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# Findings And Policies

# EXPLOITABLE NATURAL RESOURCES

COASTAL ZONE INFORMATION CENTER

# DRAFT

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CRMC

Rhode Island. Coastal Resources Management Council.

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STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

COASTAL RESOURCES MANAGEMENT COUNCIL
83 Park Street
Providence, R.I. 02903

May 11, 1977

CZIC COLLECTION

Dear Friend

We will not be able to develop a good program for the management of our coastal resources without your help. We hope to benefit the most from your thoughts and criticisms by providing you with materials that are still very much in draft form. Please do not concern yourself with editorial details at this time but review the drafts for their scope, accuracy and content.

These drafts have been prepared by the University of Rhode Island Coastal Resources Center. When reworked they will become a part of the Rhode Island Coastal Resources Managment Program. When formally adopted by the Coastal Resources Management Council (CRMC) this Program will serve as the basis for the management of our coastal resources. The CRMC was created by the legislature in 1971 and granted broad powers to plan for and to manage the coastal region of our state. If this Program is also approved by the federal Office of Coastal Zone Management, the state will receive substantial funding to assist it in implementing the Program and federal actions in the coastal region will have to be consistent with the policies of this Program.

The drafts contained in this report will be discussed at the third in a series of five public workshops on the major segments of the Program. The first series of workshops, dealt with the Natural Environment, the second were on Coastal Development.

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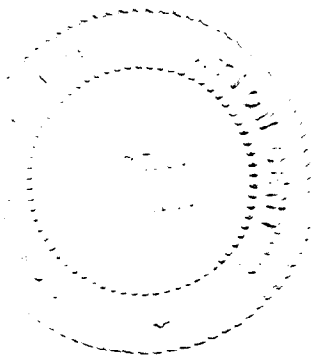


Rhode Island Coastal Resource Management Council

The drafts in this package are on Exploitable Natural Resources, including marine fisheries, aquaculture, minerals, agricultural lands, forests, succession lands, wetlands, wildlife and native energy resources. Workshops on these drafts are scheduled for 7:30 p.m. on May 17th, at the Dutch Inn in Galilee and on May 18th, at the Middletown High School.

If you have comments on these drafts, on the Program or on the manner in which we are soliciting public input, please come to the workshops or write to the Council or call the URI Coastal Resources Center at 783-1385. Your interest is greatly appreciated.

Sincerely

John A. Lyons/SBO

John A. Lyons, Chairman
COASTAL RESOURCES MANAGEMENT COUNCIL

JAL:mm

# EXPLOITABLE NATURAL RESOURCES

## I. General Findings

A. Although Rhode Island is smaller than the average United States county it is endowed with a wealth and variety of exploitable natural resources. These resources must be carefully managed for the benefit of future as well as present Rhode Islanders.

- The state's marine and estuarine waters and those of outlying continental shelf are rich in fish and shellfish that support growing sport and commercial fisheries.

- The state has abundant fresh water supplies. __ percent of the known aquifers and __ of the fresh water ponds, rivers and stream acreage are in the coastal region.

- Aquaculture is presently not of major importance in Rhode Island. Some of the best remaining farm lands are being developed for residential and industrial uses. The state's woodlands, though much more abundant, are under similar pressures. Agricultural lands and forestry resources may become more economically important as the national energy situation changes.

- Sand and gravel deposits overlie much of Rhode Island and are of crucial importance to the construction industries. Land use conflicts are restricting the exploitation of these resources and this is likely to bring pressures to exploit marine deposits.

- Wildlife and freshwater fish are relatively abundant; they are a significant and a generally well managed resource.

- Native energy resources include coal, solar energy, and hydropower. None of these are a significant source of power at present but their potential for future importance is great.

## II. Marine Fish and Fisheries: Findings

A. Fishery resources support an industry with highly favorable economic characteristics and are a major source of recreation. Fishery resources are likely to play an increasingly important role in the lives of Rhode Islanders.

- The recently enacted 200 mile fishing limit holds the promise for effective management of New England's fishery resources. Commercial fisheries may grow dramatically if overfished stocks recover and if domestic fishermen claim

an increasingly large share of the total annual harvest. Sport fisheries also stand to benefit since stocks of many species important to recreational fishermen have been reduced by heavy fishing offshore.

- Growth of Rhode Island fishing industries should be fostered since they are based on a renewable native resource, are labor intensive and are not heavy users of energy.

B. Fishery resources have been severely depleted and damaged by heavy fishing and environmental degradation. There is some evidence that this long established trend is changing.

- The first European settlers found large intertidal populations of lobsters, clams and oysters. Smelt, alewives and some salmon were seasonally abundant in many streams and rivers. Marine fish such as flounder, cod and scup appeared inexaustable.

- A series of advances in fishing technology and alterations to the coastal environment drastically reduced the abundance of most major fin and shellfish populations.
  - Early hook and seine fisheries were preempted by floating fish traps in the mid nineteenth century.
  - Use of more efficient gear, the beam and otter trawl, coincided with another reduction in the overall abundance of fish and replaced the floating trap fishery in the early twentieth century.
  - In recent years New England trawlers have suffered heavy competition from large offshore foreign fleets and fish stocks have again been drastically reduced.

- The damming and pollution of streams brought the demise of most Rhode Island anadromous fish populations.

- The pollution of estuarine waters and heavy fishing have reduced many shellfish populations and made others unfit for human consumption.
  - The once important oyster fishery went into a rapid decline in 1937 and large quahaug populations in the upper Bay are now off limits to fishermen due to pollution.

- These are recent indications that at least some of the causes for declining fishery resources are being corrected. Sport fish have recently been taken in the upper Providence River, bluecrabs and bay scallops that all but disappeared from Rhode Island estuaries in the 1960's appear to be making a

a comeback and a vigorous effort to re-establish anadromous fish populations has had several notable successes.

C. Rhode Island commercial fisheries are flourishing and provide a solid base upon which future expansion of the industry may be built. Our commercial fisheries are highly diversified and Rhode Island fishermen recently have pioneered many innovative fisheries.

- Rhode Island's commercial fisheries are unique in the region since they have thrived at a time when other major commercial fisheries have seen drastic declines. Between 1950 and 1975 Rhode Island landings increased by 110 percent in tonnage and by 238 percent in value compared to the regional decrease in tonnage of 55 percent and an increase in value of only 74 percent.

- Rhode Island's success may be attributed to the diversification in fisheries at Point Judith and the re-emergence of Newport in the late 1960's as a major commercial port (see Port section).

- Figures 1 and 2 illustrate that trawlers dominate Rhode Island fisheries but that pot fisheries and shellfisheries are also very important.

- Figures 3 and 4 show trends in landings by species group. Foodfish are most important in both tonnage and value. Increasing prices have permitted a rapid increase in the total value of foodfish and crustaceans despite only moderate increases or a decrease in landings by tonnage.

- In 1975 some 17 percent of the Point Judith and Newport landings by value were taken nearshore in the National Marine Fisheries (NMFS) statistical area 539 (Fig. 5). The source of all fin and shellfish landed in Rhode Island in 1975 is shown in Table 1. The Point Judith fleet is more dependent on nearshore grounds than vessels landing in Newport. In 1975, for example, only 8 percent of the Point Judith landings came from the Georges Bank vicinity compared to 70 percent of the landings at Newport.

D. Commercial fisheries generate much greater economic benefits for the state than the "average" industry. Commercial fisheries are based on a renewable native resource; they are both labor intensive and have relatively low energy requirements. These characteristics make the growth of commercial fisheries highly desirable.

Fig. 1. Rhode Island Landings by Gear Group, Pounds

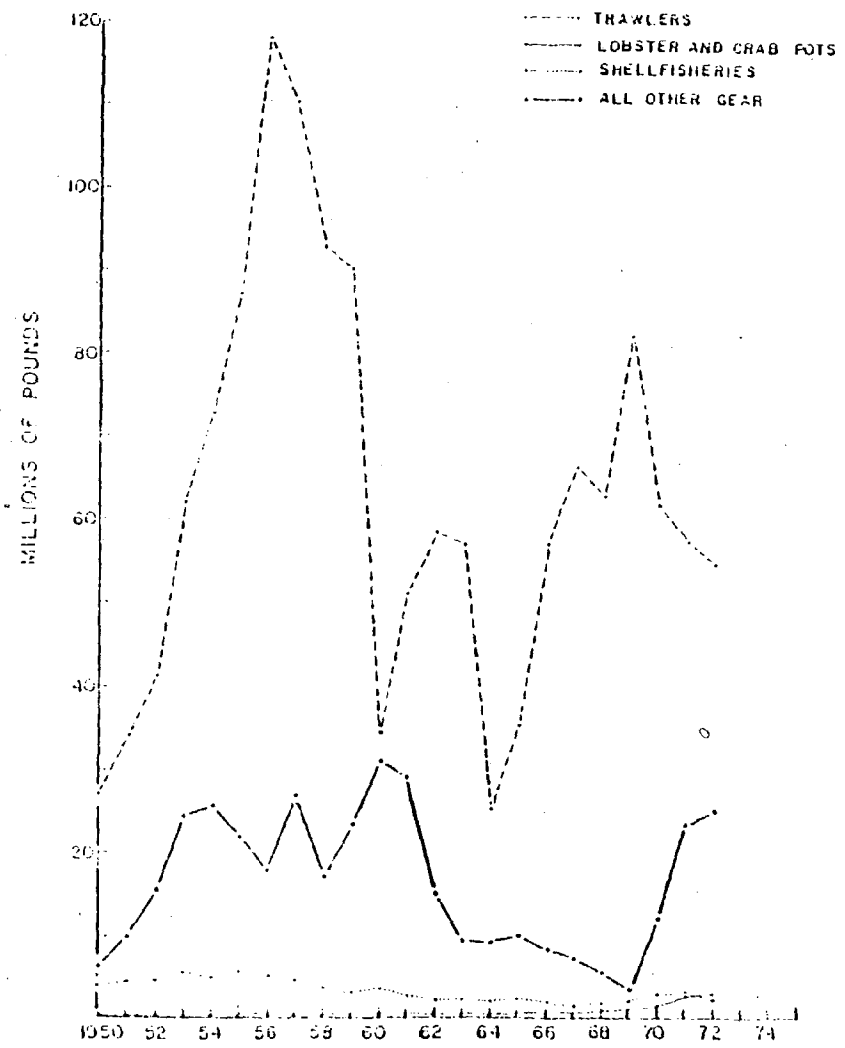
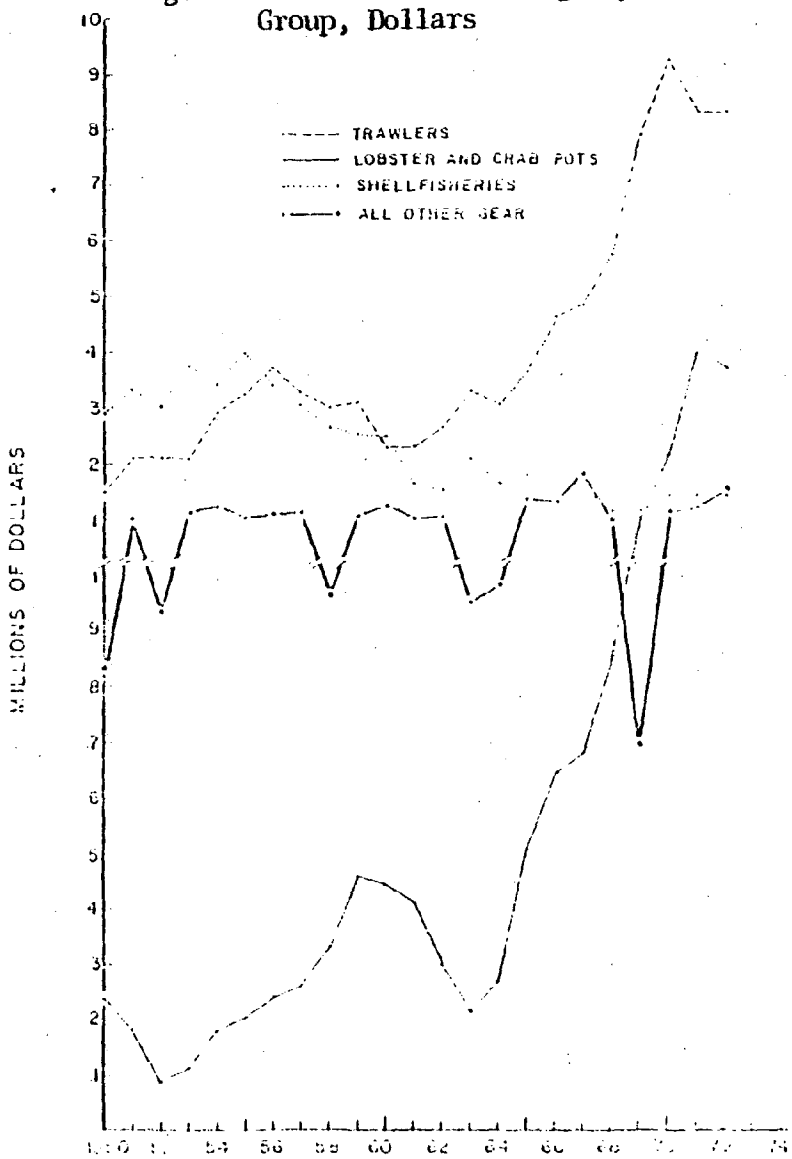


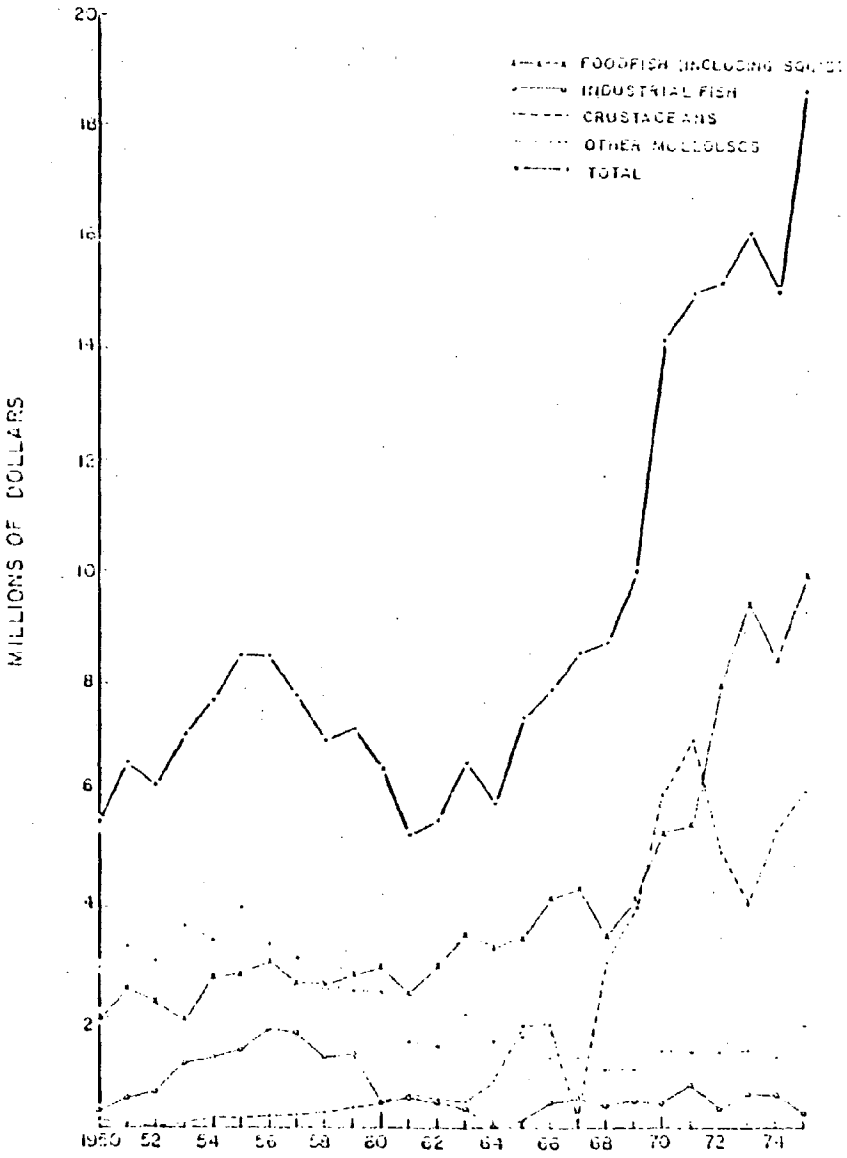

Fig. 2. Rhode Island Landings by Gear Group, Dollars




From: Olsen et al. (in press) 1977. Fishing and Petroleum Interactions on Georges Bank. Vol II. The New England Regional Commission, Boston, MA.

Fig. 3. Rhode Island Landings by Species Group, Pounds

Fig. 4. Rhode Island Landings by Species Group, Dollars




From: Olsen, et al. (in press). 1977. Fishing and Petroleum Interactions on Georges Bank, Vol. II The New England Regional Commission, Boston, MA.

Table 1: 1975 Commercial Landings at Point Judith and Newport by NMFS Statistical Area

| NMFS Area | thousands of pounds | thousands of dollars |
|---|---|---|
| 350 | 94 | 106 |
| 443 | 141 | 166 |
| 453 | 77 | 80 |
| 454 | 25 | 29 |
| 463 | 29 | 10 |
| 464 | 70 | 61 |
| 465 | 20 | 4 |
| 514 | 181 | 8 |
| 521 | 248 | 78 |
| 522 | 549 | 196 |
| 523 | 598 | 312 |
| 524 | 4,790 7% | 2,042 13% |
| 525 | 3,238 | 1,319 |
| 526 | 3,746 | 2,716 |
| 537 | 20,604 29% | 5,009 33 |
| 538 | 1,487 | 303 |
| 539 | 28,946 40% | 1,540 10 |
| 611 | 2,064 | 205 |
| 612 | 43 | 23 |
| 613 | 4,023 | 524 |
| 616 | 687 | 290 |
| 622 | 1 | 1 |
| 632 | 3 | --- |
| Total | 71,666 | 15,028 |

- In 1975 the 79.3 million pounds of fish and shellfish landed in Rhode Island had a dockside value of $18.8 million.

- If the economic impact of these landings is traced through handling, packing and processing, and the economic activity set off by support to the fishing catching process is included, it has been calculated that each $100 in fish landings stimulates $424 in economic activity in the state. The 1975 landings therefore, genereated $79.7 million for the state's economy.

- A more detailed breakdown of the multiplier effects of segments of the fishing industry is shown in Table 2.

- Figure 6 shows trends in the numbers of people employed in fish catching industries. __ percent of the __ fishermen listed in 1972 were bay shellfishermen, primarily bay quahaugers; these fishermen depend on a purely Rhode Island resource.

- The Rhode Island fish processing industry is presently small and is composed of 14 plants which provide an annual average employment of some 250 people.

- The date in Table 2 makes it clear that the state should foster landings by Rhode Island vessels and should encourage in-state packing and processing.

E. Although there are many uncertainties in the outcome of management efforts under the 200 mile fishing limit the potential for a major expansion in Rhode Island commercial fisheries is very great.

- The Rhode Island industry is healthy and has demonstrated that it is highly adaptable to gear innovations and is not tradition-bound.

- Commercial fisheries are attracting young men and the University of Rhode Island has proved to be effective in assisting the industry in developing new technologies.

- Recent dredging in the port of Point Judith will permit expansion in that fleet.

- Excessed Navy lands offer exciting possibilities for the development of new fleets and fishing port facilities.

- Recent studies investigating the potential expansion of New England fisheries under the 200 mile limit indicate that the potential for growth in both new and traditional fisheries are great (see Ports section).

TABLE 2

TOTAL OUTPUT, AGGREGATE MULTIPLIERS AND HOUSEHOLD INCOME MULTIPLIERS RHODE ISLAND, 1975

| | Total Output | Aggregate Multiplier (per $100 of output) | Household Income Multiplier (per $100 of output) |
|---|---|---|---|
| Finfishing | $6,779,000 | $253 | $ 74 |
| Lobstering | 4,195,000 | 254 | 77 |
| Mollusk catching | 2,351,000 | 276 | 100 |
| Non-R.I. vessels | 5,472,000 | 109 | 3 |
| | $18,797,000 | | |
| Handling packing and processing | 31,264,000 | 268 | 52 |
| R.I. "average" industry | not available | 163 | 33 |

From: Callaghan, D.W. and R.A. Commerford. 1977. Commercial Fishing has a Wide-Reaching Economic Effect in Rhode Island. Maritimes, February 1977, University of Rhode Island, Kingston, R.I.

Figure 5. NMFS statistical areas.

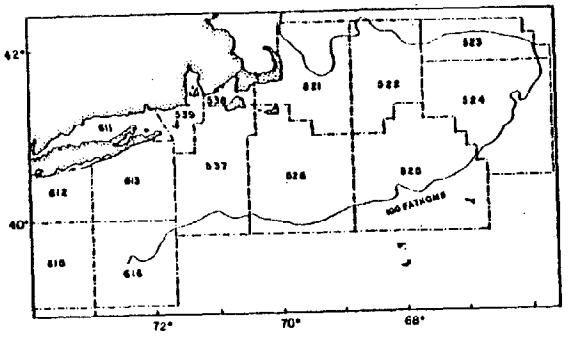
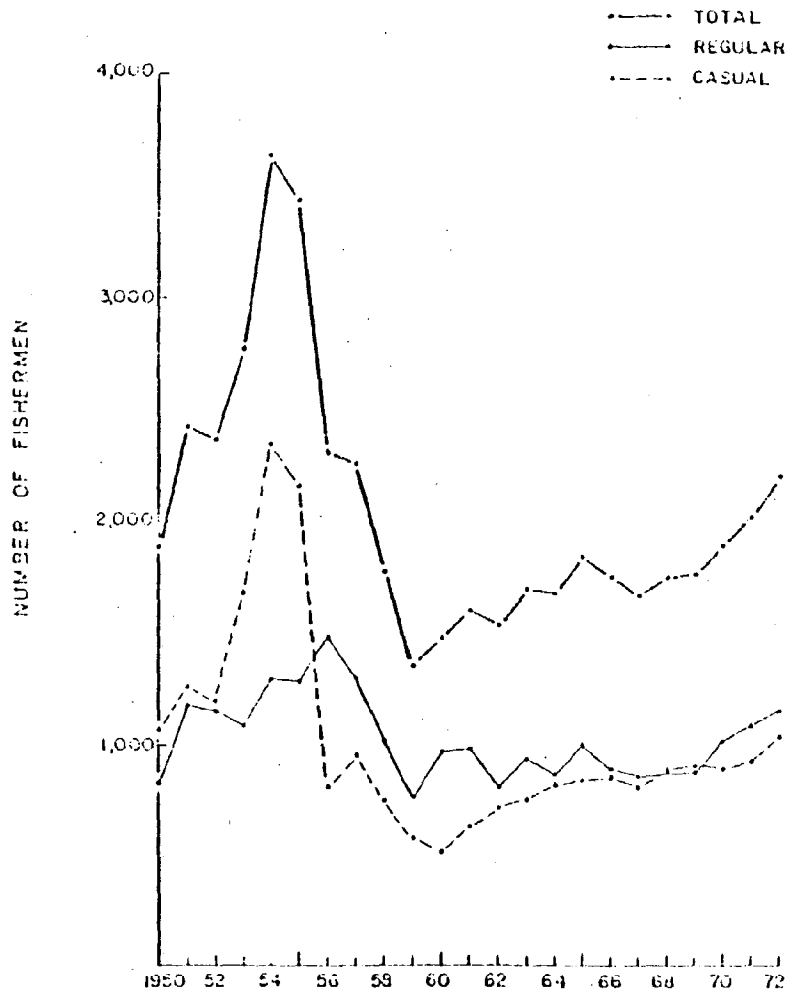



Fig. 6. Number of Fishermen, Rhode Island




From: Olsen, Et al. (in Press) 1977. Fishing and Petroleum Interactions on Georges Bank. Vol.II The New England Regional Commission, Boston.

F. Marine sport fishing activity is at an all-time high and is likely to increase. There are, however, many problems related to heavy fishing and conflicts with other user groups.

- A 1973-74 survey accounted for some 285,000 Rhode Island sportfishermen. Statistics for landings by Rhode Island sportfishermn are not available but sportfishermen in the northeast region as a whole are estimated to have taken 36 percent of the combined 1970 commercial and sport catch.

- Some ___ percent of the 23,000 recreational craft licensed in Rhode Island in 1976 were used primarily for sportfishing.

- Sportfishing is most active in the summer when bluefish and striped bass are abundant.
  . Other important sport species taken from the shore or along the coast include winter flounder and tautog. Several "head boats" operate from Galilee taking parties of sportfishermen to Cox Ledge where cod fishing is popular. Tuna and swordfish also support important deep water sport fisheries.

- Recreational shellfishing is very popular and results in rapid seasonal depletion of populations of soft shelled clams and shallow sets of quahaugs.
  . Enforcement of daily catch limits are made difficult by the lack of way to readily differentiate among instate and out-of-state recreational fishermen and commercial fishermen. Good sets of softshelled clams are frequently exploited before the clams have grown to a suitable size.

- Sport fisheries for both shell and finfish are in some areas compromised by losses in the aesthetic qualities of the area, inadequate access and crowding.

G. Marine sportfisheries make a substantial contribution to the state economy and have important social benefits.

- In 1974 an estimated 115,210 Rhode Island households contained atleast one marine sport fisherman. They spent an estimated $7.2 million on food, lodging, transportation, licences, bait, tackle and boat rental fees.

H. The management of salt water fisheries within state waters is the responsibility of the Marine Fisheries Council and the Department of Natural Resources.

- The Marine Fisheries Council was created in 1976 upon recommendation of the Fisheries Task Force which was sponsored by Govenor Noel and the Coastal Resources Management Council. The Fisheries Council may promulgate regulations governing fishing gear, seasons, size and catch limits, and the closure of fishing grounds.

- The Department of Natural Resources is responsible for enforcing all fisheries management regulations and monitoring the condition of fishery resources. The Department also conducts research and engages in stocking and transplant programs.

- The management of fisheries on a regional level is entrusted to the Regional Fisheries Council that came into being in 1976 with the passage of the 200 mile fishing limit.

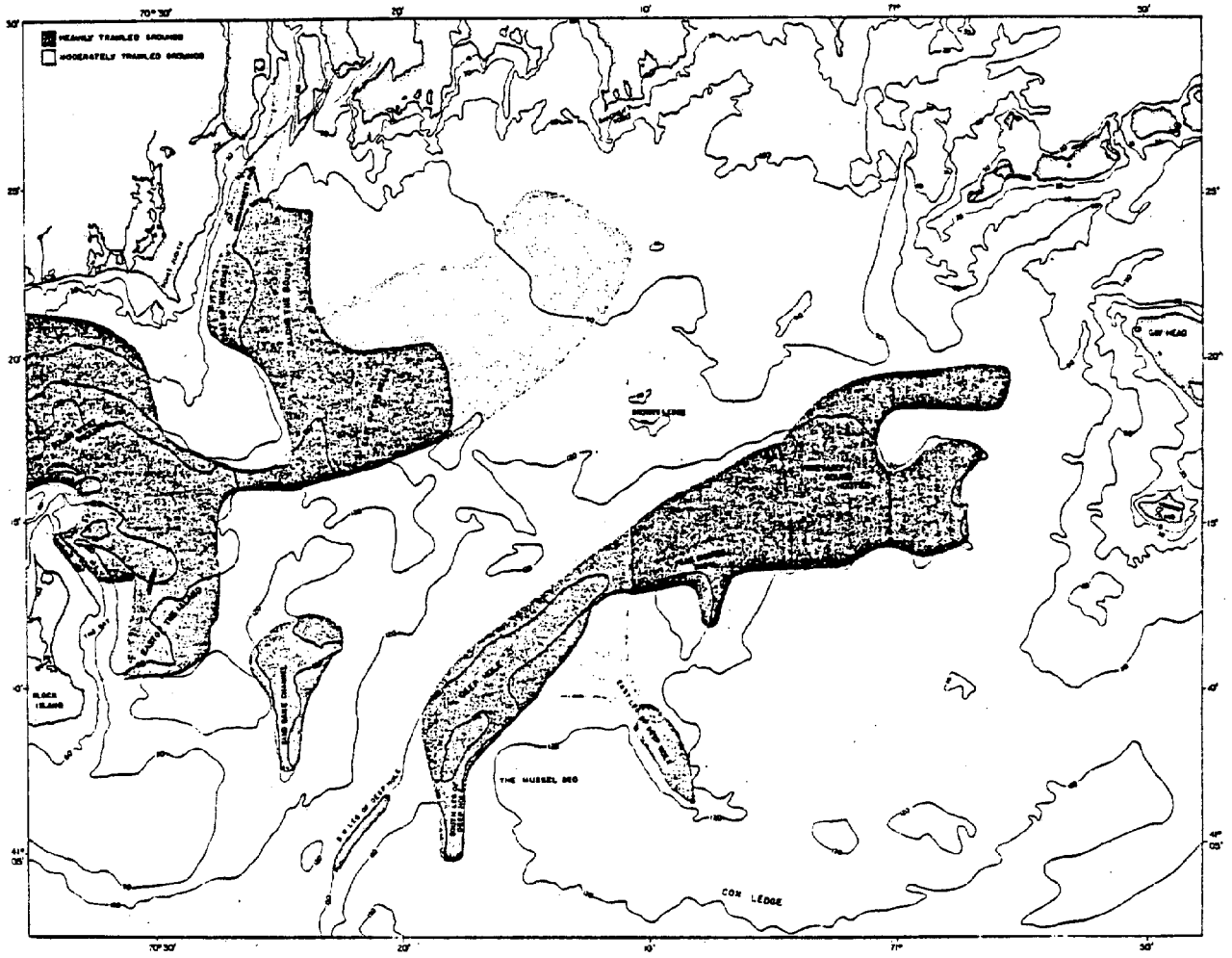
I. The Coastal Resources Management Council is concerned that the state's fisheries be managed in the most effective possible manner. The Council has been very active in planning for the future of the state's fisheries and in attempting to resolve use conflicts. The following issues are of particular concern.

- The pollution of upper Narragansett Bay has closed some of the states most productive grounds for bay quahogs. Highly valuable grounds in a conditional area north of Patience Island may be permanently closed if better data on pollutants are negative and more stringent water classification criteria are adopted by the Department of Health.

- As the level of activities increases in state and in nearshore waters important fishing grounds and habitats may be threatened by a diversity of activities and environmental alterations including increased boat and ship traffic, dredging and spoils disposal, the placement of cables and pipelines, the destruction of valuable habitats (particularly breeding areas) and access to shoreline fisheries.

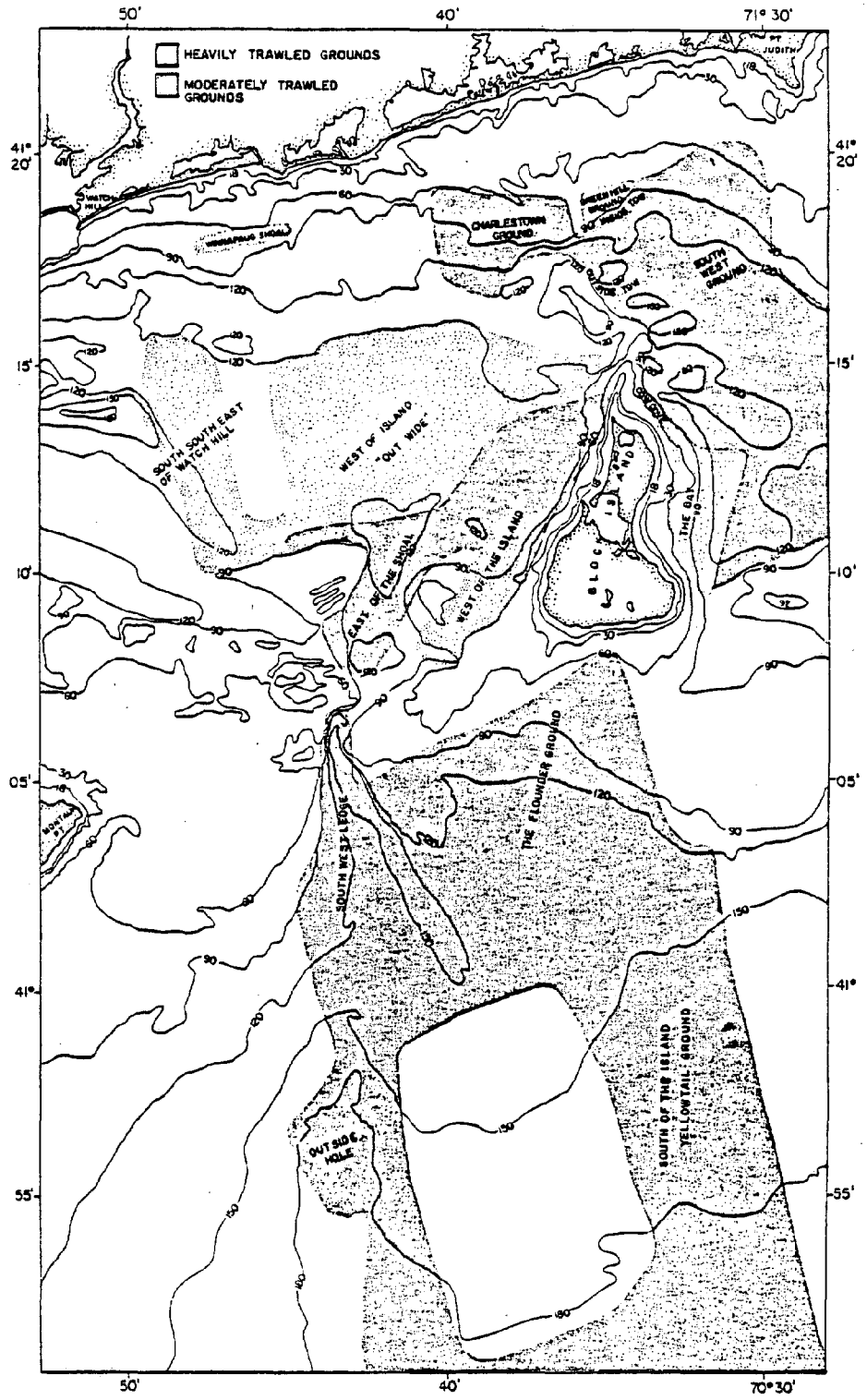
- Recreational shellfishing is highly popular and enforcement officers from the Department of Natural Resources cannot always effectively inforce existing laws on catch limits. The intensity of shellfishing is such that many beds are heavily exploited before the shellfish have grown to an optimal size.

Figure 8: Principal Nearshore Trawling Grounds




From: Olsen, S.B. and D.K. Stevenson. 1975. Commercial Marine Fish and Fisheries of Rhode Island. URI Marine Tech. Report #34. Kingston, R.I.

Figure 9: Principal Nearshore Trawling Grounds




From: Olsen, S.B. and D.K. Stevenson. 1975. Commercial Marine Fish and Fisheries of Rhode Island. URI Marine Tech. Report #34. Kingston, R.I.

J. In recognizing the unique value of commercial fisheries the CRMC has sponsored research and taken a leading role in assisting the industry in a variety of ways:

- The CRMC co-sponsored, with Governor Noel, the Fisheries Task Force, and endorsed its finding and recommendations. Two results of the Task Force's work are the creation of the Marine Fisheries Council and the exemption of commercial fishing vessels and gear from the state sales and use tax.

- The CRMC sponsored a study that documents the secondary economic benefits that accrue to the state from commercial fisheries.

- The CRMC was instrumental in having the port of Point Judith dredged and has worked with Newport fishermen to find a solution to the crowding problem in that port.

## III. Marine Fish and Fisheries: Management Policies

A. The CRMC designates commercial and sport fisheries as a high priority use of all waters classified by the Department of Health as SA and SB.

B. (1) The CRMC shall work to preserve and where possible restore the marine fishery resources of this state by preserving important habitats (particularly breeding areas) and fishing grounds. The CRMC recognizes that some coastal areas are known to be particularly valuable for fishery resources and has therefore adopted policies to protect them from degredation; these areas include salt marshes and breached coastal ponds. (Findings and Policies regarding these areas were discussed at Public Workshops on March 15, 16 and 31).

(2) The CRMC shall protect all prime fishing grounds from uses and activities that threaten their value as fishing grounds. These grounds include, but are not limited to those shown in Figures 8 and 9.

(3) In implementing its permitting authorities regarding developments and operations within, above, or beneath the state's tidal waters including but not limited to dredging, dumping, ocean mining and cable and pipeline installation the Council shall be particularly concerned with their probable impacts on known fishing grounds.

(4) Where a reasonable probability exists that such impacts will result the Council shall require in addition to any other evidentiary burdens imposed by applicable Management Policies that the applicant:

- Describe the fishing grounds, habitat, species or fishing activity likely to be affected.

- Describe proposed efforts to mitigate adverse impacts on any and all of the above; or.

- Demonstrate by a fair preponderance of evidence that no such impacts will result.

(5) The Council shall routinely notify and solicit the opinion of fishing interests regarding any application demonstrating a reasonable probability of effecting knonw fishing grounds.

C. The CRMC will continue in its effort to promote the best fishery management by sponsoring and participating in the Fisheries Task Force and by cooperating will all relevent Marine Fisheries Council and Department of Natural Resources programs and actions.

D. The Council has adopted specific policies regarding fishing ports, the onshore facilities needed to support commercial fisheries (see sections on Ports) and the facilities needed to support marine sport fisheries (see sections on Culture and Recreation).

III. Planning and Funding Policies

A. The CRMC shall continue its policy of sponsoring and financially supporting research and other forms of assistance which promote the growth of the commercial fishing industry.

B. The CRMC shall provide for funding of additional enforcement personnel within the DEpartment of Natural Resources Division of Enforcement as an element of federally approved program. (See Findings and Policies on Enforcement-discussed at March 15, 16 and 27 Public Workshops).

1. Aquaculture Findings

Definition: Aquaculture is defined as the culture of aquatic species under either natural or artificial conditions. It includes but is not limited to fish farming utilizing pens, tanks or impoundments and the culture of shellfish on the sea floor or suspended in the water column.

A. The cultivated oyster industry was once one of the state's most important marine businesses. Recent attempts at aquaculture, using various techniques have been primarily on a small scale and of an experimental nature.

- The Rhode Island cultivated oyster industry peaked in 1910 when 15.3 million pounds of oysters were harvested primarily from some 21,000 acres of leased bottom in Narragansett Bay. The industry declined rapidly for a variety of reasons including a lack of seed oysters, labor problems, poaching and water pollution.

- Recent and on-going aquaculture efforts have met with varying success. Culture techniques include the culture of oysters in coastal ponds and embayments and raising salmonids in tanks on shore.

B. There are proven aquacultural techniques but the technology is for the most part in its infancy. It is unclear which of a variety of techniques might be best suited for Rhode Island.

- Few attempts have as yet been made to culture shellfish on or near the bottom in deep water where use conflicts are minimal.

- It is possible to raise fish in tanks on-shore and salmonid culture has been proved economically feasible. However, major problems stand in the way of commercial enterprise; major obstacles include difficulties in obtaining water discharge permits and disease control among the cultured organisms.

C. Because Rhode Island is a small heavily populated state use conflicts are key problems for prospective aquaculturists. Potential conflicts involve a host of legal issues.

- Many of the most suitable sites for on-shore aquaculture are prohibitively expensive, are zoned for residential use and abut high quality waters which have stringent requirements for discharges.

- Many shallow protected waters in coastal ponds, river estuaries and coves in the Bay are heavily utilized by recreational boaters, and some are highly valued as shellfishing areas. There are therefore few shallow protected areas where use conflicts should not be a major concern for an aquaculturist.

- Legal and institutional issues are a major deterant to potential aquaculturists. These issues include:

    . Interference with traditional fishing rights
    . Interference with riparian rights
    . The costs of leasing an area and guarantees for the renewal of the lease
    . Problems involved in protecting organisms and gear from poaching and other damages if the organisms are cultured in the natural environment
    . The difficulty in obtaining financing and insurance for an aquaculture venture

D. With all of its potential problems, the concept of aquaculture as a viable manner to supplement increasing demands for marine fish and shellfish food products must be recognized.

- Federal interest in aquaculture has increased and could lead to grants to state, local and private agencies for undertaking site suitability studies and experimental aquaculture programs.

- Rhode Island's coastal waters, due to our abundant native shellfish stocks, appear to posess many of the biological and physical parameters necessary for successful aquaculture ventures.

- Present use conflicts may decline somewhat if food supply, energy and transportation costs continue to climb.

- The establishment of depuration and thermal processing techniques may reduce restraints on the utilization for aquaculture of waters classified below SA standards.

II. Management Policies

A. (1) Proposed aquaculture activities in Rhode Island's coastal region and in tidal waters shall require a Council permit.

(2) Applicants for such a permit shall demonstrate by a fair preponderance of evidence that the proposed action:

- Will not conflict with any resources management plan or program as set forth in the Coastal Resources Management Program.

- Will not make any area unsuitable for any uses or activities to which it is allocated by such resources management plans or programs; and/or.

- Will not significantly damage the environment of the coastal region.

(3) Applications shall:

- Describe the location and size of the area proposed.

- Identify the species to be managed or cultivated within the permitted area and over which the applicant shall have exclusive right.

- Describe the method or manner of management or cultivation to be utilized.

- Provide such other information as may be necessary to determine
  - . The compatibility of the proposal with other existing and potential uses of the affected area and areas contiguous to it
  - . The degree of exclusivity required for aquacultural uses of the proposed site

(4) The council shall consult with the Department of Natural Resources and the Maine Fisheries Council to ensure that the proposed project is not in conflict with any fisheries management plan, program or regulation.

(5) In evaluating evidence before it the Council shall take into consideration the effect of the proposed action on:

- The riparian rights of adjacent land owners.

- Nairgation

- Water quality

- Marine and coastal recreation.

- Native coastal and marine life forms.

(6) A Council permit for a proposed aquacultural activity in tidal waters will be in the form of a lease. Such lease shall stipulate:

- Maintenance responsibilities including posting and security.

- Liability

- Duration

- Renewal stipulations and procedures.

- Rents or fees.

(B) Any person who maliciously and willfully destroys, vandalizes or otherwise disrupts aquacultural activities which are the subject of a valid Council permit shall be deemed in violation of an order of the Council and liable to all fines and penalties under law.

I. Minerals Extraction: Findings

A. Commercial minerals extraction in Rhode Island is at present limited to sand and gravel mining and a few small bedrock quarries.

- Sand and gravel deposits are abundant in Rhode Island both on land and on the sea floor in Narragansett Bay and the Sounds. Onshore sand and gravel is extensively exploited and is of critical importance to the construction industry.

- Although land deposits of sand and gravel are abundant, use conflicts will increasingly limit the areas in which extraction may take place. It is therefore possible that within the next 10 to 20 years marine deposits will be proposed as a major commercial source of sand and gravel.

- Hard stone quarrying has been an important industry in Rhode Island. At present, however, only a few small operations are active and there is no quarrying along the immediate shoreline.

B. Minerals extraction may have major and long lasting environmental impacts.

- On land quarrying of hard stone and sand and gravel drastically changes the appearance of the land. Topsoil and vegetation are destroyed and ground water may be effected. Noise, dust and traffic are secondary impacts that are of great concern to neighboring land owners.

- Quarrying along the shore can have dramatic impacts on the supplies of sand and gravel needed to maintain nearby beaches, on the vulnerability of the area to storm damage and on the aesthetic qualities of the area. Along Rhode Island's intensively utilized shoreline there is no area where shoreline mining will not result in a host of use conflicts.

- Ocean sands and gravels are a valuable natural resource in that they form the reservoirs of material from which natural processes replenish the state's irreplaceable sand beaches which have the highest recreational, aesthetic, and environmental value. In both near and offshore waters they support commercially and recreationally valuable populations of shellfish and finfish. In many areas they are crossed by transmission cables and pipelines. The waters over them are used extensively by commercial and recreational craft. Mining of ocean sands and gravel may have any of the following effects on the marine environment:
  - Disruption of natural beach replenishment cycles;
  - Destruction of bottom organisms and disruption of bottom communities;
  - Adverse impacts on finfish;
  - Interference with navigation and recreation.

C. Neither field nor laboratory research has as yet conclusively established the potential for marine aggregate mining to either harm or benefit the marine environment.

- The beneficial and adverse affects of marine aggregate mining upon other established uses of public waters is also unknown.

- Additional research is necessary before marine sand and gravel mining can be properly and effectively managed.

D. Under Title 46, Chapter 23 of the General Laws. the Council is charged to approve, modify, set conditions for, or reject the design, location, construction, alteration and operation of any minerals extraction activity in the State of Rhode Island when this activity is related to an area under the Council's jurisdiction regardless of its actual location. The Council's authority over such activities shall extend to situations in which there is a reasonable probability of conflict with a plan or program for resources management or of damage to the coastal environment.

II. Management Policies

A. (1) Persons proposing to extract mineral resources for any purpose within the State of Rhode Island shall be required to notify the Council of their intention to do so after receiving all other applicable state and local permits.

(2) Notification shall be in writing and shall be submitted at least 120 days prior to initiation of the proposed action. Notification shall describe in words and/or maps the location, nature, size and duration of the action, proposed environmental safeguards and any other information the Council may subsequently request.

(3) Where on the basis of information presented to it in the above notification or by any other source the Council finds a reasonable probability of impacts on adopted resource management plans or programs and/or of damage to the coastal environment it shall require a Council permit to be obtained.

(4) Applicants for such a permit shall be required to demonstrate by a fair preponderance of evidence that the design, location, construction, alteration and/or operation of the proposed action:

1. will not conflict with plans or programs for resources management as these are set forth in the Coastal Resources Management Program; and

2. will not damage the coastal environment.

(5) In evaluating such evidence the Council shall take into consideration the following factors:

1. the capability of coastal resources to support the proposed activity including most particularly impacts associated with noise, site devegetation, alteration of groundwater levels and runoff patterns, contamination of surface and groundwater, erosion, destruction of wildlife habitat and similar occurrences;

2. compatibility of the proposed activity with existing or proposed use of the site or contiguous areas including most particularly impacts associated with noise, dust, traffic or aesthetic quality;

3. compatibility of the proposed activity with applicable local, state and federal plans, regulations or ordinances and standards including most particularly zoning ordinances, municipal plans, the State Guide Plan and water and air quality standards set by the Department of Health;

4. Effect of the proposed activity on transportation facilities;

5. Duration, seasons, days and hours during which the proposed activity will be in operation;

6. Restoration and reuse proposals to be initiated upon deactivization of the proposed activity.

(6) Subsequent to approving any minerals extraction proposal before it the Council shall require the applicant to post a performance bond in a form and amount to be specified in the assent.

B. The mining or quarrying of any material from cliffs, bluffs, wetlands or beaches abutting tidal waters is expressly prohibited.

C. (1) The mining and extraction of minerals, including but not limited to sand and gravel from the territorial waters of the state of Rhode Island, whether by land-based or floating machinery, shall be prohibited until such time as sufficient technical and research data is shown to this Council to prove under what condition said extracting and mining may be carried out without adversely altering the marine environment or conflicting with other use of tidal waters. Council sponsored research is in progress.

(2) This prohibition shall not extend to dredging of tidal waters for navigational purposes, channel maintenance or beach replenishment.

III. Planning and Funding Policies

A. The Council encourages and shall continue to support research into the environmental and economic impact of sand and gravel mining in state waters. It shall modify its management policies regarding this activity if appropriate upon completion of said research.

I. Public Water Supplies: Findings

A. Rhode Island is endowed with abundant freshwater resources. These include both surface water in the form of lakes, streams and reservoirs and groundwater supplies that may be exploited by drilling wells. Sources that are now developed for public water systems meet present needs.

- Approximately 130 million gallons of water a day is supplied by developed sources. These sources supply some 65 percent of the state's population.

- Major groundwater reserves in the coastal region are found in the upper Pawcatuck River area and along the west Bay. No major groundwater reserves with potential as public water supplies have been found on the Bay islands or on the east side of the Bay.

- Much remains to be learned about the size and characteristics of developable groundwater reserves before a full assessment can be made of the volumes and quality of water they could produce on a sustained basis. Investigations on this topic are in progress.

B. According to a 1969 report prepared by the Statewide Planning Program on public water systems, a growing population and a steadily increasing per capita rate of water consumption will require the development of new public water supplies.

- The report states that the per capita rate of water consumption will increase by 1.5 gallons a day each year.

- The report also forecasts continued increases in population and a heavier reliance on public, rather than individual water systems.

- Projections are that by 1990 public water supplies should be capable of providing an additional 67 million gallons per day.

- The 1969 report is now outdated since the rate of population growth has declined and all long range need projections have changed in light of new economic realities.

C. The development of major new water supplies involves a host of environmental and social issues.

- The State Water Resources Board was created by the legislature in 1967 and was charged to develop a comprehensive state water resources program. The Board is empowered to acquire property, construct facilities and approve or disapprove municipal water plans.

- The state Department of Health is responsible for water quality and must approve all public water supply sources and treatment plants.

- Present plans developed by the Water Resources Board include the construction of large inland reservoirs. This involves large tracts of land, relocating the population and flooding the land.

- The realization of large scale plans require a large measure of cooperation among effected towns and large sums of money. Both requirements have to date caused considerable debate and conflict.

D. While water supply in the Rhode Island coastal region is not presently a problem and none of the new reservoirs proposed by the Water Resources Board are in the coastal region, the Council recognizes that water supply is an issue of potentially great future significance.

- It will be necessary to reevaluate both population projections and consumption patterns to obtain an accurate picture of long term public water supply requirements.

- Conservation practices such as recycling and rate manipulation should all be considered for their impact on consumption rates and patterns.

II. Management Policies

A. It shall be the Council's policy to cooperate in any manner possible with the Water Resources Board and other state and municipal bodies involved in public water supply planning as that planning effects or involves the water resources of the coastal region.

B. Where the Council finds a relationship between water resources plans and programs and the resources of the coastal region it shall ensure that such plans and programs are consistent with the Coastal Resources Management Program.

# AGRICULTURE

## I. Identification

Agricultural land is identified as: (1) tilled or tillable land upon which a crop is being or has recently been produced, (2) actively managed orchards, nurseries and cranberry bogs and (3) lands used for livestock pasturing.

## II. Findings

A. New England agriculture has been declining for nearly a century. In Rhode Island land committed to agriculture has been reduced from some ____ acres in 18___ to only ___ acres in 197_.

- Many of the factors involved in this trend are beyond the capabilities of state government to redress. These include:
  - Competition from such other more productive farming regions as Florida, California and the Midwest;
  - Competition for labor from higher paying vocations in commerce and industry;
  - Drastic increases in labor, equipment and general production costs;
  - Increased productivity per acre for prime lands which discourage the continued working of marginal areas.

- Some factors are, however, responsive to management efforts. These include:
  - Tax policies which influence residential or conversion of farm lands;
  - Planning policies and siting criteria for residential and commercial-industrial development.

B. Agricultural lands have a significance which frequently exceeds their direct economic value:

- They are often ground water recharge areas.

- They provide scenic diversity and enhance visual quality.

- Cropland borders provide valuable wildlife habitat.

- Rising transportation costs from out-of-state areas of production are likely to increase demands for locally grown agricultural products.

C. Preservation of agricultural lands is an issue of statewide and not purely coastal significance. Management of agricultural lands must accomodate the statewide nature of the problems and issues involved if it is to properly and effectively address them.

- Agriculutre is not a primary land use in the Rhode Island coastal region.
- Coastal agricultural policies cannot be formulated in isolation .
- Council Management policies and priorities must be formulated in the context of statewide initiatives.

III. Management Policies

A. The Council recognizes that local government has the principal responsibility to plan for manage land use and development, much of which is of local concern only. CRMC, however, encourages and shall endeavor to support local efforts to adopt plans, zoning ordinances and taxation policies that:

- Recognize the social, environmental and economic values of prime agricultural lands.
- Make a distinction in planning, zoning and taxation policies between urban areas (higher and medium intensity development in the coastal region) and rural areas (agricultural and rural/resource land in the plan), based on land capability and availability of public services.
- Channel development away from agricultural land.
- Make maximum utilization of the enabling provisions of the Forest, Farm and Open Space Tax Law (44-27-1, G.L.R.I.) to preferentially tax lands committed to long term agricultural uses.

B. The Council recognizes continued undirected law-density residential development as a major factor in the coversion of prime agricultural lands to other uses.

It finds so called "sprawl," a problem of statewide magnitude and concern, neither unique or indigenous to the coastal region. The Council consequently supports and urges passage of Bill 77H-6299, An act Establishing A State-Local Land Management Program. It finds the Act's purpose, to wit:

- Relating development to physical capabilities of land.
- Relating intensity of development to availability of public service.
- Recognizing the areawide impact to some development decisions.
- Protecting valuable natural resources and areas.
- Reserving suitable sites for needed economic development.
- Providing adequate housing for all residents.
- Improving the visual quality of development.

fully consistent with and supportive of its own planning and management objectives relative to utilization of the state's coastal resources.

C. Pending passage of comprehensive statewide land management legislation, however, the Council finds there is much that it can do on its own authority to protect prime agricultural land from excessive development pressure.

Specifically, through its planning and management responsibilities regarding sewage treatment and disposal related activities and developments within or affecting the coastal region and its resources the Council ~~has~~ will adopt siting policies and criteria for commercial and industrial developments (Policies re' Commerce and Industry will be discussed at June 1 and 2 Public Workshops). These policies and criteria will have the effect of discouraging commercial and/or industiral development of prime agricultural lands.

# FORESTS AND FOREST TRANSITION LANDS

## I. Findings

A. Forests are a major land resource that presently occupy approximately 59 percent (395,300 acres) of Rhode Island's total land area.

- However, only 28% of the state's woodlands are located in the coastal cities and towns.

- Natural reforestation of abandoned fields has resulted in large increases in total forest acreage since the agricultural decline began in late 1800's. However, recent USDA statistics show that total forest acreage has fallen by 8 percent since 1953. At the same time, the total volume of growing stock has doubled. Our forests are thus maturing but decreasing in acreage.

- Wood products from Rhode Island forests include pulp, veneer, firewood, and low grade construction lumber. Careful management can increase the economic value of our forest products, especially in light of rising energy needs and dwindling national supplies.

B. Forests provide important environmental and recreational amenities.

- Hiking trails, state and private camping facilities, sports clubs, hunting areas, etc. are usually situated within forested regions.

- Large forest tracts effectively moderate temperature and winds, and can help reduce air and noise pollution. Forest lands contribute to groundwater retention and check or prevent soil erosion.

- Some species of wildlife are highly dependent on forest ecosystems for breeding and feeding habitat.

- Forests are increasingly needed to provide recreational alternatives to crowded shoreline areas.

C. Abandoned fields and pastures are lands which are in varying stages of transition to a forest community.

- Such undeveloped open lands account for 25,000 acres or 4% of the state's total land area. Nearly 70% of these lands lie in coastal communities.

- Because their cover and vegetative characteristics differ from forest areas, transitional lands provide significant wildlife habitat. They are a land use type which is decreasing as natural plant succession proceeds.

D. Forest preservation and management is not a significant problem in the Rhode Island coastal region. However, the following state controls and programs contribute to preservation and restoration of this resource:

- The Department of Natural Resources regulates burning in forests and open lands.

- Swampland forests are protected and regulated under the provisions of the Freshwater Wetlands Act of 197_ (as ammended).

- The Farm, Forest and Open Space Tax Law provides for preferential taxation of lands committed to long term forest or open space use.

- Council management policies relating to forest preservation the Rhode Island coastal region include:
  - Policies for the protection and aquisition of recreation areas (discussed at March 15, 16 and 30 Public Workshops)
  - Policies for the protection and aquisition of conservation and wildlife management areas (discussed at the above workshop)
  - Policies regarding residential development (discussed at April 11 and 13 Public Workshop)
  - Policies for the siting of major facilities (to be discussed at June 1 and 2 Public Workshops).

- The Council does not at this time find a need to promulgate plans or policies in deletion to those referenced above to ensure preservation and restoration of forests and/or forest transition lands.

# FRESHWATER WETLANDS

## I. Findings

A. Freshwater wetlands are among the most valuable of all natural systems in Rhode Island.

- Approximately 6,000 acres of land in Rhode Island are classified as freshwater wetlands (not including forested swamps). This is less than 1% of the total land area in the state. Over half of these are in the coastal cities and towns, primarily in Washington County.

- Freshwater wetlands are among the most biologically productive ecosystems, comparing favorably with intensively managed agricultural land.

- In addition to their well recognized fish and wildlife values, freshwater wetlands are important in water storage and frequently reduce flooding in low lying areas.

- They frequently have high aesthetic appeal and as undisturbed natural areas enhance outdoor educational and recreational opportunities.

B. Freshwater wetlands can significantly influence coastal waters.

- Negative impacts on coastal waters may result if drainage from wetland areas include toxic materials, organic nutrients, or heavy sediment loads.

- In general, the more inland a freshwater wetland is situated, the greater its chances of assimilating foreign substances or settling suspended sediments before impacting tidal areas.

C. Rhode Island's freshwater wetlands are protected and managed by legislative mandate. Principal state controls included the Freshwater Wetlands Act of 1971 (20-1-18 to 25, G.L.R.I.) and Department of Health water quality controls (46-12, G.L.R.I.).

- The Freshwater Wetlands Act establishes as public policy the preservation of the purity and integrity of freshwater, ponds, streams, rivers, swamps, marshes and bogs.

- The Freshwater Wetlands Act requires A Department of Natural Resources permit for any alteration to the character of a freshwater weland and sets forth standards for unacceptable alteration:
    - Reduction of flood retention and mitigation ability
    - Reduction of groundwater recharge capacity
    - Reduction of water quality
    - Reduction of wildlife habitat or recreational value

- The Department of Health is the state's legislatively designated water pollution control agency. The Department is authorized and charged to:*
    - Prevent, control and abate pollution of the state's waters through appropriate rules and regulations
    - Adopt and modify as necessary water quality standards
    - Regulate discharge of sewage into state waters

- The Department of Natural Resources also undertakes the following management programs relative to freshwater wetlands:
    - Fish and wildlife stocking
    - Marsh construction
    - Waterfowl inventorying
    - Acquisition of wildlife habitat

D. The Council finds that its legislatively mandated responsibility to ensure "that preservation and restoration of ecological systems shall be the primary guiding principle upon which environmental alteration of coastal resources will be measured, judged and regulated" is best discharged through effective implementation of the above described state laws regulations and programs.

III. Management Policies

A. It shall be the Council's policy to cooperate through its own planning, regulatory and permitting actions with the Department of Natural Resources and the Department of Health in implementing, respectively, the provisions of Title 20, Chapter 18 and Title 46, Chapter 12 of the General Laws as expressed by applicable rules and regulations promalgated pursuant thereto.

B. Council Management Policies regarding protection and aquisition or recreation areas, conservation and wildlife management areas, residental development and major facility siting will be implemented with particular concern for their impact on the preservation and restoration of the state's freshwater wetlands.

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*A more detailed description of the Department's powers and duties is included in Pollution Findings and Policies to be discussed at June 13 and 16 Public Workshops.

# WILDLIFE

## I. Findings

A. Rhode Island's wildlife resources are abundant and provide important recreational and economic benefits long recognized by CRMC and other state and private agencies.

- Wildlife, especially waterfowl, deer and rabbits support recreational hunting which supplies considerable revenues to the state in the form of licenses, annunition and arms sales.

  Over $_____ in federal excise tax revenues on arms and annunition have been returned to Rhode Island since 19___ for the acquisition and management of wildlife lands. Approximately 8,000 acres of land have been acquired in this manner, ____% of which are within the coastal region.

- An abundant wildlife resource helps maintaine the attractiveness of the coastal region and is dependent upon adequate environmental diversity and quality.

- Non-game species are the most abundant of our wildlife resource. Songbirds and small mammals are particularly plentiful. Census counts and birdwatching are significant recreational and scientific activities. Rhode Island is more significant to migratory than to breeding waterfowl.

B. Department of Natural Resources' wildlife management programs are designed to maintain healthy populations and to assure that adequate habitats are provided.

- Rhode Island's deer herd is estimated to be between 1200 and 2400 animals and is considered one of the healthiest herds in New England. Washington County and Prudence Island have the highest deer populations in the coastal region.

- Waterfowl hunting is well regulated. Waterfowl management includes programs in waterfowl banding and censuses, wildlife marsh construction, and food plot establishment.

C. Residential and other developments are usurping many acres of wildlife habitat.

- Many wildlife populations are being forced into fewer and smaller areas. This is also causing increased restrictions on traditional hunting practices and recreational pursuits in general.

- While wetlands habitat destruction has slowed, changing land uses in upland regions place increasing pressures on wildlife.

- Species showing the greatest population gains in recent years are those which have readily adopted to suburban and other heavily altered landscape types.

D. The Council finds that the preservation and restoration of the wildlife resources of the coastal region is adequately provided for under existing state programs. These include:

- Department of Natural Resources wildlife management programs including regulation of hunting, seasonal closures, licensing, game breeding and stocking.

- Council Management Policies regarding protection and aquisition of recreation areas, conservation and wildlife management areas, residential development and major facility siting.

- The Council does not at this time find a need to promulgate plans or policies in addition to those referenced above to ensure preservation and restoration of wildlife.

work in Doi's comments on recent R.I. dependence on oil & gas. Coal was more important until '55 (?).

## NATIVE ENERGY RESOURCES

1. Findings

A. A crucial factor in the future of the Northeast is the supply and cost of the energy needed to power industry, heat homes and provide transportation .

- The Northeast is presently heavily dependent upon imported oil.

- The costs of energy are relatively high in the region compared to other parts of the country. This climate is such that energy consumption in industries is also somewhat higher than in many other states. These factors often discourage industries from locating in the region (See Commerce and Industry). Our dependence on foreign oil makes us particularly vulnerable to the uncertainties of world politics.

- Rhode Island at present makes no singificant use of energy resources from within the state's boundareis. Native energy resources do exist, however, and may become of great significance in the future.

B. Reserves of deeply buried low sulfer coal have recently been discovered in the Narragansett Basin.

- Figure 1 summarizes the results of preliminary research in the 900 square mile basin. Some of the most promising sites are in POrtsmouth and Bristol Counties, Rhode Island.

- Preliminary data suggests that the 60 square mile area with the highest potential might contain 90 million tons of mineable coal of which some 15 million tons may lie within Rhode Island.

- The total estimated recoverable reserves are comparable to New England's projected energy demand for 1985 or equivalent to the coal needed to power four large power plants for 50 years.

- Researchers presently feel that the best manner of utilizing this resource may be to gasify the coal in-situ by igniting seams, pressurizing the fire, and removing the gas down seam from the fire. The gas could be used to drive turbines above ground.

- Application for a $3.5 million grant has been filed to fund four years of further research to obtain more accurate data on the size of the resource and then to develop a feasible coal mining program for southeastern New England.

C. Solar energy is presently regarded as a potentially important source of energy that could provide a significant proportion of our energy needs.

- The total solar energy received by the state each year is many times our total annual energy consumption. The problem is that solar energy is diffused and must be concentrated to be usable as an energy source.

- The most practical uses of solar energy are presently home water heating (for domestic and commercial use) and space heating. These two energy uses presently account for some 40 percent of Rhode Island's total annual energy consumption.

- Heating water with solar power is presently competitive with electrical water heating when the initial cost is discounted over approximately 2.5 years.

- The federal government has recently proposed a series of incentives which would encourage the installation of solar water heaters.

- Solar powered home heating has been proved feasible but the technology is not as advanced or as readily available as that needed to provide hot water. The initial costs of installing such a system are high.

D. Wind power may prove to be a significant supplemental source of power in the future but many problems remain to be solved before the feasibility of using wind power as a significant energy source can be evaluated.

- No analysis has been made of the possibility of utilizing wind power throughout Rhode Island. Providence, however, is one of the windiest cities in the U.S. with speeds averaging 10.7 mph over a year.

- Large wind powered electrical generators could interfere with local television and radio reception.

- Wind power is probably most feasible as a supplemental energy source that could be used, for example, in conjunction with solar collectors.

D. Water powered Rhode Island industries in the last century, but this energy source is presently almost entirely unutilized.

- There were 460 water wheels in operation in 1875 but only 4 in 1972.
- Water was used to power textile mills, saw mills, and grist mills. The Pawcatuck, Pawtuxet, Providence and Blackstone rivers were the sites for most water powered industries.
- Although the amount of power that can be produced in Rhode Island from water appears relatively small, water power could again be utilized to power some manufacturing plants and residential buildings.

E. Other native sources of energy include wood, solid waste and geothermal energy.

- As the cost of electricity, oil and gas spiral upwards more and more people are using wood stoves to help heat their homes. Highly efficient stoves are readily available and firewood is relatively inexpensive.
- The Rhode Island Solid Waste Management Corporation is planning to burn sewage sludge and solid waste in a power plant that is expected to produce 2 percent of the state's energy needs by the early 1980's
- Geothermal energy may prove to be a power source for centralized industries and institutions. The technology for using the resource in Rhode Island is in the still experimental phase. The concept is to drill approximately six kilometers down into the earth's crust and to circulate water to the bottom of the hole where it will become heated. The heated water or steam could be used for space heating or industrial process steam. It is unlikely the next 10-20 years.

F. Energy conservation is in itself a major untapped energy resource.

- An alarming proportion of the energy consumed by industrial commercial and residential users in wasted.
- Conservation of energy through more efficient space heating, appliances and building insulation will beome an increasingly important element in the state's energy policy.

- Conservation options and potential must be evaluating as carefully and extensively as development of any other native energy resource.

II. Management Policies

A. The Council shall continue existing cooperative efforts with other state agencies and the Governor's Office in undertaking energy planning and formulating state energy policies.

B. Council Management Policies regarding Ports, Commercial/Industrial and Energy Facility Siting recognize and accomodate state energy needs.

III. Planning and Funding Policies

As an element of an approved Energy Facility Planning grant under new section 305(1b)(8) of the Federal Coastal Zone Management Act and in order to properly identify energy facilities likely to affect the Rhode Island coastal region the Council shall undertake and/or sponsor continued research into the development potential and problems of native energy sources.

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