRATIONS IN FLOUNDER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR.

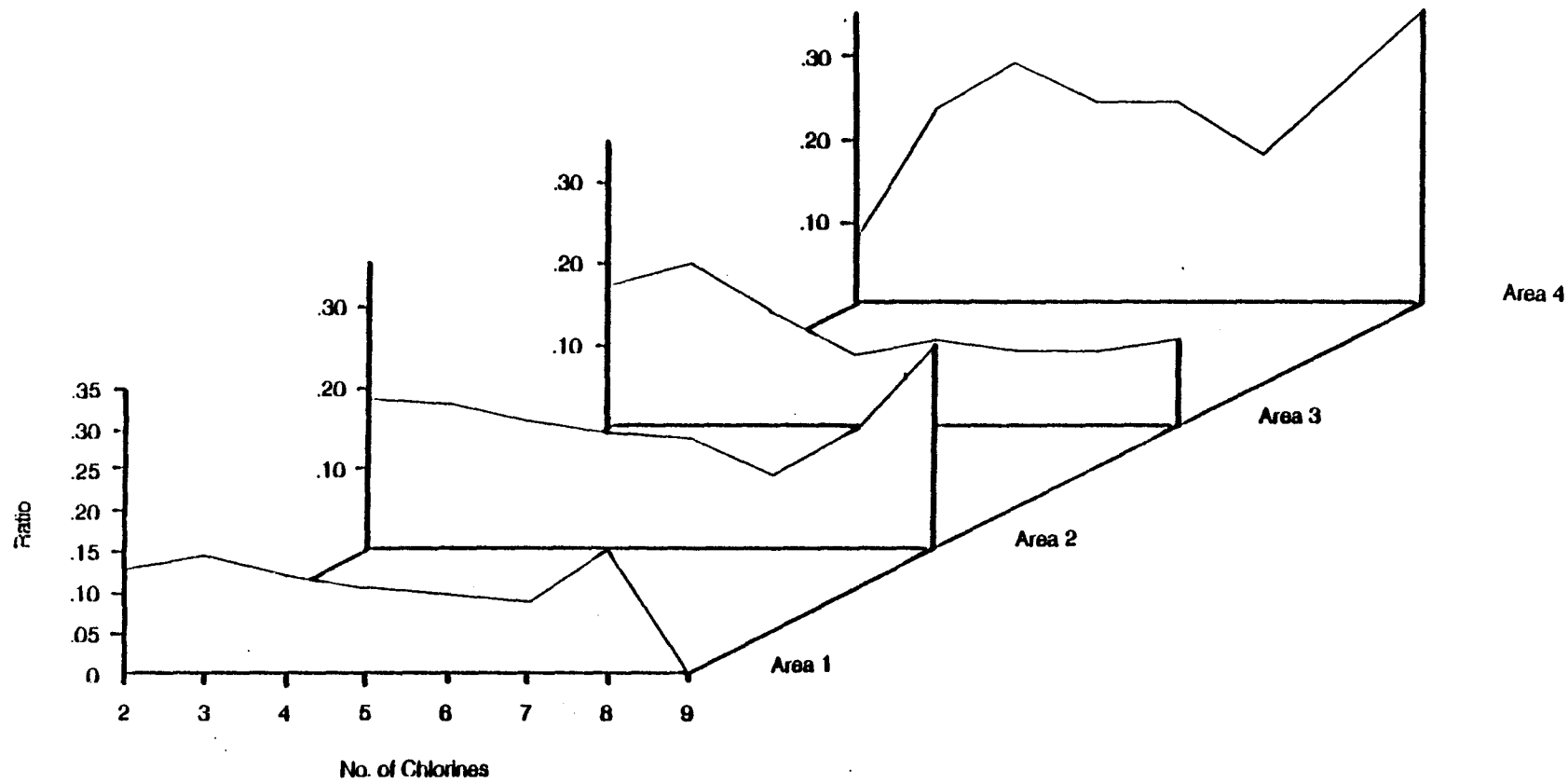

FIGURE 3. MEDIAN EDIBLE MUSCLE TO WHOLE BODY RATIOS OF PCB CONGENERS IN FLOUNDER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR.

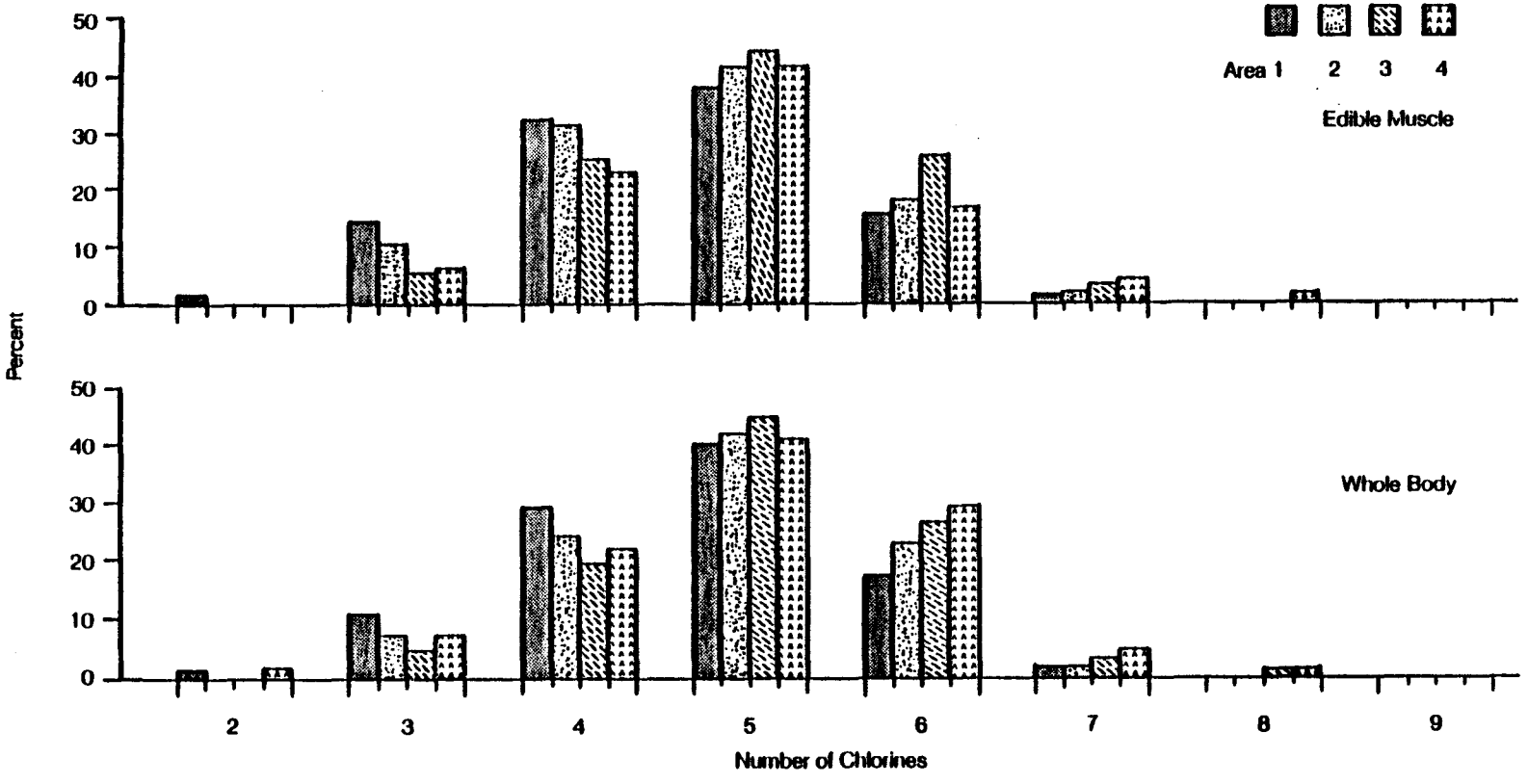

FIGURE 4. MEDIAN PERCENTAGES OF EACH CONGENER IN EDIBLE MUSCLE AND WHOLE BODY OF FLOUNDER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR.

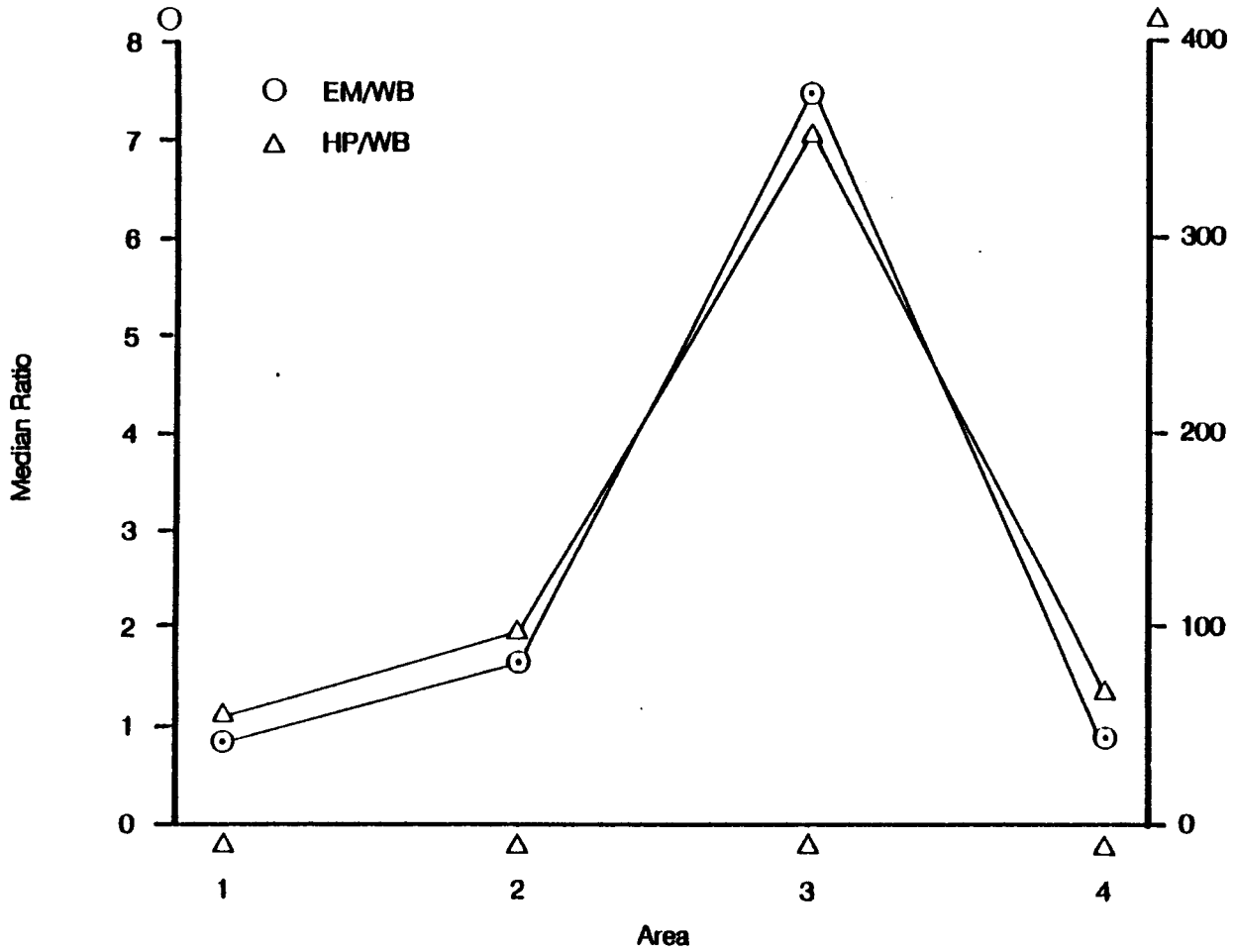

FIGURE 5. MEDIAN EDIBLE MUSCLE TO WHOLE BODY ( ) AND HEPATOPANCREAS TO WHOLE BODY ( ) RATIOS OF TOTAL PCB CONCENTRATIONS IN LOBSTER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR.

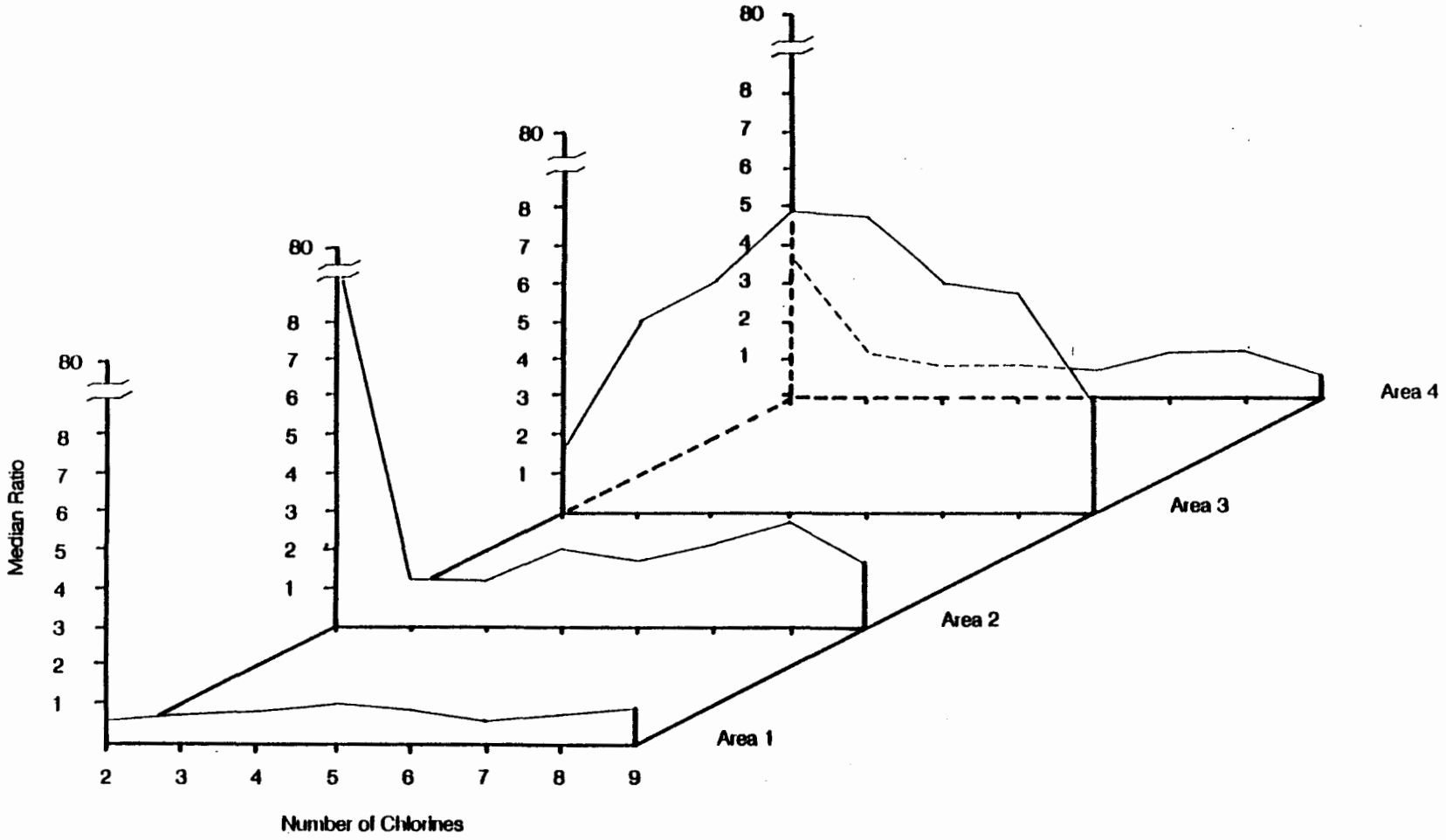

FIGURE 6. MEDIAN EDIBLE MUSCLE TO WHOLE BODY RATIOS OF PCB CONGENERS IN LOBSTER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR.

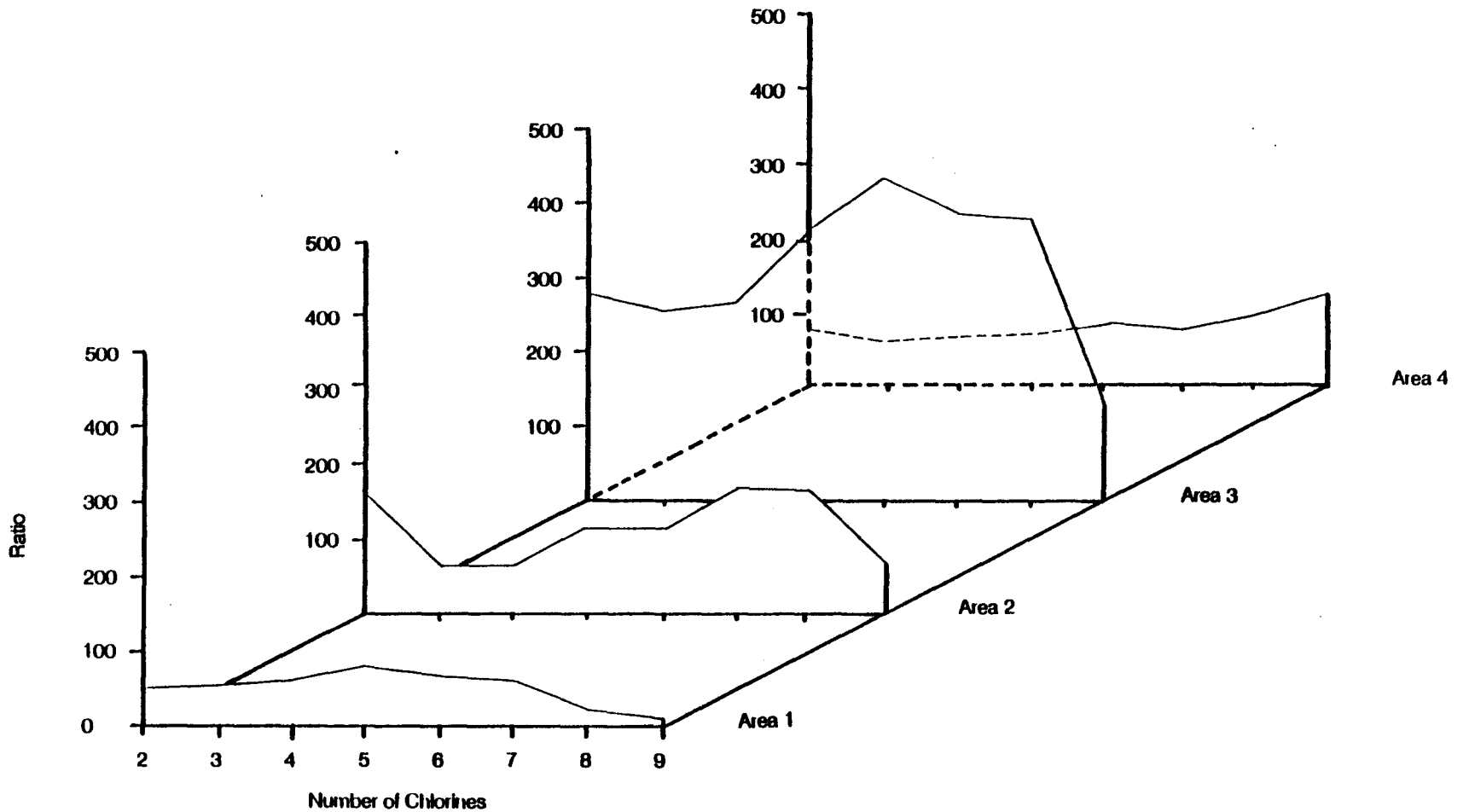

FIGURE 7. MEDIAN HEPATOPANCREAS TO WHOLE BODY RATIOS OF PCB CONGENERS IN LOBSTER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR.

TABLE 1. NEW BEDFORD HARBOR RI/FS PROGRAM SIZE CLASSIFICATION FOR WINTER FLOUNDER AND LOBSTER

Species	Small	Medium	Large
Winter Flounder (Total Length)	<75 mm	75-105 mm	>105 mm
Lobster (Carapace Length)	<178 mm	178-254 mm	>254 mm

TABLE 2. PCBs (PPB) IN WHOLE BODY OF FLOUNDER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorine 2	3	4	5	6	7	8	9	Total PCB
1	S	1	48.1	1038.0	2642.1	2850.9	1176.6	101.6	16.0	0.8	7874.1
1	S	2	99.2	1388.5	3671.9	4174.8	1722.9	150.3	20.8	3.6	11231.8
1	S	3	29.3	1049.7	1687.1	2556.6	1080.2	90.6	13.5	0.0	6506.9
1	M	1	51.1	928.3	2555.3	2749.6	1174.8	101.6	17.1	2.0	7279.8
1	M	3	50.9	1112.5	4038.3	5481.0	2602.3	228.1	37.4	2.1	13552.6
1	L	1	18.9	543.3	1716.3	2488.5	1306.2	135.0	30.2	3.7	6242.0
1	L	2	16.4	419.1	958.1	2001.0	1108.9	110.4	15.3	0.9	4630.1
1	L	3	12.7	402.1	1609.4	2798.3	1647.1	167.4	32.9	5.0	6674.8
2	S	1	23.2	169.9	801.5	1407.6	826.4	95.2	21.1	1.2	3346.1
2	S	2	7.3	289.9	1081.9	1654.2	800.2	70.6	10.5	7.0	3921.5
2	S	3	37.5	376.5	1359.9	2096.5	1162.7	105.5	26.1	23.0	5187.6
2	M	1	12.0	971.1	2848.6	3785.8	1608.0	183.1	39.5	0.7	9448.9
2	M	2	11.6	863.3	2820.0	5091.6	2672.8	230.6	43.2	3.2	11736.2
2	M	3	23.7	308.0	1203.3	2077.5	1229.5	121.7	26.3	5.9	4995.8
2	L	1	53.1	2040.1	4794.5	6023.5	2754.4	294.3	46.5	2.4	16008.7
2	L	2	18.6	320.0	1172.5	2294.1	1351.0	139.3	21.1	2.3	5318.8
2	L	3	16.2	67.3	265.1	499.5	268.4	30.3	5.5	0.9	1153.1
3	S	1	4.0	237.8	1160.2	2252.3	1276.5	128.2	17.0	1.7	5077.8
3	S	2	2.9	143.8	775.9	1592.8	915.9	102.1	13.1	2.4	3548.2
3	S	3	1.1	49.7	279.4	532.8	303.7	28.0	4.1	3.1	1201.8
3	M	1	8.8	68.7	356.7	868.9	575.3	74.9	10.6	1.3	1965.1
3	M	2	0.8	27.1	210.8	558.6	388.6	38.4	8.0	1.0	1233.3
3	M	3	8.6	30.2	147.3	338.5	209.9	38.5	4.1	0.5	777.6
3	L	1	10.9	93.4	491.3	1150.4	788.9	86.6	19.5	1.3	2642.3
4	S	1	6.2	9.2	42.9	127.4	92.7	12.4	3.1	0.3	294.2
4	S	2	9.4	52.8	236.1	488.7	321.6	57.7	8.2	1.2	1175.7
4	S	3	0.4	10.8	87.6	210.3	132.3	14.9	2.1	0.2	458.5
4	M	1	6.1	16.0	44.8	66.4	55.6	8.1	1.3	0.1	198.4
4	M	2	41.9	4221.9	10068.6	9194.5	3014.9	236.0	31.4	4.5	26813.5
4	M	3	9.0	362.1	1134.4	1427.9	653.0	66.3	9.4	0.6	3662.6

TABLE 3. PCBs (PPB) IN EDIBLE MUSCLE OF FLOUNDER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

Area	Size	Replicate	S = Small; M = Medium; L = Large Number of Chlorines 2	3	4	5	6	7	8	9	Total PCB
1	S	1	6.6	150.3	312.5	291.4	105.4	8.4	3.4	0.0	878.0
1	S	2	8.4	199.1	430.4	435.0	161.1	12.1	2.4	0.0	1248.4
1	M	1	5.2	167.9	385.3	434.0	165.0	13.6	3.6	0.0	1174.7
1	L	1	3.9	86.2	192.3	231.6	93.9	8.2	2.6	0.1	618.7
1	L	2	3.0	76.3	181.7	230.8	104.1	9.8	2.2	0.0	608.1
2	S	1	3.6	61.8	270.4	477.7	263.0	25.8	4.9	0.4	1107.6
2	S	2	4.9	149.0	502.8	662.8	282.2	19.8	3.2	0.3	1625.0
2	M	1	2.9	204.0	605.5	675.7	252.4	18.3	6.6	1.7	1767.2
2	M	2	2.2	69.3	204.3	264.1	130.0	10.0	2.4	0.3	682.6
2	L	1	2.3	117.3	250.3	276.0	111.4	9.2	2.1	1.3	769.8
2	L	2	1.5	37.7	122.9	204.6	116.6	10.5	2.0	0.4	496.1
3	S	1	1.4	43.9	206.5	365.3	203.8	18.3	2.7	0.2	841.9
3	S	2	0.7	21.2	100.3	181.2	103.1	10.7	1.7	0.3	419.0
3	M	1	0.3	9.6	42.1	80.5	46.3	4.1	0.7	0.7	183.7
3	M	2	0.2	11.3	32.7	46.0	37.2	3.4	0.3	0.0	131.2
3	L	1	1.6	18.4	71.2	133.9	85.1	9.0	1.8	0.1	321.0
4	S	1	0.1	2.4	17.0	37.6	29.2	3.4	0.9	0.1	90.8
4	S	2	0.4	15.3	88.2	169.2	108.4	10.9	1.8	0.4	394.4
4	M	1	0.1	2.1	7.4	12.2	8.2	1.3	0.5	0.2	32.1
4	M	2	9.4	914.4	1913.2	1514.2	416.5	33.5	4.8	0.0	4806.0

TABLE 4. MEDIAN TOTAL PCB CONCENTRATION (PPB) IN WHOLE BODY AND EDIBLE MUSCLE OF FLOUNDER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

Area	Whole Body	Edible Muscle
1	6978	878
2	5188	939
3	1965	321
4	818	242

TABLE 5. RATIOS OF PCB CONCENTRATIONS IN EDIBLE MUSCLE TO CONCENTRATIONS IN WHOLE BODY IN FLOUNDER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines 2	3	4	5	6	7	8	9	Total PCB
1	S	1	0.13	0.14	0.12	0.10	0.10	0.08	0.21	0.00	0.11
1	S	2	0.08	0.14	0.12	0.10	0.09	0.08	0.11	0.00	0.11
1	M	1	0.10	0.18	0.17	0.16	0.14	0.13	0.21	0.00	0.16
1	L	1	0.21	0.16	0.11	0.09	0.07	0.06	0.08	0.03	0.10
1	L	2	0.19	0.08	0.19	0.12	0.09	0.09	0.15	0.00	0.13
2	S	1	0.16	0.36	0.34	0.34	0.32	0.27	0.23	0.33	0.33
2	S	2	0.68	0.52	0.46	0.40	0.35	0.14	0.31	0.05	0.41
2	M	1	0.24	0.21	0.21	0.18	0.16	0.10	0.17	2.51	0.19
2	M	2	0.19	0.08	0.07	0.05	0.05	0.04	0.05	0.09	0.06
2	L	1	0.04	0.06	0.05	0.05	0.04	0.03	0.05	0.54	0.05
2	L	2	0.08	0.12	0.10	0.09	0.09	0.08	0.10	0.16	0.09
3	S	1	0.17	0.09	0.09	0.08	0.08	0.08	0.10	0.19	0.17
3	S	2	0.46	0.31	0.27	0.23	0.22	0.18	0.20	0.08	0.12
3	M	1	0.03	0.14	0.12	0.09	0.08	0.05	0.07	0.53	0.09
3	M	2	0.25	0.42	0.16	0.08	0.10	0.09	0.04	0.00	0.11
3	L	1	0.14	0.20	0.14	0.12	0.12	0.10	0.09	0.10	0.12
4	S	1	0.12	0.26	0.40	0.30	0.32	0.28	0.29	0.32	0.31
4	S	2	0.04	0.29	0.37	0.35	0.34	0.19	0.22	0.38	0.34
4	M	1	0.02	0.13	0.17	0.18	0.15	0.16	0.39	1.58	0.16
4	M	2	0.23	0.22	0.19	0.16	0.14	0.14	0.15	0.00	0.18

TABLE 6. MEDIAN RATIOS OF TOTAL PCB CONCENTRATION IN EDIBLE MUSCLE TO WHOLE BODY IN FLOUNDER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

Area	Median Ratio
1	0.11
2	0.14
3	0.12
4	0.25
Whole Harbor	0.13

TABLE 7. PERCENT OF TOTAL PCBs REPRESENTED BY EACH CONGENER IN WHOLE BODY OF FLOUNDER FROM NEW BEDFORD HARBOR

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines 2	3	4	5	6	7	8	9
1	S	1	0.6	13.2	33.6	36.2	14.9	1.3	0.2	0.0
1	S	2	0.9	12.4	32.7	37.2	15.3	1.3	0.2	0.0
1	S	3	0.5	16.1	25.9	39.3	16.6	1.4	0.2	0.0
1	M	1	0.7	12.8	31.0	37.8	16.4	1.4	0.2	0.0
1	M	3	0.4	8.2	29.8	40.4	19.2	1.7	0.3	0.0
1	L	1	0.3	8.7	27.5	39.9	20.9	2.2	0.5	0.1
1	L	2	0.4	9.1	20.7	43.2	24.0	2.4	0.3	0.0
1	L	3	0.2	6.0	24.1	41.9	24.7	2.5	0.5	0.1
2	S	1	0.7	5.1	24.0	42.1	24.7	2.9	0.6	0.0
2	S	2	0.2	7.4	27.6	42.2	20.4	1.8	0.3	0.2
2	S	3	0.7	7.3	26.2	40.4	22.4	2.0	0.5	0.4
2	M	1	0.1	10.3	30.2	40.1	17.0	1.9	0.4	0.0
2	M	2	0.1	7.4	24.0	43.4	22.8	2.0	0.4	0.0
2	M	3	0.5	6.2	24.1	41.6	24.6	2.4	0.5	0.1
2	L	1	0.3	12.7	30.0	37.6	17.2	1.8	0.3	0.0
2	L	2	0.4	6.0	22.0	43.1	25.4	2.6	0.4	0.0
2	L	3	1.4	5.8	23.0	43.3	23.3	2.6	0.5	0.1
3	S	1	0.1	4.7	22.9	44.4	25.1	2.5	0.3	0.0
3	S	2	0.1	4.1	21.9	44.9	25.8	2.9	0.4	0.1
3	S	3	0.1	4.1	23.2	44.3	25.3	2.3	0.3	0.3
3	M	1	0.5	3.5	18.2	44.2	29.3	3.8	0.5	0.1
3	M	2	0.1	2.2	17.1	45.3	31.5	3.1	0.7	0.1
3	M	3	1.1	3.9	19.0	43.5	27.0	5.0	0.5	0.1
3	L	1	0.0	3.5	18.6	43.5	29.9	3.3	0.7	0.0
4	S	1	2.1	3.1	14.6	43.3	31.5	4.2	1.1	0.1
4	S	2	0.8	4.5	20.1	41.6	27.4	4.9	0.7	0.1
4	S	3	0.1	2.4	19.1	45.9	28.9	9.4	0.5	0.0
4	M	1	3.1	8.1	22.6	33.5	28.0	4.1	0.7	0.1
4	M	2	0.2	15.7	37.6	34.3	11.2	0.9	0.1	0.0
4	M	3	0.3	9.9	31.0	39.0	17.8	1.8	0.3	0.0

TABLE 8. PERCENT OF TOTAL PCBs REPRESENTED BY EACH CONGENER IN EDIBLE MUSCLE OF FLOUNDER FROM NEW BEDFORD HARBOR

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines							
			2	3	4	5	6	7	8	9
1	S	1	0.7	17.1	35.6	33.2	12.0	1.0	0.4	0.0
1	S	2	0.7	15.9	34.5	34.8	12.9	1.0	0.2	0.0
1	M	1	0.4	14.3	32.8	36.9	14.0	1.2	0.3	0.0
1	M	2	0.3	12.9	30.3	37.6	17.2	1.3	0.4	0.0
1	L	1	0.6	13.9	31.1	37.4	15.2	1.3	0.4	0.0
1	L	2	0.5	12.5	29.9	38.0	17.1	1.6	0.4	0.0
2	S	1	0.3	5.6	24.4	43.1	23.7	2.3	0.4	0.0
2	S	2	0.3	9.2	30.9	40.8	17.4	1.2	0.2	0.0
2	M	1	0.2	11.5	34.3	38.2	14.3	1.0	0.4	0.1
2	M	2	0.3	10.1	29.9	38.7	19.0	1.5	0.3	0.0
2	L	1	0.3	15.2	32.5	35.8	14.5	1.2	0.3	0.2
2	L	2	0.3	7.6	24.8	41.2	23.5	2.1	0.4	0.1
3	S	1	0.2	5.2	24.5	43.4	24.2	2.2	0.3	0.0
3	S	2	0.2	5.0	23.9	43.2	24.6	2.5	0.4	0.1
3	M	1	0.1	5.2	22.9	43.8	25.2	2.2	0.4	0.0
3	M	2	0.1	8.6	24.9	35.1	28.4	2.6	0.2	0.0
3	L	1	0.5	5.7	22.2	41.7	26.5	2.8	0.5	0.0
4	S	1	0.1	2.6	18.8	41.4	32.2	3.8	1.0	0.1
4	S	2	0.1	3.9	22.3	42.9	27.5	2.7	0.5	0.1
4	M	1	0.4	6.5	23.2	38.1	24.9	4.0	1.6	0.6
4	M	2	0.2	19.0	39.8	31.5	8.7	0.7	0.1	0.0

TABLE 9. PCBs (PPB) IN WHOLE BODY OF LOBSTERS FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines 2	3	4	5	6	7	8	9	Total PCB
1	L	1	39.2	254.4	313.5	317.3	166.2	25.9	11.6	3.4	1131.4
2	S	1	5.0	70.1	161.9	261.4	171.3	16.1	2.7	0.9	689.4
2	M	1	0.0	32.2	113.1	201.1	135.3	13.8	2.3	2.8	500.7
2	M	2	2.8	17.0	44.5	58.0	41.7	3.2	0.6	0.2	167.9
2	M	3	0.4	7.6	28.6	54.1	34.5	2.9	0.5	0.0	128.6
2	L	1	0.8	13.0	59.0	126.5	84.1	9.9	1.5	2.7	297.5
2	L	2	1.1	15.8	47.4	81.4	55.8	6.2	1.2	1.4	210.1
2	L	3	1.3	26.2	125.1	251.4	176.7	17.4	2.5	1.1	601.6
3	M	1	0.9	6.1	20.6	45.1	34.9	4.0	0.8	0.3	112.7
3	M	2	0.1	0.9	3.5	10.5	8.3	1.0	0.2	0.1	24.3
3	M	3	0.1	1.6	5.7	12.4	10.1	1.0	0.2	0.1	31.1
3	L	1	0.4	2.9	12.8	28.7	23.6	3.2	0.6	0.2	72.5
3	L	2	2.3	4.2	18.1	42.7	31.9	3.4	0.7	0.4	103.7
3	L	3	0.7	11.0	52.6	117.6	90.5	10.4	1.4	1.3	285.6
4	S	1	0.4	1.9	6.1	11.1	9.2	1.0	0.2	0.1	29.9
4	S	2	0.2	1.5	4.9	16.7	15.3	1.9	0.4	0.1	41.0
4	M	1	0.1	0.3	1.9	7.3	8.2	1.0	0.2	0.0	18.9
4	M	2	0.6	2.9	18.9	67.4	57.2	5.8	1.2	0.2	154.1
4	M	3	0.3	0.9	5.8	16.5	18.5	2.4	0.5	0.2	45.2
4	L	1	0.3	3.0	18.7	58.1	54.7	7.6	1.7	2.2	146.4
4	L	2	0.4	2.0	9.7	28.8	25.5	3.7	0.7	1.2	71.8
4	L	3	0.2	1.5	5.2	13.7	12.1	1.8	0.4	0.3	35.2

TABLE 10. PCBs (PPB) IN EDIBLE MUSCLE OF LOBSTERS FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines 2	3	4	5	6	7	8	9	Total PCB
1	M	1	0.8	26.8	101.3	340.9	196.2	15.2	2.9	0.3	684.4
1	L	1	18.1	173.8	254.6	369.6	137.8	12.2	8.3	2.9	977.3
2	M	1	4.6	36.3	89.7	227.3	139.2	14.4	6.6	1.1	519.2
2	M	2	0.7	26.6	74.1	174.8	108.0	10.6	1.7	0.6	397.0
3	M	1	1.6	5.2	18.5	55.4	37.5	4.3	0.9	0.2	123.6
3	M	2	0.2	8.5	39.9	154.2	121.1	11.1	2.1	0.5	337.4
4	S	1	2.9	3.6	10.9	32.1	23.2	2.9	0.6	0.0	76.1
4	S	2	0.9	1.9	4.8	15.1	12.8	2.1	0.6	0.1	38.2
4	M	1	0.4	0.8	4.4	14.1	11.9	1.2	0.3	0.0	33.2
4	M	2	2.1	3.7	13.3	48.3	37.5	6.6	3.3	1.9	116.6
4	L	1	0.6	1.7	7.2	23.8	19.7	2.7	1.6	0.3	57.6
4	L	2	0.7	2.4	8.2	27.1	22.9	2.6	0.5	0.1	64.4

TABLE 11. PCBs (PPB) IN HEPATOPANCREAS OF LOBSTERS FROM FISHERY CLOSURE AREAS OF NEW BEDFORD HARBOR

S = Small; M = Medium; L = Large

			Number of Chlorines								
Area	Size	Replicate	2	3	4	5	6	7	8	9	TotaL PCB
1	M	1	6017.7	23378.8	20189.4	24461.8	16905.3	1938.5	298.2	154.1	93343.7
1	L	1	1975.7	13070.0	16963.0	22653.0	11000.6	1357.1	232.1	20.6	67272.2
2	M	1	9.0	1132.0	3443.0	8400.3	6004.6	531.3	100.8	10.8	19631.9
2	M	2	64.2	1342.1	4179.8	10607.4	7411.3	855.6	156.1	22.4	24638.9
3	M	1	22.9	428.0	1811.6	6165.3	4921.4	559.1	107.6	27.6	14044.2
3	M	2	54.2	389.8	1509.3	6070.7	5994.0	633.0	121.4	12.0	14784.3
4	S	1	53.4	99.4	528.0	1577.0	1478.6	172.3	47.9	24.7	3981.4
4	S	2	19.3	62.4	305.0	1244.6	1449.2	170.2	42.0	15.7	3308.4
4	M	1	3.8	39.4	283.6	1299.2	1552.7	178.1	39.1	5.5	3401.3
4	M	2	1.8	163.0	758.5	3324.4	3390.9	336.8	84.3	15.8	8075.3
4	L	1	23.7	36.5	165.8	754.0	750.2	86.7	22.3	6.9	1845.9
4	L	2	60.0	326.8	626.8	1494.3	1561.3	195.7	56.2	2.5	4323.6

TABLE 12. MEDIAN PCB CONCENTRATIONS (PPB) IN WHOLE BODY, EDIBLE MUSCLE, AND HEPATOPANCREAS FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

Area	Whole Body	Edible Muscle	Hepatopancreas
1	1131	831	80308
2	298	458	22136
3	89	231	14414
4	43	61	3691

TABLE 13. RATIOS OF PCB CONCENTRATIONS IN LOBSTER EDIBLE TISSUE TO LOBSTER WHOLE BODY FROM VARIOUS AREAS IN NEW BEDFORD HARBOR

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines 2	3	4	5	6	7	8	9	Total PCB
1	L	1	0.46	0.68	0.81	1.16	0.83	0.47	0.72	0.85	0.86
2	M	1	152.33	1.13	0.79	1.13	1.03	1.04	2.87	0.39	1.04
2	M	2	0.25	1.56	1.67	3.01	2.59	3.31	2.83	3.00	2.36
3	M	1	1.78	0.85	0.90	1.23	1.07	1.08	1.13	0.67	1.10
3	M	2	2.00	9.44	11.40	14.69	14.60	11.10	10.50	5.00	13.88
4	S	1	7.25	1.89	1.79	2.89	2.52	2.90	3.00	0.00	2.55
4	S	2	4.50	1.27	0.98	0.90	0.84	1.10	1.50	1.00	0.93
4	M	1	4.00	2.67	2.32	1.93	1.45	1.20	1.50	1.33	1.76
4	M	2	3.50	1.28	0.70	0.72	0.66	1.14	2.75	9.50	0.76
4	L	1	2.00	0.57	0.39	0.41	0.36	0.36	0.94	0.14	0.39
4	L	2	1.75	1.20	0.85	0.94	0.90	0.70	0.71	0.08	0.90

TABLE 14. RATIOS OF PCB CONCENTRATIONS IN LOBSTER HEPATOPANCREAS TO LOBSTER WHOLE BODY FROM VARIOUS AREAS IN NEW BEDFORD HARBOR

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines 2	3	4	5	6	7	8	9	Total PCB
1	L	1	50.40	51.38	54.12	71.39	66.19	52.40	20.01	6.06	59.46
2	M	1	300.00	35.16	30.44	41.77	44.38	38.50	43.83	3.86	39.21
2	M	2	22.93	78.95	93.93	182.89	177.73	267.38	260.17	112.00	146.75
3	M	1	25.44	70.16	87.94	136.70	141.01	139.78	134.50	92.00	124.62
3	M	2	542.00	433.11	431.23	578.16	722.17	633.00	607.00	120.00	608.41
4	S	1	133.50	52.32	86.56	142.07	160.72	172.30	239.50	247.00	133.16
4	S	2	96.50	41.60	62.24	74.53	94.72	89.58	105.00	157.00	80.69
4	M	1	38.00	131.33	149.26	177.97	189.35	178.10	195.50	183.33	179.96
4	M	2	3.00	56.21	40.13	49.32	59.28	58.07	70.25	79.00	52.40
4	L	1	79.00	12.17	8.87	12.98	13.71	11.41	13.12	3.14	12.61
4	L	2	150.00	163.40	64.62	51.89	61.23	52.89	80.29	2.08	60.22

TABLE 15. MEDIAN RATIOS OF PCB CONCENTRATIONS IN EDIBLE MUSCLE TO WHOLE BODY AND HEPATOPANCREAS TO WHOLE BODY IN LOBSTER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

Area	Edible Muscle/ Whole Body	Hepatopancreas/ Whole Body
1	0.86	59.46
2	1.70	92.98
3	7.49	366.51
4	0.92	70.46

TABLE 16. PERCENT OF TOTAL PCBs IN LOBSTER WHOLE BODY FROM NEW BEDFORD HARBOR AS REPRESENTED BY EACH PCB CONGENER

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines 2	3	4	5	6	7	8	9
1	L	1	0.7	4.1	16.7	43.5	28.9	3.0	0.5	1.7
2	S	1	0.7	10.2	23.5	37.9	24.8	2.3	0.4	0.1
2	M	1	0.0	6.4	22.6	40.2	27.0	2.7	0.5	0.6
2	M	2	1.7	10.1	26.5	34.6	24.8	1.9	0.3	0.1
2	M	3	0.3	5.9	22.2	42.1	26.8	2.3	0.4	0.0
2	L	1	0.3	4.4	19.8	42.5	28.3	3.3	0.5	0.9
2	L	2	0.5	7.5	22.5	38.7	26.5	2.9	0.6	0.7
2	L	3	0.2	4.4	20.8	41.8	29.4	2.9	0.4	0.2
3	M	1	0.8	5.4	18.3	40.0	31.0	3.5	0.7	0.2
3	M	2	0.5	3.5	14.2	42.9	34.1	3.9	0.6	0.2
3	M	3	0.4	5.1	18.2	39.7	32.5	3.2	0.6	0.3
3	L	1	0.6	4.0	17.7	39.6	32.6	4.4	0.8	0.3
3	L	2	2.2	4.0	17.5	41.1	30.8	3.3	0.7	0.3
3	L	3	0.3	3.8	18.4	41.2	31.7	3.6	0.5	0.4
4	S	1	1.2	6.5	20.3	37.0	30.8	3.4	0.5	0.2
4	S	2	0.6	3.7	11.9	40.7	37.4	4.6	0.9	0.2
4	M	1	0.4	1.7	9.8	38.4	43.3	5.1	1.1	0.2
4	M	2	0.4	1.9	12.2	43.7	37.1	3.8	0.8	0.1
4	M	3	0.7	2.0	12.8	36.6	41.0	5.4	1.1	0.3
4	L	1	0.2	2.0	12.8	39.7	37.4	5.2	1.2	1.5
4	L	2	0.5	2.7	13.5	40.1	35.5	5.1	0.9	1.7
4	L	3	0.6	4.3	14.7	38.9	34.4	5.1	1.0	1.0

TABLE 17. PERCENT OF TOTAL PCBs IN LOBSTER EDIBLE MUSCLE FROM NEW BEDFORD HARBOR AS REPRESENTED BY EACH PCB CONGENER

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines 2	3	4	5	6	7	8	9
1	M	1	0.1	3.9	14.8	49.8	28.7	2.2	0.4	0.0
1	L	1	1.8	17.8	26.0	37.8	14.1	1.2	0.8	0.3
2	M	1	0.8	7.0	17.3	43.8	26.8	2.8	1.3	0.2
2	M	2	0.2	6.7	18.7	44.0	27.2	2.7	0.4	0.1
2	M	1	1.3	4.2	15.0	44.8	30.3	3.5	0.7	0.1
2	M	2	0.0	2.5	11.8	45.7	35.9	3.3	0.6	0.1
3	S	1	3.8	4.7	14.3	42.2	30.5	3.9	0.7	0.0
3	S	2	2.4	4.8	12.6	39.6	33.4	5.5	1.5	0.2
4	M	1	1.4	2.5	13.3	42.4	35.8	3.7	0.8	0.1
4	M	2	1.8	3.2	11.4	41.4	32.1	5.7	2.8	1.7
4	L	1	0.1	2.9	12.5	41.2	34.3	4.8	2.8	0.5
4	L	2	1.0	3.6	12.7	42.1	35.6	4.0	0.8	0.1

TABLE 18. PERCENT OF TOTAL PCB'S IN LOBSTER HEPATOPANCREAS FROM NEW BEDFORD HARBOR AS REPRESENTED BY EACH PCB CONGENER

S = Small; M = Medium; L = Large

Area	Size	Replicate	Number of Chlorines 2	3	4	5	6	7	8	9
1	M	1	6.4	25.0	21.6	26.2	18.1	2.1	0.3	0.2
1	L	1	2.9	19.4	25.2	33.7	16.4	2.0	0.3	0.0
2	M	1	0.0	5.8	17.5	42.8	30.6	2.7	0.5	0.1
2	M	2	0.3	5.4	17.0	43.1	30.1	3.5	0.6	0.1
3	M	1	0.2	3.1	12.9	43.9	35.0	4.0	0.8	0.2
3	M	2	0.4	2.6	10.2	41.1	40.5	4.3	0.8	0.1
3	S	1	1.3	2.5	13.3	39.6	37.1	4.3	1.2	0.6
3	S	2	0.6	1.9	9.2	37.6	43.8	5.1	1.3	0.5
3	M	1	0.1	1.2	8.3	38.2	45.6	5.2	1.1	0.2
3	M	2	0.0	2.0	9.4	41.2	42.0	4.2	1.0	0.2
4	L	1	1.3	2.0	9.0	40.8	40.6	4.7	1.2	0.4
4	L	2	1.4	7.6	14.5	34.6	36.1	4.2	1.3	0.1

TABLE 19. MEDIAN PERCENTAGE OF EACH CONGENER IN WHOLE BODY, EDIBLE MUSCLE, AND HEPATOPANCREAS OF LOBSTER FROM FISHERY CLOSURE AREAS IN NEW BEDFORD HARBOR

		Number of Chlorines							
Tissue	Area	2	3	4	5	6	7	8	9
Whole Body	1	1	4	17	44	29	3	1	2
Whole Body	2	0	6	23	40	27	3	0	0
Whole Body	3	1	4	18	41	33	4	1	0
Whole Body	4	1	3	13	39	37	5	1	0
Edible Muscle	1	1	11	21	44	22	2	1	0
Edible Muscle	2	1	6	16	45	29	3	1	0
Edible Muscle	3	2	5	14	41	32	4	1	0
Edible Muscle	4	1	3	13	42	35	5	2	1
Hepatopancreas	1	5	22	24	30	17	2	0	0
Hepatopancreas	2	0	0	17	43	30	4	1	0
Hepatopancreas	3	1	3	12	39	41	5	1	1
Hepatopancreas	4	1	2	9	40	42	5	1	0