STRIPED BASS HEALTH INDEX MONITORING
1985 FINAL REPORT

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INTRODUCTION

The Department of Fish and Game (DFG) annually monitors striped bass health under contract to the State Water Resources Control Board (SWRCB). Striped Bass Health Index (SBHI) Monitoring was established as a component of The Regional Effects Monitoring Element of the State's Aquatic Habitat Program. The purpose of the SBHI is to provide a long-term program to monitor striped bass body and reproductive condition, parasite load, and pollutant burden to indicate whether toxic pollutants may be affecting the reproduction and survival of the species. Data on striped bass health and pollutant burden will aid in making water quality management decisions for the protection of this valuable sport fishery.

Striped bass abundance in the Sacramento-San Joaquin Estuary increased so dramatically following its 1879 introduction that both sport and commercial fisheries developed before 1900. The commercial fishery was closed in 1935 due to pressure from sport fishermen (Stevens 1980). During the past 25 years the adult population has decreased to one-quarter of what it was, and is now probably at the lowest level since its early development (Stevens et al. 1985).

The principal reason for low adult abundance appears to be poor production of young. Extensive summer tow-net surveys provide good evidence that less than half as many young are produced now as a decade ago (Stevens et al. 1985). This probably results from a combination of (1) reduced adult stock producing fewer eggs, (2) reduced food production in the nursery area, (3) entrainment losses into water diversions, and (4) toxic effects of water-borne pollutants.

The effect of toxic pollutants on striped bass in the Sacramento-San Joaquin Estuary was the subject of extensive research from 1978 to 1983 by the Physiological Ecology Investigation staff at the National Marine Fisheries Service's (NMFS) Tiburon Laboratory and the Cooperative Striped Bass Study (COSBS). The Cooperative Striped Bass Study pooled resources of NMFS, the State Water Resources Control Board, Department of Fish and Game, University of California at Santa Cruz and Davis campuses, and San Francisco State University. The purpose of COSBS was to expand the NMFS Tiburon Laboratory studies on the effects of pollutants on the Bay-Delta striped bass population. These studies demonstrated statistical associations between certain pollutants and poor fish condition (SWRCB 1980, 1981, 1983; Jung et al. 1984; Whipple 1984). Specifically, poor liver condition was significantly correlated with high levels of heavy metals and petroleum hydrocarbons. An increased rate of egg resorption was associated with petroleum hydrocarbons, while abnormal egg development and coagulation of the yolk were associated with chlorinated hydrocarbons, particularly DDT.

Striped bass were heavily infested with internal parasites and many had tapeworm-induced lesions.

Techniques developed during this research (Whipple et al. 1984) are currently being used by DFG to annually monitor striped bass health under contract to the SWRCB. SBHI Monitoring contract reports include the most recent year's data and provide analysis of the cummulative data base. Where comparable, data from the NMFS and COSBS research are included.

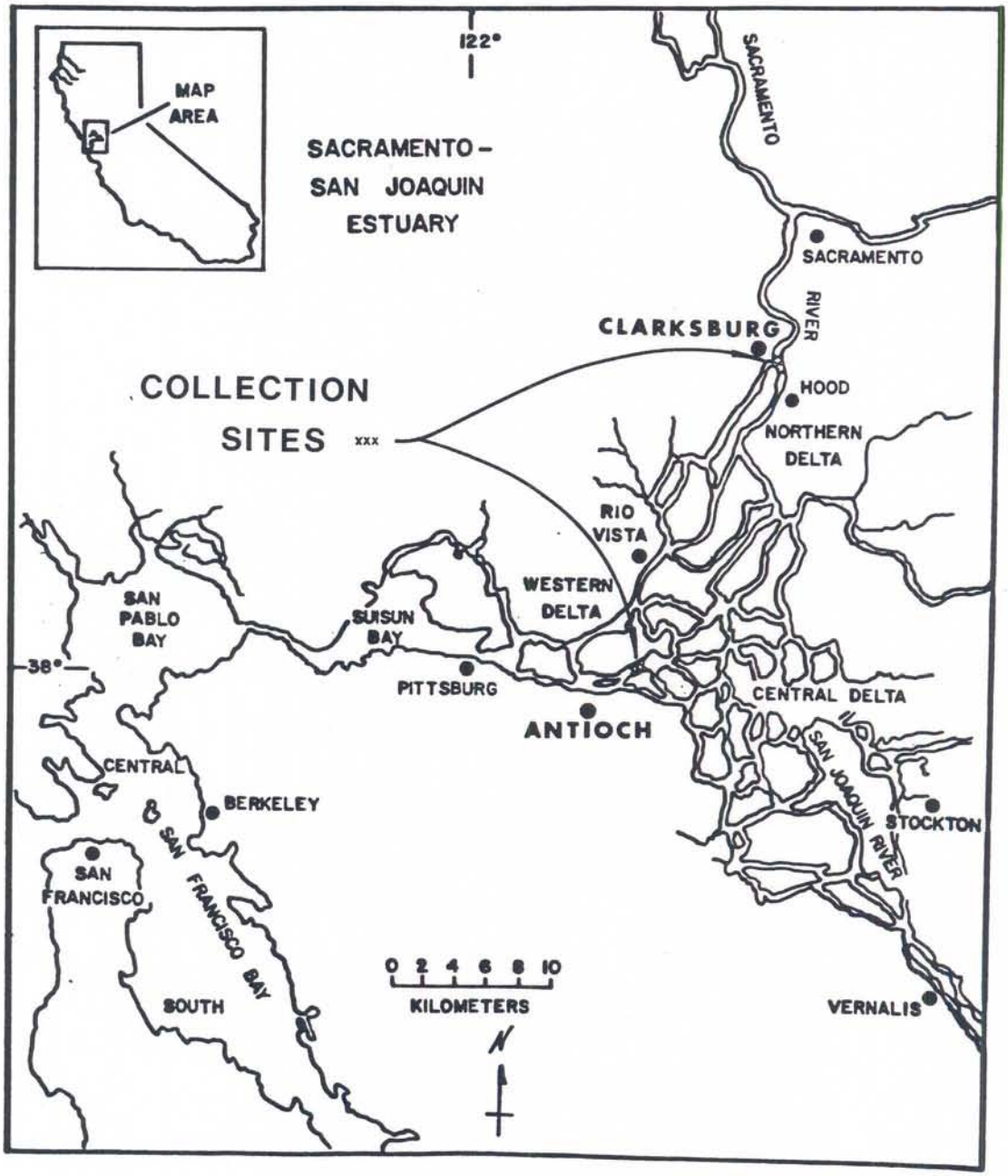
The SBHI program monitors pollutants only in liver tissue because NMFS and COSBS found that condition measurements, including reproductive condition, were better correlated with pollutant levels in liver tissue than with levels in gonads or muscle (Whipple et al. 1984). Starting in 1986, SBHI Monitoring will include analysis of muscle tissue for mercury because of its implications for human health.

METHODS

Field Sampling

From April 14 to May 28, 1985, adult striped bass were collected during the DFG tagging program using gill nets on the San Joaquin River near Antioch and fyke traps (Hallock et al. 1957) on the Sacramento River near Clarksburg (Figure 1). Gear used at each location is dictated by river conditions. Sublegal and very old fish are caught by both methods, but the fyke traps are less size-selective than the nets. Mature prespawning

Figure 1. Striped bass collections for 1985 were made near Antioch on the San Joaquin River and near Clarksburg on the Sacramento River.



females were selected for examination by collecting only fish which were greater than 50 cm in fork length, were not obviously spawned out, and did not extrude milt when the abdomen was pressed. Although male striped bass also showed high levels of PCB's, petroleum hydrocarbons and parasites, measures of reproductive condition in females can be more easily evaluated and used to estimate effects on the population (Whipple et al. 1984).

The two sampling locations were selected because they are both near known spawning areas. The COSBS research suggested that there may be different stocks spawning in the two rivers based on striping pattern, strength of inflammatory response to cestode larvae, and efficiency of detoxifying or depurating some pollutants (monocyclic aromatic hydrocarbons and metals) (SWRCB 1983; Jung et al. 1984; Whipple et al. 1984). The Clarksburg collections are far enough upstream to be considered Sacramento River stock, but collections made near Antioch include fish that may spawn in either river. During the 2-month sampling period at least 20 females were collected at each site, but no more than four fish were collected weekly at each site so that the majority of the spawning season was covered. This procedure rendered collections less sensitive to episodic pollution (Whipple et al. 1984). Upon collection, fish were killed, wrapped in aluminum foil for protection from contamination, placed on ice to preserve tissues and any parasites, and transported to the lab for examination.

Concurrent with each fish collection, surface water

temperature and salinity were recorded. Temperature affects timing of both upriver movement and spawning (Turner 1976). Salinity affects the toxicity of some pollutants to striped bass (Palawski 1985).

Biological Measurements

In the laboratory, each fish was systematically examined, dissected, and subsampled for factors determined to be associated with pollutant exposure (SWRCB 1983; Jung et al. 1984; Whipple et al. 1984). All examinations followed standardized procedures as defined for this study (Whipple et al. 1984).

The biological measurements included:

(1) External examination and morphology -- length, depth, weight, age (from scales), striping pattern, skeletal abnormalities, and parasites (type, location, severity, and host reaction).

(2) Internal examination and morphology -- (a) liver: weight, color, percent fat, and liver somatic index (LSI); (b) ovaries: size, weight, ovary maturity stage, egg color, fecundity, gonadosomatic index (GSI), egg stage, and proportion of eggs resorbing; and (c) other: viscera weight, mesenteric fat abundance rank, and parasites (type, location, severity, and host reaction).

Striping pattern (defined as solid=1 or broken=2 lateral striping for each of the anterior, middle, and posterior portions of each side, dorsally and ventrally) was recorded and

photographed. Differences in striping pattern may indicate separate spawning populations (SWRCB 1983; Jung et al. 1984; Whiple et al. 1984).

The severity (visually ranked slight=2 to very severe=5) of observed skeletal abnormality types (such as reduced size and pugheadedness) was recorded for each location where it occurred (such as gill rakers or snout). For each type of parasite, the severity of the infestation (visually ranked slight=2 to heavy=5) was recorded for each different host reaction (such as adhesions or necrosis) at each location where it occurred in the fish. Severity ranks for all occurrences of each type of parasite or abnormality were summed for each fish. Mean severity rank for a given parasite or abnormality type was calculated by summing the severity ranks for all occurrences of the type in an annual sample and dividing by the number of fish examined in the sample.

Commonly occurring parasite types are: tapeworm (Lacistorhynchus tenuis) and roundworm (Anisakis sp.) larvae, tapeworm rafts (an aggregation of dead tapeworm larvae which has been covered by striped bass connective tissue), and tapeworm lesions (open or healed wounds associated with raft extrusion which primarily occur on the body wall in the abdominal region). Extrusion of tapeworm rafts through the body wall is an unusual and severe form of immune response to this common fish parasite. Resulting wounds are subject to secondary infection.

Several variables were measured to indicate body and liver condition. Mesenteric fat abundance (visually ranked from none=1 to abundant=4) is a simple measure of body condition, with more

fat indicating better condition. Liver color, a simple measure of liver condition, was visually ranked from deep red=1 through yellow to white-yellow=5 (a higher rank indicating higher lipid content). Lipid content of liver (percent) was also later determined analytically by the Water Pollution Control Laboratory of DFG. The meaning of high and low values of percent fat in the liver is less clear than for mesenteric fat abundnce rank, but it is possible that fish with either very low or very high levels are unhealthy (Jeannette Whipple, NMFS, pers. comm.). Liver somatic indices[1/] (body to liver weight ratios) were calculated as additional measures of liver condition. Viscera weight includes all tissues inside the peritoneal cavity (heart and kidneys not included). LSI_2 does not include ovary weight and so is less influenced by the sexual maturity of the fish.

Ovary maturity stage (immature=1, prespawning=2, spawning=3, spent=4) was noted to confirm prespawning condition. As a simple measure of egg conditon, the egg color of a fresh egg sample spread on white filter paper was matched to a hue, value, and chroma from the Munsell Book of Color. Hues range from 1 through 16 (red through yellow to green) for this study. Greenish eggs are considered to be in better condition than yellowish eggs

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1/ LSI_1 = (wet weight liver/wet weight whole fish) x 100

LSI_2 = [wet weight liver/(wet weight fish - wet weight viscera)] x 100

(SWRCB 1983). Gonadosomatic indices were calculated[1/]. Fecundity was estimated from frozen samples, using standard methods. Egg stage (after Yamamoto 1956, modified by Dr. Jeannette Whipple, NMFS; Whipple et al. 1984), and proportion of eggs resorbing[2/], were determined from right anterior ovary samples that were formalin-fixed and thinly sliced (10-12 u) using a freezing microtome to produce an ovary cross section of at least 100 eggs. Mounted slices were stained for lipid using Oil Red O, C.I.26125, and counterstained with Harris Hematoxylin (after Humason 1972, modified by Mike Bowers, NMFS; Whipple et al. 1984). Recorded were the predominant egg stage, number of maturing eggs of each stage, and number of previously maturing eggs undergoing resorption (identified by the changed condition of lipid within the resorbing egg). Any observed abnormalities, such as abnormal yolk coagulation or granulomas, were footnoted. Egg resorption, which affects the potential numbers of eggs spawned per individual and which has been associated with high pollutant levels, might affect the population's overall reproductive potential.

Some slides of ovary cross sections in 1985 exhibited a red overstain which may have made resorbing eggs less detectable.

1/ GSI_1 = (wet weight gonads/wet weight whole fish) x 100

GSI_2 = [wet weight gonads/(wet weight fish - wet weight viscera)] x 100

2/ Proportion of eggs resorbed = $\frac{\text{\# resorbing eggs}}{\text{\# maturing eggs}}$

NMFS and DFG will investigate lab procedures used to produce the slides in order to trace and correct the problem. For quality control, all slides will be read by NMFS and reread by DFG.

Pollutant Analyses

Past studies (SWRCB 1980, 1981, 1983; Jung et al. 1984) showed associations between some measures of body condition and presence of certain classes of pollutants in striped bass liver tissue (see Introduction, p. 3). As a result, DFG monitors three classes of pollutants in striped bass liver tissue: volatile petroleum hydrocarbons (monocyclic aromatic hydrocarbons [MAHs] and alicyclic hexanes [AHs]), synthetic organic compounds (pesticides and polychlorinated biphenyls [PCBs]), and trace elements (heavy metals and selenium).

Tissue preparation for all pollutant analyses followed protocol in Whipple et al. 1984. Tissue for trace element analyses was transferred to acid-washed, air-dried nalgene vials and frozen in individual plastic bags. For analysis of synthetic organic compounds, tissue was double-wrapped in hexane-rinsed aluminum foil and frozen. Tissue for volatile petroleum hydrocarbon analysis was transferred to clean, air-dried glass containers. Due to the volatility of the MAHs and AHs, liver tissue for analysis was digested in sodium hydroxide and these hydrocarbons extracted in freon (Whipple et al. 1984) immediately following the fish necropsy. The freon extractions were stored at $-10^{\circ}C$. Liver tissue to be analyzed for a third group of

volatile petroleum hydrocarbons, the polycyclic aromatic hydrocarbons (PAHs), has been archived in a low temperature freezer at NMFS, Tiburon.

Trace element, synthetic organic hydrocarbon, and liver fat analyses were performed at the DFG Fish and Wildlife Water Pollution Control Laboratory (WPCL).

Standard laboratory procedures were used for trace element analyses (Appendix B). Techniques employing conventional (flame) atomic absorption spectrophotometry (copper and zinc), and cold vapor technique (mercury) were done on a Varian Model AA-475[1/] atomic absorption spectrophotometer. Analyses requiring a graphite furnace (cadmium, chromium, and selenium) were done on a Perkin-Elmer Model 5000[1/] atomic absorption spectrophotometer equipped with a HGA-500[1/] graphite furnace. All analytical values were corrected using procedural blanks. Ten percent of the trace element samples were analyzed in duplicate for quality control purposes. To protect sample integrity, all materials contacting samples during laboratory operations were analyzed for trace metal content. To ensure accuracy, National Bureau of Standards oyster reference material was analyzed at two different times during trace element analyses. Zero ppm was recorded in the SBHI database for compounds found at less than the detection limit.

Analyses for pesticides and PCBs in liver were performed using a sample of liver dried with Na_2SO_4 and homogenized with

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1/ Use of brand names in this report does not imply endorsement by the State of California.

petroleum ether in an all-glass blender with stainless steel blades. The homogenized sample was filtered and an aliquot of the petroleum ether extract was eluted through a florisil column. The florisil columns were eluted with petroleum ether (Fraction 1) and 6% ethyl ether/petroleum ether (Fraction 2)(Appendix C). The fractions were concentrated to an appropriate volume in Kuderna-Danish concentrators prior to analysis by gas chromatography. A mixture of synthetic standards was eluted through the florisil column to determine the recovery and separation characteristics of the column. Detection levels for various compounds in liver varied from 5 to 200 ppb (Appendix C). For quality control purposes, ten percent of the samples were analyzed in duplicate. All materials and solutions contacting the sample after initial extractions were analyzed for organic contamination. To preclude errors due to contamination, a vertical solvent blank was passed through each set of glassware, and analyzed before introducing a new sample. To insure accuracy, an Environmental Protection Agency quality control sample of freeze-dried fish was analyzed for PCBs before beginning PCB analyses. SBHI samples were tested for all compounds in Appendix C, and all compounds detected in one or more samples were reported by the WPCL. Zero ppm was recorded in the SBHI database for compounds found at less than the detection limit.

MAHs and AHs were analyzed at the NMFS Tiburon Laboratory using a Hewlett Packard 5880A[1/] gas chromatograph with a 6' x 1/8" stainless steel 100-120 Supelcoport[1/], 5% SP1200/1.75% Bentone 34 packed column. The gas chromatograph was calibrated, and periodically recalibrated, to a mixture of standards of the analyzed compounds (Appendix A). A solvent blank was eluted through the column between samples to preclude contamination from previous samples. Several of the AHs are detected only in a group (combined peak) of compounds, such as the combined peak comprised of 1,2-dimethylcyclohexane and ethylcyclohexane. Levels of those compounds, therefore, were recorded as a group and not individually. All detected amounts of MAHs and AHs were recorded in the SBHI database, regardless of the stated detection limits, following the convention used by NMFS.

Data Analyses

Biological and pollutant data were analyzed using the same procedures. Statistical comparisons were made to discern differences between the two collection sites and differences over time (1978-1985). Twenty-three variables were selected for statistical analysis for this report based on data availability and relative importance.

Variables were first screened to meet the requirements of parametric analysis. Variables which were not ranked

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(scored type) variables, and which also met the assumption of normality (Shapiro and Wilk's Statistic at $p < 0.001$[1/]), after transformation if necessary (Table 1), were treated parametrically. Since sampling took place at Clarksburg in only 4 out of 8 years, two one-way analyses of variance (ANOVAs), or analyses of covariance (ANCOVAs), as appropriate, were performed on each variable: one comparing the collection sites and another comparing years for just the Antioch site. ANCOVA was used to remove the effect of size (fork length) as a covariate whenever possible. Unexpectedly, fork length often could not be used as a covariate in variance analyses (Table 1) because the variables were not significantly related to fork length, the covariance was not homogeneous, or the variables required nonparametric methods (which cannot take covariates into account). Sexual maturity stage was not used as a covariate because the stages are only descriptive, and so provide data on a nominal scale, rather than the interval or ratio scale appropriate for a covariate. When ANOVA/ANCOVA detected that differences between years existed ($p < 0.05$), an a-posteriori test for unequal sample sizes (Scheffe' method, Sokal and Rohlf 1981) was applied to determine which years were actually different. The conservative Scheffe' method did not always detect which years were different, although the method was unlikely to present false differences. A more powerful a-posteriori method, such as the Student-Newman-Kuels

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1/ Because ANOVA and ANCOVA are robust regarding normality, a conservative p-value for rejecting H_o (that data were normally distributed) was used.

Table 1. Characteristics of the statistical analysis of data from female striped bass collected in the Sacramento-San Joaquin Estuary 1978-1985. ns = not significant.

Variable	Transformation	Parametric (P) or Nonparametric (NP)	Correlation with[1] Fork Length ($p < 0.05$)	ANOVA (a) or ANCOVA (b)
Parasite Severity:				
All Parasites	-	NP	0.44	a
Tapeworm Larvae	-	NP	0.18	a
Tapeworm Rafts	-	NP	ns	a
Roundworm Larvae	-	NP	0.54	a
% Eggs Resorbed	-	NP	-0.26	a
Egg Color	-	NP	ns	a
Mesenteric Fat Abundance	-	NP	-0.27	a
% Fat in Liver	-	NP	ns	a
Skeletal Abnormality Severity	-	NP	ns	a
Striping Pattern	-	NP	ns	a
Fork Length	natural log	P	-	a
Age	natural log	P	0.71	a
MAHs[4]	-	NP	ns	a
AHs[4]	-	NP	ns	a
DDT and Metabolites[5]	natural log	P	ns	a
Other Pesticides[6]	natural log	P	ns	a
PCB-1260[7]	-	NP	ns	a
Copper	natural log	P	ns	a[2]
Zinc	-	P	0.24	a[3]
Cadmium	square root	P	0.22	b[3]
Chromium	-	NP	0.24	a[3]
Mercury	natural log	P	0.63	b[3]
Selenium	natural log	P	0.29	b[3]

1/ Data from all years for both locations used in correlation analysis.
2/ Heterogeneity of covariance precluded using analysis of covariance with fork length as covariate.
3/ Fork length used as covariate.
4/ See Appendix A for list of compounds included.
5/ Includes p,p'-DDT; o,p-, p,p'-DDD; and o,p-, p,p'-DDE.
6/ Includes toxaphene, chlordane, nonachlor, oxychlordane, hexachlorabenzene (HCB), and aldrin.
7/ PCB-1260 was analyzed prior to 1984, so it was selected for statistical analysis.

test or Tukey's Honestly Significant Difference test, will be used when a statistical package containing such a program becomes available to us.

Nonparametric ANOVA (Kruskall-Wallis) was used on untransformed data to compare collection sites and years for ranked variables[1/] (most of the biological measurements), and for variables not normally distributed even after transformation. When Kruskall-Wallis ANOVA indicated significant differences between years ($p < 0.05$), a Tukey-type nonparametric a-posteriori test with unequal sample sizes (Zar 1984) was used to determine which years were different. Although this method was the equivalent of a relatively powerful parametric test, it was not always able to determine which years differed.

The degree of association between pairs of variables was measured by correlation analysis ($\alpha = 0.05$). After transformation (Table 1), some pairs showed bivariate normal distributions, and could be analyzed parametrically. However, most of the variable pairs included at least one ranked or non-normally distributed variable, therefore, Spearman Rank Correlation (nonparametric) was used on untransformed data for most of the analyses.

1/ These ranked variables provide data on the ordinal scale, and therefore are not appropriate for parametric analysis.

RESULTS

Field Sampling

Measurements of water temperature and salinity at the sampling sites indicated that the San Joaquin River location had the same temperature on average, but was more salty, than the Sacramento River location when striped bass were being collected (Appendices D and D-2).

Forty-five striped bass were collected in spring 1985, 24 from the San Joaquin River and 21 from the Sacramento River (Table 2). Because the method of visually selecting prespawning females is not perfect, only 43 of the 45 fish collected were females, and 39 of those were prespawners. The average time from collection to necropsy was 4.6 hours.

Biological Measurements, Pollutant Analyses and Data Analyses

The original data for each fish collected in 1985 can be found in Appendix M-8. Comparable original data from all past years (1978-1984) for the two collection sites are included in Appendices M-1 through M-7. These appendices include approximately 40 of the more than 110 variables currently being recorded for each fish. Further database programming will produce appendices of all data recorded for each fish, including calculated variables[1/], for future reports. For the important

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1/ These will include all pollutant measurements (individual MAHs, AHs, pesticides, PCB isomers, etc.), percent moisture of tissue analyzed, and biological measurements (parasite ranks, etc.)

Table 2. Reproductive maturity of striped bass collected during the 1985 Striped Bass Health Index monitoring.

Sex	Gonad Maturity	Location	
		San Joaquin River	Sacramento River
female	immature	2	0
	pre-spawning (maturing)	19	20
	spawning, ripe-running	1	0
	spent	1	0
	Subtotal	23	20
male	spent	1	0
hermaphrodite	pre-spawning (maturing)	0	1
	Total	24	21

variables, appendices D through L-4 contain sample sizes, means, standard deviations, and ranges for 1985 and past years.

Looking first at 1985 biological measurements, 91% of the fish collected contained tapeworm larvae, 67% had tapeworm rafts and 63% had roundworm larvae (Appendices K-2 through K-4). Tapeworm larvae most often affected the mesenteries and swim bladder causing either pressure necrosis or no visually obvious reaction (Appendix L-5). Tapeworm rafts occurred most frequently in the mesenteries, and muscle of the abdominal region, causing visceral adhesions (Appendix L-6). Roundworm larvae (Appendix L-7) appeared most often on mesenteries or gonads, causing no obvious reaction. None of the fish collected in 1985 showed 100% egg resorption (Apendices K-5 and K-6). Any changes required in 1985 egg resorption values after quality control measures are completed (see Methods - Biological Measurements) will be reported in the next SBHI Monitoring report. A background egg resorption level of approximately 2% or less can be expected in a relatively healthy striped bass (Jeannette Whipple, NMFS, pers. comm.). Mesenteric fat abundance in 1985 was average (Appendix K-8). The mean level of fat in the liver was 7.7% (Appendix K-9). One third of the fish showed some kind of skeletal abnormality (Appendix K-10), most often slightly misshapened gill rakers.

In 1985, liver tissue of eight fish (18.6%) contained at least one of the MAHs: toluene, ethylbenzene or xylene (Appendix E). The mean MAH concentration was 0.26 ppm wet weight. Alicyclic hexanes (AHs) were not detected. Thirteen

fish (30%) contained unmetabolized DDT in the liver (Appendix F). DDT metabolites (DDD or DDE) (Appendix F-2) and PCB-1260 (Appendix H) were detected in 42 of the 43 fish sampled. The mean level of DDT and metabolites was 0.968 ppm wet weight. The mean for PCB-1260 was 0.42 ppm wet weight. Mercury and selenium were detected in livers of all fish sampled in 1985. Refer to Appendices J through J-6 for sample means for all trace elements.

For fish collected in the San Joaquin River, there were significant differences between years for 10 of 12 biological variables (Table 3). The a-posteriori tests used to determine which year(s) differed from others (see METHODS) were only able to discern differences for six variables.

Although all measures of specific parasite burdens (Appendices K through K-4) were significantly different between years, the a-posteriori test was able to detect the years when these differences occurred only for tapeworm larvae, for which fewer larvae were recorded in 1978 than in all other years. Jeannette Whipple (NMFS, pers. comm.) suggests that parasite severity ranks may have been low in 1978 due to observer inexperience. The same cause may explain the low severity of skeletal abnormalities (Appendix K-10) that also occurred in 1978.

Annual variability in mesenteric and liver fat was not consistent. Mean mesenteric fat rank was lower in 1980 and 1981 than in all other years (Appendix K-8). Percent fat in the liver

Table 3. Annual comparisons of biological and pollutant measurements in female striped bass collected from the San Joaquin River 1978-1985. Years with letters in common were not significantly different ($p < 0.05$) based on an a-posteriori test; significant difference denoted alphabetically in descending order. Asterisks indicate that the a-posteriori test was unable to determine which year(s) differed from others. nm = variable not measured.

Variable	Significant Difference Between Years?[1]	1978	1979	1980	1981	1982	1983	1984	1985
BIOLOGICAL MEASUREMENTS:									
All Parasites	no								
Tapeworm Larvae	yes	B	A	A	A	A	A	A	A
Tapeworm Rafts	yes	*	*	*	*	*	*	*	*
Roundworm Larvae	yes	*	*	*	*	*	*	*	*
% Eggs Resorbed	yes	*	*	*	*	*	*	*	*
Egg Color	no								
Mesenteric Fat Abundance	yes	A	A	B	B	A	A	A	A
% Fat in Liver	yes	nm	nm	A	nm	nm	nm	B	A
Skeletal Abnormality Severity	yes	B	A	A	A	A	A	A	A
Striping Pattern	yes	B	A	A	A	A	A	A	B
Fork Length	yes	*	*	*	*	*	*	*	*
Age	yes	A	A	B	A	A	A	A	B
POLLUTANTS:									
MAHs[2]	yes	B	C	B	A	B	C	C	B
AHs[2]	yes	A	A	B	B	B	B	B	B
DDT and Metabolites[3]	no	nm	nm	nm		nm	nm		
Other Pesticides[4]	no	nm	nm	nm	nm	nm	nm		
PCB-1260[5]	no	nm	nm	nm		nm	nm		
Copper	yes	nm	nm	B	AB	nm	nm	AB	A
Zinc	yes	nm	nm	B	A	nm	nm	A	A
Cadmium	no	nm	nm	nm		nm	nm		
Chromium	yes	nm	nm	nm	A	nm	nm	B	C
Mercury	yes	nm	nm	nm	*	nm	nm	*	*
Selenium	no	nm	nm	nm		nm	nm		

1/ Determined by ANOVA, ANCOVA, or nonparametric ANOVA, as appropriate; see METHODS.
2/ See Appendix A for list of compounds included.
3/ Includes p,p'-DDT; o,p-, p,p'-DDD; and o,p-, p,p'-DDE.
4/ Includes toxaphene, chlordane, nonachlor, oxychlordane, hexachlorabenzene (HCB), and aldrin.
5/ PCB-1260 had been analyzed prior to 1984, so it was selected for statistical analysis.

was measured only in 1980, 1984, and 1985. Among those years, percent fat was lower in 1984 than in 1980 or 1985 (Appendix K-9).

The other biological measurements for which distinctions in mean values between specific years could be made were striping pattern and age. The striping pattern index, a possible characteristic for differentiating between genetic stocks, was lower (more solid striping) in 1978 and 1985 than in all other years (Appendix K-11). Finally, fish collected in the San Joaquin River were younger in 1980 and 1985 than in other years (Appendix K-13).

While ANOVA indicated that both percent eggs resorbed (Appendix K-5) and fork length (Appendix K-12) differed between years, the years where those differences occurred could not be detected with the a-posteriori test.

Before leaving the subject of annual differences in biological measurements, we note that "tapeworm lesions" were omitted from the analysis. Tapeworm lesions were coded differently by NMFS (1978-1983) and DFG (1984-1985) and this was not discovered until late in the analysis for this report. This problem will be corrected before the next report.

Fish from the San Joaquin River also showed significant differences between years for six of 11 pollutants (Table 3).

MAHs and AHs were measured in liver tissue in all years (Whipple et al. 1981). MAH burdens were lower in 1978, 1983, and 1984 than in other years and higher in 1981 than in other years (Appendix E). AHs were highest in 1978 and 1979 (Appendix E-2).

Trace elements with significant differences between years were only measured in 3 (chromium, mercury) or 4 (copper, zinc) years. The liver concentrations of both copper (Appendix J) and zinc (Appendix J-2) were lower in 1980 than in the other years. Copper was highest in 1985. Although only measured in 3 years, chromium concentrations appeared to be decreasing over time, with the lowest value in 1985 and the highest in 1981 (Appendix J-4). Mercury concentrations (Appendix J-5) were significantly different between years, but the a-posteriori test did not identify which year(s) differed.

For years when striped bass were collected from both the San Joaquin and Sacramento rivers (1979, 1980, 1984, 1985), only three variables were significantly different between the two collection sites. Fish from the Sacramento River were larger (greater fork length), older, and more solidly striped than San Joaquin River fish (Appendices K-12, K-13 and K-11).

The degree of association between pairs of variables was examined with correlation analysis (Table 4). Data points from all years at both collection sites were included in the analyses (roughly twice as many fish were collected at the Antioch site). Some patterns in the correlation matrix are apparent and lead to the following broad generalizations:

1. Parasites are more abundant in older fish and fish with higher levels of trace elements. Parasites are less abundant in fish with high levels of petroleum hydrocarbons and pesticides.

Table 4. Correlation matrix for variables measured from female striped bass collected in the Sacramento-San Joaquin Estuary 1978 - 1985. ns = not significant, $p > 0.05$.

Variable	All Parasites	Tapeworm Larvae	Tapeworm Rafts	Roundworm Larvae	% Eggs Resorbed	Egg Color	Mesentric Fat Abundance	% Fat in Liver	Skeletal Abnormality Severity	Striping Pattern	Fork Length	Age	MAH's	AH's	DDT and Metabolites	Other Pesticides	PCB-1260	Copper	Zinc	Cadmium	Chromium	Mercury	Selenium
All Parasites		0.70	0.60	0.67	-0.26	ns	ns	ns	ns	ns	0.44	0.37	ns	-0.16	-0.25	-0.26	ns	0.20	0.18	0.50	ns	0.33	0.34
Tapeworm Larvae			0.38	0.28	-0.29	ns	ns	ns	ns	ns	0.18	ns	ns	-0.29	-0.23	ns	ns	0.25	ns	0.51	ns	ns	0.33
Tapeworm Rafts				ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	-0.14	-0.13	ns	ns	ns	ns	0.35	ns	ns	ns
Roundworm Larvae					-0.19	ns	ns	ns	ns	ns	0.54	0.47	ns	ns	-0.22	-0.23	ns	ns	0.17	0.29	ns	0.40	0.28
% Eggs Resorbed						ns	0.15	ns	ns	ns	-0.26	-0.14	0.18	0.20	ns	ns	ns	ns	ns	ns	ns	ns	ns
Egg Color							ns	ns	ns	ns	ns	ns	-0.18	-0.15	ns	ns	ns	ns	ns	ns	0.21	ns	ns
Mesenteric Fat Abundance								0.46	-0.15	ns	-0.27	-0.34	-0.18	0.26	0.28	0.45	ns	ns	ns	ns	-0.39	-0.62	-0.34
% Fat in Liver									ns	ns	ns	ns	0.31	4/	0.76	0.77	0.44	ns	0.58	-0.26	-0.56	-0.46	-0.42
Skeletal Abnormality Severity										0.14	ns	ns	ns	ns	ns	ns	ns	ns	0.24	ns	0.40	0.35	0.24
Striping Pattern											ns	ns	ns	-0.19	ns	ns	ns	-0.24	0.18	ns	ns	ns	ns
Fork Length												0.71*	ns	ns	ns*	ns*	ns	ns*	0.24*	0.22*	ns	0.63*	0.29*
Age													ns	ns	ns*	ns*	ns	ns*	0.19*	0.29*	ns	0.60*	0.29*
MAHs[1/]														0.22	0.26	0.26	0.22	ns	ns	ns	0.38	ns	ns
AHs[1/]															ns	4/	ns	ns	0.21	ns	0.22	ns	4/
DDT and Metabolites[2/]																0.93*	0.39	-0.33*	-0.36*	-0.29*	ns	-0.20*	-0.36*
Other pesticides[3/]																	0.57	-0.34*	0.41*	-0.26*	-0.29	-0.39*	-0.39*
PCB-1260																		ns	ns	ns	ns	ns	ns
Copper																			0.72*	0.47*	ns	ns*	0.57*
Zinc																				0.43*	0.26	0.38*	0.43*
Cadmium																					ns	0.36*	0.61*
Chromium																						0.34	ns
Mercury																							0.52*
Selenium																							

*Parametric correlation. All others are nonparametric rank correlations (Spearman).
1/ See Appendix A for list of compounds included.
2/ Includes p,p'-DDT; o,p-, p,p'-DDD; o,p-, p,p'-DDE.
3/ Includes toxaphene, chlordane,nonachlor, oxychlordane, hexachlorabenzene (HCB) and aldrin.
4/ The two variables did not occur together in any of the fish collected.

2. Egg resorption is lower in older fish, and is associated with petroleum hydrocarbons.
3. If fish with high levels of body fat are in good condition, then those "healthy" fish tend to be young, have high levels of fat soluable pollutants (petroleum hydrocarbons, pesticides and PCB) and low levels of trace elements. Perhaps an advantage of being "fat" is that the lipophilic pollutants are bound in the fat and not mobilized into tissues where they might do damage.
4. Skeletal abnormalities are associated with high burdens of trace elements in liver tissue.
5. Older fish have higher levels of trace elements in the liver.
6. Organic pollutants tend to occur together, possibly because of their common fat solubility. Thus, fish with high levels of DDT and its metabolites in the liver are likely to have high liver concentrations of other pesticides.
7. Fish with high levels of pesticides tend to have low concentrations of trace elements.
8. Trace elements tend to occur together.

The many overlapping weak correlations (any one variable may be correlated with several others) indicate that multiple interactions occur among the variables measured. Multivariate statistical techniques, therefore, are more appropriate for analyzing these data than simple correlation analysis and will be

completed for future reports. However, data that are ranked, non-normally distributed, or incomplete (not all variables measured in all years) will limit the extent to which these techniques can be utilized.

CONCLUSIONS AND RECOMMENDATIONS

To summarize, DFG's first statistical analysis of striped bass health monitoring data has provided a useful if limited description of the fish collected. The data analysis will be improved for future reports by using less conservative a-posteriori tests when available and by pursuing a multivariate approach to data analysis. We will investigate adequacy of sample size and the extent to which we might use sample size to control the high degree of variability found in some variables.

This first data analysis determined that Clarksburg fish were older, larger, and more solidly striped than those from the Antioch area. The striping difference is striking considering that the Antioch collections are a mix of fish destined for both rivers, and it may indicate that different genetic stocks were sampled.

There is no indication that striped bass health has improved over the years examined. When differences could be discerned, the between year comparisons of Antioch fish did not show an overall improvement in condition, nor decrease in parasite load or pollutant burden (except for decreases in chromium and alicyclic

hexanes). High parasite and pollutant loads still justify concern over the health of the Sacramento-San Joaquin Estuary's striped bass population.

The basic goal of the project, to provide baseline data on striped bass pollutant burden, parasite load, and body condition, is being accomplished. The monitoring assures a consistant, long-term record of pollutant levels in a estuarine fish high in the food chain and is basic to further assessments of pollutant affects.

A long-term goal of the study is to develop an index of striped bass health. It is presently difficult to interpret the health of the striped bass population from the wide array of measures of fish condition, reproductive condition, parasite abundance, and pollutant burden. We recommend that the data be subjected to discriminant function analysis to try to obtain an objective composite index of health. Based on measurements from fish already collected, discriminant function analysis would be used to provide predictive equations that would classify newly collected fish as "healthy" or "unhealthy". However, this would be a relative index and of less value than one which incorporated, for instance, pollutant levels that have known affects on striped bass.

Controlled laboratory studies would have to be undertaken to identify cause-effect relationships (including synergistic or antagonistic) which may exist between the variables, and to determine how those relationships affect striped bass egg and larva survival. Correlation analysis and further multivariate

analysis (such as Principal Component Analysis) could serve to appropriately focus this work on variables which show strong associations in the field. Such studies are needed to make the best use of data collected thus far, and are essential to formulating a meaningful index of striped bass health.

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Appendix A

Detection limits for volatile petroleum hydrocarbon analyses of striped bass liver tissue, done for the Striped Bass Health Index.

Compound	Detection Limit ug/g (ppm) wet weight
Monocyclic Aromatic Hydrocarbons:	
Benzene	0.60
Toluene	0.15
Ethylbenzene	0.13
Para-xylene	0.10
Meta-xylene	0.24
Ortho-xylene	0.08
Alicyclic Hexanes:	
Cyclohexane	*
Methylcyclohexane	*
1,1; 1,3; and 1,4 Dimethylcyclohexane (DMCH)	*
1,2 and 1,4 DMCH	*
1,2 DMCH and Ethyl-cyclohexane	*

*Detection limits for the alicyclic hexanes are not available.

Appendix B

Digestion techniques, instrumentation, and detection limits for trace element analyses of striped bass tissue, done for the Striped Bass Health Index since 1984.

Element	Digestion Technique	Atomic Absorption Instrumental Analysis	Detection Limit in Liver Tissue ug/g (ppm) wet weight[3/]
Copper[1/]	HNO_3 wet pressure	Flame	0.02
Zinc[1/]	HNO_3 wet pressure	Flame	0.05
Cadmium[1/]	HNO_3 wet pressure	Graphite Furnace	0.01
Chromium[1/]	HNO_3 wet pressure	Graphite Furnace	0.02
Mercury[2/]	$H_2SO_4/KMnO_4$	Cold Vapor	0.02
Selenium[1/]	HNO_3 wet pressure	Graphite Furnace With a Nickel Matrix Modifier	0.2

1/ Adrian 1971
2/ Hatch and Ott 1967
3/ Detection limits are converted to dry weight using the percent moisture value for an individual fish.

Appendix C

Distribution of synthetic organic compounds (pesticides and PCBs) among two fractions of a standard florisil column and detection limits for analyses of striped bass liver tissue, done for the Striped Bass Health Index since 1984.

(0%) Fraction 1	Detection Limit in Liver Tissue ng/g (ppb) wet weight
HCH, alpha**	2
aldrin	5
*cis-chlordane**	5
chlordene, alpha	5
chlordene, gamma	5
DDE, o, p'	10
*DDE, p, p'	5
*DDMU, p, p'	15
*DDT, o, p'	10
*DDT, p, p'**	10
heptachlor	5
*HCB (hexachlorabenzene)	2
mirex	20
cis-nonachlor	5
*trans-nonachlor	50
PCB 1242	50
PCB 1248	50
PCB 1254	50
*PCB 1260	50
chlorpyrifos	10

(6%) Fraction 2	Detection Limit in Liver Tissue ng/g (ppb) wet weight
benefin	5
HCH, alpha**	2
HCH, beta	10
HCH, gamma	2
HCH, delta	2
carbophenothion	20
CDEC	5
chlorbenside	5
cis-chlordane**	5
*trans-chlordane	5
chloroneb	30
*DDD, o, p'	10
*DDD p, p'	10
*DDMS, p, p'	30
DDT, p, p'**	10
dichlofenthion	10
dicofol	100
endosulfan I -	15
ethion	20
fonofos	5
heptachlor epoxide	5
methoxychlor	30
*oxychlordane	5
PCNB	5
perthane	150
phenkapton	25
phorate	60
ronnel	5
strobane	200
toxaphene	100

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* = Compounds detected in 1985 samples.
** = Can be found in both 0% and 6% fractions.

Appendix D

Annual summary of environmental variables measured during striped bass collections in the Sacramento-San Joaquin Estuary.

Surface Water Temperature (^{o}C)

Location	Year	All Fish		
		N	Mean±SD	Range
San Joaquin River	1978	59	17.3 ± 1.14	15.5 - 19.3
	1979	42	18.1 ± 1.74	16.3 - 21.0
	1980	21	16.9 ± 0.67	16.0 - 18.0
	1981	12	18.8 ± 0.92	18.0 - 20.1
	1982	7	17.2 ± 1.09	15.5 - 18.5
	1983	16	14.2 ± 1.19	13.0 - 17.0
	1984	21	18.5 ± 1.26	16.0 - 22.0
	1985	23	17.6 ± 0.36	17.0 - 18.0
Sacramento River	1979	31	17.1 ± 1.98	14.0 - 19.3
	1980	22	16.5 ± 2.52	12.0 - 19.8
	1984	19	19.2 ± 1.46	17.0 - 21.0
	1985	20	17.5 ± 1.02	16.0 - 19.0

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Salinity (ppt)

Location	Year	All Fish N	All Fish Mean±SD	All Fish Range
San Joaquin River	1978	54	0.41 ± 0.056	0.3 - 0.5
	1979	21	2.60 ± 0.870	1.8 - 4.0
	1980	21	1.97 ± 0.128	1.8 - 2.2
	1981	7	0.34 ± 0.113	0.2 - 0.5
	1982	4	0.13 ± 0.050	0.1 - 0.2
	1983	8	0.11 ± 0.064	0.0 - 0.2
	1984	20	0.76 ± 0.383	0.5 - 2.2
	1985	23	0.64 ± 0.339	0.2 - 1.1
Sacramento River	1979	25	1.44 ± 0.166	1.2 - 1.7
	1980	22	1.51 ± 0.465	1.0 - 2.4
	1984	19	0.24 ± 0.121	0.1 - 0.4
	1985	20	0.11 ± 0.022	0.1 - 0.2

Appendix E

Annual summary of concentrations of volatile petroleum hydrocarbons in liver tissue of female striped bass collected in the Sacramento-San Joaquin Estuary. Concentrations in ug/g (ppm) wet weight. N = sample size. SD = standard deviation. ND = none detected. NM = not measured.

Monocyclic Aromatic Hydrocarbons (MAHs)[1/]

Location	Year	All Fish		Fish That Contained MAH			% of All Fish That Contained MAH
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978	57	0.33±0.518	46	0.40±0.549	0.02-3.29	81
	1979	40	0.17±1.045	1	6.61		3
	1980	19	0.05±0.082	7	0.13±0.092	0.01-0.25	37
	1981	12	2.10±1.193	12	2.10±1.193	0.43-5.24	100
	1982	7	0.22±0.553	2	0.78±0.986	0.08-1.47	29
	1983	15	0.46±1.682	2	3.43±4.378	0.34-6.53	13
	1984	21	ND				0
	1985	23	0.41±0.775	6	1.59±0.636	0.63-2.24	26
Sacramento River	1979	37	0.12±0.595	4	1.12±1.659	0.01-3.59	11
	1980	19	0.17±0.338	9	0.36±0.426	0.01-1.41	47
	1984	19	0.05±0.118	4	0.25±0.133	0.11-0.43	21
	1985	20	0.09±0.375	2	0.88±1.138	0.07-1.68	10

1/ See Appendix A for list of compounds included.

E-2

Alicyclic Hexanes (AHs)[1/]

Location	Year	All Fish		Fish That Contained AH			% of All Fish That Contained AH
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978	57	0.14±0.221	39	0.21±0.241	0.02-1.19	68
	1979	40	0.41±0.698	14	1.18±0.694	0.09-2.22	35
	1980		ND				
	1981	12	0.02±0.054	2	0.14±0.026	0.12-0.15	17
	1982		ND				
	1983	15	0.73±2.289	2	5.51±4.561	2.28-8.73	13
	1984		ND				
	1985		ND				
Sacramento River	1979	37	0.67±0.916	17	1.45±0.828	0.19-3.51	46
	1980	19	0.27±1.156	1	5.04		5
	1984		ND				
	1985		ND				

1/ See Appendix A for list of compounds included.

Appendix F

Annual summary of concentrations of DDT and its metabolites DDD and DDE in liver tissue of female striped bass collected in the Sacramento-San Joaquin Estuary. Concentrations in ug/g (ppm) wet weight. N = sample size. SD = standard deviation. ND = none detected. NM = not measured.

		DDT					
		All Fish		Fish That Contained DDT			% of All Fish That Contained DDT
Location	Year	N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978		NM				
	1979		NM				
	1980		NM				
	1981	12	0.010±0.0346	1	0.120		8
	1982		NM				
	1983		NM				
	1984	20	0.001±0.0041	2	0.013±0.0042	0.010-0.016	10
	1985	23	0.129±0.0315	7	0.042±0.0468	0.007-0.140	30
Sacramento River	1979		NM				
	1980		NM				
	1984	19	0.008±0.0122	6	0.025±0.0044	0.017-0.030	32
	1985	20	0.543±0.1987	6	0.181±0.3501	0.011-0.890	30

F-2

DDT & Metabolites DDD, DDE

Location	Year	All Fish		Fish That Contained DDT & Metabolites			% of All Fish That Contained DDT & Metabolites
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978		NM				
	1979		NM				
	1980		NM				
	1981	12	0.723±0.5687	12	0.723±0.5687	0.059-1.570	100
	1982		NM				
	1983		NM				
	1984	20	0.246±0.1427	20	0.246±0.1427	0.105-0.592	100
	1985	23	0.490±0.8535	23	0.490±0.8535	0.060-3.932	100
Sacramento River	1979		NM				
	1980		NM				
	1984	19	0.387±0.2541	19	0.387±0.2541	0.104-1.023	100
	1985	20	1.518±3.6135	20	1.518±3.6135	0.016-13.420	100

Appendix G

Annual summary of concentrations of other pesticides in liver tissue of female striped bass collected in the Sacramento-San Joaquin Estuary. Concentrations in ug/g (ppm) wet weight. N = sample size. SD = standard deviation. ND = none detected. NM = not measured.

Other Pesticides[1/]

Location	Year	All Fish		Fish That Contained Other Pesticides			% of All Fish That Contained Other Pesticides
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978		NM				
	1979		NM				
	1980		NM				
	1981		NM				
	1982		NM				
	1983		NM				
	1984	20	0.041±0.0251	20	0.041±0.0251	0.018-0.101	100
	1985	23	0.082±0.1153	23	0.082±0.1153	0.008-0.444	100
Sacramento River	1979		NM				
	1980		NM				
	1984	19	0.075±0.0634	19	0.075±0.0634	0.017-0.242	100
	1985	20	0.108±0.1625	19	0.113±0.1649	0.021-0.642	95

1/ "Other Pesticides" includes only toxaphene, chlordane, nonachlor, oxychlordane, hexachlorabenzene, and aldrin.

Appendix H

Annual summary of concentrations of PCB-1260 in liver tissue of female striped bass collected in the Sacramento-San Joaquin Estuary. Concentrations in ug/g (ppm) wet weight. N = sample size. SD = standard deviation. ND = none detected. NM = not measured.

PCB-1260

Location	Year	All Fish		Fish That Contained PCB-1260			% of All Fish That Contained PCB-1260
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978		NM				
	1979		NM				
	1980		NM				
	1981	12	1.51±1.688	7	2.58±1.409	0.87-5.00	58
	1982		NM				
	1983		NM				
	1984	20	0.47±0.175	20	0.47±0.175	0.20-0.83	100
	1985	23	0.40±0.294	23	0.40±0.294	0.07-1.40	100
Sacramento River	1979		NM				
	1980		NM				
	1984	19	0.66±0.374	19	0.66±0.374	0.19-1.20	100
	1985	20	0.44±0.372	19	0.47±0.367	0.11-1.40	95

APPENDIX J

Annual summary of concentrations of trace elements in liver tissue of female striped bass collected in the Sacramento-San Joaquin Estuary. Concentrations in ug/g (ppm) dry weight. N = sample size. SD = standard deviation. ND = none detected. NM = not measured.

Copper

Location	Year	All Fish		Fish That Contained Copper			% of All Fish That Contained Copper
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978		NM				
	1979		NM				
	1980	21	30±31.1	20	32±31.2	5-122	95
	1981	12	66±52.0	12	66±52.0	27-220	100
	1982		NM				
	1983		NM				
	1984	21	76±77.7	21	76±77.7	8-338	100
	1985	23	67±45.2	23	67±45.2	9-154	100
Sacramento River	1979		NM				
	1980	21	16±14.0	21	16±14.0	1-55	100
	1984	19	43±36.8	19	43±36.8	12-146	100
	1985	20	65±82.7	20	65±82.7	8-384	100

J-2

Zinc

Location	Year	All Fish		Fish That Contained Zinc			% of All Fish That Contained Zinc
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978		NM				
	1979		NM				
	1980	21	81±48.9	21	81±48.9	10-175	100
	1981	12	159±67.0	12	159±67.0	28-250	100
	1982		NM				
	1983		NM				
	1984	21	175±57.4	21	175±57.4	85-272	100
	1985	23	147±39.3	23	147±39.3	64-213	100
Sacramento River	1979		NM				
	1980	21	70±41.0	21	70±41.0	9-204	100
	1984	19	145±28.3	19	145±28.3	104-204	100
	1985	20	155±35.1	20	155±35.1	91-211	100

J-3

Cadmium

Location	Year	All Fish		Fish That Contained Cadmium			% of All Fish That Contained Cadmium
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978		NM				
	1979		NM				
	1980		NM				
	1981	12	2.62±2.729	12	2.62±2.729	0.29-9.40	100
	1982		NM				
	1983		NM				
	1984	21	2.90±1.808	21	2.90±1.808	0.28-8.40	100
	1985	23	3.69±2.335	23	3.69±2.335	0.20-8.60	100
Sacramento River	1979		NM				
	1980		NM				
	1984	19	2.18±1.174	19	2.18±1.174	0.97-5.20	100
	1985	20	3.94±3.034	20	3.94±3.034	0.10-12.40	100

J-4

Chromium

Location	Year	All Fish N	All Fish Mean±SD	Fish That Contained Chromium n	Fish That Contained Chromium Mean±SD	Fish That Contained Chromium Range	% of All Fish That Contained Chromium
San Joaquin River	1978		NM				
	1979		NM				
	1980		NM				
	1981	12	1.42±0.800	12	1.42±0.800	0.61-3.30	100
	1982		NM				
	1983		NM				
	1984	21	0.12±0.048	21	0.12±0.048	0.05-0.23	100
	1985	23	0.08±0.021	23	0.08±0.021	0.04-0.15	100
Sacramento River	1979		NM				
	1980		NM				
	1984	19	0.16±0.121	19	0.16±0.121	0.04-0.61	100
	1985	20	0.07±0.009	20	0.07±0.009	0.05-0.09	100

J-5

Mercury

Location	Year	All Fish		Fish That Contained Mercury			% of All Fish That Contained Mercury
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978		NM				
	1979		NM				
	1980		NM				
	1981	12	3.4±2.93	12	3.4±2.93	0.8-10.0	100
	1982		NM				
	1983		NM				
	1984	21	1.7±0.81	21	1.7±0.81	0.6-3.3	100
	1985	23	1.1±0.74	23	1.1±0.74	0.1-2.7	100
Sacramento River	1979		NM				
	1980		NM				
	1984	19	1.3±0.84	19	1.3±0.84	0.5-3.7	100
	1985	20	3.0±4.37	20	3.0±4.37	0.3-19.8	100

J-6

Selenium

Location	Year	All Fish		Fish That Contained Selenium			% of All Fish That Contained Selenium
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978		NM				
	1979		NM				
	1980		NM				
	1981	5	8.5±3.33	5	8.5±3.33	3.5-12.9	100
	1982		NM				
	1983		NM				
	1984	21	7.3±3.71	21	7.3±3.71	3.2-17.0	100
	1985	23	7.2±2.71	23	7.2±2.71	1.8-12.7	100
Sacramento River	1979		NM				
	1980		NM				
	1984	19	6.9±3.89	19	6.9±3.89	4.0-21.0	100
	1985	20	8.6±6.68	20	8.6±6.68	2.9-35.1	100

Appendix K

Annual summary of individual measures of female striped bass health from fish collected in the Sacramento-San Joaquin Estuary. N = sample size. SD = standard deviation. NM = not measured.

Severity Rank - All Parasites

Location	Year	All Fish		Fish That Contained Parasites			% of All Fish That Contained Parasites
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978	59	10.5±9.16	56	11.1±9.07	2-45	95
	1979	42	18.5±20.38	36	21.6±20.45	2-107	86
	1980	21	15.2±11.17	21	15.2±11.17	2-42	100
	1981	12	15.0±14.12	9	20.0±12.72	2-45	83
	1982	7	30.4±28.45	7	30.4±28.45	6-86	100
	1983	16	10.6±9.08	13	13.0±8.30	2-28	81
	1984	21	14.5±10.49	21	14.5±10.49	2-43	100
	1985	23	14.9± 8.04	21	16.3± 6.84	2-31	91
Sacramento River	1979	38	12.5±12.33	26	18.3±10.71	2-39	68
	1980	22	14.0±14.69	19	16.2±14.63	2-60	86
	1984	19	16.8±10.75	19	16.8±10.75	2-35	100
	1985	20	19.4±12.03	18	21.6±10.61	6-46	90

K-2

Tapeworm Larvae Severity Rank

Location	Year	All Fish		Fish That Contained Tapeworm Larvae			% of All Fish That Contained Tapeworm Larvae
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978	59	2.6±2.23	40	3.9±1.55	2-8	68
	1979	42	4.6±3.43	34	5.6±2.89	2-15	81
	1980	21	6.7±3.92	21	6.7±3.92	2-16	100
	1981	12	4.3±3.26	9	5.8±2.28	2-9	75
	1982	7	16.0±14.80	7	16.0±14.80	4-48	100
	1983	16	4.4±3.29	13	5.5±2.73	2-10	81
	1984	21	5.4±3.37	20	5.7±3.22	2-14	95
	1985	23	7.5±4.15	21	8.2±3.59	2-17	91
Sacramento River	1979	38	3.5±3.93	24	5.6±2.89	2-14	63
	1980	22	4.6±3.90	17	6.0±3.35	2-13	77
	1984	19	5.8±2.79	19	5.8±2.79	2-13	100
	1985	20	8.4±5.79	18	9.3±5.32	4-26	90

K-3

Tapeworm Larval Raft Severity Rank

Location	Year	All Fish		Fish That Contained Rafts			% of All Fish That Contained Rafts
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978	59	2.0±4.51	17	7.0±6.06	2-22	29
	1979	42	7.4±15.87	24	12.9±19.36	2-99	57
	1980	21	3.5±4.06	13	5.6±3.80	2-13	62
	1981	12	4.2±5.95	6	8.3±6.02	2-19	50
	1982	7	0.3±0.76	1	2.0		14
	1983	16	4.9±5.48	10	7.9±4.91	2-16	63
	1984	21	3.4±3.99	13	5.5±3.78	2-13	62
	1985	23	4.1±3.18	17	5.5±2.32	2-10	74
Sacramento River	1979	38	3.8±6.23	19	7.6±7.00	2-30	50
	1980	22	6.0±8.59	16	8.3±9.14	2-34	73
	1984	19	4.9±7.31	10	9.4±7.78	2-25	53
	1985	20	3.7±4.26	12	6.2±3.83	2-15	60

K-4

Roundworm Larvae Severity Rank

Location	Year	All Fish		Fish That Contained Roundworm Larvae			% of All Fish That Contained Roundworm Larvae
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978	59	5.8±5.46	48	7.2±5.20	2-20	81
	1979	42	5.0±8.49	23	9.2±9.71	2-36	55
	1980	21	4.8±7.22	12	8.3±7.90	2-22	57
	1981	12	6.5±9.34	5	15.6±7.89	2-24	42
	1982	7	11.6±12.49	5	16.2±11.84	2-32	71
	1983	16	1.2±1.68	6	3.2±0.98	2-4	38
	1984	21	4.6±5.90	11	8.7±5.46	2-20	52
	1985	23	3.0±3.70	13	5.2±3.49	2-12	57
Sacramento River	1979	38	5.2±8.48	18	10.9±9.48	2-34	47
	1980	22	3.4±8.43	7	10.6±12.65	2-38	32
	1984	19	5.6±6.62	13	8.2±6.52	2-20	68
	1985	20	6.7±7.26	14	9.5±6.93	2-22	70

K-5

Percent Eggs Resorbed

Location	Year	All Fish		Fish That Contained Resorbed Eggs			% of All Fish That Contained Resorbed Eggs
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978	52	35.8±42.02	43	43.3±42.57	1.6-100.0	83
	1979	39	24.9±39.33	27	36.0±43.00	0.7-100.0	69
	1980	19	13.4±27.06	12	21.2±31.90	5.3-100.0	63
	1981	12	24.5±35.82	10	29.4±37.52	5.3-100.0	83
	1982	3	0.0	0			0
	1983	15	18.6±33.82	11	23.3±36.57	1.1-100.0	73
	1984	20	1.8± 3.16	8	4.6± 3.54	1.5- 11.6	44
	1985	21	6.3±14.95	20	6.6±15.26	0.5- 69.6	95
Sacramento River	1979	36	30.2±41.27	27	40.2±43.28	27.7-100.0	75
	1980	19	3.6± 6.23	8	8.5± 7.23	1.9- 23.3	42
	1984	18	2.5± 5.62	6	7.6± 7.83	0.8- 17.5	33
	1985	20	3.5± 4.04	20	3.5± 4.04	0.2- 16.9	100

K-6

Percent Females Resorbing All Eggs

Location	Year	All Fish N	% of All Fish Resorbing All Eggs
San Joaquin River	1978	52	28.8
	1979	39	20.5
	1980	19	5.3
	1981	12	16.7
	1982	3	0
	1983	15	13.3
	1984	20	0
	1985	21	0
Sacramento River	1979	36	25.0
	1980	19	0
	1984	18	0
	1985	20	0

K-7

Egg Color Hue[1/]

Location	Year	All Fish N	All Fish Mean ± SD	All Fish Range
San Joaquin River	1978	59	11.7±2.95	4-15
	1979	42	12.3±3.18	4-16
	1980	21	11.0±4.80	1-16
	1981	12	12.0±4.39	3-16
	1982	7	12.6±4.76	3-16
	1983	16	12.3±4.09	3-16
	1984	21	12.2±4.54	1-16
	1985	23	11.6±3.13	3-15
Sacramento River	1979	38	12.2±3.01	3-16
	1980	21	11.0±4.67	3-16
	1984	19	13.7±3.38	1-16
	1985	20	13.2±1.95	9-16

1/ Coded 1 - 16 going from red to yellow to green.

K-8

Mesenteric Fat Abundance Rank

Location	Year	All Fish N	All Fish Mean±SD	All Fish Range
			NM	
San Joaquin River	1978			
	1979	11	2.5±1.29	1-4
	1980	20	1.9±0.67	1-4
	1981	12	1.3±0.65	1-3
	1982	7	1.9±0.69	1-3
	1983	16	2.6±0.89	1-4
	1984	21	2.4±0.92	1-4
	1985	23	3.0±0.95	1-4
Sacramento River	1979	12	3.1±1.08	1-4
	1980	16	2.4±1.21	1-4
	1984	19	2.6±0.96	1-4
	1985	20	2.5±0.89	1-4

K-9

Percent Fat in Liver

Location	Year	All Fish N	All Fish Mean±SD	All Fish Range
San Joaquin River	1978		NM	
	1979		NM	
	1980	3	9.2±1.03	8.3-10.4
	1981		NM	
	1982		NM	
	1983		NM	
	1984	20	3.3±2.11	1.1-10.0
	1985	23	8.2±8.86	2.0-36.0
Sacramento River	1979		NM	
	1980	8	19.8±9.38	12.1-36.1
	1984	19	4.6±3.09	1.5-12.4
	1985	20	7.1±5.21	2.0-23.0

K-10

Severity Rank - All Skeletal Abnormalities

Location	Year	All Fish		Fish with Skeletal Abnormalities			% of All Fish with Skeletal Abnormalities
		N	Mean±SD	n	Mean±SD	Range	
San Joaquin River	1978	58	0.2±0.77	5	2.6±0.89	2-4	9
	1979	42	1.7±3.11	17	4.1±3.74	2-17	40
	1980	21	1.6±2.69	9	3.7±3.08	2-11	43
	1981	12	4.1±3.48	10	4.9±3.21	2-13	83
	1982	7	1.6±3.36	2	5.5±4.95	2-9	29
	1983	16	2.4±2.63	9	4.3±1.94	2-7	56
	1984	21	1.0±1.45	8	2.6±1.06	2-5	38
	1985	23	1.0±1.51	8	2.9±1.00	2-4	35
Sacramento River	1979	38	1.3±1.94	16	3.2±1.72	2-9	42
	1980	22	1.1±1.58	9	2.8±1.20	2-5	41
	1984	19	1.5±1.43	11	2.6±0.67	2-4	58
	1985	20	0.7±1.17	6	2.3±0.82	2-4	30

K-11

Total Striping Rank

Location	Year	All Fish N	All Fish Mean±SD	All Fish Range
San Joaquin River	1978	49	8.5±1.75	6-12
	1979	42	9.9±1.45	7-12
	1980	21	10.5±1.40	8-12
	1981	12	9.0±1.41	7-11
	1982	7	9.1±1.46	7-11
	1983	16	10.1±0.96	9-12
	1984	21	10.1±1.30	8-12
	1985	23	8.8±1.27	7-11
Sacramento River	1979	38	8.9±1.31	6-12
	1980	22	10.0±1.20	8-12
	1984	19	9.7±1.24	8-12
	1985	20	9.5±1.15	8-11

K-12

Morphometrics

Location	Year	Fork Length (cm) N	Fork Length (cm) Mean ± SD	Fork Length (cm) Range	Standard Length (cm) N	Standard Length (cm) Mean ± SD	Standard Length (cm) Range	Depth* (cm) N	Depth* (cm) Mean ± SD	Depth* (cm) Range
San Joaquin River	1978	59	66.3±7.71	50.5-86.0						
	1979	42	64.3±8.64	48.5-83.5						
	1980	22	65.1±8.62	52.5-81.0						
	1981	12	76.8±13.22	56.5-100.0						
	1982	7	69.0±5.16	60.5-75.5						
	1983	16	62.8±7.06	48.5-77.0						
	1984	21	67.3±8.54	53.5-84.0	21	59.7±8.02	48.0-75.0	21	14.6±2.04	11.0-18.5
	1985	23	63.3±5.76	56.0-75.5	23	57.3±5.29	50.5-68.5	23	15.6±1.82	13.0-19.0
Sacramento River	1979	38	69.2±12.47	49.0-96.0						
	1980	22	64.5±11.46	45.5-91.5						
	1984	19	67.8±8.00	56.5-87.5	19	59.8±7.30	50.0-77.0	19	14.5±1.98	12.0-18.5
	1985	20	77.4±11.20	59.0-108.0	20	70.2±9.40	54.5-94.5	20	18.6±2.81	14.5-27.0

*Measured directly behind operculum, in front of pectoral fin

K-13

Age

Location	Year	All Fish N	All Fish Mean±SD	All Fish Range
San Joaquin River	1978	59	5.6±0.98	4-8
	1979	42	5.4±1.19	4-11
	1980	21	5.0±1.02	4-7
	1981	12	8.1±3.03	4-13
	1982	7	5.4±0.53	5-6
	1983	16	5.0±0.82	3-6
	1984	21	5.2±1.04	4-8
	1985	23	4.9±1.06	1-6
Sacramento River	1979	38	6.1±1.88	4-12
	1980	22	5.3±1.39	3-9
	1984	19	5.5±1.22	4-9
	1985	20	7.2±3.25	1-17

APPENDIX L

Annual summaries of miscellaneous individual measures of female striped bass health from fish collected in the Sacramento-San Joaquin Estuary. N = sample size. SD = standard deviation. NM = not measured.

L-1

Gonad Maturity Rank

Location	Year	All Fish N	All Fish Mean±SD	All Fish Range
San Joaquin River	1978	59	2.0±0.63	1-4
	1979	42	1.8±0.40	1-2
	1980	21	2.6±1.24	1-6
	1981	12	2.3±0.89	1-4
	1982	7	2.3±0.76	2-4
	1983	14	2.1±0.47	1-3
	1984	21	2.1±0.65	1-4
	1985	23	2.0±0.56	1-4
Sacramento River	1979	38	1.9±0.34	1-2
	1980	22	2.3±1.32	1-6
	1984	19	2.1±0.57	1-4
	1985	20	2.0±0.00	2-2

L-2

Age-Specific Total Fecundity[1/]

		Age (years)									
		4		5		6		7		8	
Location	Year	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD
San Joaquin River	1978	3	221,812±56,379	25	312,325±109,964	15	508,687±205,465	6	745,572±174,366	0	
	1979	5	224,925±135,219	16	458,070±234,003	13	765,274±341,357	2	252,595±206,376	0	
	1980	5	278,727±112,052	5	531,006±122,111	3	638,900±79,240	0		0	
	1981	0		2	422,690±270,857	1	753,706	0		1	1,003,909
	1982	0		4	580,113±213,117	2	793,052±25,382	0		0	
	1983	2	309,511±18,701	8	425,740±163,644	4	798,209±467,210	0		0	
	1984	3	569,145±234,305	9	562,288±243,108	4	766,112± 264,260	1	1,360,323	1	1,462,374
	1985	2	411,359±310,626	12	550,207±233,874	5	616,075± 116,596	0		0	
Sacramento River	1979	2	272,039±16,292	11	591,759±182,087	9	738,681±326,912	3	903,465±331,455	2	1,506,883±293,734
	1980	2	142,791±93,835	6	298,538±84,710	5	687,350±191,968	0		1	797,565
	1984	2	436,212±112,407	11	584,425±142,660	1	526,796	3	1,367,955±242,943	0	
	1985	1	226,478	3	587,449±241,235	6	830,309± 250,905	1	1,191,187	4	1,090,702±106,691

continued next page

1/Total number of eggs per fish; includes only maturing fish that could be aged.

L-2 (continued)

Mean Age-Specific Total Fecundity*

		Age (years)											
		9		10		11		12		13		17	
Location	Year	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD
San Joaquin River	1978	0		0		0		0		0		0	
	1979	0		0		1	1,365,942	0		0		0	
	1980	0		0		0		0		0		0	
	1981	2	1,198,350±388,475	0		0		2	1,235,415±181,977	1	1,375,334	0	
	1982	0		0		0		0		0		0	
	1983	0		0		0		0		0		0	
	1984	0		0		0		0		0		0	
	1985	0		0		0		0		0		0	
Sacramento River	1979	2	647,282±711,236	2	2,470,223±999,475	0		1	2,903,808	0		0	
	1980	0		0		0		0		0		0	
	1984	0		0		0		0		0		0	
	1985	0		2	1,537,903±591,268	1	2,026,537	0		0		1	2,006,188

*Total number of eggs per fish; includes only maturing fish that could be aged.

L-3

Gonadosomatic Index

Location	Year	N	GSI 1 Mean±SD	GSI 1 Range	GSI 2 Mean±SD	GSI 2 Range
San Joaquin River	1978	58	9.0±4.11	1.0-15.9	NM	
	1979	42	8.4±5.03	0.6-20.0	9.9±6.20	0.6-26.0
	1980	21	7.4±4.38	0.7-13.7	8.7±5.30	0.8-16.5
	1981	12	11.5±6.12	1.9-21.4	14.1±8.30	2.0-29.1
	1982	7	11.4±4.97	1.8-16.6	13.8±6.28	1.9-20.9
	1983	16	9.5±5.40	0.4-17.7	11.5±7.10	0.4-22.2
	1984	20	10.1±4.00	0.5-15.1	11.5±5.36	0.5-18.5
	1985	23	9.8±4.89	0.6-20.5	11.7±6.28	0.6-26.7
Sacramento River	1979	38	9.4±4.82	0.8-16.4	11.3±5.97	0.8-20.5
	1980	22	6.2±3.87	0.4-13.1	7.2±4.59	0.4-15.8
	1984	19	9.1±3.01	1.2-13.5	10.6±3.73	1.4-16.3
	1985	20	10.6±3.22	5.2-17.2	12.6±4.31	5.9-21.9

$$GSI_1 = \frac{\text{wet weight gonads}}{\text{wet weight whole fish}} \times 100$$

$$GSI_2 = \frac{\text{wet weight gonads}}{\text{wet weight fish - wet weight viscera}} \times 100$$

L-4

Liver Somatic Index

Location	Year	N	LSI_1 Mean±SD	LSI_1 Range	LSI_2 Mean±SD	LSI_2 Range
San Joaquin River	1978	54	1.2±0.30	0.7-1.9	NM	
	1979	42	1.2±0.33	0.6-2.2	1.3±0.38	0.7-2.5
	1980	21	1.1±0.27	0.7-1.9	1.3±0.32	0.8-2.2
	1981	12	0.9±0.27	0.6-1.5	1.1±0.28	0.8-1.6
	1982	7	1.0±0.16	0.8-1.2	1.1±0.18	0.9-1.4
	1983	16	1.3±0.44	0.6-2.1	1.5±0.53	0.8-2.7
	1984	21	1.1±0.31	0.7-1.8	1.2±0.36	0.8-2.1
	1985	23	1.2±0.34	0.6-2.1	1.3±0.39	0.8-2.3
Sacramento River	1979	38	1.3±0.41	0.6-2.3	1.5±0.60	0.7-3.5
	1980	22	1.3±0.34	0.4-1.8	1.4±0.41	0.4-2.1
	1984	19	1.2±0.27	0.7-1.9	1.3±0.39	0.9-2.7
	1985	20	1.2±0.27	0.6-1.6	1.4±0.30	0.7-1.9

$$LSI_1 = \frac{\text{wet weight liver}}{\text{wet weight whole fish}} \times 100$$

$$LSI_2 = \frac{\text{wet weight liver}}{\text{wet weight fish - wet weight viscera}} \times 100$$

Tapeworm Larvae Frequency

			Affected Fish																				
			Number of Reactions																				
			in Body Part											of Each Reaction Type									
Location	Year	N	internal body musculature	swim bladder	peritoneum	mesenteries	stomach	pyloric cecae	intestine	liver	spleen	gonad	fin	no reaction obvious	healed external wound	clouding	reddened	tissue hardened	tissue erosion	hemorrhaging	pressure necrosis	visceral adhesions
San Joaquin River	1978																						
	1979																						
	1980																						
	1981																						
	1982																						
	1983																						
	1984																						
	1985	21	3	19	6	22	1	0	8	9	10	1	0	29	0	0	0	0	4	0	46	0	
Sacramento River	1979																						
	1980																						
	1984																						
	1985	19	4	14	3	19	2	2	5	6	10	5	0	30	0	0	1	0	3	1	33	2	

Parasites may cause several host reactions to occur in a given body part, therefore a body part may be affected more than once and the same reaction may occur many times in a given fish.

L-6

Tapeworm Raft Frequency

Location	Year	N	Affected Fish: Number of Reactions in Body Part: internal body musculature	swim bladder	peritoneum	mesenteries	stomach	pyloric cecae	intestine	liver	spleen	gonad	fin	Affected Fish: Number of Reactions of Each Reaction Type: no reaction obvious	healed external wound	clouding	reddened	tissue hardened	tissue erosion	hemorrhaging	pressure necrosis	visceral adhesions
San Joaquin River	1978																					
	1979																					
	1980																					
	1981																					
	1982																					
	1983																					
	1984																					
	1985	18	17	1	0	15	0	2	0	1	0	1	0	3	1	1	1	0	1	0	7	23
Sacramento River	1979																					
	1980																					
	1984																					
	1985	13	9	2	0	9	0	3	0	3	0	1	0	3	0	0	1	0	0	2	5	17

Parasites may cause several host reactions to occur in a given body part, therefore a body part may be affected more than once and the same reaction may occur many times in a given fish.

L-7

Roundworm Larvae Frequency

Location	Year	N	Affected Fish: Number of Reactions in Body Part: internal body musculature	swim bladder	peritoneum	mesenteries	stomach	pyloric cecae	intestine	liver	spleen	gonad	fin	Affected Fish: Number of Reactions of Each Reaction Type: no reaction obvious	healed external wound	clouding	reddened	tissue hardened	tissue erosion	hemorrhaging	pressure necrosis	visceral adhesions
San Joaquin River	1978																					
	1979																					
	1980																					
	1981																					
	1982																					
	1983																					
	1984																					
	1985	14	1	2	1	13	1	1	0	4	2	5	0	25	0	0	1	0	0	0	4	0
Sacra-mento River	1979																					
	1980																					
	1984																					
	1985	14	4	5	4	11	1	0	2	9	5	11	0	29	0	0	1	0	7	0	13	2

Parasites may cause several host reactions to occur in a given body part, therefore a body part may be affected more than once and the same reaction may occur many times in a given fish.

APPENDIX M

Original data by year. Data for 1978-1983 provided by NMFS, Tiburon. Data for 1984 and 1985 collected by DFG, Stockton. Missing = not measured.

Key to Appendix M column headings:

NUMBER	FISH NUMBER	
LOCATION	COLLECTION LOCATION	2=ABOVE ANTIOCH, SAN JOAQUIN RIVER 5=CLARKSBURG, SACRAMENTO RIVER
MONTH	COLLECTION MONTH	
DAY	COLLECTION DAY	
TEMP_C	SURFACE TEMPERATURE (^{o}C) AT TIME OF COLLECTION	
SALINITY	SURFACE SALINITY (ppt) AT TIME OF COLLECTION	
AGE	AGE BY SCALES	
FL	FORK LENGTH (to nearest 0.5 cm)	
WW	TOTAL WET WEIGHT (gm)	
STRPdors	DORSAL STRIPING RANK, RANGE FROM 3=SOLID STRIPING TO 6=BROKEN STIPIING	
STRPvent	VENTRAL STRIPING RANK, RANGE FROM 3=SOLID STRIPING TO 6=BROKEN STRIPING	
STRPtot	TOTAL STRIPING RANK, RANGE FROM 6=SOLID STRIPING TO 12=BROKEN STRIPING	
MATURITY	GONAD MATURITY	1=IMMATURE 3=SPAWNING 2=MATURING 4=SPENT 5=RESTING/RECOVERING
WWgonad	WET WEIGHT OF GONADS (gm)	
FECUND	FECUNDITY	
RANK2EC	EGG COLOR HUE BY MUNSELL BOOK OF COLOR, RED TO YELLOW TO GREEN, CODED 1 TO 16.	
EGGSTAGE	HIGHEST PREDOMINANT EGG STAGE, RANGE FROM STAGE 1 TO STAGE 11.	
MAT_EGGS	NUMBER OF MATURING EGGS (stages 4 to 11)	
NUMB_RES	NUMBER OF RESORBING EGGS	
PERC_RES	PROPORTION OF MATURING EGGS THAT ARE RESORBING	

WWliver	WET WEIGHT OF LIVER (gm)
WWviscer	WET WEIGHT OF VISCERA (gm)
MES_FAT	MESENTERIC FAT ABUNDANCE, RANKED FROM 1=NONE TO 4=ABUNDANT
TOT_PAR	TOTAL SEVERITY RANK FOR ALL PARASITES COMBINED (see MEHTODS)
TAPELARV	TOTAL SEVERITY RANK FOR TAPEWORM LARVAE
TAPERAFT	TOTAL SEVERITY RANK FOR TAPEWORM RAFTS
RNDWLARV	TOTAL SEVERITY RANK FOR ROUNDWORM LARVAE
TOT_ABN	TOTAL SEVERITY RANK FOR ALL SKELETAL ABNORMALITIES
Cd	CADMIUM IN LIVER TISSUE (ppm dry weight)
Cr	CHROMIUM IN LIVER TISSUE (ppm dry weight)
Cu	COPPER IN LIVER TISSUE (ppm dry weight)
Hg	MERCURY IN LIVER TISSUE (ppm dry weight)
Zn	ZINC IN LIVER TISSUE (ppm dry weight)
Se	SELENIUM IN LIVER TISSUE (ppm dry weight)
MAH	MONOCYCLIC AROMATIC HYDROCARBONS[1/] IN LIVER TISSUE (ppm wet weight)
AH	ALICYCLIC HEXANES[1/] IN LIVER TISSUE (ppm wet weight)
LIPID	PERCENT LIPID IN LIVER TISSUE
PCB_1260	PCB-1260 IN LIVER TISSUE (ppm wet weight)
DDT pp	p,p' DDT IN LIVER TISSUE (ppb wet weight)
DDT_MET	DDT AND ITS METABOLITES[2/] IN LIVER TISSUE (ppb wet weight)
Other CHC	OTHER PESTICIDES[3/] IN LIVER TISSUE (ppb wet weight)

1/ See Appendix A for list of compounds included.
2/ Includes p,p'-DDT; o,p-, p,p'-DDD; and o,p-, p,p'-DDE.
3/ Includes toxaphene, chlordane, nonachlor, oxychlordane, hexachlorabenzene, and aldrin.

M - 1
1978 Striped Bass Data

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
5	2	4	14	16.700	.500	7
6	2	4	14	16.700	.500	6
7	2	4	14	15.800	.500	5
8	2	4	14	15.800	.400	6
9	2	4	20	15.700	.400	5
10	2	4	20	15.700	.400	6
12	2	4	20	15.600	.400	5
13	2	4	20	15.600	.400	5
14	2	4	20	15.500	.400	6
15	2	4	20	15.800	.400	6
16	2	4	20	15.800	.400	5
17	2	4	20	15.700	.400	5
18	2	4	20	15.700	.400	5
21	2	4	27	16.300	.300	5
22	2	4	27	16.100	.300	5
23	2	4	27	16.100	.300	5
24	2	4	27	16.100	.300	5
25	2	4	27	16.300	.300	4
27	2	4	27	16.300	.300	6
28	2	4	27	16.400	.300	6
30	2	5	4	16.900	.500	6
31	2	5	4	17	.400	7
32	2	5	4	17	.400	5
33	2	5	4	17.100	.400	6
34	2	5	4	17	MISSING	5
35	2	5	10	18	.500	5
36	2	5	10	17.600	.400	7
38	2	5	10	17.800	.400	6
39	2	5	10	18.100	.400	5
40	2	5	10	18.200	.400	5
41	2	5	10	18.100	.400	7
42	2	5	10	18.100	.400	5
43	2	5	12	17.300	.500	5
44	2	5	12	17.300	.500	6
45	2	5	12	17.300	.400	5
46	2	5	12	17.500	.400	6
47	2	5	12	17.500	.400	6
48	2	5	12	17.300	MISSING	6
49	2	5	12	17.300	MISSING	5
50	2	5	18	18.300	.400	4
51	2	5	18	18.300	.400	5
52	2	5	18	18.500	.400	5
53	2	5	18	18.400	.400	6
54	2	5	18	18.900	.400	6
55	2	5	18	18.800	.500	5
56	2	5	18	18.900	.500	4
57	2	5	18	18.900	.500	8
58	2	5	24	17.700	.400	6
59	2	5	24	18	.400	7
60	2	5	24	18	.400	7
62	2	5	24	18.100	.400	5
63	2	5	24	18.200	.400	7
64	2	5	24	18.200	MISSING	8
65	2	5	24	18.500	.400	5

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
66	2	5	24	18.500	.400	5
67	2	5	25	19.100	MISSING	7
70	2	5	25	19	.400	4
71	2	5	25	19	.400	8
72	2	5	25	19.300	.400	5

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
5	79	7258	MISSING	3	MISSING	2
6	66	4415	MISSING	MISSING	MISSING	2
7	66	4888	MISSING	MISSING	MISSING	2
8	68.500	3810	3	3	6	2
9	50.500	1901	MISSING	3	MISSING	1
10	70.500	4640	MISSING	3	MISSING	2
12	59	2774	MISSING	3	MISSING	2
13	67	3946	MISSING	3	MISSING	2
14	72.500	5325	MISSING	MISSING	MISSING	2
15	58	2515	3	3	6	2
16	64	3561	MISSING	3	MISSING	2
17	64.500	3533	MISSING	3	MISSING	2
18	73	5200	3	3	6	2
21	64	3962	6	5	11	2
22	66	4353	6	4	10	2
23	61	2840	5	5	10	2
24	57.500	2712	5	5	10	2
25	59	2735	4	3	7	2
27	64	3900	5	3	8	2
28	62.500	3478	6	4	10	2
30	70.500	4934	5	5	10	2
31	79.500	7350	5	3	8	2
32	60.500	2950	6	3	9	2
33	57	2799	4	4	8	2
34	69	4552	4	3	7	2
35	61.500	3108	6	6	12	2
36	76.500	6530	4	3	7	2
38	72.500	5030	4	3	7	2
39	59	2776	4	3	7	2
40	67	4312	5	3	8	2
41	69.500	4929	3	3	6	2
42	63.500	3853	6	6	12	2
43	68	4226	6	3	9	2
44	61.500	3143	4	4	8	2
45	61.500	3565	4	3	7	2
46	75	6031	4	4	8	2
47	67	4380	6	6	12	1
48	75	5765	4	4	8	2
49	62.500	3655	6	3	9	1
50	54	1764	4	3	7	1
51	65.500	3492	4	3	7	2
52	66	4230	6	3	9	2
53	60	2780	4	3	7	1
54	75.500	5904	4	3	7	2
55	61	2797	4	3	7	1
56	58.500	2868	5	5	10	2
57	86	7560	5	4	9	4
58	68	3090	6	5	11	4
59	77	5260	4	3	7	1
60	69	4590	6	6	12	2
62	61.500	3000	5	5	10	2
63	79	6370	6	4	10	2
64	82.500	6367	5	4	9	4
65	58	2392	6	4	10	2

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
66	63	3160	5	3	8	2
67	68	3900	4	5	9	2
70	54	2130	4	3	7	2
71	81	5665	5	3	8	4
72	58	2626	3	3	6	2

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH_NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
5	640.300	783727	13	6	66	0
6	487.600	491013	13	6	74	16
7	377.600	333043	15	6	54	4
8	332.500	312550	15	5	56	56
9	27.800	MISSING	10	4	54	54
10	418.500	451143	13	5	97	6
12	285.700	302271	13	6	63	63
13	288.100	287812	10	6	67	67
14	498	909348	13	5	62	62
15	141.600	245534	10	5	50	50
16	327.600	248976	13	6	50	50
17	190.400	311875	10	5	59	59
18	340.400	394864	15	5	62	62
21	387	285993	13	6	70	10
22	406.800	387274	15	5	21	21
23	263.900	187369	10	6	63	10
24	249.300	210908	15	7	79	18
25	157.100	211928	10	5	66	66
27	592.900	528274	13	7	62	5
28	415.200	340464	15	7	66	4
30	598.500	492566	13	7	72	16
31	1036	935508	15	6	54	1
32	311.200	360992	15	6	75	13
33	399.700	351736	15	8	70	4
34	412.900	504151	13	7	52	0
35	311.100	246080	10	8	56	0
36	827.900	814654	13	7	62	2
38	767.600	644016	13	8	MISSING	MISSING
39	265.200	253001	13	8	81	20
40	387.900	439879	10	6	59	59
41	718.500	694071	13	6	MISSING	MISSING
42	554.100	603415	13	7	65	0
43	344.900	362490	9	6	93	21
44	431.700	425656	10	8	67	6
45	325.600	307692	13	8	MISSING	MISSING
46	834.500	714332	15	6	77	3
47	697.600	304154	13	8	75	7
48	543.900	515617	10	6	62	1
49	79.200	99792	7	4	50	50
50	27.800	MISSING	5	MISSING	MISSING	MISSING
51	158.100	158891	13	5	56	56
52	396.800	298394	10	8	MISSING	MISSING
53	MISSING	MISSING	5	3	0	0
54	918.600	903902	10	6	79	3
55	28.100	MISSING	7	4	22	22
56	177.600	171029	13	6	68	13
57	202.400	MISSING	7	11	24	0
58	46.300	MISSING	4	11	69	0
59	138.500	MISSING	7	11	68	0
60	469.900	426669	13	5	68	13
62	286.200	349450	13	8	92	20
63	806.700	818801	13	5	68	10
64	134	MISSING	7	11	78	0
65	189.900	183064	15	6	74	11

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH_NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
66	455.400	401207	13	7	71	6
67	481.100	MISSING	13	7	61	1
70	221.900	282479	15	7	94	32
71	102.300	MISSING	6	11	37	0
72	209.900	289242	13	7	MISSING	MISSING

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH_NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
5	0	100.900	MISSING	MISSING	4	0
6	.216	52.900	MISSING	MISSING	6	0
7	.0741	88.200	MISSING	MISSING	5	0
8	1	49.200	MISSING	MISSING	0	0
9	1	31.600	MISSING	MISSING	4	0
10	.0619	73.100	MISSING	MISSING	4	0
12	1	29.800	MISSING	MISSING	0	0
13	1	55.400	MISSING	MISSING	3	0
14	1	70.200	MISSING	MISSING	6	0
15	1	45.800	MISSING	MISSING	23	0
16	1	55.400	MISSING	MISSING	4	0
17	1	56.300	MISSING	MISSING	4	0
18	1	71.100	MISSING	MISSING	9	0
21	.143	49.800	MISSING	MISSING	11	0
22	1	MISSING	MISSING	MISSING	10	0
23	.159	MISSING	MISSING	MISSING	11	5
24	.228	MISSING	MISSING	MISSING	2	0
25	1	MISSING	MISSING	MISSING	8	4
27	.0807	MISSING	MISSING	MISSING	2	0
28	.0606	34.800	MISSING	MISSING	2	0
30	.222	63.300	MISSING	MISSING	12	4
31	.0185	100.600	MISSING	MISSING	11	4
32	.173	41.800	MISSING	MISSING	6	3
33	.0571	36.300	MISSING	MISSING	8	4
34	0	57.600	MISSING	MISSING	6	3
35	0	33	MISSING	MISSING	3	3
36	.0323	85.100	MISSING	MISSING	20	4
38	MISSING	48.500	MISSING	MISSING	27	8
39	.247	25.600	MISSING	MISSING	7	3
40	1	73.600	MISSING	MISSING	18	4
41	MISSING	64.800	MISSING	MISSING	0	0
42	0	37.900	MISSING	MISSING	3	3
43	.226	58.800	MISSING	MISSING	2	2
44	.0896	38.200	MISSING	MISSING	14	4
45	MISSING	53	MISSING	MISSING	14	4
46	.0390	68.700	MISSING	MISSING	13	3
47	.0933	36.200	MISSING	MISSING	17	5
48	.0161	71.300	MISSING	MISSING	7	2
49	1	69.500	MISSING	MISSING	4	2
50	MISSING	15.100	MISSING	MISSING	2	2
51	1	64	MISSING	MISSING	3	3
52	MISSING	45.900	MISSING	MISSING	15	2
53	MISSING	27.700	MISSING	MISSING	27	5
54	.0380	57.400	MISSING	MISSING	31	3
55	1	25	MISSING	MISSING	10	3
56	.191	42.100	MISSING	MISSING	2	2
57	0	86.500	MISSING	MISSING	45	3
58	0	29.600	MISSING	MISSING	16	4
59	0	40.100	MISSING	MISSING	7	4
60	.191	59.200	MISSING	MISSING	30	7
62	.217	25.300	MISSING	MISSING	8	4
63	.147	68.300	MISSING	MISSING	9	5
64	0	69.600	MISSING	MISSING	24	8
65	.149	22.600	MISSING	MISSING	17	7

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH_NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
66	.0845	30.100	MISSING	MISSING	10	4
67	.0164	30.800	MISSING	MISSING	14	4
70	.340	20.600	MISSING	MISSING	4	2
71	0	40.200	MISSING	MISSING	25	5
72	MISSING	25.300	MISSING	MISSING	10	5

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
5	0	4	0	MISSING	MISSING	MISSING
6	0	6	0	MISSING	MISSING	MISSING
7	0	5	0	MISSING	MISSING	MISSING
8	0	0	0	MISSING	MISSING	MISSING
9	0	4	0	MISSING	MISSING	MISSING
10	0	4	0	MISSING	MISSING	MISSING
12	0	0	0	MISSING	MISSING	MISSING
13	0	3	0	MISSING	MISSING	MISSING
14	3	3	0	MISSING	MISSING	MISSING
15	20	3	0	MISSING	MISSING	MISSING
16	4	0	0	MISSING	MISSING	MISSING
17	0	4	0	MISSING	MISSING	MISSING
18	0	9	2	MISSING	MISSING	MISSING
21	0	11	0	MISSING	MISSING	MISSING
22	5	5	0	MISSING	MISSING	MISSING
23	2	4	0	MISSING	MISSING	MISSING
24	0	2	0	MISSING	MISSING	MISSING
25	0	4	2	MISSING	MISSING	MISSING
27	0	2	0	MISSING	MISSING	MISSING
28	0	2	0	MISSING	MISSING	MISSING
30	0	8	0	MISSING	MISSING	MISSING
31	0	7	0	MISSING	MISSING	MISSING
32	0	3	0	MISSING	MISSING	MISSING
33	0	4	0	MISSING	MISSING	MISSING
34	0	3	0	MISSING	MISSING	MISSING
35	0	0	3	MISSING	MISSING	MISSING
36	0	16	0	MISSING	MISSING	MISSING
38	3	16	0	MISSING	MISSING	MISSING
39	4	0	0	MISSING	MISSING	MISSING
40	0	14	2	MISSING	MISSING	MISSING
41	0	0	0	MISSING	MISSING	MISSING
42	0	0	4	MISSING	MISSING	MISSING
43	0	0	0	MISSING	MISSING	MISSING
44	0	10	0	MISSING	MISSING	MISSING
45	0	10	0	MISSING	MISSING	MISSING
46	3	7	0	MISSING	MISSING	MISSING
47	5	7	0	MISSING	MISSING	MISSING
48	0	5	0	MISSING	MISSING	MISSING
49	0	2	0	MISSING	MISSING	MISSING
50	0	0	0	MISSING	MISSING	MISSING
51	0	0	0	MISSING	MISSING	MISSING
52	2	11	0	MISSING	MISSING	MISSING
53	5	17	0	MISSING	MISSING	MISSING
54	13	15	0	MISSING	MISSING	MISSING
55	5	2	0	MISSING	MISSING	MISSING
56	0	0	0	MISSING	MISSING	MISSING
57	22	20	0	MISSING	MISSING	MISSING
58	0	12	0	MISSING	MISSING	MISSING
59	0	3	0	MISSING	MISSING	MISSING
60	11	12	0	MISSING	MISSING	MISSING
62	0	4	0	MISSING	MISSING	MISSING
63	0	4	0	MISSING	MISSING	MISSING
64	0	16	0	MISSING	MISSING	MISSING
65	8	2	0	MISSING	MISSING	MISSING

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH_NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
66	0	6	0	MISSING	MISSING	MISSING
67	4	6	0	MISSING	MISSING	MISSING
70	0	2	0	MISSING	MISSING	MISSING
71	0	20	0	MISSING	MISSING	MISSING
72	0	5	0	MISSING	MISSING	MISSING

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
5	MISSING	MISSING	MISSING	.246	.129	MISSING
6	MISSING	MISSING	MISSING	.508	.550	MISSING
7	MISSING	MISSING	MISSING	.289	.207	MISSING
8	MISSING	MISSING	MISSING	0	0	MISSING
9	MISSING	MISSING	MISSING	0	0	MISSING
10	MISSING	MISSING	MISSING	.382	.451	MISSING
12	MISSING	MISSING	MISSING	.440	0	MISSING
13	MISSING	MISSING	MISSING	.177	0	MISSING
14	MISSING	MISSING	MISSING	.266	.268	MISSING
15	MISSING	MISSING	MISSING	1.485	.750	MISSING
16	MISSING	MISSING	MISSING	.535	.190	MISSING
17	MISSING	MISSING	MISSING	3.285	.196	MISSING
18	MISSING	MISSING	MISSING	.252	.236	MISSING
21	MISSING	MISSING	MISSING	.713	0	MISSING
22	MISSING	MISSING	MISSING	.204	.0720	MISSING
23	MISSING	MISSING	MISSING	.209	.197	MISSING
24	MISSING	MISSING	MISSING	0	0	MISSING
25	MISSING	MISSING	MISSING	1.827	.164	MISSING
27	MISSING	MISSING	MISSING	0	0	MISSING
28	MISSING	MISSING	MISSING	.176	.0690	MISSING
30	MISSING	MISSING	MISSING	.177	.161	MISSING
31	MISSING	MISSING	MISSING	.141	.249	MISSING
32	MISSING	MISSING	MISSING	0	0	MISSING
33	MISSING	MISSING	MISSING	0	0	MISSING
34	MISSING	MISSING	MISSING	.306	0	MISSING
35	MISSING	MISSING	MISSING	0	0	MISSING
36	MISSING	MISSING	MISSING	.169	.318	MISSING
38	MISSING	MISSING	MISSING	.746	1.188	MISSING
39	MISSING	MISSING	MISSING	0	0	MISSING
40	MISSING	MISSING	MISSING	.284	.281	MISSING
41	MISSING	MISSING	MISSING	0	0	MISSING
42	MISSING	MISSING	MISSING	.541	0	MISSING
43	MISSING	MISSING	MISSING	0	0	MISSING
44	MISSING	MISSING	MISSING	.306	.259	MISSING
45	MISSING	MISSING	MISSING	.447	.0540	MISSING
46	MISSING	MISSING	MISSING	.208	.145	MISSING
47	MISSING	MISSING	MISSING	.269	.174	MISSING
48	MISSING	MISSING	MISSING	.0200	.0200	MISSING
49	MISSING	MISSING	MISSING	.760	.762	MISSING
50	MISSING	MISSING	MISSING	.233	.0400	MISSING
51	MISSING	MISSING	MISSING	.176	.105	MISSING
52	MISSING	MISSING	MISSING	.0820	.0220	MISSING
53	MISSING	MISSING	MISSING	.173	.123	MISSING
54	MISSING	MISSING	MISSING	.109	.151	MISSING
55	MISSING	MISSING	MISSING	.0200	0	MISSING
56	MISSING	MISSING	MISSING	.117	.0520	MISSING
57	MISSING	MISSING	MISSING	.386	.142	MISSING
58	MISSING	MISSING	MISSING	.331	.0210	MISSING
59	MISSING	MISSING	MISSING	.204	.0450	MISSING
60	MISSING	MISSING	MISSING	.293	.124	MISSING
62	MISSING	MISSING	MISSING	.0200	.0200	MISSING
63	MISSING	MISSING	MISSING	.256	.0800	MISSING
64	MISSING	MISSING	MISSING	.394	.0400	MISSING
65	MISSING	MISSING	MISSING	.0200	0	MISSING

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
66	MISSING	MISSING	MISSING	0	0	MISSING
67	MISSING	MISSING	MISSING	.251	.0400	MISSING
70	MISSING	MISSING	MISSING	MISSING	MISSING	MISSING
71	MISSING	MISSING	MISSING	.136	.0200	MISSING
72	MISSING	MISSING	MISSING	MISSING	MISSING	MISSING

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH_NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
5	MISSING	MISSING	MISSING	MISSING
6	MISSING	MISSING	MISSING	MISSING
7	MISSING	MISSING	MISSING	MISSING
8	MISSING	MISSING	MISSING	MISSING
9	MISSING	MISSING	MISSING	MISSING
10	MISSING	MISSING	MISSING	MISSING
12	MISSING	MISSING	MISSING	MISSING
13	MISSING	MISSING	MISSING	MISSING
14	MISSING	MISSING	MISSING	MISSING
15	MISSING	MISSING	MISSING	MISSING
16	MISSING	MISSING	MISSING	MISSING
17	MISSING	MISSING	MISSING	MISSING
18	MISSING	MISSING	MISSING	MISSING
21	MISSING	MISSING	MISSING	MISSING
22	MISSING	MISSING	MISSING	MISSING
23	MISSING	MISSING	MISSING	MISSING
24	MISSING	MISSING	MISSING	MISSING
25	MISSING	MISSING	MISSING	MISSING
27	MISSING	MISSING	MISSING	MISSING
28	MISSING	MISSING	MISSING	MISSING
30	MISSING	MISSING	MISSING	MISSING
31	MISSING	MISSING	MISSING	MISSING
32	MISSING	MISSING	MISSING	MISSING
33	MISSING	MISSING	MISSING	MISSING
34	MISSING	MISSING	MISSING	MISSING
35	MISSING	MISSING	MISSING	MISSING
36	MISSING	MISSING	MISSING	MISSING
38	MISSING	MISSING	MISSING	MISSING
39	MISSING	MISSING	MISSING	MISSING
40	MISSING	MISSING	MISSING	MISSING
41	MISSING	MISSING	MISSING	MISSING
42	MISSING	MISSING	MISSING	MISSING
43	MISSING	MISSING	MISSING	MISSING
44	MISSING	MISSING	MISSING	MISSING
45	MISSING	MISSING	MISSING	MISSING
46	MISSING	MISSING	MISSING	MISSING
47	MISSING	MISSING	MISSING	MISSING
48	MISSING	MISSING	MISSING	MISSING
49	MISSING	MISSING	MISSING	MISSING
50	MISSING	MISSING	MISSING	MISSING
51	MISSING	MISSING	MISSING	MISSING
52	MISSING	MISSING	MISSING	MISSING
53	MISSING	MISSING	MISSING	MISSING
54	MISSING	MISSING	MISSING	MISSING
55	MISSING	MISSING	MISSING	MISSING
56	MISSING	MISSING	MISSING	MISSING
57	MISSING	MISSING	MISSING	MISSING
58	MISSING	MISSING	MISSING	MISSING
59	MISSING	MISSING	MISSING	MISSING
60	MISSING	MISSING	MISSING	MISSING
62	MISSING	MISSING	MISSING	MISSING
63	MISSING	MISSING	MISSING	MISSING
64	MISSING	MISSING	MISSING	MISSING
65	MISSING	MISSING	MISSING	MISSING

M - 1 (CONTINUED)
1978 STRIPED BASS DATA

FISH_NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
66	MISSING	MISSING	MISSING	MISSING
67	MISSING	MISSING	MISSING	MISSING
70	MISSING	MISSING	MISSING	MISSING
71	MISSING	MISSING	MISSING	MISSING
72	MISSING	MISSING	MISSING	MISSING

M - 2
1979 Striped Bass Data

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
1	2	4	24	16.300	MISSING	4
2	2	4	24	16.300	MISSING	6
3	2	4	24	16.300	MISSING	6
4	2	4	24	16.300	MISSING	4
5	2	4	24	16.300	MISSING	4
6	2	4	24	16.300	MISSING	6
7	2	4	24	16.300	MISSING	5
8	2	5	1	16.300	MISSING	4
9	2	5	1	16.300	MISSING	6
10	2	5	1	16.300	MISSING	6
11	2	5	1	16.300	MISSING	5
12	2	5	1	16.300	MISSING	5
13	2	5	1	16.300	MISSING	4
14	2	5	1	16.300	MISSING	6
15	2	5	8	16.400	MISSING	6
16	2	5	8	16.400	MISSING	5
17	2	5	8	16.400	MISSING	7
18	2	5	8	16.400	MISSING	5
19	2	5	8	16.900	MISSING	6
20	2	5	8	16.900	MISSING	7
21	2	5	8	16.900	MISSING	5
22	2	5	15	20.200	4	6
23	2	5	15	20.200	4	6
24	2	5	15	20.200	4	5
25	2	5	15	20	3.800	4
26	2	5	15	20	3.800	11
27	2	5	15	19.900	3.400	6
28	2	5	15	19.900	3.400	6
29	2	5	22	18.900	2	5
30	2	5	22	19	1.900	6
31	2	5	22	19	1.900	5
32	2	5	22	19	1.900	5
33	2	5	22	19	1.800	4
34	2	5	22	19	1.900	5
35	2	5	22	19	1.900	5
36	2	5	30	19.900	2.300	5
37	2	5	30	20	2.200	5
38	2	5	30	19.800	2	5
39	2	5	30	19.800	2	5
40	2	5	30	19.800	2	5
42	2	6	1	20.700	2.200	6
44	2	6	1	21	2.200	6
1	5	4	26	MISSING	MISSING	7
2	5	4	26	MISSING	MISSING	6
3	5	4	26	MISSING	MISSING	5
4	5	4	26	MISSING	MISSING	5
5	5	4	26	MISSING	MISSING	7
6	5	4	26	MISSING	MISSING	6
7	5	4	26	MISSING	MISSING	6
8	5	5	3	16.200	MISSING	10
9	5	5	3	16.100	MISSING	5
10	5	5	3	16.100	MISSING	9
11	5	5	3	16.100	MISSING	5
12	5	5	3	16.200	MISSING	6

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
13	5	5	3	16.200	MISSING	5
14	5	5	10	14	1.200	8
15	5	5	10	14	1.200	5
16	5	5	10	14	1.200	5
17	5	5	10	14	1.200	5
18	5	5	10	14	1.300	6
19	5	5	10	14	1.300	6
20	5	5	10	14	1.300	4
22	5	5	17	18.200	1.700	4
23	5	5	17	18.200	1.700	6
24	5	5	17	18.200	1.700	7
25	5	5	17	18.200	1.700	6
26	5	5	17	18.200	1.700	5
28	5	5	24	18	1.500	5
29	5	5	24	18.100	1.500	5
30	5	5	24	18.500	1.500	6
31	5	5	24	18.500	1.500	4
32	5	5	31	18	1.400	5
33	5	5	31	18	1.500	8
37	5	6	4	19.200	1.400	12
38	5	6	4	19.200	1.400	9
39	5	6	4	19.200	1.400	5
41	5	6	4	19.200	1.400	4
42	5	6	4	19.200	1.400	4
43	5	6	4	19.300	1.400	7
44	5	6	4	19.300	1.400	10

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
1	53	1987	5	3	8	1
2	68.500	4894	4	3	7	2
3	63	3766	6	5	11	2
4	59	2952	5	3	8	2
5	50.500	1479	5	5	10	1
6	74.500	5931	6	6	12	2
7	64.500	4045	6	4	10	2
8	49	1651	6	6	12	2
9	64.500	3815	6	6	12	2
10	78	6550	6	4	10	2
11	57	2684	6	3	9	1
12	59.500	3100	6	5	11	2
13	54	2306	4	4	8	2
14	72.500	5326	6	4	10	2
15	72.500	4469	4	4	8	1
16	66.500	4086	5	5	10	2
17	72	5387	6	5	11	2
18	72.500	5653	5	5	10	2
19	73.500	5523	6	4	10	2
20	68	4550	6	6	12	2
21	64.500	3426	6	4	10	2
22	70	5059	4	3	7	2
23	67	3952	6	4	10	1
24	61	2864	6	4	10	2
25	48.500	1359	6	5	11	1
26	83.500	8389	4	4	8	2
27	70	4825	6	4	10	2
28	76.500	5858	4	4	8	2
29	60	3030	6	6	12	2
30	71.500	4820	6	6	12	1
31	59.500	2971	6	3	9	1
32	59	2845	6	4	10	2
33	53.500	2090	5	5	10	2
34	49	1696	5	4	9	2
35	67.500	4316	6	6	12	2
36	70.500	4956	5	5	10	2
37	65	3650	6	5	11	2
38	64	3382	6	4	10	2
39	62.500	3489	6	4	10	2
40	51.500	1713	6	3	9	2
42	73	4860	5	3	8	2
44	61	3259	6	6	12	2
1	76	6317	4	3	7	2
2	62.500	3710	6	3	9	2
3	57.500	2914	5	3	8	2
4	54.500	2443	6	4	10	2
5	82.500	8544	5	5	10	2
6	63.500	3729	4	3	7	2
7	68	4448	6	5	11	2
8	95	12490	5	3	8	2
9	66	4194	6	4	10	2
10	86	9212	4	3	7	2
11	70	4193	6	3	9	2
12	59.500	2793	5	4	9	2

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
13	72	5089	6	5	11	2
14	78.500	6919	6	5	11	2
15	67	4584	5	3	8	2
16	55.500	2234	6	4	10	2
17	67	4335	5	4	9	2
18	78	6475	4	4	8	2
19	61	2716	6	3	9	2
20	51.500	1930	4	3	7	1
22	49	1564	4	4	8	2
23	72.500	5136	5	4	9	2
24	71.500	4463	4	4	8	1
25	77	6545	5	5	10	2
26	56.500	3672	4	4	8	2
28	67.500	4132	6	4	10	2
29	70	4605	6	3	9	2
30	73.500	5929	4	4	8	2
31	52	1795	5	3	8	1
32	66.500	3622	6	4	10	2
33	91	12258	3	3	6	2
37	95	13620	6	3	9	2
38	75.500	6074	6	3	9	2
39	62.500	2818	6	4	10	1
41	56	2602	6	3	9	2
42	55	1902	4	4	8	1
43	70	4700	6	6	12	2
44	96	13166	6	3	9	2

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
1	12.500	16413	6	2	1	0
2	242.800	405233	12	4	95	95
3	406.900	341389	12	8	89	6
4	266.600	282596	15	7	MISSING	MISSING
5	9.600	MISSING	5	2	0	0
6	811	676374	14	7	103	4
7	348.300	459756	13	5	56	56
8	114	163932	13	6	78	2
9	665	768740	14	7	103	0
10	399	581742	13	8	152	1
11	15.400	MISSING	5	4	29	29
12	248.400	323665	13	6	92	4
13	260.500	321457	16	6	71	0
14	856	912496	14	7	66	0
15	72.500	MISSING	4	11	58	0
16	374.500	325066	11	8	67	0
17	301	398524	11	7	105	0
18	677	760271	15	7	84	6
19	876	976740	15	7	86	0
20	54.700	106665	14	6	100	100
21	286.300	350431	16	7	73	7
22	1011	1587270	12	8	83	3
23	63.300	MISSING	11	11	56	0
24	244.800	375523	13	7	81	26
25	25.100	MISSING	5	11	47	0
26	753	1365942	16	6	83	17
27	714	1093848	15	7	94	0
28	693	785169	15	7	53	0
29	171	321480	11	5	63	63
30	393	890538	11	5	116	116
31	93.800	413095	11	4	61	61
32	265.100	401096	13	6	94	13
33	203	340228	16	7	53	14
34	27.400	50690	13	7	83	4
35	74.800	111302	15	7	74	2
36	596	783144	11	7	MISSING	MISSING
37	434.100	554780	11	7	66	3
38	441.400	886773	14	8	88	4
39	327.800	713621	15	6	71	2
40	140.800	498432	10	7	74	74
42	582	477822	14	6	73	10
44	384	451200	12	7	82	4
1	668	790244	13	7	87	5
2	587	801255	11	MISSING	MISSING	MISSING
3	226.300	435628	10	5	83	83
4	335.200	324809	15	6	80	80
5	1323	1276695	16	7	71	0
6	269.700	505148	12	7	59	7
7	310.200	495389	13	7	94	7
8	1551	1763487	12	7	78	0
9	295	529230	12	5	54	54
10	859	1150201	12	6	81	10
11	364	575120	12	6	63	5
12	375.700	554158	16	7	81	5

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
13	716	747504	16	7	67	4
14	949	1299181	12	8	85	6
15	754	905554	13	7	68	0
16	205.800	437942	11	6	80	9
17	517	739310	13	6	95	18
18	863	951026	10	8	90	0
19	252.300	319160	14	7	73	2
20	41.700	MISSING	9	4	60	60
22	109.700	205688	13	5	50	50
23	710	1155170	12	7	52	0
24	61.700	MISSING	7	5	49	49
25	676	592176	14	7	57	0
26	370	515780	16	7	81	13
28	403	489242	13	8	64	5
29	603	809226	15	8	56	0
30	863	1274651	15	7	66	7
31	17.800	MISSING	3	6	34	34
32	69.600	MISSING	15	7	70	10
33	1436	1714584	13	7	73	7
37	1824	2903808	12	7	67	5
38	58	144362	13	5	83	83
39	28.700	MISSING	6	11	29	0
41	96.600	338390	13	5	61	61
42	14.700	MISSING	5	3	0	0
43	457	643456	15	7	108	24
44	1871	3176958	13	6	51	0

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
1	0	24.400	124	MISSING	29	11
2	1	109.300	605	MISSING	14	4
3	.0674	57.700	573	MISSING	15	5
4	MISSING	44.600	413	MISSING	5	5
5	MISSING	14.600	82	MISSING	6	3
6	.0388	80.100	110	MISSING	30	8
7	1	72.500	575	MISSING	14	6
8	.0256	26.800	195	MISSING	0	0
9	0	35	768	MISSING	8	4
10	.00658	81.700	963	MISSING	9	3
11	1	31.800	178	MISSING	20	5
12	.0435	46.400	393	MISSING	9	5
13	0	39	386	MISSING	0	0
14	0	52.600	1053	MISSING	13	5
15	0	49.600	408	MISSING	27	3
16	0	47.600	550	MISSING	107	5
17	0	51.600	814	MISSING	38	3
18	.0714	66.500	902	MISSING	21	6
19	0	51.500	1047	MISSING	13	9
20	1	50	717	MISSING	8	6
21	.0959	23	393	MISSING	16	4
22	.0361	40.300	1173	MISSING	23	7
23	0	37.800	216	2	32	5
24	.321	29.700	370	4	7	2
25	0	14.200	83	MISSING	4	4
26	.205	104.900	1159	2	31	4
27	0	37	857	MISSING	18	7
28	0	64.600	966	4	19	8
29	1	52	323	4	15	15
30	1	66.500	592	4	22	8
31	1	25.400	240	2	24	12
32	.138	30	370	MISSING	25	3
33	.264	22.800	278	MISSING	0	0
34	.0482	19.800	345	MISSING	0	0
35	.0270	33.200	845	MISSING	2	0
36	MISSING	42.700	758	3	29	0
37	.0455	36	58	MISSING	5	2
38	.0455	19.900	540	1	0	0
39	.0282	41.100	467	MISSING	7	3
40	1	17.300	193	1	0	0
42	.137	40.400	757	MISSING	81	5
44	.0488	34.600	505	1	32	7
1	.0575	71.600	883	MISSING	0	0
2	MISSING	53.800	706	MISSING	5	3
3	1	66.200	444	MISSING	0	0
4	1	54.900	485	MISSING	0	0
5	0	80.700	1620	1	23	5
6	.119	64.500	450	MISSING	6	0
7	.0745	78.300	517	MISSING	18	2
8	0	215.500	2207	MISSING	27	4
9	1	69.900	521	MISSING	7	3
10	.123	111.200	1328	MISSING	35	12
11	.0794	50.500	532	MISSING	9	5
12	.0617	31.600	496	MISSING	2	2

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
13	.0597	64	929	MISSING	11	3
14	.0706	62.800	1190	MISSING	20	12
15	0	41.200	904	MISSING	13	2
16	.113	29.300	295	MISSING	10	8
17	.189	50.200	680	MISSING	19	2
18	0	50.300	1805	MISSING	33	12
19	.0274	29.100	350	2	29	14
20	1	24.700	154	4	0	0
22	1	29.500	270	4	0	0
23	0	45.700	897	MISSING	11	4
24	1	59.200	279	MISSING	0	0
25	0	52.600	881	2	25	7
26	.160	71.900	500	4	36	6
28	.0781	31.700	533	MISSING	17	7
29	0	29.400	732	MISSING	20	3
30	.106	72.100	1081	2	0	0
31	1	21.200	1190	4	0	0
32	.143	36.900	316	3	8	5
33	.0959	175.100	2084	MISSING	26	0
37	.0746	183.300	2432	MISSING	0	0
38	1	71.700	810	MISSING	0	0
39	0	19.400	110	MISSING	0	0
41	1	38.700	267	4	0	0
42	MISSING	18.600	118	4	5	5
43	.222	34.400	611	3	22	3
44	0	162.200	2366	MISSING	39	5

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
1	14	4	0	MISSING	MISSING	MISSING
2	3	7	0	MISSING	MISSING	MISSING
3	10	0	3	MISSING	MISSING	MISSING
4	0	0	6	MISSING	MISSING	MISSING
5	3	0	0	MISSING	MISSING	MISSING
6	3	19	0	MISSING	MISSING	MISSING
7	0	8	6	MISSING	MISSING	MISSING
8	0	0	0	MISSING	MISSING	MISSING
9	0	4	3	MISSING	MISSING	MISSING
10	0	6	5	MISSING	MISSING	MISSING
11	15	0	0	MISSING	MISSING	MISSING
12	4	0	2	MISSING	MISSING	MISSING
13	0	0	0	MISSING	MISSING	MISSING
14	4	4	2	MISSING	MISSING	MISSING
15	14	10	0	MISSING	MISSING	MISSING
16	99	3	2	MISSING	MISSING	MISSING
17	0	35	0	MISSING	MISSING	MISSING
18	11	4	0	MISSING	MISSING	MISSING
19	0	4	0	MISSING	MISSING	MISSING
20	0	2	6	MISSING	MISSING	MISSING
21	12	0	2	MISSING	MISSING	MISSING
22	6	10	0	MISSING	MISSING	MISSING
23	25	2	2	MISSING	MISSING	MISSING
24	3	2	0	MISSING	MISSING	MISSING
25	0	0	0	MISSING	MISSING	MISSING
26	0	0	0	MISSING	MISSING	MISSING
27	7	4	2	MISSING	MISSING	MISSING
28	9	2	2	MISSING	MISSING	MISSING
29	0	0	0	MISSING	MISSING	MISSING
30	0	14	0	MISSING	MISSING	MISSING
31	12	0	0	MISSING	MISSING	MISSING
32	22	0	2	MISSING	MISSING	MISSING
33	0	0	0	MISSING	MISSING	MISSING
34	0	0	2	MISSING	MISSING	MISSING
35	2	0	17	MISSING	MISSING	MISSING
36	8	8	0	MISSING	MISSING	MISSING
37	3	0	0	MISSING	MISSING	MISSING
38	0	0	0	MISSING	MISSING	MISSING
39	0	4	6	MISSING	MISSING	MISSING
40	0	0	0	MISSING	MISSING	MISSING
42	15	36	0	MISSING	MISSING	MISSING
44	5	20	0	MISSING	MISSING	MISSING
1	0	0	0	MISSING	MISSING	MISSING
2	0	2	0	MISSING	MISSING	MISSING
3	0	0	0	MISSING	MISSING	MISSING
4	0	0	4	MISSING	MISSING	MISSING
5	0	18	0	MISSING	MISSING	MISSING
6	2	4	9	MISSING	MISSING	MISSING
7	10	6	0	MISSING	MISSING	MISSING
8	0	23	0	MISSING	MISSING	MISSING
9	4	0	3	MISSING	MISSING	MISSING
10	7	16	0	MISSING	MISSING	MISSING
11	2	2	2	MISSING	MISSING	MISSING
12	0	0	0	MISSING	MISSING	MISSING

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
13	2	6	2	MISSING	MISSING	MISSING
14	6	2	3	MISSING	MISSING	MISSING
15	9	2	4	MISSING	MISSING	MISSING
16	2	0	0	MISSING	MISSING	MISSING
17	17	0	0	MISSING	MISSING	MISSING
18	5	16	0	MISSING	MISSING	MISSING
19	15	0	0	MISSING	MISSING	MISSING
20	0	0	0	MISSING	MISSING	MISSING
22	0	0	3	MISSING	MISSING	MISSING
23	3	4	2	MISSING	MISSING	MISSING
24	0	0	0	MISSING	MISSING	MISSING
25	10	8	2	MISSING	MISSING	MISSING
26	30	0	0	MISSING	MISSING	MISSING
28	5	5	0	MISSING	MISSING	MISSING
29	3	14	0	MISSING	MISSING	MISSING
30	0	0	2	MISSING	MISSING	MISSING
31	0	0	3	MISSING	MISSING	MISSING
32	3	0	3	MISSING	MISSING	MISSING
33	0	26	2	MISSING	MISSING	MISSING
37	0	0	0	MISSING	MISSING	MISSING
38	0	0	4	MISSING	MISSING	MISSING
39	0	0	0	MISSING	MISSING	MISSING
41	0	0	0	MISSING	MISSING	MISSING
42	0	0	0	MISSING	MISSING	MISSING
43	10	9	0	MISSING	MISSING	MISSING
44	0	34	3	MISSING	MISSING	MISSING

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
1	MISSING	MISSING	MISSING	0	1.178	MISSING
2	MISSING	MISSING	MISSING	0	0	MISSING
3	MISSING	MISSING	MISSING	0	.0889	MISSING
4	MISSING	MISSING	MISSING	0	.148	MISSING
5	MISSING	MISSING	MISSING	0	.310	MISSING
6	MISSING	MISSING	MISSING	MISSING	MISSING	MISSING
7	MISSING	MISSING	MISSING	0	0	MISSING
8	MISSING	MISSING	MISSING	0	0	MISSING
9	MISSING	MISSING	MISSING	0	0	MISSING
10	MISSING	MISSING	MISSING	0	1.718	MISSING
11	MISSING	MISSING	MISSING	0	2.219	MISSING
12	MISSING	MISSING	MISSING	0	0	MISSING
13	MISSING	MISSING	MISSING	0	1.464	MISSING
14	MISSING	MISSING	MISSING	0	1.317	MISSING
15	MISSING	MISSING	MISSING	0	0	MISSING
16	MISSING	MISSING	MISSING	0	0	MISSING
17	MISSING	MISSING	MISSING	0	0	MISSING
18	MISSING	MISSING	MISSING	0	0	MISSING
19	MISSING	MISSING	MISSING	0	0	MISSING
20	MISSING	MISSING	MISSING	0	0	MISSING
21	MISSING	MISSING	MISSING	0	0	MISSING
22	MISSING	MISSING	MISSING	0	0	MISSING
23	MISSING	MISSING	MISSING	0	0	MISSING
24	MISSING	MISSING	MISSING	0	1.880	MISSING
25	MISSING	MISSING	MISSING	0	2.013	MISSING
26	MISSING	MISSING	MISSING	0	0	MISSING
27	MISSING	MISSING	MISSING	MISSING	MISSING	MISSING
28	MISSING	MISSING	MISSING	0	0	MISSING
29	MISSING	MISSING	MISSING	0	0	MISSING
30	MISSING	MISSING	MISSING	0	1.397	MISSING
31	MISSING	MISSING	MISSING	0	0	MISSING
32	MISSING	MISSING	MISSING	0	0	MISSING
33	MISSING	MISSING	MISSING	0	1.092	MISSING
34	MISSING	MISSING	MISSING	6.610	0	MISSING
35	MISSING	MISSING	MISSING	0	.447	MISSING
36	MISSING	MISSING	MISSING	0	0	MISSING
37	MISSING	MISSING	MISSING	0	0	MISSING
38	MISSING	MISSING	MISSING	0	0	MISSING
39	MISSING	MISSING	MISSING	0	0	MISSING
40	MISSING	MISSING	MISSING	0	0	MISSING
42	MISSING	MISSING	MISSING	0	1.292	MISSING
44	MISSING	MISSING	MISSING	0	0	MISSING
1	MISSING	MISSING	MISSING	0	1.867	MISSING
2	MISSING	MISSING	MISSING	0	.622	MISSING
3	MISSING	MISSING	MISSING	.326	0	MISSING
4	MISSING	MISSING	MISSING	0	.193	MISSING
5	MISSING	MISSING	MISSING	MISSING	MISSING	MISSING
6	MISSING	MISSING	MISSING	0	3.509	MISSING
7	MISSING	MISSING	MISSING	0	0	MISSING
8	MISSING	MISSING	MISSING	0	.659	MISSING
9	MISSING	MISSING	MISSING	3.588	1.261	MISSING
10	MISSING	MISSING	MISSING	0	0	MISSING
11	MISSING	MISSING	MISSING	0	1.574	MISSING
12	MISSING	MISSING	MISSING	0	0	MISSING

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
13	MISSING	MISSING	MISSING	0	1.425	MISSING
14	MISSING	MISSING	MISSING	0	0	MISSING
15	MISSING	MISSING	MISSING	0	1.768	MISSING
16	MISSING	MISSING	MISSING	.00670	0	MISSING
17	MISSING	MISSING	MISSING	0	0	MISSING
18	MISSING	MISSING	MISSING	0	0	MISSING
19	MISSING	MISSING	MISSING	0	0	MISSING
20	MISSING	MISSING	MISSING	0	1.447	MISSING
22	MISSING	MISSING	MISSING	.575	.973	MISSING
23	MISSING	MISSING	MISSING	0	0	MISSING
24	MISSING	MISSING	MISSING	0	0	MISSING
25	MISSING	MISSING	MISSING	0	0	MISSING
26	MISSING	MISSING	MISSING	0	0	MISSING
28	MISSING	MISSING	MISSING	0	0	MISSING
29	MISSING	MISSING	MISSING	0	0	MISSING
30	MISSING	MISSING	MISSING	0	0	MISSING
31	MISSING	MISSING	MISSING	0	.729	MISSING
32	MISSING	MISSING	MISSING	0	0	MISSING
33	MISSING	MISSING	MISSING	0	0	MISSING
37	MISSING	MISSING	MISSING	0	2.512	MISSING
38	MISSING	MISSING	MISSING	0	0	MISSING
39	MISSING	MISSING	MISSING	0	2.516	MISSING
41	MISSING	MISSING	MISSING	0	1.555	MISSING
42	MISSING	MISSING	MISSING	0	.789	MISSING
43	MISSING	MISSING	MISSING	0	1.216	MISSING
44	MISSING	MISSING	MISSING	0	0	MISSING

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
1	MISSING	MISSING	MISSING	MISSING
2	MISSING	MISSING	MISSING	MISSING
3	MISSING	MISSING	MISSING	MISSING
4	MISSING	MISSING	MISSING	MISSING
5	MISSING	MISSING	MISSING	MISSING
6	MISSING	MISSING	MISSING	MISSING
7	MISSING	MISSING	MISSING	MISSING
8	MISSING	MISSING	MISSING	MISSING
9	MISSING	MISSING	MISSING	MISSING
10	MISSING	MISSING	MISSING	MISSING
11	MISSING	MISSING	MISSING	MISSING
12	MISSING	MISSING	MISSING	MISSING
13	MISSING	MISSING	MISSING	MISSING
14	MISSING	MISSING	MISSING	MISSING
15	MISSING	MISSING	MISSING	MISSING
16	MISSING	MISSING	MISSING	MISSING
17	MISSING	MISSING	MISSING	MISSING
18	MISSING	MISSING	MISSING	MISSING
19	MISSING	MISSING	MISSING	MISSING
20	MISSING	MISSING	MISSING	MISSING
21	MISSING	MISSING	MISSING	MISSING
22	MISSING	MISSING	MISSING	MISSING
23	MISSING	MISSING	MISSING	MISSING
24	MISSING	MISSING	MISSING	MISSING
25	MISSING	MISSING	MISSING	MISSING
26	MISSING	MISSING	MISSING	MISSING
27	MISSING	MISSING	MISSING	MISSING
28	MISSING	MISSING	MISSING	MISSING
29	MISSING	MISSING	MISSING	MISSING
30	MISSING	MISSING	MISSING	MISSING
31	MISSING	MISSING	MISSING	MISSING
32	MISSING	MISSING	MISSING	MISSING
33	MISSING	MISSING	MISSING	MISSING
34	MISSING	MISSING	MISSING	MISSING
35	MISSING	MISSING	MISSING	MISSING
36	MISSING	MISSING	MISSING	MISSING
37	MISSING	MISSING	MISSING	MISSING
38	MISSING	MISSING	MISSING	MISSING
39	MISSING	MISSING	MISSING	MISSING
40	MISSING	MISSING	MISSING	MISSING
42	MISSING	MISSING	MISSING	MISSING
44	MISSING	MISSING	MISSING	MISSING
1	MISSING	MISSING	MISSING	MISSING
2	MISSING	MISSING	MISSING	MISSING
3	MISSING	MISSING	MISSING	MISSING
4	MISSING	MISSING	MISSING	MISSING
5	MISSING	MISSING	MISSING	MISSING
6	MISSING	MISSING	MISSING	MISSING
7	MISSING	MISSING	MISSING	MISSING
8	MISSING	MISSING	MISSING	MISSING
9	MISSING	MISSING	MISSING	MISSING
10	MISSING	MISSING	MISSING	MISSING
11	MISSING	MISSING	MISSING	MISSING
12	MISSING	MISSING	MISSING	MISSING

M - 2 (CONTINUED)
1979 STRIPED BASS DATA

FISH NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
13	MISSING	MISSING	MISSING	MISSING
14	MISSING	MISSING	MISSING	MISSING
15	MISSING	MISSING	MISSING	MISSING
16	MISSING	MISSING	MISSING	MISSING
17	MISSING	MISSING	MISSING	MISSING
18	MISSING	MISSING	MISSING	MISSING
19	MISSING	MISSING	MISSING	MISSING
20	MISSING	MISSING	MISSING	MISSING
22	MISSING	MISSING	MISSING	MISSING
23	MISSING	MISSING	MISSING	MISSING
24	MISSING	MISSING	MISSING	MISSING
25	MISSING	MISSING	MISSING	MISSING
26	MISSING	MISSING	MISSING	MISSING
28	MISSING	MISSING	MISSING	MISSING
29	MISSING	MISSING	MISSING	MISSING
30	MISSING	MISSING	MISSING	MISSING
31	MISSING	MISSING	MISSING	MISSING
32	MISSING	MISSING	MISSING	MISSING
33	MISSING	MISSING	MISSING	MISSING
37	MISSING	MISSING	MISSING	MISSING
38	MISSING	MISSING	MISSING	MISSING
39	MISSING	MISSING	MISSING	MISSING
41	MISSING	MISSING	MISSING	MISSING
42	MISSING	MISSING	MISSING	MISSING
43	MISSING	MISSING	MISSING	MISSING
44	MISSING	MISSING	MISSING	MISSING

M - 3
1980 Striped Bass Data

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
7	2	4	22	16	2	4
8	2	4	22	16	2	4
9	2	4	30	16	1.800	5
10	2	4	30	16	1.800	5
12	2	4	30	16	1.800	4
14	2	5	6	17	2	6
16	2	5	6	17	2	5
17	2	5	6	17	2.100	5
20	2	5	13	16.800	1.900	4
21	2	5	13	16.800	1.900	4
22	2	5	13	16.800	1.900	6
23	2	5	13	17	1.900	4
24	2	5	13	17	1.900	6
25	2	5	13	17	1.900	7
26	2	5	13	17	1.900	4
27	2	5	13	17	1.900	5
28	2	5	13	17.200	1.900	5
31	2	5	19	18	2.200	6
33	2	5	19	18	2.200	7
35	2	5	19	18	2.200	4
36	2	5	28	18	2.100	4
1	5	4	9	12	1.200	6
5	5	4	17	14.900	1.300	6
7	5	4	17	15	1.300	5
9	5	4	17	15	1.300	6
10	5	4	24	12.500	1.200	8
13	5	4	24	12.700	1.200	5
14	5	4	24	12.800	1	5
15	5	5	2	16	1.100	6
17	5	5	2	16	1.100	4
18	5	5	2	16	1.100	4
19	5	5	2	16	1.100	4
20	5	5	2	16	1.100	5
21	5	5	21	19	1.900	5
30	5	6	3	19	2.400	3
31	5	6	3	19	2.400	5
32	5	6	3	19	2.400	5
33	5	6	5	18.500	1.900	4
34	5	6	5	18.500	1.900	6
36	5	6	10	19.800	1.800	5
37	5	6	10	19.800	1.800	9
39	5	6	13	18.200	1.400	7
41	5	6	13	18.300	1.400	4

M - 3 (CONTINUED)
1980 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
7	61.500	3059	6	6	12	2
8	56	2840	6	5	11	2
9	68	4400	6	6	12	3
10	63	3677	6	5	11	2
12	55	2077	6	6	12	2
14	77	4968	6	6	12	4
16	67.500	3828	4	5	9	5
17	68.500	4433	4	5	9	2
20	58	2138	5	4	9	1
21	54.500	2101	6	5	11	2
22	69.500	4448	5	6	11	2
23	58.500	2510	6	6	12	6
24	72.500	4622	5	4	9	2
25	79.500	6329	6	6	12	4
26	57.500	2391	6	6	12	2
27	68.500	4670	6	4	10	2
28	69.500	4715	6	5	11	2
31	72.500	5159	5	4	9	2
33	81	6521	5	4	9	4
35	56.500	2293	4	4	8	2
36	52.500	1948	6	3	9	2
1	72	5263	6	6	12	2
5	72	5866	6	5	11	2
7	61	2924	5	4	9	2
9	79	6759	5	5	10	2
10	80	7068	4	4	8	2
13	62.500	3401	4	4	8	2
14	62	3115	6	4	10	2
15	63.500	3129	6	4	10	2
17	45.500	1170	6	5	11	2
18	58	2639	5	4	9	2
19	55	2103	4	4	8	2
20	59	2330	6	6	12	6
21	62.500	3490	5	4	9	2
30	48.500	1310	6	5	11	1
31	61	3060	5	6	11	2
32	70.500	4383	5	4	9	2
33	53	1776	6	4	10	1
34	81	6708	6	5	11	2
36	58	2795	5	5	10	2
37	91.500	8878	6	4	10	4
39	70	3749	5	5	10	6
41	53	1961	6	5	11	1

M - 3 (CONTINUED)
1980 STRIPED BASS DATA

FISH NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
7	366.400	458366	14	7	63	1
8	165	191730	10	8	55	3
9	481	478595	14	8	36	0
10	347	359145	13	6	46	46
12	248	315456	14	6	58	44
14	71	MISSING	4	11	19	0
16	59	MISSING	11	11	112	0
17	522	562194	14	8	40	0
20	15.800	MISSING	1	3	0	0
21	207.400	195786	14	7	60	4
22	536.200	563010	15	6	71	2
23	49	MISSING	5	11	58	0
24	632	721112	12	8	72	11
25	116.500	MISSING	3	11	47	0
26	106.900	MISSING	15	6	35	4
27	521.500	565306	10	8	68	7
28	501.300	689789	14	7	76	5
31	461.400	632579	16	6	57	2
33	161.400	MISSING	3	11	MISSING	MISSING
35	172.200	232298	16	5	68	0
36	113.600	MISSING	13	6	73	11
1	490.300	668279	16	6	33	0
5	445.200	654444	12	6	56	2
7	173.500	175235	15	6	57	0
9	696.800	884936	14	6	24	0
10	647.900	797565	12	6	52	1
13	267.700	290455	15	6	36	0
14	198.600	235937	14	5	38	0
15	410.700	395093	13	6	42	3
17	101.900	MISSING	11	5	60	0
18	130.100	131271	16	6	65	9
19	114.900	154311	14	5	47	5
20	37	MISSING	5	11	55	0
21	323.400	312728	16	7	43	10
30	8.400	MISSING	4	3	0	0
31	295	401200	13	5	54	2
32	375.300	375675	13	6	53	2
33	21.500	MISSING	3	3	27	0
34	695	834000	13	6	52	0
36	124	MISSING	MISSING	5	51	0
37	92.500	MISSING	3	11	27	0
39	15.100	MISSING	5	MISSING	MISSING	MISSING
41	8.500	MISSING	5	3	0	0

M - 3 (CONTINUED)
1980 STRIPED BASS DATA

FISH NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
7	.0159	33.200	475	1	4	4
8	.0546	54.500	368	MISSING	9	5
9	0	51.300	661	2	19	9
10	1	52.100	498	2	2	2
12	.759	23.200	339	2	4	2
14	0	47	277	2	13	11
16	0	48	220	2	7	5
17	0	52	701	2	27	5
20	MISSING	17.400	103	2	10	7
21	.0667	18.300	311	1	31	6
22	.0282	40.700	713	2	24	2
23	0	31.500	168	1	6	4
24	.153	45	796	2	2	2
25	0	49	357	1	26	16
26	.114	30.300	252	4	16	12
27	.103	62.500	722	2	23	8
28	.0658	46.700	657	2	27	10
31	.0351	54.700	681	2	8	6
33	MISSING	61.900	422	2	42	11
35	0	16.800	272	1	14	10
36	.151	23	200	2	5	3
1	0	74	709	1	37	3
5	.0357	92.100	790	4	60	9
7	0	30	276	2	3	3
9	0	106.100	1020	3	17	7
10	.0192	87.900	950	2	24	4
13	0	50.900	448	4	17	10
14	0	43.200	442	2	10	4
15	.0714	37.200	532	1	9	0
17	0	21	164	2	2	0
18	.138	26.400	300	MISSING	6	4
19	.106	28.600	207	2	9	6
20	0	22.700	223	1	0	0
21	.233	60.300	542	4	13	2
30	MISSING	12.500	70	MISSING	14	7
31	.0370	45.500	443	MISSING	0	0
32	.0377	61.200	578	MISSING	11	5
33	0	15.100	97	MISSING	7	4
34	0	54.800	912	2	0	0
36	0	34.800	297	4	12	7
37	0	97.500	534	MISSING	4	2
39	MISSING	15.800	131	1	39	13
41	MISSING	31.100	165	4	14	12

M - 3 (CONTINUED)
1980 STRIPED BASS DATA

FISH NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
7	0	0	4	MISSING	MISSING	6.130
8	4	0	2	MISSING	MISSING	0
9	6	4	0	MISSING	MISSING	8.570
10	0	0	2	MISSING	MISSING	17.800
12	0	2	0	MISSING	MISSING	11.300
14	0	2	0	MISSING	MISSING	30.400
16	2	0	0	MISSING	MISSING	17
17	11	11	0	MISSING	MISSING	50.800
20	3	0	0	MISSING	MISSING	73.200
21	0	19	2	MISSING	MISSING	61.500
22	0	22	6	MISSING	MISSING	12.700
23	2	0	2	MISSING	MISSING	7.190
24	0	0	2	MISSING	MISSING	21
25	6	4	0	MISSING	MISSING	16.700
26	2	2	0	MISSING	MISSING	14.900
27	8	7	0	MISSING	MISSING	12.800
28	13	4	0	MISSING	MISSING	11.600
31	0	2	2	MISSING	MISSING	63
33	10	21	11	MISSING	MISSING	122
35	4	0	0	MISSING	MISSING	67.500
36	2	0	0	MISSING	MISSING	5.140
1	34	0	2	MISSING	MISSING	7.240
5	13	38	0	MISSING	MISSING	6.720
7	0	0	2	MISSING	MISSING	21.600
9	0	10	0	MISSING	MISSING	12.400
10	8	12	0	MISSING	MISSING	25.500
13	2	5	0	MISSING	MISSING	22.900
14	6	0	0	MISSING	MISSING	54.900
15	9	0	0	MISSING	MISSING	15.100
17	2	0	0	MISSING	MISSING	8.880
18	2	0	0	MISSING	MISSING	12.900
19	3	0	0	MISSING	MISSING	1.470
20	0	0	0	MISSING	MISSING	24.300
21	7	4	4	MISSING	MISSING	4.290
30	4	3	0	MISSING	MISSING	17.400
31	0	0	2	MISSING	MISSING	6.130
32	6	0	2	MISSING	MISSING	18.400
33	3	0	2	MISSING	MISSING	18
34	0	0	0	MISSING	MISSING	2.090
36	5	0	4	MISSING	MISSING	MISSING
37	0	2	2	MISSING	MISSING	4.820
39	26	0	5	MISSING	MISSING	49
41	2	0	0	MISSING	MISSING	6.930

M - 3 (CONTINUED)
1980 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
7	MISSING	46	MISSING	0	0	MISSING
8	MISSING	23	MISSING	0	0	MISSING
9	MISSING	78.700	MISSING	.250	0	MISSING
10	MISSING	121	MISSING	0	0	MISSING
12	MISSING	97.800	MISSING	0	0	MISSING
14	MISSING	61.200	MISSING	.144	0	MISSING
16	MISSING	46.500	MISSING	.157	0	MISSING
17	MISSING	94.400	MISSING	.0193	0	MISSING
20	MISSING	87.600	MISSING	0	0	MISSING
21	MISSING	164	MISSING	.0901	0	MISSING
22	MISSING	65.300	MISSING	0	0	MISSING
23	MISSING	78.400	MISSING	0	0	MISSING
24	MISSING	10.100	MISSING	MISSING	MISSING	MISSING
25	MISSING	58.700	MISSING	.218	0	MISSING
26	MISSING	50.800	MISSING	0	0	MISSING
27	MISSING	33.400	MISSING	.0140	0	MISSING
28	MISSING	60.600	MISSING	0	0	MISSING
31	MISSING	175	MISSING	MISSING	MISSING	9
33	MISSING	141	MISSING	0	0	MISSING
35	MISSING	173	MISSING	0	0	8.330
36	MISSING	32.300	MISSING	0	0	10.360
1	MISSING	57.400	MISSING	.00600	0	MISSING
5	MISSING	38	MISSING	0	0	MISSING
7	MISSING	78.400	MISSING	0	5.039	MISSING
9	MISSING	79	MISSING	0	0	MISSING
10	MISSING	106	MISSING	0	0	MISSING
13	MISSING	83.900	MISSING	MISSING	MISSING	MISSING
14	MISSING	78.900	MISSING	0	0	MISSING
15	MISSING	81.700	MISSING	0	0	MISSING
17	MISSING	58.900	MISSING	.203	0	MISSING
18	MISSING	76.100	MISSING	1.414	0	MISSING
19	MISSING	39.500	MISSING	0	0	MISSING
20	MISSING	62.600	MISSING	.133	0	MISSING
21	MISSING	20.100	MISSING	0	0	36.100
30	MISSING	67.700	MISSING	MISSING	MISSING	MISSING
31	MISSING	46	MISSING	.594	0	21.500
32	MISSING	74.900	MISSING	.243	0	13.200
33	MISSING	83.200	MISSING	.168	0	MISSING
34	MISSING	110	MISSING	MISSING	MISSING	15.300
36	MISSING	MISSING	MISSING	0	0	32.200
37	MISSING	16.900	MISSING	0	0	12.400
39	MISSING	204	MISSING	.193	0	15.800
41	MISSING	8.550	MISSING	.273	0	12.100

M - 3 (CONTINUED)
1980 STRIPED BASS DATA

FISH NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
7	MISSING	MISSING	MISSING	MISSING
8	MISSING	MISSING	MISSING	MISSING
9	MISSING	MISSING	MISSING	MISSING
10	MISSING	MISSING	MISSING	MISSING
12	MISSING	MISSING	MISSING	MISSING
14	MISSING	MISSING	MISSING	MISSING
16	MISSING	MISSING	MISSING	MISSING
17	MISSING	MISSING	MISSING	MISSING
20	MISSING	MISSING	MISSING	MISSING
21	MISSING	MISSING	MISSING	MISSING
22	MISSING	MISSING	MISSING	MISSING
23	MISSING	MISSING	MISSING	MISSING
24	MISSING	MISSING	MISSING	MISSING
25	MISSING	MISSING	MISSING	MISSING
26	MISSING	MISSING	MISSING	MISSING
27	MISSING	MISSING	MISSING	MISSING
28	MISSING	MISSING	MISSING	MISSING
31	MISSING	MISSING	MISSING	MISSING
33	MISSING	MISSING	MISSING	MISSING
35	MISSING	MISSING	MISSING	MISSING
36	MISSING	MISSING	MISSING	MISSING
1	MISSING	MISSING	MISSING	MISSING
5	MISSING	MISSING	MISSING	MISSING
7	MISSING	MISSING	MISSING	MISSING
9	MISSING	MISSING	MISSING	MISSING
10	MISSING	MISSING	MISSING	MISSING
13	MISSING	MISSING	MISSING	MISSING
14	MISSING	MISSING	MISSING	MISSING
15	MISSING	MISSING	MISSING	MISSING
17	MISSING	MISSING	MISSING	MISSING
18	MISSING	MISSING	MISSING	MISSING
19	MISSING	MISSING	MISSING	MISSING
20	MISSING	MISSING	MISSING	MISSING
21	MISSING	MISSING	MISSING	MISSING
30	MISSING	MISSING	MISSING	MISSING
31	MISSING	MISSING	MISSING	MISSING
32	MISSING	MISSING	MISSING	MISSING
33	MISSING	MISSING	MISSING	MISSING
34	MISSING	MISSING	MISSING	MISSING
36	MISSING	MISSING	MISSING	MISSING
37	MISSING	MISSING	MISSING	MISSING
39	MISSING	MISSING	MISSING	MISSING
41	MISSING	MISSING	MISSING	MISSING

M - 4
1981 Striped Bass Data

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
3	2	5	19	18	.500	6
4	2	5	19	18	.500	8
5	2	5	19	18	.300	9
6	2	5	19	18	.300	9
7	2	5	19	18	.300	6
8	2	5	21	18.200	.300	12
9	2	5	21	18.100	.200	5
10	2	5	26	19.500	MISSING	13
11	2	5	26	19.500	MISSING	12
13	2	5	29	19.900	MISSING	5
14	2	5	29	20.100	MISSING	8
15	2	5	29	20	MISSING	4

M - 4 (CONTINUED)
1981 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
3	67	3672	5	4	9	4
4	85	7403	5	3	8	4
5	81	7144	4	3	7	2
6	77.500	7325	5	5	10	3
7	72.500	5757	6	4	10	2
8	91	9883	5	4	9	2
9	70	4441	6	5	11	2
10	100	12258	5	5	10	2
11	89.500	10896	4	3	7	2
13	58	2491	4	4	8	2
14	73.500	5275	6	5	11	2
15	56.500	2226	4	4	8	1

M - 4 (CONTINUED)
1981 STRIPED BASS DATA

FISH NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
3	68	MISSING	6	11	27	0
4	183.800	MISSING	3	11	32	0
5	1046	923657	14	6	84	9
6	1564	1473043	15	8	77	6
7	856	753706	14	7	70	70
8	1367.70	1106737	16	7	95	7
9	478.900	614215	14	7	97	15
10	1618	1375334	14	7	83	14
11	1600	1364092	12	7	57	3
13	183.300	231165	15	7	92	20
14	931.500	1003909	15	7	97	9
15	106.400	MISSING	6	4	93	93

M - 4 (CONTINUED)
1981 STRIPED BASS DATA

FISH NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
3	0	29.700	188	1	17	8
4	0	110.200	516	1	30	6
5	.107	91.900	1343	2	45	5
6	.0779	45	1958	1	0	0
7	1	40.800	1026	1	11	3
8	.0737	90.200	1784	1	19	7
9	.155	35.900	626	1	17	7
10	.169	100.100	2158	1	0	0
11	.0526	85.200	2004	1	28	5
13	.217	22.100	282	3	11	9
14	.0928	50.200	1148	1	0	0
15	1	29.200	196	2	2	2

M - 4 (CONTINUED)
1981 STRIPED BASS DATA

FISH NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
3	9	0	7	1.200	1.400	56
4	0	24	5	2.200	.880	45
5	19	21	3	2.200	1	49
6	0	0	4	.880	1.500	38
7	4	4	2	2.200	1	220
8	0	12	4	6.900	3.300	71
9	10	0	4	2.200	1.400	36
10	0	0	5	1.200	1	27
11	6	17	13	9.400	2.700	77
13	2	0	0	2.200	1.500	28
14	0	0	2	.560	.800	63
15	0	0	0	.290	.610	85

M - 4 (CONTINUED)
1981 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
3	1.300	160	8.970	2.203	0	MISSING
4	2.600	140	8.580	1.504	0	MISSING
5	3.200	140	MISSING	.986	0	MISSING
6	2.100	200	MISSING	.431	0	MISSING
7	2.400	190	MISSING	2.245	0	MISSING
8	9.999	210	12.870	2.733	0	MISSING
9	2	180	MISSING	2.377	0	MISSING
10	4.600	220	8.580	1.708	0	MISSING
11	8.500	250	3.510	1.776	0	MISSING
13	.800	42	MISSING	5.241	.118	MISSING
14	2.400	150	MISSING	2.546	0	MISSING
15	.920	28	MISSING	1.436	.154	MISSING

M - 4 (CONTINUED)
1981 STRIPED BASS DATA

FISH NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
3	3.500	0	1100	MISSING
4	5	0	900	MISSING
5	0	0	76	MISSING
6	0	120	1480	MISSING
7	1.300	0	127	MISSING
8	.870	0	59	MISSING
9	1.900	0	277	MISSING
10	0	0	338	MISSING
11	3	0	860	MISSING
13	2.500	0	1570	MISSING
14	0	0	1400	MISSING
15	0	0	490	MISSING

1982 Striped Bass Data

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
1	2	4	29	16.700	.100	6
2	2	5	4	16.900	.100	5
3	2	5	5	15.500	.100	6
4	2	5	5	16.500	.200	5
5	2	5	12	17.500	MISSING	5
6	2	5	20	18.500	MISSING	6
7	2	5	27	18.500	MISSING	5

M - 5 (CONTINUED)
1982 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
1	75.500	4994	5	3	8	4
2	60.500	2772	6	3	9	2
3	73.500	5709	6	5	11	2
4	67	4077	5	4	9	2
5	67.500	4277	6	5	11	2
6	72.500	5026	5	4	9	2
7	66.500	3707	4	3	7	2

M - 5 (CONTINUED)
1982 STRIPED BASS DATA

FISH NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
1	88.300	MISSING	3	11	36	0
2	231.700	344537	13	7	60	0
3	811	811000	16	7	63	0
4	510	501330	14	7	MISSING	MISSING
5	712	849416	16	7	MISSING	MISSING
6	704	775104	16	7	MISSING	MISSING
7	455.200	625170	10	8	MISSING	MISSING

M - 5 (CONTINUED)
1982 STRIPED BASS DATA

FISH_NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
1	0	45.100	306	1	32	13
2	0	33.400	341	2	6	4
3	0	52.400	1030	3	48	18
4	MISSING	46.600	664	2	12	10
5	MISSING	38	865	2	12	12
6	MISSING	37.900	879	2	86	48
7	MISSING	33.900	742	1	17	7

M - 5 (CONTINUED)
1982 STRIPED BASS DATA

FISH NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
1	0	13	0	MISSING	MISSING	MISSING
2	2	0	0	MISSING	MISSING	MISSING
3	0	24	0	MISSING	MISSING	MISSING
4	0	2	0	MISSING	MISSING	MISSING
5	0	0	2	MISSING	MISSING	MISSING
6	0	32	9	MISSING	MISSING	MISSING
7	0	10	0	MISSING	MISSING	MISSING

M - 5 (CONTINUED)
1982 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
1	MISSING	MISSING	MISSING	1.473	0	MISSING
2	MISSING	MISSING	MISSING	.0782	0	MISSING
3	MISSING	MISSING	MISSING	0	0	MISSING
4	MISSING	MISSING	MISSING	0	0	MISSING
5	MISSING	MISSING	MISSING	0	0	MISSING
6	MISSING	MISSING	MISSING	0	0	MISSING
7	MISSING	MISSING	MISSING	0	0	MISSING

M - 5 (CONTINUED)
1982 STRIPED BASS DATA

FISH NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
1	MISSING	MISSING	MISSING	MISSING
2	MISSING	MISSING	MISSING	MISSING
3	MISSING	MISSING	MISSING	MISSING
4	MISSING	MISSING	MISSING	MISSING
5	MISSING	MISSING	MISSING	MISSING
6	MISSING	MISSING	MISSING	MISSING
7	MISSING	MISSING	MISSING	MISSING

1983 Striped Bass Data

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
2	2	4	21	15.100	0	3
5	2	MISSING	MISSING	14.400	MISSING	5
6	2	4	26	14	.100	6
9	2	4	26	14.400	.100	5
10	2	4	28	13.900	.100	6
11	2	4	28	13.900	.100	4
12	2	5	3	13.500	.100	5
15	2	5	4	13.200	.200	5
16	2	5	4	13.200	.200	5
20	2	5	10	13	MISSING	4
21	2	5	10	13	MISSING	5
22	2	5	12	13.500	MISSING	6
25	2	5	12	13.500	MISSING	5
26	2	5	17	15	MISSING	5
35	2	5	24	16.500	MISSING	6
36	2	5	26	17	MISSING	5

M - 6 (CONTINUED)
1983 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
2	48.500	1465	5	4	9	1
5	69	4504	5	5	10	2
6	66.500	4397	6	5	11	2
9	64.500	3138	6	4	10	3
10	68	4054	6	4	10	2
11	54.500	2154	6	5	11	2
12	58.500	2295	6	5	11	2
15	67	3992	5	4	9	2
16	60.500	3135	6	3	9	2
20	53	2058	6	4	10	3
21	61.500	3124	5	4	9	2
22	77	5768	5	4	9	2
25	59.500	2356	6	5	11	MISSING
26	66.500	4213	5	5	10	2
35	68	4114	6	6	12	2
36	62	2717	6	5	11	MISSING

M - 6 (CONTINUED)
1983 STRIPED BASS DATA

FISH_NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
2	5.900	MISSING	3	2	MISSING	MISSING
5	227.200	413734	10	5	138	0
6	488.800	487203	14	6	80	0
9	208.200	345678	11	5	90	3
10	189.400	397479	12	4	132	132
11	186.600	296287	15	6	157	6
12	207.500	224808	16	6	184	51
15	354.400	539145	13	6	163	4
16	166.700	322765	11	5	145	145
20	340.200	322734	15	8	90	1
21	486	496468	14	8	130	4
22	869.900	1422649	16	8	203	29
25	207.500	319978	15	5	167	12
26	688.700	743347	16	7	60	6
35	727.100	885504	13	8	115	7
36	64.600	MISSING	3	30	43	0

M - 6 (CONTINUED)
1983 STRIPED BASS DATA

FISH_NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
2	MISSING	20.700	93	4	8	8
5	0	73.200	473	3	25	5
6	0	52.600	680	3	13	8
9	.0333	33.600	332	2	23	9
10	1	51.300	392	3	28	10
11	.0382	36.200	311	3	7	5
12	.277	23.200	300	3	7	3
15	.0245	57.600	557	2	6	2
16	1	65.200	372	3	16	6
20	.0111	43.300	460	4	2	2
21	.0308	21.300	579	1	0	0
22	.143	59.100	1331	2	17	5
25	.0719	26.600	307	3	12	6
26	.100	54	915	3	0	0
35	.0609	25.900	842	1	0	0
36	0	20.800	176	2	5	2

M - 6 (CONTINUED)
1983 STRIPED BASS DATA

FISH_NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
2	0	0	5	MISSING	MISSING	MISSING
5	16	4	7	MISSING	MISSING	MISSING
6	2	3	0	MISSING	MISSING	MISSING
9	12	2	0	MISSING	MISSING	MISSING
10	14	4	2	MISSING	MISSING	MISSING
11	0	2	0	MISSING	MISSING	MISSING
12	4	0	0	MISSING	MISSING	MISSING
15	4	0	0	MISSING	MISSING	MISSING
16	10	0	6	MISSING	MISSING	MISSING
20	0	0	6	MISSING	MISSING	MISSING
21	0	0	0	MISSING	MISSING	MISSING
22	8	4	0	MISSING	MISSING	MISSING
25	6	0	2	MISSING	MISSING	MISSING
26	0	0	5	MISSING	MISSING	MISSING
35	0	0	2	MISSING	MISSING	MISSING
36	3	0	4	MISSING	MISSING	MISSING

M - 6 (CONTINUED)
1983 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
2	MISSING	MISSING	MISSING	0	0	MISSING
5	MISSING	MISSING	MISSING	0	8.730	MISSING
6	MISSING	MISSING	MISSING	0	2.279	MISSING
9	MISSING	MISSING	MISSING	MISSING	MISSING	MISSING
10	MISSING	MISSING	MISSING	0	0	MISSING
11	MISSING	MISSING	MISSING	6.529	0	MISSING
12	MISSING	MISSING	MISSING	.338	0	MISSING
15	MISSING	MISSING	MISSING	0	0	MISSING
16	MISSING	MISSING	MISSING	0	0	MISSING
20	MISSING	MISSING	MISSING	0	0	MISSING
21	MISSING	MISSING	MISSING	0	0	MISSING
22	MISSING	MISSING	MISSING	0	0	MISSING
25	MISSING	MISSING	MISSING	0	0	MISSING
26	MISSING	MISSING	MISSING	0	0	MISSING
35	MISSING	MISSING	MISSING	0	0	MISSING
36	MISSING	MISSING	MISSING	0	0	MISSING

M - 6 (CONTINUED)
1983 STRIPED BASS DATA

FISH_NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
2	MISSING	MISSING	MISSING	MISSING
5	MISSING	MISSING	MISSING	MISSING
6	MISSING	MISSING	MISSING	MISSING
9	MISSING	MISSING	MISSING	MISSING
10	MISSING	MISSING	MISSING	MISSING
11	MISSING	MISSING	MISSING	MISSING
12	MISSING	MISSING	MISSING	MISSING
15	MISSING	MISSING	MISSING	MISSING
16	MISSING	MISSING	MISSING	MISSING
20	MISSING	MISSING	MISSING	MISSING
21	MISSING	MISSING	MISSING	MISSING
22	MISSING	MISSING	MISSING	MISSING
25	MISSING	MISSING	MISSING	MISSING
26	MISSING	MISSING	MISSING	MISSING
35	MISSING	MISSING	MISSING	MISSING
36	MISSING	MISSING	MISSING	MISSING

M - 7
1984 Striped Bass Data

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
1	2	5	3	16	.900	6
2	2	5	3	16	.900	5
3	2	5	7	17	MISSING	6
8	2	5	9	18	.600	6
9	2	5	9	18	.800	8
10	2	5	9	18	.800	4
11	2	5	9	18	.800	4
15	2	5	15	18	.500	4
16	2	5	15	18.500	.500	5
17	2	5	15	18.500	.500	5
18	2	5	15	19	.500	4
19	2	5	16	19	.500	5
20	2	5	16	19	.500	6
21	2	5	16	19	.500	6
26	2	5	21	18.500	.600	4
27	2	5	21	18.500	.600	5
28	2	5	21	18.500	.600	7
29	2	5	21	19	.900	5
30	2	5	21	19	.900	5
34	2	5	23	20	2.200	5
39	2	5	31	22	1	5
4	5	5	8	17	.100	7
5	5	5	8	17	.100	6
6	5	5	8	17	.100	5
7	5	5	8	17	.100	5
12	5	5	10	17.500	.100	5
13	5	5	14	20	.100	5
14	5	5	14	20	.100	5
22	5	5	17	19	.400	4
23	5	5	17	19	.400	5
24	5	5	17	19	.400	5
25	5	5	17	19	.400	5
31	5	5	22	20	.300	5
32	5	5	22	20	.300	5
33	5	5	22	20	.300	5
35	5	5	24	21	.200	9
36	5	5	24	21	.200	7
37	5	5	30	21	.300	7
38	5	5	30	21	.300	4
40	5	6	4	19	.300	5

M - 7 (CONTINUED)
1984 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
1	81	7608	6	5	11	2
2	60	3041	6	5	11	2
3	69.500	4232	6	5	11	2
8	74.500	4926	6	6	12	4
9	84	7890	6	3	9	2
10	53.500	1874	6	4	10	1
11	62	2591	6	3	9	4
15	62.500	3302	4	4	8	2
16	65	3728	6	4	10	2
17	61.500	3528	6	4	10	2
18	61	3179	6	5	11	2
19	65	3784	6	4	10	2
20	76	5737	6	5	11	2
21	72	5093	6	6	12	2
26	63.500	3690	4	4	8	2
27	57.500	2531	6	4	10	2
28	83	7720	5	4	9	2
29	64	3305	5	3	8	2
30	58.500	2574	6	6	12	2
34	67.500	3974	6	3	9	2
39	71	5204	6	5	11	2
4	76.500	5951	6	5	11	2
5	73.500	4698	4	4	8	2
6	61.500	2943	6	5	11	2
7	62.500	2973	6	5	11	2
12	67	3882	6	3	9	2
13	67	4061	6	4	10	2
14	66.500	3711	6	3	9	2
22	57	2517	6	3	9	2
23	67.500	4278	6	3	9	2
24	65	3575	6	5	11	2
25	63.500	3465	6	3	9	3
31	65.500	3677	4	4	8	2
32	61	2630	6	5	11	1
33	63.500	3379	6	3	9	2
35	87.500	8637	6	6	12	4
36	79.500	6752	6	3	9	2
37	78	6667	6	5	11	2
38	56.500	2304	5	3	8	2
40	69.500	3945	6	4	10	2

M - 7 (CONTINUED)
1984 STRIPED BASS DATA

FISH NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
1	479.400	1133781	14	5	190	0
2	239.100	452616	14	5	247	7
3	275.900	507932	15	6	94	0
8	112.400	MISSING	1	3	32	0
9	790.900	1462374	14	5	151	0
10	9.400	MISSING	2	2	0	0
11	MISSING	MISSING	2	3	18	0
15	497.600	364243	13	9	78	0
16	490	543900	14	8	139	12
17	479.100	626663	14	7	185	7
18	444	518592	14	7	109	0
19	428.500	575904	13	7	93	0
20	708.700	682478	11	8	100	3
21	596.500	740257	13	7	133	2
26	532	824600	15	7	156	0
27	258.800	281057	14	8	138	16
28	889.100	1360323	15	6	153	0
29	261.300	400312	15	6	75	2
30	213.900	324058	14	6	101	3
34	527.900	812966	14	6	88	0
39	643.900	1043118	16	6	152	0
4	595.500	1587008	14	5	121	0
5	414.800	526796	15	6	86	0
6	203.200	575462	10	5	168	2
7	240.900	375804	15	6	106	0
12	320.800	455857	13	6	186	6
13	426.400	811013	14	5	185	0
14	294	586236	16	5	132	23
22	244	356728	16	6	102	0
23	322.600	584229	15	5	75	0
24	341.400	469766	15	6	76	4
25	462.800	590533	13	7	119	1
31	444.500	860108	14	6	50	0
32	128.100	MISSING	14	7	114	20
33	274.500	588528	15	5	66	0
35	104.100	MISSING	1	3	0	0
36	786.500	1410194	16	6	153	0
37	881.100	1106662	16	8	77	0
38	310.100	515696	14	7	85	0
40	302.300	531141	14	5	129	0

M - 7 (CONTINUED)
1984 STRIPED BASS DATA

FISH NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
1	0	134.800	864	2	26	7
2	.0283	44.600	382	2	2	0
3	0	46.100	428	2	18	5
8	0	44.800	297	1	21	14
9	0	138.900	1205	2	28	3
10	MISSING	18.700	120	4	2	2
11	0	24.900	160	2	2	2
15	0	25	610	1	4	4
16	.0863	29.300	624	4	10	2
17	.0378	36.400	607	1	13	7
18	0	28.500	546	3	8	4
19	0	25.900	561	2	5	5
20	.0300	73.800	899	2	43	10
21	.0150	37	782	3	18	6
26	0	37	657	2	12	6
27	.116	17.600	353	3	15	8
28	0	88	1189	2	17	4
29	.0267	32.200	388	3	6	6
30	.0297	33.100	335	3	8	2
34	0	35.700	671	2	23	11
39	0	55	854	4	23	5
4	0	76.600	844	3	26	6
5	0	44.400	593	1	10	6
6	.0119	43.400	331	2	13	6
7	0	33.500	354	2	2	2
12	.0323	43.300	501	2	8	8
13	0	77.600	594	3	22	7
14	.174	45.200	444	4	4	2
22	0	19.600	220	3	35	8
23	0	55.400	510	4	15	7
24	.0526	37	469	2	30	7
25	.00840	27.700	583	2	8	4
31	0	43.100	583	4	27	9
32	.175	28.600	243	3	13	4
33	0	41.600	416	2	18	13
35	MISSING	109.200	1016	3	24	6
36	0	71.800	1095	1	27	6
37	0	48.500	1095	2	31	6
38	0	24.700	405	3	2	2
40	0	52.900	488	4	4	2

M - 7 (CONTINUED)
1984 STRIPED BASS DATA

FISH NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
1	0	15	0	1.400	.0600	18
2	0	2	0	1.300	.0500	37
3	13	0	0	2.300	.0700	47
8	2	5	3	4.400	.230	99
9	5	10	0	1.600	.0800	13
10	0	0	0	.280	.0600	30
11	0	0	0	8.400	.160	99
15	0	0	5	4.400	.100	189
16	8	0	0	3	.100	46
17	6	0	0	2.200	.180	60
18	0	4	0	3	.150	130
19	0	0	2	6	.130	338
20	13	20	2	4.200	.180	117
21	3	6	3	2.800	.170	84
26	3	0	0	2.500	.160	24
27	4	3	2	2.900	.100	135
28	3	10	2	1.800	.120	8
29	0	0	2	2.700	.120	14
30	6	0	0	1.500	.150	13
34	2	10	0	2.700	.0800	40
39	3	11	0	1.600	.0900	50
4	14	6	3	1.800	.0600	21
5	0	2	0	2.200	.150	32
6	7	0	2	1.400	.0400	23
7	0	0	3	1.900	.170	33
12	0	0	0	1.100	.180	21
13	8	7	0	1.200	.140	30
14	2	0	3	1.200	.610	24
22	25	2	2	5.200	.240	52
23	0	8	2	1.600	.100	27
24	19	4	0	3.100	.120	138
25	4	0	2	1.500	.100	146
31	0	18	0	2.900	.230	50
32	3	6	0	1.300	.130	32
33	2	3	3	1.800	.150	12
35	0	18	3	3.200	.190	37
36	10	11	4	3.800	.0800	18
37	0	20	0	3.900	.120	54
38	0	0	2	.970	.130	44
40	0	2	0	1.400	.100	25

M - 7 (CONTINUED)
1984 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
1	1.200	100	6.900	0	0	5.600
2	1.300	149	6.200	0	0	3.500
3	.700	137	5.800	0	0	4.800
8	3.200	198	9.500	0	0	1.500
9	2.500	103	5.800	0	0	4.300
10	1	85	3.200	0	0	MISSING
11	1.700	272	12	0	0	1.200
15	1.700	241	12.400	0	0	1.100
16	.900	198	4.900	0	0	2.500
17	1.300	222	5.500	0	0	3.500
18	1.100	208	6.700	0	0	2.800
19	1.500	239	17	0	0	1.800
20	3.300	257	15	0	0	1.200
21	2	234	5	0	0	2.600
26	.600	149	3.900	0	0	2.300
27	1.600	212	6.500	0	0	3.300
28	3.200	108	5.800	0	0	4.400
29	.900	131	5.700	0	0	2
30	1.500	128	4.900	0	0	5.500
34	2.200	158	7	0	0	1.900
39	1.400	138	4.400	0	0	10
4	1.300	104	4.300	0	0	12.400
5	.900	120	4.900	0	0	1.700
6	.600	198	4.600	0	0	6.500
7	.900	125	8.600	0	0	3.400
12	1	136	5.100	.230	0	2.800
13	1.400	121	4.600	.230	0	5.100
14	.600	129	4	.110	0	5.600
22	1.100	177	6.400	0	0	2.100
23	.500	127	5	0	0	7.300
24	1.900	138	12	0	0	1.700
25	1.100	204	5.100	0	0	2.800
31	.600	160	6.900	0	0	1.500
32	.600	142	5.200	.430	0	8.900
33	1.200	116	6	0	0	2.300
35	3.700	132	21	0	0	5.100
36	3.100	183	7.500	0	0	2.400
37	1.400	154	6.700	0	0	3.600
38	1	159	6.600	0	0	2.400
40	1.600	132	6.400	0	0	9.500

M - 7 (CONTINUED)
1984 STRIPED BASS DATA

FISH NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
1	.830	0	295	48
2	.450	0	192	42
3	.670	0	362	73
8	.330	0	105	18
9	.430	0	109	19
10	MISSING	MISSING	MISSING	MISSING
11	.650	0	166	38
15	.320	0	113	21
16	.510	10	370	101
17	.460	0	222	50
18	.280	0	152	21
19	.450	0	160	28
20	.420	0	114	22
21	.260	0	262	36
26	.350	0	115	22
27	.460	0	429	37
28	.620	0	313	37
29	.200	0	237	23
30	.450	0	495	80
34	.340	0	110	20
39	.820	16	592	87
4	1.100	30	629	124
5	.250	0	173	28
6	.960	17	441	116
7	.270	0	152	34
12	1.200	0	307	84
13	.860	0	300	76
14	.710	24	788	242
22	.410	0	104	23
23	1.200	0	534	96
24	.260	0	117	17
25	.930	0	344	50
31	.300	0	198	27
32	1.100	25	1023	156
33	.340	0	169	27
35	.570	0	277	35
36	.370	0	201	23
37	.410	0	350	37
38	.190	27	591	43
40	1.100	27	653	181

1985 Striped Bass Data

FISH NO.	LOCATION	MONTH	DAY	TEMP_C	SALINITY	AGE
1	2	4	18	18	.500	5
2	2	4	18	18	.500	6
7	2	4	24	17	1.100	6
8	2	4	24	17	1.100	5
9	2	4	24	17	1.100	6
10	2	4	24	17	1.100	5
11	2	4	29	17.500	1	4
12	2	4	29	17.500	1	5
13	2	4	29	17.500	1	6
14	2	4	29	17.500	1	5
23	2	5	8	18	.600	5
24	2	5	8	18	.600	4
26	2	5	8	18	.600	4
27	2	5	9	17.500	.600	5
28	2	5	9	17.500	.600	5
29	2	5	9	17.500	.600	5
34	2	5	15	17.500	.200	6
35	2	5	15	17.500	.200	5
36	2	5	15	17.500	.200	5
37	2	5	15	17.500	.200	1
42	2	5	21	18	.300	5
43	2	5	21	18	.300	5
44	2	5	21	18	.300	4
3	5	4	23	16	.100	8
4	5	4	23	16	.100	7
5	5	4	23	16	.100	10
15	5	4	30	17	.100	5
16	5	4	30	17	.100	6
17	5	4	30	17	.100	6
18	5	4	30	17	.100	6
19	5	5	6	17.500	.100	6
20	5	5	6	17.500	.100	5
21	5	5	6	17.500	.100	6
22	5	5	6	17.500	.100	11
30	5	5	13	17	.100	8
31	5	5	13	17	.100	8
32	5	5	13	17	.100	5
33	5	5	13	17	.100	4
38	5	5	20	19	.100	8
39	5	5	20	19	.100	1
40	5	5	20	19	.100	6
41	5	5	20	19	.100	10
45	5	5	28	19	.200	17

M - 8 (CONTINUED)
1985 STRIPED BASS DATA

FISH NO.	FL	WW	STRPdors	STRPvent	STRPtot	MATURITY
1	62	2885	6	4	10	2
2	65.500	3811	4	3	7	2
7	65	3700	5	4	9	2
8	58	2565	5	3	8	2
9	74.500	5231	4	3	7	2
10	63.500	3353	6	4	10	2
11	59.500	2447	5	3	8	1
12	59	2615	4	3	7	2
13	72	4620	5	4	9	2
14	62	3267	5	3	8	2
23	62.500	3016	5	3	8	4
24	56	2439	5	4	9	2
26	58	2695	6	4	10	1
27	71	5416	5	3	8	2
28	58.500	2620	5	4	9	2
29	60	2857	6	5	11	2
34	56	2524	6	5	11	2
35	68.500	4265	5	3	8	2
36	66	3905	4	3	7	2
37	75.500	6138	5	4	9	2
42	57.500	2466	6	4	10	3
43	65	3806	6	4	10	2
44	60.500	3107	6	4	10	2
3	81.500	7110	5	3	8	2
4	79	6153	4	5	9	2
5	94	10700	6	5	11	2
15	59	2728	6	5	11	2
16	77	6699	4	4	8	2
17	76.500	5598	6	4	10	2
18	76	5789	5	4	9	2
19	65.500	3560	6	5	11	2
20	68	3877	5	4	9	2
21	75	5025	6	4	10	2
22	90	9537	5	3	8	2
30	80	6480	6	5	11	2
31	84	6905	6	4	10	2
32	72	4809	5	3	8	2
33	63	3346	6	4	10	2
38	77	5754	6	4	10	2
39	73	5248	6	5	11	2
40	68	4145	5	4	9	2
41	82	7280	5	3	8	2
45	108	16569	6	3	9	2

M - 8 (CONTINUED)
1985 STRIPED BASS DATA

FISH NO.	WWgonad	FECUND	RANK2EC	EGGSTAGE	MAT_EGGS	NUMB_RES
1	210.900	277183	12	5	188	0
2	551.300	638236	11	7	217	2
7	379.300	769708	14	5	579	5
8	180.900	415625	12	6	519	4
9	440	567951	12	5	380	7
10	305.100	319338	13	8	352	11
11	14.200	MISSING	7	2	MISSING	MISSING
12	184.400	281944	15	5	340	2
13	498.100	651787	15	6	372	4
14	229.900	608975	8	5	620	3
23	73.400	MISSING	6	11	224	156
24	119.200	191713	15	5	389	29
26	16.300	MISSING	3	4	MISSING	MISSING
27	475.700	957295	11	5	694	5
28	294.100	345059	13	8	354	4
29	451.900	897942	13	MISSING	393	7
34	337.700	452695	15	8	491	12
35	542.700	616266	12	8	389	7
36	521.900	766548	14	7	349	3
37	836.600	750384	13	7	375	20
42	504.800	569905	13	9	341	43
43	442	546404	9	8	340	34
44	431.500	631005	11	6	446	37
3	747.700	1126069	13	6	343	3
4	569.600	1191187	11	5	369	2
5	1209.70	1955992	15	5	528	17
15	204	332744	13	6	390	7
16	345.600	1246546	9	5	674	5
17	613.600	839384	16	5	411	4
18	657.300	937174	13	6	335	21
19	311.100	590744	15	5	440	7
20	461.200	812467	10	5	381	11
21	510.900	806087	12	6	389	2
22	1642	2026537	15	7	411	1
30	703	955870	14	MISSING	384	8
31	640.100	1210333	10	MISSING	525	19
32	496.200	617136	14	MISSING	366	18
33	229.300	226478	15	8	343	58
38	931.800	1070535	14	8	348	1
39	339	610765	12	5	502	23
40	363	561919	14	5	453	35
41	947.100	1119813	13	7	299	26
45	2691.40	2006188	15	7	299	3

M - 8 (CONTINUED)
1985 STRIPED BASS DATA

FISH NO.	PERC_RES	WWliver	WWviscer	MES_FAT	TOT_PAR	TAPELARV
1	0	55.100	375	3	9	7
2	.00922	42.500	730	3	0	0
7	.00864	42.800	529	3	18	11
8	.00771	29.600	228	3	8	8
9	.0184	61.400	665	3	24	5
10	.0313	27.600	416	2	14	6
11	MISSING	21.700	134	4	25	17
12	.00588	39.300	315	3	31	15
13	.0108	41.600	650	2	20	9
14	.00484	49.200	390	4	14	9
23	.696	37.700	219	3	14	8
24	.0746	50.100	281	4	2	2
26	MISSING	26.900	197	4	13	10
27	.00721	67.500	730	4	16	4
28	.0113	23	386	2	11	4
29	.0178	31.500	568	2	9	7
34	.0244	25.200	432	1	0	0
35	.0180	35	690	3	23	8
36	.00860	38.900	665	3	21	8
37	.0533	80.200	1107	4	20	10
42	.126	14.100	574	1	17	11
43	.100	34.800	595	4	12	9
44	.0830	39.700	581	4	22	4
3	.00875	103.300	1059	2	21	11
4	.00542	77.500	866	3	28	7
5	.0322	117.600	1678	2	33	7
15	.0180	37.100	323	3	15	5
16	.00742	106.500	823	4	0	0
17	.00973	84	906	4	15	11
18	.0627	63.300	870	2	14	5
19	.0159	35	434	2	20	12
20	.0289	41.500	607	1	0	0
21	.00514	62.900	728	2	18	4
22	.00243	91.900	2054	2	36	11
30	.0208	68.900	959	2	29	11
31	.0362	86.400	954	2	15	7
32	.0492	51.900	692	3	13	4
33	.169	29.200	357	4	13	11
38	.00287	33	1117	2	46	26
39	.0458	71.400	575	2	6	4
40	.0773	67.300	576	4	10	10
41	.0870	65.500	1181	2	34	15
45	.0100	154	3407	2	22	6

M - 8 (CONTINUED)
1985 STRIPED BASS DATA

FISH NO.	TAPERAFT	RNDWLARV	TOT_ABN	Cd	Cr	Cu
1	0	2	0	1	.0700	30.900
2	0	0	0	.200	.150	20.600
7	5	2	2	4.800	.0700	78.300
8	0	0	2	4.800	.0700	17.800
9	9	10	0	3.500	.0800	58.100
10	4	4	3	3.600	.0800	52
11	8	0	0	5.100	.0600	51.400
12	8	6	0	3.300	.0700	9.200
13	4	7	0	6.800	.0800	131.400
14	5	0	4	5.400	.0600	71.600
23	0	2	0	4.900	.0700	154
24	0	0	0	.400	.0400	18.100
26	3	0	0	2.400	.0400	19.600
27	4	8	0	2.200	.0700	33.300
28	4	3	0	.500	.0800	50
29	2	0	2	4.200	.0900	79.100
34	0	0	4	.300	.0800	11.600
35	10	2	0	7.700	.0800	101
36	5	8	0	4.200	.0800	96.200
37	8	2	0	1.900	.0800	65
42	6	0	2	8.600	.0800	125
43	3	0	0	4.400	.0800	103
44	6	12	4	4.700	.0900	153
3	0	10	0	4.800	.0700	75.800
4	0	19	0	2.100	.0700	107.100
5	4	22	0	7.100	.0800	9.500
15	5	5	0	4.300	.0700	27.800
16	0	0	0	.100	.0500	10.600
17	0	2	0	.200	.0800	8
18	3	6	0	3.600	.0700	72.500
19	8	0	0	2	.0800	56
20	0	0	0	1.200	.0800	52.800
21	5	9	0	4.400	.0700	28.100
22	0	21	4	4	.0800	101
30	9	9	2	7.100	.0800	11
31	4	4	0	5.100	.0700	58.400
32	0	9	0	1	.0700	44.500
33	2	0	0	4.800	.0700	121
38	7	13	2	12.400	.0800	384
39	2	0	0	.100	.0700	11.200
40	0	0	2	2.800	.0600	77.100
41	15	2	2	4.200	.0800	33.500
45	10	2	2	7.400	.0900	17.500

M - 8 (CONTINUED)
1985 STRIPED BASS DATA

FISH NO.	Hg	Zn	Se	MAH	AH	LIPID
1	.400	127	9.400	1.270	0	14
2	.500	96	2.600	0	0	9
7	.600	138	8.200	0	0	3
8	.700	148	5.900	0	0	10
9	1.200	143	7.800	0	0	5
10	1.200	184	7.200	0	0	3
11	1.300	119	9.300	0	0	11
12	.600	118	4.900	0	0	10
13	2.300	169	12.700	0	0	2
14	.600	128	6.900	1.870	0	14
23	1.500	175	9.100	0	0	5
24	.100	69	1.800	0	0	36
26	.400	64	3.400	1.290	0	21
27	.500	142	5	0	0	6
28	2.500	213	6.700	.630	0	2
29	1.300	149	9.300	0	0	4
34	2.700	116	4.800	0	0	3
35	1.100	171	9.800	0	0	2
36	1.400	176	9.200	0	0	2
37	.600	176	4.900	0	0	6
42	2.500	196	8.600	0	0	2
43	1	202	7.100	2.240	0	3
44	1.200	162	10.600	2.230	0	6
3	2.400	183	8.300	1.680	0	8
4	1.700	171	12.100	0	0	5
5	6.300	126	7.500	0	0	7
15	.600	113	5.300	0	0	12
16	.700	135	2.900	0	0	23
17	1.400	124	5.600	0	0	4
18	.800	192	7.600	0	0	6
19	1.400	180	7.200	0	0	2
20	5.300	187	6.500	0	0	2
21	2.500	155	7.400	0	0	6
22	6.500	190	9.700	0	0	4
30	1.700	138	6.700	0	0	2
31	2.900	131	10.200	0	0	5
32	.600	202	4.100	0	0	10
33	.300	176	5.900	0	0	9
38	3	211	35.100	0	0	2
39	.800	102	4.800	.0700	0	9
40	.500	91	6	0	0	16
41	1.300	167	7.200	0	0	5
45	19.800	133	12	0	0	5

M - 8 (CONTINUED)
1985 STRIPED BASS DATA

FISH NO.	PCB_1260	DDTpp	DDT_MET	OtherCHC
1	.700	23	536	188
2	.120	52	355	74
7	.100	0	60	12
8	.310	0	356	67
9	.290	0	173	29
10	.420	0	127	33
11	.850	0	525	94
12	.500	0	417	72
13	.200	11	144	22
14	.550	0	467	88
23	.550	0	222	42
24	.400	50	2070	405
26	1.400	140	3932	444
27	.380	0	172	34
28	.240	0	120	16
29	.250	0	157	32
34	.0700	0	298	31
35	.150	0	84	8
36	.120	0	72	10
37	.380	13	421	86
42	.470	0	140	26
43	.280	0	104	17
44	.460	7	321	62
3	.560	0	407	55
4	.210	0	155	25
5	.540	0	298	26
15	.940	15	503	85
16	.380	890	10490	624
17	.160	0	171	38
18	.350	0	188	30
19	.110	0	135	21
20	0	0	16	0
21	.760	0	331	65
22	.460	0	132	23
30	.140	0	74	29
31	.400	0	275	58
32	.350	31	782	111
33	.220	0	361	68
38	1.200	0	385	67
39	.170	13	1376	165
40	1.400	11	620	118
41	.360	0	245	39
45	.160	125	13420	507