P U B L I C H E A R I N G

before

ASSEMBLY CONSERVATION AND NATURAL RESOURCES COMMITTEE

ASSEMBLY BILL NO. 3430

(Regulates the Taking of Menhaden)

May 23, 1990
John A. Taylor Pavilion
Belmar, New Jersey

MEMBERS OF COMMITTEE PRESENT:

Assemblyman Daniel P. Jacobson, Vice Chairman
Assemblyman Joseph A. Mecca

ALSO PRESENT:

Assemblyman John A. Villapiano
District 11

Leonard J. Colner
Office of Legislative Services
Aide, Assembly Conservation and
Natural Resources Committee

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Hearing Recorded and Transcribed by
Office of Legislative Services
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Hearing Unit
State House Annex
CN 068
Trenton, New Jersey 08625

New Jersey State Legislature
ASSEMBLY CONSERVATION
AND NATURAL RESOURCES COMMITTEE
STATE HOUSE ANNEX, CN-068
TRENTON, NEW JERSEY 08625-0068
(609) 292-7676

NOTICE OF A PUBLIC HEARING

The Assembly Conservation and Natural Resources Committee will hold a public hearing on:

A-3430 (Jacobson/Villapiano) Regulates taking of menhaden.

The hearing will be held on *Wednesday, May 23, 1990, at 7:30 p.m. at the John A. Taylor Pavilion, 5th Avenue and Ocean Avenue, Belmar, New Jersey.*

The public may address comments and questions to Jeffrey T. Climpson or Leonard J. Colner, Committee Aide, and persons wishing to testify should contact Deborah Del Vecchio, secretary at (609) 292-7676. Those persons presenting written testimony should provide 10 copies to the committee on the day of the hearing.

DIRECTIONS:

From Trenton, take I-195 East. At its terminus, it will turn into Route 138 (formerly Route 38). Continue on Route 138 until you intersect Route 35 at the terminus of Route 138. Take Route 35 North. At about 5th traffic light, turn right onto 8th Avenue. Continue on 8th Avenue for 7 or 8 blocks to Ocean Avenue. Turn left onto Ocean Avenue and continue straight for 3 blocks to the pavilion (a large white building), which is located on the boardwalk and beach. Metered parking may be found along the beachfront. Other parking may be found around Silver Lake nearby.

From Garden State Parkway, take Exit 98 onto Route 138, then follow directions as above.

Issued: 5/11/90

ASSEMBLY, No. 3430

STATE OF NEW JERSEY

INTRODUCED APRIL 26, 1990

By Assemblymen JACOBSON and VILLAPIANO

AN ACT concerning the taking of menhaden, amending P.L.1979, c.199, R.S.23:3-48, R.S.23:3-51, and R.S.23:3-52, and supplementing Title 23 of the Revised Statutes.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. Section 73 of P.L.1979, c.199 (C.23:2B-14) is amended to read as follows:

73. For purposes of this section, the "act" means and includes all the new sections and amended sections contained herein, all the remaining sections of Title 50 of the Revised Statutes, sections 23:3-41, 23:3-46, 23:3-47, 23:3-48, 23:3-51, 23:3-52, 23:5-9, 23:5-16, [23:5-35,] 23:9-114, and 23:9-115 [and 23:9-120] of Title 23 of the Revised Statutes, [sections 1, 2, 3 and 7 of P.L.1938, c.318 (C.23:5-5.1 through 23:5-5.3 and 23:5-5.7), P.L.1952, c.216 (C.23:5-5.1a), and] section 5 of P.L. , c. (C.) (now before the Legislature as this bill), sections 1, 2, and 3 of P.L.1941, c.211 (C.23:5-24.1 to 23:5-24.3), section 10 of P.L.1980, c.120 (C.23:5-35.2), and section 1 of P.L.1938, c.240 (C.23:9-120).

The commissioner may utilize any or all of the following remedies for any violation of this act:

a. (1) Any person who violates the provisions of this act or of any rule, regulation, license or permit promulgated or issued pursuant to this act shall be liable to a penalty of not less than $100.00 or more than $3,000.00 for the first offense and not less than $200.00 or more than $5,000.00 for any subsequent offense, unless the commissioner has established an alternate penalty for a specific offense pursuant to subsection a. (2) of this section.

(2) The Commissioner of Environmental Protection, with the approval of the Marine Fisheries Council, may, by regulation, establish a penalty schedule for any specific violation of this act or of any rule or regulation promulgated pursuant to this act. No such penalty may be less than $10.00 or more than $100.00 on the first offense or less than $20.00 or more than $200.00 on any subsequent offense. Any penalty provided for by this act or by the fee schedule promulgated by the commissioner shall be collected in a civil action by a summary proceeding under the penalty enforcement law (N.J.S.2A:58-1 et seq.). The Superior Court [or any County Court, county district court] or municipal

EXPLANATION--Matter enclosed in bold-faced brackets [thus] in the above bill is not enacted and is intended to be omitted in the law.

Matter underlined thus is new matter.

court shall have jurisdiction to enforce said penalty enforcement law. If the violation is of a continuing nature, each day during which it continues shall constitute an additional, separate and distinct offense.

b. Any person who violates the provisions of this act or any rule or regulation or any license or permit promulgated or issued pursuant to this act shall be liable to the revocation of any license which he holds pursuant to this act for such period of time as the court may choose.

c. If any person violates any of the provisions of this act, or any rule or regulation or any license or permit promulgated or issued pursuant to the provisions of this act, the department may institute a civil action in a court of competent jurisdiction for injunctive relief to prohibit and prevent such violation or violations and the said court may proceed in the action in a summary manner.

The department is hereby authorized and empowered to compromise and settle any claim for a penalty under this section in such amount in the discretion of the department as may appear appropriate and equitable under all of the circumstances.

d. In addition to the penalties prescribed by this section, a person violating the provisions of R.S.50:4-3 shall be subject to the forfeiture of any vessel or equipment used in the commission of the violation. A designated enforcement officer of the Department of Environmental Protection, the marine police, or any other law enforcement officer may seize and secure any vessel or equipment used in the commission of such a violation. Upon the seizure of the vessel or equipment, the enforcement officer, member of the marine police, or other law enforcement officer shall immediately thereafter institute a civil action to determine if the forfeiture is warranted in the court in which the penalty action was filed pursuant to this section, which court shall have jurisdiction to adjudicate the forfeiture action. The owner or any person having a security interest in the vessel or equipment may secure a release of the same by depositing with the clerk of the court in which the action is pending a bond with good and sufficient sureties in an amount to be fixed by the court, conditioned upon the return of the vessel or equipment to the Department of Environmental Protection upon demand after completion of the court proceeding. The court may proceed in a summary manner and may direct the confiscation of the vessel or equipment by the department for its use or for disposal by sale or public auction. Moneys collected by the department through the sale or public auction of the vessel or equipment shall be used by the Division of Fish, Game and Wildlife for the enforcement of the provisions of this act.

(cf: P.L.1983, c.219, s.1)

2. R.S.23:3-48 is amended to read as follows:

23:3-48. Nothing in [sections] R.S.23:3-46 to [23:3-49 of this title] R.S.23:3-48 shall apply to vessels engaged in taking

menhaden, but they shall be licensed to operate in the taking of menhaden pursuant to [sections 23:3-50 to 23:3-53 of this title] R.S.23:3-51.

(cf: R.S.23:3-48)

3. R.S.23:3-51 is amended to read as follows:

23:3-51. A person intending to take menhaden with purse or shirred nets in [any waters in] that portion of the Atlantic ocean within the jurisdiction of this State [, including the waters of the Atlantic ocean, within 3 nautical miles of] and at least 2.0 nautical miles from the coast line of this State, or 0.6 nautical miles in the case of any vessel the gross weight of which is 50 tons or less, shall apply to the commissioner for a license therefor. The commissioner, upon the receipt of the application and payment to him of the fee provided in [section] R.S.23:3-52 [of this Title], may, in his discretion, issue to the applicant a license [,] to take menhaden with purse or shirred nets. The license shall be void after December 31 next succeeding its issuance.

(cf: P.L.1979, c.199, s.66)

4. R.S.23:3-52 is amended to read as follows:

23:3-52. [The fees for issuing a license under sections 23:3-50 and 23:3-51 of this Title shall be as follows: For each

Vessel of not less than 30 nor more than 100 tons gross tonnage, owned by residents of New Jersey $125 00
Vessel of not less than 100 nor more than 150 tons gross tonnage, owned by residents of New Jersey 250 00
Vessel of not less than 150 nor more than 175 tons gross tonnage, owned by residents of New Jersey 400 00
Vessel of not less than 175 nor more than 200 tons gross tonnage, owned by residents of New Jersey 550 00
Vessel over 200 tons gross tonnage, owned by residents of New Jersey 900 00
Vessel not over 20 tons gross tonnage used by residents for taking menhaden for bait purposes only 20 00
Vessel of not less than 30 nor more than 100 tons gross tonnage, owned or leased by nonresidents of New Jersey 450 00
Vessel of not less than 100 nor more than 150 tons gross tonnage, owned or leased by nonresidents of New Jersey 700 00
Vessel of not less than 150 nor more than 175 tons gross tonnage, owned or leased by nonresidents of New Jersey 1,000 00
Vessel of not less than 175 nor more than 200 tons gross tonnage, owned or leased by nonresidents of New Jersey 1,150 00
All vessels over 200 tons gross tonnage, owned or leased by nonresidents of the State of New Jersey 1,500 00

The fees for vessels from out of the State, leased by residents of New Jersey, shall be the same as the nonresident license fees.

Such gross tonnages shall be determined by Custom House measurements.] Menhaden fishing.

a. The license fees, by class, for menhaden purse seine or shirred net vessels shall be fixed by regulation adopted by the commissioner pursuant to the "Administrative Procedure Act," P.L.1968, c.410 (C.52:14B-1 et seq.). Vessel classes shall be based on gross tonnage as determined from United States Coast Guard admeasurements. Classifications and fee ranges shall be as follows:

	Resident	Nonresident
Vessels 20 tons or less	$50 to $100	$100 to $200
Vessels more than 20 tons and less than or equal to 100 tons	$250 to $500	$500 to $1,000
Vessels more than 100 tons	$1,500 to $3,000	$3,000 to $6,000

b. There is established within the "hunters' and anglers' license fund," created pursuant to R.S.23:3-11 and R.S.23:3-12, a separate and dedicated account to be known as the "menhaden account." This account shall be credited with all revenues received by the Division of Fish, Game and Wildlife from the sale of licenses for menhaden purse seine or shirred net vessels pursuant to R.S.23:3-51 and this section.

c. The menhaden account shall be used exclusively for the benefit of the marine fisheries resource, including, but not limited to, menhaden fisheries law enforcement.

d. The commissioner shall adopt, pursuant to the "Administrative Procedure Act," rules and regulations necessary for the management of the menhaden resource.

e. In addition to the penalties established under section 73 of P.L.1979, c.199 (C.23:2B-14) for any violation of R.S.23:3-51, R.S.23:3-52, or section 5 of P.L. , c. (C.) (now before the Legislature as this bill), the commissioner may, for such violation, suspend a license issued pursuant to R.S.23:3-51 and R.S.23:3-52 for 14 days for the first offense, and from 30 days to not more than one year for each subsequent offense.

(cf: P.L.1975, c.116, s.9)

5. (New section) No person may take menhaden with purse or shirred nets in the following waters of the State: Sandy Hook bay; Raritan bay; Lower bay; Delaware bay; and in the Atlantic

ocean, less than 2.0 nautical miles from the coast line of this State or 0.6 nautical miles in the case of any vessel the gross weight of which is 50 tons or less.

6. This act shall take effect January 1 next following enactment.

STATEMENT

This bill would prohibit the taking of menhaden, commonly known as "moss bunkers," from Sandy Hook bay, Raritan bay, Lower bay, Delaware bay and in the waters of the Atlantic ocean, within 2.0 nautical miles of the coastline of the State or within 0.6 nautical miles in the case of vessels with a gross weight of 50 tons or less.

This bill would also establish a range within which the Department of Environmental Protection would set fees for menhaden fishing licenses. These fees would be deposited into a "menhaden account," established in the "hunters' and anglers' license fund," to be used for enforcement and for managing the marine fisheries resource, including menhaden fisheries law enforcement.

The bill provides that violators of the act's provisions would be subject to the same penalties assessed for certain other violations of the State's "fish and game" statutes pursuant to section 73 of P.L.1979, c.199 (C.23:2B-14). In addition, a violator would be subject to menhaden fishing license suspension for a period of 14 days for the first offense and from 30 days to not more than one year for each subsequent offense.

NATURAL RESOURCES

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ASSSEMBLYMAN DANIEL P. JACOBSON (Vice Chairman): Gentlemen, ladies: Unfortunately, our microphones don't work here, but I think the mike will be working up there, though. Is that projecting? (affirmative response) In any event, I am going to call this meeting of the Assembly Conservation and Natural Resources Committee to order. My name is Assemblyman Dan Jacobson. I am the Vice Chairman, and I will be chairing today's hearing on a proposal which has been sponsored in the Assembly by Assemblyman Villapiano and myself, regarding a two-mile limit for the menhaden fishery.

Also here, graciously coming down to the shore, is Assemblyman Joseph Mecca, from Bergen and Passaic Counties. Assemblyman John Villapiano will be filling in on the Committee also to hear testimony. I know he will probably be arriving shortly.

If anyone wants to testify who isn't on the sign-in sheet, please fill out a request form right up here -- we have pens -- and feel free to testify. Again, this is for the Committee to get consideration of this legislation. We will be considering this legislation.

In addition, we also have a transcript service here. There will be a transcript made of this hearing for the benefit of the Committee, as well as for the full Legislature.

One other thing which I will also ask-- This happens a lot of times at public hearings. If there is a point which you feel is important, feel free to mention that you think that point is important, but if the point has been brought up a few times, in the interest of time, let's see if we can kind of not be repetitious, and just bring up new points.

The first witness we are going to call is Senator Joseph Palaia, who represents the 11th District with me. Senator Palaia.

S E N A T O R J O S E P H A. P A L A I A: Thank you, Assemblyman. Assemblyman Mecca, welcome to the 11th District.

I hope you had a nice trip down. It is a beautiful day for you down here.

I will be very brief. I wanted to be here to say that I wholeheartedly support the bill as submitted by Assemblymen Jacobson and Villapiano. I have the countermeasure of that over on the Senate side. I don't know whether you are aware that this bill was put in a couple of years ago and we missed, by a couple of days, getting it finished off. We ran out of time with the session. So I applaud you for getting it in early. I don't know whether the individuals who are here tonight realize that if we don't have a bill signed into law in two years, by the end of that session date that bill has to start all over again. So I don't think we can start too early to make sure that the "menhaden bill," as it is called, is put into effect as soon as possible.

I think it is about time that we started to protect our fishermen in this area, so they will not be raided by people coming up from Virginia and the southern part of our country. It is a bill whose time has come. I think two miles is a reasonable limit offshore, and I think it would protect and preserve the rights of our fishermen in this particular area.

Again, I commend Assemblymen Jacobson and Villapiano for their initiative in this matter. I am here to support you in this, and I am sure I will get that same support when it comes up on the Senate side, which I hope will be next month. I have been promised a date as soon as possible. So, again, I congratulate. I am here to listen to what our fishermen have to say, and I say, "Let's get moving with this bill as soon as possible."

Thank you, Assemblyman. (applause)

ASSEMBLYMAN JACOBSON: Thank you, Senator Palaia. It is always a pleasure to call on Senator Palaia. Senator Palaia was my former principal in first and second grades, which is

kind of funny. Of course, I am a Democrat and he is a Republican, but that's all right. Somehow, he didn't teach me too well. But thank you very much for your testimony, Senator.

SENATOR PALAIA: My pleasure.

ASSEMBLYMAN JACOBSON: The next witness will be Tom Fote, President, Jersey Coast Anglers Association.

T H O M A S P. F O T E: Thank you for coming down here to listen to our point of view. The Jersey Coast Anglers Association was formed, really, in the bunkers about 10 or 11 years ago. We were looking to get this bill through a long time ago. At that time, Senator Pallone, now Congressman Pallone, introduced legislation, and Assemblyman Jacobson, when he was his aide, was working on this legislation many years ago.

We thought we had a compromise worked out last year. We had worked on it for two-and-a-half years. We thought we would go along with it, work it out, and see if it would do what it was supposed to do. We warned the industry, though, that if they took us to court, and they sued the State, they would waste the Attorney General's money; they would waste the State legislators' time spent on new regulations and legislation; and we would go ahead and request a two-mile limit. We were going to put legislation in.

As soon as I heard the lawsuit was filed, I contacted Assemblyman Jacobson and Assemblyman Villapiano, and requested that they look into putting the legislation in. I am very happy that they did. Maybe we will show the other states that they can't mess with us; can't waste our time; and can't waste our money on frivolous lawsuits.

I will just keep it short, because there are a lot of people here who want to speak. Thank you very much. We support the bill wholeheartedly at this time.

ASSEMBLYMAN JACOBSON: Thank you very much, Tom.

ASSEMBLYMAN MECCA: Thank you, Tom.

ASSEMBLYMAN JACOBSON: The next witness will be John Horn. Mr. Horn, did you also want to reserve the right to comment again? I remember we talked, and you wanted to give some rebuttal to some of the comments made.

J O H N J. H O R N: No, the only thing I would want to do, if this comes up -- and I am sure it will -- before your Committee--

ASSEMBLYMAN JACOBSON: Yeah.

MR. HORN: When the Committee meets, I would like to speak on it then.

ASSEMBLYMAN JACOBSON: When it actually comes time for consideration and a vote-- Before that, we will actually have another opportunity for public comment.

MR. HORN: Fine. I would like to speak then, too.

ASSEMBLYMAN JACOBSON: Okay.

MR. HORN: Good evening, honorable Assemblymen and prime sponsors. I had John Villapiano, but John is not here yet, so Mr. Jacobson and Assemblyman Mecca, I would like to thank you for the opportunity to speak to you this evening on this legislation.

Let me introduce myself. I am John J. Horn, former Assemblyman and former Democratic Leader in the Assembly; former Senator, and former member of the Governor's Cabinet, serving as Commissioner of Labor and Industry. I am also the Executive Director of the Atlantic States Menhaden Council, as well as a lifelong New Jersey surf fisherman from Seaside Park, New Jersey.

I am surprised at the introduction of this legislation, since the Marine Fisheries Council of the State of New Jersey just recently, last year, in conjunction with the recreational fishermen represented by the Jersey Coast Anglers Association, with a membership of approximately 56 fishing clubs and three environmental clubs, accepted the compromise offered by the Jersey Coast Anglers to move the line from

six-tenths of a mile to 1.2 miles for the taking of menhaden by the large boats. At the same time, they allowed the bait fishermen with the smaller boats to fish within three-tenths of a mile within the beach and the bays.

While we objected to these regulations based on facts and testimony supported by the heads of the Department of Environmental Protection and the Director of Fish and Game and their factual studies, we have complied 100% with the new regulations. The record shows that since 1896, when the first license was issued, inclusive of 1983, when the trouble first started, the menhaden industry submitted a code of ethics, and there has never been a proven violation, which supports my surprise at the introduction of Assembly Bill No. 3430.

I shall supply you with copies of our prior testimony for each member of the Committee outlining our objections to this legislation, within a few days. I will make myself available to you for further input. My presence here tonight was due to the hearing which was called by you.

Thank you for allowing me the privilege of speaking before you tonight, and you will hear from me in the future. Thank you very much.

ASSEMBLYMAN JACOBSON: Thank you, Mr. Horn. Our next witness will be Nicholas Scheskowsky, New Jersey Saltwater Flyrodders.

N I C H O L A S S C H E S K O W S K Y: Thank you for the opportunity to speak this evening. I worked with the Division of Fish, Game and Wildlife to draw up these present bunker regulations. As sportfishermen, the saltwater flyrodders in New Jersey recognize the need of both commercial netters and sportfishermen to utilize the same resources. But the purse-seining methods of the commercial bunkers industry are not compatible with the sportfishermen trying to fish alongside these 300-foot mother ships working with their long nets.

The New Jersey Division of Fish, Game and Wildlife recognizes that the potential of danger exists. That is why the bunker regulations were put into effect. Now these regulations are being challenged in court with a lawsuit. We feel that legislation at this time would put a stop to such suits. Each state on the East Coast has some form of regulation. Starting with New Hampshire, they prohibit all purse seining within two miles of the beach. Massachusetts has no open season, but has special permits for designated areas. Connecticut has a closed season from buoy line -- Brian River to Stonington. Delaware has no purse seining within three miles of the shore. Maryland has no purse seining for commercial manhaden fishery. North Carolina has a closed season, and an open season from May 15 to January 15, one mile from the beach. South Carolina has no purse seining of menhaden within three miles of the beach, and Georgia has no purse seining inside the rivers, creeks, sounds, and 1000 feet from Jekyll Island. Florida has no purse seining along designated areas on the West Coast, and no net fishing in Broward County.

So I don't feel that two miles is an awful lot to ask for in the State of New Jersey. It would give the sportfishermen the added protection they need from the larger ships.

Thank you. If you have any questions, I would be happy to answer them for you.

ASSEMBLYMAN JACOBSON: Thank you. The next witness will be David Bramhall, from United Boatmen.

D A V I D B R A M H A L L: Assemblymen: Our organization represents party and charter boat operators in the area. We would like to speak in favor of the legislation. It seems to us that the legislation seems to address several issues and concerns which have traditionally been ignored by fisheries' management schemes. The first and most important is, New Jersey has a $1.5 billion recreational fishing industry, which should be protected.

Second, fishery decisions for New Jersey waters should be designed to protect the interests of New Jersey citizens and industry first. Consideration of any out-of-state industry should come only when there is no adverse effect on any New Jersey interest.

Thirdly, any large-scale commercial exploitation of State fishery resources by any out-of-state interests, without concern for a significant economic return to the State of New Jersey, should be prohibited.

Further, any such exploitation should at least consider some sort of replenishment of New Jersey's resource. It seems to me that the public trust requires that we in New Jersey protect and preserve our public resources for the use of New Jersey citizens first, and to preserve those resources for the use of future generations. It seems to me that with this legislation, you are addressing these issues rather clearly. We are thinking of New Jersey first and New Jersey's recreational fishing industry. We are recognizing its importance and we are trying to protect it.

Thank you.

ASSEMBLYMAN JACOBSON: Thank you very much, David.

ASSEMBLYMAN MECCA: Thank you.

ASSEMBLYMAN JACOBSON: The next witness will be Ron Sickler, from the Jersey Coast Anglers Association.

R O N S I C K L E R: I presented each one of you with a copy of this Atlantic Menhaden Advisory Committee Report, if you would like to refer to it. If anyone else would like a copy, I have a limited supply. When we are finished, you can catch a copy.

Well, it has been said before, and I will mention it one more time: I represent the Jersey Coast Anglers. There are 56 clubs, as well as three environmental groups. Their membership is in excess of 20,000 people. Never has any one organization come out as strongly as the Jersey Coast Anglers

has over all these years for a particular issue.

John Horn mentioned the fact that we sought, and achieved, regulation over a long period of time, and we are going back on that deal, as it were. Well, there are a few reasons for going back on that deal, one of which is in this report. This report, if you notice, is dated April of 1990, so I don't believe you are going to find anything much more current than that. It is also worthwhile mentioning that the Atlantic Menhaden Advisory Committee is predominantly an industry-related committee.

What is brought up in this report -- and it really frightens me because it is something that is taking place in Maine at this very time, and has been taking place since 1988-- We heard bits and pieces of it, but never got any facts on it up until this present time. What I am concerned with is something called "Internal Waters Processing." This allows a state, any given state, to have people within the state fish for herring or bunker -- menhaden, if you will -- and sell those fish directly to a Russian factory ship based within our waters. The figures that have been thrown about on this, as they initialed it IWP-- For each application, they were given 40,000 metric tons they were allowed to harvest. Gentlemen, this is 88 million pounds of fish -- 88 million pounds -- for one application.

Further on down from the introduction -- I underlined your report so you will be able to find this -- "Two Atlantic Coast species have been subject to IWPs so far: Atlantic sea herring and Atlantic menhaden. In 1988, Maine received and approved an IWP application for 40,000 metric tons. In early June, 1989, unofficial information indicated that five IWPs might be submitted in the North Atlantic, with a cumulative total of 172,000 metric tons."

Now, this is not related to industries on our shorelines. This is related to selling to a foreign fleet.

That 172,000 metric tons, by the way -- to also put that into a pound figure -- comes to 378,400,000 pounds of fish that can potentially be removed from these waters, should these boats apply for, and get, these IWPs in other states. Now, so far, Maine and Massachusetts are the only two states, and I tell you here and now, if Massachusetts gets an IWP, this State will surely feel the result of that fishery along its shorelines.

So, with respect to what has happened in the past, things have changed since then, and we have to change with them. The time has come for us to support wholeheartedly this bill that you have before you -- A-3430.

I would also like to mention at this time -- you will see it there -- only one IWP was approved, because, fortunately, even the people on this committee realized that these stocks cannot withstand this kind of pressure.

The industry has constantly told us that they are self-policing, and that they can manage a natural resource without abusing it. If this is true, why, since 1980, have nine U.S. plants closed in this country? That is not policing. That, to me -- and to a great many of us -- is abuse.

Further down in the report, it says: "Total numbers of Atlantic menhaden in recent years compare favorably with numbers in the 1950s." Well, in the '50s, that was probably the zenith, the peak, of the bunker industry. All right? So you read this, and automatically assume, "Well, hell, if there are that many fish, then there is nothing wrong with the industry. The industry is alive and well." But if you continue on, a sentence just below that says: "However, the population biomass is well below that of the 1950s." It is a confusing issue. All right?

The total numbers refers to the individual fish in a school. The biomass refers to the total weight of that group of fish. In other words, if you had 100 fish in a school and the biomass weight was one pound per fish, you would have 100

pounds of biomass. So what they are telling us is, though the numbers are there in the number of individual fish, the biomass is far below that. So again, it points to the fact that, no, the fishery is not alive and well.

Turning to the next page, under population projections, it says: "Population projections were made for the total stock at several different levels of fishing in the North Atlantic. Under all scenarios" -- every single scenario -- "recruitment, spawning stock size, population size, total landings, and spawning stock ratios--" Every one of them declined, with the major point of concern being the spawning stocks declined most rapidly. Gentlemen, when your spawning stocks are declining rapidly, what future is there for your fishery?

On the last page of this document, there is basically an informational point to be made here: "Summaries of the Two IWP Applications Received by Maine as of 30 March 1990." There are two applicants, each for 40,000 metric tons, 88 million pounds of fish each, and each to be sold to a boat of Russian registry. And these are in state waters; they are not in Federal waters. So this has changed -- this entire picture -- drastically.

New Jersey has a great deal at stake when it comes to the menhaden. The dollar value has already been mentioned. It has been put at $1.5 billion spent on sports fishing in this State alone. Now more than ever before, we must protect these fish. Why? Last year, the fluke fishery fell flat on its face. This hurt the sports fishing industry. Striped bass and weakfishing have been falling off for the last few years. Now the Federal government has seen fit to put a 10-fish limit on us in Federal waters for bluefish. An aside note, but something that frightens me, is the way I read this article here -- this report, if you will -- there is nothing to stop a company from applying for an IWP for bluefish and trolling

those bluefish and selling them within State waters. I can't help but wonder if this is somewhere in the back of the Federal government's mind. That is a battle for another time.

At very best, our sports fishery is being strained to its breaking point. Menhaden are a major food source for striped bass, bluefish, weakfish, shark, and blue fin and yellow fin tuna. Assembly Bill No. 3430 would help ensure the well-being of our sports fishery for this State. Every other state has some type of a law on its books -- as has been mentioned before. Several have three-mile restrictions. Again, we are not looking for three; we are looking for two. I feel that is quite a compromise, given the threat of these IWPs.

We have a regulation in place that is being challenged now in court, but in light of what you have in front of you, I say now is the time for more restrictive legislation, instead of regulation. We must be protected. Conservation of this natural resource will benefit everyone in New Jersey and everyone who fishes in New Jersey waters.

I thank you very much for your time. (applause)

ASSEMBLYMAN JACOBSON: Thank you, Ron. Our next witness will be Don MacPherson.

D O N A L D H. M a c P H E R S O N: Thank you for hearing me. I represent tackle dealers, clubs, and individuals, all fishermen. I am a fisherman myself. I did give a talk before the Senate Committee that was mentioned a little while ago. That was a few years ago. I had quite a lengthy discussion on very, very many things having to do with the menhaden fishery. It was an overhead projection type of discussion. I do not intend to go into that tonight. I am going to pare it all down and be as brief as I possibly can, just to save you people some time.

I have the 10 copies of my statement I was requested to bring with me, and it would be good if you would spread these out among you people, because I will be referring to it.

The information I will present is all backed up with factual information.

I am not a paid lobbyist. I paid for all of this myself because I am quite interested in it. I would ask you to turn three pages over until you see Fig. 1. The typed information-- I apologize, the typewriter went crazy. Incidentally, much of the information I am going to provide to you has been taken from that Fig. 1, the Atlantic Menhaden Management Board's report. This was a five-year study of the menhaden industry, and I have underlined the pertinent points here, and in the rest of the things I will be using. I will refer to this as Reference A, when you see it. You will notice down at the bottom that the funds for this report, over a five-year history of study, were supplied, among others, by the State of New Jersey and the menhaden industry. Okay?

Now, incidentally, anytime you have questions, please feel free to call upon me.

Now, let's talk about the menhaden industry and how they fish: The nets they use are about a quarter of a mile long and they are 65 to 90 feet deep. So what I am going to do is try to bring to your attention the problem we have with destruction of the marine environment. Now, what do I mean by that? If you will turn to Fig. 2, you will see the size of the nets they use underlined at the top.

Now what happens, how they fish is, a factory ship comes into the area, and by aircraft they locate a large school of fish. They launch two small boats that drag this quarter-of-a-mile net and surround the large school. The net is weighted at the bottom, with floats on top. They surround the school. Once that is done, they then draw the net at the bottom closed. It is much like a woman's purse, where they pull the strings and it closes at the top. This net is inverted, so it closes at the bottom.

Now, just think: I just mentioned that his net is 65 to 90 feet deep. The waters one mile out from New Jersey are 35 feet deep, and increase in depth five feet per mile. So when they close the net, they can't possibly help but destroy every crab, every lobster, and every finfish they come in contact with. Turn the page and you will find out from the Federal government how deep the water is. Okay?

Now, when the Department of Environmental Protection heard about this, they did, some time later, get an emergency regulation out which restricted the menhaden. They had to stay out a little more than a half a mile -- not one mile, not two miles, a little more than a half a mile. This was the directive. They were concerned mostly about the conflict that existed between sportfishermen and the menhaden. So if you turn to the next page, to Fig. 4, you will see it underlined there.

They didn't concern themselves about the financial loss to the industry. What they didn't tell you was that there was also tax loss to the State of New Jersey and the Federal government. The Federal government has an excise tax on all hunting and fishing equipment of the most minute character. So, that amount of money is lost. Now, the Federal government sends that back to the State, provided the State goes into conservation -- trout raising, and things of that nature.

ASSEMBLYMAN JACOBSON: I'm sorry. Were you a friend of Dingle (phonetic spelling) Johnson?

MR. MacPHERSON: I'm sorry?

ASSEMBLYMAN JACOBSON: Were you a friend of Dingle Johnson?

MR. MacPHERSON: Yes, yes. There is a specific example: I have been a hunter education instructor for many years. For every hour a hunter education instructor is involved in that activity, the Federal government returns to the State, $5 for every hour. So if we are losing money in this respect--

What I did when I saw this regulation was, I wrote to the Department of Environmental Protection and said, "Now, I know you don't support the bunder bill, but the least you could do -- the very least you could do -- would be to reduce the depth of the net so you do not destroy the marine environment." And, believe it or not -- turn to page 5 -- I got a response. They "found them quite interesting." Having heard it all along, they "found them quite interesting," and the last sentence says: "They may wish to respond to your advice in greater depth." Note the date -- 1984. They have never contacted me. They have never put a directive out to decrease the depth of the net. I think this agency is for the birds.

Incidentally, it came to mind that, Monday, in the Asbury Park Press -- just this past Monday in the Asbury Park Press -- the headline states: "Environmental Official Resigns from State after Three Months. Eric Evenson, Acting Director of the Division of Water Resources since September, and Ocean Program Coordinator, is going to leave June 1. He is going to expand his horizons. Deputy Commissioner Michael F. Catania resigned Friday after just three months on the job -- a surprise move that some environmentalists view as a sign of trouble in the agency." The last paragraph says: "Neither one of them has a job." That is not in my report, because that just happened Monday, but I will give you that.

Who are they protecting? Who could they possibly be protecting by not taking some action? I'll tell you. Turn the page. You will notice that all of the large factory boats that fish off our shores are licensed by the State and they come from Virginia. We have a small boat in our State that does mostly bait fishing. Incidentally, I mentioned that they kill lobsters. Lobsters are off our shore, in case you are not aware of it. They trap them about a quarter of a mile offshore, and they are just as tasty as the famous Maine lobsters.

Now, let's talk about what is going to happen to the industry if we restrict them.

ASSEMBLYMAN JACOBSON: Mr. MacPherson, let me interrupt you. You're going at a good clip here, but please remember that we do have a lot of witnesses, and we do want to fit them all in.

MR. MacPHERSON: Yes, in two minutes I will stop. Okay?

ASSEMBLYMAN JACOBSON: Okay.

MR. MacPHERSON: What effect does this two-mile restriction have? Basically, bunkers are found out halfway to the continental shelf. The continental shelf is 70 miles off Jersey. I am being rapid now. What that means is, if we decrease the area -- 35 miles now -- we decrease the area about 3%. I don't think that is a hardship. These are all facts. You can see them in the report.

In conclusion, we fully support the two-mile restriction. We think, also, that you ought to hound Environmental Protection to decrease the size of the net.

Thank you. (applause)

ASSEMBLYMAN JACOBSON: Thank you very much, Mr. MacPherson. I know your interest and your dedication to the issue go back several years. Again, thank you very much for your testimony.

MR. MacPHERSON: You're welcome.

ASSEMBLYMAN JACOBSON: The next witness will be Joseph Pallotto, President of the Asbury Park Fishing Club; also, Beach Supervisor for the City of Asbury Park.

J O S E P H P A L L O T T O: Number one, I would like to thank you for allowing me to speak. Number two, I would like to say that the Asbury Park Fishing Club, which is the oldest saltwater fishing club in the country, backs your bill 100%. We are also members of the New Jersey Bass Fishermen's Association.

I would like to get off the fishing end of it for a moment and get to the beach end of it for a moment. I have had these factory ships only a half a mile, or quarter of a mile off our beaches. In the afternoons sometimes when the wind is out of the east/southeast, when they emit their bilges and bilge out their hulls, and after they are loaded with tons of bunkers or menhaden, if you have ever seen the slick that they let come out of these boats and just wash ashore-- People don't know what it is. I have already called the Health Department on them, and they didn't know what to do about it. But it is an unsightly scene, to see this bunker slick come out of a boat, and I mean a huge slick, just come washing ashore. It is probably not unhealthy, but it definitely is unsightly.

Second of all -- I will get back on the fishing end of it -- I have seen acres and acres of bunker. Their spotter planes show up, and a day later the ships are here. Two days later there are no more fish to catch.

That is all I have to say. We support your bill. Thank you. (applause)

ASSEMBLYMAN JACOBSON: Thank you. Before we go on, I see on the list Edward Cattell, from AMPRO. I assume he is testifying in opposition.

E D W A R D V. C A T T E L L, JR., ESQ.: (speaking from audience) I will reserve my comments. I will be testifying shortly.

ASSEMBLYMAN JACOBSON: Okay. Rick Englesbe, Hudson River Fishermen's Association, New Jersey Chapter.

R I C K E N G L E S B E: Good evening. My name is Rick Englesbe. I represent the Hudson River Fishermen's Association, New Jersey Chapter. We are out of Bergen County. We are also members of the Jersey Coast Anglers Association. Our club consists of about 148 members, and we are 100% behind Assembly Bill No. 3430 -- moving the bunker boats two miles offshore.

One of our concerns is that everybody is looking for underutilized species of fish to make money off of. Unfortunately, bunker-- You get down towards the lower end of the food chain, and your bass, your bluefish, weakfish -- everything feeds on them. That is disturbing, because if these bunker tend to disappear, you are not going to have the larger fish around, and you are not going to have the recreational anglers coming down and spending their money to fish for striped bass, and what have you.

Just one incident comes to mind: Back in the '30s, with the California sardine industry, that was big business. Sardines comprised, I think, 60% of your marine oils. Menhaden oil was about 10% or 15%. Well, the sardine industry collapsed. In 1960, menhaden oil was 88% of marine oils in the U.S. Now, in the '80s, 98% of your marine oils is menhaden oil. What has happened is, the sardine industry has not come back. The FDA, just this year, allowed grass status, which means they generally recognized the safe -- or that menhaden oil can be used in foods in the U.S. In the past, it has been used for animal feeds or sent over to Europe to be used in shortenings, margerines, spreads, what have you.

Well, now that it is approved here, there is going to be a lot more interest in using these oils to compete with your soybeans, your palm oils, and everything else. So I see a big increase -- or a potential increase in the amount of menhaden that is going to be harvested.

They are also trying to take the menhaden and make a surimi out of it. Surimi has been big time for Alaskian fishermen. They have been really banging the heck out of pollack out there and making the surimi, so much so that now they are having problems with the pollack, and they feel that that may be in short supply.

ASSEMBLYMAN JACOBSON: Surimi -- with the food products and--

MR. ENGLESBE: Right, right, that is made out of mostly Alaskian pollack, but there is an effort underway to make surimi out of bunker, in which case, yes, that would be big money. I see more and more fishing, and hard fishing on menhaden. Without some sort of restrictions, I think down the road we are in for some serious problems.

I would like to thank you for your time.

ASSEMBLYMAN JACOBSON: Thank you.

ASSEMBLYMAN MECCA: Thank you.

ASSEMBLYMAN JACOBSON: Our next witness will be Brian Kelly, New Jersey Striped Bass Fishermen's Association.

B R I A N K E L L Y: First off, I would like to thank you for this opportunity to testify, and I would like to thank the Assemblymen for taking the initiative to support the New Jersey sportfishermen with the introduction of this bill, A-3430.

There have been a lot of points touched on here tonight. I am not going to dwell on them. A lot of them we are very much in agreement with. I would just like to say, the New Jersey Striped Bass Fishermen's Association is in full support of A-3430. It is long overdue, and well needed.

The one point I do want to make -- and I am sure most of the people sitting in this room here tonight can remember -- is, 1985 was the last major influx we had of Virginia commercial bunker boats. They came in, and in a period of two weeks, they absolutely raped our beaches. For three weeks thereafter, there was not a fluke, a bluefish, a striped bass, bunker-- There was absolutely nothing along the coast after these big commercial boats came in. This is a situation that cannot be afforded. It is not fair to the fishermen. It is not fair to the tackle dealers, the party boat fishermen, or anyone within the State. Particularly today, with the budget crisis within the State, we cannot afford to be devastated economically. The fishermen do not deserve to have their fisheries taken away.

We would like to thank you, and we are in full support of your bill.

ASSEMBLYMAN JACOBSON: Thank you, Brian.

ASSEMBLYMAN MECCA: Thank you.

ASSEMBLYMAN JACOBSON: Our next witness will be Mr. R. Leonard, who is, I guess, a party charter boat representative. Mr. Leonard?

M R S. R. L E O N A R D: (no first name available) That's Mrs. Leonard.

ASSEMBLYMAN JACOBSON: Oh, excuse me, Mrs. Leonard. You fooled me with the "R." That's what it was.

MRS. LEONARD: That's all I use -- R. Leonard. I would like to thank you. I am somewhat unprepared, but I would just like to take this opportunity to mention that the party boat industry -- I do see some of my compatriots here, and I think I might be able to speak for them, as well -- is in favor of this bill being passed, due to the fact that we have been dealt a very severe blow recently with the passage of the 10 bluefish limit.

The taking of the menhaden within two miles, as heard in previous testimony -- the mere size of the nets-- There has to be some kind of an incidental catch taken with it. The fact that the blues feed on the bunker, as do other species-- There has to be some amount of blues taken. This is very critical to our industry, which has now, as I say, been put at a disadvantage. To allow them in closer, not only to wipe out part of the food chain, but also to take the incidental catch, when we are now going to find ourselves fishing more and more within the State waters, is out of the question.

Again, I say we are in favor of passage of this bill, not only to protect the menhaden, but to protect the incidental catches of the other species along with them. Thank you.

ASSEMBLYMAN JACOBSON: Thank you, Mrs. Leonard. Our next witness will be Fred Gartner, Shark River Striped Bass Club. Mr. Gartner?

F R E D G A R T N E R: Thanks for letting me speak. One of the main things about netting along here -- I have seen it with my own eyes -- is, they not only get bunker, they lift those nets and they are so full of striped bass, weakfish, and bluefish, which they take -- which they are allowed to take -- for four or five weeks. I have seen myself fish my head off and still not able to get a fish, on account of this.

They have everything sophisticated today. One of the main things, again, is, it isn't only the bunker they are netting. It is all the other fish.

I represent the Sharp River anglers, and I thank you for allowing me to speak.

ASSEMBLYMAN JACOBSON: Thank you. The last witness -- I believe he is the last witness -- for the bill, I guess appropriately so to wind up, is Jimmy Ventresco, from the Monmouth Beach Cartoppers. The last time I heard Jimmy speak, it was on the bass issue. It was very impassioned testimony.

J I M M Y V E N T R E S C O: Thank you, gentlemen, for allowing me to be a witness here this evening. Along with that membership, I am also a member of the New Jersey Striped Bass Fishermen's Association. I feel very surrounded -- if I can just get a show of hands of all members belonging to the Association-- May I see you raise your hands here for a moment? (members of audience comply) Fantastic! I love you guys, all of you. You are real marine fishermen.

I think rather than address a lot of facts, going back to when the bill was proposed and passed on the one-and-a-half mile, there was opposition. You new fellows coming on deck, I want you to know that. There was opposition. I feel kind of set back a little bit because this is almost like, "I told you so," because originally the marine sportfishermen were looking for a two-mile limit. Maybe had that gone into effect, we would not be having this meeting here tonight.

So, without, say, all the ado of additional facts, and presentations of papers and statistics -- God knows our association has files and files full of them -- I would like to maybe conclude, since I am the last one, by making a statement:

In my opinion, as John Q. Public -- and I did a little bit of insight and soul searching on this since my association -- our association with the two new legislators, Mr. Villapiano and also Mr.--

ASSEMBLYMAN JACOBSON: Jacobson.

MR. VENTRESCO: Jacobson, I'm sorry. I got a little tongue-tied there for a minute.

ASSEMBLYMAN JACOBSON: As long as you remember it in November '91. That's all I ask. Also, Mr. Ventresco -- just to let other people know -- there is one other witness after you, I believe. You're for or against the bill? (Mr. Cattell sitting in audience shakes head negatively) Neither, okay.

MR. VENTRESCO: I will conclude with a statement for myself then.

ASSEMBLYMAN JACOBSON: Go ahead.

MR. VENTRESCO: This menhaden legislative bill, A-3430 -- and this was hammered out with your efforts in it -- may set a precedent for all future marine resource management policy setting -- I want that underlined, because I believe it will -- inasmuch as this communication between the general public -- and it is very rare for us to get this kind of an opportunity -- and our legislators addressing coastal inshore public user groups of the marine resources, appears to be a marriage needed to formulate fair, sound, and equitable resource management planning. This, in my opinion, is a first, and I hope it will continue.

The marine resources are unique and apart in many ways from any other managed, controlled, and identified water resources. Also, marine offshore and marine inshore environments demand separate and individual management criteria. I think we are establishing that here tonight.

The marine fisheries resources must be protected. You all seem to agree with that. While these resources are inshore and their migratory routes are on their feeding grounds, or on their inshore spawning and nursery areas, coastwide and inshore they must be protected, and I like this bill.

This bill is the American way. The public has been heard and has made input. Our legislators have listened and have drafted legislation for us. Our legislators have acted. While the passage of this menhaden bill -- A-3430 -- is before us, and when it passes, and I know it will, the inshore menhaden resourse will be protected.

So, as a member, and also as John Q. Public, I have to thank the two legislators and anyone else who hammered out this bill. It's a good one, and we are going to go for it (applause), I can tell you that.

ASSEMBLYMAN JACOBSON: Thank you very much, Jimmy.

Mr. Cattell, would you like to say anything?

MR. CATTELL: (speaking from audience) I will just submit my comments in writing.

ASSEMBLYMAN JACOBSON: Okay.

MR. CATTELL: Thank you.

ASSEMBLYMAN JACOBSON: Thank you very much. Are there any other witnesses? Would anyone else like to speak? (no response)

Okay. Just quickly, for the record, I have to say that we have received a statement signed by Bob Itchmoney, Assistant Director, Division of Fish, Game and Wildlife, outlining the Division of Fish, Game's opposition to John's and my bill. This statement will be entered into the record. We have it here, and will enter it.

UNIDENTIFIED SPEAKER FROM AUDIENCE: Why do they have opposition?

ASSEMBLYMAN JACOBSON: I will read it, if you want. It is about a page-and-a-half. Do you want me to read it here? (affirmative response from audience)

"The Department of Environmental Protection must oppose A-3430 as it would supersede N.J.A.C. 7:25-22, which regulates the taking of menhaden. These regulations currently limit the taking of menhaden by purse seine for industrial purposes to the Atlantic Ocean beyond 1.2 nautical miles of the New Jersey coastline. These regulations further provide for a limited menhaden purse-seine fishery, for bait purposes only, as close as 0.6 miles of the coast in the Atlantic Ocean and Delaware Bay, and 0.3 miles of a coast within Raritan and Sandy Hook Bays. The Department's Division of Fish, Game and Wildlife feels that these regulations have been working quite well since their implementation in July of 1989 and that additional restrictions are not required at this point in time.

"As written, the bill would allow vessels of under 50 gross tons to harvest menhaden by purse seine within 0.6 miles of the coastline for any purpose. We are concerned that a significant number of smaller vessels may enter the fishery to fulfill the requirements of the large-scale menhaden fishmeal reduction industry, thereby impinging upon the inshore sport fishery. We would respectfully request that the bill be amended to limit the activities of those smaller menhaden purse-seine vessels to the harvesting of menhaden for bait purposes only and to further allow those vessels to fish within the confines of Delaware Bay up to 0.6 miles from the coast and within Raritan/Sandy Hook Bays up to 0.3 miles from the coast.

"The ability to provide a steady source of low-priced bait for both the commercial lobster and crab fishery and the sport fishery is very important to those industries. Nonetheless, although very important, the total market for menhaden for bait purposes is limited. This, in turn, limits the number of these smaller purse-seine vessels that will be able to pursue the purse-seine menhaden fishery in the inshore waters. New Jersey currently licenses only four purse-seine vessels of less than 90 feet in length for the taking of bait.

We anticipate that these will satisfy the market and thus impose a 'natural' limit on the size of the inshore menhaden fishery.

"Thank you for the opportunity to comment at this time. Respectfully submitted, Robert A. Itchmoney, Assistant Director, Division of Fish, Game and Wildlife."

We will take his comments into account, particularly if there is any type of loophole in the legislation that would allow any type of expanded fishery. But that is the basic opposition of DEP.

Okay, closing comments? Assemblyman Villapiano?

ASSEMBLYMAN VILLAPIANO: These are really my opening comments. I am actually quite sorry that I couldn't get here at 7:30. I did send down a message that I would be late tonight. I believe I owe everyone here an explanation. My daughter was doing track in Freehold Township. She was our baby-sitter, and she didn't get back in town, because of a bus problem they had, until 7:30. So, I do apologize. You know how those things happen. I am a family man, as well as an Assemblyman, and sometimes these things happen.

But you do know that our concerns and our sympathies have always been with the fishermen in this room. We have worked very hard on your behalf -- Assemblyman Jacobson, myself, and numerous other legislators. I appreciate Assemblyman Mecca coming down tonight to hear the testimony.

I promise you all that I will read the transcript -- I will get a copy -- so I will know exactly what was said. We feel that we have a good bill here. We have met with fishermen -- sportfishermen -- and I do want to say for the record, we have met with those people who are opposing it. It is kind of a new wrinkle, as far as I am concerned, that DEP is opposing this bill tonight. I am sure we will meet with them very, very soon to try to see exactly -- to try to find out exactly what their objection is.

Gentlemen, ladies, we are going to keep working on behalf of the fisheries of the Atlantic Ocean. We are going to keep working to try to continue the fact that we will have fish -- a controlled fishery; a fishery that makes a lot of sense; a fishery so that your children and grandchildren will continue to have the resource that you enjoy. With the signing of the Clean Water legislation this morning, I am sure that we will not only have the resource of being able to fish, but we will also have some clean water that they will be able to thrive in in the future.

I appreciate the attendance. It is a terrific turnout. Thank you very much for being here.

ASSEMBLYMAN JACOBSON: Thank you, Assemblyman Villapiano.

Assemblyman Joseph Mecca, my good friend from Passaic and Essex Counties.

ASSEMBLYMAN MECCA: Some of you might know that I am not from the shore area. Dan was kind enough to provide me with a limited visa to come here tonight. It expires at midnight, so I have to get back up north.

But I think it is very important that someone from the other regions of the State -- not from the shore -- be here to hear the testimony, to bring back the message. It is also very important that so many of you came out to speak for and against the bill, especially for, in my opinion. We have plenty of testimony to hear back in Trenton. The purpose of having it here at night was so that it would be available to you, the people who really count the most.

We will bring the message back to our Assembly Committee. There are three other members. Although Dan is very influential with us on the Committee, it is important for us to get the message back to them and back to the other 78 or so Assemblymen who are not that familiar with your situation down here.

I thank you for having me as your guest, and I appreciate that so many people have come out. Thank you.

ASSEMBLYMAN JACOBSON: Thank you very much, Assemblyman Mecca, and truly, thank you for coming down. The Assemblyman is a very, very busy man. He is a lawyer and he has a very thriving practice, a very busy practice, and I know it was quite a bit for him to come down. I also think he may be coming down next week. Are you still planning on coming down?

ASSEMBLYMAN MECCA: Oh, yeah.

ASSEMBLYMAN JACOBSON: We are also going to have a hearing on the proposal of DEP to have a license to sell fish next week.

Gentlemen, ladies, Mrs. Leonard, I would like to thank you very much for -- not that you are not a lady, Mrs. Leonard, I just-- You very much are. I opened myself up for-- Let me start again. Is the red in my face matching my tie, yet? That is what I want to know.

Ladies and gentlemen, thank you very much. As was mentioned before, I am very proud to be here tonight and am proud to have my name on this legislation, along with Assemblyman Villapiano. As an aide to Senator Pallone back in 1984, I did a lot of work on that bill. I helped Frank to draft that piece of legislation. I was at some of the hearings then, and some of the battles then. I am still convinced today, as I was back then, that this legislation is needed. I am very, very concerned with some of the aspects of the menhaden fishery and some of the testimony we heard tonight.

One of the biggest problems which I think still exists today, and existed in '84 when we started this, is the problem of enforcement. Joe Pallotto, from the Asbury Park Fishing Club, mentioned how the boats come into shore. Because of the nature of enforcement in this State, it is very hard to determine-- A boat can go in and out of any limit, and you

never know when they are getting too close. It is very hard to tell what they are doing. If it were a perfect world where we could enforce things properly, it might make a little bit of difference, but I think there is a lot of room for abuse. It is very, very hard to determine what's happening.

I am sure people say, "Well, there is no evidence of any abuse." That is what was heard, and I am sure that will be heard back in Trenton when we are actually ready to vote on the bill. But the point for the shore area is, we just can't afford that risk. Our economy and our quality of life is very, very dependent on this fishery. We can't have depletion of these stocks, or our main game fish could be endangered. In addition, it is a hazard, how the boats operate off the shore.

There is no doubt that the party boat people, the bait shops-- This is very, very important to their livelihood and to their future. We are going to go to work on it. I am happy that we had a good turnout here tonight, and I am very optimistic that we can get this through this Committee which I am Vice Chairman of.

So, we will go back to Trenton. We will go to work. We appreciate your support. The transcript, as we said, will be made available to everybody. Keep involved, and keep in tune with what is going on, and we will do our best.

Thank you very much for coming out. The hearing is adjourned. (applause)

(HEARING CONCLUDED)

APPENDIX

1990 FISHING YEAR INTERNAL WATERS PROCESSING EVALUATION

AND

RECOMMENDATION TO THE ATLANTIC MENHADEN BOARD

By

Atlantic Menhaden Advisory Committee

Atlantic States Marine Fisheries Commission

Interstate Fishery Management Program

April 1990

IX

INTRODUCTION

Internal Waters Processing (IWP) consists of harvests by U.S. vessels for processing on board foreign-flag vessels located within the internal waters of a coastal state. Section 306(c) of the Magnuson Fishery Conservation and Management Act (MFCMA) provides the governors of coastal states with authority to allow IWPs. The sole guidance provided is that the governors must consider the IWP request in light of their state's processing capacity. These activities are limited to species for which MFCMA fishery management plans do not exist and which are harvested predominantly in states' waters.

At its 1989 annual meeting, the Atlantic States Marine Fisheries Commission (ASMFC) passed Resolution Number 1 directing that its component units undertake reviews of IWP application information and provide recommendations to affected states on allocation of fishery resources for IWPs.

By Resolution 102 of the New England Governors Conference (December 1989), those governors asked the ASMFC to provide guidance for Atlantic sea herring IWPs. Together with the 1989 ASMFC resolution, it is assumed that Atlantic Coast governors intend to consider more than just their own state's processing capacity in making IWP decisions; they wish to examine the situations on at least a regional basis. Evaluation of the total stock and fisheries for affected species is necessary to provide the governors with the fisheries information needed for allocation decisions.

Two Atlantic coast species have been subject to IWPs so far: Atlantic sea herring and Atlantic menhaden. The first menhaden IWP occurred in 1988, and was repeated in 1989. Both operations were located in the coastal waters of Maine.

In 1988, Maine received and approved an IWP application for 40,000 mt. In early June, 1989, unofficial information indicated that five IWPs might be submitted in the North Atlantic, with a cumulative total of up to 172,000 mt. far exceeding the historic menhaden landings in the region. Applications were actually submitted in Maine and Massachusetts, with requested total allocations of 120,000 mt. Following coordination among officials in those two

states, along with comments received at public hearings and comments from other interested parties, only one IWP was approved: continuation of the 40,000 mt allocation in Maine. From this confused situation there emerged a consensus that a coordinated approach was required for responsible allocation of resources to IWP ventures. The two resolutions referred to above focused the concensus.

1990 INTERNAL WATERS PROCESSING APPLICATIONS FOR MENHADEN

As of 30 March 1990, two IWP applications have been received; each for 40,000 mt in Maine (summaries at end of this report).

In response to the AMAC request of 23 February 1990, Maine has provided the following data (Table 1) on their menhaden fisheries for the 1980s. Confidentiality releases have been received from Resource Trading Company and Conners Brothers Ltd.

Table 1. Landings (= removals) of Atlantic menhaden, 1980-89, from Gulf of Maine waters, as provided by Maine Department of Marine Resources. Bait data are estimates.

Year	Reduction landings (mt)	Bait landings (mt)	Landed in Canada (mt)	IWP landings (mt)	Total (mt)
1980	8,530	Unknown			8,530
1981	5,563	Unknown			5,563
1982	21,725	Unknown			21,725
1983	19,254	Unknown			19,254
1984	8,077	Unknown			8,077
1985	13,922	1,134			15,056
1986	9,487	771			10,258
1987	7,833	635	16,861		25,329
1988	8,261	670	11,884	20,538	41,353
1989	0	136	15,415	22,722	38,273

EVALUATION OF ATLANTIC MENHADEN STOCK AND FISHERIES

The AMAC has examined data provided by states in response to the February 1990 request by AMAC. The primary data examined were provided by the Beaufort Menhaden Laboratory Team in a report entitled "Assessment of the Status of the Atlantic Menhaden Stock With Reference to North Atlantic IWP," which is appended to this report. Historic landings data were examined using VPA techniques to estimate fishing mortality, population and spawning stock size, and recruitment. Stock status was examined using three modelling techniques: surplus production, spawner-recruit, and spawning stock ratio. Projections were made, using 1980s data, for future stock condition under several different sets of conditions.

Nine processing plants closed during the 1980s, while two new operations began, both dependent on the Gulf of Maine (Conners Brothers in Canada and the IWP in Maine). Three U.S. plants currently process menhaden. Landings for reduction have averaged 341,300 mt during the 1980s (319,400 mt average during 1987-89), while estimated bait landings have averaged about 15,200 mt during 1986-88.

Effective fishing effort has been variable during the 1980s, but is somewhat higher now than during the early 1980s. Catch-per-effective-effort has declined through the 1980s. While recruitment has fluctuated during the 1980s, it has generally been well above that during the previous two decades. Total numbers of Atlantic menhaden in recent years compare favorably with numbers of the 1950s, except for the population attributable to the huge 1958 year-class. However, population biomass is well below that of the 1950s. The relative difference between population size in numbers and biomass is attributable to a general decline in menhaden size-at-age since the early 1970s. This reduction is probably due partly to the concentration of the fishery on smaller southern fish and density-dependent factors. However, much of the decline in size-at-age cannot be explained. Fishing mortality has been quite variable for the period of record, but is generally about 0.9-1.0 for the 1980s, with an increase on age-0 fish and a decrease on age-1 fish.

The surplus production model shows that effective fishing effort has increased from the 1950s to the 1980s. The model used provided an MSY

estimate of 484,000 mt. The spawner recruit model found a weak relationship between spawning stock and subsequent recruitment at age-1. Environmental conditions are probably of equal or greater importance as spawning stock size in determining recruitment. Use of spawning stock ratios is a fairly new technique which estimates optimal proportions of spawners for a stock. For menhaden, observed values (generally 5% for the 1980s) are generally well below the optimal values (about 20% or more). Population projections were made for the total stock at several different levels of fishing in the North Atlantic. Under all scenarios, recruitment, spawning stock size, population size, total landings, and spawning stock ratios all declined. Spawning stock declined most rapidly. Because almost all of the menhaden taken in the North Atlantic are spawners, the fishery in that area has a much more direct impact on the spawning stock than fisheries in other areas. Recruitment has been good during most of the 1980s, probably due to favorable environmental conditions, allowing the stock to rebuild. The stock is quite sensitive to recruitment variability. Good recruitment and stock recovery have occurred over the last 15 years, a period of consistently high fishing mortality. Fishing mortality throughout the fishery should be monitored and adjusted, as necessary to allow for continued rebuilding of the stock.

RECOMMENDATION

For the North Atlantic region, total removals should not exceed recent historical landings. For historical landings, see Table 1, especially the landings for 1988-89, which most accurately reflect the current status of the fishery.

SUMMARIES OF THE TWO INP APPLICATIONS RECEIVED BY MAINE AS OF 30 MARCH 1990

Applicant #1

Name of Applicant: Resource Trading Company
Amount Requested: 40,000 metric tons
Name of Processing Vessel: M/V RIGA
Country of Registry: USSR
Time Period of Operation: June 1, 1990 - October 31, 1990

Applicant #2

Name of Applicant: Portland Lobster & Bait Company
Amount Requested: 40.000 metric tons
Name of Processing Vessel: M/V JOHANNES VARES
Country of Registry: USSR
Time Period of Operation: June 1, 1990 - November 30, 1990

A REPORT IN SUPPORT OF RESTRICTING MANHADEN NETTING WITHIN 2 MILES OF SHORE AND IN BAYS BY LEGISLATION.

* * * * *

LADIES AND GENTLEMEN:

I represent Sport Equipment Dealers and Sportsmen - Individuals and clubs. I have not been paid or will not accept any payment from anyone - individual or club. I, too, am a sportsman and offered to prepare and deliver this report at my expense. I will present the report to members of the committee.

The information I will present is factual and references are attached. I've avoided opinions and emotional statements made by others.

Donald H. MacPherson

DONALD H. MacPHERSON 5/20/90

7X

INTRODUCTION

I delivered a report to a Senate Committee a few years ago in support of limiting menhaden netting close to our shores, and detailed a number of reasons in support of their proposal. The reasons included, 1) the reduction of menhaden stocks which impact on sport fishing, 2) the dangerous conflicts that exist when menhaden netting and sport fishing exist in the same area, 3) the loss of recreation fishing days for sportsmen, as well as the loss to both the State and Federal governments in tax dollars, 4) the destruction of the marine environment by menhaden purse seiners.

Because this is an evening meeting, I will limit my remarks to the destruction of the marine environment, caused by purse seining for menhaden, and be as brief as possible.

The major source of information was taken from the Atlantic Menhaden Management Board report, figure 1. Many pages from this report will be used and are referred to as reference A.

PURSE SEINING - DESTRUCTION OF THE MARINE ENVIRONMENT

The purse seine used in menhaden fishing is about one quarter of a mile long and 60 to 90 feet deep, see figure 2. In operation, the mother ship launches two small boats that drag the weighted net to surround a school of fish, usually located by aircraft. The net is then closed at the bottom to prevent the escape of the fish.

8X

The depth of the ocean one mile from shore is 35 ft. and increase in depth at the rate of five feet per mile, as one goes farther from the shore, see fig. 3. One cannot avoid destroying the marine environment using nets 60 to 90 feet deep in such shallow waters. It is obvious that all crabs, lobsters and fin fish are trapped or destroyed.

After the Senate Committee meeting, I mentioned earlier, the Environmental Protection Department took action to reduce the problem between the manhaden fishing and recreational fishing only - see fig. 4. As a result, I mailed a copy of my report to the Department, and said if they do not support legislation, the least they could do is limit the depth of the seines, so they do not scrape the sea bottom. The response is shown on fig. 5. I never heard from them again, and no regulation on net depth exists! Incidently, all the large factory ships taking madhaden are registered in Virginia, see fig. 6.

IS THE TWO MILE RESTRICTION HARMFUL?

Manhaden are found in schools out to the inner half of the continental shelf, see fig. 7. This distance, off New Jersey, equates to 35 miles, see fig. 8. Thus, the manhaden fishing area is decreased by approximately 3%, by restricting fishing from 2 miles off the shore. The report the industry paid for, with help from New Jersey, shows that the restriction is only a small restriction.

CONCLUSION

The legislation to prohibit Manhaden netting within two miles of the coast line does not harm the industry as the reduction is only approximately 3% of the total ones the fish are netted. However, it is my strong opinion that the net depth must be reduced to 35 feet to reduce the damage to the marine environment that result from the present method employed today.

D. H. MacPHERSON
675 Ocean Avenue,
West End, N. J. 07740

FISHERY MANAGEMENT PLAN FOR ATLANTIC MENHADEN

BREVOORTIA TYRANNUS (LATROBE)

(A) REF.

Prepared by the

ATLANTIC MENHADEN MANAGEMENT BOARD

JOHN M. CRONAN

CHAIRMAN

(as part of the Interstate Fishery Management Program administered by the Atlantic States Marine Fisheries Commission.)

August 1981

Funds, manpower and support services for plan preparation over the 5 year history of the Atlantic Menhaden Program were provided by the coastal states (most notably, Commonwealth of Virginia, State of New Jersey, State of North Carolina), cooperating menhaden companies (especially Standard Products, Inc., Zapata Haynie Corp., Seacoast Products, Inc.), and National Marine Fisheries Service (in particular the Beaufort Laboratory and the State Federal Fisheries Management Program). The Interstate Fisheries Management Program is supported by funds provided by Northeast Region, National Marine Fisheries Service, National Oceanic and Atmospheric Administration under Cooperative Agreement No. NA-80-FA-H-00017.

FIG 1

10X

REF (A)

World War II are discussed in Section 5. Today, menhaden vessels range from about 70 ft (21m) to 195 ft (60m). Most menhaden vessels carry two purse seine boats about 36 ft (11m) in length (a few small vessels have only one purse boat). The purse seine has a stretched mesh of 1 1/4 in (3cm) to 2 3/8 in (6.3 cm) and ranges in length from about 1000 ft (305 m) to about 1400 ft (427m), and in depth from about 65 ft (20m) to about 90 ft (27m).

Over the years, vessels participating in the Atlantic menhaden purse seine fishery have varied considerably in size, fishing methods, gear, and intensity of effort. Most of the purse seine vessels fishing in Chesapeake Bay and Middle Atlantic areas have been devoted to the fishery for the duration of the season (~ 26 weeks/year). These are generally large conventionally-rigged vessels which carry two smaller purse seine boats. However, several smaller vessels utilizing only one purse seine boat ("snapper rigs") have fished in these regions, often in areas not available to the larger vessels. The catches of the "snapper rigs" (a very small fraction of the total) are often sold for bait (sport fishery, crab pots, etc.) as well as being processed into meal, oil, and solubles. Few conventional menhaden vessels have ever been based in the North Atlantic because of the variability of occurrance of menhaden in that region. Rather, trawlers and draggers convert for purse seine operation in a manner similar to the "snapper rigs" farther south. They fish for menhaden as long as it pays to do so. If the season begins poorly, most of these vessels leave the fishery for more profitable pursuits. If more menhaden appear later in the year, some of those vessels may re-enter the fishery. Conventional vessels from the middle Atlantic area often fish in the New England area if the long run is justified by significant quantities of fish in the area, especially if fishing is relatively poor nearer their home ports. The South Atlantic fleet is composed of vessels of a wide size range, with some smaller vessels using two purse boats. All of the vessels, however, fish exclusively for menhaden throughout the summer and fall seasons.

The number of purse seine vessels fishing for menhaden has varied widely, depending principally on availability of fish. Greer (1914) reported 147 vessels in 1912. During the fishery's peak (1953-1962), about 115-130 vessels fished during the summer, while about 30 to 60 participated in the North Carolina Fall fishery. As the fishery declined during the 1960s, fleet size decreased by more than 50%; from 108 full-time menhaden vessels in 1963 to 47 in 1968 (Nicholson 1971). Since 1972, from 35 to 43 full-time menhaden vessels have fished during the summer season, while 15 to 23 boats have fished in the North Carolina Fall fishery.

The number of full-time vessels in the fishery has not changed appreciably since 1972, but the "quality" of those vessels

FIG 2

ANGLERS' GUIDE - SECTION IV

U.S. DEPARTMENT OF COMMERCE

JULY 1974

Beach Haven Inlet to Cape May

LAND CONFIGURATION AND WATER DEPTH

From Beach Haven Inlet to Cape May the shoreline is formed by a number of low lying sandy barrier islands that vary from 3 to 7 miles in length and from a few hundred yards to 1½ miles in width. They are separated from each other by shoals and inlets and from the mainland by a network of saltmarshes and shallow estuaries which is usually several miles wide. By tradition the irregular shaped saltmarshes are called meadows or sedges and the large patches of open estuarine water, bays and sounds. Narrow interconnecting waterways, often called thoroughfares, form a kind of lattice work as viewed drom a high flying airplane. Along this stretch of coast there are only two places where sizable rivers join and flow to the sea. One, the Mullica River and its important tributaries, Wading and Bass Rivers, flows into Great Bay. The other, Great Egg Harbor River, is joined by the Middle and Tuckahoe Rivers near its mouth before flowing into Great Egg Harbor Bay.

Off this section of New Jersey, the sea bottom slopes downward at a moderate rate to a depth of 35 feet about a mile offshore. From there to about the 300-foot bottom contour, located 60 miles farther offshore, the descent is very gradual. For the most part the bottom over this part of the continental shelf is virtually a level sandy plateau, interrupted by scattered shoals, the most famous and extensive of which is Five Fathom Bank. This series of gullies and sand mounds, some of which rise to within 17 feet of the surface, has been an excellent fishing ground for nearly 300 years.

HISTORY

In precolonial and colonial times, people fished mostly in the brackish and salt water at the mouths of the various rivers and bays, where fish as well as crabs and clams tend to concentrate. For over two centuries after the first colonial settlement in 1648, most of the people living near the shore depended largely on the bays for their livelihood. Those that "followed the bay" during the entire year, oystering and soft clamming during cold months and fishing, crabbing, and quahauging during warm ones, became known as *baymen*. During this period the bays provided a good living.

Unfortunately, catches of many species today fall far short of those in the past. For example, even though striped bass and white perch still overwinter in the Mullica and Great Egg Harbor Rivers, their present abundance yields far less than the catch of 250,000 pounds such as was usual during the late 1800's. Although the weakfish, more often called gray sea trout, have been returning to this area recently after about 15 years of scarcity, this excellent game fish is still far less abundant than it was a century ago when 2½ million pounds were caught yearly, and by hook and line at that! Only limited demand kept the catch from exceeding even that amount. Sheepshead, a species now rarely occurring in New Jersey, were caught by the thousands of pounds and ranked next to weakfish in importance. Although hard-shell clams or quahaugs are important today, the total harvest is only about half its former amount of about 200,000 bushels. Great Bay alone once yielded 40,000 bushels annually; Lakes Bay, behind Atlantic City, 18,000 bushels; and Little Egg Harbor, 25,000 bushels.

During the latter part of the 1800's and the first 20 years of the 1900's, large summer resorts such as Ocean City, Sea Isle City, Avalon, and Wildwood came into being. Hotels with rooms for hundreds, sometimes even thousands, of visitors were the order of the

water organisms might cling and build u
life." Called a fishing preserve when the
became the first large-scale artificial fish
Ocean. This reef, located about 10 miles
fishing spot.

FISH AND FISHING

As the cold, strong northwest wind
milder, ocean temperatures begin to ris
continental shelf reaches about 45° or 4(
usually arrive inshore. After overwinter
overlying the outer edge of the continent
on the profusion of zooplankton, primar

Within the western North Atlantic th
and southern, which have a combined dis
Carolina. These have different winterin
reach them. The southern group, which
offshore towards New Jersey during sp
continental shelf. The spawning is heav
where the adults pause for a month or s
and eventually, about midsummer, into

Unlike the adults, juvenile mackere
summer, apparently in or near the area v
tuna and other large pelagic fishes caught
are often gorged with mackerel 2 to 6
inshore, entering the bays and sounds
especially in the fall.

During some years, chub mackerel, a
the summer. This fish prefers water that is

In the fall, as the coastal water be
Atlantic mackerel, by now as long as 8
same time or soon thereafter, larger At
This fall run is smaller than that of the
is during this run that we can see how m
the summer. One-year-old fish that had n
of a pound in the spring are now 13 or 14
that had measured 14 inches and weigh
time are 14½ inches and 1¼ pounds in
grow very slowly, for although some of
18 inches or 2½ pounds.

12X FIG 3

NEWS
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CN 402, TRENTON, N.J. 08625
609-292-2994
THOMAS H. KEAN, GOVERNOR
ROBERT E. HUGHEY, COMMISSIONER

(STATEWIDE)
No. 85/163

Immediate release:
July 12, 1984

EMERGENCY REGULATIONS ADOPTED FOR PURSE-SEINE FISHING OF MENHADEN

TRENTON--State Department of Environmental Protection (DEP) Commissioner Robert E. Hughey has signed into law emergency regulations promulgated by the DEP Division of Fish, Game and Wildlife which prohibit the use of purse nets in menhaden fishing closer than 3,600 feet from shore.

"The primary purpose of the regulations," Commissioner Hughey stated, "is to lessen conflict between menhaden purse-seine fishermen and our own recreational fishermen."

The new regulations are in response to incidents last fall in which 16 menhaden purse-seine vessels, some as long as 160 feet, had concentrated their fishing on school of menhaden close to New Jersey beaches. At the same time hundreds of small recreational fishing craft and party boats were fishing for bluefish feeding on the same schools of menhaden.

A special conflict which could have had serious safety implications occurred. The menhaden fishery, however, did interfere with the recreational activity of many anglers, including some fishing from the beach and jetties. A financial loss to the recreational fishing industry resulted when catches of fish and, subsequently, bait and tackle sales declined.

The emergency regulations became effective on July 10, 1984, and apply to anyone licensed to use a menhaden purse-seine in the state's marine waters. The new regulations prohibit the use of purse nets in the Atlantic Ocean and Delaware, Raritan and Sandy Hook bays closer than 0.6 nautical miles (3,600 feet) from the shoreline, jetties or fishing piers.

F16 4

The regulations also make it the responsibility of the captain of a menhaden purse-seine vessel to determine the possibility of drifting inside the 0.6 nautical mile limit

(more) 13X

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DONALD T. GRAHAM, ASST. COMMISSIONER
CN 402
TRENTON, N.J. 08625
609 - 292 - 9289

October 22, 1984

Mr. D. H. MacPherson
675 Ocean Avenue
West End, NJ 07740

Dear Mr. MacPherson:

Thank you for sending Commissioner Hughey copies of your materials on the proposed menhaden fishing restrictions legislation. We found them quite interesting, expecially the deep net destruction of the marine environment.

I will share your letter and comments with DEP staff responsible for New Jersey marine fisheries: Director Cookingham and Administrator Freeman. They may wish to respond to your advice in greater depth.

Thank you again for writing.

Sincerely,

Donald T. Graham
Assistant Commissioner

cc: Director Cookingham
Administrator Freeman

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14X

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF
FISH, GAME AND WILDLIFE
RUSSELL A. COOKINGHAM
DIRECTOR

PLEASE REPLY TO:
CN 400
TRENTON, NEW JERSEY 08625

January 20, 1984

Mr. Joe Melillo
22 Evergreen Place
Howell, NJ 07731

Dear Mr. Melillo:

I am responding to your inquiry of the other day concerning a list of the vessels that the state licenses (N.J.S.A. 23:3-51). During 1983, we had twenty vessels licensed for use of menhaden purse seines. They are as follows: "Reedville", "Tangier Island", "Great Wicomico", "Smith Island", "John D. Deihl", "J. Frank Jett", "Northumberland", "John S. Dempster Jr.", "Mance Lassiter", "Earl J. Conrad Jr.", and "Lancaster". All of these vessels are registered to Zapata Haynie Corporation in Reedville, Virginia, and are approximately 167' in length.

The "Atlantic Breeze", "Atlantic Venture", "Atlantic Surf", "Atlantic Mist", "Atlantic Queen", "Atlantic Beach", and "Atlantic Coast" are all Standard Products Company boats. These boats are approximately 175' in length and are registered to Standard Products Company of Kilmarnock, Virginia.

The last vessel is the "Bellatrix", registered to Chris and Ernest Anthopulos of Port Monmouth, New Jersey. This vessel is about 50' in length.

If you have any other questions concerning the licensing of these vessels, please feel free to give me a call.

Sincerely,

Bruce L. Freeman
Marine Fisheries Administrator

am

c Russell Cookingham
Paul Hamer

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15X

REF
(A)

tendency for fish of similar size and age to occur together in a given locality, but to remain distinct from those of overlapping sizes and ages in adjacent localities. Thus, a north-south gradient in size and age becomes established, with larger and older fish found farther northward (June and Reintjes 1959; McHugh et al. 1959).

A southward withdrawal of fish from the summer grounds takes place in autumn. Prior to their southward migration, the fish congregate in large schools, which sometimes cover a surface area of many square kilometers. The fishing fleet follows the large schools as they migrate southward in October, but frequently the schools travel in deep water offshore where they cannot be caught. However, the schools are intercepted again as they pass close inshore along the coast of North Carolina in November. The large, migrating schools are last seen off the North Carolina coast in December or January (June 1961; Nicholson 1971 and 1972; Kroger and Guthrie 1973; Dryfoos et al. 1973; Roithmayr 1963; Reintjes 1969). Young-of-the-year (age 0) as well as older (age 1 and 2) and mature Atlantic menhaden (age 3+) undertake extensive migrations along the Atlantic coast of the United States (Figure 1.1).

In 1963, Roithmayr reported the distribution of fishing by purse seine vessels for the five-year period, 1955-1959. He estimated that during the five seasons surveyed, some 158,000 sets were made between April and January (Figure 1.2 and 1.3). From these data and other information early investigators concluded that Atlantic menhaden do not occur in equal abundance throughout the range, but are concentrated in certain localities during certain periods of the year. During the warmer months, the fish congregate in schools in the near surface waters overlying the inner half of the Continental Shelf. While variations in the amount and distribution of fishing effort occurred from year to year, the area of concentration remained nearly the same over the 5 years for which such information was available. During the colder months, the fish rarely are seen in the surface waters. There is evidence that during this period they occur in loose aggregations in deeper water over the Continental Shelf. In Chesapeake Bay, however, menhaden have been taken at all times of year (McHugh, et al. 1959).

The observations and conclusions drawn by Roithmayr regarding the place and time that Atlantic menhaden appear in fishable quantities along the coast still hold true today, but distribution of fishing effort has changed. In recent years, purse seine fishing has concentrated in Chesapeake Bay and North Carolina. Fishing efforts in New England and Florida waters have been reduced from former years depicted in Figures 1.2 and 1.3.

FIG 7

16X

REF
(A)

At Cape Hatteras, the continental shelf extends seaward approximately 33 km (20 miles) then widens gradually to 113 km (70 miles) off New Jersey and Rhode Island and then broadens to 193 km (120 miles) off Cape Cod forming Georges Bank. The substrate of the shelf in this region is predominantly sand interspersed with large pockets of sand-gravel and sandshell. Beyond 200 m, the substrate becomes a mixture of silt, silt-sand, and clay.

On the continental shelf north of Cape Hatteras, surface circulation is generally southwesterly during all seasons, although this may be interrupted by coastal indrafting and some reversal of flow at the northern and southern extremities of the area. Speeds of the drift are on the order of five nautical miles per day. There may be a shoreward component to this drift during the warm half of the year and an offshore component during the cold half. This drift, fundamentally the result of temperature-salinity distribution, may be made final by the wind. A persistent bottom drift at speeds of tenths of nautical miles per day extends from beyond midshelf toward the coast and eventually into the estuaries.

A southerly flowing coastal current such as that prevalent north of Hatteras is transient to the south of Hatteras. During winter a cross shelf thermal gradient causes a northerly set to the coastal waters. In summer the cross shelf thermal gradient is nearly non-existent, so a general southerly movement is found over most of the shelf.

Circulation in the western North Atlantic is profoundly influenced by the Gulf Stream, an intense western boundary current. Transport by the Gulf Stream off Cape Hatteras has been estimated to be 63 x $10^6 m^3$/sec, and surface currents as high as 200 cm/sec have been measured.

The salinity cycle results from stream flow and the intrusion of slope water from offshore. The salinity maximum of winter is reduced to a minimum in early summer by large volumes of spring river runoff. Inward drifts of offshore saline water throughout the autumn eventually counterbalance the fresh water outflow and return the region's salinity distribution to the winter maximum. Due to the proximity of the Gulf Stream and the low amount of runoff per unit length of coast, the shelf water south of Hatteras is relatively saline when compared to coastal waters farther north. Shelf salinity here is lower during summer. Water salinities near shore average 32 °/oo, increase to 34-35 °/oo along the shelf edge, and exceed 36.5 °/oo along the main lines of the Gulf Stream.

Most, if not all, of the coastal waters and estuaries from New England to central Florida are utilized by juvenile menhaden as

FIG 8

17X

New Jersey Department of Environmental Protection
Position Statement On Assembly Bill 3430 Regulating The Taking Of Menhaden
For Submission to Assembly Conservation and Natural Resources Committee
Public Hearing on May 23, 1990

The Department of Environmental Protection must oppose A-3430 as it would supersede N.J.A.C. 7:25-22, which regulates the taking of menhaden. These regulations currently limit the taking of menhaden by purse seine for industrial purposes to the Atlantic Ocean beyond 1.2 nautical miles of the New Jersey coastline. These regulations further provide for a limited menhaden purse seine fishery, for bait purposes only, as close as 0.6 miles of the coast in the Atlantic Ocean and Delaware Bay, and 0.3 miles of a coast within Raritan and Sandy Hook Bays. The Department's Division of Fish, Game and Wildlife feels that these regulations have been working quite well since their implementation in July of 1989 and that additional restrictions are not required at this point in time.

As written, the bill would allow vessels of under 50 gross tons to harvest menhaden by purse seine within 0.6 miles of the coastline for any purpose. We are concerned that a significant number of smaller vessels may enter the fishery to fulfill the requirements of the large scale menhaden fishmeal reduction industry, thereby impinging upon the in-shore sport fishery. We would respectfully request that the bill be amended to limit the activities of those smaller menhaden purse seine vessels to the harvesting of menhaden for bait purposes only and to further allow those vessels to fish within the confines of Delaware Bay up to 0.6 miles from the coast and within Raritan/Sandy Hook Bays up to 0.3 miles from the coast.

The ability to provide a steady source of low-priced bait for both the commercial lobster and crab fishery and the sport fishery is very important to those industries. Nonetheless, although very important, the total market for menhaden for bait purposes is limited. This, in turn, limits the number of these smaller purse seine vessels that will be able to pursue the purse seine menhaden fishery in the in-shore waters. New Jersey currently licenses only four purse seine vessels of less that 90 feet in length for the taking of bait. We anticipate that these will satisfy the market and thus impose a "natural" limit on the size of the in-shore menhaden fishery. Thank you for the opportunity to comment at this time.

Respectfully submitted,

Robert A. Itchmoney

Robert A. Itchmoney, Assistant Director
Division of Fish, Game and Wildlife
5/23/90

CLARK
LADNER

FORTENBAUGH & YOUNG

ATTORNEYS AT LAW

ONE CENTENNIAL SQUARE ■ HADDONFIELD, NJ 08033 ■ (609) 429-5351 ■ Cable: CLARKLAD Telex: 83-1462 ■ Fax: (609) 428-0238
Managing Partners: Edward V. Cattell, Jr., Stuart M. Goldstein, William L. Mueller

Edward V. Cattell, Jr.
Also Member Pennsylvania Bar

June 13, 1990

PHILADELPHIA OFFICE
One Commerce Square
2005 Market Street
Philadelphia, PA 19103
(215) 241-1800

Mr. Leonard Colner
Office of Legislative Services
State House Annex
Room 350
Trenton, New Jersey 08625

Re: Assembly Bill A-3430

Dear Mr. Colner:

Enclosed are ten copies of the comments of Ampro Fisheries Inc. on Assembly Bill A-3430. We would like to have these comments supplement the record which was commenced at the public hearing on May 23rd held in Belmar. If you have any questions, or need additional copies, we would be pleased to respond. Ampro Fisheries, Inc. requests the opportunity to testify at the committee hearings to be held in Trenton on the bill.

We would appreciate being advised of the dates of those hearings and of the availability of the transcript of the May 23rd hearing in Belmar. Thank you very much for your assistance.

Very truly yours,

CLARK, LADNER, FORTENBAUGH & YOUNG

By: _____
Edward V. Cattell, Jr.

EVC/dml
cc: John C. Barnes, III, Sr. Vice President
Ampro Fisheries, Inc.
Mr. John Horn
Atlantic Menhaden Council
Barney White, President
Zapata Haynie Corporation
Enclosures:

20K

CLARK
LADNER

FORTENBAUGH & YOUNG

ATTORNEYS AT LAW

ONE CENTENNIAL SQUARE ■ HADDONFIELD, NJ 08033 ■ (609) 429-5351 ■ Cable: CLARKLAD Telex: 83-1462 ■ Fax: (609) 428-0238
Managing Partners: Edward V. Cattell, Jr., Stuart M. Goldstein, William L. Mueller

Edward V. Cattell, Jr.
Also Member Pennsylvania Bar

June 12, 1990

PHILADELPHIA OFFICE
One Commerce Square
2005 Market Street
Philadelphia, PA 19103
(215) 241-1800

Assemblyman Daniel Jacobsen
c/o Mr. Leonard Colner
Office of Legislative Services
State House Annex
Room 350
Trenton, New Jersey 08625

Re: Comments on A-3430

Dear Assemblyman Jacobsen;

We offer to the Committee the comments of Ampro Fisheries, Inc., which we represent, to the proposed Menhaden bill, A-3430. Ten copies are enclosed. We can provide additional copies, for the convenience of the committee, if that is helpful to you.

Ampro Fisheries, Inc. is a commercial menhaden processing company, operating a plant in Reedville, Va. and plants in the Gulf of Mexico. Of relevance to this legislation, however, is the Atlantic Menhaden fishery. At the public hearing, held in Belmar on May 23rd, the sport fishermen offered many of the "truths" that they hold most dear. These "truths" are, however, the product of generations of folk myth and refusal of the sports to face the facts as repeatedly demonstrated by scientific survey and study. We offer the Committee documentation that the various assertions of the sports, which they rely upon to support their position that this bill is necessary and in the public interest, are untrue, and that this bill is contrary to the public interest.

Assertion: The menhaden boats catch sport fish in large quantities along with the menhaden because when they encircle a school of menhaden on which blues and strippers are feeding, they catch the blues and strippers too.

Fact: The menhaden fishery is a "clean" fishery. There is virtually no by-catch, that is, there are almost no fish caught other than menhaden. Sports have been complaining, for generations, that they have seen "with my own eyes", to quote one older gentleman at the hearing, the capture of sportfish, by the menhaden seiners. The menhaden is a slow swimming, toothless fish that depends on numbers for survival. When threatened, they rise to the surface in a compact mass. Blues, strippers or other predators feeding on the school can attack only those fish on the bottom or outside of the tight school. When encircled with a net, however, the blues and other predators sound, or dive, to escape. As the net is pursed, or drawn closed at the bottom, the predators have an opportunity to and do escape from the net before it is drawn all the way closed.

New Jersey Marine Fisheries Administration Administrator Bruce Halgren, who rode Ampro's vessels last summer observing the catch, is able to verify that it is a clean fishery.

Sportsmen who have taken the trouble to educate themselves on the issue have reached the same conclusion. We attach, as Exhibit A, a letter written by William Feinberg, Esq., a sportfisherman and member of the Asbury Park Fishing Club, in August, 1981, when the legislature was considering similar legislation pushing the menhaden boats out to 1.2 miles offshore. Mr. Feinberg, a "most ardent" sportfisherman, wrote:

"As a boy on the beach, I had a strong disdain for the bunker fleet. To me they were responsible for poor fishing, for the destruction of bluefish, strippers, and weaks and for the depletion of prey upon which the sportfish existed. I held this belief for many years until I began to hear arguments on the other side. These arguments from my opponents were supported by facts and figures while I was totally unable to come up with any proof to justify my stand. Believe me, I did research on the subject but found nothing. I was forced to concede that what I had believed all along was based largely on the psychological effect caused by seeing the bunker boats fishing close to shore and nothing more.

"I feel that the present effort to legislate the menhaden industry out of existence, for that is what will happen if this bill goes through, is based on the same type of bias of which I was guilty for so many years. The arguments presented are emotional, but they are not backed up by the facts.

"Bunker boats have fished our shores for more than a century. They have used advanced technology, including spotter planes for over 30 years. Despite this, statistics indicate that the menhaden population remains relatively stable." Letter from William Feinberg to Coleman Gibbs, August 21, 1981.

Mr. Feinberg was not alone in reaching the conclusion that the 1.2 mile line was unreasonable. In July 1967, the sports publication New Jersey Rod & Gun included a first person account by Steven P. Tczap, president of the N.J. State Federation of Sportsmen's Clubs, Inc., of his visit to a menhaden seiner for an inspection trip. A copy of this article is attached as Exhibit B. Mr. Tczap related that when aboard the seiner they met a state fisheries biologist who was aboard monitoring the number of food fish caught with the menhaden. Further, the captain was genuinely pleased to see the sportsmen aboard, having invited "complaining fishermen and party boat captains" aboard many times to observe the operation, but "..to date not one of these people have taken him up on his offer." After explaining the operation of the boat, Mr. Tczap stated that he observed a haul of 100,000 fish, and subsequent hauls of 50,000 and 100,000 fish. Which were taken aboard the boat. Mr. Tczap observed the loading of the fish into the hold:

"The skipper and I were stationed approximately ten feet from the chute which dropped the fish into the hold. I pointed out several fish which I were (sic) sure were bluefish. Upon closer examination of these fish I was proven wrong. During the operation Fisheries Biologist Ronald White was diverting samples from the chute to be dropped on the deck area. His samples ranged from four or five hundred or more from each catch. A few pint porgees were found in his samples. I don't believe there were more than four or five and these added up to about two/three inches long. During the day I counted a total of 18 weakfish that were gillnetted and these ranged from 8/10 inches in length. I was amazed at this small percentage of food and sports fish being caught." New Jersey Rod & Gun, July, 1967, ppg. 12, 10.

In 1966 and 1967 the State of New Jersey conducted a through study of the menhaden fishery in Delaware Bay. The state was responding to a situation in which: "Members of the sport fishing community had accused the menhaden boats of taking large amounts of sport fish and oysters and were demanding closure of the Bay to all menhaden purse seining." The Report issued by the state on this project (Project 32-R-2), a copy of which is attached as Exhibit C, and an Abstract of which is attached as Exhibit D, concluded:

"1. During both years of this investigation, few sport and food fish were taken by the menhaden fishery. The majority of those which were caught were too small to be of immediate value to the sport fishery.

"2. The menhaden fishery poses no threat to the Delaware Bay shellfish industry as oysters or clams were never observed in the boats' holds, on deck, or entangled in their nets.

"3. The physical competition observed for fishing areas does not seem to be a valid reason for terminating menhaden fishing in Delaware Bay.

"4. The 1967 fishing season caught ten times the number of menhaden as did the 1966 season, and yet the percentages of menhaden taken in both seasons were the same. It is doubtful that any further increases in the size of the menhaden catch in future years will substantially affect the catch compositions reported here.

"5. The whole problem of the menhaden fishery and how it relates to the sport fishery seems to be one of a sociological nature rather than one having any sound biological basis.

"RECOMMENDATIONS: In light of the finds of this study, based on two years of investigations, no new legislative action should be taken to restrict the menhaden fishery in Delaware Bay." Final Report Project 32-R-2, January 30, 1968, ppg. 8,9.

We believe that this data and information dispels the fiction that the menhaden industry is responsible for catching any significant number of sportsfish.

Assertion: The bunker boats catch all the menhaden and destroy the food chain by taking the fish on which the blues and strippers feed.

Fact: Extensive research done by the National Marine Fisheries Service, through their facility at Woods Hole, Mass., the Atlantic States Marine Fisheries Commission, and the New Jersey Marine Fisheries Administration firmly establishes that bluefish, stripped bass, weakfish, and the other species which feed on menhaden also feed on a wide variety of other fish and invertebrates. Menhaden do not represent a major portion of the diet of these species. There is absolutely no data which even suggests, let alone establishes, that the commercial harvest of menhaden to date has had any impact on the strength of the predator species. It is well known, however, that certain of these species have suffered from overfishing by recreational interests, which

has recently resulted in management plans intended to reduce the recreational harvest of these fish. The bluefish management plan is the latest of these plans to emerge from the federal management councils.

It is acknowledged that where a school of menhaden is being fed on by a concentration of predators, sportfishermen will find it easier to catch their target species. If the school of menhaden is caught, it will result in a short term scattering of the predator species. The predators are still there, however, and can still be caught. If there is any overall impact of the commercial menhaden harvest, it is to reduce the overall impact of the sportfishermen on the bluefish, stripped bass, etc., which is consistent with the goals of the management plan to reduce the catch of these species.

Evidence of the foregoing statements is provided by the recent responses of the Division of Fish, Game and Wildlife to the comments submitted on the current D.E.P. regulations governing the menhaden fishery. One comment,on this subject, and the response of the Division, were as follows:

"COMMENT: Menhaden purse seine fishing activity disrupts feeding of weakfish, stripped bass, and bluefish and, thereby, disrupts sport fishing for these species. Even the perception of a loss of gamefish, or their availability, to the sport angler results in a real economic loss to party and charter boats, bait and tackle shops and tourism in general. Any reduction in the conflicts between the menhaden industry and sportfishermen in nearshore areas and any resolution on the real or perceived impact to gamefish should be accomplished to protect the economies of coastal communities.

RESPONSE: Available information indicates that menhaden purse seine fishing does not result in the harvest of significant numbers of sportfish. Existing data further suggests that menhaden do not constitute a major portion of the diet of bluefish or stripped bass. At certain times, however, sportfish do feed heavily on concentrated schools of menhaden. At these times, sportfish increase in local abundance and become more available to sport fishermen. Disruption or removal of these menhaden schools at such times will have the impact of reducing local availability of the predatory fishes and thus impact the recreational fishery and support industries. The adoption [of the proposed regulation, since adopted] should reduce the real as well as the perceived conflicts and, thereby, reduce the impacts to the coastal communities as described in the comment." 21 N.J.R. 2035, Monday, July 17, 1989.

The thrust of the State's responde, since the data reveals that there is no long term impact on the sport fishery, is to address the perceived conflicts as envisioned by the sport fishermen. It is these unfounded perceptions and prejudices which we address herein.

Assertion: The long nets of the menhaden seiners damaged the bottom and catches everything that is down there.

Fact: As was revealed in the 1966-1967 research into the menhaden industry, there is no catch of bottom species at all. There has never been any incidental catch of clams, crabs, oysters observed in the catch, on the deck, or in the nets of the menhaden boats over many years of intensive observation of the fleet.

The reason for this is the way in which the seiners fish. While the seine nets are deep enough to touch the bottom, they are pursed up off the bottom as soon as the school is surrounded. The nets are expensive. Dragging them on the bottom causes damage and is avoided at all times to the greatest extent possible. The fact that bottom species are not found in the nets indicates that the seine boat captains are quite skillful at achieving their goal in this regard.

Assertion: The recreational fishermen are many thousands in number and spend millions of dollars on fishing tackle and related items in the New Jersey economy; therefore, the menhaden boats should be pushed to 2 miles offshore.

Fact: It is difficult to counter generalizations such as this. There are indeed many sportfishermen. They undoubtedly spend money on their hobby and a great deal of it is undoubtedly spent in New Jersey. On the other hand, there is absolutely no evidence that a single one of those sportsmen would spend any less money on his hobby or in New Jersey if the proposed bill was withdrawn or defeated. It is a fact that the sportsfishery has grown to its present size over the last 20 years fishing alongside of the menhaden industry. The present bill is nothing more than an attempt to eliminate the menhaden industry in order to satisfy the demand of the sportsmen to exclusive access to New Jersey's fishing grounds.

Although the sportsmen claim that they are thousands in number and spend millions of dollars in the New Jersey economy, which may be true, there is absolutely no evidence to suggest, let alone support any notion that this bill is needed to support the economy of the New Jersey shore. It is doubtful that a single sportfisherman will abandon his love for the sport because there are menhaden seine boats within 2 miles of the beach. Not a single

fishing day will be lost, not a single dollar of income will be missed. To suggest otherwise is to ignore the fact that the sportsfishing industry has grown to its present size right alongside the menhaden industry, sharing access to the same fishing grounds.

What is evident, however, is that A-3430, if passed, will damage the commercial menhaden industry. The New Jersey legislature has considered this very bill on two prior occasions. In the early eighties the legislature considered S-3395. That bill would have restricted menhaden fishing within 1.2 miles of the coast. At that time the Division of Fish, Game and Wildlife wrote, in comment:

"The Senate Bill 3395 further restricts the taking of menhaden within 1.2 nautical miles of the coastline by vessels larger than 50 gross tons. We believe this to be an unnecessary restraint on the commercial fishery and will have an effect of greatly reducing the catch or eliminating the commercial catch entirely. Another provision would disallow the use of purse seines in Sandy Hook Bay, Raritan Bay, and Delaware Bay. We feel the prohibition of nets in the areas beyond the current regulations is unwarranted and will have an overly adverse impact upon the commercial fishery." Statement Concerning The Taking Of Menhaden (S-3395), by the Division of Fish, Game and Wildlife, attached as Exhibit E.

In 1984 another bill was introduced into the Senate, which was virtually identical to S-3395, and identical to A-3430, except that the limit was 1.2, not 2 miles. That bill was S-1372. The Department of Environmental Protection also opposed the provisions in that bill which would have restricted fishing for menhaden to 1.2 miles offshore and prohibited fishing within the bays. See letter of Paul Hamer, Bureau of Marine Fisheries, February 11, 1986, attached as Exhibit F.

Even the sportsmen recognize that the 1.2 mile line, or the 2 mile line, if this bill passes, will have a devastating effect on the commercial fishery. Mr. Feinberg, in his letter, attached as Exhibit A, stated: "I feel the present effort to legislate the menhaden industry out of existence, for that is what will happen if this bill goes through, is based on the same type of bias of which I was guilty for so many years. The arguments presented are emotional, but they are not backed up by the facts."

The Division of Fish, Game and Wildlife, in its responses to *comments on the recent regulations in this area*, stated: "Approximately half of the recent fishing effort directed upon menhaden for fishmeal reduction purposes has been within the zone [1.2 miles] that would be restricted by this proposal." 21 N.J.R. 2035, Monday, July 17, 1989.

In fact, in 1988, the last full year of fishing prior to the imposition of the 1.2 mile line in 1989, 90% of the fishing effort was directed within that zone between 1.2 and .6 miles from the coast and in Delaware Bay. It is easily observed that pushing the menhaden boats out to 2 miles and excluding them from Delaware Bay will have a devastating effect on the fishery.

Assertion: The menhaden biomass needs protection from the commercial industry.

Fact: The Division of Fish, Game and Wildlife, in responde to Comments made on amendments to the menhaden regulation promulgated by that agency acknowledged that there is no evidence that the biomass (the total number and weight of fish) is not as large as it has ever been. The reports of the Atlantic States Marine Fisheries Commission and the National Marine Fisheries Service indicate that the menhaden stocks are healthy. During the period from 1981 to 1989, on the other hand, the commercial menhaden industry, in responde to coastal development and foreign market pressures, was reduced from 11 operating reduction plants to 4 in operation at the present time. The fleet of menhaden boats was reduced, over the same time period, from over 50 vessels to 22 vessels in operation at the present time.

In the State of Maine, coastal development pressure resulted in the closing of all the menhaden plants. There is now no market for menhaden in that state other than a limited volume of fish caught for bait purposes. In responde to the elimination of that commercial fishery, the State of Maine, not the commercial reduction industry, has granted what are known as IWP's, or Internal Waters Permits, to two joint ventures with the Soviet Union, under which Soviet factory processing vessels may operate within 3 miles of the coast of Maine (in state, not federal waters) purchasing 40,000 metrio tons of menhaden per venture, from Maine fishermen. The fish meal and oil produced by these ventures belongs to the Soviet companies involved and competes on the world market with the fish meal and oil produced by our domestic processing industry.

The size of the menhaden biomass is so large, however, that even with the commercial fishing effort, and the joint ventures, "fishkills" still occur with regularity. A fishkill results when juvenile menhaden, under pressure from predators, attempt to escape by swimming into estuaries where they consume all available oxygen and suffocate themselves by their vast numbers. The dead fish create a massive clean-up effort for health officials. Attached, as Exhibit G is an article from The Times, July 9, 1988, reporting on a fishkill in the Bronx, N.Y.

We hope that we have offered, in the foregoing submission, the evidence necessary to persuade the members of the committee that the bill before you is not necessary. We would also like to offer, for your consideration, evidence of why the bill is not only not necessary, but why it is contrary to the public interest.

Menhaden meal and oil is an important part of the national effort to combat heat disease: The commercial menhaden reduction industry produces two main products. They are fish meal and fish oil. The menhaden is an oily fish. It is edible, however, there is no market for it as a food fish since the available substitutes are more attractive. However, menhaden is one of the fish that is highest in Omega III fatty acids, which have been proven to reduce cholesterol levels in human beings. In other words, consumption of menhaden oil not only does not increase cholesterol levels in the body, but actually reduces them. It has also been established that feeding a fish meal diet to chickens results in the retention of the fatty acids by the poultry meat to a limited degree and that eggs from fish meal fed hens are lower in cholesterol than eggs from grain fed hens. Poultry and eggs from fish meal fed hens is healthier than from grain fed hens.

Attached as Exhibit H are three documents. The first is a copy of a publication titled " n-3 News, Unsaturated Fatty Acids and Health", published by Harvard Medical School and Massachusetts General Hospital, March 1988, detailing the findings with regard to chickens fed with fish meal; second is an Abstract of a paper delivered at the Tenth Annual Meeting of the Southern Poultry Science Society, January, 1989, evidencing the effect of menhaden oil on the cholesterol in eggs; and, third, Information Pamphlet 1, January 1990, NOAA/National Marine Fisheries Service, on the benefits of fish oil from various food fish species. Menhaden is not included in this listing because it is not a food fish. However, menhaden is among the highest in Omega III fatty acids.

Menhaden oil will shortly be available to the American consumer in a variety of forms. In September, 1989, the Food and Drug Administration approved menhaden oil, which has been used as a cooking oil and as margarine in Europe for many years, for human consumption in our domestic market. It is anticipated that it will be available in those forms in this market shortly. The advantage of menhaden oil over alternatives such as corn oil is that while corn oil contains no cholesterol, menhaden oil actually reduces cholesterol in the human body.

The current bill eliminates the possibility of economic reinvestment by the menhaden industry in New Jersey: In 1982 the last operating menhaden plant in New Jersey closed down. In 1985 the site was sold and that plant has since been torn down. Seacoast Products, Inc., which was for many years a major employer in the menhaden industry and in New Jersey is no longer in business. However, the menhaden continue to plentifully populate the near-shore waters of the state. The effective range of the menhaden boats, which fish from the existing plants in Virginia, is northern New Jersey or the western end of Long Island, N.Y. If a plant were located in New Jersey, then the range of these boats would be extended to Nantucket Shoals, or beyond. In the past, a fish meal plant meant drying fish meal in large ovens with the vapors vented to the atmosphere. Current technology, however, has developed new techniques which enable the menhaden to be processed into valuable products in a closed system solubles plant which releases nothing to the outside. New Jersey would be a very desireable location for such a plant, having available labor, and natural resources (the fish), as well as infrastructure (industrial waterfront in close proximity to rail and roads). However, with the menhaden boats effectively precluded from harvesting the fish, its would be foolish for any company to consider locating here. The benefits of a plant in New Jersey are obvious. The plant would be built and would represent tax ratables where there are now none. Jobs would be created in the construction and operation of the plant. The sales from the plant would contribute to the state's gross product and to tax revenues.

There is no need for the 2 mile line proposed by A-3430. The perception by the sportsfishermen that it is needed is prompted either by their lack of knowledge of the well established evidence which is proffered above, or by their refusal to accept facts which they have grown up rejecting as a matter of course. The establishment of the 2 mile line will result in devastating damage to the commercial fishery since the vast majority of the fish are located inside of the current 1.2 mile line, let alone a 2 mile line.

The commercial fishing industry has offered to work with the Department of Environmental Protection, Division of Fish, Game and Wildlife to develop a system of zones which would limit the commercial fishing effort in any geographic area to a specific number of vessels at any one time, and to eliminate commercial fishing entirely during peak recreational fishing times such as weekends and holidays. A copy of the proposal is attached hereto as Exhibit I. That offer, however, has not been accepted to date. It is also suggested that if the menhaden license fees are to be increased, that the additional funds be dedicated to educational projects among the sportfishing community in order that future misunderstandings between the sport and commercial fisheries can be prevented. If Mr. Feinberg and Mr. Tczap can educate themselves on the error of their strongly held misperceptions, then there is hope that this entire controversy might be laid permanently to rest and the two segments of the fishery exist, once more, in harmony. To this end, it is instructive that the Atlantic States Marine Fishery Commission, of which New Jersey is a member, is presently working on developing just such an education program. The funding from this source would be of great benefit to the program. In A-3430 the funds are dedicated to menhaden enforcement. However, in the entire history of the menhaden regulations, there has never been a violation. Funds are just not needed for the purpose designated by the bill.

The commercial industry wishes to continue this vital New Jersey fishery for the good of consumers of menhaden products in New Jersey and in the nation as a whole. We request that the present bill be withdrawn and a substitute introduced to address the real issue- education. If the committee, or any member of the legislature has any questions that the industry can address, to shed further light on this subject, we will be happy to respond.

Very Truly Yours,

Ampro Fisheries, Inc., by
Clark, Ladner, Fortenbaugh & Young

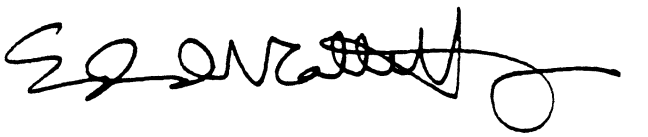
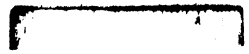


Exhibit A



32.k

JACK FEINBERG (1915-1967)
VINCENT T. DEE (1928-1976)
WILLIAM M. FEINBERG
RICHARD J. FEINBERG
CATHY J. POLLAK

FEINBERG, DEE & FEINBERG
COUNSELLORS AT LAW
554 BROADWAY
BAYONNE, N.J. 07002

FEDERAL 9 5500 5501 5502

August 21, 1981

Mr. Coleman Gibbs
Trustee, Asbury Park Fishing Club
Box 96 1/2
Newtons Corner Road
Howell, NJ 07731

RE: Menhaden (Moss Bunker) Fishery

Dear Cole:

As you know, I have arranged for a panel discussion to be conducted at our next meeting on September 8, 1981 to consider proposed legislation to restrict the menhaden fishery. These restrictions would prevent the taking of menhaden in Raritan Bay and would require menhaden vessels to fish more than one mile offshore. The ostensible purpose of this legislation is to conserve moss bunkers which, it is said, are being depleted. The proponents of the legislation claim that the commercial fishery is responsible for this depletion, and it is their position that this results in a decline of bait for sport fish and a worsening of water quality.

Unfortunately, a long planned fishing trip to Nova Scotia will prevent my being present at the September meeting, and so I would appreciate your reading this letter to the members after the panel presentation is completed.

Lest anyone accuse me of being unfaithful to the sport fishing cause, I can say that although I may not be the most successful fisherman, I count myself among the most ardent. Thus it has been for over 40 years and thus it will be while I am still able to lift a rod. However, being an avid sport fisherman does not mean I can't examine a fishery issue by looking at the facts rather than deciding it on the basis of emotionalism.

continued.....

As a boy on the beach, I had a strong disdain for the bunker fleet. To me they were responsible for poor fishing, for the destruction of bluefish, stripers and weaks and for depletion of the prey upon which the sportfish existed. I held this belief for many years until I began to hear arguments on the other side. These arguments from my opponents were supported by facts and figures while I was totally unable to come up with any proof to justify my stand. Believe me, I did research on the subject but found nothing. I was forced to concede that what I had believed all along was based largely on the psychological effect caused by seeing the bunker boats fishing close to shore and nothing more.

I feel that the present effort to legislate the menhaden industry out of existence, for that is what will happen if this bill goes through, is based on the same type of bias of which I was guilty for so many years. The arguments presented are emotional, but they are not backed up by the facts.

Bunker boats have fished our shores for more than a century. They have used advanced technology, including spotter planes for over 30 years. Despite this, statistics indicate that the menhaden population remains relatively stable. This industry is, I understand, the single largest payer of fishery license fees to the State of New Jersey. These fees are applied to the improvement of our sportfishery and as such constitute a most important source of funds. I am certain this will disappear if the menhaden fishermen are driven out of our State, and I feel this should be carefully considered.

Fish are a common resource. They belong to no one - sport or commercial. We have no more right to believe they belong to us than commercial men do in believing they are theirs. Long before our country was born the colonists fished together - recreational and commercial. This is the way it has been and should be. There is enough for us all, and in this spirit we should each respect the rights of the other. In my opinion, a fisherman is a fisherman, and what hurts one hurts us all.

continued.....

Without hesitation, I am opposed to the petition and the legislation it supports.

Sincerely,

Bill

William M. Feinberg

WMF:kml

Exhibit B

36X

New Jersey
ROD & GUN

Archery . Fishing . Hunting . Shooting . Skin Diving . Conservation

VOL. 2 NO. 19 SECOND HALF, JULY 1957

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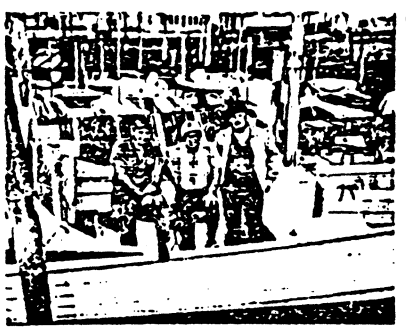
37K

Sportsmen Examine Menhaden Fishing

Picture taken on board the Menhaden boat John - G showing (from l. r.) The State Federation's Corresponding Secretary Charles Webber; State Fish & Game Marine biologist, Ronald White; Captain of the John - G, Charles Williams and the President of the State Federation Steve Tezap.



(Left) C.O. John Russack, Charles Webber and Steve Tezap aboard the Division patrol boat, Harriet - H (r) shows fishermen leaning over the side of the John-G inspecting the Menhaden caught in the purse seine. This is only a small portion of the near 100,000 caught on the one haul of the net.

All sportsmen know that the Menhaden industry is the scourge of the saltwater fishermen. All of us have heard about the large amounts of food and sport fish which are caught in the purse seines of the menhaden vessels. To the layman, such as myself, this information seemed logical for I could not imagine how anyone could net thousands of one species of fish without having a large number of other fish included in the catch. On July 6, 1967, I found out how wrong I was.

On that day, Mr. Charles Webber, State Secretary of the Sportsmen's Federation, and I were the guests of the Division of Fish & Game Coastal Patrol. This wasn't a planned visit but was done on the spur of the moment so no one had a chance to prepare a show for us. The purpose of the visit was to gather information on the functions and operation of the Patrol which would allow us to better discuss the units operation with the sportsmen of our State.

Our day started at 5 am when we left Clifton, N.J. We reached Mullica Hills, N.J. at 7 a.m. where we met Assistant District Conservation Officer John Russack who escorted us to the boat basin at Portsmouth, N.J. Our first stop was at the U.S. Coast Guard Search & Rescue Station where radio contact was made with each of the CG lighthouse stations in Delaware Bay, to see if any menhaden vessels were operating in the area. Two vessels were sighted in Delaware waters.

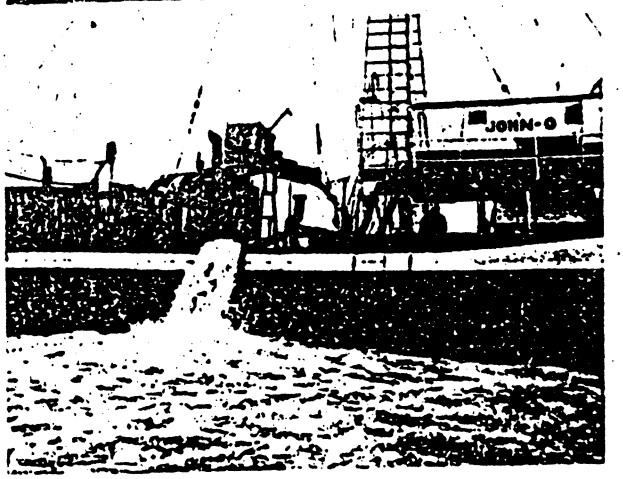
We boarded the Division Patrol Boat "Harriet H" and sped off across the Bay. Captain Russack warned us that the patrol boat was a wet one and that it did not have the comforts of home; fortunately we were lucky for the visibility was good, the weather clear and the waters calm. During the trip across the Bay, Captain Russack explained that one of the functions of the Patrol was to keep a constant check of menhaden vessels while they operated in New Jersey waters. This function was required because of the constant complaints received from partyboat captains and fishermen that the menhaden vessels were taking large quantities of food and sport fish with their catch.

In short order we sighted the two menhaden vessels operating on the Delaware side of the Bay. We boarded the first vessel, the "John O" where we met Ronald White who is employed by the Division of Fish & Game as a fisheries biologist. He was on board conducting a count survey under which the State and Federal authorities expected to get an accurate percentage measure of the number of food and sports fish which were caught in the menhaden netting operation.

Captain Russack introduced us to Captain Charles Williams, skipper of the "John O." The skipper seemed genuinely pleased to have us aboard and conducted us on a tour of his vessel while explaining its operation. He stated that he had on many occasions invited complaining fishermen and partyboat captains to board his vessel to examine his catch but todate not one of these people have taken him up on his offer. He invited us to stay aboard and view the vessel in action, and I can truthfully say that we found the operation fascinating.

Menhaden operations take team work. The "John O" was accompanied by an airplane and two small open boats. The airplane circled the Bay area looking for schools of menhaden. I was told that the pilot could tell what type of fish were in these schools by observing the action or ripples in the water. Upon sighting the school of fish the pilot would make radio contact with the mother ship; the two small boats would be hastily manned and under the direction of the airplane would proceed to the point where the pilot would advise them to drop their nets and encircle the school of fish. When the boats completed their operation, the mother ship would pull along side of the boats; hook onto the net; drop a large suction tube into the net area, and proceed to suck up

Continued on Page 18



The opposite side from where the fish are being pumped aboard the fishing boat shows the vast amount of water being returned to the ocean after the fish have been removed.

38X

Examine Menhaden Fishing

Continued from Page 12

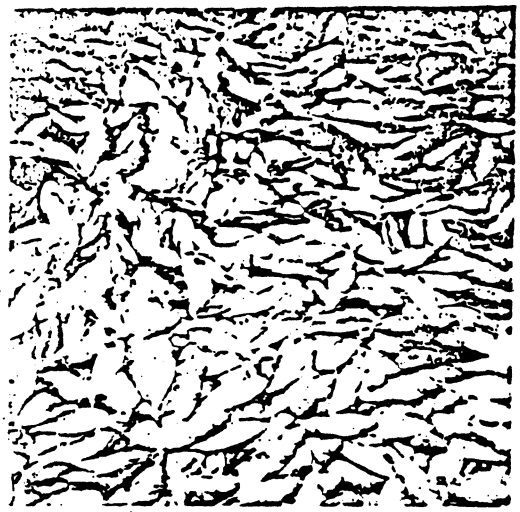
the fish and into the hold of the mother ship.

Our luck must have rubbed off on the menhaden fishermen because this day proved to be the most successful one of the present season. This first catch was in excess of 100,000 fish, and successive catches ranged from 50,000 to over 100,000.

The skipper and I were stationed approximately ten feet from the chute which dropped the fish into the hold. I pointed out several fish which I were sure were blue fish. Upon closer examination of these fish I was proven wrong. During the operation Fisheries Biologist Ronald White was diverting samples from the chute to be dropped on the deck area. His samples ranged from four or five hundred or more from each catch. A few pint porgees were found in his samples, I don't believe there were more than four or five and these added up to about two/to three inches long. During the day I counted a total of 18 weakfish which were gill netted and these ranged from 8/10 inches in length. I was amazed at this small percentage of food and sports fish being caught. The captain explained that menhaden had a characteristic which caused them to bunch up into a tight ball when startled and they would become stacked up like cordwood. This kept the other fish out and enabled the menhaden fishermen to net them with this small percentage of other fish being caught.

The second vessel we boarded was the "Jane M" skippered by Captain Manual Haynie. He too, gave us a cordial welcome and did everything possible to see to it that we saw every phase of his operation. We alternated boarding these two vessels during the day. During this period a boat pulled along side one of the vessels as we were boarding it. The captain and the people on the boat watched the operation from approximately 20 or more yards away from the menhaden vessel. As the party watched, my mind went back to the early part of the day when I sat approximately ten feet could not tell the difference between some of the menhaden and blue fish; and I wondered whether these people or anyone who watched (from shore or from another boat could tell what type of fish were being pumped aboard.

I came away from my visit amazed at the change which had been made in my opinion of menhaden fishing. I would strongly suggest that the saltwater fisherman and boatman who comes upon one of these vessels ask to be allowed to board it and to examine the catch. I am sure that you will come away as I did, knowing that you were giving them fair examination and treatment prior to naming them guilty of ruling your sport.

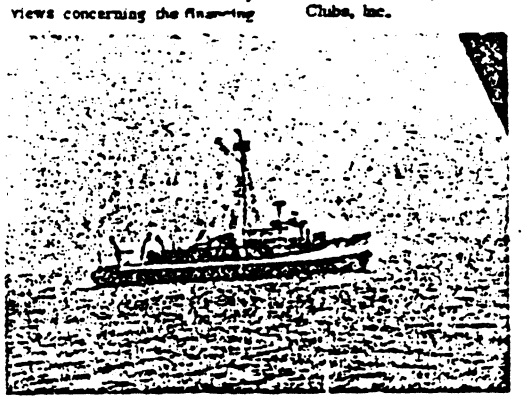


The Menhaden are stored in the hold of the fishing boat until time they are delivered to the processing plant.

My visit with the Coastal Patrol had proved to be most interesting. Captain Russack and his mate, Howard Brown, cooperated fully to see to it that we learned as much as possible from our visit. Both men are conscientious workers, devoted to serving the responsibilities which were placed upon them. They and the Patrol clearly deserve the support of the sportsmen for doing a good job in the field. Unfortunately, the lack of manpower, good equipment and money hamper the effective operation of the Coastal Patrol in bringing it to its peak efficiency.

The visit did not alter my views concerning the financing of the Patrol. In fact it helped to strengthen my stand that some way must be found for the people who benefit from this unit to help pay for its operation. One way could be to divert boat fuel tax monies to the Division of Fish and Game. Another method, very unpopular with the saltwater angler and boatmen, would be to impose a saltwater or tidal water fishing license. Whichever method is chosen, the sportsmen must cooperate in supporting the cause which would provide sound management of our ocean and tidal water resources, provide proper law enforcement, and provide for the maintenance and construction of facilities which could be used to produce both products and pleasure for all the people of our State.

Steven P. Tczap, President
N.J. State
Federation of Sportsmen's
Clubs, Inc.



Menhaden boat preparing to pull in the purse seine. Picture shows John - O getting ready to haul in largest catch of the season.

39X

Exhibit C

EVALUATION OF THE MENHADEN FISHERY IN DELAWARE BAY

FINAL REPORT

Project 3-2-R-2

Ronald L. White, Project Leader
John T. Lane, Assistant Project Leader

January 30, 1968

New Jersey Department of Conservation and Economic Development
Division of Fish and Game
Bureau of Fisheries
Marine Fisheries Section

INTRODUCTION

In June 1966, the New Jersey Division of Fish and Game initiated a project to determine the catch composition of the Delaware Bay menhaden fishery and the effects, if any, which it exerted on the sport fishery in the same area. Members of the sport fishing community had accused the menhaden boats of taking large amounts of sport fish and oysters and were demanding closure of the Bay to all menhaden purse seining.

Accusations of this type are nothing new. The 1905 Annual Report of the New Jersey Fish and Game Commission tells of complaints made by certain sport fishermen and summer residents which included fishing too close to the beach, catching and/or scaring away sport fish, principally bluefish, and general misunderstanding of the laws under which these boats operated. These accusations now have been expanded somewhat to include the taking of shellfish, but are basically the same ones which periodically have arisen since that time and still persist today.

METHODS OF INVESTIGATION

Sampling Techniques. Most of the catch sampling was carried out by project personnel while staying aboard the menhaden vessels for two or three day periods. There also were a number of unannounced boardings made by project personnel from the Division of Fish and Game Coastal Patrol boat just prior to the pumping of the catches on board the menhaden vessels. A total of 123 purse net sets were sampled. Sampling was done during the entire pumping operation by randomly removing fish from the pump shute and placing them on the deck. The removal of the fish was executed by either catching them in a wire basket or by allowing the shute to direct the fish onto the deck or onto a board partially covering the hold, from which they fell to the deck. The size of our samples varied from 200 to 2000 fish, and were approximately proportionate to the size of the sets being sampled, as the length of the pumping operation determined the number of fish which could be collected for sampling. This proportion holds true up to about 2000 fish which was the maxi-

sum number that a sampler could process at one time.

An additional 17 sets were observed while being pumped on board but could not be sampled as they were being loaded on the vessel's decks after their holds were filled and it was impossible to separate one set's catch from that of others. During these observations, notes were made as to the relative abundance of non-menhaden fishes.

The fish from each sample were identified and counted. All non-menhaden were weighed and measured. A random sample of 50 menhaden was also weighed and measured.

This procedure differs from that used in 1966 in that weights of the fishes were also taken.

In addition to the above data, the location of each set checked as well as the set size estimate made by the boat pilot also was recorded. Any non-menhaden or shellfish observed in the holds, on the deck or entangled in the net and not contained in our sample were also recorded. This was especially true of sharks, rays and skates which the crew gaffed out of the net before they had a chance to enter the intake hose and clog the pumps.

Catch Logs. Every menhaden fishing license issued by the Division of Fish and Game in 1967 was accompanied by a catch log book and letter of explanation. The captains were asked to please record the date, time, estimated size and location of every purse set made in Delaware Bay. An example page from these log books appears as Appendix I. In some instances where there was a breakdown in communications and the logs were not kept, copies of other logs kept for the Bureau of Commercial Fisheries Laboratory, Beaufort, were obtained. However, these did not give precise locations in distance and bearing of the sets recorded for Delaware Bay.

During the 1966 season study there was little or no cooperation given to us by the sport fishing interests of Delaware Bay, especially from the charter boat

captains. Because of this, it was decided that during the 1967 fishing season, the total project effort would be put to gathering as much data as possible on the catch composition of the menhaden fishing fleet and to abandon the use of creel census and catch log books in an effort to survey the sport fish catch, as was previously done.

RESULTS

Catch Size and Species Composition. The total reported catch of menhaden in Delaware Bay for 1967 was 20,317,770 fish, or 19,693,965 pounds. This compares favorably to a total number of 2,200,000 fish reported for 1966 1/.

Samples for catch composition were taken from 123 sets or 24.9% of the total of 462 reported sets. Last year samples were taken from 17 sets, or 27.8% of the total of 61 reported sets.

A total of 5,744,000 fish were caught in these 123 sets from which we removed 77,828 fish, or 1.35% of this catch. In 1966, the 17 sets we checked took 518,000 fish from which we removed 6,629, or 1.25% of this catch.

Table 1 shows the species composition and their occurrence in the 123 survey samples. The species categories are sport fish, food fish, non-food fish and menhaden. Butterfish is the only species in the food fish category. It is placed there because it is not generally caught on hook and line, and therefore, does not contribute to the sport fishery. Both occurrence (i.e., number of times seen in our samples) and numbers of fish seen are shown for both 1966 and 1967. Weights of fish were recorded only during the 1967 season.

Samples from the purse seine catches included 77,828 fish, of which 97.98% by numbers, were menhaden, as compared to 98.72% of 6,629 fish in our samples during 1966, counting each set of equal value. Weighting each catch according to its size caused no significant change in these percentages.

1/ These figures also contained the percentages of non-menhaden fishes reported on later in this report.

For 1967, the percentage of menhaden calculated by weight was 99.59%.

Table 2 shows the estimated composition of the total 1967 menhaden purse seine catch by weight, based on a total reported catch of 19,093,965 pounds of fish.

Table 3 shows the percentage of sets checked for both years, composed of various percentages of menhaden, by numbers of fish. Note that in 1966 all of the 17 sets checked were composed of 94% menhaden or better. In 1967, 110 sets out of 123, or 89.4%, were at least 90% pure menhaden; 10 sets out of 123, or 8.2%, were between 80.1% and 90% pure; whereas, only 3 sets, or .8%, were less than 80.1% pure menhaden.

Table 4 presents the percent of menhaden as does Table 3, but it is based on the weights of the fish in pounds. Note that all of the 123 sets checked during 1967 were at least 94.1% pure menhaden by weight.

Table 5 is patterned after one presented by Christmas (1960). It can be seen that the smaller sets contained the lower percentage of menhaden and conversely, the larger sets contained the higher percentage of menhaden. Instead of using the pilots' estimates for finding mean set size, we used the actual factory weigh-outs, in pounds, of the boats for which we had catch composition data for the time periods listed.

Length Frequencies. Figure 1 shows the length frequencies of menhaden measured from our samples during both seasons. There was no aging done on these fish, all ages discussed being estimates taken from Nicholson and Higham (1965).

Figure 2 shows the length frequencies of the three most abundant non-menhaden fish found during both years. Scup, the most abundant sport fish seen and measured in our samples, has a length frequency ranging from 8 to 19 cm. (4 - 7.5 inches). This species made up .3% and 1.0% by numbers, of the total catch in 1966 and 1967, respectively. Weakfish composed .2% and .5%, by numbers, of the 1966 and

1967 catch, respectively, and had a length frequency range of 11 to 30 cm. (5 - 11 inches); 75% were 21 cm. (8 inches) or less.

Fishery Size, Season and Location. The 1967 Delaware Bay menhaden fishery began on June 6 and continued almost constantly to September 5. There were from one to ten boats fishing on any one day with a total of 13 boats engaged in the fishery during some part of the season. Eight of these boats were owned by the Reedville Oil and Guano Company and fished for the New Jersey Menhaden Products Company of Wildwood, New Jersey. The other five boats were owned and operated by J. Howard Smith Company, Belford, New Jersey.

During the 1967 season, there were approximately 130 boat days of fishing effort during a 40-day season for Delaware Bay, whereas in 1966 there were approximately 54 boat days during a 15-day season. August 1967 saw the greatest fishing effort with an average of over 20 boat days per week. It should be noted that a boat day does not necessarily connotate a successful fishing day as the boats did, at times, return to the dock without even having made a successful set.

The total reported number of sets made in Delaware Bay during the 1967 season was 494 as opposed to 61 made during 1966. The average total number of sets per year for Delaware Bay between 1956 and 1962 was 695 (June and Reintjes, 1960; June, 1961; June and Nicholson, 1964; Nicholson and Higham, 1964; Nicholson and Higham, 1964; Nicholson and Higham, 1965).

Figure 3 shows the locations of 244 purse net sets made in Delaware Bay during the 1967 season. The remaining 250 sets were not plotted as their exact locations were not reported. There is no reason to suppose that their general distribution would differ from those shown. It should be noted that the larger number of sets in the New Jersey portion of the Bay was caused by Delaware closing its portion of the Bay to menhaden fishing.

Size of Nets, Boats, Crews. The average size of the holds of the 13 menhaden boats fishing in Delaware Bay during the 1967 season was approximately 190 tons. Each boat carried a crew of five officers and 11 men, or a total of 208 men for the entire fleet. Approximately 75 additional men were employed at the two processing plants servicing these 13 boats.

The size of the purse seines used by the boats was 200 fathoms (1200 feet) long and 15 fathoms (90 feet) deep, composed of either 7/8 or 1 inch mesh bar measurement.

DISCUSSION

Catch Composition. During the 1966 season, it was seen that the non-menhaden fish in the catches were quite small in size (see Table 6) and a percent composition based only on numbers could give them an importance out of proportion to their true value. Therefore, it was decided that a percent composition based on weights would give a truer picture of the catch. Because of this, the 1967 data was recorded in both weights and numbers of fish seen in our samples.

The calculated mean percentage values of menhaden seen in our samples for 1966 and 1967 were 96.97% and 98.44%, based on 17 and 123 sets, respectively. A T-test run on these means gave a value of -1.0768. For 138 degrees of freedom, this value was not significant at the 90% level. We can, therefore, conclude that there was no significant difference between the total percentages of menhaden found in our samples during both years.

These percentages compare favorably to those found by other researchers. Christmas, Gunter and Whatley, 1960, state that "97.2% of the menhaden catch in Mississippi and Louisiana was menhaden. Three-quarters of the remainder were mullet and croakers. Sport fish among 56,000 menhaden amounted to 0.31%". Miles and Simmons (1950) as quoted by Christmas, et al. (1960) stated that "one other animal, including shrimp and crabs, was taken for each 4,490 menhaden." Knapp (1950), again from a quotation by Christmas, et al (1960), reported that "Among 5,326,000

menhaden there were 36 gafftopsail catfish, 75 crabs, 91 jacks, 103 croakers, 191 shrimp, 195 spanish mackerel, 242 white trout, 304 bluefish and a few other fishes, the total being 7,589." (.14%).

Again, comparing the 1966 and 1967 data in Table 1, it can be seen that in 1966 a total of .528% of the menhaden catch was composed of sport fish whereas in 1967 the percentage rose to 1.564%. A T-test run on the mean percentages of sport fish seen in our samples gave a value of 4.0559. For 138 degrees of freedom, this value was significant at the 99% level. This means then that the total non-menhaden portion of the 1967 catch was composed of a higher percentage of sport fish, by numbers, than appeared in the 1966 catch. However, it bears repeating that although the 1967 catch shows a higher percentage of sport fish, their total value by weight was only .258% of our samples, or 184 pounds out of 71,219 pounds of fish sampled.

Length Frequencies. From Figure 2 it can be seen that the 1966 menhaden length frequencies seem to be uni-modal, composed mostly of fish estimated as 3 years old; whereas, the 1967 sampling included these plus a group estimated as two year olds.

The small amount of scup and weakfish seen in our samples, their combined numbers totalling .5% and 1.5% of the catch (Table 1) in 1966 and 1967, respectively, was not the same size class of fish sought by the sport fishery. No actual competition, insofar as catching the same size fish is concerned, prevailed between these two fisheries. The future contribution, if any, of these fish to the sport fishery is unknown.

Size of Sets. During both seasons, investigators observed that the larger menhaden sets contained the higher percentages of menhaden. We had hoped to prove this hypothesis by using the estimated size of the sets as given to us by the boat pilots. When we checked these estimates on a daily basis, against the actual factory weigh-outs, we saw wide discrepancies. This led us to believe that the pilots' set size estimates were in error and not reliable enough for use in this analysis.

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However, when taken on an overall seasonal basis, the pilots' estimates were amazing similar to the exact factory weigh-outs. It is felt that this is due to the fact that the pilots' estimates are volumetric and do not allow for the size differences in the fish caught but are based on an average size menhaden which accounts for the fact that they are fairly accurate on a seasonal basis.

The higher percentage of menhaden in the larger sets, as shown in Table 5, has also been noted by other investigators. Christmas (1960) states that "The larger hauls usually contained a higher percentage of menhaden than small hauls. Seventy-five percent of the catch was taken in 50 percent of the hauls and contained over 99% menhaden." The author states that he had checked the estimates of set size given him by boat captains and they they tallied closely to actual factory weigh-outs. Therefore, he used these estimates.

It is felt that this difference of the percentages of menhaden according to set size is due to a number of factors, one of which is the schooling behavior of the menhaden. When a large school of menhaden is caught in a net, its compact schooling behavior probably makes it very difficult for any other species to enter the school and be caught along with it. A large school of fish also will be able to "blow out" the net, that is, to swim against it with sufficient force to lift the wing line off the bottom, thus eliminating the possibility of entrapping bottom species and shellfish.

During the fishing operation, it is more economical in terms of time and energy to actively search for and set upon the largest school of menhaden available Therefore, the menhaden fishery, by its very nature, tends to catch the schools of menhaden which will contain the lowest number of other fishes.

CONCLUSIONS

1. During both years of this investigation, few sport and food fish were taken by the menhaden fishery. The majority of those which were caught were too

small to be of immediate value to the sport fishery.

2. The menhaden fishery poses no threat to the Delaware Bay shellfish industry as oysters or clams were never observed in the boats' holds, on deck, or entangled in their nets.

3. The physical competition observed for fishing areas does not seem to be a valid reason for terminating menhaden fishing in Delaware Bay.

4. The 1967 fishing season caught ten times the number of menhaden as did the 1966 season, and yet the percentages of menhaden taken in both seasons were the same. It is doubtful that any further increase in the size of the menhaden catch in future years will substantially affect the catch compositions reported here.

5. This whole problem of the menhaden fishery and how it relates to the sport fishery seems to be one of a sociological nature rather than one having any sound biological basis.

RECOMMENDATIONS

In light of the findings of this study, based on two years of investigations, no new legislative action should be taken to restrict the menhaden fishery in Delaware Bay.

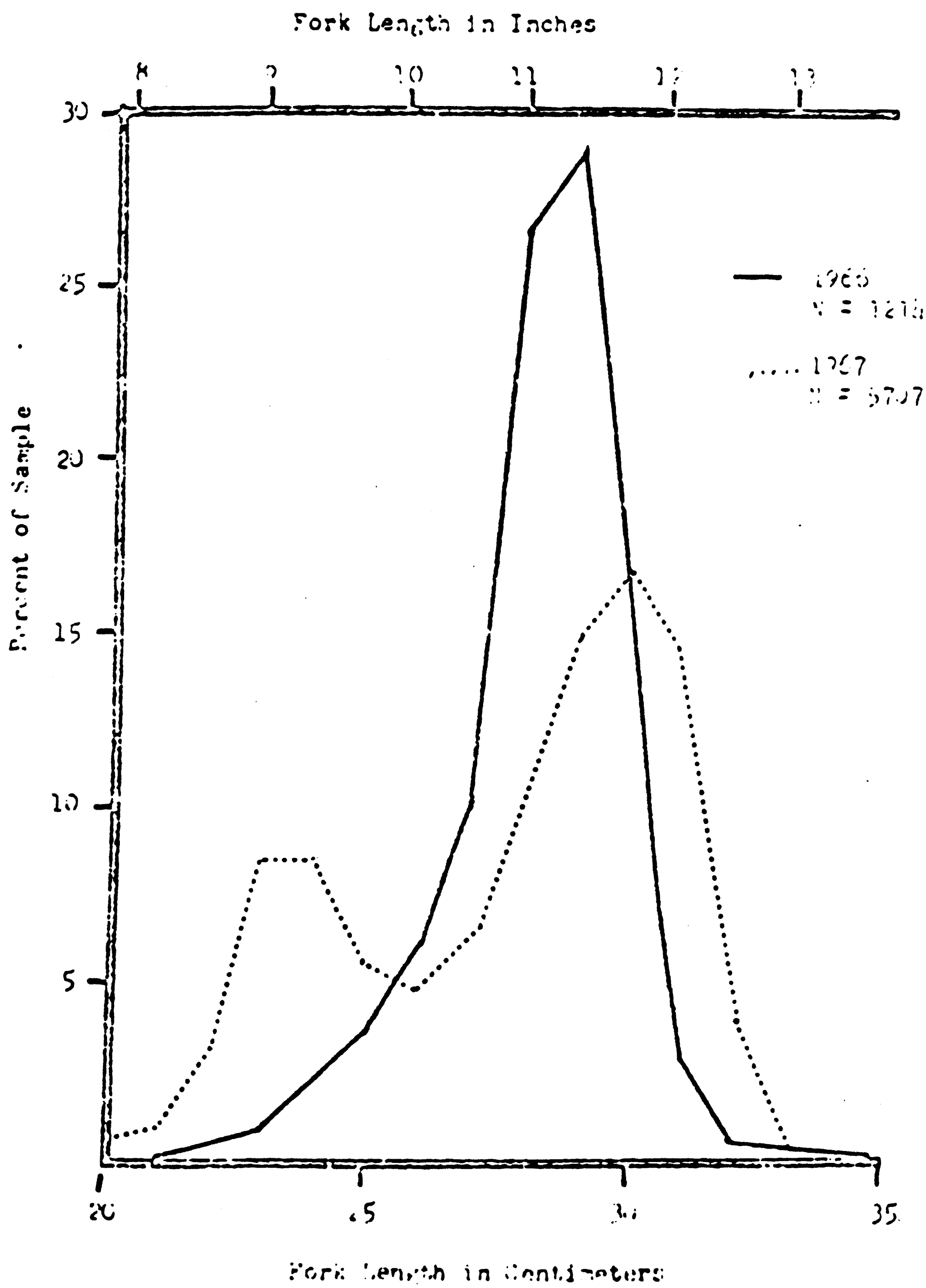

FIGURE 1. Length Frequencies of Menhaden in

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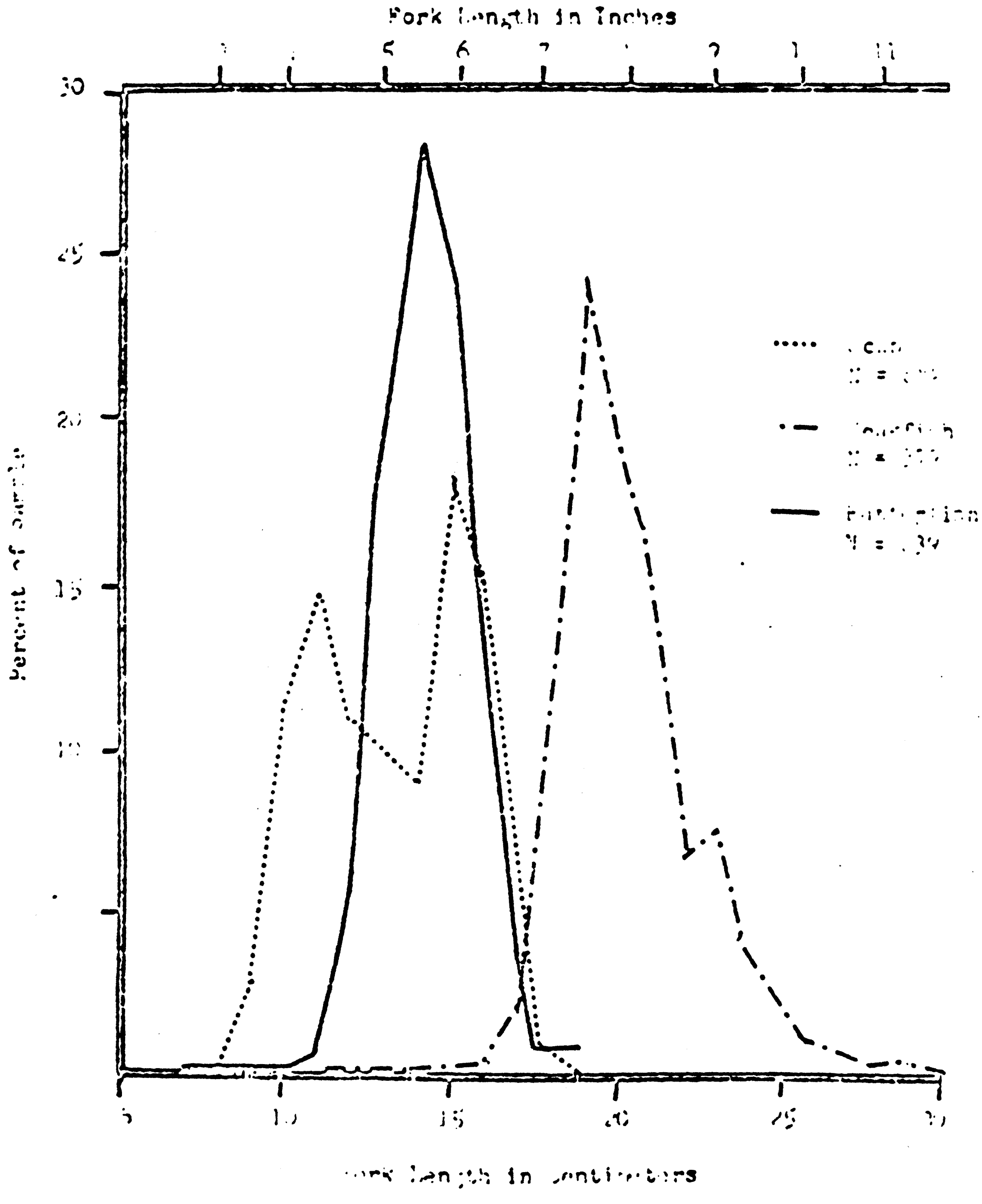
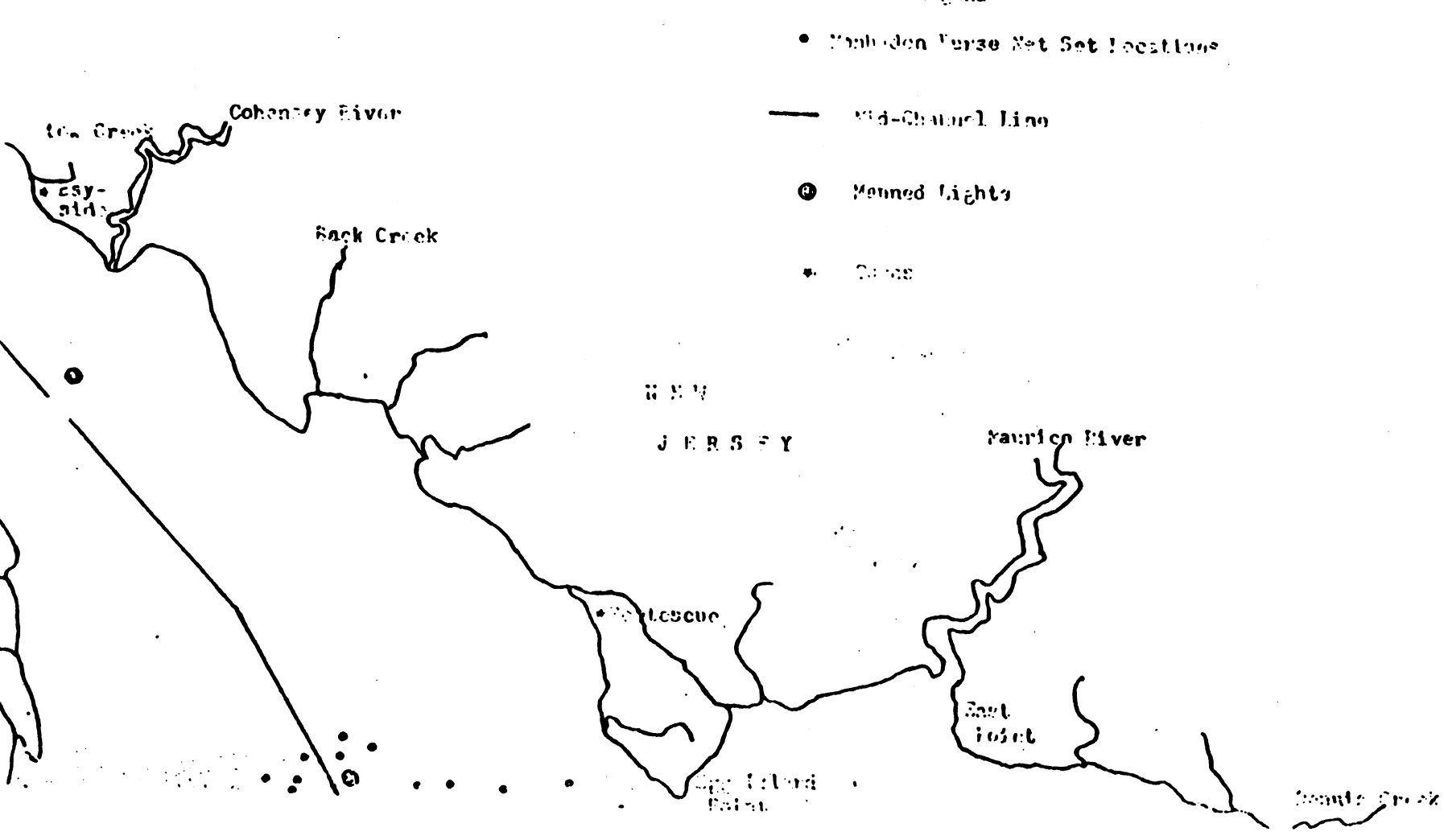


FIGURE 2. Length Frequencies of Three Major Species of Non-Menhaden Found in Purse Seine Samples 1966-1967.

Figure 3. Mahaden Purse Net Fishing Locations
in Delaware Bay - 1967



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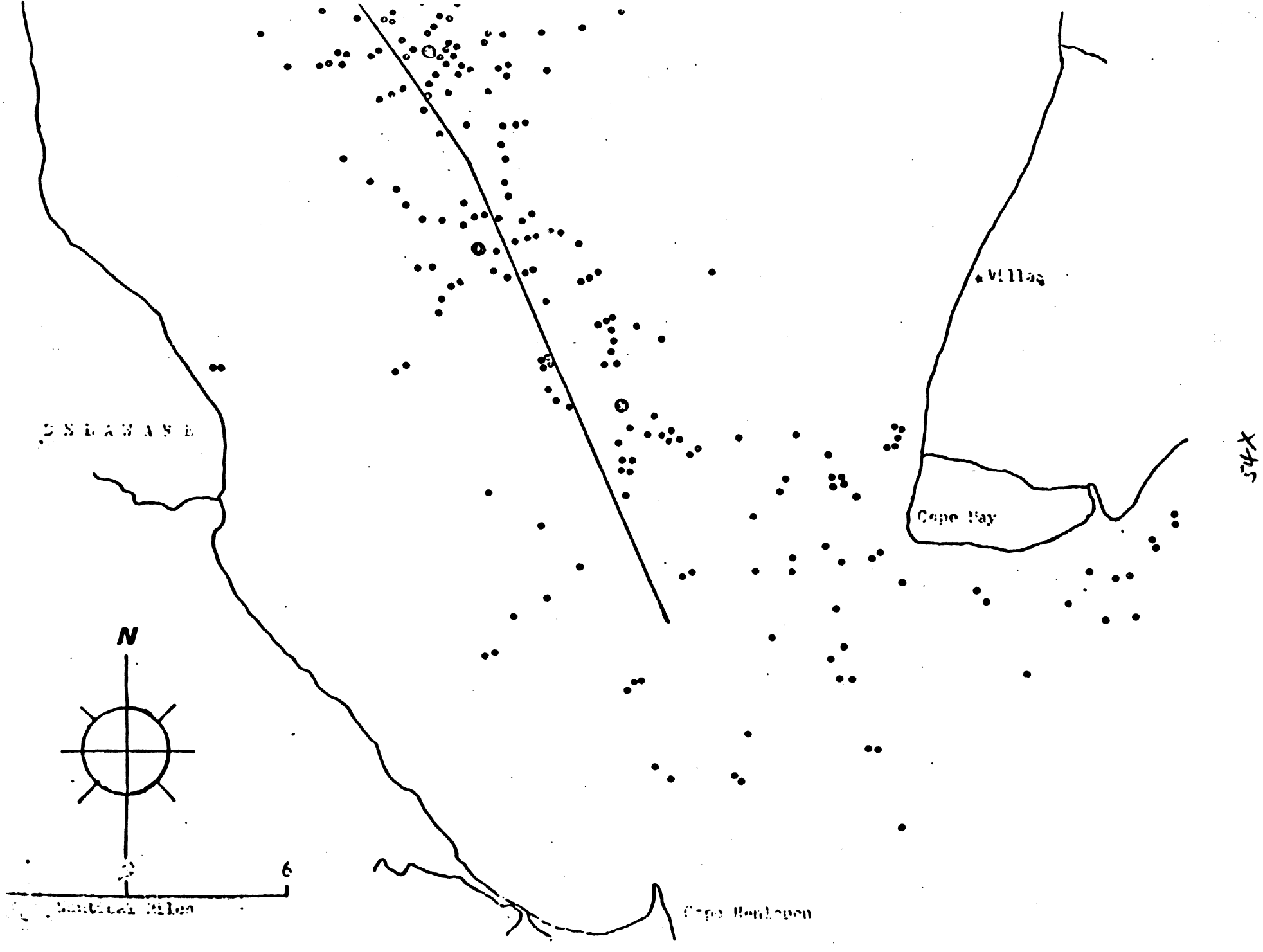
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TABLE 1. Species Composition of Samples Taken from Purse Seine Sets.

Category and Species	Occurrence 1966 No. Sets	Occurrence 1966 % Sets	Occurrence 1967 No. Sets	Occurrence 1967 % Sets	Numbers 1966 Count	Numbers 1966 %	Numbers 1967 Count	Numbers 1967 %	Weight 1/ 1967 Pounds	Weight 1/ 1967 %
Sport Fish										
Scup	6	35.29	42	34.1	19	.287	790	1.015	95.7	.134
Weakfish	4	23.53	35	28.5	12	.181	405	.520	73.3	.103
bluefish	3	17.65	8	6.5	3	.045	12	.016	12.3	.017
Blowfish	-	-	5	4.1	-	-	6	.008	1.5	.002
Kingfish	-	-	2	1.6	-	-	2	.003	1.6	.001
Winter fl.	-	-	1	.8	-	-	1	.001	.1	.0005
Sea bass	-	-	1	.8	-	-	1	.001	.1	.0005
Summer fl.	1	5.88	-	-	1	.015	-	-	-	-
Sub-total Sport Fish					35	.521%	1,217	1.564%	184.0	.258%
Food Fish										
Butterfish 2/	8	47.06	47	38.2	14	.211	231	.297	37.1	.052
Sub-total all Sport and Food Fish					49	.739%	1,448	1.861%	221.1	.310%

1/ Weights not recorded in 1966.

2/ Butterfish are considered food fish but are not catchable on hook and line, and, therefore, do not contribute to the sport fishery.

TABLE 1. (Continued)

Category and Species	Occurrence 1966 No. Sets	Occurrence 1966 % Sets	Occurrence 1967 No. Sets	Occurrence 1967 % Sets	Numbers 1965 Count	Numbers 1965 %	Numbers 1967 Count	Numbers 1967 %	Weight 1967 Pounds	Weight 1967 %
Non-Food Fish										
Chokers	3	17.65	22	17.9	10	.151	43	.054	6.6	.009
Sea robins	3	17.65	22	17.9	16	.241	33	.042	7.9	.001
Smallmouth fl.	2	11.76	9	7.3	2	.030	12	.016	1.2	.002
Sharks (sp.)	-	-	8	6.5	-	-	9	.012	15.0	.021
Herring (sp.)	1	5.8	7	5.7	-	-	9	.012	3.0	.004
Spotted hake	-	-	4	3.3	-	-	6	.008	1.9	.003
Skates (sp.)	3	17.65	3	2.4	4	.060	6	.008	28.0	.039
Toadfish	-	-	4	3.3	-	-	5	.006	1.9	.003
Windowpane fl.	-	-	2	1.6	-	-	3	.004	.4	.0005
Rays(sp.)	-	-	1	.8	-	-	1	.001	1.4	.002
Anchovy (sp.)	1	5.88	1	.8	1	.015	1	.001	.1	.0005
Pilotfish	1	5.88	-	-	1	.015	-	-	-	-
Filefish	1	5.88	-	-	1	.015	-	-	-	-
Smooth dogfish	1	5.88	-	-	1	.015	-	-	-	-
Sub-total all Non-Food Fish					36	.542%	128	.164%	67.9	.095%
Total all Non-Menhaden					85	1.281%	1,576	2.025%	289.0	.405%
Menhaden	17		123		6,544	98.719	76,252	97.975	70,930.1	99.595
Grand Total					6,629	100.000%	77,828	100.000%	71,219.1	100.000%

TABLE 2. Estimated Composition by Weight of Total 1967 Menhaden Purse Seine Catch.

Category	Percent	Pounds
Sport Fish	.25	47,736.1
Food Fish	.05	9,547.2
Trash Fish	.10	19,094.4
Menhaden	99.60	19,017,587.3
Total	100.00	19,093,965.0

TABLE 3. Percent of Menhaden in Purse Seine Sets by Numbers - 1966, 1967.

Percent Menhaden by Number	SETS 1966 Numbers	1966 Percent	1967 Numbers	1967 Percent
99.1 - 100	10	58.8	74	60.2
98.1 - 99	1	5.9	14	11.4
97.1 - 98	4	23.5	3	2.4
96.1 - 97	-	-	5	4.1
95.1 - 96	-	-	2	1.6
94.1 - 95	2	11.8	5	4.1
93.1 - 94	-	-	2	1.6
92.1 - 93	-	-	2	1.6
91.1 - 92	-	-	2	1.6
90.1 - 91	-	-	1	.8
Sub-total 90.1 - 100	17	100.0%	110	89.4%
89.1 - 90			-	-
88.1 - 89			2	1.6
87.1 - 88			2	1.6
86.1 - 87			2	1.6
85.1 - 86			-	-
84.1 - 85			1	.8
83.1 - 84			1	.8
82.1 - 83			1	.8
81.1 - 82			-	-
80.1 - 81			1	.8
Sub-total 80.1 - 90			10	8.2%
79.1 - 80			1	.8
75.1 - 76			1	.8
Sub-total 70.1 - 80			2	1.6%
66.1 - 67			1	.8
Sub-total 60.1 - 70			1	.8%
Grand Total	17	100%	123	100.0%

TABLE 4. Percent of Menhaden in 123 Purse Seine Sets By Weight - 1967 *

Percent Menhaden by Weight	SETS Number	Percent
99.1 - 100	95	77.2
98.1 - 99	13	10.6
97.1 - 98	6	4.9
96.1 - 97	4	3.3
95.1 - 96	2	1.6
94.1 - 95	3	2.4
Total	123	100.0

* Weights were not recorded in 1966.

TABLE 5. Differences in the Percentage of Menhaden Caught in Varying Size Purse Seine Sets.

Periods	No. Sets	Thousands of Pounds: Total Catch	Thousands of Pounds: Mean Catch/set	Percent of Menhaden in Samples: Mean	Min.	Max.
8/1, 8/2	10	341.3	34.1	99.8	99.5	100.0
8/7, 8/8, 8/9	19	636.8	33.5	98.6	87.5	100.0
8/15, 8/17	16	480.8	30.1	96.6	67.7	100.0
7/5. 7/6, 7/7	26	682.5	26.3	93.6	75.73	99.85

TABLE 6. Length Frequencies for All Sport and Food Fish in Samples of Menhaden Purse Seine Catches - Delaware Bay, 1966 - 1967.

Length Cm.	Approx. Inches	Scup	Weak-fish	Butter-fish	Blue-fish	Blow-fish	King-fish	Sea Bass	Winter Flounder	Summer Flounder
6	2.4			1		1				
7	2.8									
8	3.1	1								
9	3.5	18								
10	3.9	77		1						
11	4.3	102		2		1				
12	4.7	76	1	14						
13	5.1	62		54						
14	5.5	74	1	69						
15	5.9	129	2	58		1				
16	6.3	103	1	27						
17	6.7	36	19	9						
18	7.1	6	44	2				1	1	
19	7.5	1	95	2	1					
20	7.9		72			1				
21	8.3		62		1					
22	8.7	1	25							
23	9.1		29							
24	9.4		14							
25	9.8		8				1			
26	10.2		4							
27	10.6		2		1		1			
28	11.0		1							
29	11.4		2		2					
30	11.8		1		1					
31	12.2				1					
32	12.6									1
33	13.0				3					
34	13.4									
35	13.8									
51	20.1				1					
Totals		602	379	239	11	4	2	1	1	1

SELECTED BIBLIOGRAPHY

American Fisheries Society. 1960. A list of the common and scientific names of the fishes from the United States and Canada. Second Edition. Report of the Committee on Names of Fishes, presented at the 69th Annual Meeting. Amer. Fish. Soc., Spec. Pub. No. 2, 102 p.

Christmas, J. Y., Gordon Gunter, and Edward C. Whatley. 1961. Fishes taken in the menhaden fishery of Alabama, Mississippi and eastern Louisiana. Fish and Wildl. Serv., Spec. Sci. Rep. - Fish. No. 373.

Gunter, Gordon. Gulf menhaden fisheries as related to sports fisheries. Gulf Coast Research Laboratory, Ocean Springs, Mississippi.

June, Fred C. 1961. Age and size composition of the menhaden catch along the Atlantic coast of the United States, 1957. Fish and Wildl. Serv., Spec. Sci. Rep. - Fish. No. 373.

_____, and William R. Nicholson. 1964. Age and size composition of the menhaden catch along the Atlantic coast of the United States, 1958. Fish and Wildl. Serv., Spec. Sci. Rep. - Fish. No. 446.

_____, and John W. Reintjis. 1960. Age and size composition of the menhaden catch along the Atlantic coast of the United States, 1956. Fish and Wildl. Serv., Spec. Sci. Rep. - Fish. No. 336.

Knapp, Frank T. 1950. Menhaden utilization in relation to the conservation of food and game fishes of the Texas Gulf coast. Trans. Amer. Fish. Soc. 79:137-144.

Miles, Dewey W., and Ernest G. Simmons. 1950. The menhaden fishery. Marine Laboratory Series II, Bulletin, Texas Game, Fish and Oyster Commission, 1 - 28.

New Jersey Fish and Game Commission. 1906. Annual report 1906. New Jersey Fish and Game Commission, Trenton, N.J.

Nicholson, William R., and Joseph R. Higham, Jr. 1964. Age and size composition of the menhaden catch along the Atlantic coast of the United States, 1959. Fish and Wildl. Serv., Spec. Sci. Rep. - Fish. No. 478.

_____, and _____. 1964. Age and size composition of the 1960 menhaden catch along the U. S. Atlantic coast. Fish and Wildl. Serv. Spec. Sci. Rep. - Fish. No. 479.

_____, and _____. 1965. Age and size composition of the menhaden catch along the Atlantic coast of the United States, 1961. Fish and Wildl. Serv., Spec. Sci. Rep. - Fish. No. 495.

_____, and _____. 1965. Age and size composition of the menhaden catch along the Atlantic coast of the United States, 1962. Fish and Wildl. Serv., Spec. Sci. Rep. - Fish. No. 527.

White, Ronald L., and John T. Lane. 1967. Evaluation of the menhaden fishery of Delaware Bay and adjacent waters. Annual Project Report. Federal Aid Project 32 R-1. Div. of Fish and Game, Trenton, N.J.

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Appendix 1.

Date	Location	Time	Set #	Estimate Size of Catch	Remarks

APPENDIX 2. Common and Scientific Names of Fish Mentioned in this Report.

Common Name	Scientific Name
Menhaden	Brevoortia tyrannus
Scup	Stenotomus chrysops
Weakfish	Cynoscion regalis
Butterfish	Poronotus triacanthus
Bluefish	Pomatomus saltatrix
Northern puffer(blowfish)	Sphaeroides maculatus
Northern kingfish	Menticirrhus saxatilis
Winter flounder	Pseudopleuronectes americanus
Summer flounder	Paralichthys dentatus
Smallmouth flounder	Etropus microstomus
Windowpane	Scophthalmus aquosus
Black sea bass	Centropristes striatus
Hogchoaker	Trinectes maculatus
Spotted hake	Urophycis regius
Northern sea robin	Prionotus carolinus
Bay anchovy	Anchoa mitchilli
Planehead filefish	Monacanthus hispidus
Oyster toadfish	Opsanus tau
Herring sp.	Clupea sp.
Pilotfish sp.	Naucrates sp.
Black drumfish*	Pogonias cromis
Shark sp.	
Rays sp.	
Skates sp.	
Conch (empty shells)	

* Only observed in hold, never taken in samples.

Exhibit D

ABSTRACT OF FINAL REPORT ON PHASE II OF PROJECT 32-R-1

"Evaluation of the Menhaden Fishery in Delaware Bay and Adjacent Waters"

In light of conflicts and accusations between the food fishery and menhaden purse seine fishery in this bay, an investigation was undertaken by State Marine Fisheries personnel under the Federal Aid to Commercial Fisheries Act. Data was gathered on both fisheries and any effects on each other during the summer of 1966.

The food fishery investigation involved: inventory of boats and facilities; catch logs kept by head boat captains (only 4 of 16 who agreed to keep logs did so); creel census for 33 man days at key locations; 20 aerial flights in conjunction with creel census. The Report includes detailed analysis of data as to type of boat, area fished, species caught, etc. Projecting this data, it was estimated that 25,431 boat-days were spent involving over 95,000 men and 460,000 man-hours. Nearly 550,000 fish were caught, almost 470,000 of them food fish, better than 1 per hour. Principal species included: weakfish, over 200,000; scup, almost 100,000 (mostly small); fluke, over 67,000.

The menhaden investigation involved catch logs kept by all 7 captains who fished the bay (including exact location of most sets) and random sampling of 17 catches (out of 61 sets). The sampling was carried on throughout the pumping operation; menhaden and non-menhaden were counted, non-menhaden and a sub-sample of menhaden measured, and any non-menhaden observed in the hold counted. Fishing did not start until August 2 and involved only about 15 days. The 61 sets compared to an annual average of 895 that pre-

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The total reported catch by the menhaden fleet was 3,131,000 fish, of which 2,280,000 were caught in Delaware Bay, the rest offshore. Only 4 of the sets were north of 14-Foot Bank. The 17 catches sampled involved 518,000 fish. Over 6200 (1.25%) were randomly removed, of which 85 were not menhaden and 49 were food fish (including butterfish). Projecting these findings over the entire menhaden catch in the Bay, just over 12,000 sport fish were taken, 2½ % of the total taken by the food fishery. Most of these fish were small. 38 non-menhaden, 13 of them sport fish were observed in holds. The finding that 98.7% of purse seine catches were menhaden compares closely to other studies.

Two incidents of conflict were personnally observed by project personnel. In the first case, a menhaden boat was accused of setting on pure weakfish, but no weaks at all were found in the catch; no one from the accusing food fish fleet accepted an invitation to board the seiner. The other involved a radio report of seiners fishing, when they had just been observed lying-to and were seen travelling south immediately afterward. Conclusion based on the study's findings are as follows:

1. Few food fish were taken by the menhaden purse net fishery. The majority were too small to be of immediate value to the food fishery.
2. Most menhaden fishing was not conducted on or near principal food fish grounds (shown on map accompanying report).
3. No oysters, clams or other shellfish were observed in samples, holds or entangled in nets.
4. The conflict between the food fishery and the menhaden fishery seems to be a sociological one rather than one having a sound biological basis.

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5. The 1966 season for both fisheries was a very poor one. It is

fish abundance. However, the percentage of non-menhaden found in samples compares closely with those presented in other reports on this subject.

Recommendations include: 1. not attempting to secure cooperation from the food fishery, as little was given; 2. repeating the study of menhaden purse net catch composition, as 1966 may not have been representative; 3. (in toto) In light of the findings of this report, no immediate action should be taken in restricting the menhaden fishery in Delaware Bay.

MENHADEN BOATS IN DELAWARE BAY!
DO THEY CATCH SPORT FISH?

or

THOSE BUNKER BOATS: WHAT DO THEY REALLY CATCH?

Synopsis of an Historical and Scientific Survey

INTRODUCTION

In the summer of 1966, a project was initiated by the New Jersey Division of Fish and Game to study the menhaden fishery in Delaware Bay. Points of special interest were the composition of the catch made by menhaden boats and the relationship of this commercial fishery to Sport Fishing in the Bay.

Two events coincided to make this project desirable and feasible: the first was a strong contention by many sport and oyster fishermen that menhaden purse seining was detrimental to their activities, based on a belief that menhaden boats caught large quantities of sport fish, attracted sharks, destroyed oyster stakes and disturbed the bottom; the second was passage of the Federal Aid to Commercial Fisheries Act, making funds available to the Division, so that only 25% of the cost was met by the State's licensed hunters and fresh water anglers.

The summer of 1966 was an exceptionally poor season for both menhaden and sport fishermen. Although findings bore out those made in other States that menhaden boats caught few fish besides menhaden, it was determined to continue the study for a more typical season. During the interim,

State Fisheries Biologist Ronald White and others on the staff of the Nacote Creek Research Station undertook a thorough review of all available data on the history of menhaden as a species and a fishery. This material replete with references included in a full scale report compiled after completion of the project.

Because of the strong popular interest in this study, it was determined to prepare a synopsis of this study to foster better public understanding of the situation in Delaware Bay. Detailed biological data, a colorful account of historic menhaden fishing and documentation of the scientific methods employed can be obtained through the New Jersey Marine Fisheries Laboratory at Nacote Creek.

WHAT ARE MENHADEN?

Menhaden are known by many common names, mossbunker or just bunker (most common in New Jersey), pogy, shad, fatback, oldwife and others -- more than thirty along the Atlantic Coast. Brevoortia Tyrannus is the scientific name of the Atlantic menhaden, the type caught in New Jersey waters. Menhaden are part of the large family Clupeidae, which includes the American shad and the alewife and blueback herring.

INSERT DRAWING OF MENHADEN

The average size of menhaden sampled in Delaware Bay was 11 inches, with an average weight of slightly under a pound. This is larger than the coastwide average of 1/5 pound; in general, menhaden run larger in the northern portion of their range. Their body color ranges from dark blue to blue-gray, blue-brown or green. The silvery belly has a brassy luster, and the fins range from yellow to brassy, giving them a flashing gold appearance as they swim by. From the air, schools appear as large rusty splotches.

Menhaden are found from Nova Scotia to Florida, with New Jersey's population abundant from May to September. New Jersey is basically the northern terminus of the industry today, although activity was concentrated to the north prior to 1850. Water temperatures are considered a major factor in their fluctuating population in the North Atlantic.

The most notable habit of menhaden is their tendency to run in dense schools; hundreds to hundreds of thousands swim side by side and tier on tier. This is their sole means of defense against predators, saving the bulk of the school at the expense of a few fish at the periphery. They swim near the surface and produce ripples, as the top fish lift their heads and turn tails, apparently while feeding.

In the New Jersey area, spawning takes place fairly close to shore, primarily in June. Larval fish move into estuarine areas evidently requiring a low salinity environment for proper development, such as is found in the coastal marshes New Jersey is seeking to preserve.

Having no teeth, menhaden feed by straining large quantities of water for plankton, organisms that float more or less passively in the water. They filter up to seven gallons of water per minute, with comblike gill rakers holding over two cubic inches solids, as the water is expelled through the gills.

Menhaden are vulnerable to many larger fish, because of their schooling habits, and to man and birds because of their surface swimming. Except for man, blue fish are probably their prime predator. However, numerous studies indicate they are not a preferred or major dietary item for blues or any other fish.

USES - YESTERDAY AND TODAY

The name "menhaden" apparently derives from an American Indian word for fertilizer. The practice of planting fish in the corn fields was evidently common among early settlers, as told in the Pilgrim story. Use of menhaden scrap for fertilizer continued until more valuable uses were found.

Use of menhaden for food was also common among colonists who found them easy to catch and salt, notably in the southern New Jersey area. In the late 1800's, canned menhaden enjoyed some vogue as a delicacy (sometimes passed off as sardines) until more sophisticated tastes came to prevail, with the availability of more varied sea foods.

Use of silvered menhaden as bait was important to early commercial fishermen in North America, until development of nets made this unnecessary. Today, ground bunker is commonly used in chumming for blues and other species by sport fishermen.

The industrial importance of menhaden, however, began with the discovery, apparently around 1850, that it was possible to extract oil, a valued commodity in the pre-petroleum era. Cheaper to produce than other oils, menhaden oil was often used as a substitute or an adulterant. In paint, it was 50% cheaper than linseed oil. Less scrupulous operators sold it pure as whale or even olive oil. Legitimate uses included tanning, rope-making and soap. It was too adhesive to be a good lubricant.

In the early days, the oil was extracted by steaming the fish in wooden vats, and then applying a screw press (later a hydraulic press). The oil and water from the vats and the press were placed in settling tanks and the oil skimmed off. Fish were hauled from net to vat in hand-drawn carts, and men entered the vats after cooking to throw them into the press. Initially, the remaining scrap was left in putrefying heaps under the factory; later, as methods became more efficient, this guano was reprocessed to extract remaining oil, with the balance sold as fertilizer, a boon to both profits and the noses of workers and neighbors.

By contrast, today's menhaden plant is fully automated. Fish are carried from boat to cooker by conveyor or suction. A continuous screw carries them through a cooker into an automatic screw press. Oil and water are separated in huge centrifuges with far more efficiency than the skimming process. The "stickwater" is reserved for the valuable fish solubles it contains, and the press cake of solids is dried and preserved.

Today, the oil is extensively used in paints, resins, caulking compounds, linoleum, cosmetics and many pigments and chemicals and is exported for use in shortenings and margarine. The meal and solubles are widely used in animal feeds, particularly for poultry. The meal, once a useless by-product, is now the most valuable commodity.

The potential of menhaden is even greater. With its high protein content and the poly-unsaturated nature of its fats it holds a high nutritional value for potential human as well as animal consumption. Scientists are working on development of a fish protein concentrate (FPC) or "fish flour" that can meet health standards in providing an inexpensive means of meeting the world's growing food needs.

In economic terms, a century ago, the entire national investment in factories and boats was estimated at $3,000,000, an amount equal to the annual production derived primarily from oil and secondarily from guano. New Jersey had four small plants, worth less than $30,000 in factories and vessels. By 1905, four New Jersey factories exceeded a quarter million dollars in boats and equipment; production, value, employment and worth more than doubled in the first five years of the new century, despite the enactment of a licensing act for menhaden, the State's first, in 1896. In 1965, the national catch of 1.7 billion pounds of fish was four times that of the 1870's, and the worth of menhaden products was nearly $44 million (scrap and meal, $26 million; oil, $13 million; solubles, $4½ million).

FISHING METHODS

Since the 1850's, when the demand for menhaden oil rose, the purse seine has been almost universally employed as the most efficient means of catching these top-schooling fish. The growth of the oil industry led the larger companies to invest in their own boats and equipment. In 1877, about half the boats were still sail powered, and the most modern steamers cost $14,000; many of today's boats are surplus minesweepers, converted for about $300,000, but the newest diesel vessels, electronically equipped with refrigerated holds carrying up to two million fish, cost over $800,000.

Smaller purse boats, used in setting the nets, have developed from wooden craft powered by pairs or, later, teams of oarsmen to diesel-powered aluminum boats, equipped with hydraulic blocks to handle the nets. Cost has risen from under $400.00 to about $40,000.00 per pair of boats.

Half the net is carried on each of these small boats. When a school of menhaden is observed the two boats will endeavor to encircle it with the net, meeting at the far side of the school from the main ship. The bottom of the net is then drawn or pursed together by means of ropes attached to a "tom weight". The net is gradually drawn in until the fish are sufficiently concentrated to be captured. In the early days of oar-powered boats and manual handling of the nets, great exertion was required to capture a school, and it was not uncommon for the fish to escape before the set could be completed. As mentioned, speedy diesel boats and hydraulic power blocks have speeded this operation, and suction hoses have replaced over-sized dip nets or brail nets for

transferring the fish into the hold of the main ship. Spotter planes are now used to direct ships to large schools, and radio communications aid in speedily setting the most productive schools.

Students of Americana would be fascinated by accounts of bunker fishing as practiced a century ago, including the chanting of purse boat crews and men jumping from the rigging to balance the brail nets bringing the fish aboard. Today's more efficient methods lack the harsh demands made on old-time crews, as well as the color of the "good old days".

Nets have grown longer and somewhat shallower over the years. The earliest nets were about 600 feet long and 130 feet deep, capable of handling only relatively small schools. Today's nets are 1200 feet long and 90 feet deep, and use of nylon instead of cotton has increased their life from two to six years. These nets cost about $14,000 each.

Understanding of the seining procedure is vital in comprehending some of the controversy surrounding the fishery. While the top-schooling menhaden may tend to swim outward, when alarmed, often escaping in the days of less speedy purse boats, the 90-foot deep nets have proved deep enough to hold them. Other species which may be accompanying the school, tend to escape downward before completion of the set. The trend to shallower nets enhances their chances, as it lessens the danger of the valuable nets being damaged by encountering bottom.

CONTROVERSIES

Accusations similar to those of the mid '60's have surrounded the menhaden industry for many years, both in New Jersey and other Atlantic and Gulf States. Complaints that menhaden boats took or scared bluefish and operated too close to shore appear in the 1909 and 1906 Annual Reports of the New Jersey Fish and Game Commission, even earlier complaints having led to the licensing act of 1896. The Commissioners dismissed these complaints as unproven, although a short-lived law forbade all but fyke netting in May and June; in 1913 the licensing law was made enforceable by raising the fine to exceed the fee. A scarcity of fish and World War I caused complaints to subside until the mid '20's; these led to an official State inquiry.

E.J. Burlington, President of the State Fish and Game Commission summed up results in a radio statement, "There is much misunderstanding regarding the menhaden catch. [redacted] was on a menhaden boat for nearly a week [redacted] made there was not enough food fish to feed the crew. This and other experiences show that the menhaden boats do not take food fish. The menhaden travel in large schools, and it only pays the menhaden boats to take menhaden."

The menhaden industry has often invited its critics to board boats, announced or unannounced, a practice long followed by the State Coastal Patrol. Commissioner Burlington's observations have been repeatedly confirmed. In 1967, Steven Fogap, President of the State Federation of Sportsmen's Clubs reported on such an unannounced visit. "Although from as near as ten feet from the net-to-hold chute, he spotted several fish which he believed were blues, they soon proved to be

menhaden. On a successful day's fishing, he found but a handful of undersized porgies and weakfish. Regrettably few critics have had Mr. Tozap's courage to see for himself.

The post war menhaden boom has led the industry to police itself by avoiding recreation areas on weekends, taking extra care to watch out for smaller fishermen, avoid littering, and show general courtesy to other marine users. Captains employed by the ten major subscribing companies are subject to severe penalties for infractions of this written Code of Ethics. Neither these efforts, nor the industry's increased information program have had much effect on public concern, as witnessed by the closing of certain waters to menhaden fishing on the part of Virginia, Maryland and Delaware. The Gulf States, led by Mississippi have taken a more scientific approach, conducting scientific studies to determine facts and fallacies; they have found no real conflict with sport fisheries. New Jersey Fish and Game officials, cognizant of the increased license revenues and the industry's great economic potential, were able to choose the latter course and undertake the study reported herein, conducted by the State's professional Biologists and financed by Federal and State funds.

WHAT THE STUDY FOUND

The investigation initiated in early 1956 endeavored to gather data about both the menhaden and sport fisheries in Delaware Bay. To this end, sport fishing boat captains were asked to keep log books, and extensive aerial surveys and creel census operations were conducted, in addition to the

surveillance of the menhaden fleet. Regrettably, most of the captains failed to maintain the log books or otherwise cooperate. Despite this, fishing grounds were located, and data gathered sufficient to indicate that 1966 was a very poor season for the sport fishery. Nonetheless, it was estimated that nearly half a million sport fish, primarily weak fish, were caught, a substantial consideration.

1966 was also an exceptionally bad season for menhaden. Fishing did not start until August 2, and only 61 sets were made, compared to an average of nearly 900 in the late '50's. Samples were taken from over a quarter of these sets, and these samples proved to be 98.7% menhaden; no shellfish were found in sets or holds; many of the non-menhaden were butterfish and all were very small. Location of nearly all sets was away from major sport fishing grounds.

Although these findings were in keeping with other scientific studies, it was decided to continue the investigation of the menhaden fishery in 1967, as 1966 was not a representative year. Extensive sampling of menhaden sets by State Biologists was correlated with total catch statistics obtained from the Bureau of Commercial Fisheries, Captains' logs, pilots' estimates and other observations. Sampling included weighing of any non-menhaden taken and a representative number of menhaden.

The 1967 season was far more successful, with 20 million menhaden reported caught, almost ten times the 1966 catch.

Fishing started almost two months earlier. Of 462 sets made, 123 were sampled, again about a quarter. The following table shows the exact species composition of these samples:

INSERT TABLE

By number, 97.98% of the fish sampled were menhaden, closely comparable to the 98.7% from the smaller 1966 sample. By weight, the percentage of menhaden exceeded 99½% in 1967.

Only 13 of the 123 sets sampled in 1967 contained less than 90% menhaden (none in 1966), and only 3 less than 80%. These proved to be smaller sets, bearing out other findings that the larger, more sought-after, schools contain the fewest sport fish. The largest porgies found measured 7½ inches, and the largest weakfish, 11 inches, with 79% of the weaks under 7½ inches. No shellfish were observed in samples, holds, or entangled in nets. Pinpointing location of about half the sets found little competition with prime sport fishing grounds.

The biologists' full report includes full statistical treatment of all data and references to over 40 publications from 1871 to the present. It concludes that no action should be taken to restrict the menhaden fishery in Delaware Bay. Very few sport fish, of small size, and no shellfish are taken. The hope is expressed that in the future, controversies will come from a united fishing community against the real evils of water pollution and estuarine destruction which adversely affect all fishermen.

Exhibit E

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STATEMENT CONCERNING THE TAKING OF MENHADEN (S-3395)

By the Division of Fish, Game and Wildlife

On May 2, 1983, the Department of Environmental Protection promulgated rules that regulates purse seine fishing, designates areas in which purse seine nets can be used, prohibits the use of these nets during weekends and holidays, and sets a season for the taking of menhaden. The rule also requires vessels engaged in the fishery to be properly equipped to minimize slicks from the loading of fish, prohibits the discharge of litter or garbage at sea and makes the vessel responsible for the cleanup of any fish that are spilled. A final provision prohibits the disturbance of channel markers, fixed fishing gear and the intrusion onto shellfish leased areas.

In particular, the rules prohibits the use of menhaden purse seines within 0.6 nautical miles of the shoreline, jetties or piers. This was put into place to allow predatory fishes and birds to feed on menhaden in this nearshore zone and to allow recreational fishermen to take predatory fishes which feed on menhaden without competition from large purse seine nets. **The prohibition of menhaden fishing on weekends and holidays was also put into effect to reduce conflicts with recreational fishermen,** and thereby, improve recreational fishing. **These regulations have been stringently enforced since implementation in 1983 and spacial and gear conflicts have been greatly reduced between recreational fishermen and commercial fishermen.**

The Senate Bill 3395 further restricts the taking of menhaden within 1.2 nautical miles of the coastline by vessels larger than 50 gross tons. We believe this to be an unnecessary restraint on the commercial fishery and will have an effect of greatly reducing the catch or eliminating the commercial catch entirely. Another provision would disallow the use of purse seines in Sandy Hook Bay, Raritan Bay and Delaware Bay. We feel the prohibition of nets in the areas beyond the current regulations is unwarranted and will have an overly adverse impact upon the commercial fishery.

Another provision of S-3395 restructures the license fees, increases the penalties for people violating provisions of the existing law, and sets license money, as well as penalty monies, into a special fund which can be used for enforcement, as well as to benefit the marine resource. We support these provisions of the bill.

Exhibit F

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF
FISH, GAME AND WILDLIFE
RUSSELL A. COOKINGHAM
DIRECTOR

PLEASE REPLY TO:
CN 400
TRENTON, NEW JERSEY 08625

Nacote Creek Research Station
Bureau of Marine Fisheries
Star Route
Absecon, NJ 08201

February 11, 1986

Captain David Hart
101 E. Lafayette Street
Cape May, New Jersey 08204

Dear Captain Dave:

At the Director's request, I'm sending you a copy of S-1372 with certain sections highlighted in pink, which we do not feel are needed. Also enclosed is a copy of the menhaden regulations setting the season, areas where fishing is legal, etc. I think that you will agree that with the regulation in place we do not need those portions of S-1372 highlighted in pink.

I also changed the effective date of S-1372 to October 25, 1986. This will give us time to promulgate a regulation setting the license fees within the framework established by the bill if the bill passes. Until then we can go with the old fee schedule.

Sincerely, with best wishes,

Paul

Paul E. Hamer, Chief
Bureau of Marine Fisheries

Enclosures
cc: Director Cookingham
Bruce Freeman

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[ASSEMBLY REPRINT]

SENATE, No. 1372

[OFFICIAL COPY REPRINT]

STATE OF NEW JERSEY

INTRODUCED FEBRUARY 27, 1984

By Senators PALLONE, GORMLEY, RUSSO and ZANE

Referred to Committee on Natural Resources and Agriculture

AN ACT concerning the taking of menhaden, amending R. S. 23:3–48, R. S. 23:3–51, ***R. S. 23:3–52 and,*** P. L. 1979, c. 199**,** and supplementing chapter 3 of Title 23 of the Revised Statutes.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. R. S. 23:3–48 is amended to read as follows:

23:3–48. Nothing in **[**sections**]** *R. S.* 23:3–46 to *R. S.* 23:3–49 of this title shall apply to vessels engaged in taking menhaden, but they shall be licensed to operate in the taking of menhaden pursuant to **[**sections 23:3–50 to 23:3–53 of this title**]** *R. S.* ***[***23:351***]*** ***23:3–51***.

2. R. S. 23:3–51 is amended to read as follows:

23:3–51. A person intending to take menhaden with purse or shirred nets in **[**any waters in the jurisdiction of this State, [redacted]ing the waters**]** *that portion of* the Atlantic ocean, within **[**3 nautical miles of**]** *the jurisriction of this State and at least* ***[***two***]** [redacted] *nautical miles from* the coast line of this State, **or 3 nautical miles in the case of any vessel the gross weight of which is 50 tons* [redacted] shall apply to the commissioner for a license therefor. The commissioner, upon the receipt of the application and payment to him of the fee provided in [redacted] *R. S.* 23:3–52 [redacted], may, in his discretion, issue to the applicant a license, to take menhaden with purse or shirred nets. The license shall be void after December 31 next succeeding its issuance.

**3. R. S. 23:3–52 is amended to read as follows:

EXPLANATION—Matter enclosed in bold-faced brackets [thus] in the above bill is not enacted and is intended to be omitted in the law.
Matter printed in italics *thus* is new matter.
Matter enclosed in asterisks or stars has been adopted as follows:
***—Senate committee amendments adopted September 20, 1984.**
****—Assembly committee amendments adopted April 15, 1985.**

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23:3-52. [The fees for issuing a license under sections 23:3-50 and 23:3-51 of this Title shall be as follows: For each

Vessel of not less than 30 nor more than 100 tons gross tonnage, owned by residents of New Jersey	$125.00
Vessel of not less than 100 nor more than 150 tons gross tonnage, owned by residents of New Jersey	250.00
Vessel of not less than 150 nor more than 175 tons gross tonnage, owned by residents of New Jersey	400.00
Vessel of not less than 175 nor more than 200 tons gross tonnage, owned by residents of New Jersey	550.00
Vessel over 200 tons gross tonnage, owned by residents of New Jersey	900.00
Vessel not over 20 tons gross tonnage used by residents for taking menhaden for bait purposes only	20.00
Vessel of not less than 30 nor more than 100 tons gross tonnage, owned or leased by nonresidents of New Jersey	450.00
Vessel of not less than 100 nor more than 150 tons gross tonnage, owned or leased by nonresidents of New Jersey	700.00
Vessel of not less than 150 nor more than 175 tons gross tonnage, owned or leased by nonresidents of New Jersey	1,000.00
Vessel of not less than 175 nor more than 200 tons gross tonnage, owned or leased by nonresidents of New Jersey	1,150.00
All vessels over 200 tons gross tonnage, owned or leased by nonresidents of the State of New Jersey	1,500.00

The fees for vessels from out of the State, leased by residents of New Jersey, shall be the same as the nonresident license fees.

Such gross tonnages shall be determined by Custom House measurements.] *Menhaden fishing.*

a. The license fees, by class, for menhaden purse seine or shirred net vessels shall be fixed by the commissioner pursuant to the "Administrative Procedure Act," P. L. 1968, c. 410 (C. 52:14B-1 et seq.). Vessel classes shall be based on gross tonnage as determined from U. S. Coast Guard admeasurements.

Classifications and fee ranges shall be as follows:

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	Resident	*Nonresident*
Vessels 20 tons or less	*$50.00 to $100.00*	*$100.00 to $200.00*
Vessels more than 20 tons and less than or equal to 100 tons	*$250.00 to $500.00*	*$500.00 to $1,000.00*
Vessels more than 100 tons	*$1,500.00 to $3,000.00*	*$3,000.00 to $6,000.00*

b. There is established within the "hunters' and anglers' license fund," created pursuant to R. S. 23:3-11, a separate and dedicated account to be known as the "menhaden account." This account shall be credited with all revenues received by the Division of Fish, Game and Wildlife from the sale of licenses for menhaden purse seine or shirred net vessels.

c. The menhaden account shall be used exclusively for the benefit of the marine fisheries resource, including, but not limited to, menhaden fisheries law enforcement.

d. The commissioner shall, pursuant to the "Administrative Procedure Act," adopt the rules and regulations necessary for the management of the menhaden resource.

*e. In addition to the penalties for violations established under section 73 of P. L. 1979, c. 199 (C. 23:2B-14), the commissioner may suspend a license issued pursuant to R. S. 23:3-51 for 14 days for the first offense and from 30 days to one year for each subsequent offense.***

[3.] ***4.*** Section 73 of P. L. 1979, c. 199 (C. 23:2B-14) is amended to read as follows:

73. For purposes of this section, the "act" means and includes all the new sections and amended sections contained herein, all the remaining sections of Title 50 of the Revised Statutes, sections 23:3-41, 23:3-46, 23:3-47, 23:3-48, 23:3-51, 23:3-52, 23:5-9, 23:5-16, 23:5-35, 23:9-114, 23:9-115 and 23:9-120 of Title 23 of the Revised Statutes, sections 1, 2, 3 and 7 of P. L. 1938, c. 318 (C. 23:5-5.1 through 23:5-5.3 and 23:5-5.7), P. L. 1952, c. 216 (C. 23:5-5.1a); **[**and**]** sections 1, 2 and 3 of P. L. 1941, c. 211 (C. 23:5-24.1 to 23:5-24.3); *and section* ***[**4**]*** ***5*** *of P. L. , c. (C.) (now pending before the Legislature as Senate Bill No.* ***1372 (OCR)*** *of* ***[**198**]*** ***1984***).

The commissioner may utilize any or all of the following remedies for any violation of this act:

a. (1) Any person who violates the provisions of this act or of any rule, regulation, license or permit promulgated or issued pursuant to this act shall be liable to a penalty of not less than $100.00 or more than $3,000.00 for the first offense and not less than $200.00

or more than $5,000.00 for any subsequent offense, unless the commissioner has established an alternate penalty for a specific offense pursuant to subsection a. (2) of this section.

(2) The Commissioner of Environmental Protection, with the approval of the Marine Fisheries Council, may, by regulation, establish a penalty schedule for any specific violation of this act or of any rule or regulation promulgated pursuant to this act. No such penalty may be less than $10.00 nor more than $100.00 on the first offense or less than $20.00 nor more than $200.00 on any subsequent offense. Any penalty provided for by this act or by the fee schedule promulgated by the commissioner shall be collected in a civil action by a summary proceeding under the penalty enforcement law (N. J. S. 2A:58-1 et seq.). The Superior Court or any [County Court, county district court or] municipal court shall have jurisdiction to enforce said penalty enforcement law. If the violation is of a continuing nature, each day during which it continues shall constitute an additional separate and distinct offense.

b. Any person who violates the provisions of this act or any rule or regulation or any license or permit promulgated or issued pursuant to this act shall be liable to the revocation of any license which he holds pursuant to this act for such period of time as the court may choose.

c. If any person violates any of the provisions of this act, or any rule or regulation or any license or permit promulgated or issued pursuant to the provisions of this act, the department may institute a civil action in a court of competent jurisdiction for injunctive relief to prohibit and prevent such violation or violations and the said court may proceed in the action in a summary manner.

The department is hereby authorized and empowered to compromise and settle any claim for a penalty under this section in such amount in the discretion of the department as may appear appropriate and equitable under all of the circumstances.

d. In addition to the penalties prescribed by this section, a person violating the provisions of R. S. 50:4-3 shall be subject to the forfeiture of any vessel or equipment used in the commission of the violation. A designated enforcement officer of the Department of Environmental Protection, the marine police, or any other law enforcement officer may seize and secure any vessel or equipment used in the commission of such a violation. Upon the seizure of the vessel or equipment, the enforcement officer, member of the marine police, or other law enforcement officer shall immediately thereafter institute a civil action to determine if the forfeiture is warranted in the court in which the penalty action was filed pursuant to this

section, which court shall have jurisdiction to adjudicate the forfeiture action. The owner or any person having a security interest in the vessel or equipment may secure a release of the same by depositing with the clerk of the court in which the action is pending a bond with good and sufficient sureties in an amount to be fixed by the court, conditioned upon the return of the vessel or equipment to the Department of Environmental Protection upon demand after completion of the court proceeding. The court may proceed in a summary manner and may direct the confiscation of the vessel or equipment by the department for its use or for disposal by sale or public auction. Moneys collected by the department through the sale or public auction of the vessel or equipment shall be used by the Division of Fish, Game and Wildlife for the enforcement of the provisions of this act.

[4.] ***5.*** (New section) A person shall not take menhaden with purse or shirred nets in the following **[jurisdictional]** waters of this State: Sandy Hook bay; Raritan bay; Lower bay; *Delaware bay;* and in the Atlantic ocean, less than *[two]* *1.2* nautical miles from the coast line of this State *or .6 nautical miles in the case of any vessel the gross weight of which is 50 tons or less*.

[5.] ***6.*** This act shall take effect *[immediately]* *on October 25, 1985*.

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90X

Exhibit G

91X

Dead fish cleanup caus a big stink in the Bronx

NEW YORK (AP) — The smell hits you on the drive south along Interstate 95 just as you head over the Hutchinson River toward the Bronx. By the time you get to Co-Op City's ball fields you know something's fishy.

And there they are, rotting in lifeless mounds on the shore of the river and Eastchester Creek — millions of menhaden, or mossbunkers, who suffocated themselves in their flight from predators.

Despite efforts by 200 city Health Department workers using nets, rakes and hands to haul in the fish from the rocky shore, officials predict it will be several days before enough of the rotting corpses are removed to decrease the odor.

In neighboring Mount Vernon, where the fish lay dead as well, the dispute over the cleanup was causing as big a stink as the fish and no one knows when the corpses will be removed.

"We need a boat," said Randy Dupree, the city's deputy health commissioner. "If we had a boat, we could scoop them in with nets. But, as it is, we use nets and rakes and when the tide comes back in, it brings more back."

NO AGENCY has a boat to lend the Health Department and the department has none of its own, said Dupree.

A private commercial fisherman who had volunteered to help never showed up yesterday.

Since this is the first time the department has ever had to handle such a massive fish kill, Dupree had to go out Thursday morning and buy nets at $10 or $11 each.

But the rocky terrain makes using nets and rakes difficult and workers often were gathering the fish by hand, one by one.

The fish kill was discovered over the weekend in Eastchester Creek on the border of Mount Vernon and Pelham Manor in Westchester County.

The small fish apparently were chased from the Long Island Sound into Eastchester Bay and the Hutchinson River by predatory bluefish, according to environmental officials.

IN THE SHALLOW water, they quickly depleted the dissolved oxygen in the water and died. The hot weather contributed to the kill because dissolved oxygen in water declines as the temperature rises, the officials said.

Environmental officials say the fish kill is a natural phenomenon.

But dead fish attract other things, including rats, and city Health Department workers in Co-Op City posted warning signs yesterday advising the community's 65,000 families that rat poison had been spread along the shore to try to control and contain the problem.

"I'd be here, too, if I were a rat," said Dupree, as he and his workers labored in 90-degree heat.

AP Laserphoto

BIG STINK — Joanna Licata (left) and Gina Licursi hold their noses yesterday near some of the tens of thousands of bunker fish that died when they were chased up a Bronx, N.Y., stream by ravenous bluefish. The fish perished due to a lack of oxygen in the overcrowded stream.

7-8-88 - Trenton Times A2

NYC workers start cleaning up dead fish in the Bronx

NEW YORK (AP) — City workers yesterday began clearing away tens of thousands of dead fish that are clogging creeks and shallow riverbeds in the northeast Bronx and creating a foul smell, the city health and sanitation departments said.

The small herring, called menhaden, apparently were chased from the Long Island Sound into Eastchester Bay and the Hutchinson River by predatory bluefish, according to environmental officials.

In the shallow water, they quickly depleted the dissolved oxygen in the water and died. The hot weather contributed to the kill because dissolved oxygen in water declines as the temperature rises, the officials said.

The fish kill was discovered over the weekend in Eastchester Creek on the border of Mount Vernon and Pelham Manor.

"It poses absolutely no health threat — just a strong smell," said Barry Adkins, a Health Department spokesman.

The city will hire a commercial boat today to gather the dead fish that are floating in the Bay, Adkins said.

Exhibit H

93x

n-3 News
Unsaturated Fatty Acids and Health

MARCH 1988 VOLUME III NUMBER 1

The Broiler Chicken - Its Current and Potential Role as a Source of Long-Chain n-3 Fatty Acids in our Diets

R.G. Ackman, Ph.D., F. Lamothe, M.F. H.W Hulan, Ph.D. and F.G. Proudfoot, Ph.D.

Editor's Abstract

Historically the common broiler chicken has not been a food that people recommend or think of as a rich source of n-3 fatty acids in the diet. The authors present interesting findings from actual analyses of the lipid content in chicken. Fatty acid determinations were made on both white and dark meat of chicken fed fish meal and non-fish meal diets. The results indicate that chicken may be comparable to cod as a source of n-3 fatty acids.

n-3 News has addressed the question of sources of n-3 fatty acids in papers emphasizing the longer chain lengths (C_{20} and C_{22}) from marine sources (1,2) and the α-linolenic acid of C_{18} chain length (18:3n-3) from vegetable sources (3). In general, meats of terrestrial animals are poor sources of the C_{20} and C_{22} PUFA, tending to emphasize those fatty acids of n-6 structure in the longer chain lengths (4). Fish are the major source of the C_{20} and C_{22} n-3 fatty acids in the "Western" diet (5), but we have now learned that this is supplemented by contributions from one of the most widely accepted and eaten terrestrial meats of all, that of the common broiler chicken.

An initial study was designed (6) to show that the chicken has a natural predisposition to accumulate eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), biosynthesized from precursor 18:3n-3, and further to show that this effect could be amplified by fish meal without affecting flavor.

Table 1 gives the diet compositions and Table 2 the main fatty acids in these diets as determined by *actual* analyses. The amount of 18:3n-3 was low and similar in both diets. The fish meal diet (FMD) slightly depressed food intake but induced better growth, indicating better utilization. Table 3 gives the lipid content of various tissues as recovered by the Bligh and Dyer procedure (7), and shows that some of the weight increase was due to the FMD depositing more fat in the skin and subdermal fat layer, as well as in other tissues. The lipid classes analyzed by Iatroscan (8) show (Table 4) that the lipids in the breast meats of both males and females were largely phospholipids, with triglycerides becoming dominant in the lipid classes of the dark (thigh) meats. An interesting point is that cooking apparently increased the relative proportion of triglycerides in both white meat and dark meats, presumably reflecting migration of fat from the skin or other fatty tissues as confirmed by Table 3.

The non-fish-meal diet produced (Table 5) muscle fatty acids containing not only EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) but also an important relative proportion

continued on page 2

TABLE 1

COMPOSITION (WEIGHT %) AND CALCULATED ANALYSES OF THE EXPERIMENTAL STARTER AND FINISHER DIETS (FISH MEAL AND NON-FISH MEAL)

	Starters		*Finishers*	
Ingredients	Fish meal diet	Non-fish meal diet	Fish meal diet	Non-fish diet
Ground corn	55	45	59	50
Ground wheat	15	14	20	19
Stabilized tallow	–	2	1	3
Soybean meal (49%)	9	35	–	24
White fish meal	20	–	19	–
Ground limestone	–	1.5	–	1.5
Di-calcium phosphate	–	1.5	–	1.5
Salt	0.5	0.5	0.5	0.5
Vitamin-mineral Premix*	0.5	0.5	0.5	0.5
Calculated analysis:				
Crude protein (%)	24.2	23.4	20.1	19.01
Metabolized energy (Kcal/Kg)	3020	2920	3140	3050
Calorie: protein ratio	125	125	156	160
Calcium	1.51	0.98	1.41	0.95
Phosphate	0.98	0.70	0.99	0.66

*Supplied per kilogram of diet: 10,000 IU vitamin A; 200 ICU vitamin D_3; 8 mg riboflavin; 15 mg d-calcium pantothenate; 15 μg vitamin B_{12}; 4 mg vitamin K (menadione sodium bisulfite); 35 mg niacin; 2 mg folic acid; 20 IU vitamin E; 1000 mg choline; 300 mg biotin; 5 mg pyridoxine; 3 mg thiamine; 187.5 mg amprolium; 200 mg ethoxyquin, 80 mg manganese, 70 mg zinc; 8 mg copper; 90 mg iron; 350 μg iodine; 100 μg selenium.

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continued

of the n-3 isomer of DPA (docosapentaenoic acid). This fatty acid has largely been ignored in fish-oriented fatty acid and health studies, usually being less than 10% of EPA and DHA in fish oils and lipids (9). However not only did the work of von Schacky et al (10) show n-3 DPA to be a viable intermediate in man between EPA and DHA, but a reassessment of the fatty acid composition of the seal fats such as are prominent in the Eskimo diet (11) showed that DPA was quantitatively nearly as important as DHA. It seems entirely reasonable to include n-3 DPA in all consideration of the benefits of n-3 fatty acids in human health (12).

The fish meal diet group (Table 5) showed a greatly enhanced accumulation of the C_{20} and C_{22} n-3 fatty acids, approximately 5-fold in the phospholipids relative to the NMFD group. The triglycerides also contained more of these fatty acids, and in all of the tissues lipids of Table 5 the FMD n-3 fatty acids displace the n-6 fatty acids found in the lipids of the NMFD group. There must be a chain length effect as well as that of n-3 and n-6, since both the 18.2n-6 and 18.3n-3 are reduced. The results for female chickens are not given, but were essentially similar (6). For practical purposes the skin triglycerides and subdermal fat layers can be taken as having fatty acid compositions similar to the dark meat triglyceride shown in Table 5.

TABLE 2

PRINCIPAL FATTY ACIDS OF THE FISH MEAL DIET (FMD) AND THE NON-FISH MEAL DIET (NMFD) FED TO BROILER CHICKENS

Fatty acids	FMD	NFMD
16:0	12.1	18.9
16:1	4.7	4.7
18:1	22.0	33.2
18.2n-6	41.9	35.2
18.3n-3	1.4	1.6
20.4n-6	0.2	0.1
20.5n-3	2.7	-
22.5n-3	0.5	-
22.6n-3	0.7	-

Fish are the major source of the C_{20} and C_{22} n-3 fatty acids in the "Western" diet (5), but we have now learned that this is supplemented by contributions from one of the most widely accepted and eaten terrestrial meats of all, that of the common broiler chicken.

In calculations of the impact of chicken on humans it is feasible to make several simplifying assumptions. For example on a per capita basis Canadians in recent years have eaten 17 kg of chicken and 7 kg of fish. The chicken skin and subdermal fats cannot be ignored since in the cooking process for a whole chicken a considerable amount of these fats will migrate and be included with the white breast meat. The exact type of fish eaten is also not known exactly, but it can safely be assumed that Atlantic

TABLE 3

LIPID CONTENT (W/W%) OF DIFFERENT PARTS OF THE CHICKENS

Body Parts	Males		Females	
	FMD	NFMD	FMD	NFMD
White meat	1.0	1.0	1.0	1.0
White meat, cooked	2.2	1.5	2.1	1.5
Dark meat	3.1	2.4	3.0	3.1
Dark meat, cooked	9.4	7.5	9.2	8.3
Skin	33.0	28.1	32.7	27.7
Skin, cooked	47.1	47.2	42.0	48.3
Subdermal fat	66.8	58.9	70.7	55.5
Brain	8.8	5.6	7.6	8.7
Heart	10.7	10.3	15.2	13.1
Liver	3.9	3.6	3.8	4.4
Plasma (mg/ml)	9.3	8.3	3.4	8.3
Erythrocytes (mg/ml)	13.0	4.1	4.3	13.7

Pooled samples (n=4) for each group

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cod will be a basic level for n-3 fatty acids with mollusks (bivalve shellfish) probably contributing a little less and crustacea (shrimp, crab, lobster) rather more. Two recent U.S. composition tabulations (13,14) indi-

It seem entirely reasonable to include n-3 DPA (docosapentaenoic acid) in all consideration of the benefits of n-3 fatty acids in human health (12).

cate that the total for PUFA, as a proportion of the wet weight of cod muscle, is nominally 0.25 g/100 g, and this is known to be mostly DHA with rather less EPA and little DPA (15). Therefore 100 g of the cod fillet can be said to have 0.25 g (EPA + DPA + DHA), although the DPA is a minor component, provided that none is lost to autoxidation in extended cold storage (16).

Table 6 gives some of the fatty acid components of lipids of the *cooked* chicken breasts and thighs. Combining this data with that of Table 3 enables one to calculate that the cooked white breast meat of the FMD group has, per 100 g, 2.2 g x 0.75 x 0.069 = 114 mg of the (EPA + DPA + DHA). The only assumption made is that the fatty acid content of the lipid is 75% by weight, a conservative compromise based on the PL/TG ratio for uncooked white meat (Table 4).

TABLE 6

PRINCIPAL FATTY ACIDS OF INTEREST (W/W%) IN TOTAL LIPID (TL), PHOSPHOLIPIDS (PL) AND TRIGLYCERIDES (TG) OF MALE CHICKEN BREASTS (WHITE MEAT, UNCOOKED), AND THIGHS (DARK MEAT, UNCOOKED) ON DIFFERENT DIETS

	White Meat					
	FMD			NFMD		
Fatty Acid	TL	PL	TG	TL	PL	TG
16:0	23.3	23.5	27.6	22.7	20.3	27.2
16:1	4.8	3.9	8.1	4.4	2.7	8.0
18:1	31.3	24.5	41.6	29.5	23.1	36.0
18:2n-6	14.9	13.9	10.9	19.1	18.8	14.8
18:3n-3	0.3	0.1	0.3	0.6	0.3	0.7
20:4n-6	2.8	4.4	0.1	6.0	9.9	0.3
20:5n-3	2.4	3.0	0.4	0.5	0.6	–
22:5n-3	2.1	1.6	0.1	0.9	1.0	–
22:6n-3	5.6	4.4	0.2	1.0	1.5	–
	Dark Meat					
16:0	23.4	17.4	18.1	21.3	16.8	18.7
16:1	8.4	2.4	12.5	6.0	1.6	8.7
18:1	38.8	20.2	46.6	37.7	17.6	46.5
18:2n-6	13.6	19.2	13.1	16.2	22.1	16.4
18:3n-3	0.5	0.1	0.5	0.8	0.1	0.8
20:4n-6	1.8	7.7	0.1	3.3	13.3	0.2
20:5n-3	1.0	2.5	0.2	0.1	0.1	–
22:5n-3	1.1	0.9	0.1	0.4	0.3	–
22:6n-3	2.5	3.9	0.4	0.3	0.8	0.1

Similarly the thigh meat figure will be 9.4 g x 0.75 x 0.017 = 120 mg of the long chain PUFA of n-3 structure. If 10 g of skin fat are eaten as an incidental part of the meal this can add another 50-60 mg of these acids. There is thus a two-fold result from this study. Referring only to the white breast muscle, the most acceptable part of the chicken, an all-vegetable diet should lead to deposition of the desirable long-chain n-3 fatty acids in an amount significant compared to other non-fish dietary sources. This experiment shows that even if chickens do not have fish meal included in this diet they will deposit long-chain n-3 fatty acids in the breast phospholipids at about 25% (6.9-1.7, from Table 6) of the above figure, or 28 mg/100 g. By feeding 20% of white fish meal this accumulation of beneficial fatty acids could be quadrupled and begin to approach the long-chain n-3 fatty acids provided by an equivalent weight of cod muscle. White fish meal is typically 4-5% recoverable lipid, and regular fish meal 8-10%. Repetition of the experiment with regular fish meal made from redfish (*Sebastes sp.*) showed that the effect was in fact matched at 10% of regular fish meal in the diet (17) and that in both cases taste panels failed to show the adverse taste effects found in fish oil dietary supplementation (18,19).

Poultry do not have a fully developed digestive system when newly hatched, and there is even a sex difference in digestibility of lipids over the first few weeks (20). The form of lipid in fish meal may account for some of the fatty acid benefits transferred to the bird phospholipids, as the lipids of white fish meal made primarily from

TABLE 4

PRINCIPAL LIPID CLASSES IN WHITE AND DARK MEATS OF CHICKENS ON THE FISH MEAL DIET (FMD) AND ON THE NON-FISH MEAL DIET (NFMD). FOR SIMPLICITY RESULTS ARE GIVEN ONLY FOR MALES

	Lipid Class (w/w%)		
Sample	Phospholipid	Triglyceride	Cholesterol
White meat, raw			
FMD	65	31	3.6
NFMD	71	25	3.5
White meat, cooked			
FMD	55	41	4.8
NFMD	59	33	5.4
Dark meat, raw			
FMD	28	70	1.6
NFMD	25	75	0.7
Dark meat, cooked			
FMD	13	86	0.3
NFMD	14	86	0.4

TABLE 6

PRINCIPAL FATTY ACIDS OF INTEREST (W/W%) IN TOTAL LIPID OF MALE CHICKEN BREASTS (WHITE MEAT), COOKED, AND THIGHS (DARK MEAT), COOKED

	Breasts		Thighs	
	FMD	NFMD	FMD	NFMD
16:0	22.4	22.4	24.0	22.2
16:1	6.7	4.2	9.4	6.7
18:1	33.6	33.2	38.5	42.2
18:2n-6	13.8	17.9	13.0	16.9
18:3n-3	0.4	0.6	0.5	0.9
20:4n-6	1.9	5.3	0.8	1.4
20:5n-3	1.6	0.5	0.7	0.1
22:5n-3	1.4	0.7	0.8	–
22:6n-3	3.9	0.7	2.5	–
Omega-3 LC-PUFA Total	6.9	1.7	4.0	0.1

lean fish muscle trimmings should contain a high proportion of readily digested fish phospholipids (15). In regular fish meal these are also present, with additional fat as triglyceride and possibly some free fatty acids. Fish meal is a very acceptable source of protein for growth in the broiler chicken (21), so birds with an enhanced long-chain n-3 fatty acid content would not require a major shift in current rearing practice.

Since chicken consumption per capita may have approached a plateau in the last few years, this is an opportune time to consider the dietary implications of the EPA, DPA and DHA of chicken lipids. Information on these fatty acids in meats is scanty (22), and often lumped in with alpha-linolenic (18:3n-3) acid, whereas the nutritional and health significance of the longer chain n-3 fatty acids lies in their actual availability in the human diet. Thus in man any deficiencies in enzyme activity for the conversion from 18:3n-3 (23), or competitive effects from linoleic (18:2n-6) acid (24), are not relevant.

R G. Ackman is Professor at the Canadian Institute of Fisheries Technology, Technical University of Nova Scotia, Halifax, Nova Scotia.

F. Lamothe is at the Institut Universitaire de Technologie in Marseille, France.

Dr H.W. Hulan and Dr F.G. Proudfoot are at the Agriculture Canada Research Station in Kentville, Nova Scotia.

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1. Ackman RG. Perspectives on eicosapentaenoic acid (EPA) n-3 *News* 1986; 1(4): 1-4.
2. Bimbo AP. Use of fish oils: Task for new technology. *n-3 News* 1986; 1(3): 1-4, 1(4): 4.
3. Hunter EJ. n-3 fatty acids from vegetable oils. *n-3 News* 1987; 2(1): 1-4, 6.
4. Kuksis A. Fatty acid composition of glycerolipids of animal tissues. In: Kuksis A, ed. *Handbook of Lipid Research*, New York: Plenum Press, 1978: 351-442.
5. *Health Effects of Polyunsaturated Fatty Acids in Seafoods*. In: Simopoulos AP, Kifer RR, Martin RE, eds. Orlando: Academic Press, 1986: 473 pages.
6. Lamothe F. *The Transfer of Eicosapentaenoic Acid in Nutrition*. Technical University of Nova Scotia, M.Sc. Thesis, 1984.
7. Bligh EG, Dyer WJ. A rapid method of total lipid extraction and purification. *Can J Biochem Physiol* 1959; 37: 911-917.
8. Ackman RG. Flame ionization detection applied to thin-layer chromatography on coated quartz rods. In: Lowenstein JM, ed. *Methods in Enzymology*, Vol. 72D. New York: Academic Press, 1981: 205-242.
9. Ackman RG. Fatty acid composition of fish oils. In: Barlow SM, Stansby ME, eds. *Nutritional Evaluation of Long-chain Fatty Acids in Fish Oils*. London: Academic Press, 1982: 25-88.
10. von Schacky C, Weber PC. Metabolism and effects on platelet function of the purified eicosapentaenoic and docosahexaenoic acid in humans. *J Clin Invest* 1985; 76: 2446-2450.
11. Ackman RG, Eaton CA. n-3 docosapentaenoic acid in dam and pup gray seal *Halichoerus grypus* blubber: Implications in the Eskimo diet for human health. *Can J Zool submitted for publication*.
12. Ackman RG. Some possible effects on lipid biochemistry of differences in the distribution on glycerol of long-chain n-3 fatty acids in the fat of marine fish and marine mammals. *Atherosclerosis*, in press.
13. Krzynowek J, Murphy J. Proximate composition, energy, fatty acid, sodium and cholesterol content of finfish, shellfish and their products. Springfield, VA: NOAA Technical Report NMFS 55, 1987: 53 pages.
14. Exler J. Composition of foods: finfish and shellfish products, raw, processed, prepared. Washington, D.C.: U.S. Dept. Agric. Handbook No. 8-15, 1987: 192 pages.
15. Ackman RG. Fish lipids. Part 1. In: Connell JJ, ed. *Advances in Fish Science and Technology*. Farnham, U.K.: Fishing News Books, 1980: 86-103.
16. Hardy R, McGill AS, Gunstone FD. Lipid and oxidative changes in cold-stored cod (*Gadus morrhua*). *J Sci Food Agric* 1979; 30: 999-1006.
17. Ratnayake WMN, Ackman RG, Hulan HW. Effect of redfish meal-enhanced diets on the taste and n-3 PUFA of 42-day old broiler chickens. *J Sci Food Agric*, submitted for publication.
18. Crawford L, Kretsch MJ. GC-MS identification of the volatile compounds extracted from roasted turkeys fed a basal diet supplemented with tuna oil. Some comments on fishy flavor. *J Food Sci* 1976; 41: 1470-1476.
19. Miller D, Robisch P. Comparative effects of herring, menhaden and safflower oils on broiler tissues fatty acid composition and flavor. *Poultry Sci* 1969; 48: 2146-2157.
20. Krogdahl A. Digestion and absorption of lipids in poultry. *J Nutr* 1985; 115: 675-685.
21. Hulan HW, Proudfoot FG. Replacement of soybean meal in chicken broiler diets by rapeseed meal and fish meal complementary sources of dietary protein. *Can J Anim Sci* 1981; 61: 999-1004.
22. Hepburn FN, Exler J, Weihrauch JL. Provisional tables on the content of omega-3 fatty acids and other fat components of selected foods. *J Am Diet Assoc* 1986: 788-793.
23. Bjerve KS, Fischer S, Alme K. Alpha-linolenic acid deficiency in man: Effect of ethyl linolenate on plasma and erythrocyte fatty acid composition and biosynthesis of prostanoids. *Am J Clin Nutr* 1987; 46: 570-576.
24. Lands WEM. Fish and Human Health. Orlando: Academic Press, 1986: 170 pages.

Letter to the Editor

Below is a letter written in response to the questions Should we be advising consumption of fish oil from seafood or in supplement form? What factors should be considered? We hope this will stimulate further discussion from you.

Several factors need to be considered in the supplement/seafood question.

First of all, what constitutes optimal intake of n-3 PUFAs? This question hasn't been definitively answered, but it appears that 3-4 grams/day is a reasonable approximation. Dr. John Kinsella has espoused this position and it is supported by Hirai and Tamura in the 12/87 *n-3 News*. Even though there is no evidence of side-effects at this level, perhaps it is wise to be cautious and recommend 2-4 grams.

If one accepts this, how is one to obtain this amount? If seafood is the only source, American dietary habits will have to undergo a drastic, and probably unrealistic metamorphosis. Per capita consumption of *all* fish in this country is 9lbs./yr. Even if this were entirely from fatty species (this is certainly not the case), a more than tenfold increase would be necessary to achieve 2-3 grams/day.

So we are left to consider supplements as an additional source. The following points need discussion:

1. Are supplements expensive? Two grams of n-3 PUFAs can be obtained from capsules for less than $1.00/day (e.g., *Promega* contains 500 mg n-3/ capsule and retails for about $.20-$.25/ capsule). Salmon, generally considered the most palatable fatty fish, sells for $9/lb and approximately one-third pound supplies 2 grams n-3 PUFA. It seems supplements are cheaper.
2. Are supplements high in cholesterol? Although ingestion of large amounts of some brands can significantly add to total dietary cholesterol, the most reputable manufacturers are now removing all cholesterol.
3. Are supplements high in the potentially toxic fat soluble vitamins A and D? This is only a problem if the capsules contain fish liver oil, such as cod. Other oils, from the body of the fish, contain negligible amounts.
4. Do supplements contain toxic heavy metals and organic impurities? Again, reliable manufacturers screen for and remove these substances. Can one say the same for fish?
5. Finally, do fish oil supplements increase the risk of stroke or other hemorrhage? If this occurs at all, it is almost definitely a dose-related phenomenon. Japanese fishermen, who consume close to what appears to be the optimal amounts, actually have fewer strokes than their farmer counterparts who consume much less n-3 PUFAs (probably due to differences in salt consumption, but the important point is that this amount of n-3 doesn't put one at risk for cerebrovascular disease).

Certainly more research is needed to further determine long-range effects and refine dosage recommendations. However, we should not lose sight of the fact that at least as many studies that have contributed to our knowledge of the beneficial effects of the n-3 PUFAs have been done with fish oil as with fish. As long as one stays within the 2-3 gram range, and isn't on medications which prolong bleeding time, I can imagine no contraindications to supplements. An approach of this sort will allow millions of non-fatty fish eating Americans to take advantage of the benefits of n-3 PUFAs.

Jeffrey Fisher, M D
Mendham, New Jersey

The Editors will refrain from commenting on submitted letters but hope you readers will!

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RESEARCH HIGHLIGHTS

Omega-3 fatty acids in broiler diets: There has been considerable interest in the effect of omega-3 fatty acids on human health, particularly in regard to cardiovascular disease. H.W. Hulan, R.G. Ackman, W.M.N. Ratnayake, and F.G. Proudfoot of Agriculture Canada and the Canadian Institute of Fisheries Technology report that when broilers are fed diets containing fish meal or oil, the omega-3 fatty acid content of the edible tissues increase (Can. J. Anim. Sci., 1988. 68:533-547).

In earlier experiments, it was observed that whitefish meal increased the omega-3 fatty acid content, particularly the eicosapentaenoic acid (EPA, 20:5n-3) fraction, of the carcass fat of broilers. The present experiment was conducted to ascertain the extent to which the omega-3 fatty acid content of broiler carcasses could be enhanced by feeding additional fish meal or oil.

A total of 1200 chicks were used in the experiment. Six diets were fed ad libitum as mash. Diet 1 was a control diet. Diets 2, 3, and 4 contained 7.5, 15.0, and 30.0% redfish meal (RFM), respectively. Diets 5 and 6 were formulated to contain the same concentration of EPA as Diets 3 and 4, respectively, with the source being redfish oil (RFO) or contained 2.1 and 4.2% RFO, respectively. The diets were equicaloric and isonitrogenous. RFM was added at the expense of soybean meal and RFO was added at the expense of poultry fat. Breast and thigh tissues were extracted with chloroform-methanol. The lipid fractions were methylated and assayed by gas chromatography.

Broilers fed RFM or RFO diets tended to have lower body weights at 42 days, feed consumption, and feed efficiencies compared to broilers fed the control diet. It was suggested that the reduction in feed consumption was due to palatibility of the RFM and was not the result of reduced protein bioavailability or oxidation. RFO fed broilers were heavier and more feed efficient than RFM fed broilers. Mortality was higher in broilers fed Diets 3 or 4 compared to RFO diets. Excess calcium in the fish meal may have attributed to the leg problems of the growing broilers.

Neither RFM nor RFO increased the total lipid content of the meat. RFM or RFO caused a reduction in saturated fatty acids and an increase in omega-3 fatty acids, especially 20:5n-3 and 22:6n-3 in the meat. Breast meat had a greater concentration of omega-3 fatty acids than did thigh meat and this may have been due to the greater phospholipid content of the breast meat. The linear accumulation of omega-3 fatty acids in the carcass over time suggests the need for long-term feeding. Additional research from this laboratory indicates that RFM fed to broilers had no adverse effect on broiler meat flavor.

TENTH ANNUAL MEETING

OF THE

SOUTHERN POULTRY SCIENCE SOCIETY

JANUARY 30-31, 1989

WORLD CONGRESS CENTER

ATLANTA, GEORGIA

INTRODUCTION OF OMEGA-3 POLYUNSATURATED FATTY ACIDS INTO EGGS

R L Adams*[1], D E Pratt[2], J H Lin[2], W J Stadelman[3]

[1]Department of Animal Sciences, [2]Department of Foods and Nutrition, [3]Department of Food Science, Purdue University, West Lafayette, IN 47907

Two levels of corn oil, purified menhaden oil and omega-3 oil, 3 and 6%, were fed to study the change in polyunsaturated fatty acids in the egg. Ten hens per treatment were used for the 46 day trial.

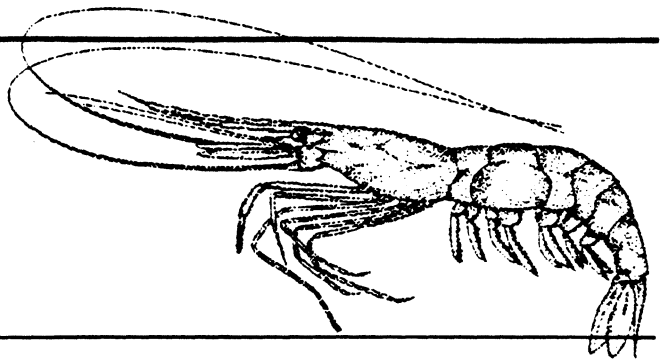
Amounts of eicosapentaenoic acid (EPA) in mg/100g of yolk from the 3 and 6% levels of each oil were: corn oil, only trace amounts, menhaden oil 103 and 107, and omega-3 oil 203 and 212. Amounts of docosahexaenoic acid (DHA) were corn oil 56 and 71; menhaden oil 519 and 477; and omega-3 oil 1021 and 785. Only traces of linolenic acid, an omega-6 fatty acid, were found with the corn oil and menhaden oil but with the omega-3 oil 176 and 232 amounts were found. The omega-3 oil and the menhaden oil affected the cholesterol level of the egg, but the corn oil did not. Hens on the 6% omega-3 oil diet went out of production before the end of the 46 days but all other hens laid well.

Organoliptic tests of eggs from hens fed the three oils showed a very slight off flavor from eggs from hens fed the 6% menhaden oil and the 6% omega-3 oil. No other differences were detected.

KEY WORDS OMEGA-3 FATTY ACIDS, EGG COMPOSITION

100%

The Seafood Way to a Healthy Heart



Medical evidence strongly suggests a relationship between diet and heart disease. The National Institutes of Health and the American Heart Association have recommended dietary guidelines for a healthy heart:

- ✔ **Restrict cholesterol intake to 300 mg per day for men and 225 mg per day for women**
- ✔ **Restrict fat intake to 30 percent of caloric intake**
- ✔ **Reduce the amount of saturated fats**

Recent findings indicate that including fish in the diet helps prevent cardiovascular diseases. Medical researchers attribute the therapeutic effect of seafood to a group of polyunsaturated fatty acids found in fish oil. These are popularly called Omega-3 fatty acids. Seafoods are the richest source of Omega-3 fatty acids.

How do different kinds of seafood stack up against the healthy heart guidelines? Fish and shellfish eat food that varies in type and availability. Their fat content fluctuates with season, food availability, location of catch, and many other factors. This effect is more pronounced in fattier fish such as mackerel.

Cholesterol and fatty acids constitute a large portion of the fat. As such, they can also be expected to fluctuate. The values found in the table are averages of many samplings. A good rule of thumb is to think of the value listed as being the average, and figure that the actual content for any individual is within 20 percent of the number listed. Most species are surprisingly low in cholesterol and fat, and a diet could be planned around seafood that would easily comply with all the guidelines.

The Omega-3 content has been included in the table in anticipation of future dietary recommendations. The current recommendation is to substitute fish for meat in your diet twice a week.

Species (4 oz., cooked)	Cholesterol (mg)	Fat (g)	Omega-3 (g)
Grey sole	68	0.9	0.23
Monkfish	81	0.8	0.20
American plaice	40	1.1	0.26
Red hake	47	0.7	0.26
Haddock	69	1.0	0.27
Scrod cod	51	0.8	0.29
White hake	58	0.9	0.30
Cusk	58	0.9	0.35
Pollock	62	1.0	0.35
Yellowtail flounder	77	1.1	0.40
Blackback flounder	69	1.1	0.42
Ocean perch	65	1.6	0.67
Silver hake	50	4.1	0.93
Mackerel, Atlantic	79	4.6	1.07
Herring, Atlantic	72	9.4	1.88
Yellowfin tuna	37	6.8	1.69
Bluefin tuna	44	24.4	3.67
Maine sardines	94	13.1	2.81
canned in soybean oil, drained			
Red crab	78	0.9	0.26
Jonah crab	78	1.1	0.31
American lobster	125	1.5	0.41
Surf clam	66	1.4	0.33
Shrimp	150	0.9	0.63
Rock crab	71	1.2	0.36
Blue mussels	61	2.3	0.68
Long-finned squid	470	2.3	0.76
Blue crab	101	1.2	1.03

For more information on the nutritional values of fish contact:
Information Services Section
NOAA/National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, MA 02543

Information Pamphlet 1 January 1990

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Exhibit I

AMPRO Fisheries, Inc.

Corporate Offices
Highway 200, P.O. Box 250
Burgess, VA 22432-0250
Telephone (804) 453-3808 Fax: (804) 453-5912

Martin McHugh, Esquire
Division of Regulatory Affairs
New Jersey Department of Environmental Protection
CN 402
Trenton, New Jersey 08625

Dear Mr. McHugh:

In response to the proposed change in regulations by the Division of Fish, Game and Wildlife (Proposal #PRN-1988), we submit the following items for your consideration:

1. Table 1 - The Importance of the .6 Mile Zone
2. Table 2 - Total Fish Caught in N. J.
3. Table 3-6 - Total Days Fished by Location
4. Proposed Zone System Chart 1, Figure 1
5. Industry Views on Specific Issues
6. Science Abstracts
7. Proposed Regulation Comments

We welcome the opportunity to address your questions and comments and look forward to resolving these matters prior to the start of this fishing season. It is the intent of the industry to be more active in addressing the concerns of the sports fishing community. We welcome any suggestions such as roundtable discussions or group meetings.

We are open to any format to achieve this end.

Sincerely,

John C. Barnes III

John C. Barnes, III
Senior Vice President

001019

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ECONOMIC AND SOCIAL ISSUES

These proposed regulations would curtail the rights of the citizens of the state of New Jersey to share in the important health benefits of menhaden meal and oil. Physicians and researchers have identified menhaden oil's potential as an important factor in the reduction of coronary heart disease. Hens fed an omega rich diet show a reduction in the cholesterol level in their eggs. The menhaden industry has long provided high quality protein to poultry growers which in turn translates into the quality and value which we all enjoy.

The menhaden industry clearly provides an economical method to bring the benefits of seafood to those citizens who have little direct access to the resource itself. The Department of Environmental Protection clearly has the responsibility to represent the interests of all the citizens of the state in this important matter. The enactment of these proposed regulations would result in the reduction of the availability of high quality protein at reasonable cost to the poultry industry and would jeopardize the menhaden industry's ability to contribute to the improvement of cardiovascular health of the citizens of the state.

THE INDUSTRY'S RESPONSE

While the industry feels the proposed regulations are unnecessary without substantial scientific foundation and perhaps discriminatory as written, we respectfully submit a set of voluntary guidelines which might resolve the issue as perceived from the sports fishing industry's perspective. These guidelines incorporate six specific areas. Our industry's fine record of compliance with previous voluntary guidelands lends credibility to our good faith efforts to put forth a proposal which can be agreed upon by all parties.

Key Elements of Voluntary Program:

1. Cease fishing by 12 noon Friday in New Jersey waters
2. Stay out of Sandy Hook Bay and Raritan Bay
3. Remain one (1) mile from all inlets
4. Remain one (1) mile from all piers and jettys
5. Limit amount of boats in each zone coastal
6. Limit amount of boats in Delaware Bay
7. While the industry wishes to retain its legal tolerance of 1% by-catch, industry policy will be instituted to reduce the by-catch to the lowest possible amount.

DUSTRY VIEW ON SPECIFIC ISSUES

BIOMASS

The Menhaden resource is in excellent condition.

The stocks have shown good recruitment, good year class distribution and a stable biomass. The industry's fishing effort in the past few years has been essentially stable. Thus, there is NO evidence the current level of fishing effort from the menhaden industry is depleting the resource.

There is NO scientific evidence these proposed regulations would have ANY beneficial effect on the survival of juvenile menhaden, as pointed out in the section titled "Environmental Impact." Small menhaden are usually found far upstream in tidal waters and marsh lands far removed from possible exploitation by any commercial gear. The issue of over fishing on an unstable biomass is simply refuted by the preponderance of scientific evidence to the contrary.

MENHADEN AS PREY

Menhaden make up only a small proportion of the total diet of common sports fish, as such fish are highly opportunistic predators which feed on a wide range of fish species and invertebrates. To quote Dr. Marvin Grosslein, Deputy Chief Marine Ecosystems Division NMFS Woods Hole Lab, "I would say it's most unlikely Menhaden would make up even 10% of the average composition of the total diet of bluefish and striped bass."

Dr. William Rickhus of Verser, Inc., who is currently writing a Striped Bass Management Plan, concurs with this opinion specifically: "Striped bass are voracious feeders and consume a wide variety of fish and invertebrates."

The stability of the menhaden biomass, its wide geographic availability and the opportunistic nature of the predator sports fish clearly indicate the current industry fishing efforts have little realistic negative impact on the availability of sports fish.

In contrast, the sports fishing industry has increased its fishing effort on species with poor recruitment, poor distribution and unstable biomasses. Therefore, we feel these proposed regulations would have no significant effect on the status of sports fishing stocks.

PROPOSED ZONE SYSTEM

CHART 1

NEW JERSEY

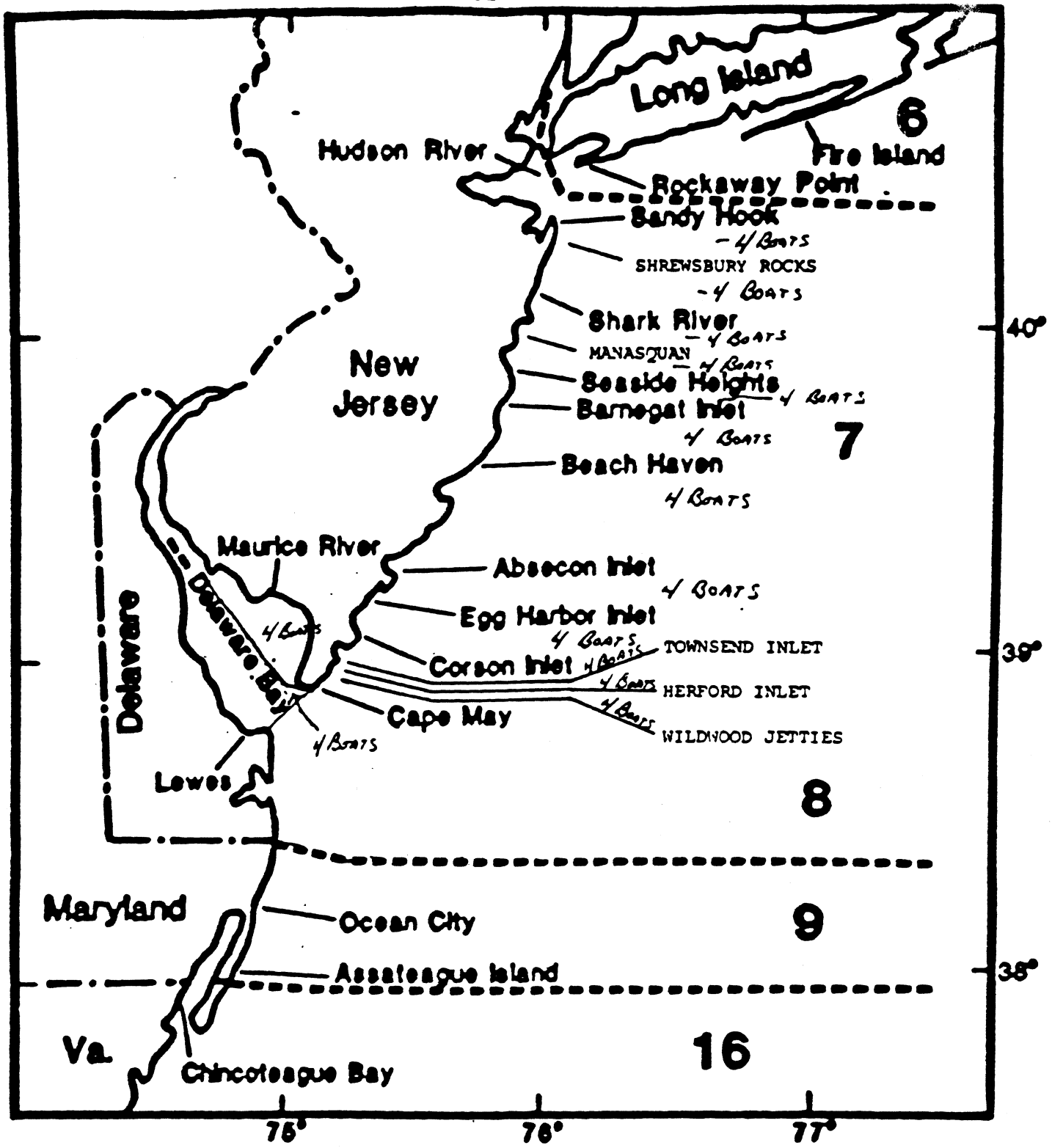
	Miles from A to B	Miles from Shore	Maximum No. Boats
A. Sandy Hook to B. Shrewsbury Rocks	8	.6 to 3	4 out of 20
A. Shrewsbury Rocks to B. Shark River	10	.6 to 3	4 out of 20
A. Shark River to B. Manasquan Inlet	5	.6 to 3	4 out of 20
A. Manasquan Inlet to B. Seaside Park Pier	10	.6 to 3	4 out of 20
A. Seaside Park Pier to B. Barnegat Inlet	10	.6 to 3	4 out of 20
A. Barnegat Inlet to B. Beach Haven Crest	10	.6 to 3	4 out of 20
A. Beach Haven Crest to B. Absecon Inlet	20	.6 to 3	4 out of 20
A. Absecon Inlet to B. Great Egg Inlet	7	.6 to 3	4 out of 20
A. Great Egg Inlet to B. Corson Inlet	7	.6 to 3	4 out of 20
A. Corson Inlet to B. Townsend Inlet	7	.6 to 3	4 out of 20
A. Townsend Inlet to B. Hereford Inlet	8	.6 to 3	4 out of 20
A. Hereford Inlet to B. Wildwood Jetties	6	.6 to 3	4 out of 20
A. Wildwood Jetties to B. Cape May Light	4	.6 to 3	4 out of 20

DELAWARE BAY (N. J. WATERS)

1. No more than 4 boats will be allowed North of a line from Cape May Light to Brandywine Light to Fourteen Ft. Light.

2. No more than 4 boats will be allowed South of a line from Cape May Light to Brandywine Light to Fourteen Ft. Light (N. J. Waters).

FIGURE 1


Long Island
6
Hudson River
Fire Island
Rockaway Point
Sandy Hook
- 4 Boats
SHREWSBURY ROCKS
- 4 Boats
Shark River
- 4 Boats
MANASQUAN
4 Boats
Seaside Heights
4 Boats
Barnegat Inlet
4 Boats
7
Beach Haven
4 Boats
New
Jersey
40°
Maurice River
Absecon Inlet
4 Boats
Egg Harbor Inlet
4 Boats
4 Boats
TOWNSEND INLET
Corson Inlet
4 Boats
4 Boats
HERFORD INLET
4 Boats
WILDWOOD JETTIES
Cape May
4 Boats
4 Boats
Delaware Bay
Delaware
39°
Lewes
8
Maryland
Ocean City
9
Assateague Island
38°
Va.
16
Chincoteague Bay
75°
76°
77°