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## The Assessment of Commercial Fishing Effort in Virginia Annual Report 1990

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**The Assessment of Commercial Fishing Effort in Virginia**

**Annual Report 1990**

**Prepared by**

**Joice S. Davis, James C. Owens and Joseph G. Loesch**

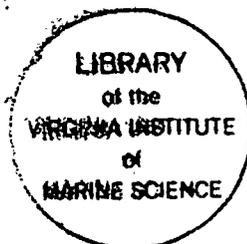
**of the**

**Virginia Institute of Marine Science**

**School of Marine Science**

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We express our sincere thanks to the many commercial watermen who generously gave us information about their fishing gear and shared their knowledge of the saltwater fisheries of Virginia. We also thank the seafood dealers who answered our questions about the complexities of food fish marketing.

We are indebted to the following Virginia Institute of Marine Science personnel: Dianne Bowers, who prepared the art work; Connie Darouse, who typed the manuscript; Julie Peterson, who helped prepare the tables; and Sam White, pilot of the VIMS plane.

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## Summary

1. Pound nets were counted by aerial survey and/or telephone canvass. A maximum of 144 nets were counted during the first three months of the contract period (October, November, and December 1989) and a maximum of 173 active nets were counted during the period January through September 1990.
2. Stake gill net effort was assessed by personal interviews and counts of gill net stands by observers using a small boat. Peak activity occurred in March and April.
3. Personal and telephone interviews with commercial fishermen indicated that anchor gill net effort in spring 1990 exceeded effort in fall 1989, in the James, the York and Rappahannock rivers. Rappahannock River effort reached a peak in the second half of March, followed by the York in the first half of April, and the James in the second half of April.
4. Drift gill nets were fished in the upper reaches of the James, Pamunkey, Mattaponi and Rappahannock rivers. The commercial fishery exceeded the recreational fishery in the Pamunkey and Mattaponi according to fishermen in the area. No drift gill nets were fished in March because of the large numbers of striped bass available to the fishery.
5. The James River fyke net fishery was active in all months of the contract period except January, with a maximum count of 15 nets. Greatest haul seine activity was reported in the lower York River, followed by Mobjack Bay and Poquoson Flats areas during late spring and summer 1990.
6. Recommendations:
  - a. Gear assessment data collection should be continued, in order to broaden the data base, and provide an indicator of the status of the fisheries. Gear license purchases can not be relied upon as an indicator.
  - b. Virginia Marine Resources Commission (VMRC) should document the location of each stationary fishing devise by the use of LORAN.

- c. Descriptors should be required on VMRC license so as to discriminate between large, visible fyke nets and small submerged fyke nets.
- d. Descriptors should be required on VMRC license application, a definition of gill net status, i.e., commercial full-time, commercial part-time, or recreational.
- e. Descriptors should be required on VMRC license application a definition of intended fishing location and expected usage of gill nets.

# The Assessment of Commercial Fishing Effort in Virginia

## INTRODUCTION

The Virginia Institute of Marine Science (VIMS), through funding by the Virginia Marine Resources Commission (VMRC), has conducted an assessment of commercial fishing effort in Virginia's major rivers and Chesapeake Bay beginning in late 1985 to the present, except for brief intervals when funding was unavailable.

This report primarily summarizes the final year of assessment, from 1 October 1989 through 30 September 1990. Objectives of the study were: 1) to assess pound net fishing effort in Chesapeake Bay, in the James, York, Rappahannock, and Potomac rivers, and the Virginia tributaries to the Potomac River; and, 2) to assess stake, anchor and drift gill net fishing effort in the three major Virginia river systems. In the course of our data collection for the James, York and Rappahannock rivers, we have also obtained incidental effort data for these rivers and other areas in the Bay. Fyke net, haul seine and gill net fisheries data are included in this report. Three quarterly reports have been submitted to VMRC during the contract period. Data were acquired in the same general manner as for previous reports (Davis et al. 1986). Preliminary data included in the quarterly reports have been adjusted where necessary to reflect the final counts or estimates.

Appendices to this report are a VMRC map of Virginia water body designations and corresponding water codes (two of which we modified slightly), and maps of the Chesapeake Bay and major rivers, including the Potomac River, showing pound net sites that were occupied during the study period.

## METHODS

### Pound Nets

A pound net is a stationary fishing device that is deemed to be actively fishing when all of its parts, the hedging (lead), heart, and head are in place. Actively fishing pound nets were counted in Chesapeake Bay and the rivers by an observer during aerial surveys at low altitudes during the contract period. The survey design was to schedule two flights, one per each half-month in all months except for December through February. One flight per month in these three months was considered sufficient, since there is minimal pound net activity during the winter months. If a flight was cancelled for any reason, it was rescheduled and made as soon as possible following the cancellation. In addition to the aerial surveys, we interviewed some pound net fishermen by telephone calls and/or letters of inquiry on the north side of Potomac River, Lower Section (subarea 175), Lower Central Section (subarea 275) and Potomac River where air space is restricted or in areas where calls or letters were more economically feasible. James River, Upper Section (subarea 337), Potomac River, Upper Central Section (subarea 375), Pocomoke Sound (subarea 072) and seaside Eastern Shore (subarea 097) were aerially surveyed as necessary to upgrade data if insufficient data were collected by telephone calls.

We have identified areas where pound nets are located in Chesapeake Bay and its tributaries, using VMRC-designated codes and names of Virginia water bodies (Appendix I), and further divided and numbered two VMRC water areas along the western side of Chesapeake Bay, using VIMS historical aerial pound net survey designations, which are more definitive. Data are presented in tabular form by water body, showing the number of pound nets fishing in each

sampling period, the mean number of net-days per day, and the number of net-days per month.

#### Stake Gill Nets

Stake gill net effort in the James River was assessed by observers in small boats during the first half of April and in the York River during the first half of May, near the usual peak of the American shad (Alosa sapidissima) gill net fishing season. Each active stand was counted, and the number of sections per stand and the approximate length of each section in the stand were recorded.

Personal interviews with Rappahannock River gill net fishermen, and a count by observers in a small vessel on May 16, were utilized to ascertain maximum stake gill net activity in spring 1990.

Telephone contact with fishermen continued on a semi-weekly to weekly basis, depending on fishing intensity, in each half-month throughout the duration of the contract period. Effort data are reported as the maximum number of active stands and total linear feet of net fished per half-month.

#### Anchor and Drift Gill Nets

Personal interviews and telephone calls were employed to assess the anchor and drift gill net fisheries in the three major Virginia tributaries to the Chesapeake Bay. These types of gear, particularly drift gill nets, are generally a "one-man" operation, are very mobile, can easily be moved from one water body to another, and are fished by both commercial fishermen and recreational fishermen. Therefore, these are probably the most under-reported types of gear that are licensed by the Commonwealth of Virginia. We have included the recreational as well as the commercial aspect of these fisheries

when data were available. Effort data for anchor gill nets are shown as the maximum number of nets and estimated linear feet of nets fished per half-month. Effort data for drift gill nets are shown as mean number of nets per month, mean length of nets and estimated linear feet of net per month.

#### Fyke Nets

Data for fyke nets were collected through personal interviews with commercial fishermen. The major fyke net fishery is located on the upper James River. We also obtained data on one fyke net in the lower York River. Data are presented as units of gear by half-month, mean number of net days per day, and the number of net days per month.

#### Haul Seines

Data for haul seines were collected through personal interviews with commercial fishermen. This type of gear was utilized primarily in the James and York rivers, Subarea 711, and Mobjack Bay. Data are presented as units of gear, by half-month.

## RESULTS

### Pound Nets

#### Chesapeake Bay Areas

Pound net data for Chesapeake Bay, its Virginia tributaries, and the Potomac River, are given in Tables 1 through 5 and Tables 30 through 53 using VMRC-designated subarea codes, except where such subareas were further divided to more closely match the VIMS historical aerial pound net survey designations (see Appendix I, subareas 111, 311). The Virginia Marine Resources Commission is the state agency that sets and enforces regulations governing Virginia's saltwater bodies and issues gear licenses. The Potomac River Fisheries Commission (PRFC) is the regulatory agency that issues gear licenses for the Potomac River. Dates of aerial surveys and the number of active pound nets observed for the contract period are shown in Table 1. Tables 2 through 5 show the maximum number of pound nets, by subarea code, by 3-month periods during the years 1985 through September 1990, for comparison of years, by season. Tables 30 through 53 show pound net effort for the contract period. Data are reported by half-month, mean net days per day, net days per month, total net days per 3-month period, mean net days per 3-month period, total net days for the contract period and mean net days for the contract period, by calendar year. Tables 6 through 29 include data covered in the three quarterly reports previously submitted, in addition to the last three months of the present contract period.

In general, the most active period of the pound net fisheries was from April through June. Among the rivers, the highest number of pound nets

occurred in the Potomac River, while the greatest number of pound nets in the Bay were located in subarea 411.

### Stake Gill Nets

#### James River

The earliest stake gill net set in the James River for the contract period was reported in early February 1990 in subarea 137, Lower Section. Four stands were in the river in the second half of February. Two were located in the Lower Section and two were in the Central Section. In early March four additional stands were in place. Subarea 137, Lower Section, had four stake gill net stands in place by early March, with an additional stand in by late March and they remained through the first half of April. In subarea 237, four stake gill nets were in place during early March and six were in place by late March. These continued fishing through early April. By late April two stands had ceased operation. Four stands were fished during the second half of April, and were removed from the stakes by May. The maximum stake gill net activity during spring in both sections of the river reached eleven stands and these gill nets were primarily set for American shad (Alosa sapidissima) (Table 54).

#### York River

The York River had the most extensive stake gill net fishery of the three major Virginia tributaries. However, the fishery was limited to the two uppermost sections of the river.

One stake gill net was reported in the Central Section (subarea 295) in the second half of January 1990, and the number increased to 33 in March. The maximum count of 34 nets was in the first half of April. Two nets were recorded in the first half of February in the Upper Section (subarea 395). The peak number of nets (51) occurred in this section during the first half of April, while the largest catches of American shad in this section of the river occurred during the last half of March. The VMRC regulation banning the taking of striped bass (Morone saxatilis) discouraged fishing effort until the spring shad fishing season began. The peak of the stake gill net fishery occurred in the first half of April (Table 55).

#### Rappahannock River

All stake gill nets on the Rappahannock River were located in the Central Section, subarea 277, except for one net that was fished in March 1990 in the Upper Section, subarea 377, for white perch (Morone americana). One stand was already in place in subarea 277 in the second half of November 1989. The count increased to five stands by the first half of December 1989. By the second half of March there were nine stands fishing, subsequently, the number of nets declined and all but three had been removed by the end of April. The remaining three were removed by 31 May. The total number of stands and estimated linear feet, by half-month, are shown in Table 56.

#### Anchor Gill Nets

Maximum numbers of nets per half-month and total linear feet of netting were assessed for all subareas of the James, York and Rappahannock rivers (Tables 57-59).

## James River

In the fall 1989 anchor gill net fishery in subarea 137, the largest number of nets occurred in the second half of October; in subarea 237, the second half of October; and in subarea 337, the first half of October (Table 57). The spring 1990 fishery was more extensive than the 1989 fall fishery. Subarea 137 had a maximum of 39 nets in April, subarea 237 had a maximum of 43 nets in April, and subarea 337 had a maximum of 19 nets in late April (Table 57).

## York River

The anchor gill net fishery in the York River was more extensive in subarea 195, Lower Section, in fall 1989 than in any other subarea, with 55 nets in the first half of October. All had been removed by the second half of December (Table 58). Subarea 195 was also the most heavily exploited in spring 1990. Two nets were set in early January and a peak of 65 nets was reached in late April. Late December was the only half-month of the year with no anchor gill net activity in any subarea, due to extremely cold weather conditions and ice in the rivers. The maximum number of nets in subareas 295 and 395 occurred in April, with 46 nets and 23 nets reported, respectively.

## Rappahannock River

The Rappahannock River had an active commercial anchor gill net fishery throughout the contract period. Subarea 277 (Central Section) was the most heavily exploited of the three subareas (Table 59). Upriver nets (subarea

377) averaged about 325 linear feet per net in length, compared to an average length of 900 feet for downriver nets (subarea 177). The second half of March was the period of most fishing activity, with an estimated 41,900 feet of gill netting set in the three subareas.

#### Other Areas

Mobjack Bay (subarea 055) and Chesapeake Bay both had anchor gill net fisheries. An estimation of 78 nets in the Chesapeake Bay, Smith Point to New Point (subareas 011,111,511), and 83 anchor nets in Chesapeake Bay from New Point south to the Bay mouth (subareas 611,711,811), exclusive of the Poquoson area, and 42 nets in the Mobjack was made by commercial watermen who were familiar with the fisheries in these particular areas (personal communication). The Poquoson (Tue Marsh-Old Point) area was reported to have had 54 commercial nets. Forty-five to 50 anchor nets were reportedly fished in the vicinity of New Point for a two-week period around the middle of September 1990, in addition to all the others previously reported (Table 60).

#### Drift Gill Nets

The drift gill net fisheries for American shad and river herring (Alosa sp.) in the upper portions of the James, Pamunkey and Mattaponi rivers were assessed for the contract period (Table 61). In addition to the three rivers mentioned above, the Rappahannock River supported a minimal recreational, or part-time, fishery (personal communication). The drift gill net fishery generally begins in early April and the season is over toward the end of May. It targets the anadromous fishes that come into the rivers to spawn.

### Fyke Nets

Fyke nets in the Upper Section (subarea 337) of the James River were set to fish during the entire contract period except January, and fifteen days in September 1990 (Table 62). One fyke net in the lower York (subarea 195) was fishing from April 1990 through September 1990 except for two brief periods.

### Haul Seines

The haul seine fishery was assessed during the contract period (Table 63). One unit was operating in the lower York (subarea 195) in October 1989. In 1990, the earliest haul seine effort occurred in the second half of March in the lower York, in the Central Section of the James and offshore of Poquoson in Chesapeake Bay. The York usually had more units working in each half-month than any other subarea, followed closely by Mobjack Bay and the Poquoson area.

### Mullet Nets

In addition to the above mentioned gear types, there was a striped mullet (Mugil cephalus) or "jumper" fishery in York River during late June through early September. Seven units (at least four of these were recreational) were counted in subarea 195 in late July, and three units were counted in the Central Section, subarea 295 in late July and August.

### Data Comparison Between Years

The number of food-fish licenses issued by VMRC in 1990 exceeded those sold in 1989 (preliminary 1990 VMRC gear license data) (Tables 65 and 66). Also included in these tables are peak counts, by gear, by river, for the two seasons represented in the contract period.

## DISCUSSION

Preliminary 1990 gear license data from VMRC indicate that food fish gear licenses sold in 1990 exceeded the sale of these licenses in 1989 by 28.8% (Tables 65, 66).

VMRC issued 146 pound net licenses in 1989 and 147 in 1990. Additionally, PRFC issued 93 pound net licenses in 1989 and 85 licenses in 1990. Pound net effort for Virginia and the Potomac River was estimated to be 30,939 net-days during the contract year October 1989 - September 1990, compared to 35,439 net days in the period October 1988 - September 1989. The Potomac River was the most heavily exploited in both years (10,152 net-days in 1989-90, and 13,071 net-days in 1988-89). The lower Eastern Shore (subarea 411) was the second most highly exploited during the contract year with total effort estimated at 4,463 net-days, followed by the Rappahannock River with 2,137 net-days. Subareas 011, 511 and 195 had almost equal total effort with 2,094, 2,092, and 2,082 net-days, respectively. Potomac Creek, a small tributary of the Potomac River, ranked seventh with 1,764 net-days, most of which was directed toward the anadromous fishery in the spring.

Anchor gill net license sales showed the largest increase of any food fish gear in 1990. This may be due, in part, to the expected late fall 1990 lifting by VMRC of the moratorium placed on the striped bass fishery.

The number of units of the various types of fishing gear in the Chesapeake Bay and its tributaries changes greatly during the course of a year, and reflects the commercial watermen's knowledge and experience concerning the seasonal fisheries. Migratory patterns and cyclic appearances of desirable, or marketable, species affect seasonal availability. Market demands, both foreign and domestic, tend to affect and influence the

fishermen's choice of gear and net sizes, as do the economics of setting large, stationary traps or using small, mobile types of gear. Fishery regulations, resulting from depletion of, or reduction in stocks, (i.e., flounder, striped bass), and pollution (i.e., kepone contamination of the James River) are also contributory factors in the fishermen's choice of location, gear, and net sizes. Fluctuations in numbers of actively fishing gear are influenced by seasonal hydrological conditions, such as winter storms, droughts, flooding, and hurricanes.

Diversification has become the key that allows the self-employed fisherman to stay in business. Most fishermen are prepared to vary their methods of capture according to the type of seafood available despite ever increasing costs of "gearing up" for each selected fishery. For example, it is not unusual for crab potters or eel potters to pull their pots and set anchor gill nets when food fish are bountiful and dock-side prices are good. One James River fisherman who fishes a haul seine in the Chickahominy River during late winter-early spring before the regular herring run, has developed a market for gizzard shad (Dorosoma cepedianum) in some southern states. This species has been increasingly plentiful in all rivers in recent years, and there is generally no local market available.

Gizzard shad are taken in all types of stationary gear as well as gill nets during late winter-early spring. Today, a gill net fisherman or crabber may move his gear from one river to another or even outside the Bay if economics demand it.

Commercial fishermen reported a fair American shad season on all three major Virginia rivers in spring 1990. Spanish mackerel (Scomberomorus maculatus) were caught in large numbers in Lynnhaven pound nets during March, April and May. Pound netters in the lower York River and adjacent areas also

reported an abundance of this species as the season progressed. However, catches of summer species such as blue fish (Pomatomus saltatrix), weakfish (Cynoscion regalis), spot (Leiostomus xanthurus), and Atlantic croaker (Micropogonias undulatus) have not been as plentiful in 1990 as they have been in recent years in the Bay, according to seafood dealers. The dealers had difficulties finding enough of these fish to supply their markets throughout the summer.

### Pound Nets

#### Chesapeake Bay

Pound nets in Chesapeake Bay tend to be clustered in certain areas. The choice of locations is influenced by: 1) accessibility to home ports; 2) location of docking facilities and/or seafood handling facilities; 3) good launching sites; 4) areas of sufficient size for net maintenance, pole preparation and storage; 5) family fishing traditions and 6) fish migratory patterns. Pound net sites occupied in 1989 and 1990 are indicated in Appendix II. Pound net fishermen in Virginia were dealt a devastating economic blow in mid-December when temperatures dipped below zero and resulting ice wiped out the remaining pound net and gill net stands, broke poles off and destroyed nets left in the water to catch perch, and "scrap" which would be used as bait. Fishes that have little or no demand in the marketplace as food fish are referred to as scrap.

Pound nets located in the Chesapeake Bay (Western Management Area) and the area from Windmill Point on the Rappahannock River to New Point capture edible species that are sold to local markets and are trucked to city markets.

These catches are sold locally as crab bait, trucked to processing plants in Reedville, Virginia, or sold to dealers in southern states, such as North Carolina, Georgia and Louisiana.

The York Spit area (subarea 611) is usually a productive fishing area, and pound nets located there are set primarily for the summer and fall fisheries. Croaker, spot, bluefish, grey trout, summer flounder (Paralichthys dentatus) and Atlantic menhaden (Brevoortia tyrannus) are some of the species usually caught, as the season progresses. Historically, pound nets in the Tue Marsh-Old Point areas (subarea 711) are fished primarily for river herring (Alosa aestivalis and A. pseudoharengus), American shad, and spot and other summer species. However, only one net was set there in 1990, for the latter half of June.

The five pound net sites in the Cape Henry area located along the shore to the east of Lynnhaven Inlet are usually set to catch the early arriving anadromous species, river herring and shad, and subsequent summer species; however, catches were below normal in the spring except for the previously mentioned mackerel harvest.

The numerous pound net sites in Chesapeake Bay (Lower Eastern Section, subarea 411), for the most part, lie very close inshore, and the majority of them are found from Cape Charles south. They usually remain set through the fall season when marketable summer species migrate out of the Bay.

#### James River

The James River pound net fishery has been affected by a VMRC ban on fishing since 1975 because of kepone contamination of the river. This restriction and the high cost of setting pound nets virtually eliminated this

fishery from the James River until late 1986 when a gizzard shad fishery developed in the Upper Section (subarea 337) of the James River above the kepone-contaminated area. One fisherman set three pound nets in early 1989 in the Upper Section in order to fulfill market demands for this species. No nets were set in this area in fall of 1989 or 1990. The ban imposed on finfish harvest because of kepone was lifted in July 1988. It is expected that the fishing industry will continue in the James River; however, it might be years before it regains its former magnitude, due, in part, to a moratorium placed on the striped bass fishery, and economics in general.

#### York River

Fish caught in pound nets in the Lower Section (subarea 195) of the York River are landed nearby and are sold to wholesale buyers, shipped to retail markets, or used locally as crab bait. Some nets were in place in early February, as soon as threat of winter storm damage was past. Unusually warm weather conditions prompted the pound netters to set their stands early, with the anticipation of catching the early runs of shad and herring. However, the early runs did not materialize or, perhaps, eluded the nets. Only below normal catches of river herring and shad were reported.

#### Rappahannock River

Pound nets in all sections of the Rappahannock River were in place by late March, set to catch the river herring, menhaden and American shad entering the river. However, fishermen reported low catches, possibly due to

unseasonably warm weather in February, with an accompanying rise in water temperature which may have triggered an early spawning migration of alosids.

In the Upper Section, from mile 35 to mile 60, all but one net were removed by early May. Catches included catfish (Ictalurus sp.), white perch and the anadromous fishes. Retail and wholesale markets are the destinations of the edible catch, and bait is sold to crab and eel pot fishermen (Davis et al. 1987).

In late 1989 one of the major seafood buyers on the Potomac River went out of business, leaving the fishermen of both the Rappahannock and the Potomac with one less catfish market. Pound net fishermen on the Rappahannock River were then forced to limit their catches of catfish or find new markets in different areas.

#### Potomac River

The Potomac River and its Virginia tributaries continue to lead in the number of active pound nets, with Subarea 175 being the most heavily exploited. Potomac Creek, a small Virginia tributary at mile 59, again had a maximum of 15 nets set during spring 1990. Fishermen utilize the scrap fish they catch as bait for crab pots later in the year. One fisherman has developed a market for gizzard shad in the south where the fish are utilized as a feed supplement by mink farmers.

#### Stake Gill Nets

Generally, the stake gill net fisheries in the James, York, and Rappahannock rivers begin in the spring when ice in the rivers is no longer a threat to poles and nets. The York River system has the most extensive stake

gill net fishery in Virginia. Since the moratorium was placed on striped bass harvest, the stake gill net season in the James and York rivers begins with the arrival of the American shad. Mesh sizes range from 4 7/8-inch to 5-inch stretched mesh, which would select the larger, more desirable roe shad entering the rivers to spawn. Fishing restrictions due to kepone contamination of the James River were lifted on 1 July 1988. However, the VMRC regulation banning the removal of striped bass from Virginia waters had an adverse impact on fishing effort in all rivers until the spring season began. White perch are the target species in the Rappahannock River in February and March before the arrival of American shad.

Stake gill nets are subject to fouling by marine organisms, grass, and other detritus. These conditions affect catch and occasionally the nets must be raised and cleaned or replaced. The nets are removed when shad are scarce or dockside prices are low. Other fisheries (haul seine, anchor gill net, crab pot, etc.) replace the stake gill net fishery. White perch and catfish were the target species through the late fall and winter months. According to personal interviews with local fishermen on the York River system and their catch records which we obtained for another study, the spring American shad fishery of 1989 had apparently been the best one in four or five years, and the shad had brought better prices; however, catches were fewer in spring 1990.

#### Anchor Gill Nets

The temporal and spatial aspects of the anchor gill net fisheries in Virginia were discussed in detail by Davis et al. (1986).

In general, effort in the James, York, and Rappahannock rivers in 1989-90 surpassed that reported in 1988 (Davis et al. 1989).

### Drift Gill Nets

Drift gill nets are usually employed in the upper portions of rivers. They are readily fished from small boats, and target species have traditionally been the anadromous fishes on their spawning runs in the James, York, and Rappahannock rivers. Drift gill nets are generally fished about 4 hours at a time; and at the peak of the spawning runs they are usually fished on one tide each day, either early morning or late evening. Commercial fishermen will sometimes drift nets on both tides. The nets do not generally catch as well during daylight hours, probably due to water clarity and an avoidance reaction by the fish to the nets. The Mattaponi and Pamunkey rivers support large recreational drift gill net fisheries during American shad spawning season (early April to late May) according to interviews with commercial fishermen. People from surrounding areas who know the rivers and their productivity have been known to spend their vacations fishing for shad, generally one to two weeks each year.

The James and Rappahannock rivers support similar recreational fisheries, but they are probably not as extensive as the Mattaponi and Pamunkey fisheries. The James River area is better suited for drift nets than the Rappahannock. It is likely that we have underestimated the true magnitude of the recreational fishery, particularly in a good season like spring 1989 on the York system. American shad in good numbers were caught on the spawning grounds of the Mattaponi and Pamunkey rivers in 1990 even though downriver catches of shad in gill nets and pound nets were less than the catches in spring 1989 (personal communication). Limited information about this fishery

is due, in part, to the size of the area to be canvassed (four tributaries), number of VMRC gill net licenses sold (361 licenses = potential fishermen), mobile nature of the gear, and length of season.

#### Fyke Nets

The fishing style of this type of non-selective gear, utilized mainly by commercial fishermen in the upper James River, was discussed in Davis et al. (1986). Maximum effort on the James River in 1988-89 exceeded that in 1989-90 with 26 nets reported for the year, compared to a maximum of 15 nets (late April to early July 1990). One unit on the York River was fished, from April to the end of the contract period.

#### Haul Seines

General areas utilized and seasonal activity of this non-selective gear were discussed in Davis et al. (1986). The York River, Mobjack Bay and Poquoson areas were the areas of heaviest exploitation in summer 1990. Mobjack Bay had a maximum fishery reported of three units in 1990. Two haul seine units operated in the James River in spring 1990, and three units in the summer. Three units were working out of Poquoson (subarea 711) in summer 1990. On the Rappahannock River no haul seine units were reported in operation in 1990.

#### Data Comparison Between Years

VMRC license data in Tables 65 and 66 indicate that more food fish licenses are issued than gears fished. Therefore, if gear licenses are used as a measurement of effort in Virginia waters, effort will be overestimated.

## RECOMMENDATIONS

There is a continuing need for commercial and recreational gear assessment studies in the State of Virginia. Fishing effort data have played an important part in the formulation of management plans of the fisheries of Virginia, and are usually cited when attempts are made to calculate catch-per-unit-effort (CPUE) statistics or to explain changes in a fishery's productivity.

The methods we have utilized in data acquisition, i.e., aerial pound net counts, personal interviews and telephone conversations with commercial watermen and seafood dealers, have yielded pertinent data concerning Virginia fisheries since 1985. We recommend continuing the assessment of gear use by commercial and recreational fishermen in order to expand the data base. Personal contacts and telephone interviews with fishermen and seafood dealers have been the most reasonable way to collect gear data short of implementing an individual fisherman reporting system.

In the past each aerial pound net survey was accomplished in one day unless bad weather or other circumstances beyond our control forced a change of plans. The upper James, upper York, and upper Potomac rivers as well as the Tangier-Chincateague-Oceanside areas, would be more adequately assessed if the aerial survey were divided in two segments in each half-month.

Stationary fishing devices such as pound nets and fyke nets are generally licensed for the same positions year after year, and could be identified and documented by the use of LORAN, a navigational aid. Such documentation by VMRC district inspectors would more accurately describe pound net locations for future licensing, and aid in aerial counts by a comparison of licensing information and actual sightings. LORAN would also prove useful as an aid in

arbitration concerning disputes over net locations. We have considered using the VIMS plane to document the locations of pound nets. However, it has not been accomplished to date. Mapping flights would be advisable, pending availability of plane and personnel time. An alternative would be to have VMRC district inspectors or their personnel document the location of each pound net and fyke net when the license is issued, by the use of LORAN, which is available on most VMRC vessels.

There is a large discrepancy in the number of fyke net licenses sold by VMRC and the number of actual fyke net sites accounted for. We believe part of the discrepancy is due to the fact that two types of fyke nets are used. One is set in the configuration of a pound net, with the hedging, heart and hoops (head) visible. The other is much smaller, and is generally totally submerged, with no hedging or heart visible. The smaller fyke is used in narrow, upriver creeks and waterways to catch catfish and other bottom feeding species. We recommend that the fyke net type and location of site be specified on the license.

Prior to 1989, VMRC made no distinction between a drift gill net and an anchored gill net, as they were sold under the same heading "Gill Net License." The drift net and anchored net differ, in that they are: generally targeting different species, fished in different salinity regimes, and in different depths in relation to the water column; therefore, data collected from the two different types of gear are not compatible. We, therefore, recommended that anchored gill nets and drift gill nets be licensed separately. Additionally, we again recommend a further subdivision of anchored gill nets and suggest that, at the time the gill net license is issued, the VMRC licensing agent could request information that would detail:

- 1) the expected use of the license (commercial full-time or part-time; or

recreational); 2) the fishing location; and 3) the amount of expected usage of the gill nets licensed. This information would then be computerized at VMRC along with other gear licensing data, and could be shared with other interested agencies.

In recent years there has been an increase in noncommercial use of anchored gill nets. Such landings may be considerable but have never been introduced into commercial landings statistics. Such landings, however, should be included in the total harvest from Virginia waters. This could be accomplished by telephone or "post card" interviews, or a system of mandatory reporting of catch by all fishermen, commercial and recreational.

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Table 1. Number of active pound nets counted by aerial survey and telephone canvass in the Chesapeake Bay, Potomac River and its Virginia tributaries, and major Virginia tributaries for the period 1 October 1989 - 30 September 1990, by VKRC water body codes.

VKRC Code	Oct	Nov	Nov		Dec	Jan	Feb	Mar		Apr		May		Jun		July		Aug		Sep	
	10	6	17	27	14	15	12	1	16	3	18	2	17	6	18	9	23-27	10	22-28	10	20-24
003	1	1	1	1	0	0	0	0	0	0	2	2	2	2	2	0	2	2	1	1	
011	8	5	4	1	0	0	1	3	10	9	9	10	9	9	9	11	12	9	5	5	7
111	1	1	1	1	0	0	0	0	1	1	1	1	2	2	2	1	1	1	1	1	1
511	9	9	6	1	0	0	1	1	6	7	8	9	11	10	9	8	8	8	9	8	8
611	3	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	3	2	3	3	3
211	4	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	0	0
311																					
711	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
811	5	3	2	0	0	0	0	0	2	4	4	5	5	5	5	5	5	5	5	5	5
411	35	30	20	11	2	0	0	0	0	8	12	19	21	17	17	12	15	14	16	23	18
017	1	1	1	1	0	0	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
027	3	0	1	0	0	0	0	0	1	3	3	3	3	4	3	3	3	3	3	3	3
055	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
068	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
073	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
074	1	2	1	0	0	0	4	13	14	15	15	15	15	9	2	1	1	1	1	1	1
075	0	0	0	0	0	0	1	2	2	2	2	2	2	2	0	0	0	0	0	0	0
175	41	32	23	9	1	0	0	3	20	24	35	47	49	48	51	47	50	47	46	46	45
275	0	0	0	0	0	0	0	2	2	2	2	2	0	0	0	0	0	0	0	0	1
375	1	1	1	0	0	0	0	4	10	10	10	9	6	3	2	0	0	0	0	0	1
177	3	4	3	1	0	0	0	0	3	3	4	4	4	4	4	3	1	0	2	3	3
277	5	5	5	3	1	0	0	0	2	3	3	4	4	4	4	2	0	0	0	2	3
377	8	5	1	0	0	0	0	1	3	3	4	1	1	1	1	1	2	2	2	2	2
084	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
093	5	4	4	4	4	1	0	1	2	3	3	4	4	4	4	5	3	4	4	4	5
195	5	0	0	0	0	0	5	5	5	9	9	10	10	10	10	10	10	9	10	8	7
Total	143	109	79	35	8	1	13	36	86	108	128	149	151	138	131	115	119	112	114	117	116

\* - See Appendix 1.

Table 2. Maximum number of pound nets, by VMRC water body codes, January-March, 1986-1990.

VMRC Subarea Code	Maximum Count				
	1986	1987	1988	1989	1990
011	2	0	4	5	10
111	0	0	0	0	1
027	0	1	2	3	1
511	6	6	5	5	6
711	0	1	1	0	0
811	1	0	2	4	2
411	7	0	9	8	0
195	1	3	5	6	5
055	0	0	1	0	0
177	1	0	4	3	3
277	2	0	3	2	2
377	7	4	2	1	3
075	0	0	0	0	2
175	1	0	16	22	20
275	0	0	3	2	2
375	0	0	7	6	10
069	1	1	1	1	0
017	0	0	0	0	2
093	1	0	0	2	2
074	0	0	2	14	14
137	1	0	0	0	0
337	<u>0</u>	<u>0</u>	<u>6</u>	<u>3</u>	<u>0</u>
<b>Total</b>	31	16	73	87	85

Table 3. Maximum number of pound nets, by VMRC water body codes, April-June 1986, 1987, 1988\*, 1989 and 1990.

VMRC Subarea Code	Maximum Count				
	1986	1987	1988*	1989	1990
011	11	8	6	10	10
111	1	0	1	1	2
027	3	3	2	3	4
511	17	14	10	13	11
611	7	6	3	3	3
711	4	3	1	1	1
811	5	5	5	5	5
411	22	20	29	24	21
211	1	3	2	2	0
195	12	12	12	10	10
055	5	1	2	1	0
177	7	7	5	7	4
277	5	4	4	5	4
377	21	12	8	7	4
075	0	1	-	0	2
175	59	55	60	58	51
275	11	8	-	2	2
375	8	4	-	7	10
003	2	0	0	1	2
069	2	1	1	1	1
017	1	0	0	2	1
093	1	4	0	4	4
074	2	4	-	15	15
084	2	3	0	1	0
237	0	0	0	1	0
337	0	4	6	0	0
029	0	2	0	0	0
Total	209	184	157	184	167

\* April-May, only

- Potomac River area not canvassed by telephone during this period.

Table 4. Maximum number of pound nets, by VMRC water body codes, July - September 1986, 1987, 1989 and 1990.

VMRC Subarea Code	1986	1987	Maximum Count 1988*	1989	1990
011	6	6		11	12
111	0	0		1	1
027	3	3		3	3
511	11	11		11	9
611	6	6		4	3
711	1	1		2	0
811	5	5		5	5
411	23	23		32	23
211	4	4		2	2
195	12	12		9	10
055	1	1		1	0
177	2	2		6	3
277	4	4		4	3
377	9	9		6	2
175	58	52		58	50
275	0	2		0	1
375	1	1		2	1
003	2	0		1	2
069	1	1		1	1
017	1	0		2	1
093	2	2		5	5
074	1	1		3	1
084	3	3		1	0
029	<u>1</u>	<u>1</u>		<u>0</u>	<u>0</u>
Total	157	150		170	138

\* No data collected, July - September 1988

Table 5. Maximum number of pound nets, by VMRC water body codes, October-December, 1985-1989.

VMRC Subarea Code	<u>Maximum Count</u>				
	<u>Oct-Dec 1985</u>	<u>Oct-Dec 1986</u>	<u>Oct-Dec 1987</u>	<u>Oct-Dec 1988</u>	<u>Oct-Dec 1989</u>
011	8	9	5	9	8
111	0	0	0	0	1
027	1	3	3	3	3
511	20	17	9	9	9
611	0	8	6	3	3
711	0	0	2	0	1
811	0	4	5	5	5
411	22	25	27	32	35
211	5	3	3	4	4
195	0	9	2	3	5
395	0	0	0	1	0
055	2	4	1	1	1
177	0	4	1	2	4
277	4	4	3	3	5
377	16	18	10	8	8
175	42	35	51	52	41
275	10	4	1	2	0
375	0	0	2	3	1
003	0	0	0	0	1
069	0	1	1	1	1
076	2	4	2	0	0
017	0	1	0	0	1
093	2	2	2	3	5
074	0	1	1	1	2
084	<u>1</u>	<u>0</u>	<u>3</u>	<u>1</u>	<u>1</u>
Total	135	156	140	146	145

Table 6. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of October 1989.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Oct. 1-15	Fyke Net	7	0	0
	Anchor gill net	9	14	16
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0
		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Oct. 1-15	Fyke Net	0	0	0
	Anchor gill net	12	22	55
	Stake gill net	0	0	0
	Pound Net	0	0	5
	Haul Seine	0	0	1
		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Oct. 1-15	Fyke Net	0	0	0
	Anchor gill net	4	10	10
	Stake gill net	0	0	0
	Pound Net	8	5	3
	Haul Seine	0	0	0

Table 7. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of October 1989.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Oct. 16-31	Fyke Net	7	0	0
	Anchor gill net	6	18	18
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Oct. 16-31	Fyke Net	0	0	0
	Anchor gill net	8	29	43
	Stake gill net	0	0	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Oct. 16-31	Fyke Net	0	0	0
	Anchor gill net	2	13	10
	Stake gill net	0	0	0
	Pound Net	5	5	4
	Haul Seine	0	0	0

Table 8. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of November 1989.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Nov. 1-15	Fyke Net	7	0	0
	Anchor gill net	2	4	6
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Nov. 1-15	Fyke Net	0	0	0
	Anchor gill net	3	6	18
	Stake gill net	0	0	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Nov. 1-15	Fyke Net	0	0	0
	Anchor gill net	1	5	5
	Stake gill net	0	0	0
	Pound Net	1	5	3
	Haul Seine	0	0	0

Table 9. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of November 1989.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Nov. 16-30	Fyke Net	7	0	0
	Anchor gill net	4	13	1
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Nov. 16-30	Fyke Net	0	0	0
	Anchor gill net	3	3	9
	Stake gill net	0	0	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Nov. 16-30	Fyke Net	0	0	0
	Anchor gill net	1	6	11
	Stake gill net	0	1	0
	Pound Net	0	3	1
	Haul Seine	0	0	0

Table 10. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of December 1989.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Dec. 1-15	Fyke Net	7	0	0
	Anchor gill net	3	13	1
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Dec. 1-15	Fyke Net	0	0	0
	Anchor gill net	2	2	3
	Stake gill net	0	0	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Dec. 1-15	Fyke Net	0	0	0
	Anchor gill net	6	10	8
	Stake gill net	0	4	0
	Pound Net	0	1	0
	Haul Seine	0	0	0

Table 11. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of December 1989.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Dec. 16-31	Fyke Net	4	0	0
	Anchor gill net	0	0	0
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Dec. 16-31	Fyke Net	0	0	0
	Anchor gill net	0	0	0
	Stake gill net	0	0	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Dec. 16-31	Fyke Net	0	0	0
	Anchor gill net	14	11	0
	Stake gill net	0	5	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

Table 12. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of January 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Jan. 1-15	Fyke Net	0	0	0
	Anchor gill net	2	5	0
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Jan. 1-15	Fyke Net	0	0	0
	Anchor gill net	2	2	3
	Stake gill net	0	0	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Jan. 1-15	Fyke Net	0	0	0
	Anchor gill net	23	28	3
	Stake gill net	0	3	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

Table 13. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of January 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Jan. 16-31	Fyke Net	0	0	0
	Anchor gill net	5	14	3
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Jan. 16-31	Fyke Net	0	0	0
	Anchor gill net	6	12	5
	Stake gill net	0	1	0
	Pound Net	0	0	2
	Haul Seine	0	0	0

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Jan. 16-31	Fyke Net	0	0	0
	Anchor gill net	28	28	2
	Stake gill net	0	5	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

Table 14. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of February 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Feb. 1-15	Fyke Net	6	0	0
	Anchor gill net	9	27	11
	Stake gill net	0	0	1
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Feb. 1-15	Fyke Net	0	0	0
	Anchor gill net	12	20	18
	Stake gill net	2	0	0
	Pound Net	0	0	5
	Haul Seine	0	0	0

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Feb. 1-15	Fyke Net	0	0	0
	Anchor gill net	31	36	12
	Stake gill net	0	5	0
	Pound Net	0	0	0
	Haul Seine	0	0	0

Table 17. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of March 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Mar. 16-31	Fyke Net	9	0	0
	Anchor gill net	17	39	31
	Stake gill net	0	6	5
	Pound net	0	0	0
	Haul Seine	0	1	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Mar. 16-31	Fyke Net	0	0	0
	Anchor gill net	23	41	51
	Stake gill net	47	33	0
	Pound Net	0	0	7
	Haul Seine	0	0	1

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Mar. 16-31	Fyke Net	0	0	0
	Anchor gill net	22	36	22
	Stake gill net	1	9	0
	Pound Net	3	3	3
	Haul Seine	0	0	0

Table 18. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of April 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Apr. 1-15	Fyke Net	14	0	0
	Anchor gill net	17	43	39
	Stake gill net	0	6	5
	Pound net	0	0	0
	Haul Seine	0	1	1
		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Apr. 1-15	Fyke Net	0	0	1
	Anchor gill net	23	46	62
	Stake gill net	51	34	0
	Pound Net	0	0	9
	Haul Seine	0	0	4
		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Apr. 1-15	Fyke Net	0	0	0
	Anchor gill net	17	27	29
	Stake gill net	0	9	0
	Pound Net	3	3	3
	Haul Seine	0	0	0

Table 19. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of April 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Apr. 16-30	Fyke Net	15	0	0
	Anchor gill net	19	43	39
	Stake gill net	0	4	0
	Pound net	0	0	0
	Haul Seine	0	0	0
	Drift gill net	25		
		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Apr. 16-30	Fyke Net	0	0	1
	Anchor gill net	23	46	65
	Stake gill net	40	30	0
	Pound Net	0	0	9
	Haul Seine	0	0	4
		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Apr. 16-30	Fyke Net	0	0	0
	Anchor gill net	11	27	29
	Stake gill net	0	9	0
	Pound Net	4	3	4
	Haul Seine	0	0	0
	Drift gill net	1		

Table 20. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of May 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
May 1-15	Fyke Net	15	0	0
	Anchor gill net	14	29	27
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	1

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
May 1-15	Fyke Net	0	0	1
	Anchor gill net	20	40	40
	Stake gill net	5	0	0
	Pound Net	0	0	10
	Haul Seine	0	1	4

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
May 1-15	Fyke Net	0	0	0
	Anchor gill net	7	31	32
	Stake gill net	0	3	0
	Pound Net	1	4	4
	Haul Seine	0	0	0

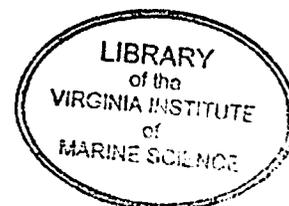


Table 21. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of May 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
May 16-31	Fyke Net	15	0	0
	Anchor gill net	9	25	27
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	1

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
May 16-31	Fyke Net	0	0	1
	Anchor gill net	11	28	39
	Stake gill net	3	0	0
	Pound Net	0	0	10
	Haul Seine	0	0	4

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
May 16-31	Fyke Net	0	0	0
	Anchor gill net	5	31	26
	Stake gill net	0	3	0
	Pound Net	1	4	4
	Haul Seine	0	0	0

Table 22. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of June 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Jun. 1-15	Fyke Net	15	0	0
	Anchor gill net	6	14	12
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Jun. 1-15	Fyke Net	0	0	1
	Anchor gill net	8	19	30
	Stake gill net	0	0	0
	Pound Net	0	0	10
	Haul Seine	0	0	4

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Jun. 1-15	Fyke Net	0	0	0
	Anchor gill net	1	22	14
	Stake gill net	0	0	0
	Pound Net	1	4	4
	Haul Seine	0	0	0

Table 23. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of June 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Jun. 16-30	Fyke Net	15	0	0
	Anchor gill net	4	5	6
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	0	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Jun. 16-30	Fyke Net	0	0	1
	Anchor gill net	1	14	17
	Stake gill net	0	0	0
	Pound Net	0	0	10
	Haul Seine	0	1	3

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Jun. 16-30	Fyke Net	0	0	0
	Anchor gill net	2	8	10
	Stake gill net	0	0	0
	Pound Net	1	4	4
	Haul Seine	0	0	0

Table 24. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of July 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
July 1-15	Fyke Net	15	0	0
	Anchor gill net	4	8	7
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	1	0	1
		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
July 1-15	Fyke Net	0	0	1
	Anchor gill net	1	16	30
	Stake gill net	0	0	0
	Pound Net	0	0	11
	Haul Seine	0	0	3
		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
July 1-15	Fyke Net	0	0	0
	Anchor gill net	1	9	10
	Stake gill net	0	0	0
	Pound Net	2	2	3
	Haul Seine	0	0	0

Table 25. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of July 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
July 16-31	Fyke Net	10	0	0
	Anchor gill net	3	8	7
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	1	0	0

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
July 16-31	Fyke Net	0	0	1
	Anchor gill net	0	16	30
	Stake gill net	0	0	0
	Pound Net	0	0	11
	Haul Seine	0	0	3

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
July 16-31	Fyke Net	0	0	0
	Anchor gill net	1	9	9
	Stake gill net	0	0	0
	Pound Net	2	1	1
	Haul Seine	0	0	0

Table 26. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of August 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Aug. 1-15	Fyke Net	7	0	0
	Anchor gill net	3	15	11
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	1	1	1

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Aug. 1-15	Fyke Net	0	0	0
	Anchor gill net	4	21	42
	Stake gill net	0	0	0
	Pound Net	0	0	11
	Haul Seine	0	0	6

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Aug. 1-15	Fyke Net	0	0	0
	Anchor gill net	1	12	14
	Stake gill net	0	0	0
	Pound Net	2	0	0
	Haul Seine	0	0	0

Table 27. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of August 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Aug. 16-31	Fyke Net	7	0	0
	Anchor gill net	3	15	11
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	1	1	1

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Aug. 16-31	Fyke Net	0	0	1
	Anchor gill net	8	39	46
	Stake gill net	0	0	0
	Pound Net	0	0	11
	Haul Seine	0	0	4

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Aug. 16-31	Fyke Net	0	0	0
	Anchor gill net	1	12	14
	Stake gill net	0	0	0
	Pound Net	2	0	2
	Haul Seine	0	0	0

Table 28. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the first half of September 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Sep. 1-15	Fyke Net	0	0	0
	Anchor gill net	3	17	11
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	1	1	1

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Sep. 1-15	Fyke Net	0	0	1
	Anchor gill net	5	39	49
	Stake gill net	0	0	0
	Pound Net	0	0	11
	Haul Seine	0	0	4

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Sep. 1-15	Fyke Net	0	0	0
	Anchor gill net	1	12	14
	Stake gill net	0	0	0
	Pound Net	2	2	3
	Haul Seine	0	0	0

Table 29. Maximum numbers of fishing gear reported by fishermen in the three major Virginia tributaries to the Chesapeake Bay, during the second half of September 1990.

		<u>James River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (337)</u>	<u>Central (237)</u>	<u>Lower (137)</u>
Sep. 16-30	Fyke Net	3	0	0
	Anchor gill net	3	11	8
	Stake gill net	0	0	0
	Pound net	0	0	0
	Haul Seine	1	1	1

		<u>York River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (395)</u>	<u>Central (295)</u>	<u>Lower (195)</u>
Sep. 16-30	Fyke Net	0	0	0
	Anchor gill net	9	32	38
	Stake gill net	0	0	0
	Pound Net	0	0	9
	Haul Seine	0	0	3

		<u>Rappahannock River</u>		
		<u>Sections</u>		
<u>Half-month</u>	<u>Gear</u>	<u>Upper (377)</u>	<u>Central (277)</u>	<u>Lower (177)</u>
Sep. 16-30	Fyke Net	0	0	0
	Anchor gill net	2	12	14
	Stake gill net	0	0	0
	Pound Net	2	3	3
	Haul Seine	0	0	0

Table 30. Pound net effort in Chesapeake Bay, Western Management Area, subarea 011, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
<u>Western Management Area</u>											
<u>Subarea 011</u>											
Aerial pound net count	8	5	4	1	0	0	1	3	10	9	9
Mean net days/day	6.5		2.5				1	6.5		9	
Net days/month	201.5		75.0				28	201.5		270	
Total net days (Oct - Dec) = 276.5						Total net days (Jan - Mar) = 229.5					
Mean net days (Oct - Dec) = 92.2						Mean net days (Jan - Mar) = 76.5					
<u>1990 (cont.)</u>											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Aerial pound net count	10	9	9	9	11	12	9	5	5	7	
Mean net days/day	9.5		9		11.5		7		6		
Net days/month	294.5		270		356.5		217		180		
Total net days (Apr - Jun) = 834.5						Total net days (Jul - Sep) = 753.5					
Mean net days (Apr - Jun) = 278.2						Mean net days (Jul - Sep) = 251.2					
Total net days (contract period) = 2094											
Mean net days (contract period) = 174.5											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 31. Pound net effort in Chesapeake Bay, Upper Western Section, subarea 111, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989				1990						
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Upper Western Section											
<u>Subarea 111</u>											
Aerial pound net count	1	1	1	1	0	0	0	0	1	1	1
Mean net days/day	1		1					0.5		1	
Net days/month	31		30					15.5		30	
Total net days (Oct - Dec) = 61						Total net days (Jan - Mar) = 15.5					
Mean net days (Oct - Dec) = 20.3						Mean net days (Jan - Mar) = 5.2					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Aerial pound net count	1	2	2	2	1	1	1	1	1	1	1
Mean net days/day	1.5		2		1		1		1		
Net days/month	46.5		60		31		31		30		
Total net days (Apr - Jun) = 136.5						Total net days (Jul - Sep) = 92					
Mean net days (Apr - Jun) = 45.5						Mean net days (Jul - Sep) = 30.7					
Total net days (contract period) = 305											
Mean net days (contract period) = 25.4											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 32. Pound net effort in Chesapeake Bay, Windmill Point - New Point, subarea 511, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Windmill Point - New Point											
<u>Subarea 511</u>											
Aerial pound net count	9	9	6	1	0	0	1	1	6	7	8
Mean net days/day	9		3.5			1		3.5		7.5	
Net days/month	279		105			28		108.5		225	
Total net days (Oct - Dec) = 384						Total net days (Jan - Mar) = 136.5					
Mean net days (Oct - Dec) = 128						Mean net days (Jan - Mar) = 45.5					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Windmill Point - New Point											
<u>Subarea 511</u>											
Aerial pound net count	9	11	10	9	8	8	8	9	8	8	
Mean net days/day	10		9.5			8		8.5		8	
Net days/month	310		285			248		263.5		240	
Total net days (Apr - Jun) = 820						Total net days (Jul - Sep) = 751.5					
Mean net days (Apr - Jun) = 273.3						Mean net days (Jul - Sep) = 250.5					
Total net days (contract period) = 2092											
Mean net days (contract period) = 174.3											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 33. Pound net effort in Chesapeake Bay, York Spit, subarea 611, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
York Spit											
<u>Subarea 611</u>											
Aerial pound net count	3	0	0	0	0	0	0	0	0	0	0
Mean net days/day	1.5										
Net days/month	46.5										
Total net days (Oct - Dec) = 46.5						Total net days (Jan - Mar) = 0					
Mean net days (Oct - Dec) = 15.5						Mean net days (Jan - Mar) = 0					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
York Spit											
<u>Subarea 611</u>											
Aerial pound net count	0	1	2	3	2	3	2	3	3	3	
Mean net days/day	0.5		2.5		2.5		2.5		3		
Net days/month	15.5		75		77.5		77.5		90		
Total net days (Apr - Jun) = 90.5						Total net days (Jul - Sep) = 245					
Mean net days (Apr - Jun) = 30.2						Mean net days (Jul - Sep) = 81.7					
Total net days (contract period) = 382											
Mean net days (contract period) = 31.8											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 34. Pound net effort in Chesapeake Bay, Tue Marsh - Old Point, subarea 711, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	10 Oct	6 Nov*	17 Nov	27 Nov	14 Dec	15 Jan	12 Feb	1 Mar	16 Mar	3 Apr	18 Apr
Tue Marsh - Old Point											
<u>Subarea 711</u>											
Aerial pound net count	1	0	0	0	0	0	0	0	0	0	0
Mean net days/day	0.5										
Net days/month	15.5										
Total net days (Oct - Dec) = 15.5						Total net days (Jan - Mar) = 0					
Mean net days (Oct - Dec) = 5.2						Mean net days (Jan - Mar) = 0					
1990 (cont.)											
	2 May	17 May	6 June	18 June	9 Jul	23- 27 Jul	10 Aug	22- 28 Aug	10 Sep	20- 24 Sep	
Tue Marsh - Old Point											
<u>Subarea 711</u>											
Aerial pound net count	0	0	0	1	0	0	0	0	0	0	0
Mean net days/day	0.5										
Net days/month	15										
Total net days (Apr - Jun) = 15						Total net days (Jul - Sep) = 0					
Mean net days (Apr - Jun) = 5						Mean net days (Jul - Sep) = 0					
Total net days (contract period) = 30.5											
Mean net days (contract period) = 2.5											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 35. Pound net effort in Chesapeake Bay, Willoughby Spit - Cape Henry, subarea 811, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Willoughby Spit - Cape Henry											
<u>Subarea 811</u>											
Aerial pound net count	5	3	2	0	0	0	0	0	2	4	4
Mean net days/day		4		1				1			4
Net days/month		124		30				31			120
Total net days (Oct - Dec) = 154						Total net days (Jan - Mar) = 31					
Mean net days (Oct - Dec) = 51.3						Mean net days (Jan - Mar) = 10.3					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Aerial pound net count	5	5	5	5	5	5	5	5	5	5	
Mean net days/day		5		5		5		5		5	
Net days/month		155		150		155		155		150	
Total net days (Apr - Jun) = 425						Total net days (Jul - Sep) = 460					
Mean net days (Apr - Jun) = 141.7						Mean net days (Jul - Sep) = 153.3					
Total net days (contract period) = 1070											
Mean net days (contract period) = 89.2											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 36. Pound net effort in Chesapeake Bay, Lower Eastern Section, subarea 411, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Lower Eastern Section											
<u>Subarea 411</u>											
Aerial pound net count	35	30	20	11	2	0	0	0	0	8	12
Mean net days/day	32.5		15.5		2					10	
Net days/month	1007.5		465.0		62					300	
Total net days (Oct - Dec) = 1534.5						Total net days (Jan - Mar) = 0					
Mean net days (Oct - Dec) = 511.5						Mean net days (Jan - Mar) = 0					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Lower Eastern Section											
<u>Subarea 411</u>											
Aerial pound net count	19	21	17	17	12	15	14	16	23	18	
Mean net days/day	20		17		13.5		15		20.5		
Net days/month	620		510		418.5		465		615		
Total net days (Apr - Jun) = 1430						Total net days (Jul - Sep) = 1498.5					
Mean net days (Apr - Jun) = 476.7						Mean net days (Jul - Sep) = 499.5					
Total net days (contract period) = 4463.0											
Mean net days (contract period) = 371.9											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 37. Pound net effort in Chesapeake Bay, Upper Eastern Section, subarea 211, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Upper Eastern Section											
<u>Subarea 211</u>											
Aerial pound net count	4	4	4	2	0	0	0	0	0	0	0
Mean net days/day	4		3								
Net days/month	124			90							
Total net days (Oct - Dec) = 214					Total net days (Jan - Mar) = 0						
Mean net days (Oct - Dec) = 71.3					Mean net days (Jan - Mar) = 0						
<u>1990 (cont.)</u>											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Upper Eastern Section											
<u>Subarea 211</u>											
Aerial pound net count	0	0	0	0	0	2	2	2	0	0	
Mean net days/day						1	2				
Net days/month						31	62				
Total net days (Apr - Jun) = 0					Total net days (Jul - Sep) = 93						
Mean net days (Apr - Jun) = 0					Mean net days (Jul - Sep) = 31						
Total net days (contract period) = 307											
Mean net days (contract period) = 25.6											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 38. Pound net effort in Chesapeake Bay, Tangier Sound, subarea 084, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Tangier Sound											
Subarea 084											
Aerial pound net count	1	1	0	0	0	0	0	0	0	0	0
Mean net days/day	1										
Net days/month	31										
Total net days (Oct - Dec) = 31						Total net days (Jan - Mar) = 0					
Mean net days (Oct - Dec) = 10.3						Mean net days (Jan - Mar) = 0					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Tangier Sound											
Subarea 084											
Aerial pound net count	0	0	0	0	0	0	0	0	0	0	
Mean net days/day											
Net days/month											
Total net days (Apr - Jun) = 0						Total net days (Jul - Sep) = 0					
Mean net days (Apr - Jun) = 0						Mean net days (Jul - Sep) = 0					
Total net days (contract period) = 31											
Mean net days (contract period) = 2.6											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 39. Pound net effort in York River, Lower Section, subarea 195, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990						
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>	
<b>Lower Section</b>												
<u>Subarea 195</u>												
Aerial pound net count	5	0	0	0	0	0	5	5	5	9	9	
Mean net days/day	2.5					5					9	
Net days/month	77.5					140					155	270
Total net days (Oct - Dec) = 77.5						Total net days (Jan - Mar) = 295						
Mean net days (Oct - Dec) = 25.8						Mean net days (Jan - Mar) = 98.3						
<u>1990 (cont.)</u>												
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>		
Aerial pound net count	10	10	10	10	10	10	9	10	8	7		
Mean net days/day	10		10		10		9.5		7.5			
Net days/month	310		300		310		294.5		225			
Total net days (Apr - Jun) = 880						Total net days (Jul - Sep) = 829.5						
Mean net days (Apr - Jun) = 293.3						Mean net days (Jul - Sep) = 276.5						
Total net days (contract period) = 2082												
Mean net days (contract period) = 173.5												

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 40. Pound net effort in Rappahannock River, Lower Section, subarea 177, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Lower Section											
<u>Subarea 177</u>											
Aerial pound net count	3	4	3	1	0	0	0	0	3	3	4
Mean net days/day	3.5		2				1.5		3.5		
Net days/month	108.5		60				46.5		105		
Total net days (Oct - Dec) = 168.5						Total net days (Jan - Mar) = 46.5					
Mean net days (Oct - Dec) = 56.2						Mean net days (Jan - Mar) = 15.5					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Lower Section											
<u>Subarea 177</u>											
Aerial pound net count	4	4	4	4	3	1	0	2	3	3	
Mean net days/day	4		4		2		1		3		
Net days/month	124		120		62		31		90		
Total net days (Apr - Jun) = 349						Total net days (Jul - Sep) = 183					
Mean net days (Apr - Jun) = 116.3						Mean net days (Jul - Sep) = 61					
Total net days (contract period) = 747											
Mean net days (contract period) = 62.3											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 41. Pound net effort in Rappahannock River, Central Section, subarea 277, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Central Section											
<u>Subarea 277</u>											
Aerial pound net count	5	5	5	3	1	0	0	0	2	3	3
Mean net days/day	5		4		1			1		3	
Net days/month	155		120		31			31		90	
Total net days (Oct - Dec) = 306						Total net days (Jan - Mar) = 31					
Mean net days (Oct - Dec) = 102						Mean net days (Jan - Mar) = 10.3					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Central Section											
<u>Subarea 277</u>											
Aerial pound net count	4	4	4	4	2	0	0	0	2	3	
Mean net days/day	4		4		1				2.5		
Net days/month	124		120		31				75		
Total net days (Apr - Jun) = 334						Total net days (Jul - Sep) = 106					
Mean net days (Apr - Jun) = 111.3						Mean net days (Jul - Sep) = 35.3					
Total net days (contract period) = 777											
Mean net days (contract period) = 64.8											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 42. Pound net effort in Rappahannock River, Upper Section, subarea 377, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Upper Section											
<u>Subarea 377</u>											
Aerial pound net count	8	5	1	0	0	0	0	1	3	3	4
Mean net days/day	6.5		0.5						2		3.5
Net days/month	201.5			15					62		105
Total net days (Oct - Dec) = 216.5					Total net days (Jan - Mar) = 62						
Mean net days (Oct - Dec) = 72.2					Mean net days (Jan - Mar) = 20.7						
<u>1990 (cont.)</u>											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Upper Section											
<u>Subarea 377</u>											
Aerial pound net count	1	1	1	1	1	2	2	2	2	2	
Mean net days/day	1		1			1.5		2		2	
Net days/month	31		30			46.5		62		60	
Total net days (Apr - Jun) = 166					Total net days (Jul - Sep) = 168.5						
Mean net days (Apr - Jun) = 55.3					Mean net days (Jul - Sep) = 56.2						
Total net days (contract period) = 613											
Mean net days (contract period) = 51.1											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 43. Pound net effort in Potosac River, subarea 075, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Potosac River											
<u>Subarea 075</u>											
Aerial pound net count	0	0	0	0	0	0	1	2	2	2	2
Mean net days/day							1	2			2
Net days/month							28	62			60
Total net days (Oct - Dec) = 0						Total net days (Jan - Mar) = 90					
Mean net days (Oct - Dec) = 0						Mean net days (Jan - Mar) = 30					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Potosac River											
<u>Subarea 075</u>											
Aerial pound net count	2	2	2	0	0	0	0	0	0	0	
Mean net days/day	2			1							
Net days/month	62			30							
Total net days (Apr - Jun) = 152						Total net days (Jul - Sep) = 0					
Mean net days (Apr - Jun) = 50.7						Mean net days (Jul - Sep) = 0					
Total net days (contract period) = 242											
Mean net days (contract period) = 20.2											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 44. Pound net effort in Potomac River, Lower Section, subarea 175, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Lower Section											
<u>Subarea 175</u>											
Aerial pound net count	41	32	22	9	1	0	0	3	20	24	35
Mean net days/day	36.5		15.5		1				11.5		29.5
Net days/month	1131.5		465		31				356.5		885
Total net days (Oct - Dec) = 1627.5					Total net days (Jan - Mar) = 356.5						
Mean net days (Oct - Dec) = 542.5					Mean net days (Jan - Mar) = 118.8						
<u>1990 (cont.)</u>											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Lower Section											
<u>Subarea 175</u>											
Aerial pound net count	47	49	48	51	47	50	47	46	46	45	
Mean net days/day	48		49.5		48.5		46.5		45.5		
Net days/month	1488		1485		1503.5		1441.5		1365		
Total net days (Apr - Jun) = 3858					Total net days (Jul - Sep) = 4310						
Mean net days (Apr - Jun) = 1286					Mean net days (Jul - Sep) = 1436.7						
Total net days (contract period) = 10152											
Mean net days (contract period) = 846											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 45. Pound net effort in Potomac River, Lower Central Section, subarea 275, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Lower Central Section											
<u>Subarea 275</u>											
Aerial pound net count	0	0	0	0	0	0	0	2	2	2	2
Mean net days/day								2		2	
Net days/month								62		60	
Total net days (Oct - Dec) = 0						Total net days (Jan - Mar) = 62					
Mean net days (Oct - Dec) = 0						Mean net days (Jan - Mar) = 20.7					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Lower Central Section											
<u>Subarea 275</u>											
Aerial pound net count	2	0	0	0	0	0	0	0	0	1	
Mean net days/day		1								0.5	
Net days/month		31								15	
Total net days (Apr - Jun) = 91						Total net days (Jul - Sep) = 15					
Mean net days (Apr - Jun) = 30.3						Mean net days (Jul - Sep) = 5					
Total net days (contract period) = 168											
Mean net days (contract period) = 14											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 46. Pound net effort in Potomac River, Upper Central Section, subarea 375, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Upper Central Section											
<u>Subarea 375</u>											
Aerial pound net count	1	1	1	0	0	0	0	4	10	10	10
Mean net days/day	1		0.5					7		10	
Net days/month	31		15					217		300	
Total net days (Oct - Dec) = 46						Total net days (Jan - Mar) = 217					
Mean net days (Oct - Dec) = 15.3						Mean net days (Jan - Mar) = 72.3					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Upper Central Section											
<u>Subarea 375</u>											
Aerial pound net count	9	6	3	2	0	0	0	0	0	1	
Mean net days/day	7.5		2.5							0.5	
Net days/month	232.5		75							15	
Total net days (Apr - Jun) = 607.5						Total net days (Jul - Sep) = 15					
Mean net days (Apr - Jun) = 202.5						Mean net days (Jul - Sep) = 5					
Total net days (contract period) = 885.5											
Mean net days (contract period) = 73.8											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 47. Pound net effort in Back River, subarea 003, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Back River											
<u>Subarea 003</u>											
Aerial pound net count	1	1	1	1	0	0	0	0	0	0	2
Mean net days/day	1		1								1
Net days/month	31		30								30
Total net days (Oct - Dec) = 61					Total net days (Jan - Mar) = 0						
Mean net days (Oct - Dec) = 20.3					Mean net days (Jan - Mar) = 0						
	1990 (cont.)										
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Back River											
<u>Subarea 003</u>											
Aerial pound net count	2	2	2	2	2	0	2	2	1	1	
Mean net days/day	2		2		1		2		1		
Net days/month	62		60		31		62		30		
Total net days (Apr - Jun) = 152					Total net days (Jul - Sep) = 123						
Mean net days (Apr - Jun) = 50.7					Mean net days (Jul - Sep) = 41						
Total net days (contract period) = 336											
Mean net days (contract period) = 28											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 48. Pound net effort in Hobjack Bay, subarea 055, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Hobjack Bay											
<u>Subarea 055</u>											
Aerial pound net count	1	1	1	0	0	0	0	0	0	0	0
Mean net days/day	1		0.5								
Net days/month	31		15								
Total net days (Oct - Dec) = 46					Total net days (Jan - Mar) = 0						
Mean net days (Oct - Dec) = 15.3					Mean net days (Jan - Mar) = 0						
<u>1990 (cont.)</u>											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Hobjack Bay											
<u>Subarea 055</u>											
Aerial pound net count	0	0	0	0	0	0	0	0	0	0	0
Mean net days/day											
Net days/month											
Total net days (Apr - Jun) = 0					Total net days (Jul - Sep) = 0						
Mean net days (Apr - Jun) = 0					Mean net days (Jul - Sep) = 0						
Total net days (contract period) = 46											
Mean net days (contract period) = 3.8											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 49. Pound net effort in Piankatank River, subarea 068, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Piankatank River											
<u>Subarea 068</u>											
Aerial pound net count	1	0	0	0	0	0	0	0	1	1	1
Mean net days/day	0.5						0.5		1		
Net days/month	15.5						15.5		30		
Total net days (Oct - Dec) = 15.5						Total net days (Jan - Mar) = 15.5					
Mean net days (Oct - Dec) = 5.2						Mean net days (Jan - Mar) = 5.2					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Piankatank River											
<u>Subarea 068</u>											
Aerial pound net count	1	1	1	1	1	1	1	1	1	1	
Mean net days/day	1		1		1		1		1		
Net days/month	31		30		31		31		30		
Total net days (Apr - Jun) = 91						Total net days (Jul - Sep) = 92					
Mean net days (Apr - Jun) = 30.3						Mean net days (Jul - Sep) = 30.7					
Total net days (contract period) = 214											
Mean net days (contract period) = 17.8											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 50. Pound net effort in Fleet's Bay, subarea 027, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Fleet's Bay											
<u>Subarea 027</u>											
Aerial pound net count	3	0	1	0	0	0	0	0	1	3	3
Mean net days/day	1.5		0.5						0.5		3
Net days/month	46.5		15						15.5		90
Total net days (Oct - Dec) = 61.5					Total net days (Jan - Mar) = 15.5						
Mean net days (Oct - Dec) = 20.5					Mean net days (Jan - Mar) = 5.2						
	<u>1990 (cont.)</u>										
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Fleet's Bay											
<u>Subarea 027</u>											
Aerial pound net count	3	3	4	3	3	3	3	3	3	3	
Mean net days/day	3		3.5		3		3		3		
Net days/month	93		105		93		93		90		
Total net days (Apr - Jun) = 288					Total net days (Jul - Sep) = 276						
Mean net days (Apr - Jun) = 96					Mean net days (Jul - Sep) = 92						
Total net days (contract period) = 641											
Mean net days (contract period) = 53.4											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 51. Pound net effort in Potomac Creek, subarea 074, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Potomac Creek											
<u>Subarea 074</u>											
Aerial pound net count	1	2	1	0	0	0	4	13	14	15	15
Mean net days/day		1.5		0.5			4		13.5		15
Net days/month	46.5		15				112		418.5		450
Total net days (Oct - Dec) = 61.5						Total net days (Jan - Mar) = 530.5					
Mean net days (Oct - Dec) = 20.5						Mean net days (Jan - Mar) = 176.8					
	1990 (cont.)										
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Potomac Creek											
<u>Subarea 074</u>											
Aerial pound net count	15	15	9	2	1	1	1	1	1	1	
Mean net days/day		15		5.5		1		1		1	
Net days/month	465		165		31		31		30		
Total net days (Apr - Jun) = 1080						Total net days (Jul - Sep) = 92					
Mean net days (Apr - Jun) = 360						Mean net days (Jul - Sep) = 30.7					
Total net days (contract period) = 1764											
Mean net days (contract period) = 147											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 52. Pound net effort in Yeocomico River, subarea 093, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Yeocomico River											
Subarea 093											
Aerial pound net count	5	4	4	4	4	1	0	1	2	3	3
Mean net days/day	4.5		4		4	1		1.5		3	
Net days/month	139.5		120		124	31		46.5		90	
Total net days (Oct - Dec) = 383.5						Total net days (Jan - Mar) = 77.5					
Mean net days (Oct - Dec) = 127.8						Mean net days (Jan - Mar) = 25.8					
1990 (cont.)											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Aerial pound net count	4	4	4	4	5	3	4	4	4	5	
Mean net days/day	4		4		4		4		4.5		
Net days/month	124		120		124		124		135		
Total net days (Apr - Jun) = 334						Total net days (Jul - Sep) = 383					
Mean net days (Apr - Jun) = 111.3						Mean net days (Jul - Sep) = 127.7					
Total net days (contract period) = 1178											
Mean net days (contract period) = 98.2											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 53. Pound net effort in Coan River, subarea 017, for the contract period 1989 and 1990. Data reported by half-month, mean net days per day, net days per month, by calendar year. Effort derived from aerial pound net counts and telephone canvass.

	1989					1990					
	<u>10 Oct</u>	<u>6 Nov*</u>	<u>17 Nov</u>	<u>27 Nov</u>	<u>14 Dec</u>	<u>15 Jan</u>	<u>12 Feb</u>	<u>1 Mar</u>	<u>16 Mar</u>	<u>3 Apr</u>	<u>18 Apr</u>
Coan River											
<u>Subarea 017</u>											
Aerial pound net count	1	1	1	1	0	0	1	1	2	1	1
Mean net days/day		1		1			1		1.5		1
Net days/month		31		30			28		46.5		30
Total net days (Oct - Dec) = 61					Total net days (Jan - Mar) = 74.5						
Mean net days (Oct - Dec) = 20.3					Mean net days (Jan - Mar) = 24.8						
<u>1990 (cont.)</u>											
	<u>2 May</u>	<u>17 May</u>	<u>6 June</u>	<u>18 June</u>	<u>9 Jul</u>	<u>23- 27 Jul</u>	<u>10 Aug</u>	<u>22- 28 Aug</u>	<u>10 Sep</u>	<u>20- 24 Sep</u>	
Coan River											
<u>Subarea 017</u>											
Aerial pound net count	1	1	1	1	1	1	1	1	1	1	1
Mean net days/day		1		1		1		1		1	
Net days/month		31		30		31		31		30	
Total net days (Apr - Jun) = 91					Total net days (Jul - Sep) = 92						
Mean net days (Apr - Jun) = 30.3					Mean net days (Jul - Sep) = 30.7						
Total net days (contract period) = 318.5											
Mean net days (contract period) = 26.5											

\* - Bad weather and scheduling problems precluded a flight during the second half of October.

Table 54. Maximum number of active stake gill net stands and estimated linear feet of net in the James River, reported by WRRC subareas, by half-month, 1 October 1989 through 30 September 1990. Data acquired by telephone and personal interviews.

<u>River</u>	<u>Half-month</u>	<u>Subarea 137</u>		<u>Subarea 237</u>		<u>Subarea 337</u>		<u>Total no.</u>	<u>Total linear feet</u>
		<u>No.</u>	<u>Estimated linear feet</u>	<u>No.</u>	<u>Estimated linear feet</u>	<u>No.</u>	<u>Estimated linear feet</u>		
James									
1989	Oct 1	0		0		0			
	Oct 2	0		0		0			
	Nov 1	0		0		0			
	Nov 2	0		0		0			
	Dec 1	0		0		0			
	Dec 2	0		0		0			
1990	Jan 1	0		0		0			
	Jan 2	0		0		0			
	Feb 1	1	510	0		0		1	510
	Feb 2	2	600	2	510	0		4	1,110
	Mar 1	4	4,050	4	1,530	0		8	5,580
	Mar 2	5	5,250	6	2,280	0		11	7,530
	Apr 1	5	5,250	6	2,280	0		11	7,530
	Apr 2	0		4	1,520	0		4	1,520
	May 1	0		0		0			
	May 2	0		0		0			
	Jun 1	0		0		0			
	Jun 2	0		0		0			
	Jul 1	0		0		0			
	Jul 2	0		0		0			
	Aug 1	0		0		0			
	Aug 2	0		0		0			
	Sep 1	0		0		0			
	Sep 2	0		0		0			

Table 55. Maximum number of active stake gill net stands and estimated linear feet of net in the York River, reported by VMRC subareas, by half-month, 1 October 1989 through 30 September 1990. Data acquired by telephone and personal interviews.

<u>River</u>	<u>Half-month</u>	<u>Subarea 195</u>		<u>Subarea 295</u>		<u>Subarea 395</u>		<u>Total no.</u>	<u>Total linear feet</u>
		<u>No.</u>	<u>Estimated linear feet</u>	<u>No.</u>	<u>Estimated linear feet</u>	<u>No.</u>	<u>Estimated linear feet</u>		
York									
1989	Oct 1	0		0		0		0	
	Oct 2	0		0		0		0	
	Nov 1	0		0		0		0	
	Nov 2	0		0		0		0	
	Dec 1	0		0		0		0	
	Dec 2	0		0		0		0	
1990	Jan 1	0		0		0		0	
	Jan 2	0		1	708	0		1	708
	Feb 1	0		0		2	360	2	360
	Feb 2	0		20	14,160	18	6,282	38	20,442
	Mar 1	0		33	23,364	47	16,403	80	39,767
	Mar 2	0		33	23,364	47	30,080	80	53,444
	Apr 1	0		34	24,072	51	32,640	85	56,712
	Apr 2	0		30	21,240	40	25,600	70	46,840
	May 1	0		0		5	3,200	5	3,200
	May 2	0		0		3	1,920	3	1,920
	Jun 1	0		0		0		0	
	Jun 2	0		0		0		0	
	Jul 1	0		0		0		0	
	Jul 2	0		0		0		0	
	Aug 1	0		0		0		0	
	Aug 2	0		0		0		0	
	Sep 1	0		0		0		0	
	Sep 2	0		0		0		0	

Table 56. Maximum number of active stake gill net stands and estimated linear feet of net in the Rappahannock River, reported by VMRC subareas, by half-month, 1 October 1989 through 30 September 1990. Data acquired by telephone and personal interviews.

River	Half-month	Subarea 177		Subarea 277		Subarea 377		Total no.	Total linear feet
		No.	Estimated linear feet	No.	Estimated linear feet	No.	Estimated linear feet		
Rappahannock									
1989	Oct 1	0		0		0		0	
	Oct 2	0		0		0		0	
	Nov 1	0		0		0		0	
	Nov 2	0		1	384	0		1	384
	Dec 1	0		5	2,016	0		5	2,016
	Dec 2	0		5	2,016	0		5	2,016
1990	Jan 1	0		4	1,104	0		4	1,104
	Jan 2	0		5	2,304	0		5	2,304
	Feb 1	0		5	3,936	0		5	3,936
	Feb 2	0		6	4,368	0		6	4,368
	Mar 1	0		7	6,412	1	360	8	6,772
	Mar 2	0		9	8,304	1	360	10	8,664
	Apr 1	0		9	9,168	0		9	9,168
	Apr 2	0		9	9,072	0		9	9,072
	May 1	0		3	480	0		3	480
	May 2	0		3	408	0		3	480
	Jun 1	0		0		0		0	
	Jun 2	0		0		0		0	
	Jul 1	0		0		0		0	
	Jul 2	0		0		0		0	
Aug 1	0		0		0		0		
Aug 2	0		0		0		0		
Sep 1	0		0		0		0		
Sep 2	0		0		0		0		

Table 57. Estimate of maximum number and linear feet of anchor gill nets fished by commercial watermen in the James River, by VMRC subarea, by half-month, 1 October 1989 through 30 September 1990. Data acquired by telephone and personal interviews.

<u>River</u>	<u>Half-month</u>	<u>Subarea 137</u>		<u>Subarea 237</u>		<u>Subarea 337</u>		<u>Total no.</u>	<u>Total linear feet</u>
		<u>No.</u>	<u>Linear feet</u>	<u>No.</u>	<u>Linear feet</u>	<u>No.</u>	<u>Linear feet</u>		
James									
1989	Oct 1	16	14,400	14	12,600	9	4,050	39	31,050
	Oct 2	18	16,200	18	16,200	6	2,700	42	35,100
	Nov 1	6	2,700	4	1,800	2	900	12	5,400
	Nov 2	1	450	13	5,850	4	1,800	18	8,100
	Dec 1	1	450	13	5,850	3	1,350	17	7,650
	Dec 2	0		0		0		0	
1990	Jan 1	0		5	2,250	2	900	7	3,150
	Jan 2	3	1,350	14	6,300	5	2,250	22	9,900
	Feb 1	11	4,950	27	12,150	9	4,050	47	21,150
	Feb 2	23	10,350	32	14,400	14	6,300	69	31,050
	Mar 1	25	11,250	32	14,400	12	5,400	69	31,050
	Mar 2	31	13,950	39	17,550	17	7,650	87	39,150
	Apr 1	39	17,550	43	19,350	17	7,650	99	44,550
	Apr 2	39	17,550	43	19,350	19	8,550	101	45,450
	May 1	27	12,150	29	13,050	14	6,300	70	31,500
	May 2	27	12,150	25	11,250	9	4,050	61	27,450
	Jun 1	12	5,400	14	6,300	6	2,700	32	14,400
	Jun 2	6	2,700	5	2,250	4	1,800	15	6,750
	Jul 1	7	3,150	8	3,600	4	1,800	19	8,550
	Jul 2	7	3,150	8	3,600	3	1,350	18	8,100
	Aug 1	11	4,950	15	6,750	3	1,350	29	13,050
	Aug 2	11	4,950	15	6,750	3	1,350	29	13,050
	Sep 1	11	4,950	17	7,650	3	1,350	31	13,950
	Sep 2	8	3,600	11	4,950	3	1,350	22	9,900

Table 58. Estimate of maximum number and linear feet of anchor gill nets fished by commercial watermen in the York River, by VERC subarea, by half-month, 1 October 1989 through 30 September 1990. Data acquired by telephone and personal interviews.

River	Half-month	Subarea 195		Subarea 295		Subarea 395		Total No.	Total Linear feet
		No.	Linear feet	No.	Linear feet	No.	Linear feet		
York									
1989	Oct 1	55	49,500	22	19,800	12	7,200	89	76,500
	Oct 2	43	38,700	29	26,100	8	4,800	80	69,600
	Nov 1	18	16,200	6	5,400	3	1,800	27	23,400
	Nov 2	9	8,100	3	2,700	3	1,800	15	12,600
	Dec 1	3	2,700	2	1,800	2	1,200	7	5,700
	Dec 2	0		0		0		0	
1990	Jan 1	3	2,700	2	1,800	2	1,200	7	5,700
	Jan 2	5	4,500	12	10,800	6	3,600	23	18,900
	Feb 1	18	16,200	20	18,000	12	7,200	50	41,400
	Feb 2	28	25,200	27	24,300	15	9,000	70	58,500
	Mar 1	28	25,200	32	28,800	17	10,200	77	64,200
	Mar 2	51	45,900	41	36,900	23	13,800	115	96,600
	Apr 1	62	55,800	46	41,400	23	13,800	131	111,000
	Apr 2	65	58,500	46	41,400	23	13,800	134	113,700
	May 1	40	36,000	40	36,000	20	12,000	100	84,000
	May 2	39	35,100	28	25,200	11	6,600	78	66,900
	Jun 1	30	27,000	19	17,100	8	4,800	57	48,900
	Jun 2	17	15,300	14	12,600	1	600	32	28,500
	Jul 1	30	27,000	16	14,400	1	600	47	42,000
	Jul 2	30	27,000	16	14,400	0		46	41,400
	Aug 1	42	37,800	21	18,900	4	2,400	67	59,100
	Aug 2	46	41,400	39	35,100	8	4,800	93	81,300
	Sep 1	49	44,100	39	35,100	5	3,000	93	82,200
	Sep 2	38	34,200	32	28,800	9	5,400	79	68,400

Table 59. Estimate of maximum number and linear feet of anchor gill nets fished by commercial watermen in the Rappahannock River, by VMRC subarea, by half-month, 1 October 1989 through 30 September 1990. Data acquired by telephone and personal interviews.

River	Half-month	Subarea 177		Subarea 277		Subarea 377		Total no.	Total linear feet
		No.	Linear feet	No.	Linear feet	No.	Linear feet		
Rappahannock									
1989	Oct 1	10	9,000	10	9,000	4	1,300	24	19,300
	Oct 2	10	9,000	13	11,700	2	650	25	21,350
	Nov 1	5	4,500	5	1,625	1	325	11	6,450
	Nov 2	11	9,900	6	1,950	1	325	18	12,175
	Dec 1	8	7,200	10	3,250	6	1,950	24	12,400
	Dec 2	0		11	3,575	14	4,550	24	8,125
1990	Jan 1	3	2,700	28	9,100	23	7,675	54	19,275
	Jan 2	2	1,800	28	9,100	28	9,100	58	20,000
	Feb 1	12	10,800	36	11,700	31	10,075	79	32,575
	Feb 2	15	13,500	36	11,700	31	10,075	82	35,275
	Mar 1	17	15,300	36	11,700	31	10,075	84	37,075
	Mar 2	22	19,800	36	11,700	32	10,400	90	41,900
	Apr 1	29	26,100	27	8,775	17	5,525	73	40,400
	Apr 2	29	26,100	27	8,775	11	3,575	67	38,450
	May 1	32	28,800	31	10,075	7	2,275	70	41,150
	May 2	26	23,400	31	10,075	5	1,625	62	35,100
	Jun 1	14	12,600	22	7,150	1	325	37	20,075
	Jun 2	10	9,000	8	2,600	2	650	20	12,250
	Jul 1	10	9,000	9	2,925	1	325	20	12,250
	Jul 2	9	8,100	9	2,925	1	325	19	11,350
	Aug 1	14	12,600	12	3,900	1	325	27	16,825
	Aug 2	14	12,600	12	3,900	1	325	27	16,825
	Sep 1	14	12,600	12	3,900	1	325	27	16,825
	Sep 2	14	12,600	12	3,900	2	650	28	17,150

Table 60. Anchor gill net activity reported by fishermen and dealers, by half-month, during the period 1 July - 30 September 1990 in areas other than the three major Virginia rivers.

Locations And Subareas	Half-month					
	1 July	2 July	1 Aug	2 Aug	1 Sep	2 Sep
Chesapeake Bay, (Smith Point, south to New Point) (111,211,511)	65	65	78	78	78	78
Chesapeake Bay, (New Point, south to Bay mouth, exclusive of Poquoson area)(611,811)	80	68	83	83	83	83
New Point Area, only						45-50
Mobjack Bay (055)	30	22	42	42	42	36
Poquoson (Tue Marsh- Old Point area) (711)	16	9	43	43	47	54

Table 61. Estimated drift gill net effort in James River, Upper Section (subarea 337), Rappahannock River, Upper Section (subarea 377), and two York River tributaries, the Pamunkey River (subarea 067), and the Mattaponi River\* (subarea 049), during the period 1 October 1989 - 30 September 1990\*\*. Data reported as number of nets per half-month, linear feet of commercial and recreational nets, and total linear feet of net available to the fishery per half-month. (Effort estimates by local commercial fishermen, personal communications).

	April				May			
	1		2		1		2	
	No.	Lin.ft.	No.	Lin.ft.	No.	Lin.ft.	No.	Lin.ft.
James River, Upper Section Subarea 337			25	7500				
Rappahannock River, Upper Section Subarea 377			1	300				
Pamunkey River, Subarea 067								
(Commercial)	60	18000	60	18000	24	7200	12	3600
(Recreational)	48	14400	48	14400	18	5400	0	0
(Total)	108	32400	108	32400	42	12600	12	3600
Mattaponi River, Subarea 049								
(Commercial)	20	6000	48	14400	14	4200	9	2700
(Recreational)	16	4800	38	11400	11	3300	0	0
(Total)	36	10800	86	25800	25	7500	9	2700

\* - One drift gill net was used in the Mattaponi River in February.

No drift gill nets were used in March because of large numbers of striped bass.

\*\* - No drift gill nets reported during periods from 1 October 1989 - 31 January 1990 and 1 March 1990 - 31 March 1990.

Table 62. Contributions of fishing effort by fyke nets, by half-month, in the James and York rivers, by subareas, 1 October 1989 - 30 September 1990. Effort derived from personal and telephone interviews with fishermen.

Subarea	Month Half-month	Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep			
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2		
337	No. of nets	7	7	7	7	7	4	0	0	6	6	6	9	14	15	15	15	15	15	15	10	7	7	0	3		
	Mean net days/day	7		7		5.5		0		6		7.5		14.5		15		15		12.5		7		1.5			
	Net days/month	217		210		170.5		0		168		232.5		435		465		450		387.5		217		45			
		Total net days (Oct-Dec) = 597						Total net days (Jan-Mar) = 400.5						Total net days (Apr-Jun) = 1350						Total net days (Jul-Sep) = 649.5							
		Total net days (contract period) = 2997.5																									
		Mean net days (Oct-Dec) = 199.2						Mean net days (Jan-Mar) = 133.5						Mean net days (Apr-Jun) = 450						Mean net days (Jul-Sep) = 216.5							
		Mean net days (contract period) = 249.8																									
Subarea	Month Half-month	Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep			
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2		
195	No. of nets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	1	0
	Mean net days/day	0		0		0		0		0		0		1		1		1		1		0.5		0.5			
	Net days/month	0		0		0		0		0		0		30		31		30		31		15.5		15			
		Total net days (Oct-Dec) = 0						Total net days (Jan-Mar) = 0						Total net days (Apr-Jun) = 91						Total net days (Jul-Sep) = 61.5							
		Total net days (contract period) = 152.5																									
		Mean net days (Oct-Dec) = 0						Mean net days (Jan-Mar) = 0						Mean net days (Apr-Jun) = 30.3						Mean net days (Jul-Sep) = 20.5							
		Mean net days (contract period) = 12.7																									

Table 63. Contributions of fishing effort by haul seine, by half-month, in specific water areas in Virginia, 1 October 1989 - 30 September 1990. Effort derived from personal and telephone interviews with fishermen.

Water Code Subarea	Month Half-month	Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
055																		2	2	3	3	3	3	3	2
711												1						1	1	1	1	3	3	3	2
137														1	1	1				1	1	1	1	1	1
237													1	1								1	1	1	1
337																					1	1	1	1	1
195		1											1	4	4	4	4	4	3	3	3	6	4	4	3
295																1			1						
811																									1

Table 64. Contribution of fishing effort by mullet nets, by half-month, in Mobjack Bay (subarea 055), York River, Lower Section (subarea 195), and York River, Central Section (subarea 295), during the period 1 June - 30 September 1990. Data reported as number of nets per half-month. Effort derived from personal and telephone interviews with fishermen.

	June		July		August		September	
	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>
Mobjack Bay Subarea 055	0	2	2	5	5	5	2	0
York River, Lower Section Subarea 195	0	2	2	7	7	7	2	0
York River, Central Section Subarea 295	0	0	0	3	3	3	0	0

Table 65. Commercial fishing effort assessment. Peak net counts, fall 1989, and number of VMRC 1989 and PRFC licenses issued.

	<u>Janes River</u>	<u>York River</u>	<u>Rappahannock River</u>	<u>Potosac River</u>	<u>Chesapeake Bay</u>	<u>Other Tributaries</u>	<u>Total</u>	<u>VMRC Licenses Issued</u>	<u>PRFC Licenses Issued</u>
Found net	0	5	16	42	70	11	144	146	93
Stake gill net	0	0	5	N.S.	N.S.	N.S.	5	180	
Anchor gill net	46	96	38	N.S.	N.S.	N.S.	180	3,535	
Drift gill net	0	0	0	N.S.	N.S.	N.S.	0	185	
Haul seine	0	0	0	N.S.	N.S.	0	0	27	
Fyke net	7	0	0	N.S.	N.S.	N.S.	7	133	

Table 66. Commercial fishing effort assessment. Peak net counts, 1990, number of VMRC licenses issued January through August 1990 and number of FRFC licenses issued, January through May 1990.

	<u>James River</u>	<u>York River</u>	<u>Rappahannock River</u>	<u>Potomac River</u>	<u>Chesapeake Bay</u>	<u>Other Tributaries</u>	<u>Total</u>	<u>VMRC Licenses Issued</u>	<u>FRFC Licenses Issued</u>
Pound net	0	10	12	63	61	26	172	147	85
Stake gill net	11	85	10	N.S.	N.S.	N.S.	106	195	
Anchor gill net	101	134	99	N.S.	161	30	525	4,425	
Drift gill net	25	194*	1	N.S.	N.S.	N.S.	219	361	
Haul seine	3	7	0	N.S.	4	3	17	37	
Fyke net	15	1	0	N.S.	N.S.	N.S.	16	140	

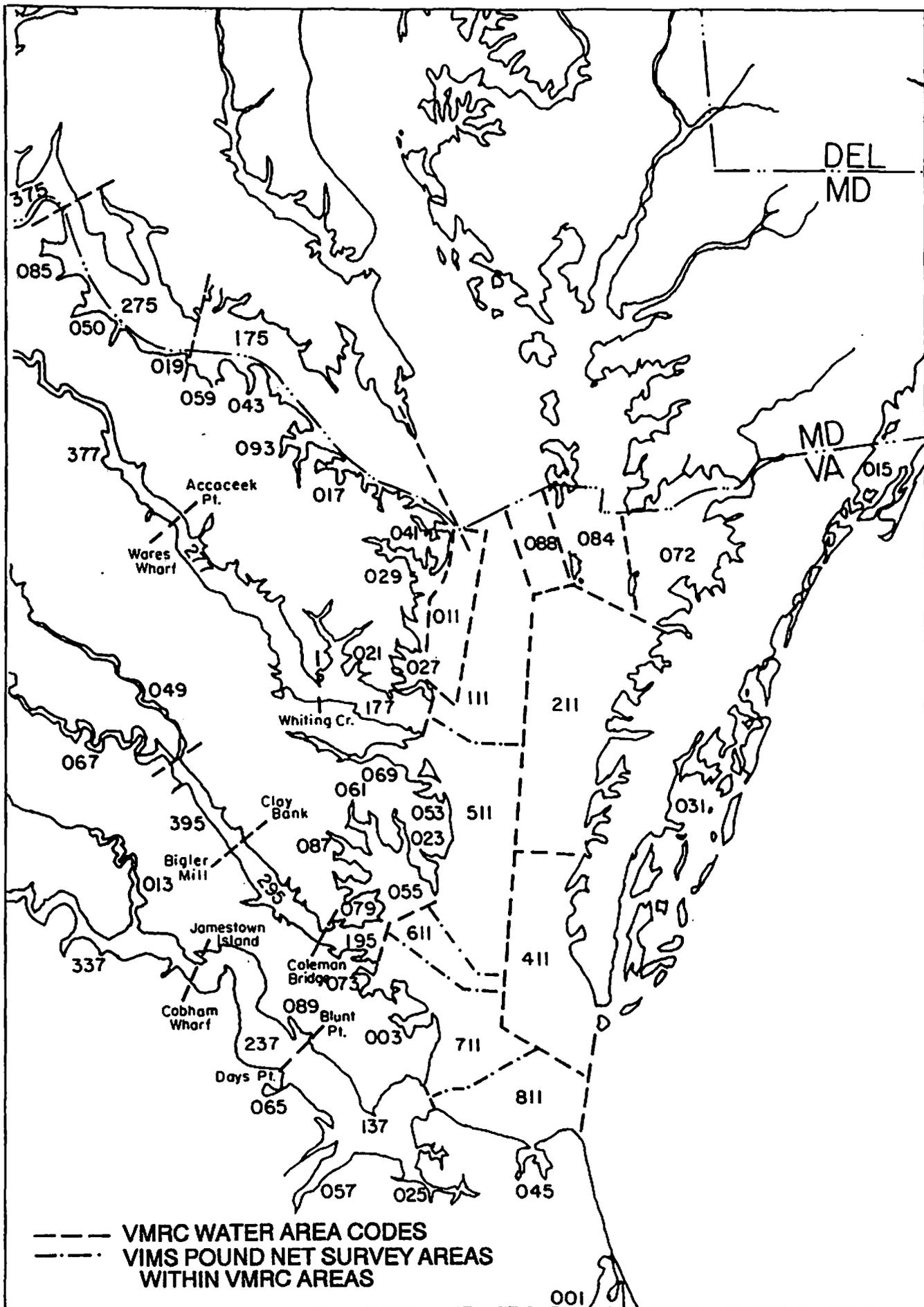
\* Mattaponi and Pamunkey, combined.

**Appendix I. Virginia Marine Resources Commission water areas and modifications**

The following information was obtained from the records of the  
 Department of the Interior, Bureau of Land Management, regarding  
 the acquisition of certain lands in the State of California.  
 The lands were acquired by the United States Government  
 under the provisions of the Act of March 3, 1879, entitled  
 "An Act to provide for the disposal of certain public lands  
 in California." The lands were acquired by the United States  
 Government under the provisions of the Act of March 3, 1879,  
 entitled "An Act to provide for the disposal of certain public  
 lands in California." The lands were acquired by the United  
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 of certain public lands in California." The lands were  
 acquired by the United States Government under the provisions  
 of the Act of March 3, 1879, entitled "An Act to provide  
 for the disposal of certain public lands in California."

**Appendix I**

The following information was obtained from the records of the  
 Department of the Interior, Bureau of Land Management, regarding  
 the acquisition of certain lands in the State of California.  
 The lands were acquired by the United States Government  
 under the provisions of the Act of March 3, 1879, entitled  
 "An Act to provide for the disposal of certain public lands  
 in California." The lands were acquired by the United States  
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 of the Act of March 3, 1879, entitled "An Act to provide  
 for the disposal of certain public lands in California."



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**Appendix I**

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Appendix I. Virginia Marine Resources Commission water areas and modifications.

<u>CODE</u>	<u>BODY OF WATER</u>	<u>CODE</u>	<u>BODY OF WATER</u>
001	Back Bay	059	Nomini Bay
003	Back River	061	North River
005	Bogue Bay	063	Outlet Bay
007	Bradford Bay	064	Oyster Bay (Seaside Eastern Shore)
009	Burton's Bay	065	Pagan River
011	Chesapeake Bay (Western Mgt. Area)	067	Pamunkey River
*111	Chesapeake Bay (Upper Western Section)	069	Piankatank River
211	Chesapeake Bay (Upper Eastern Section)	070	Pocomoke River
*311	Chesapeake Bay (Lower Western Section)	072	Pocomoke Sound
411	Chesapeake Bay (Lower Eastern Section)	073	Poquoson River
013	Chickahominy River	074	Potomac Creek (Potomac Rv. Trib.)
015	Chincoteague Bay	075	Potomac River, unclassified
017	Coan River	175	Potomac River (Lower Section)
018	Cobb Bay (Seaside Eastern Shore)	275	Potomac River (Lower Central Section)
019	Currioman Bay	375	Potomac River (Upper Central Section)
021	Corrotoman River	475	Potomac River (Upper Section)
023	East River	076	Potomac River Trib. (Unclassified)
025	Elizabeth River	177	Rappahannock River (Lower Section)
027	Fleets Bay	277	Rappahannock River (Central Section)
028	Gargathy Bay (Seaside Eastern Shore)	377	Rappahannock River (Upper Section)
029	Great Wicomico River	078	Rosier Creek (Potomac Rv. Trib.)
031	Hog Island Bay	079	Severn River
033	Horn Harbor	081	South Bay
137	James River (Lower Section)	083	Swash Bay
237	James River (Central Section)	084	Tangier Sound
337	James River (Upper Section)	088	West Tangier Management Area
038	Kegotank Bay (Seaside Eastern Shore)	085	Upper Machodoc Creek
039	Lafayette River	086	Upshur Bay (Seaside Eastern Shore)
041	Little Wicomico River	087	Ware River
043	Lower Machodoc Creek	089	Warwick River
045	Lynnhaven Bay	090	Watts Bay (Seaside Eastern Shore)
047	Magothy Bay	091	Willoughby Bay
049	Mattaponi River	092	Winter Harbor (Chesapeake Bay Tributary)
050	Mattox Creek (Potomac Rv. Trib.)	093	Yeocomico River
051	Metomkin Bay	195	York River (Lower Section)
053	Milford Haven	295	York River (Central Section)
055	Mobjack Bay	395	York River (Upper Section)
057	Nansemond River	097	Unclassified Seaside Bays and Rivers
068	Piankatank River (Mouth of)	099	Unclassified Tributaries of Chesapeake Bay

\*Description of further subdivision of VMRC water bodies in the western sections of Chesapeake Bay (Subareas 111 and 311).

Subarea 111 - The upper western Chesapeake Bay area south of the Maryland-Virginia line to the south side of Rappahannock Spit, east to Subarea 211.

Subarea 511 - From the south side of Rappahannock Spit south to the north side of York Spit, east to Subareas 211 and 411.

Subarea 611 - York Spit, east to Subarea 411.

Subarea 711 - From the south side of York Spit to Thimble Shoal Channel, east to Subarea 411

Subarea 811 - South of Thimble Shoal Channel, east to Cape Henry; on northwest-southeast demarcation of Subarea 411.



**Appendix II. Active pound net sites in Virginia waters and Potomac River in 1989-90.**

**Pound Net Sites, Fall 1989.**

**Chesapeake Bay**

**Rappahannock River**

**Potomac River and Virginia tributaries.**

**Pound Net Sites, 1990.**

**Chesapeake Bay**

**Rappahannock River**

**Potomac River and Virginia tributaries**

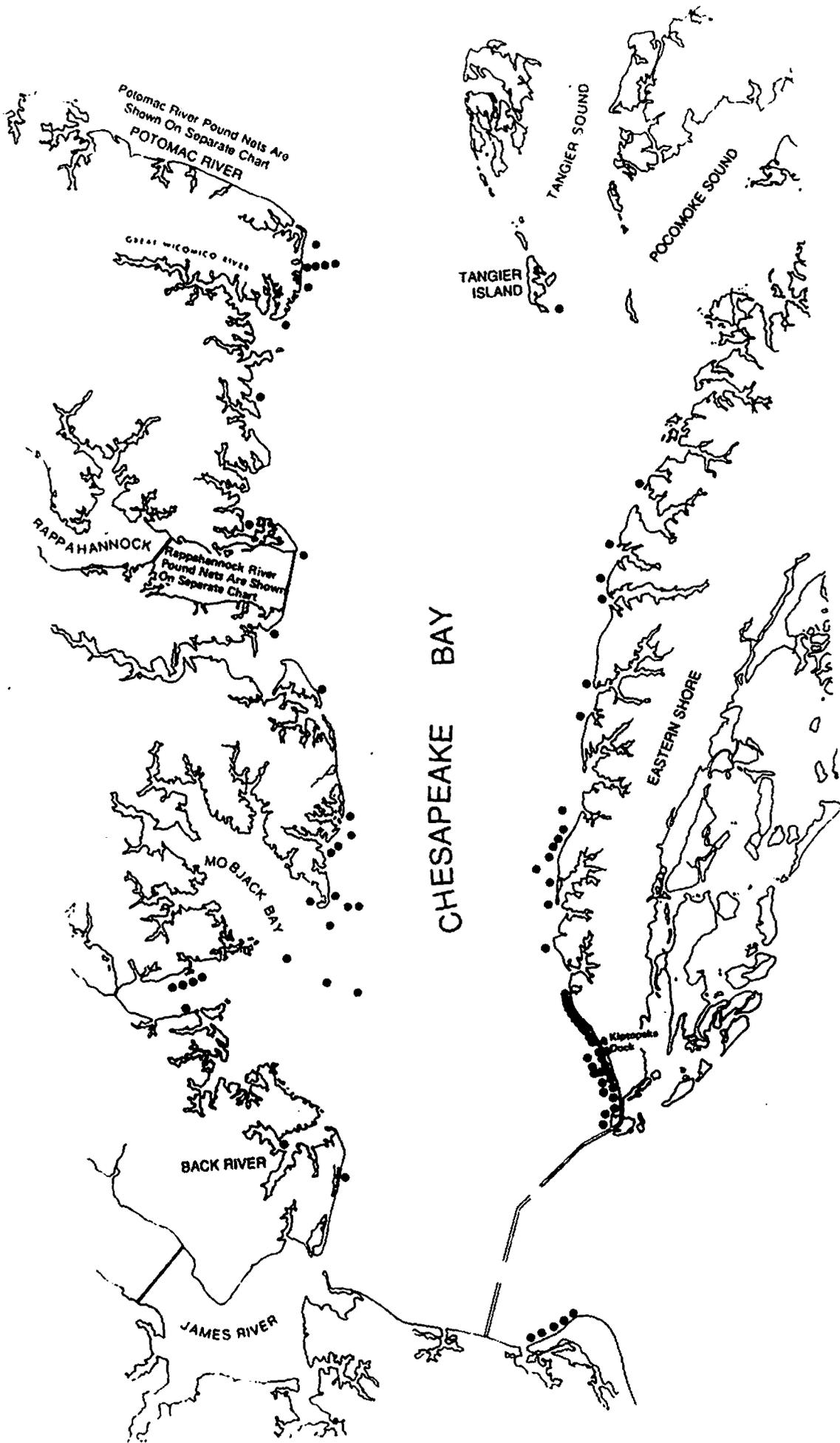
**Appendix II**

Potomac River Pound Net Sites, Fall 1989.

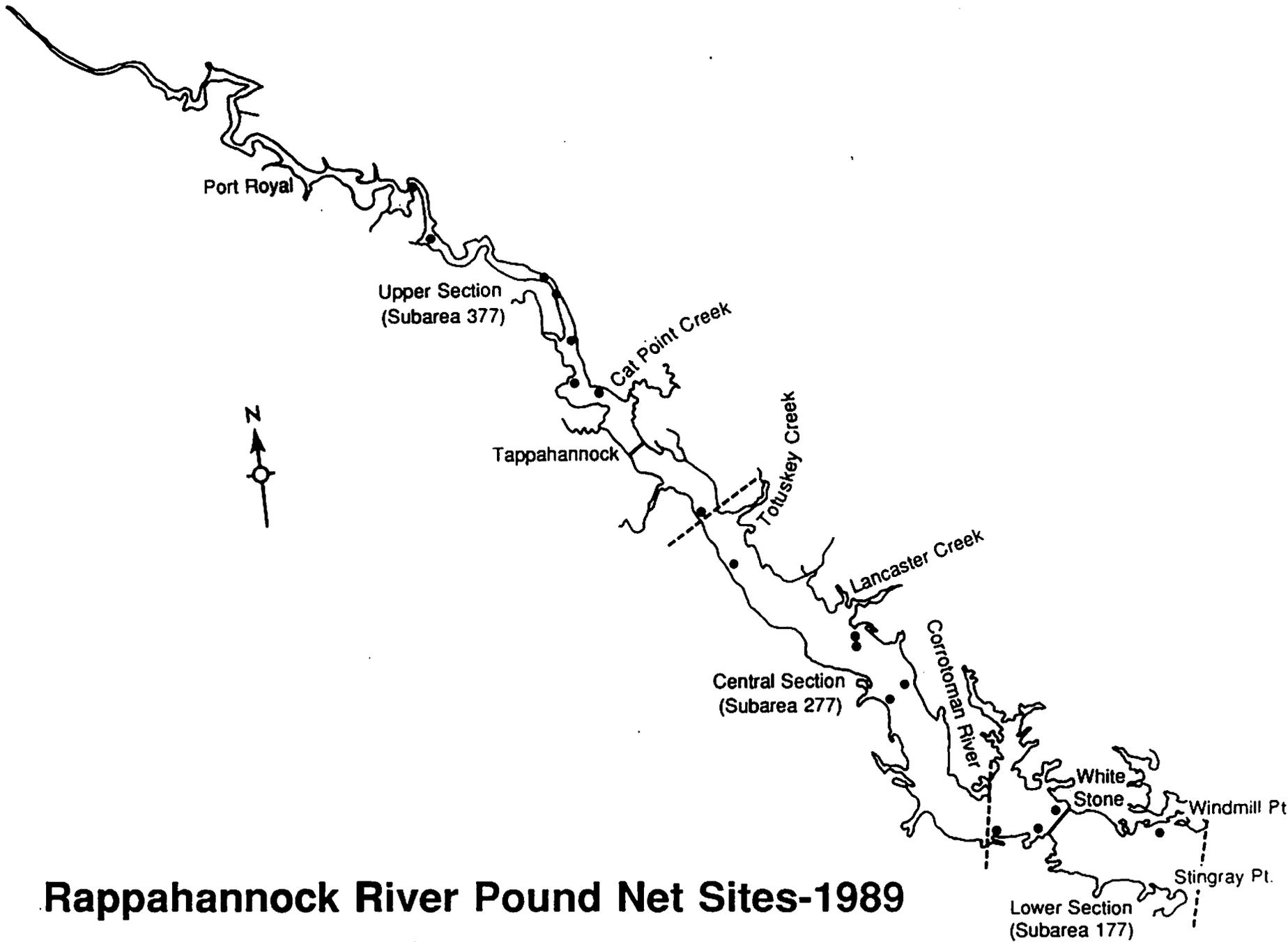
13-1 (19) 10/10/1968

**Appendix II**

**Chesapeake Bay Pound Net Sites, Fall 1989.**

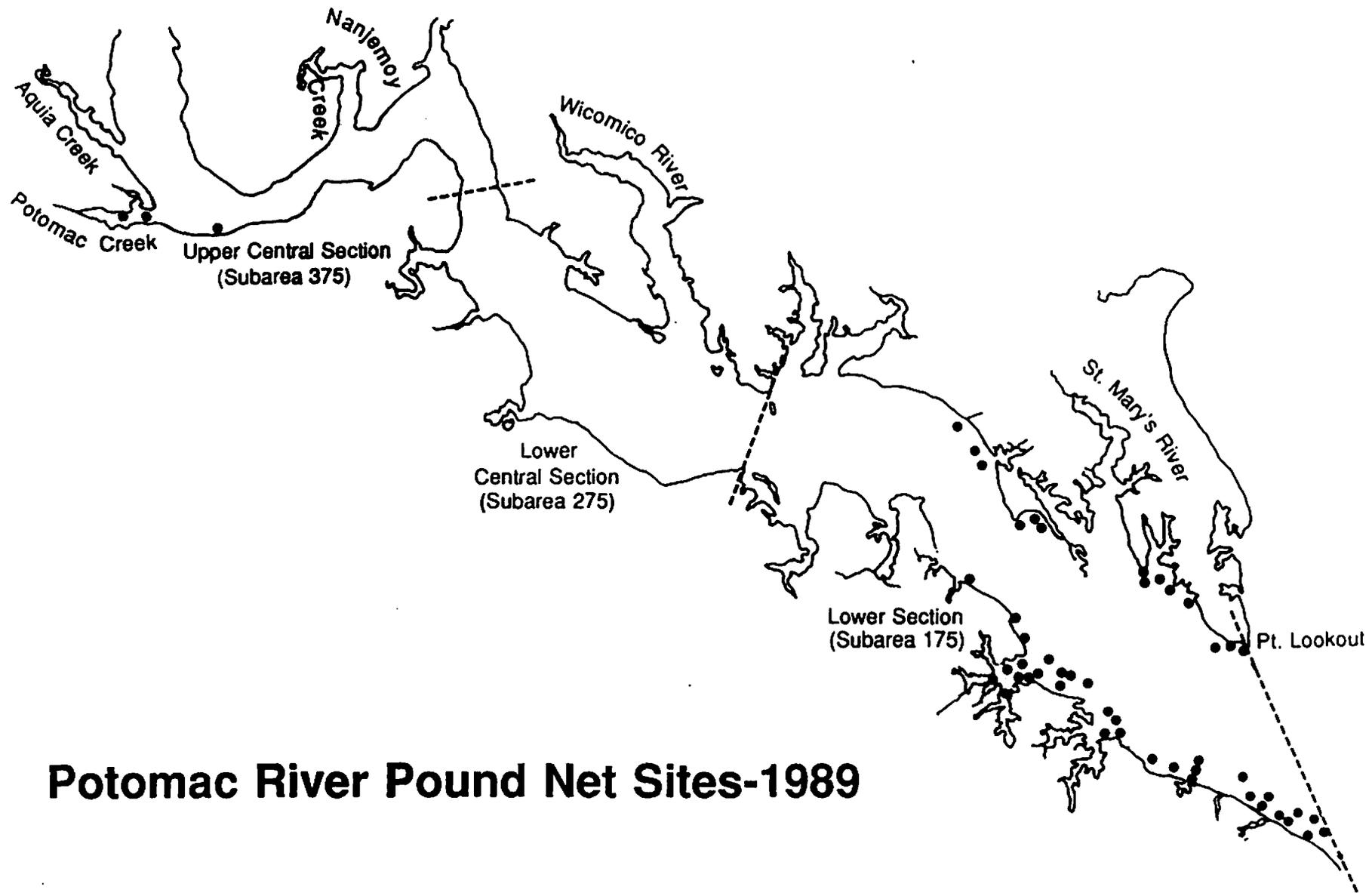


**Rappahannock River Pound Net Sites, Fall 1989.**



# Rappahannock River Pound Net Sites-1989

Potomac River Pound Net Sites, Fall 1989.



**Potomac River Pound Net Sites-1989**

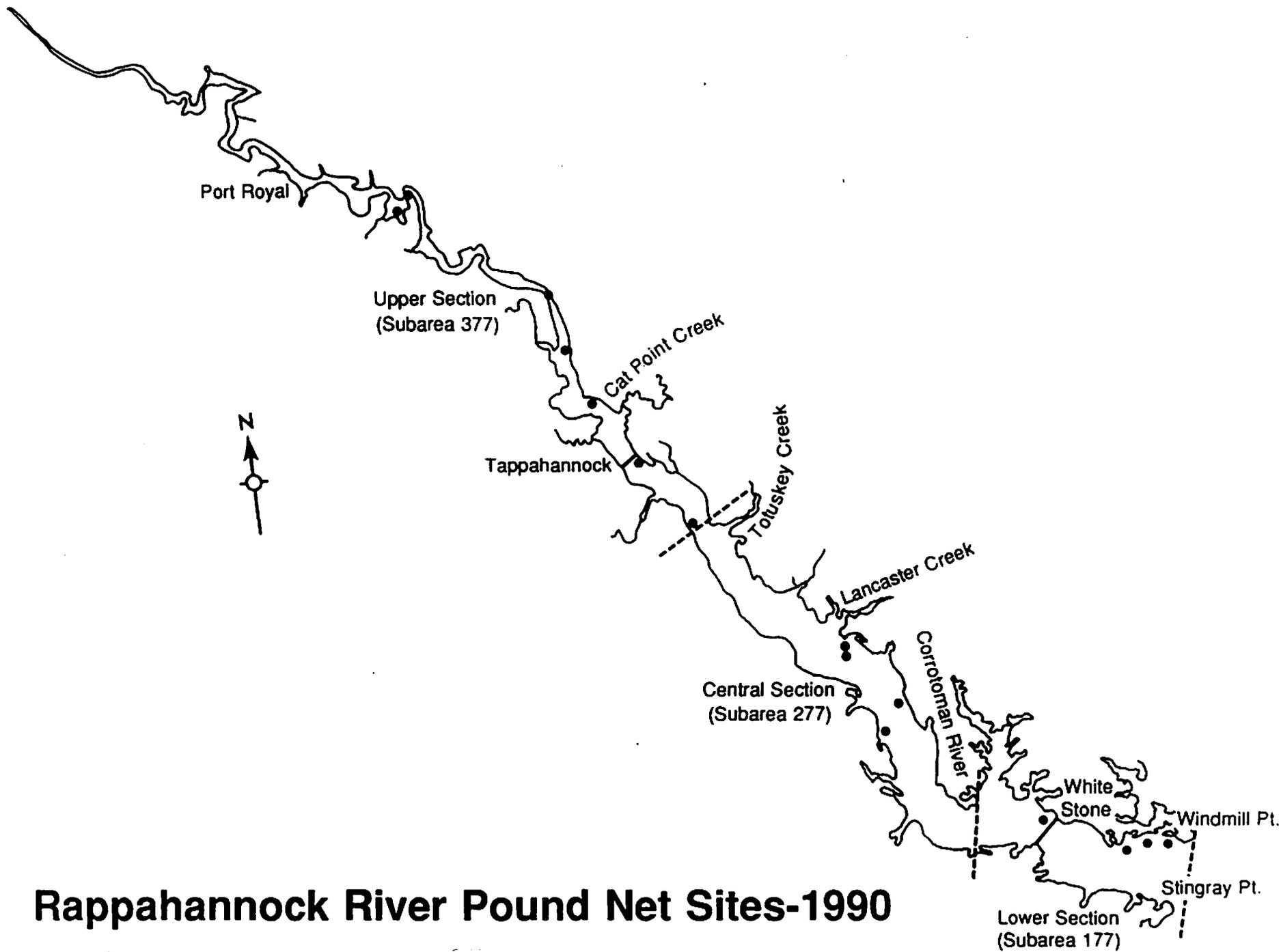
Appendix II. Chesapeake Bay Pound Net Sites, 1990.



**CHESAPEAKE BAY**

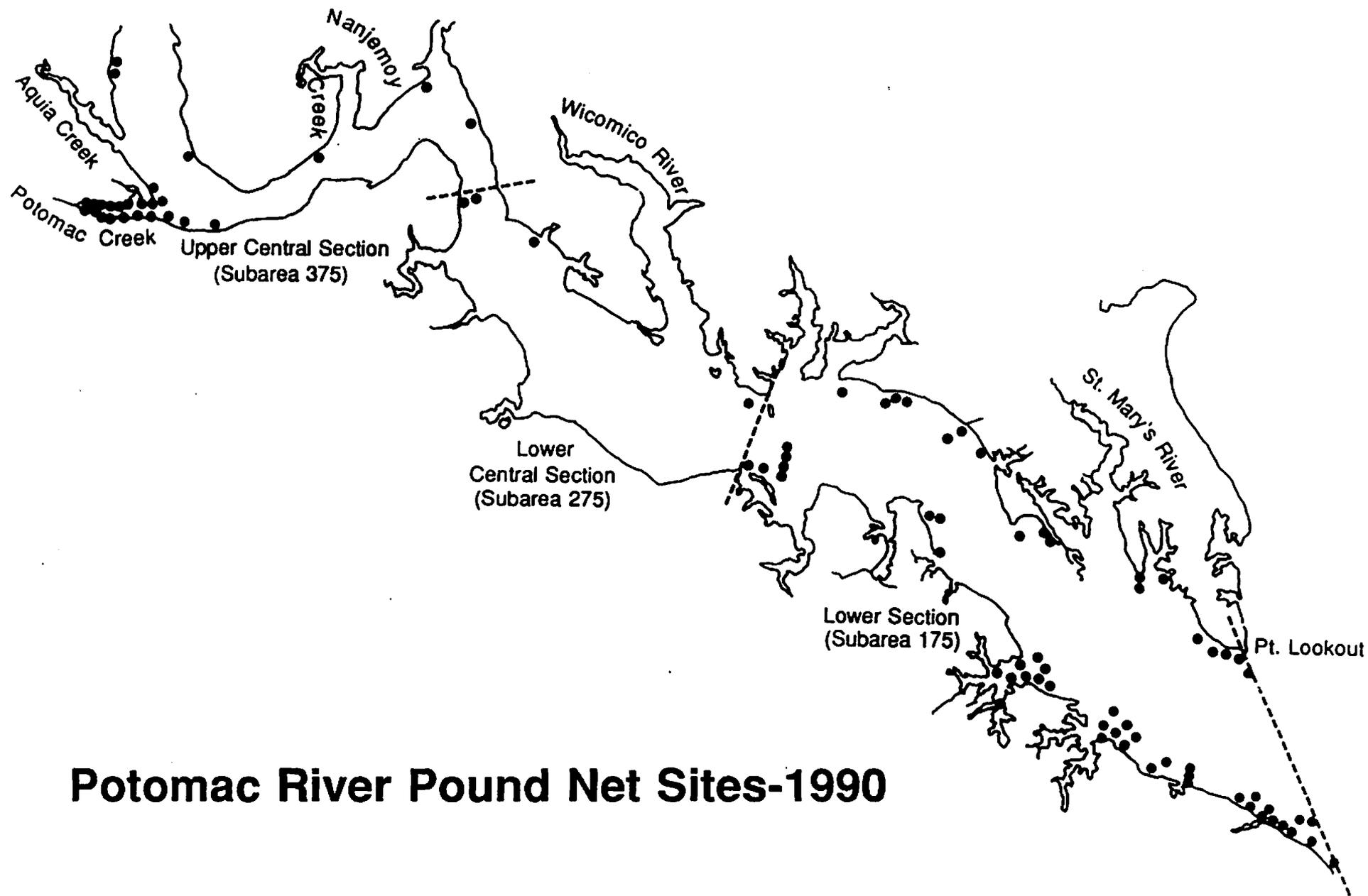


**Rappahannock River Pound Net Sites, 1990.**



**Rappahannock River Pound Net Sites-1990**

Potomac River Pound Net Sites, 1990.



**Potomac River Pound Net Sites-1990**