

**California's
Ocean Related Needs**

**A Study To Determine
The Ocean Related Needs And
To Identify Programs To Meet The Needs**

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By

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A STUDY TO DETERMINE THE OCEAN RELATED NEEDS
AND TO IDENTIFY POTENTIAL PROGRAMS TO MEET THE NEEDS

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For

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PREFACE

This study was carried out as one of the activities of the Sea Grant Institutional Program of the University of California, which was funded by Grant GH-112 from the National Science Foundation. The Sea Grant program (now administered by the National Oceanic and Atmospheric Administration of the Department of Commerce) is intended to foster the better utilization of the resources of the ocean. A Sea Grant Institution is expected to serve the needs of the nation, the state, and the local community - but first it must find out what those needs may be. This study was part of a continuing effort to determine the ocean-related needs of the State of California so that we may make better plans for our future programs.

George G. Shor, Jr.
Sea Grant Program Manager

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I. INTRODUCTION

The purpose of this study was to attempt to provide an answer to each of the following two questions:

1. What are the ocean-related needs of the State of California as expressed by government, people, and industry?
2. What can the Sea Grant Program in California do to assist in the fulfillment of the expressed needs?

The sample of persons chosen for interviews was not a "random" sample from the population of California, but was stratified. We were asked to obtain the views of "... state officials, industrial leaders, local officials, federal agencies, and people who are already carrying on research on ocean-related problems ...". The persons interviewed were all ones who had some reason, by virtue of their positions, to have some concerns about the ocean. Because time was short the sample was necessarily small.

Personal interviews were held with eighty-four persons during July, August, and September, 1971. Of these interviews, seventy-one were used in the tabulations and the remainder as background information. The composition of the sample was: 7 represented Chambers of Commerce; 9 were conservationists; 10 represented regional and local government; 5, universities and colleges; 6, large industry, labor unions, and agriculture; 5, private citizens and consultants; and 29, state and federal government. A complete list of the persons interviewed, the survey questions, forms, et cetera are in the appendices.

A set of questions to elicit the information we felt necessary was devised and utilized in the interviews. Most interviews were tape-recorded and then abstracted onto a standard form so that tabulations

and analysis could be performed. From the interview abstract, a summary statement of each interview was prepared.

Much of the information collected has been compiled into tabular presentations. Tables 1 through 9 contain a compilation of the responses obtained from the 71 interviewees; all additional tabular presentations were derived from the data in Tables 1 through 9. The major portion of analysis was based on the tabulations of needs (Table 1), problems (Table 2), and solutions (Table 3).

The stated needs, problems, and solutions, of the interviewees, were reduced to their key words or phrases; interpretation was therefore necessary for refining the broadly stated needs into the word or phrase keys without losing the interviewee's original intent. Considerable effort was made to retain accuracy in interpretation. Appendix C lists the final "keys" and more fully explains the meaning of each, although the keys are intended to be descriptive in themselves.

We were not asked to cover fisheries in our study because a separate study was conducted of the living marine resources. However, in the process of interviewing, some fisheries information was obtained and has been included and identified as such.

Finally, this study was the first effort of a planned, ongoing program to monitor the expressed ocean-related needs and problems of California and to determine who is working to solve the problems. This report is a condensation of an earlier preliminary report presented to the UC Sea Grant Coordinating Council in November. The conception, planning, interviewing, and the bulk of the analysis were accomplished in two and one-half months with a small, resourceful staff under my direction. The staff members were Jesus Arguelles,

a graduate student in planning at USC; Charles Stuart, a graduate student in economics at UCLA; Christeen Brady who helped with the analysis, tabulated, typed and generally held us together with help from Diane Haskin and John Jostes. They put in a tremendous effort in this limited period, and I thank them. Of course, final responsibility for the study is mine.

II. SURVEY RESULTS

Tables 1 through 9, presented on the following four pages, contain simple tabulations of responses given to the nine major questions asked of each interviewee. For these tables, except in cases where single response questions were asked (Tables 4 through 9), the base number of 71 (interviewees) and corresponding percentages increase due to the multiple responses given. That is, many persons would list more than one need, and therefore, the total number of responses would be greater than 71.

Table

1. WHAT DO YOU SEE AS THE MAJOR OCEAN RELATED NEEDS OF THE STATE OF CALIFORNIA?
(i.e., PEOPLE, GOVERNMENT, INDUSTRY)

NEEDS	NUMBER	PERCENT
1. Planning & Management	40	56
2. Recreation	38	54
3. Preservation & Conservation	27	38
4. Living Marine Resource Use	18	25
5. Pollution Control	16	23
6. Transport	13	18
7. Power Generation	10	14
8. Education & Research	9	13
9. Mineral Extraction	8	11
10. Ecological Knowledge	7	10
11. Water Reclamation	4	6
12. Housing & Commercial Land Use	4	6
13. Employment	1	1
14. Industrial	1	1
15. Population Control	1	1

Table

2. WOULD YOU IDENTIFY THE PRIMARY PROBLEMS IN DEALING WITH THE NEEDS YOU HAVE MENTIONED?

PROBLEMS	NUMBER	PERCENT
1. Lack of Planning & Management	35	49
2. Interest Conflicts	26	37
3. Lack of Knowledge	24	34
4. Private Land Ownership	22	31
5. Lack of Public Education	17	24
6. Pollution	17	24
7. Inadequate Funding	15	21
8. Technological Inadequacies	14	20
9. Inadequate Legislation	8	12
10. Lack of Public Priorities	7	10
11. Degradation of Coastline	7	10
12. Overpopulation	6	9
13. Research Coordination	5	7
14. Lack of Recreational Facilities	4	6
15. Irresponsible Leadership	3	4
16. Local Government Autonomy	3	4
17. Local Government Weakness	3	4
18. Public Fear of Power Generation	3	4
19. Low Economic State of Fisheries	3	4
20. Too Few Regulations	2	3
21. Unsightly Oil Derricks	2	3
22. Lack of Land	2	3
23. Damage by Sea Urchins	1	1
24. Rapidity of Social Change	1	1
25. Politically Weak Conservationists	1	1
26. Too Many Regulations	1	1
27. Lack of Federal Guidance	1	1
28. Lack of Navigation Control	1	1

Table

3. WHAT DO YOU FEEL IS THE BEST WAY TO PROCEED TO A SOLUTION OF THE PROBLEMS YOU HAVE MENTIONED?

SOLUTIONS	NUMBER	PERCENT
1. Planning & Management	52	73
2. Environmental & Technical Research	22	31
3. Public Education	18	25
4. Public Land Ownership	15	21
5. Economic and Legal Research	14	20
6. Coordination of Research	12	17
7. Regional Government Control	12	17
8. Cooperation Among Interest Groups	11	16
9. Determination of Public Priorities	7	10
10. Political Power to Conservationists	6	9
11. Moratoriums on Development	3	4
12. Regulate and Restrict Fishing	3	4
13. Reduce Pollution	3	4
14. Transport	3	4
15. Increased Government Funding	2	3
16. Better Water Quality Control Boards	2	3
17. Private Recreational Facilities	2	3
18. Information Agency	2	3
19. Compensation to Firms	1	1
20. Water Reclamation	1	1
21. Research and Development Incentives	1	1
22. Power Plant By-Products	1	1
23. Discourage the Profit Motive	1	1
24. Population Control	1	1

Table

4. GIVEN THE PROJECTED POPULATION INCREASES IN CALIFORNIA, WHICH OCEAN RELATED PROBLEM IS MOST CRITICAL?

PROBLEM	NUMBER	PERCENT
1. Land Use Planning & Management	12	17
2. Pollution	12	17
3. Recreation	11	16
4. Conservation and Preservation	9	13
5. Population Growth	6	8
6. Research	5	7
7. Land Development	3	4
8. Energy	3	4
9. No Response	10	14

Table

5. GIVEN THE STATE-LOCAL BUDGET CONSTRAINTS, WHICH OCEAN RELATED PROBLEM SHOULD BE ATTACKED FIRST?

PROBLEMS	NUMBER	PERCENT
1. Pollution	12	17
2. Recreation	11	16
3. Land Use Planning and Management	8	11
4. Conservation & Preservation	6	8
5. Land Development	3	4
6. Research	3	4
7. Not Enough Money	3	4
8. Energy	1	1
9. Other	4	6
10. No Response	20	28

Table

6. WHAT, TODAY, IS THE MOST PRESSING PROBLEM FACING THE PEOPLE, LOCAL GOVERNMENTS, AND STATE GOVERNMENT? *

PROBLEMS	NUMBER	PERCENT
1. Economic Conditions	12	17
2. Population Growth/Overcrowding	11	16
3. Land Use Planning and Management	8	11
4. Environmental Awareness/Quality	8	11
5. Bureaucratic Inefficiency	6	8
6. Social Conditions	6	8
7. Adequate Governmental Services	3	4
8. Fiscal Responsibility at All Levels	3	4
9. Resource Allocation	3	4
10. Education	2	3
11. Transportation	2	3
12. General Urban Conditions	2	3
13. Lack of Financing	1	1
14. No Response	4	6

* Many interviewees felt that the same problems face all levels of government and we accordingly aggregated all responses.

Table

7. WHAT, IN THE FUTURE, IS THE MOST PRESSING PROBLEM FACING THE PEOPLE, LOCAL GOVERNMENTS, AND STATE GOVERNMENT?*

PROBLEMS	NUMBER	PERCENT
1. Population Growth/Overcrowding	20	28
2. Environmental Awareness/Quality	8	11
3. Land Use Management and Planning	8	11
4. Bureaucratic Inefficiency	5	7
5. Social Conditions	3	4
6. Economic Conditions	2	3
7. Education	2	3
8. Resource Allocation	2	3
9. General Urban Conditions	2	3
10. Lack of Financing	2	3
11. Transportation	1	1
12. Other	3	4
13. No Response	13	18

Table

8. SHOULD THE SOLUTION OF THE PROBLEM BE UNDERTAKEN BY THE PUBLIC OR PRIVATE SECTOR?

SECTOR	NUMBER	PERCENT
1. Public	32	45
2. Public & Private	31	44
3. Private	1	1
4. No Answer	6	8
5. Makes No Difference	1	1

Table

9. IF THE SOLUTION RESTS WITH THE PUBLIC SECTOR, SHOULD THE EFFORTS TO OBTAIN A SOLUTION TO EACH PROBLEM BE UNDERTAKEN AT THE STATE, REGIONAL, OR LOCAL LEVEL?

LEVEL	NUMBER	PERCENT
1. All Levels	21	30
2. Local	10	14
3. State	8	11
4. State-Regional	8	11
5. Regional	7	10
6. State-Federal	5	7
7. Local-Regional-State	3	4
8. National	1	1
9. County-State	1	1
10. Regional-County	1	1
11. National-International	1	1
12. No Answer	5	7

* See note to Table 6.

III. ANALYSIS

A. The Needs, Problems, and Solutions

The interviewees fall into seven major categories:

1. Chambers of Commerce
2. Conservationists
3. Regional & Local Government
4. Universities and Colleges
5. Large Industry, Labor Unions, & Agriculture
6. Private Citizens & Consultants
7. Government Agencies - State & Federal

By breaking down the responses into these interviewee categories, we are able to detect patterns of response by category.

Table 10 contains the ten most frequently expressed needs and the percentage of interviewees in each category citing the specific need. For example, 89% of conservationists interviewed stated that there exists a critical need for "planning and management" while only 20% of university and college personnel cited "planning and management." In addition to their value as measures of response within a category, these percentages can be used to compare priorities between and among the various categories of interviewees and between and among the three tables, 10 (needs), 11 (problems), and 12 (solutions), so that it is possible to make comparisons and draw relationships such as the following. Relative to all other categories of interviewees, university and college personnel place relatively less emphasis on "planning and management" as a need and considerably more emphasis on "environmental and technical research" as a need. Conversely, Table 12 reveals that university and college interviewees gave "planning and management" top priority as a solution and assigned a low priority to "environmental and technical research" as a solution.

Further analysis, based in part on these tables, is presented in the following section.

Table 10

NEED	CHAMBERS OF COMMERCE	CONSERVATIONISTS	REGIONAL & LOCAL GOVERNMENT	UNIVERSITIES AND COLLEGES	LARGE INDUSTRY, LABOR UNIONS, AGRICULTURE	PRIVATE CITIZENS AND CONSULTANTS	GOVERNMENT AGENCIES - STATE & FEDERAL
1. Planning & Management	43%	89%	40%	20%		60%	72%
2. Environmental & Technical Research	71%	56%	60%	80%	50%	20%	48%
3. Public Education	29%	78%	20%	20%	50%	20%	38%
4. Public Land Ownership	43%	45%	30%	60%	67%		3%
5. Economic and Legal Research	43%	11%	20%	40%	17%	60%	14%
6. Coordination of Research	14%	22%	40%	20%	33%		10%
7. Regional Government Control	14%				33%		24%
8. Cooperation Among Interest Groups	14%		10%	20%	17%	20%	14%
9. Determination of Public Priorities		22%	30%	20%			7%
10. Political Power to Conservationists	14%	22%	10%				10%

Table 11

PROBLEMS	CHAMBERS OF COMMERCE	CONSERVATIONISTS	REGIONAL & LOCAL GOVERNMENT	UNIVERSITIES AND COLLEGES	LARGE INDUSTRY, LABOR UNIONS, AGRICULTURE	PRIVATE CITIZENS AND CONSULTANTS	GOVERNMENT AGENCIES - STATE & FEDERAL
1. Lack of Planning & Management	14%	22%	30%	40%	33%	100%	66%
2. Interest Conflicts	29%	33%	40%	40%	50%	60%	31%
3. Lack of Knowledge	57%	33%	20%	20%		80%	34%
4. Private Land Ownership	29%	44%	70%	20%	33%	20%	17%
5. Lack of Public Education	14%	11%	40%	40%	33%	40%	17%
6. Pollution	43%	44%	40%	40%	17%	40%	3%
7. Inadequate Funding	14%	22%	20%	20%	33%	20%	21%
8. Technological Inadequacies	29%	22%	20%	20%	33%	20%	14%
9. Inadequate Legislation	14%	33%	10%	20%	17%		3%
10. Lack of Public Priorities	43%	11%	10%		17%		3%

Table 12

SOLUTIONS	CHAMBERS OF COMMERCE	CONSERVATIONISTS	REGIONAL & LOCAL GOVERNMENT	UNIVERSITIES AND COLLEGES	LARGE INDUSTRY, LABOR UNIONS, AGRICULTURE	PRIVATE CITIZENS AND CONSULTANTS	GOVERNMENT AGENCIES - STATE & FEDERAL
1. Planning & Management	57%	88%	70%	100%	33%	100%	66%
2. Environmental & Technical Research	86%	33%	40%	20%	33%	20%	17%
3. Public Education		55%	30%	20%	50%		21%
4. Public Land Ownership	57%	22%	10%	20%	17%	20%	17%
5. Economic and Legal Research	14%		20%	40%		20%	28%
6. Coordination of Research	29%		40%	40%	33%		7%
7. Regional Government Control		11%	30%	20%		40%	17%
8. Cooperation Among Interest Groups			40%	20%	17%		17%
9. Determination of Public Priorities	14%	11%	10%				14%
10. Political Power to Conservationists		22%			17%		10%

B. Synthesis of Results

Each of the needs, problems, and solutions can be inserted into one of four general "classes." The fact that this could so easily be done points to an interesting uniformity among the responses. The goal is to discover what the common elements are and, on that basis, to proceed closer to an accurate interpretation of what elements should take priority, how they can do so, and why. This approach produced the conclusion that real conflicts among interviewees are minor (if they exist at all) and, further, that several important other conclusions can be reached from an examination of the total picture.

Using the ten most frequently stated needs, problems, and solutions from Tables 1, 2, and 3 respectively, we obtained the percentage breakdowns by class in Table 13 below. The percentages were based on the total number of stated needs, problems, and solutions in each of the four classes.

Table 13

CLASS	NEEDS	PROBLEMS	SOLUTIONS
Planning & Management	22%	61%	61%
Education & Research	9%	30%	39%
Preservation & Conservation	23%	9%	
Specific Physical*	47%		

* The "specific physical" class includes any need, problem, or solution which is a direct physical requirement such as for food, power, recreation, etc.

Table 13, then, provided the foundation for several important observations.

A premise must first be stated.

We can assume that problems are any hindrance to the fulfillment of a need. Thus, if a solution is implemented, the problem will have been solved and, consequently, the need fulfilled.

Therefore, an examination of the proposed solutions, given the stated needs and problems, should lead directly to a set of recommended actions for the Sea Grant Program in California.

The first two general classes, "Planning & Management" and "Education & Research," were clearly indicated as having highest priority. This result is further supported by what occurred in the last two classes. Any needs or problems which are preservation/conservation oriented are soluble, according to the interviewees, only by the application of wise planning and management and by education and research. For example, "reduce pollution" is not a solution to the pollution problem, but environmental awareness through education and wise management of environmental resources are solutions.

As for the last general class, "Specific Physical," over half the interviewees began by stating that recreation (a specific physical need) is California's greatest ocean-related need. All problems prohibiting the fulfillment of that need, however, result from either inadequate planning and management or insufficient education and research results. Further, no recreational need can be fulfilled without the implementation of those two solutions.

C. Additional Results

The synthesis "discovered" by analysis in the preceding section is well supported by the following additional results. The interview results were examined and frequency counts of specific problem and solution responses to given needs extracted. Tables 14 through 23 contain the specific problems and solutions applicable to each of the ten most frequently cited needs. The number in parenthesis following "specific problems" or "specific solutions" denotes the number of interviewees who provided specific responses.

Table 14

NEED I - PLANNING & MANAGEMENT

Responses		Absolute Frequency
PROBLEMS (28)	1. Conflicts (public vs. private economic interests, resource and land use)	10
	2. Lack of public education, concern, policy, priorities	9
	3. Lack of information and research on physical effects of planning decisions	7
	4. Lack of jurisdictional frameworks and implementation of policy	7
	5. Lack of legal, sociological, and economic research and information	6
	6. Weakness of local officials and local emphasis on autonomy	4
	7. Private ownership of land	4
	8. Lack of money and funding	3
	9. Lack of communication, cooperation	3
	10. Other	12
SOLUTIONS (27)	1. Public education	7
	2. Management system (agency or commission with guidelines and enforcement procedures)	6
	3. Public acquisition of coastal land	5
	4. Coordination, interaction, and compromise between special interest groups	5
	5. Research	4
	6. Land use control	4
	7. Intelligent, coordinated, and responsible planning (such as the COAP)	4
	8. Citizens groups to interact with legislators	4
	9. Legislation	4
	10. Responsible and effective local government	4
	11. Regulations	3
	12. Definition of public interest, goals, and priorities	3
	13. Economic and legal research	3
	14. Other	9

Table 15

NEED II - RECREATION

	Responses	Absolute Frequency
PROBLEMS (28)	1. Private ownership of land and lack of public access	21
	2. Lack of recreational facilities and/or money for such facilities	12
	3. Legislative, political	3
	4. Lack of priorities	3
	5. Conflicting interests	3
	6. Pollution	2
	7. Lack of transportation to recreational facilities and/or population concentrated far from recreational facilities	2
SOLUTIONS (16)	1. Balance between public-private ownership of and/or increased public access through private coastal land	13
	2. Construct more recreational facilities; allocate more money to recreational facilities and/or make more efficient	4
	3. Encourage private development of recreational facilities	1

Table 16

NEED III - CONSERVATION & PRESERVATION

	Responses	Absolute Frequency
PROBLEMS (20)	1. Lack of communication, coordination, cooperation, and compromise among state agencies and special interest groups	6
	2. Overcrowding, overuse, overpopulation	5
	3. Lack of money (especially for preserves)	5
	4. Conflicting interests and conflicting resource and land uses	5
	5. Lack of public education and "legislator education"	5
	6. Lack of care for beaches and coastline	4
	7. Pollution	4
SOLUTIONS (19)	1. Greater public education and concern; the formation of citizens groups	7
	2. Optimum land use control and management system	7
	3. Laws, codes, and regulations	5
	4. Pollution abatement control	2
	5. Conservation commissions and agencies	2
	6. Public acquisition of land on coast	2
	7. Moratoriums on further coastal development	2
	8. Coordination of research efforts	2
	9. Cooperation and compromise among special interest groups	2
	10. Other	4

Table 17

NEED IV - LIVING MARINE RESOURCE USE

	Responses	Absolute Frequency
PROBLEMS (16)	1. Pollution	9
	2. Inadequate technology	4
	3. Overutilization of resources (eg., overfishing)	3
	4. Conflicting interests	3
	5. Lack of data on pollution effects, pollution standards, and species counts	2
	6. Lack of priorities and lack of policy	2
	7. Other	5
SOLUTIONS (12)	1. More environmental research; especially concerning pollution effects and species data	4
	2. Reduce pollution	3
	3. More technical research	3
	4. Public education, citizens groups and public feedback to legislators	3
	5. Management system for ocean resources, industry commissions and agencies	2
	6. Limit entry into fisheries	2
	7. Other	3

Table 18

NEED V - POLLUTION CONTROL

	Responses	Absolute Frequency
PROBLEMS (8)	1. Lack of technology and standards	4
	2. Lack of industrial conformity	2
	3. Lack of public education	2
	4. Conflicting interests (public/private, agency/agency, private/private)	2
	5. Lack of political power for conservationists	1
	6. Lack of policy, priorities, planning	1
	7. Lack of money for water treatment	1
	8. Lack of data on effects of pollutants on the marine environment	1
	9. Lack of goal orientation and coordination of research	1
SOLUTIONS (8)	1. Economic force, regulation guidelines	3
	2. More research	3
	3. Public education	1
	4. Ecology citizens groups	1
	5. Water reclamation and recycling	1
	6. More cooperation among agencies	1
	7. Greater and more effective sewage treatment with simultaneous pollution research	1

Table 15

NEED II - RECREATION

	Responses	Absolute Frequency
PROBLEMS (28)	1. Private ownership of land and lack of public access	21
	2. Lack of recreational facilities and/or money for such facilities	12
	3. Legislative, political	3
	4. Lack of priorities	3
	5. Conflicting interests	3
	6. Pollution	2
	7. Lack of transportation to recreational facilities and/or population concentrated far from recreational facilities	2
SOLUTIONS (16)	1. Balance between public-private ownership of and/or increased public access through private coastal land	13
	2. Construct more recreational facilities; allocate more money to recreational facilities and/or make more efficient	4
	3. Encourage private development of recreational facilities	1

Table 16

NEED III - CONSERVATION & PRESERVATION

	Responses	Absolute Frequency
PROBLEMS (20)	1. Lack of communication, coordination, cooperation, and compromise among state agencies and special interest groups	6
	2. Overcrowding, overuse, overpopulation	5
	3. Lack of money (especially for preserves)	5
	4. Conflicting interests and conflicting resource and land uses	5
	5. Lack of public education and "legislator education"	5
	6. Lack of care for beaches and coastline	4
	7. Pollution	4
SOLUTIONS (19)	1. Greater public education and concern; the formation of citizens groups	7
	2. Optimum land use control and management system	7
	3. Laws, codes, and regulations	5
	4. Pollution abatement control	2
	5. Conservation commissions and agencies	2
	6. Public acquisition of land on coast	2
	7. Moratoriums on further coastal development	2
	8. Coordination of research efforts	2
	9. Cooperation and compromise among special interest groups	2
	10. Other	4

Table 17

NEED IV - LIVING MARINE RESOURCE USE

	Responses	Absolute Frequency
PROBLEMS (16)	1. Pollution	9
	2. Inadequate technology	4
	3. Overutilization of resources (eg., overfishing)	3
	4. Conflicting interests	3
	5. Lack of data on pollution effects, pollution standards, and species counts	2
	6. Lack of priorities and lack of policy	2
	7. Other	5
SOLUTIONS (12)	1. More environmental research; especially concerning pollution effects and species data	4
	2. Reduce pollution	3
	3. More technical research	3
	4. Public education, citizens groups and public feedback to legislators	3
	5. Management system for ocean resources, industry commissions and agencies	2
	6. Limit entry into fisheries	2
	7. Other	3

Table 18

NEED V - POLLUTION CONTROL

	Responses	Absolute Frequency
PROBLEMS (8)	1. Lack of technology and standards	4
	2. Lack of industrial conformity	2
	3. Lack of public education	2
	4. Conflicting interests (public/private, agency/agency, private/private)	2
	5. Lack of political power for conservationists	1
	6. Lack of policy, priorities, planning	1
	7. Lack of money for water treatment	1
	8. Lack of data on effects of pollutants on the marine environment	1
	9. Lack of goal orientation and coordination of research	1
SOLUTIONS (8)	1. Economic force, regulation guidelines	3
	2. More research	3
	3. Public education	1
	4. Ecology citizens groups	1
	5. Water reclamation and recycling	1
	6. More cooperation among agencies	1
	7. Greater and more effective sewage treatment with simultaneous pollution research	1

Table 19
NEED VI - TRANSPORTATION

	Responses	Absolute Frequency
PROBLEMS (7)	1. Pollution from ships (ship-loading and unloading)	3
	2. Lack of loading facilities and lack of land on which to build new ports	2
	3. Conflicts (transportation vs. other land uses)	1
	4. Lack of technology to build deep water ports	1
SOLUTIONS (9)	1. Public acquisition of land	1
	2. Prohibit or restrict coastal highway construction	1
	3. Regulations on ship pollution	1
	4. Build loading and unloading facilities	1
	5. Shipping research and application of such research	1
	6. Coast Guard radar, ship-shore monitoring service	1
	7. Maritime equivalent of F.F.A.	1
	8. Change maritime laws (especially for liability)	1
	9. Offshore floating harbors if feasible	1

Table 20
NEED VII - POWER GENERATION

	Responses	Absolute Frequency
PROBS. (5)	1. Public fear of power plants	3
	2. Inadequate technology	2
	3. Lack of policy and plans for power plants	1
	4. Growing need for power plants	1
	5. Bureaucracy in getting power plants approved and illogical legislation vis-a-vis power plant standards	1
SOLNS. (4)	1. Public education	2
	2. Compromise (in siting of power plants and in the number and characteristics of power plants)	2
	3. Beneficial use of waste heat	1
	4. Moratorium on the future expansion of fossil and nuclear power plants	1

Table 21
NEED VIII - EDUCATION AND RESEARCH

[INSUFFICIENT SPECIFIC RESPONSES FOR THIS NEED]

Table 22

NEED IX - MINERAL EXTRACTION

	Responses	Absolute Frequency
PROBS. (5)	1. Lack of techniques and technology for safe mineral extraction	4
	2. Lack of aesthetic appeal of oil derricks	1
SOLNS. (3)	1. Research for better extraction technology and safer techniques	2
	2. Better controls on ocean mining	1

Table 23

NEED X - ECOLOGICAL KNOWLEDGE

	Responses	Absolute Frequency
PROBS. (5)	1. Insufficient knowledge	5
SOLNS. (3)	1. More research	2
	2. Greater goal orientation in research	1

IV. Conclusion

Given that some interviewees saw independent and conflicting uses of California's ocean-related resources, this in itself leads to the conclusion that some planning and management efforts are needed. The question then to ask is what is required to produce a comprehensive, efficient, equitable plan (including regulations and management systems). The answer is to gather information on the goals to be obtained; that is, some estimate of the desired configuration of resource uses must be made. This study is a first step in determining the goals the people of the state consider desirable. Next, information on the existing system or structure, such as the relationship of the indicators of the goals to the variables and parameters that define the system or model are required. And, finally, we must identify which variables and parameters can be (or those we want to be) changed so that the desired configuration is made a reality.

A. The Role for Sea Grant

Analysis of the preceding tables leads to the conclusion that, according to the interviewees, the Sea Grant Program can take an integral part in the solution of each of the state's ten most often expressed ocean-related needs.

The fulfillment of the state's recreational needs can be aided by pollution abatement; this clearly can fall within the scope of Sea Grant supported research. The need for resource use planning and management could be met by public education and by research into legal, sociological and economic issues inherent in such planning and management schemes in addition to knowledge of the important "hard science" parameters.

Solutions to problems arising from expressed conservation and ecology needs involve public education and coordinated research into pollution control, acceptable levels of pollution, species data, and the nature of ecological systems. The effective utilization of living marine resources requires public education, environmental and species research, and research into efficient methods of exploitation subject to conservation constraints.

Areas of concern where the Sea Grant program can contribute are mentioned over and over. Pollution control and water quality involve research on acceptable emission standards, technology for water treatment and the effects of pollutants on the environment and public education. Transportation and shipping needs may be met through new technology in shipping and cargo landing and deep-water or floating ports. Finally, power, mineral resource and ecological knowledge needs can be met in part by the development of new technology and additional research.

Several patterns were noticed throughout the interviewing which presumably should affect the direction that the Sea Grant effort in California follows. These include the desire for more public education and for more goal oriented research. But more often than this, one notices the same specific research needs mentioned time and

again. The interviewees, who were in more cases concerned with some aspect of planning, either for a governmental agency, for an individual firm, or with a conservation group in a "watchdog" manner, wanted hard information about the ecological, economic, legal and social ramifications of societal decisions. The general need class, "more ecological knowledge and knowledge of impacts on society of ecological change," received more mention than any of the other need classes which were exclusively involved with research.

B. Specific Areas of Suggested Sea Grant Involvement

There are a variety of problems arising from people's conflicting desires for utilization of the coastal zone. The major ocean-related needs of California, expressed by the interviewees are all potentially or actually conflicting with, of course, planning the exception. In this light perhaps the most useful function that the Sea Grant Program can perform is in helping to achieve an "optimal use mix." This would involve a coordinated, where necessary inter-disciplinary, goal-oriented research program. This point cannot be over-emphasized.

To provide the answers needed to attain solutions of California's ocean-related problems it is recommended that the Sea Grant supported coordinated research efforts, at a minimum, include the following components:

1. Ecological and Physical Effects: the answers to these questions are fundamental to the design of a coastal zone use pattern which is compatible, over the long-run, with the natural balance. Included in this research are:
 - a. investigations of the nature of ecological systems;
 - b. species counts;

- c. studies of the effects of different chemical and pollutant environments on individual organisms and ecological systems;
 - d. studies of the effects of physical environmental change (such as construction in coastal areas) on marine eco-systems;
 - e. investigations of physical littoral processes;
 - f. studies of coastal engineering effects and techniques; and
 - g. investigations of the dynamics of ocean mining processes.
2. Economic, Legal, and Social Effects: these institutional and behavior considerations are more useful in the actual planning effort. They involve the questions: what type of use and goal mix do the people want? And how can this mix be efficiently achieved? Specific efforts in this area include:
- a. detailed economic (eg. cost-benefit) analysis of the value and costs to society of specific alternative land and resource uses in the coastal zone;
 - b. economic and legal studies concerned with pollution control regulations, with zoning and development regulations (including possible analysis of the effects and feasibility of special "pollution taxes," "development taxes," and new forms of property taxes);
 - c. legal and economic studies of the issues involved in public acquisition of private land along the coast; and
 - d. sociological analysis of the implications for society of various planning decisions.
3. Public Information and Education: this aspect of potential Sea Grant supported educational activity is necessary for the effective utilization of ecological, physical, economic, legal and sociological research results. Efforts by the educational establishment in California to better educate and inform the general public about the ecological laws and about

the alternative impacts of various planning and resource use decisions are an integral part of a successful program to aid decision makers. Specific suggestions for public education include:

- a. work by education departments at the various public and private universities and colleges to develop literature and reading materials, on an understandable level, for primary and secondary education (this would have to be in conjunction with biology, physical, and social science departments within the individual universities and colleges);
- b. a program of public information by all elements of the educational establishment which could include seminars and public speaking, (again on a level comprehensible to the general public) newspaper articles, television programs, and the encouragement of literature writing, for the general public; and
- c. an extension advisory service to conservationists, developers, industry, planners, and (especially) legislators and other elected government officials.

Finally, one area of public information this last suggestion raises is a policy of participation by the appropriate members of the institutes or organized research units of higher education as expert witnesses at legislative hearings where appropriate.

C. Summary

In summing up the potential role of the Sea Grant Program in California, one point should be reemphasized. Namely, only through a coordinated effort can the programs be of visible, significant assistance to the public. A synthesis of physical and ecological effects with economic, legal, and social implications considered, and public education is vital to the efficient social utilization of the educational - research resources.

To this end, it is further suggested that a permanent office and/or coordinating council be set up to coordinate the Sea Grant effort to better assist the "State" identify, analyze, and resolve its ocean-related problems. This effort should involve periodic meetings of lawyers, planners and social scientists with biologists, chemists, geologists, and other physical and natural scientists. Additionally, a panel of such persons should be set up to interview or discuss problems with individuals in the decision process and to recommend alternative courses of action to resolve the problems.

Finally, it should be stressed that neither "applied" or "basic" research is being promoted here. Goal oriented research, depending on the problem requires varying mixtures of both. Then, just as many have said, "we need balance in the use of the coast;" so too do we need balance within the Sea Grant effort.

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APPENDIX A
LIST OF INTERVIEWEES

APPENDIX A

List of Interviewees

ADAMS, JANET
California Coastal Alliance, Woodside

ADORIAN, VICTOR
Director, Department of Real Estate Management, Small Craft Harbors,
Los Angeles

BALL, DR. RICHARD
Physicist, Rand Corporation, Los Angeles

BARILOTTI, CRAIG
Biological Sciences (Marine Lab), UCSB

BELLTRAMI, ALBER
Secretary, County Court House, Ukiah

BENNETT, JACK
Director, Department of Navigation and Ocean Development, Sacramento

BENSON, JR., FORREST
Acting Assistant Director, U.S. Department of the Interior, Western
Region, National Park Service

BISSELL, HAROLD D.
Manager, COAP Development Program, State Interagency Council on
Ocean Resources, Sacramento

BONDERSON, PAUL
Chief, Division of Water Quality, State Water Resources Board,
Sacramento

BOURNEMAN, JOHN
Audubon Society, Ventura

BRONSON, BILL
Editor, "Cry California", San Francisco

BUCHTER, K.C.
Legal Counsel, Department of Parks and Recreation, Sacramento

CAILLIET, GREG
Underseas Foundation, Santa Barbara, and Marine Biologist, UCSB

CALANO, DAN
Planner, Southern California Association of Governments, Los Angeles

CANNON, KESSLER
Governor's Office, Oregon

CARTER, LEE
Chief, Food Control Development Branch, Department of Water
Resources, Sacramento

CLIFTON, PAUL
Projects Coordinator, The Resources Agency, Sacramento

CLINGMAN, TOM
Ecology Action, Berkeley

COAN, EUGENE V.
Sierra Club, San Francisco

DAVIS, FENELON
Senior Geologist, State Division of Mines and Geology, Sacramento

DEWITT, J.
Assistant Secretary, Save-the-Redwoods League, San Francisco

DOUGLAS, PETER
 Legislative Assistant, Assemblyman Alan Sieroty, Sacramento

FAY, RIMON
 President, Bio-Marine Research Company, Los Angeles

FISHER, CHARLES
 Army Corps of Engineers, Chief Coastal Engineering Branch, Los Angeles

FLITTNER, GLEN
 Marine Science Department, San Diego State College

FORD, FORD B.
 Assistant Secretary, The Resources Agency, Sacramento

GARDNER, BARBARA
 University of Southern California, Sea Grant Program, Los Angeles

GATES, DOYLE
 Manager, Marine Resources, Department of Fish & Game, Long Beach

GAY, THOMAS
 State of California Interagency Council on Ocean Resources

GEOGHEGAN, JOHN K.
 Executive Secretary, Environmental Quality Study Council, Sacramento

GREEN, ARTHUR
 Supervising Highway Engineer, Department of Public Works, Division of Highways, Sacramento

GREENHOOD, EDWARD C.
 Assistant Chief, Marine Resources Branch, Department of Fish & Game, Sacramento

HARVILLE, JOHN
 Pacific Marine Fishery Commission, Portland, Oregon

HLAVKA, GEORGE
 Southern California Water Resources Planning Project, Los Angeles

HAY, JOHN T.
 General Manager, State Chamber of Commerce, Sacramento

HESLEP, JOHN M.
 Department of Public Health, Berkeley

HESS, WILLIAM L.
 Director of Public Works, Del Norte County, Crescent City

HOLM, ROY W.
 City Councilman, Laguna Beach (Orange County)

HUFF, RICHARD J.
 Executive Director, Comprehensive Planning Organization, San Diego County

JOKELA, ART
 County Planner, San Diego County

JONES, BRUCE
 Executive Secretary, California Marine Commission, Sacramento

KAMMER, F. GEORGE
 County Planner, Santa Barbara

KEEN, DR. BERT
 Associate Professor of Geography (Marine), San Diego State College

KRUEGER, ROBERT
 Los Angeles Attorney and Chairman, California Advisory Commission on Marine and Coastal Resources

LABELLE, ERNEST
 Executive Vice President, Long Beach Chamber of Commerce

LARSON, BOB
Statewide Grants and Administration, Department of Parks and
Recreation, Sacramento

LAZIO, LAWRENCE
Owner, Lazio Fishing Company, Eureka

LINSKY, RONALD
University of Southern California, Sea Grant Program, Los Angeles

LIPPS, J.
Professor, Geology, University of California, Davis

LOWRY, STANLEY C.
Executive Vice President, Santa Barbara Chamber of Commerce

MCCRACKEN, F.A.
Southern California Edison Company, Los Angeles

MCINTYRE, JOAN
Friends of the Earth, San Francisco

METCALF, VERSIA
Conservation Director, UAW, Los Angeles

MINNICK, ROY
Cadastral Engineer, State Lands Commission, Sacramento

MONAHAN, MARK
Ecology Center, Berkeley

MOORE, J. JAMILSON
Management Consultant, Modern Management, Los Angeles

MOSS, LARRY
Southern California Representative, Sierra Club, Los Angeles

MYERS, BETTY D.
Manager, Laguna Beach Chamber of Commerce

OLCOTT, HAROLD S.
Professor, Marine Food Science, Institute of Marine Resources,
University of California, Davis

OLSON, CEDRIC
Manager, Redondo Beach Chamber of Commerce

PECK, JIM
Public Relations and Politics Director, Teamsters Union, Los
Angeles

PETERSON, JOHN
Member, California Advisory Commission on Marine and Coastal
Resources and President, Washington Fish and Oyster Company, San
Francisco

PORTER, SAM
Manager, Santa Monica Chamber of Commerce

RIDENHOUR, RICHARD
Sea Grant Program, Humboldt State College, Eureka

RIESE, RUSSELL L.
Academic Programs, Coordinating Council for Higher Education,
Sacramento

ROBB, JOHN
Bechtel Corporation, Member of the CMC and Member of the U.C. Sea
Grant Coordinating Council, San Francisco

SCHENK, JAMES H.
Assistant Manager, State Lands Division, COAP Planning, Sacramento

SEDWAY, PAUL
Planning Consultant, Sedway & Cooke, San Francisco

SIDENBERG, LOIS
Chairman, Get Oil Out, Inc., Santa Barbara

SNOW, GORDON F.
Staff Assistant, Environment Section, Department of Agriculture,
Sacramento

SWEET, JR., CHARLES P.
Project Studies Engineer, Department of Public Works, State Division
of Highways, Sacramento

TAYLOR, GEORGE G.
Chief, Air Sanitation, Air Resources Board, Sacramento

TAYLOR, TOM
San Francisco Chamber of Commerce

THAYER, PAUL S.
Office of Public Information, Berkeley, Co-author of "California's
Disappearing Coast: A Legislative Challenge"

TRYNER, JAMES P.
Chief of Resources and Protection, State Department of Parks and
Recreation, Sacramento

TWEED, PETER
for Lieutenant Governor Reinecke, Chairman, Interagency Council on
Ocean Resources, Sacramento

TWITCHELL, GLENN
Comprehensive Ocean Area Plan, Department of Navigation and Ocean
Development, Sacramento

WARNER, JOAN
Assistant to Ralph Kiser, Manager, Huntington Beach Chamber of
Commerce

WEDDLE, JAMES
Program Officer, Division of Oil and Gas, Department of Conservation,
Sacramento

WEINGAND, ALVIN C.
President, Board of Directors, Get Oil Out, Inc., (former State
Senator), Santa Barbara

WICK, WILLIAM
Sea Grant Program, Oregon State University, Eugene

WILLIAMS, ED
Landscape Architect, San Francisco

WRIGHT, HENRY
Western Oil and Gas Association, Los Angeles

ZIEROLD, JOHN
Sierra Club Lobbyist, Sacramento

APPENDIX B

SAMPLE SURVEY QUESTIONS AND ABSTRACT FORM

APPENDIX B

Sample Survey Questions

NEEDS

1. What do you see as the major ocean related (unfilled) needs of the State of California? (i.e., people, industry, government)
 2. Are there any other needs, actual or potential, which come to mind?
 3. Could you assign priorities to the needs you have mentioned?
- [List needs in order of importance and ask questions 4 - 8 of each need.]

PROBLEMS

4. Would you identify the primary problems in dealing with the (unsolved) needs you have mentioned?
5. Are there any other problems which come to mind with respect to this particular need?
6. Would you rank these problems in terms of immediacy and difficulty.
7. More generally speaking, would you classify these problems as being, say, ones of policy, administration, research, legal, or what?

SOLUTIONS

8. What do you feel is the best way to proceed to a solution of the problems you have mentioned? Do you have a particular (step-by-step) procedure in mind?
9. Should the solution of the problem be undertaken by the public or private sector? (If public)...Do you feel that the effort to obtain a solution to each problem should be undertaken at the state, regional, or local level?
10. What factors have influenced your feelings on this subject - that is, why do you feel the way you do? How strongly?
11. Who is now working on the solutions to these problems?

GENERAL BACKGROUND AND SUMMARY STATEMENTS

12. Given the projected population increases in California, which ocean related problem is the most critical?
13. Currently the state and local governments have an extremely difficult revenue-expenditure problem. Given this constraint, which ocean related problem should be attacked first?
14. What today is the most pressing problem facing the people of the state? facing the local government? facing the state government?
15. What in the future will be the most pressing problem facing the people of the state? facing the local government? facing the state government?
16. [If not discussed during course of interview]...Do you believe that the needs of industry complement or conflict with the needs of the people? Why?
17. Can you suggest anyone else with whom I should talk about the:
a) needs, b) problems, c) solutions.

ABSTRACT OF INTERVIEW

NAME _____ TITLE OR POSITION _____

ORGANIZATION OR AFFILIATION _____

DATE _____ INTERVIEWED BY _____

NEEDS (In descending order)

NEED (1) _____

PROBLEMS (Rank)

Immediacy _____

Difficulty _____

NEED (1) _____

SOLUTIONS

PRIVATE _____

PUBLIC _____ LEVEL _____

COMMENTS:

GENERAL FEELINGS (INFLUENCES):

SOLUTIONS, WHO:

GENERAL BACKGROUND AND SUMMARY STATEMENTS

POPULATION CONSTRAINT:

BUDGET CONSTRAINT:

- continued -

MOST PRESSING PROBLEM NOW:

MOST PRESSING PROBLEM IN FUTURE:

INDUSTRIAL NEEDS VS. NEEDS OF PEOPLE

PEOPLE TO SEE:

INTERVIEWER'S COMMENTS:

INTERVIEWER'S SUMMARY STATEMENT:

NEED (2) _____

PROBLEMS

SOLUTIONS

APPENDIX C

EXPLANATIONS OF NEED, PROBLEM, AND SOLUTION KEYS

APPENDIX C

Explanation of Need, Problem, and Solution Keys

NEEDS (Absolute Frequency Mentioned)

1. PLANNING & MANAGEMENT (40)
planning, decision framework (including economic uses, resources and land uses); management systems, control, and legislation; establishment of use priorities; inventory of economic and non-economic resources
2. RECREATION (38)
recreation and aesthetic including public access to and ownership of parks and open spaces
3. PRESERVATION & CONSERVATION (27)
preservation and protection of beaches, estuaries, and other marine resources; ecological equilibrium; ecological preserves; conservation of marine resources; reverse trend of exploitation of the sea; moratoriums on expansion and/or limits on utilization of marine resources
4. LIVING MARINE RESOURCE USE (18)
living marine resources (kelp, algae, fish) utilization
5. POLLUTION CONTROL (16)
pollution control, water quality, waste disposal
6. TRANSPORT (13)
transportation (ports, harbors, facilities), shipping
7. POWER GENERATION (10)
wise power plant siting; utilization of the ocean as an aid in power generation
8. EDUCATION & RESEARCH (9)
educational coordination of research, exploration; application of technology to potential uses of ocean resources; engineering knowledge
9. MINERAL EXTRACTION (8)
utilization of mineral, oil, and gas resources
10. ECOLOGICAL KNOWLEDGE (7)
more ecological knowledge and knowledge of ecological impacts of decisions
11. WATER RECLAMATION (4)
ocean water reclamation
12. HOUSING & COMMERCIAL LAND USE (4)
human residence and commercial land use
13. EMPLOYMENT (1)
increased employment opportunities
14. INDUSTRIAL (1)
industrial (living marine resources, minerals)
15. POPULATION CONTROL (1)*

PROBLEMS (Absolute Frequency Mentioned)

1. LACK OF PLANNING & MANAGEMENT (35)
lack of policy objectives, goals, coordination of planning; lack of jurisdictional frameworks; administrative bureaucracy; inventories; etc.

* Self-explanatory

2. INTEREST CONFLICTS (26)
conflicting land uses; industry interests vs. private interests vs. public interests
3. LACK OF KNOWLEDGE (24)
insufficient knowledge: physical effects, species data, economic effects, environmental change, etc.
4. PRIVATE LAND OWNERSHIP (22)
lack of public access; traditional "rights" of land ownership
5. LACK OF PUBLIC EDUCATION (17)
lack of communication to public and decision makers from researchers and academia and among all three
6. POLLUTION (17)
inadequate sewage outfall systems; badly constituted Water Quality Control Boards; pollution in general
7. INADEQUATE FUNDING (15)
lack of funds for land purchase, coordination and planning agencies, water treatment, technological research, etc.
8. TECHNOLOGICAL INADEQUACIES (14)
for safe mineral extraction, engineering, food extraction, shipping, power
9. INADEQUATE LEGISLATION (8)
insufficient and/or inadequate legislation
10. LACK OF PUBLIC PRIORITIES (7)
lack of public concern for producing priorities
11. DEGRADATION OF COASTLINE (7)
lack of care for beaches and coastline; overutilization of living marine resources; overconsumption
12. OVERPOPULATION (6)
including imbalance of concentrations, distribution of population
13. RESEARCH COORDINATION (5)
coordination of research; goal orientation
14. LACK OF RECREATIONAL FACILITIES (4)*
15. IRRESPONSIBLE LEADERSHIP (3)
political lip service, lack of political trust
16. LOCAL GOVERNMENT AUTONOMY (3)
opposition of local governments to relinquish authority to higher governmental bodies
17. LOCAL GOVERNMENT WEAKNESS (3)*
18. PUBLIC FEAR OF POWER GENERATION (3)
lack of public acceptance of the need for power generation
19. LOW ECONOMIC STATE OF FISHERIES (3)
lack of consumer acceptance of new fish products; too much sport fishing
20. TOO FEW REGULATIONS (2)*
21. UNSIGHTLY OIL DERRICKS (2)
oil derricks are aesthetically displeasing
22. LACK OF LAND (2)
lack of land on which to construct parks, harbors, etc.
23. DAMAGE BY SEA URCHINS (1)
sea urchins kill kelp

* Self-explanatory

24. RAPIDITY OF SOCIAL CHANGE (1)*
25. POLITICALLY WEAK CONSERVATIONISTS (1)
lack of political power for conservationists
26. TOO MANY REGULATIONS (1)
too many regulations hindering development
27. LACK OF FEDERAL GUIDANCE (1)
lack of federal direction, planning
28. LACK OF NAVIGATION CONTROL (1)
lack of efficient navigation and shipping control

SOLUTIONS (Absolute Frequency Mentioned)

1. PLANNING & MANAGEMENT (52)
supervisory agency (state-wide) to oversee coastal development and regulate its use, control resource allocation and conservation; codes, standards, and regulations for shipping, preservation, pollution control, public access (generally to make private interest conform to public interest); state recreation plan
2. ENVIRONMENTAL & TECHNICAL RESEARCH (22)
more research - ecological, biological, environmental, pollution standards, guidelines; technical engineering, food extraction, mineral extraction
3. PUBLIC EDUCATION (18)
public education to produce greater concern for the environment
4. PUBLIC LAND OWNERSHIP (15)
increased public ownership of coastal land (purchase, condemnation), better use of zoning laws
5. ECONOMIC AND LEGAL RESEARCH (14)
economic research and decision models, includes land inventory and legal research
6. COORDINATION OF RESEARCH (12)
research and application of; more goal oriented, interdisciplinary, coordinated and used in planning
7. REGIONAL GOVERNMENT CONTROL (12)
encourage regional and local land use plans and regionally elected government to enact such plans; change in tax structure to aid in coastal land control to help assure local governments of a voice in state and regional and increased local planning responsibility
8. COOPERATION AMONG INTEREST GROUPS (11)
encourage interaction, compromise, and coordination between special interest groups
9. DETERMINATION OF PUBLIC PRIORITIES (7)
determine public interest, priorities, objectives, policy
10. POLITICAL POWER TO CONSERVATIONISTS (6)
public having expertise in ecology, environment should have input into the political system
11. MORATORIUMS ON DEVELOPMENT (3)
moratoriums on further development, generally, or of the principal offenders such as fossil and nuclear power plants
12. REGULATE AND RESTRICT FISHING (3)
limit entry into fisheries, regulate fishing

13. REDUCE POLLUTION (3)*
14. TRANSPORT (3)
 build loading facilities for shipping (can be floating offshore); ship-shore monitoring services
15. INCREASED GOVERNMENT FUNDING (2)*
16. BETTER WATER QUALITY CONTROL BOARDS (2)*
17. PRIVATE RECREATIONAL FACILITIES (2)
 encourage private development of recreational facilities
18. INFORMATION AGENCY (2)
 information exchange and coordination agency
19. COMPENSATION TO FIRMS (1)
 compensate firms for policies enacted in public interest which may harm them
20. WATER RECLAMATION (1)*
21. RESEARCH AND DEVELOPMENT INCENTIVES (1)
 (for example) tax incentives
22. POWER PLANT BY-PRODUCTS (1)
 use heat waste from power plants to increase fishery efficiency
23. DISCOURAGE THE PROFIT MOTIVE (1)
 (as the sole motive for production)
24. POPULATION CONTROL (1)*

* Self-explanatory