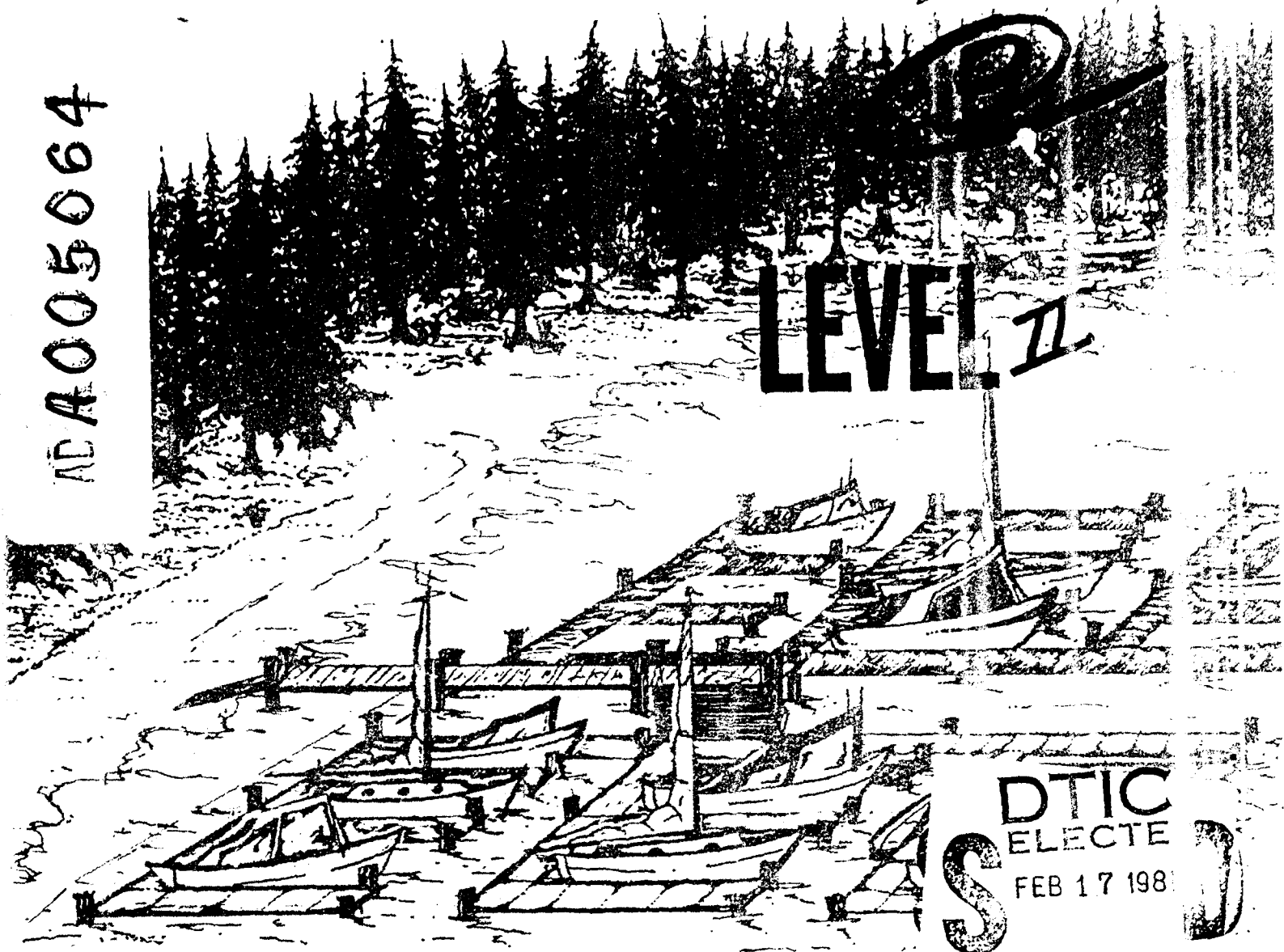


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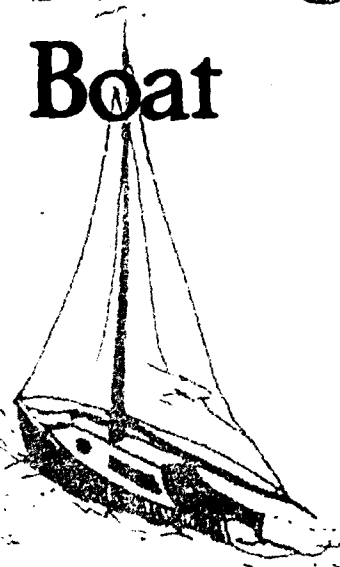
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Recreational Small Boat Moorage Study

Puget Sound
and
Adjacent Waters

Washington



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October 1980

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This update to the 1968 Puget Sound area pleasure boating study projects a near 70% increase in boat ownership in the Puget Sound region between 1980 and 2000. The demand for moorage of all kinds exceeds the capacity of existing facilities. To meet the needs of recreational boating, both public and private investments will be required. The study identifies 142 potential marina sites of which 139 received reconnaissance level design and environmental analysis.		

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Puget Sound
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STATE OF WASHINGTON

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SUMMARY OF FINDINGS

In 1968, the results of a Puget Sound area pleasure boating study were published as a joint effort of the U.S. Army Corps of Engineers and the U.S. Bureau of Outdoor Recreation, in cooperation with the Washington State Department of Commerce and Washington State Parks and Recreation Commission.^{1/*} That study identified a very large need for additional recreation boat moorages and launching facilities. Also identified were sites along the Puget Sound shoreline which had a potential for marine facilities development.

Considerable development of marina facilities has taken place during the past decade. However, lengthy moorage waiting lists at existing marinas throughout the Puget Sound area give testimony to the need for additional moorages. Because of the need for current information for both public and private development planning, Washington State Parks and Recreation Commission requested that the Corps of Engineers update the 1968 study.

This report is an update of the 1968 study and reflects the cooperative efforts of the Corps of Engineers; University of Washington, Institute for Marine Studies; Oceanographic Institute of Washington; U.S. Fish and Wildlife Service; Northwest Marine Trade Association; U.S. Environmental Protection Agency; Washington State Departments of Ecology and Fisheries; U.S. Coast Guard; and others. Information is provided on pleasure boat ownership; wet and dry moorage supply; and demand for permanent, temporary, and transient summer and winter moorages. Potential sites for new marinas were examined, with reconnaissance level studies performed to provide an indication of engineering feasibility and environmental impacts.

Chapter 1 summarizes the report content. Chapter 2 addresses the character of the 12-county study area. Chapters 3 and 4 cover moorage supply and demand, respectively, while potential marina sites are considered in chapter 5 and boat launching facilities in chapter 6. Report appendixes address the questionnaire survey used in the study (appendix A), public and agency comments on the study (appendix B), and agency policies and permit criteria associated with potential marina development (appendix C).

Pleasure boat ownership in the Puget Sound region continues to be high and is projected to increase by nearly 70 percent between 1980 and the year 2000. Interest in boating is reflected in per capita ownership estimates which show that the region has over twice as many boats per capita as the national average.

Demand for transient, temporary, and permanent moorages exceeds the capacity of existing facilities. The 1968 study evaluated the need for equivalent permanent moorages for both the winter and summer seasons.

*Number indicates reference listed in references section.

Based on information obtained for this study, including a questionnaire survey, about 26,400 additional winter rental moorages were needed in 1978, with King County experiencing the greatest moorage deficit. Winter rental moorage needs are projected to rise to over 61,000 by the year 2000 assuming no change in supply over that existing in 1978. Summer moorage demand is greater than winter demand with shortages of summer moorage estimated at about 33,200 in 1978, rising to 76,000 by the year 2000. These estimates of demand reflect moorage rates prevailing at the time of the surveys. Accordingly, substantial relative moorage fee increases could reduce rental moorage demand and its growth. Also, with increasing moorage fees and purchase prices of pleasure craft, an increasing trend in joint boat ownerships is possible.

The majority of boaters using permanent rental moorages desire covered facilities during both summer and winter. There is a substantial demand for launching facilities for trailered boats less than 27 feet long. Although the number of launching sites in the study area has doubled since 1968, the questionnaire survey indicated a continuing need for launch ramps and hoists.

To meet the needs of recreational boating, both public and private investments will be required. Summer moorages can be constructed within the financial capabilities of many private developers, as little breakwater protection is normally required. Additional floats at established marinas will, in most instances, be sufficient to supply the needs of the transient and temporary boater. However, expensive breakwater protection is required for wet moorage marinas operated year round and located along exposed shorelines. The large amount of capital required to construct a suitable protected marina usually limits small boat harbor development to public entities such as ports.

The study identified 142 potential marina sites of which 39 received reconnaissance level design and environmental analyses. These site analyses incorporated input from Federal and state resource agencies and information provided by planning offices of local governments.

For copies of this report or further information on the study, contact:

Navigation and Coastal Planning Section
U.S. Army Corps of Engineers, Seattle District
Post Office Box C-3755
Seattle, Washington 98124

TABLE OF CONTENTS

<u>Chapter</u>		<u>Page</u>
	SUMMARY OF FINDINGS	i
	TABLE OF CONTENTS	iii
1	INTRODUCTION	1
	Authority	1
	Study Need	1
	Scope	2
	Inventory	5
	Questionnaire Survey	5
	Projections	5
	Dry Storage Alternative	6
2	THE STUDY AREA	7
	Physical Features	7
	Marine Related Recreation	7
	Economic Base and Projections	7
3	PLEASURE BOATING	11
	Participation	11
	Seasonal Use	11
	Expenditures	11
	Number of Pleasure Boats	13
	Pleasure Boat Characteristics	18
	Boater Concerns	21
	Pleasure Boat Projections	24
4	PLEASURE BOAT MOORAGE FACILITIES, DEMAND AND NEEDS	29
	Inventory	29
	Marinas	29
	Existing Moorages	29
	Permanent Moorage Demand	29
	Temporary and Transient Moorage Demand	30
	Equivalent Permanent Need	41
	Future Rental Moorage Needs	42
5	MARINA DEVELOPMENT POTENTIAL AND EVALUATION	49
	Site Analysis Limitations	49
	Site Selection Procedure	49
	Sites Considered	53
	Site Design	60
	Site Environmental Evaluation	65

TABLE OF CONTENTS (con.)

<u>Chapter</u>		<u>Page</u>
	Agency Environmental Concerns	66
	Public and Agency Review Comments	66
	Sources of Additional Information	71
6	BOAT LAUNCH RAMPS	73
	Launch Ramp Demand	73
	Launch Ramp Design	75
	GLOSSARY	77
	REFERENCES	81

TABLES

<u>Number</u>		<u>Page</u>
1	Projected Average Annual Growth Rates of Population, Employment, and Personal Income	10
2	Boat-Related Expenses of the Typical Boat-owner, Puget Sound Study Area - 1978	13
3	Pleasure Boats, by Type and Division, Puget Sound Study Area - 1978	15
4	Percent Distributions of Boat Types for the Puget Sound Study Area and the United States	18
5	Pleasure Boat Ownership per 1,000 Population in the Puget Sound Area and the United States	18
6	Distribution of Fuel Use by Boat Type, Puget Sound Study Area - 1978	20
7	Distribution of Pleasure Boats by Hull Material, Puget Sound Study Area	20
8	Change in Boater Attitudes	22
9	Reported Pleasure Boat Damage, Puget Sound Study Area - 1978	23
10	Projected Average Annual Growth Rates of Population and Real Per Capita Income, Puget Sound Study Area, 1978-2000	25
11	Projected Pleasure Boatownership Growth Rates, Puget Sound Study Area, 1978-2000	26
12	Projected Pleasure Boats, Puget Sound Study Area, 1978-2000	26
13	Pleasure Boat Rental Moorages, Puget Sound Study Area - 1978	38
14	Alternative Estimates of Pleasure Boat Rental Moorage Demand, Puget Sound Study Area - 1978	40
15	Estimates of Temporary and Transient Rental Moorage Demand, Puget Sound Study Area - 1978	41

TABLE OF CONTENTS (con.)

TABLES (con.)

<u>Number</u>		<u>Page</u>
16	Pleasure Boat Rental Moorage Need - Summer, Puget Sound Study Area - 1978	43
17	Pleasure Boat Rental Moorage Need - Winter, Puget Sound Study Area - 1978	44
18	Pleasure Boat Types of Rental Moorage Demanded, Puget Sound Study Area - 1978	45
19	Federal and State Agency Input to Initial Marina Site List	52
20	List of Local Agencies Responding to Expanded Marina Sites List	53
21	Use of Boat Launch Ramps by Month and Subarea, 1978	74

FIGURES

1	Puget Sound Study Area, Location Map	3
2	Puget Sound Study Area, 3 Divisions With 12 Subareas	4
3	Projected Population, Employment, and Personal Income (1975 dollars), Puget Sound Study Area, 1978-2000	9
4	Seasonal Boating Activity by Percent of Total Boaters, Puget Sound Study Area - 1978	12
5	Distribution of Powered Pleasure Boats by Type, Puget Sound Study Area - 1978	15
6	Number of Pleasure Boats Per 1,000 Population, Puget Sound Study Area - 1978	16
7	Percent Distribution of Population and Pleasure Boats, Puget Sound Study Area - 1978	17
8	Boat Length and Horsepower, Puget Sound Study Area - 1978	19
9	Projected Pleasure Boats, Puget Sound Study Area - 1978-2000	27
10	Moorage Facilities - North Division	30
11	Moorage Facilities - Central Division	32
12	Moorage Facilities - Seattle Area	34
13	Moorage Facilities - West Division	36
14	Rental Moorage: Existing Supply and Projected Need by Division, 1978-2000	46
15	Rental Moorage: Existing Supply and Projected Need, Puget Sound Study Area, 1978-2000	47
16	Potential for Development - North Division Site Evaluation Matrix	54
	Back Cover Pocket	

TABLE OF CONTENTS (con.)

FIGURES(con.)

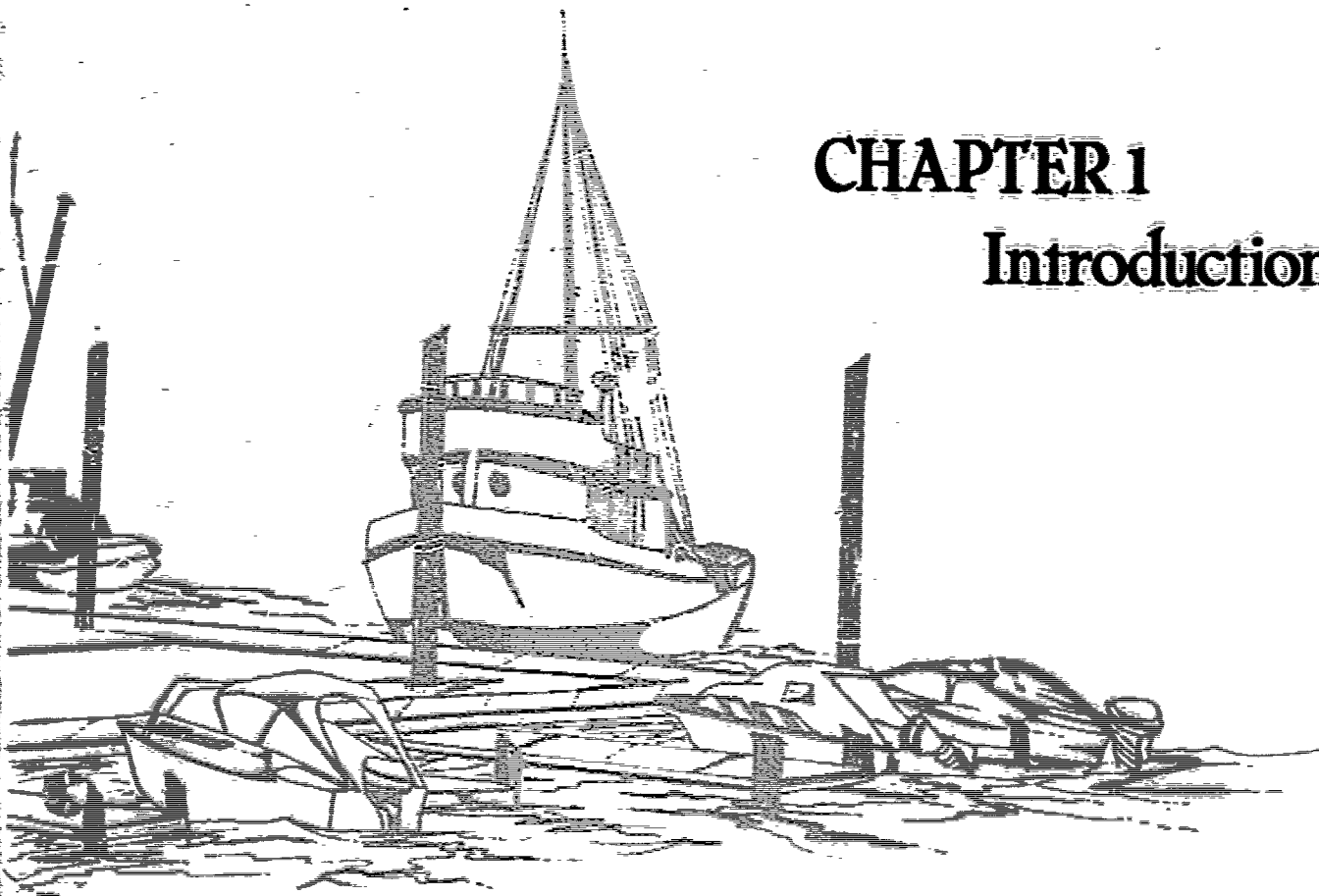
<u>Number</u>		<u>Page</u>
17	Potential for Development - Central Division	56
	Site Evaluation Matrix	Back Cover Pocket
18	Potential for Development - West Division	58
	Site Evaluation Matrix	Back Cover Pocket
19	Rubblemound Breakwater - Conceptual	
	Unit Costs	63
20	Concrete Floating Breakwater - Conceptual	
	Unit Costs	64

APPENDIXES

A	Recreational Boating Questionnaire Survey
B	Correspondence
C	Agency Policies and Programs for Marina Development and Evaluation

CHAPTER 1

Introduction



CHAPTER 1 - INTRODUCTION

Authority

The Recreational Small Boat Moorage Study was conducted under the authority of Section 209 of the 1962 Flood Control Act, Public Law 87-874, which authorized and directed the Secretary of the Army to survey several localities, including Puget Sound, Washington, under direction of the Chief of Engineers. Section 209 was also the vehicle for the U.S. Army Corps of Engineers' participation in the Comprehensive Study of Puget Sound and Adjacent Waters (PS&AW). The Comprehensive Study of Puget Sound was part of a program for comprehensive planning to cover the United States and was approved by Congress as part of the Executive Branch's Fiscal Year 1963 budget. However, the Puget Sound Comprehensive Study, initiated in 1964 and completed in 1971,^{2/*} only identified and recommended action plans and programs to be pursued by individual Federal, state, and local entities, and serves as a guide for subsequent detailed studies. The comprehensive plan was submitted to Congress by the U.S. Water Resources Council through the President's Office of Management and Budget in July 1974. The 1968 Pleasure Boating Study^{1/} was input to the navigation plan which resulted from the comprehensive study.

Study Need

The comprehensive study identified needs for navigation improvements, including small boat basin development. The needs were expressed by a market analysis of moorage facilities in the mid-1960's. The entire shoreline of Puget Sound was examined to locate sites suitable for marina facility development. Shoreline areas appearing feasible for development were noted after considering approach depths, dredging requirements, land access, parking area, and beach material composition.

Subsequent to the 1968 Pleasure Boating Study, Congress passed the National Environmental Policy and the Coastal Zone Management Acts, and the State of Washington enacted the State Environmental Policy and Shoreline Management Acts. This legislation has had a significant impact on shoreline utilization and small boat facility development, which in turn affects the pattern of future boat ownership because of possible moorage limitations. Population growth in the Puget Sound area has resulted in new patterns of residential and industrial uses of land, which also affects the pattern of small boat facility development.

This study was conducted at the specific request of the Washington State Parks and Recreation Commission and various local interests concerned with the need for current moorage related information. The results are intended for use by planners, regulatory agencies, and private investors for guidance in marina shoreline development.

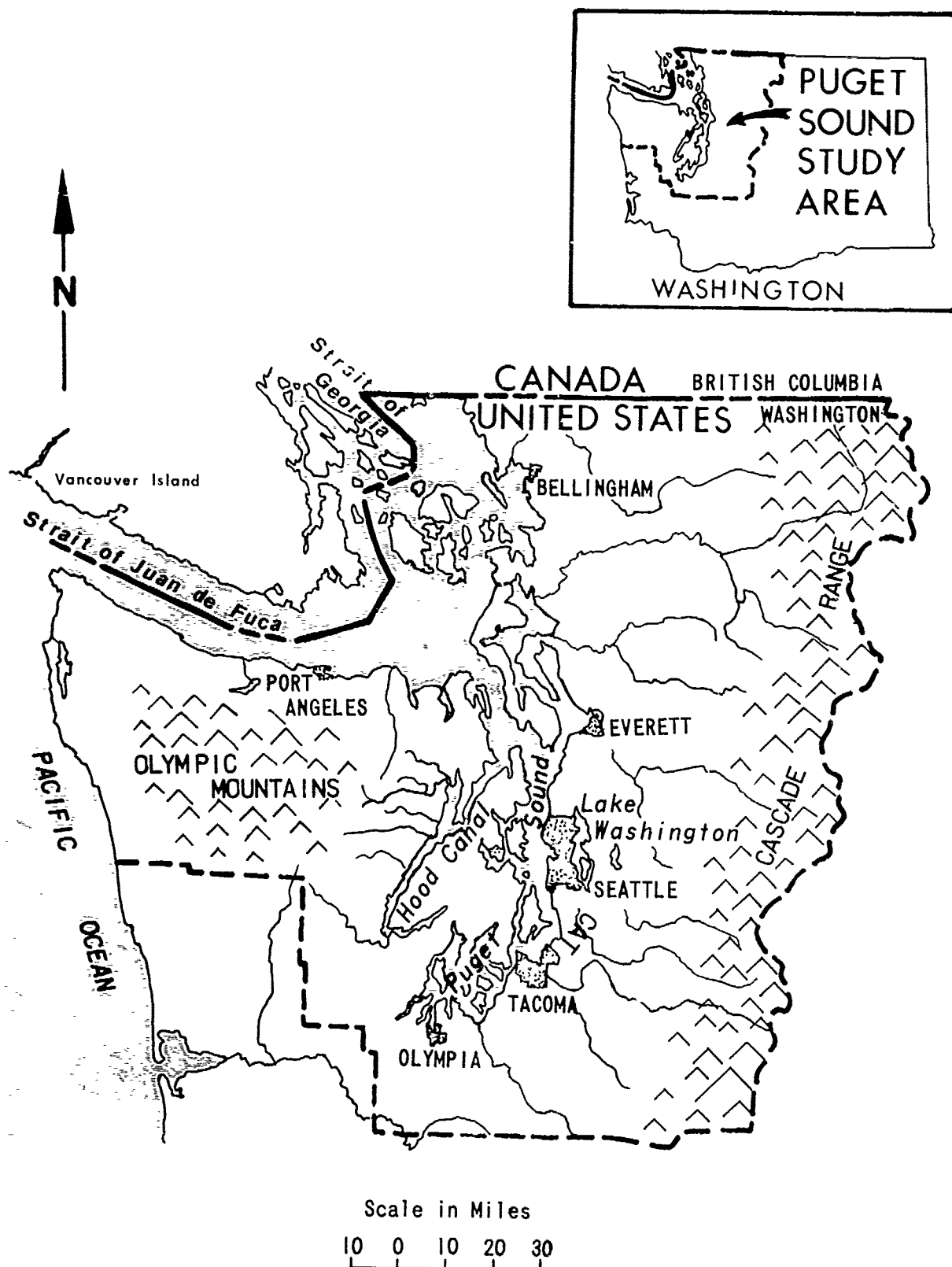
*Number indicates reference listed in references section.

Scope

Chapter 1 summarizes the report content, including a discussion of the recreational pleasure boating questionnaire survey used for the study. Chapter 2 addresses the physical, recreational, climatic, economic, and demographic character of the study area. Because various agency publications provide information on marine parks, public beaches, sport fishing areas, and boat launching ramps, chapter 2 does not cover these recreational areas of interest to the pleasure boater but merely references publications from which these data can be obtained.

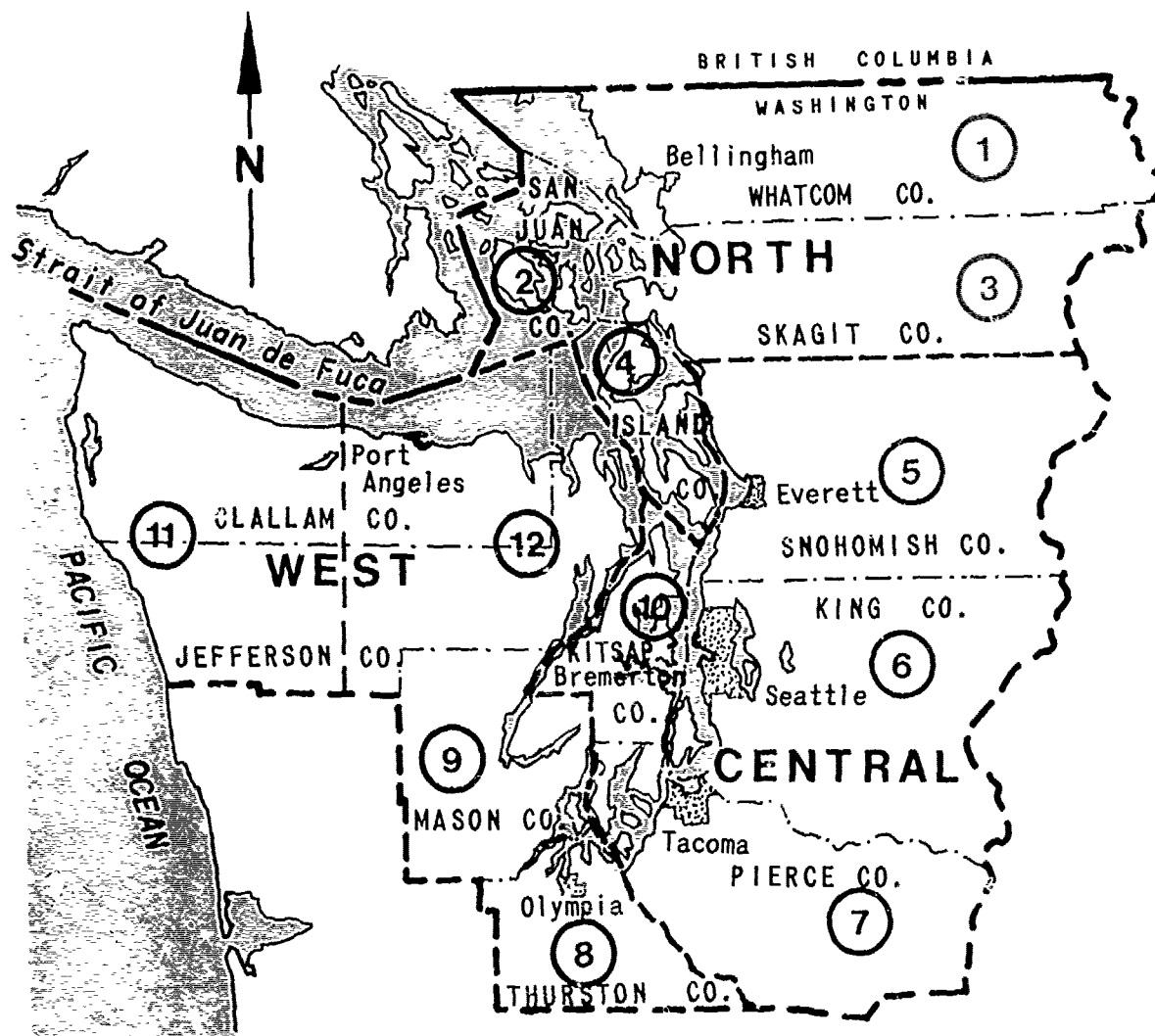
Chapter 3 addresses characteristics of the pleasure boating population, including such items as seasonal participation, boater expenditures, the estimated number of pleasure boats within the study area, selected boat characteristics, and the projected number of pleasure boats. Information is provided on the number and distribution of powered pleasure craft owned by residents of the 12-county Puget Sound study area (figure 1). The relationship of boat ownership to population and distribution of boats is given by three study area divisions: North, Central, and West, which are further divided by county into 12 subareas (figure 2) for a detailed breakdown of facility demand. Characteristics are described of pleasure craft using Puget Sound waters, which for this study also include the Lake Washington Ship Canal, and Lakes Union and Washington. Chapter 4 deals with the present moorage supply and forecasts future moorage demand and needs for the study area. Projections of boat ownership and future demand for moorages are provided for the years 1990 to 2000. Data developed for chapters 3 and 4 was generated, in part, from responses to the questionnaire survey.

Chapter 5 describes design and environmental considerations related to marina planning and offers a conceptual analyses of potential marina sites. More than 140 potential marina sites were considered, with initial screening based upon agency environmental criteria, Washington State Coastal Zone Master Programs, and local land use plans. Those sites which survived the initial screening were given limited, reconnaissance level engineering study for breakwater protection. Information developed on the evaluation of potential sites appears in the fold-out matrixes (see pocket inside back cover). Chapter 5 also summarizes agency criteria and policies associated with marina planning, including a discussion of required marina development permits. Chapter 6 contains information developed from the questionnaire about launching facility demand and design. The 1968 study included detailed assessment of the need for additional boat launch ramps and hoists. However, due to a lack of complete supply data on existing launching facilities, analysis similar to that undertaken for the 1968 study was not possible. Some information on launching facilities is available in a 1978 Oceanographic Institute of Washington (OIW) report.^{3/}



LOCATION MAP
PUGET SOUND STUDY AREA

FIGURE 1



PUGET SOUND STUDY AREA

3 DIVISIONS WITH 12 SUBAREAS

FIGURE 2

A glossary of pleasure boating and marina-related environmental terminology follows chapter 6. The questionnaire survey, its methodology, and a summary of selected results, are contained in appendix A. Appendix B contains copies of pertinent correspondence received during the course of this study. Appendix C contains information on Federal and Washington State agency policies regarding marina development.

Inventory

Data on moorage supply was drawn from an inventory of existing boat moorages compiled by the OIW.^{3/}

Questionnaire Survey

As in the 1968 Pleasure Boating Study, a boating questionnaire survey was undertaken. The questionnaire (see appendix A) was jointly developed by the Corps of Engineers and the University of Washington, Washington Sea Grant Marine Advisory Program. The questionnaire survey for the 1968 study was conducted in 1966 and will be referred to as the 1966 survey. The questionnaire survey developed for the current 1980 study was distributed in 1979 and requested boating information for the 1978 calendar year. The 1978 survey will be referred to as the questionnaire survey.

The questionnaire survey was printed by the Northwest Marine Trade Association and mailed to a randomly drawn sample of registered boaters. In order to increase the number of responses, a followup mailing was sent to those individuals who received the initial mailing.

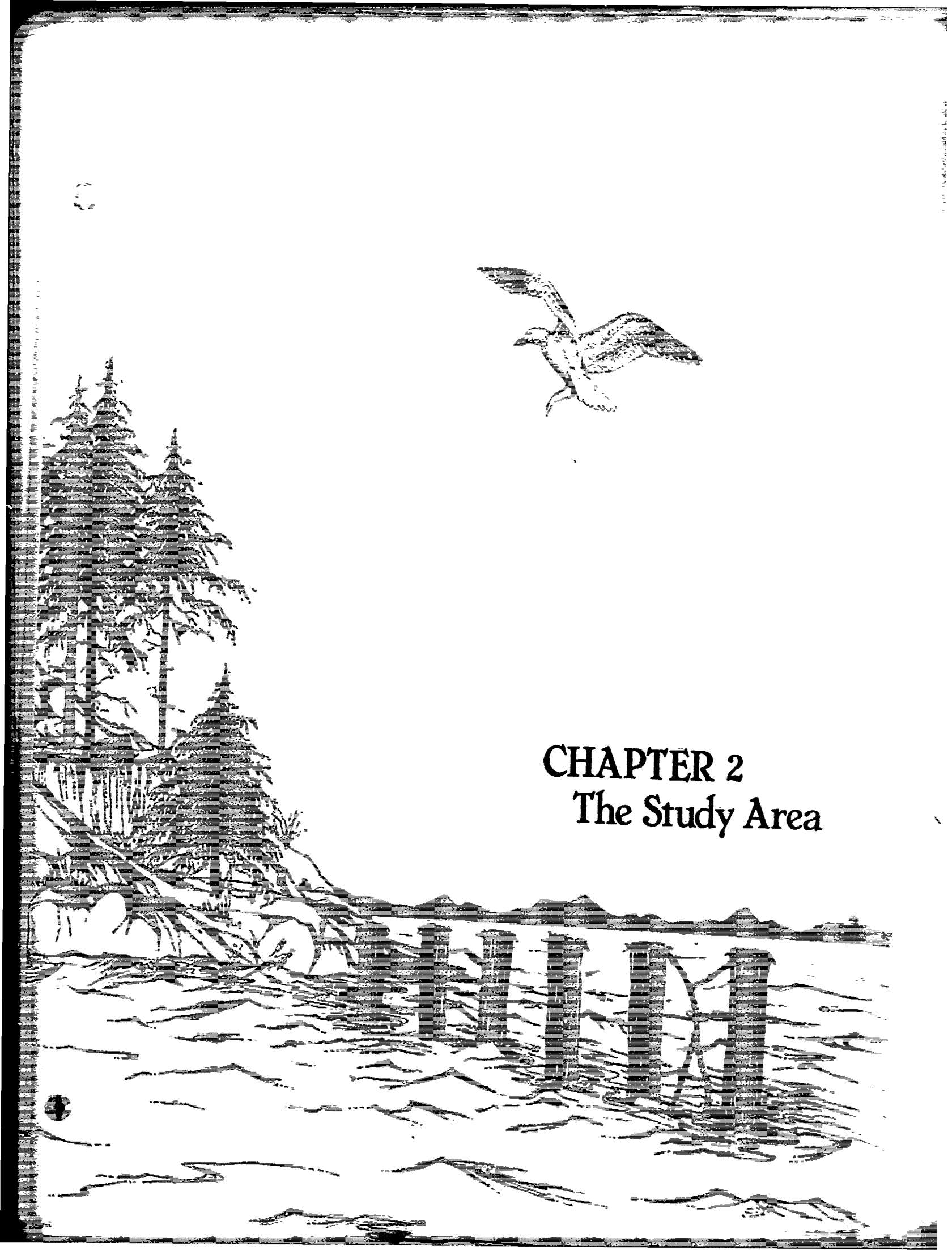
Conclusions about moorage facility demand and needs were based upon data supplied by the returned questionnaires. It was assumed that the characteristics of the boating public sampled were representative of the study area population. The questionnaire survey, its methodology, and summary of selected results are contained in appendix A.

Projections

Historically, growth in the number of recreational boats in an area has paralleled such economic indicators as the increase in population, number of people employed, and their incomes. Based on 1978 economic data and growth rates derived from studies by the U.S. Department of Energy, Bonneville Power Administration (see discussion in chapter 2), estimates were made of 1980 population, employment, and personal income. Projections were then developed for population, employment, and personal income in the study area for the years 1990 and 2000. Based on these forecasts, projections of the number of pleasure boats that can be expected in each division of the study area were prepared. The pleasure boat projections were then used as the basis for estimating the present and future rental moorage need by summer and winter boating seasons.

Dry Storage Alternative

Limited in scope, this study projects wet moorage demand and examines additional wet moorage as a way of satisfying the moorage need. Dryland storage could offset the need in part and should be looked at by planners and developers when doing detailed analysis of a particular site for moorage potential. Dryland storage would be limited generally to boats under 27 feet in length, as larger boats are difficult to launch and retrieve. Additional wetland structures would be needed, such as launching ramps, piers for temporary tieup of craft, and breakwater protection for launching and tieup facilities. To reduce boater waiting time during peak demand hours, it may be necessary to provide backup launching equipment.



CHAPTER 2

The Study Area

CHAPTER 2 - THE STUDY AREA

Physical Features

The study area, located in northwestern Washington, contains 13,200 square miles of land, 800 square miles of freshwater, and 2,500 square miles of inland sea. Approximately two-thirds of the state's population resides in the study area, which has 10 major and 12 minor rivers flowing into Puget Sound, Georgia Strait, and Hood Canal. Nationally recognized for its scenic and recreational values, water transportation, and production of fish, shellfish, and other marine resources, Puget Sound has about 2,350 miles of shoreline and innumerable islands, bays, and inlets which attract extensive pleasure boat cruising. The land area represents about 21 percent of the State of Washington. The area provides productive agricultural land, industrial sites and a transportation network, abundant water supply, and extensive forests. Alluviated river valleys bordered by bluffs and steep hills constitute an important physiographic feature of the Puget Sound lowlands. The lowland valleys, with their mountain valley extensions, contain most of the population, industry, and agriculture in the area.

Marine Related Recreation

The climate, wind, and wave conditions combine to make this inland sea a pleasure to small craft operators and recreationists. Summers are cool and winters mild. Winds are generally light to moderate during the summer, enabling boaters to cruise long distances over open water. Due to the sheltered nature of Puget Sound, waves do not generally exceed 6 feet in height during winter. Summer wave heights are much less. Many fine state shore and marine parks and public beaches are accessible to the Puget Sound boater. Limited boating facilities have been developed throughout the area to accommodate both pleasure boaters and commercial fishermen. For additional information on boater outdoor recreation opportunities, refer to the Washington State Parks and Recreation Commission's Outdoor Recreation Guide,^{4/} the Fishing and Hunting News publication Puget Sound Fishing Map,^{5/} and the Washington State Department of Natural Resources publication Your Public Beaches.^{6/}

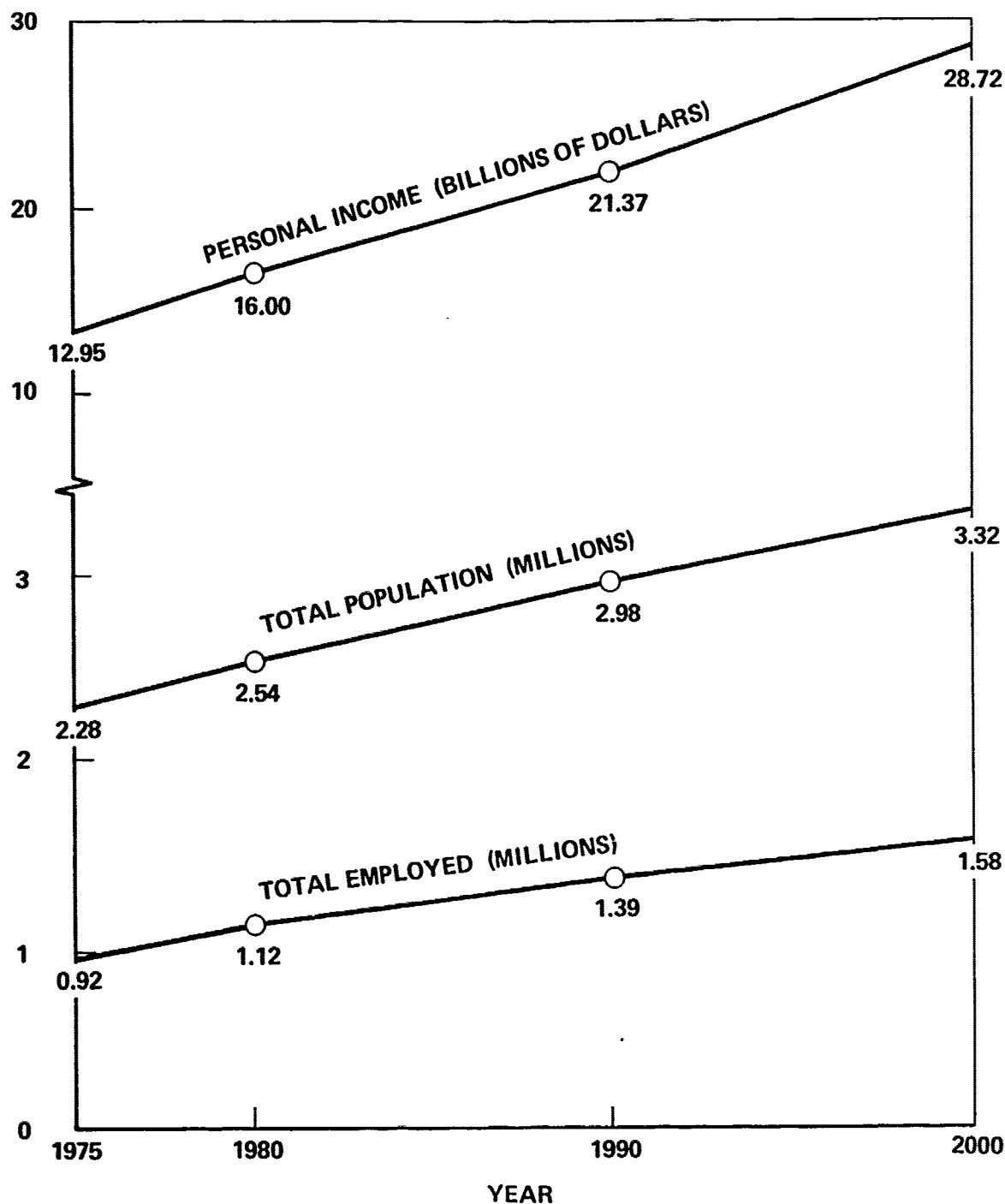
Economic Base and Projections

The 12-county study area has exhibited consistent growth since 1960 when 1.77 million persons resided in the area. In 1970, population had increased to 2.24 million. By 1975 the study area contained approximately 2.28 million people, 64.5 percent of the state's population of 3.53 million. Most of the population, 1.93 million persons in 1975, was concentrated in King, Pierce, and Snohomish Counties which underlie the Seattle-Tacoma-Everett metropolitan area. There were also significant population concentrations in Whatcom, Kitsap, and Thurston Counties. The population of the area has been attracted, and remains, not only because of the available economic opportunities, but because of the

region's appealing natural environment and moderate climate. This environment is conducive to participation in many outdoor and water-oriented recreation activities. In addition, there are significant cultural and educational opportunities, particularly in the Seattle-Tacoma-Everett metropolitan area.

The economy of the study area has also undergone substantial change in the last few decades. The economy has changed from essentially an agriculture and lumber products base to a more diversified base. Much of that change has occurred over the last decade with employment growing steadily and more rapidly than population as a result of substantial entry of women into the labor force. As expected, employment in the study area is concentrated in King, Pierce, and Snohomish Counties which contain the bulk of the manufacturing employment, primarily aerospace and other transportation equipment industries which manufacture aircraft, trucks, ships, and railroad cars. Most of the employment expansion over the last decade has resulted from growth of such nonmanufacturing industries as wholesale and retail trades; finance, insurance, and real estate; and various other business and professional services. A large proportion of the employment in these categories was directed toward satisfying the demands of local population and visitors for recreation-related goods and services. The pattern of employment increasing faster than population and the rapid growth of nonmanufacturing employment were consistent with national trends and are expected to continue in the future.

Figure 3 presents future growth in population, employment, and personal income expected in the study area. Table 1 compares this growth with that expected for the United States as a whole.^{7/8/} Population in the study area is expected to grow from a 1975 total of 2.28 million people to 3.32 million by 2000. As indicated in table 1, this would imply a modest average annual growth rate. The principal reason for this slow growth is expected low birth rates. The study area population is, however, expected to grow more rapidly than the nation as a whole due to immigration resulting from expected employment opportunities and environmental quality factors. As in the recent past, employment in the area is expected to grow more rapidly than population, rising from 0.92 million in 1975 to 1.58 million in 2000. Employment growth in the study area is expected to be more rapid than that for the nation. After a decade of adjustment in the 1980's to energy and other resource scarcity, a return to moderately increasing growth in real per capita personal income is expected both in the study area and for the nation. Consequently, total personal income (in 1975 dollars) in the study area is expected to grow from a 1975 level of \$12.95 billion to \$28.72 billion by the year 2000. The trends in population, employment, and personal income usually reflect the economic health of an area. These trends, when converted to average annual growth rates, may be used as indicators of future economic conditions such as manufacturing, sales, purchases, and recreation expenditures.



PROJECTED POPULATION, EMPLOYMENT, AND PERSONAL INCOME
(1975 DOLLARS)
PUGET SOUND STUDY AREA, 1978 - 2000

Figure 3

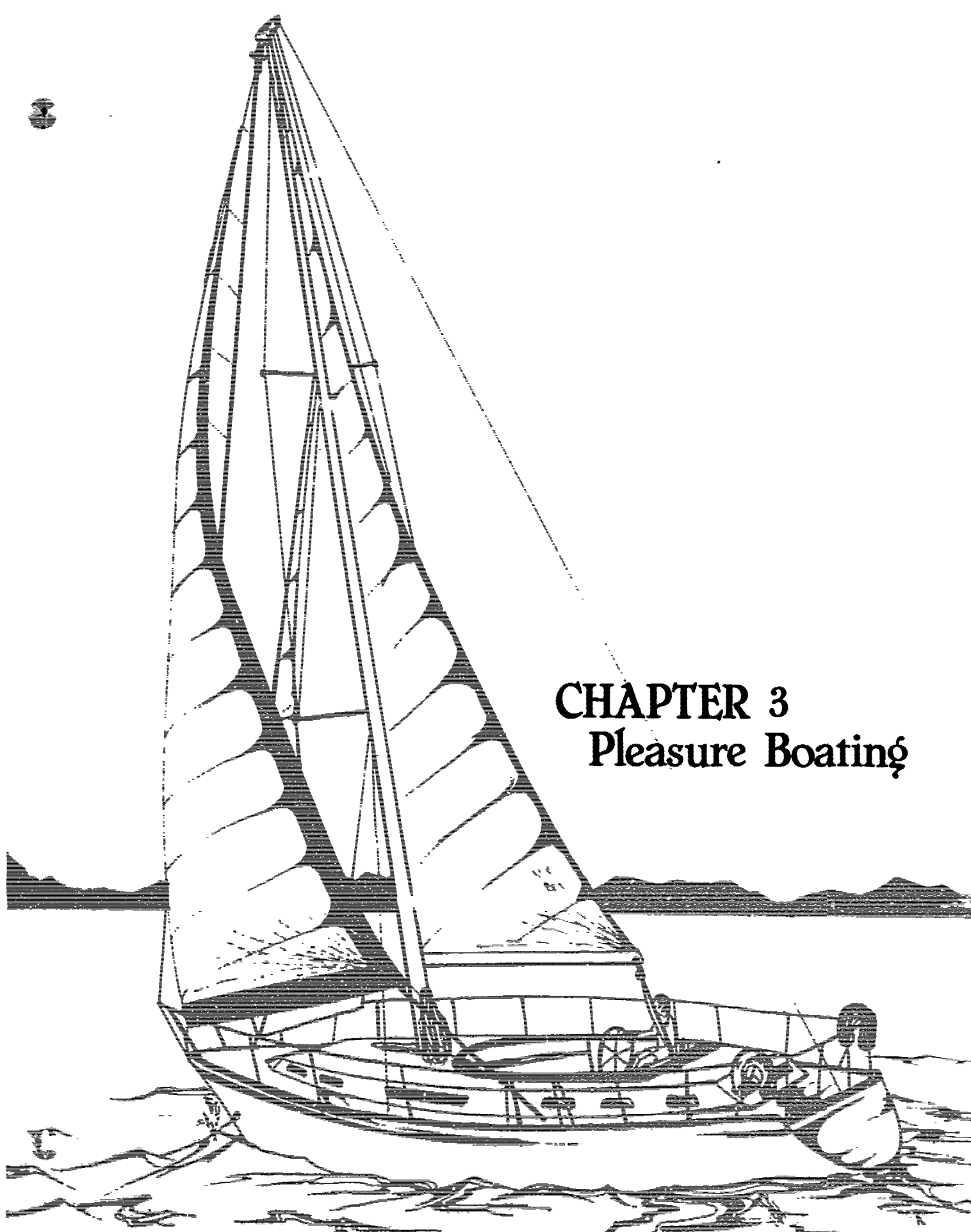
Sources with extensions to the year 2000 by the Seattle District, U.S. Army Corps of Engineers: See 7/ and 8/ in references section.

Table 1

Projected Average Annual Growth Rates
of Population, Employment, and Personal Income.

	Puget Sound Study Area (%)	United States (%)
<u>Population</u>		
1975-1980	2.2	0.8
1980-1990	1.6	0.9
1990-2000	1.1	0.6
<u>Employment</u>		
1975-1980	4.0	2.3
1980-1990	2.2	1.5
1990-2000	1.3	0.9
<u>Personal Income (adjusted for inflation, 1975 dollars)</u>		
1975-1980	4.3	2.9
1980-1990	2.9	2.2
1990-2000	3.0	2.5

Sources with extensions to the year 2000 by the Seattle District,
U.S. Army Corps of Engineers: See 7/ and 8/ in references section.



CHAPTER 3

Pleasure Boating

CHAPTER 3 - PLEASURE BOATING

Participation

As Washington State does not have a mandatory boater registration law, estimates of the Puget Sound area boating population were derived from U.S. Coast Guard data. The Coast Guard registers recreational boats operating in navigable waters of the United States under the auspices of the Federal Boating Safety Act of 1971. Data on registered craft is computerized and not generally available to the public. However, the Coast Guard does compile recreational boating data, which is published in annual documents similar to the 1977 Boating Statistics report.^{9/}

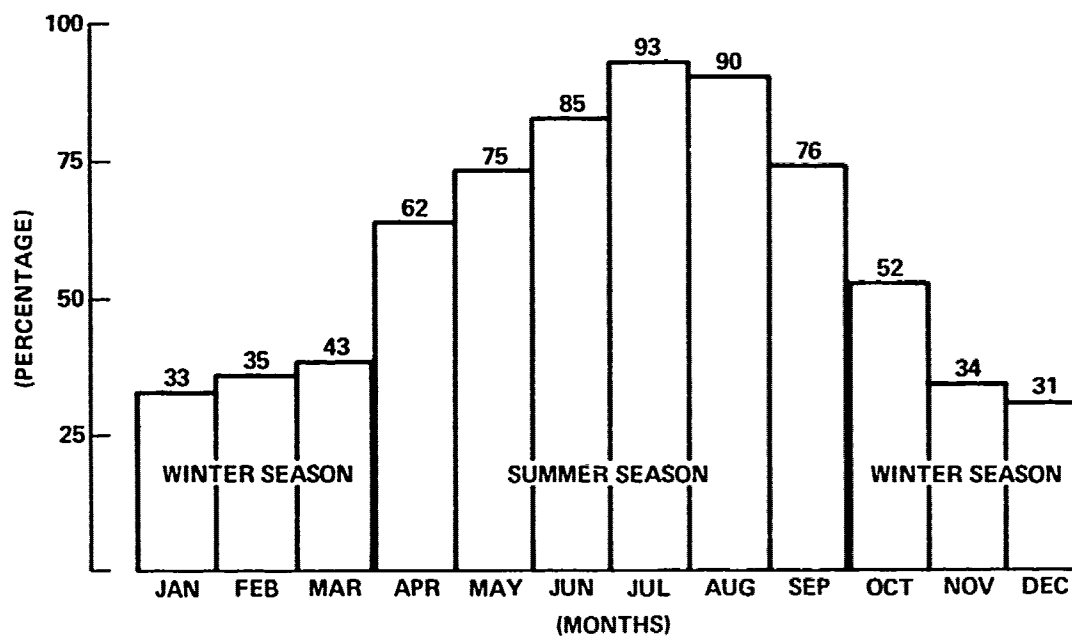
The Coast Guard computerized tape of 1978 registered Washington State boaters was used for this study. From the list of approximately 134,000 registered craft in the state, 99,192 boats were found to be owned by persons residing within the study area.

Seasonal Use

Puget Sound and adjacent waters offers an ideal boating environment with a moderate climate and year-round, ice-free waters. Figure 4 depicts boating activity by month. During the April through September summer season, at least 62 percent of boatowners use their craft once each month. During the October through March winter period, at least 31 percent of owners use their craft each month, attesting to the mild winters. The questionnaire survey results also showed that a substantial proportion of boatowners use their craft outside the study area, particularly during the summer months, and some boatowners charter or loan their craft to others. Overall, the survey data provides strong evidence of the important role of recreational boating throughout the year.

Expenditures

The typical boatowner had boat expenses (other than boat depreciation or mortgage payments) ranging from \$1,075 to \$2,665 in 1978 according to the questionnaire survey. Table 2 provides a breakdown of those expenses. Moorage and storage expenses represented the greatest cost. As might be expected, the survey indicated that maintenance and repairs; accessories, including navigation and communication equipment; insurance; and fuel and lubricants comprised the next largest expenses for the boatowner.



**SEASONAL BOATING ACTIVITY BY PERCENT OF TOTAL BOATERS
PUGET SOUND STUDY AREA - 1978**

Figure 4

Source: 1978 Corps of Engineers Questionnaire Survey Results

Table 2
Boat-Related Expenses of the
Typical Boatowner
Puget Sound Study Area - 1978

<u>Expense Item</u>	<u>Range of Expenses</u>
Insurance	\$135 - \$241
Moorage and Storage	146 - 631
Launch and Ramp Use	8 - 35
Fuel and Lubricants	160 - 229
Accessories, Including Navigation and Communication Equipment	146 - 356
Maintenance and Repair	231 - 563
Groceries and Beverages Consumed on Board	113 - 212
Tolls and Fees for Ferries, Bridges, and Campgrounds Associated with Boating	14 - 57
Automobile Expenses Associated with Boating	98 - 187
Other Boating Expenses	<u>24 - 154</u>
Totals	\$1,075 - \$2,665

Number of Pleasure Boats

There was no data source on the current number of total powered pleasure boats in the study area. Consequently, the following indirect method was adopted to derive the estimate of 151,000 pleasure boats shown in table 3:

<u>Step 1</u>	Number of boat trailers registered with Washington State (119,086)		
	divided by	=	Estimated total
	percent of boats trailered in state, from questionnaire survey (0.581)		number of pleasure boats in state (204,967 trailered and non- trailered)

Step 2 Estimated total number of pleasure
boats in state (204,967)

divided by	=	1.526 or 52.6 percent
total number of pleasure boats registered with U.S. Coast Guard in state (134,354)		more powered pleasure boats estimated in state than listed in Coast Guard register for the state.

Step 3 Total number of pleasure boats
registered with Coast Guard in study
area (99,192)

multiplied by	=	Estimated total number of pleasure boats in study area (151,000).
ratio of the total number of estimated pleasure boats in the state to those registered by the Coast Guard (1.526)		

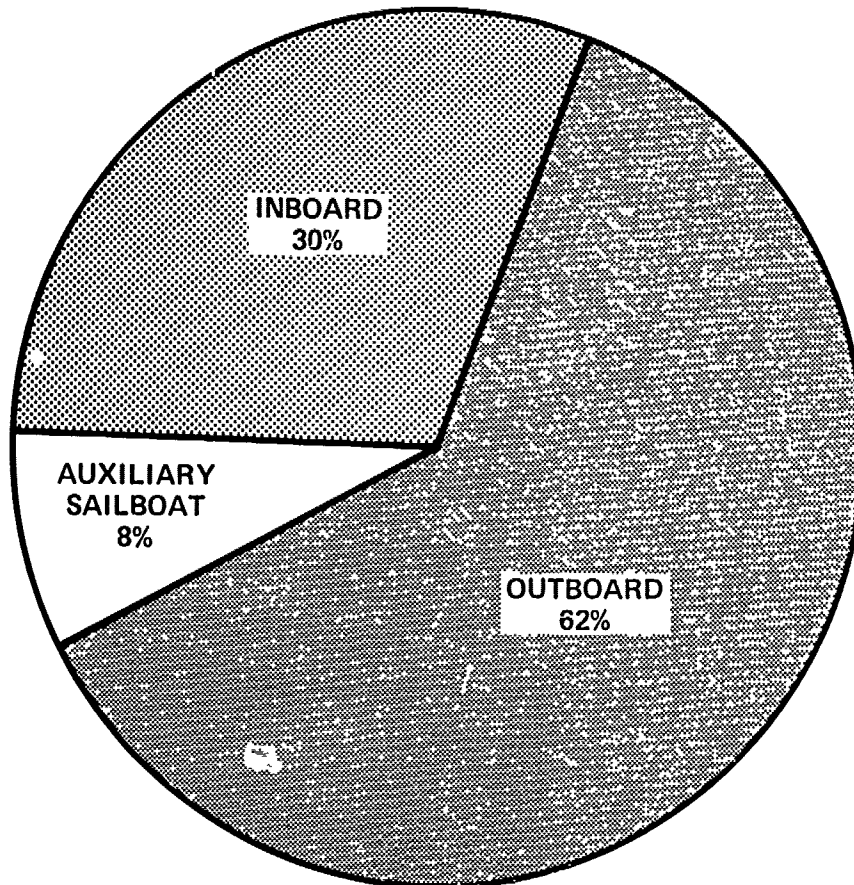
Sailboats without power and miscellaneous other craft such as row-boats, canoes, and rubber rafts were excluded from the estimates.

As shown in table 3, the total estimated number of boats for the study area is made up of 16,800 craft in the North Division (11 percent), 115,000 in the Central Division (76 percent), and 19,200 in the West Division (13 percent). Based on the questionnaire survey, 45,300 of these craft are estimated to be inboard powered, 93,600 outboard powered, and 12,100 auxiliary powered sailboats. There has been a significant shift in the relative importance of boat types in the study area since the 1966 survey. At that time the estimated breakdown among the three boat types was inboards 16.0 percent, outboards 82.8 percent, and auxiliary powered sailboats 1.2 percent. In 1978, according to the questionnaire survey, 30.0 percent of the craft were estimated to be inboard powered, 62.0 percent outboard, and 8.0 percent auxiliary powered sailboats as indicated in figure 5. From 1966 through 1978, inboards and auxiliary sailboats significantly increased their shares while the number of outboards decreased.

Table 3

Pleasure Boats, by Type and Division
Puget Sound Study Area - 1978

<u>Division</u>	<u>Inboard</u>	<u>Outboard</u>	<u>Auxiliary Sailboat</u>	<u>Total</u>
North	5,100	10,400	1,300	16,800
Central	34,500	71,300	9,200	115,000
West	<u>5,700</u>	<u>11,900</u>	<u>1,600</u>	<u>19,200</u>
Total	45,300	93,600	12,100	151,000



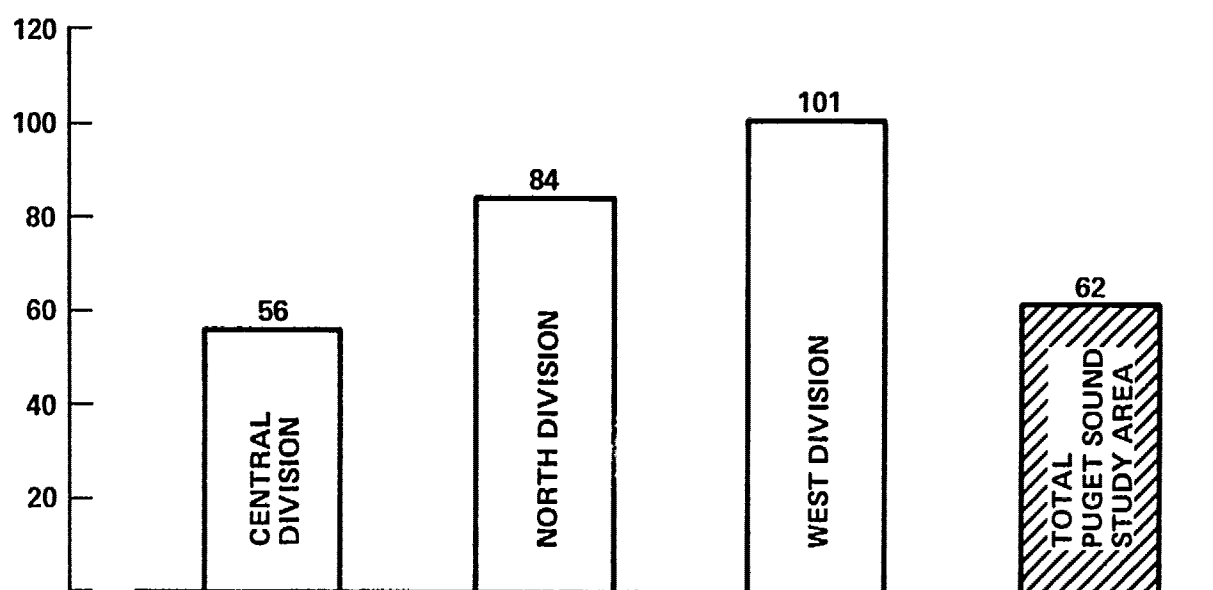
DISTRIBUTION OF POWERED PLEASURE BOATS BY TYPE
PUGET SOUND STUDY AREA - 1978

Figure 5

Figures 6 and 7 show the relationship between population and pleasure boats in the study area divisions (figure 2) in 1978 based on the questionnaire survey. Figure 6 indicates that the West Division had the highest relative concentration of pleasure boats while the Central Division had the lowest concentration. Figure 7 further displays the relationship of population to pleasure boats distributed for the three divisions.

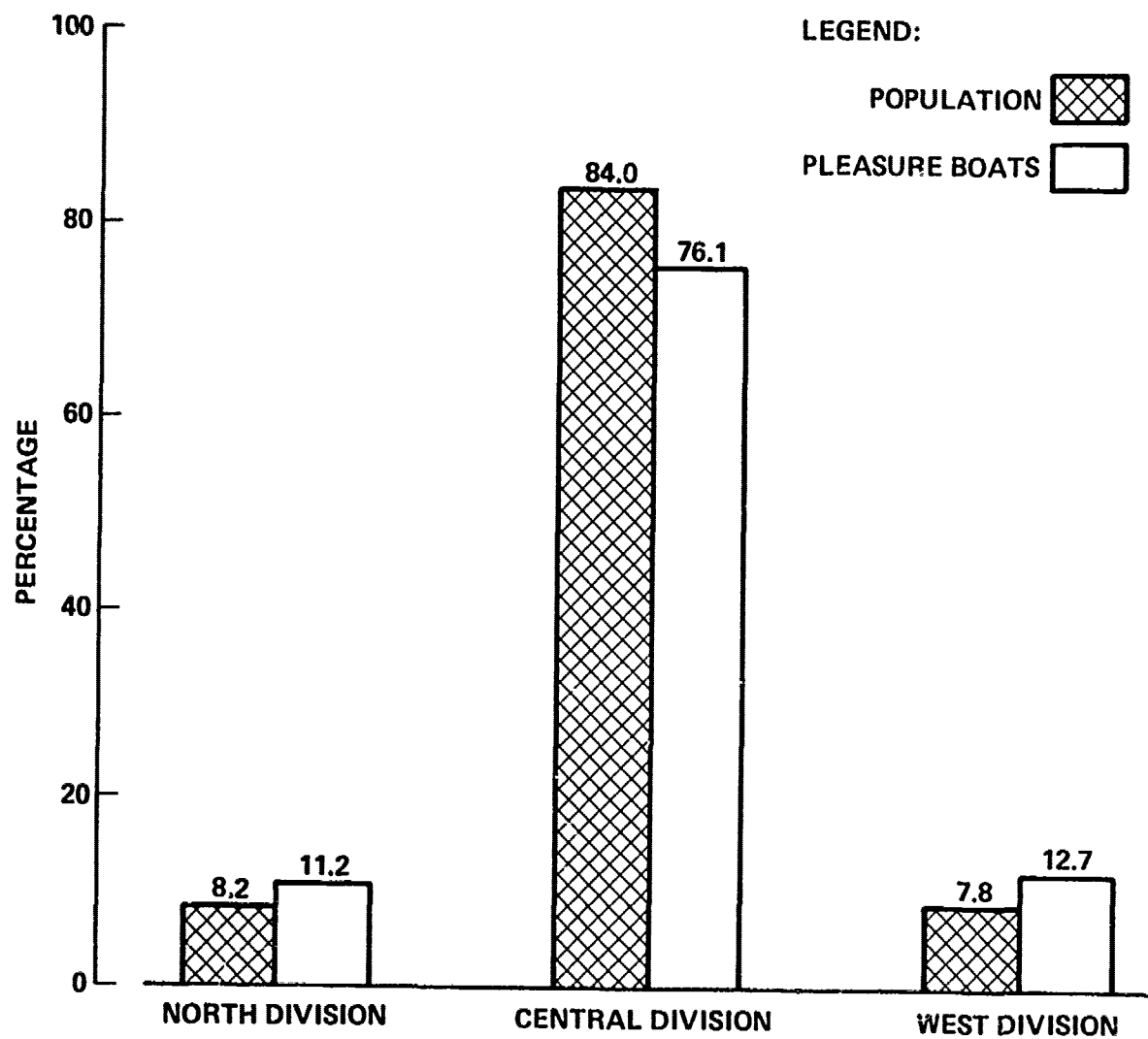
Comparable data on the breakdown of pleasure boats by type is available for the United States for 1973, from a 1978 U.S. Coast Guard publication.^{10/} Table 4 compares the distribution of boat type for the study area in 1966 and 1978 with the 1973 United States distribution. The 1966 study area distribution is much closer to the United States distribution than is the 1978 study area distribution. There are two likely reasons for this. First, since 1966 the regional distribution probably has been shifting toward one more closely related to the boating environment such as ice free winters specifically characteristic of Puget Sound. Second, related national shifts are probably occurring, but they likely were not significant until after 1973.

Table 5 compares pleasure boat ownership per 1,000 persons in the study area in 1966 and 1978 with that for the United States in 1973. The study area, as expected, has a much higher concentration of boat ownership.



NUMBER OF PLEASURE BOATS PER 1,000 POPULATION
PUGET SOUND STUDY AREA - 1978

Figure 6



PERCENT DISTRIBUTION OF POPULATION AND PLEASURE BOATS
PUGET SOUND STUDY AREA - 1978

Figure 7

Table 4

Percent Distributions of Boat Types for the Puget Sound Study
Area and the United States*

<u>Boat Type</u>	<u>Puget Sound 1966</u>	<u>Puget Sound 1978</u>	<u>United States 1973**</u>
Inboard	16.0	30.0	19.6
Outboard	82.8	62.0	79.2
Auxiliary Sailboat	1.2	8.0	1.2
Total	100.0	100.0	100.0

*Excludes sailboats without power and miscellaneous craft such as row-boats, canoes, and rubber rafts.

**See 10/ in references section for data source.

Table 5

Pleasure Boat Ownership Per 1,000 Population in
the Puget Sound Study Area and the United States*

<u>Puget Sound 1966</u>	<u>Puget Sound 1978</u>	<u>United States 1973**</u>
57.6	61.8	30.7

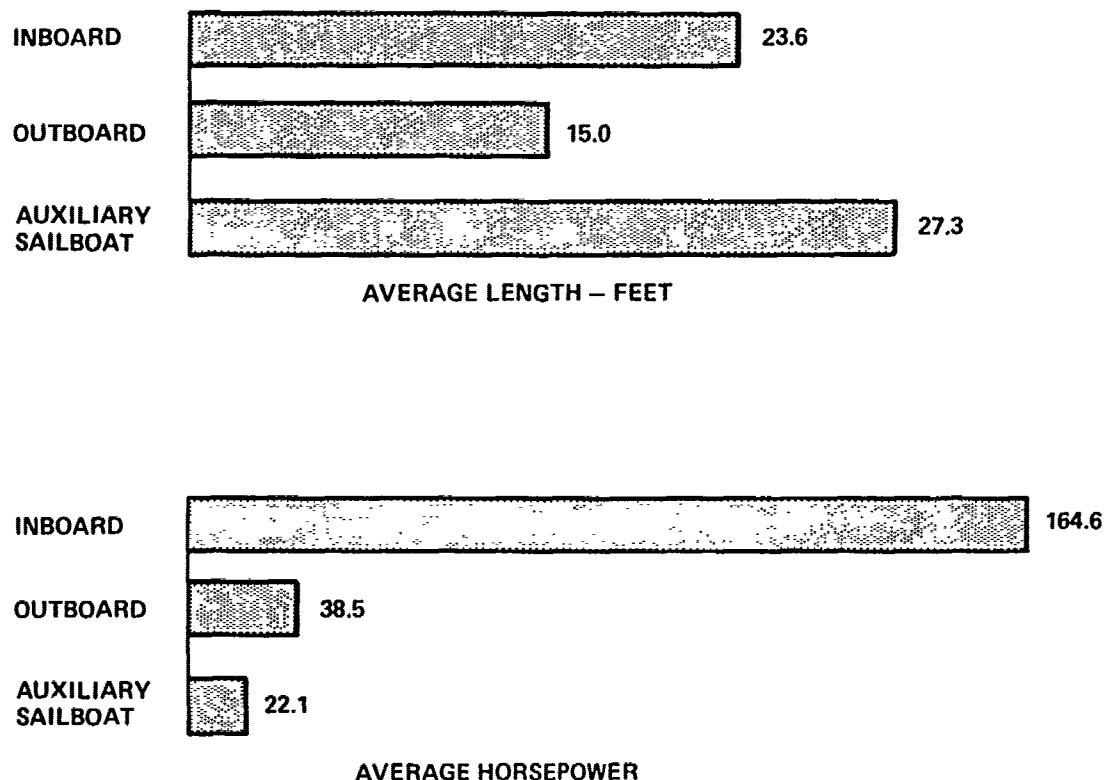
*Excludes sailboats without power and miscellaneous craft such as row-boats, canoes, and rubber rafts.

**See 10/ in references section for data source.

Pleasure Boat Characteristics

Questionnaire survey results reveal that except for boat hull material, principal pleasure boat characteristics have not changed

dramatically since the 1966 survey. Figure 8 illustrates average (arithmetic mean) length and horsepower for inboard (including those with outdrive), outboard, and auxiliary powered sailboats for the study area. There is some indication of a decrease in boat length for all boat types and an increase in horsepower for inboards since the earlier 1966 survey. Table 6 presents a breakdown for fuel use for each boat type and for all boats taken together. The majority of all boats included in the 1978 questionnaire survey were gasoline powered. Table 7 compares the percentage breakdown of hull material types in the 1966 and 1978 questionnaire surveys. Use of fiberglass and aluminum has increased significantly due primarily to easy maintenance, while the percentage of wooden-hulled boats has decreased dramatically.



**BOAT LENGTH AND HORSEPOWER
PUGET SOUND STUDY AREA - 1978**

Figure 8

Table 6

Distribution of Fuel Use by Boat Type
Puget Sound Study Area - 1978
(percent)

<u>Boat Type</u>	<u>Fuel Type</u>			<u>Total</u>
	<u>Gasoline</u>	<u>Diesel</u>	<u>Other</u>	
Inboard	91.7	8.3	0.0	100.0
Outboard	98.4	0.0	1.6	100.0
Auxiliary Sailboat	71.7	28.3	0.0	100.0
All Boats	94.0	4.7	1.3	100.0

Table 7

Distribution of Pleasure Boats by Hull Material
Puget Sound Study Area
(percent)

<u>Material</u>	<u>1966 Survey</u>	<u>1978 Questionnaire Survey</u>
Wood	68.6	15.1
Steel	0.1	0.8
Aluminum	0.7	18.6
Fiberglass	30.0	65.0
Other	<u>0.6</u>	<u>0.5</u>
Total	100.0	100.0

Boater Concerns

a. Changes in Boater Attitudes

One of the objectives of the questionnaire survey was to identify changes in boaters' attitudes since they originally purchased their boats. Table 8 presents the results of this aspect of the survey.

The majority of respondents indicated that boat design and performance and the quality of boating facilities were better or much better than when they first purchased a boat. Few respondents felt that boat design and performance was worse or much worse. According to the majority of people surveyed, moorage availability appears to be declining. The survey also indicated a fairly strong negative response to the question of the behavior of other boaters. Boating safety and the "quality of the boating experience" have essentially remained the same or have slightly improved.

The analysis of change in attitudes of boaters indicates that the two major areas of concern were moorage availability and the behavior of other boaters. This conclusion was further substantiated in many of the written comments from the boaters surveyed. These comments emphasized the need for more moorage and boat launching facilities. They also expressed concern for the behavior of other boaters, especially for not knowing the "rules of the road," not showing common boating courtesy, and for excessive use of alcohol.

b. Minimum Requirements for Operating Power Boats

The questionnaire survey also assessed views of boaters concerning minimum requirements for operating power boats. Although the majority of the respondents favored an age requirement, most did not favor a required licensing examination. Completion of a boating safety course was favored by 72 percent of respondents. However, a state licensing examination was favored by only 16 percent of respondents and a Coast Guard licensing examination was favored by only 31 percent of respondents.

c. Debris Control and Obstacle Concerns

Nineteen percent of all boaters sampled in the questionnaire survey responded that their boat incurred damage while used in 1978. Table 9 indicates the average dollar amount of damage in the study area by division. Logs and deadheads were the most frequent cause of damage, followed by small floating debris. The results of the survey indicate that the probability of incurring damage while boating in the area is low and if damage were incurred it would average about \$200. The low probability of damage from floating debris, logs, or deadheads may be attributable to the awareness and precautions taken by boaters to avoid damage. Every year the Corps of Engineers' snagboats, the "Puget" and

Table 8
Change in Boater Attitudes*
(percent)

Nature of Change	Characteristic Evaluated					
	Boat Design and Perfor- mance	Quality of Boating Facilities	Moorage Availa- bility	Behavior of Other Boaters	Safety of Boating	Overall Quality of Boating Experience
Much better	27	9	3	1	4	3
Better	51	46	13	8	30	35
Same	19	33	19	51	44	42
Worse	2	8	38	33	18	17
Much Worse	<u>1</u>	<u>4</u>	<u>27</u>	<u>8</u>	<u>4</u>	<u>3</u>
	100	100	100	100	100	100

*Comparison between current conditions and when boater first purchased boat

the sternwheeler "W.T. Preston," remove 2,000 to 3,000 tons of deadheads and debris from the waters of the Puget Sound study area. The State Department of Natural Resources conducts commercial log salvage operations in the study area and, in the Everett vicinity, also does debris control work.

Table 9

Reported Pleasure Boat Damage
Puget Sound Study Area - 1978

<u>Cause of Damage</u>	<u>Division</u>	<u>Average Loss (dollars)</u>
Collision with Another Vessel or Dock	North	20
	Central	100
	West	0
Grounding or Hitting Rocks	North	50
	Central	53
	West	40
Logs or Deadheads	North	216
	Central	211
	West	450
Stationary Debris	North	0
	Central	0
	West	50
Small Floating Debris (less than 5 feet long)	North	70
	Central	218
	West	800
Launching or Transporting Boat	North	0
	Central	75
	West	0
Other	North	455
	Central	300
	West	480
Average of All Causes	Entire Study Area	207

Pleasure Boat Projections

The unsettled nature of the energy picture, as well as the uncertainties associated with pleasure craft financing, makes development of pleasure craft growth projections a difficult task. For these reasons, low, medium, and high growth scenarios were developed. Future increases in pleasure boat ownership in the study area were based on projected population and modified by real per capita income growth (per capita income adjusted for inflation). Expected levels of population and real per capita income are shown on table 10 for the North, Central, and West Divisions in the study area. Population was selected as the principal basis of projection because past growth in number of boats has been strongly correlated with growth in population and it is likely that this relationship will continue into the future. Several published projections were considered. The projections selected as the most probable (references 7 and 8) were based on more current economic indicators than the other studies considered, and are widely accepted and utilized by economic planners. Also, these projections covered the same time frame of interest to the boating study, i.e., 1978-2000.

The second basis for forecasting growth in the boat population was expected growth in real per capita income. As people earn higher income and their economic welfare improves, they are better able and probably more inclined to participate in additional recreational activities such as boating.*

Table 11 presents low, medium, and high pleasure boat growth rates to the year 2000 for the three divisions in the study area. The low growth estimates reflect projected population increases shown in table 10 for each division. The medium projections are equal to the corresponding growth rate projected in table 10 for population, plus one-half the projected growth rate for real per capita income in the division. The high projections represent the estimated population growth plus the total real per capita income growth shown in table 10. The medium projections were selected as the most likely future scenario. This is due in part to the belief that future petroleum price increases will more adversely affect recreational boating expenditures than other recreational purchases as a result of the heavy use of petroleum in boat operation and fiberglass boat manufacture.

The number of pleasure boats in each division implied from the growth rates is shown in table 12. From a 1978 level of 151,000, pleasure boats in the Puget Sound area are projected to increase to 253,500 by the year 2000 (see figure 9).

*Correlation studies conducted to verify the assumptions used in making the growth projections for boat ownership indicate that the projections in tables 11 and 12 are conservative but reasonable. For example, from 1974 to 1978, a period reflecting the current Coast Guard requirements for boat registration, the average annual growth rate in the number of boats registered in Washington was 9.31 percent. During the same period, the average annual growth rates for population and real per capita income were 2.29 percent and 3.23 percent, respectively.

Table 10

Projected Average Annual Growth Rates
of Population and Real Per Capita Income
Puget Sound Study Area, 1978-2000

<u>Years</u>	<u>North Division (percent)</u>	<u>Central Division (percent)</u>	<u>West Division (percent)</u>
POPULATION			
1978-1980	3.1	1.9	3.3
1980-1990	2.2	1.5	2.7
1990-2000	1.5	1.0	1.6
REAL PER CAPITA INCOME (1975 dollars)			
1978-1980	2.2	2.2	2.2
1980-1990	1.4	1.4	1.4
1990-2000	2.0	2.0	2.0

Sources with extensions to 2000 by the Seattle District, U.S. Army Corps of Engineers: See 7/ and 8/ in references section.

Table 11

Projected Pleasure Boatownership Growth Rates*
Puget Sound Study Area, 1978-2000

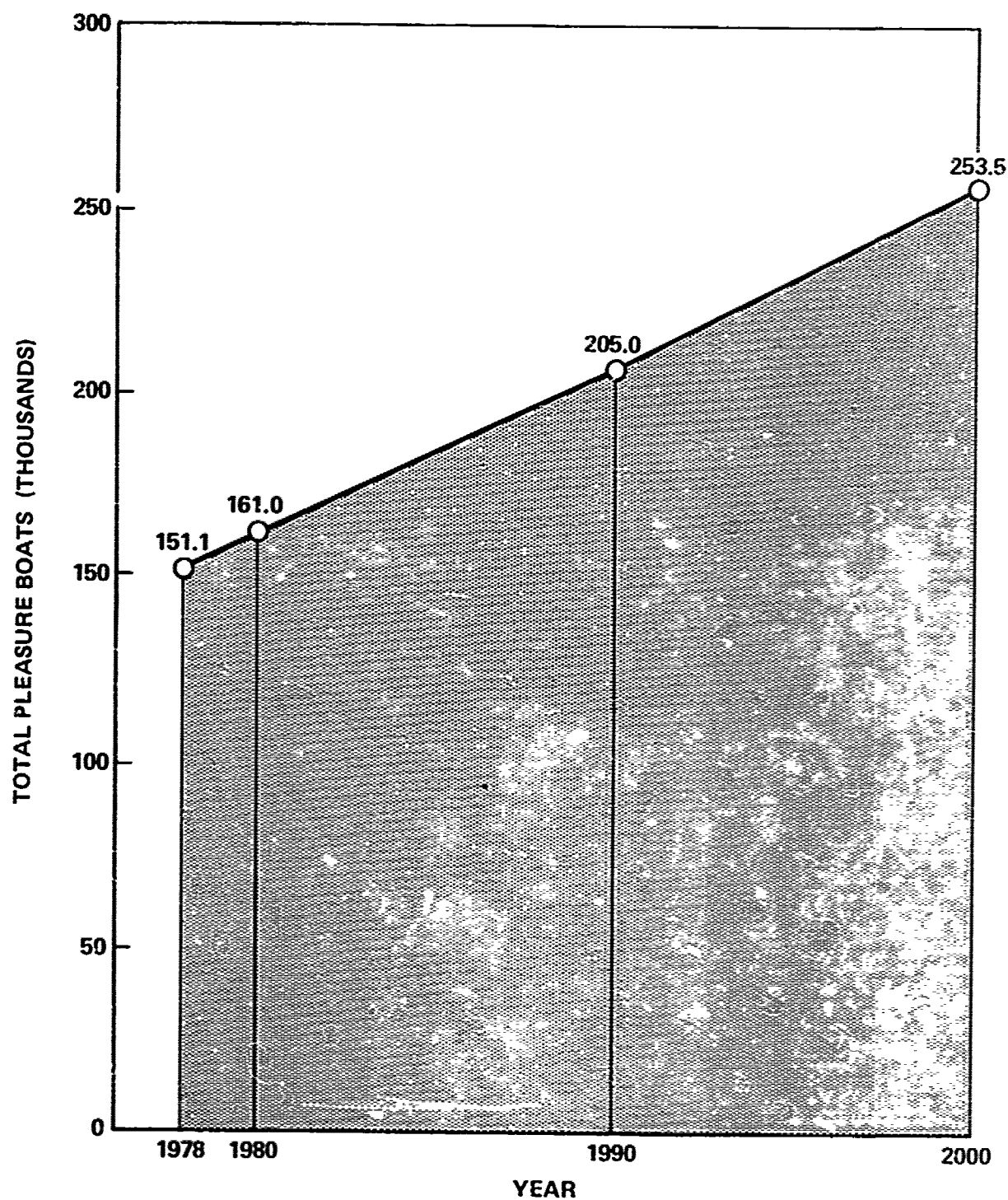
<u>Period</u>	<u>North Division %</u>			<u>Central Division %</u>			<u>West Division %</u>		
	<u>Low</u>	<u>Medium</u>	<u>High</u>	<u>Low</u>	<u>Medium</u>	<u>High</u>	<u>Low</u>	<u>Medium</u>	<u>High</u>
1978-1980	3.1	4.2	5.3	1.9	3.0	4.1	3.3	4.4	5.5
1980-1990	2.2	2.9	3.6	1.5	2.2	2.9	2.7	3.4	4.1
1990-2000	1.5	2.5	3.5	1.0	2.0	3.0	1.6	2.6	3.0

*Average annual compound growth rate.

Table 12

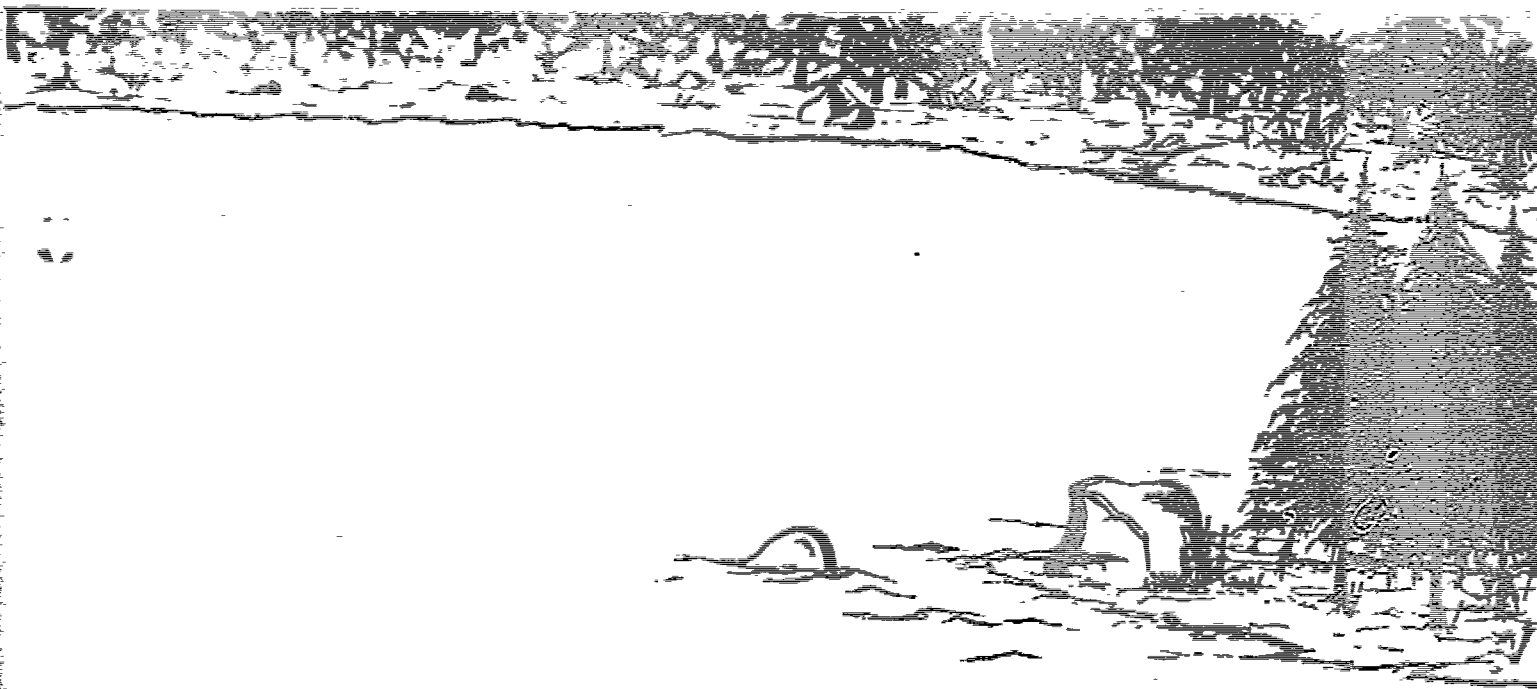
Projected Pleasure Boats (thousands)
Puget Sound Study Area, 1978-2000

<u>Division</u>	<u>Year</u>			
	<u>1978</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
North	16.8	18.2	24.2	31.0
Central	115.0	122.0	151.6	184.8
West	<u>19.2</u>	<u>20.9</u>	<u>29.2</u>	<u>37.7</u>
Total	151.0	161.1	205.0	253.5



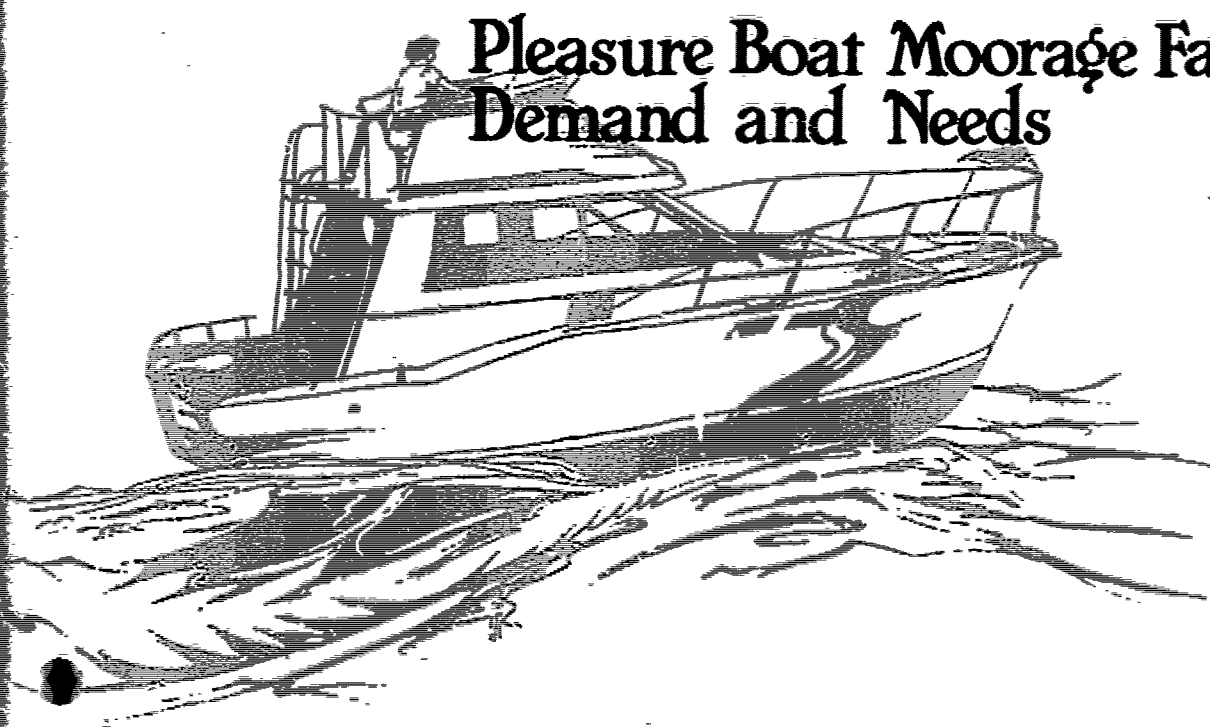
PROJECTED PLEASURE BOATS
PUGET SOUND STUDY AREA
1978 - 2000

Figure 9



CHAPTER 4

Pleasure Boat Moorage Facilities, Demand and Needs



CHAPTER 4 - PLEASURE BOAT MOORAGE FACILITIES, DEMAND AND NEEDS

Inventory

Data on available pleasure boat moorage facilities was drawn from the 1978 report prepared by the Oceanographic Institute of Washington (OIW)^{3/}, from unpublished file data supplied to the Corps by OIW staff, and from Corps staff followup contacts to marinas which had not responded to the 1978 OIW survey. The OIW report contains information on 268 public and private marinas which represent an estimated 90 to 95 percent of the available moorage in the study area.*

Marinas

Figures 10 through 13 identify the existing marina locations within the study area. In the North Division, marinas are concentrated around Anacortes, La Conner, and Langley. In the Central Division, and in the southern area, the marinas are primarily located along the eastern and western edges of Commencement Bay in Tacoma, at Day Island, and around Gig Harbor. In the Seattle area, marinas are concentrated along the Duwamish River and Lake Washington Ship Canal. Bainbridge Island contains several marinas. In the West Division, marinas are clustered around the Neah Bay area, Port Angeles, and Port Townsend in the northern portion, and near Olympia in the Division's southern area.

Existing Moorages

Within the study area, approximately 27,000 public and commercial recreational moorage slips (wet moorage and dry storage) have been identified (table 13). The majority of the slips are concentrated in the Central Division (62 percent), followed by 15 percent in the West Division and 23 percent in the North Division.

Permanent Moorage Demand

Demand represents total moorage requirements. Two methods were used to estimate both summer and winter permanent pleasure boat moorage demand by the 12 study subareas. The first method was based on the responses in the questionnaire survey as to the location and seasonal preferences for permanent moorage. The sample data was extrapolated based on the number in the boating universe used for the questionnaire survey. The

*Since the OIW survey was made, some changes have occurred in the number of marinas operating and in the moorages available. These changes are not reflected in the present report. Developers should update local moorage information when examining a specific site for possible development.

FIGURE 10

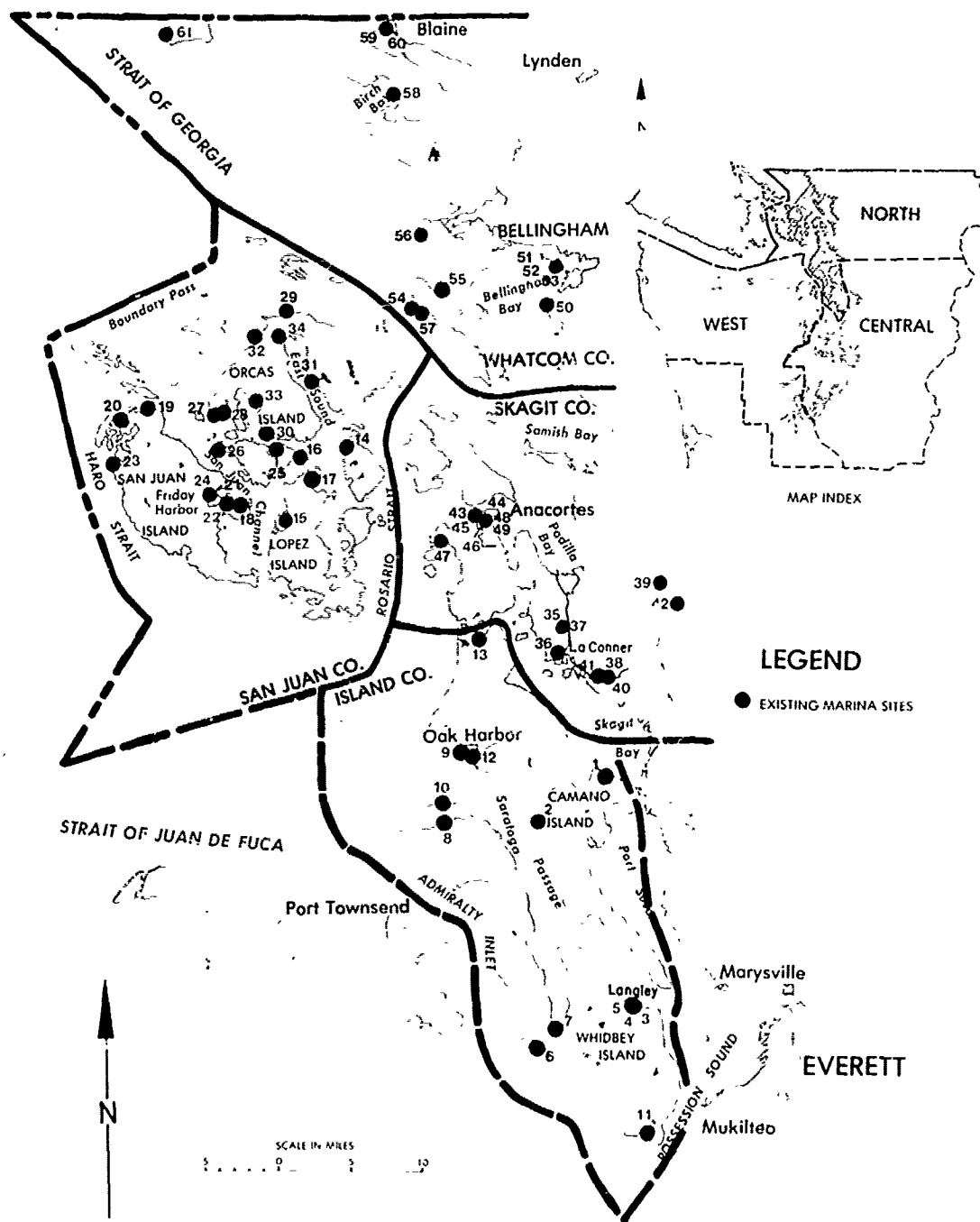
MOORAGE FACILITIES - NORTH DIVISION

County	Facility Number	Facility Name	All Year Facilities				Summer Only Facilities			
			Wet	Dry	Nonslip	Transient	Wet	Dry	Nonslip	Transient
Island	1	Stanwood-Camano Yacht Club								
	2	Sunset Beach Boat House								
	3	Langley Marina Ltd.	0	22	0	0				
	4	City of Langley Dock								
	5	Sunrise Beach Resort								
	6	Mutiny Bay Resort	15	10	0	0				
	7	Holmes Harbor Golf & Yacht Club	35	0	18	18				
	8	Port of Coupeville	0	0	6	6				
	9	Oak Harbor Marina	316	164	10	57				
	10	Whidbey-Deception Pass Boat Club								
San Juan	11	Sandy Hook Yacht Club	70	0	0	0				
	12	Sea Plane Base Marina								
	13	Cornet Bay Marina Co.	53	0	8	8				
	14	Blakely Marina	72	0	5	35				
	15	The Islander Lopez	67	0	0	0				
	16	Port of Lopez								
	17	Shoal Bay Marina								
	18	Albert Jensen & Sons, Inc.	36	45	5	0	6	0	0	0
	19	Lonesome Cove Resort								
	20	Roche Harbor Resort	154	6						
Skagit	21	San Juan Marina	0	5	50	25				
	22	San Juan Shipyard	104	0	13					
	23	Snug Harbor Marina Resort	80	15	4	16				
	24	Port of Friday Harbor	123	0	21	106				
	25	Little Portion Store & Marina	1	0	0	0				
	26	Neck Point Cove					30	0	0	0
	27	Cayou-Quay Marina								
	28	Deer Harbor Marina	22	0		all				
	29	Bartel's Resort	0	0	14	20				
	30	Port of Orcas								
Whatcom	31	Rosario Resort Hotel	36	0	5	27				
	32	West Beach Resort	0	0	0	20				
	33	West Sound Marina	106	35	21	0				
	34	Bay Head Marina	59	0	20	0				
	35	Otis Motor Service	10	0	0	0				
	36	Shelter Bay Marina	302	50	0	0				
	37	La Conner Marina	416	0	0	17				
	38	Bob's Boat House	10	0	0	0				
	39	Lefebber Bulb Co.	0	85	0	0				
	40	Phil's Boat House	0	30	13	7				
Whatcom	41	Al's Landing	48	0	0	0				
	42	Rosalies								
	43	Anchor Cove Marina	167	0	0	10				
	44	Cap Sante Marina	0	158	9	0				
	45	Gateway Cove Marina	12	56	0	0				
	46	Lovric's Sea Craft	18	0	4	8				
	47	Skyline Marina	459	**	0	0				
	48	Wyman's Marina								
	49	Cap Sante Small Boat Haven	437	0	30	24				
	50	Hilton Harbor Marina	0	150	0	0				
Whatcom	51	Weldcraft Steel and Marina	***	200	7	0				
	52	Wheel & Keel Club								
	53	Squalicum Boat Harbor	804	0	83	33				
	54	Village Point Marina	0	50	0	0				
	55	Fishermans Cove	0	280	3	0				
	56	Sandy Point Marina	33	10	8	0				
	57	Hawley's Marina	0	15	0	0				
	58	Shott's Birch Bay Marina					8	6	4	6
	59	Drayton Harbor Shipyard	0	7	0	0				
	60	Blaine Boat Harbor	362	0	4	22				
Whatcom	61	Point Roberts Marina	1,026		3	43				

*Pleasure Boat Moorages, Source: OIW^{3/}. Does not include nonstorage moorage facilities at destination recreation areas.

**3.5 acres of dry moorage available.

***Wet moorage available.



MOORAGE FACILITIES NORTH DIVISION

FIGURE 10

FIGURE 11

MOORAGE FACILITIES - CENTRAL DIVISION

County	Facility Number	Facility Name	Wet	All Year Facilities			Summer Only Facilities			
				Dry	Nonslip	Transient	Wet	Dry	Nonslip	Transient
King	62	Quartermaster Yacht Club		0	4	5				
	63	Quartermaster Marine		10	2	0				
	64	City of Des Moines Marina		104	0	0				
	65	Normandy Cove Boat Club								
Kitsap	135	Sebring's Marina					0	0	4	0
	136	Port Orchard Marina		0	0	80				
	137	Port Orchard Yacht Club	72							
	138	Sinclair Inlet Yacht Club								
	139	Suldan's Boat Works	120	0	0	0				
	140	Bremerton Boat Service	0	40	0	5				
	141	Bremerton Boating Club**								
	142	Bremerton Yacht Club	110							
	143	Port of Ilwaco	4	0	0	4				
	144	Sea Gate Marina	6	0	20	0				
	145	Port of Manchester	0	0	0	5				
	146	Eagle Harbor Marina					97	0	5	0
	147	Winslow Wharf Marina	84	0	5	7				
	148	Brownsville Marina	244	0	0	21				
	149	Port of Silverdale								
	150	Port of Keyport	25	0	0	1				
	151	Port Madison Yacht Club								
	152	Bay Marina	18	0	0	2				
	153	Port of Poulsbo	178	0	43	20				
	154	Kingston Cove Marina	288	71	15	28				
	155	Point No Point Beach Resort	0	15	0	0				
	157	Bainbridge Marina	69	0	0	0				
	158	Island Center Service	0	15	0	0				
	159	Seabeck Marina	170	0	0	0				
	160	Driftwood Key Club								
	161	Twin Spits Resort	4	8	0	40				
Pierce	162	Longbranch Improvement Club	44	0	0	10				
	163	Lakebay Marina					3	0	19	0
	164	Southsound Marina Inc.	0	31	0	10				
	165	Fox Island Yacht Club								
	166	Narrows Marina	96	277	0	0				
	167	Balman's Marina, Day Island	60	30	0	0				
	168	Day Island Marina	101	120	0	0				
	169	Day Island Yacht Club Inc.	150	110						
	170	Pt. Defiance Boat House	0	270	0	0				
	171	Tacoma Yacht Club	275	145						
	172	Warner Marina	163	0	2	2				
	173	Totem Boat Haven	84	146	13	5				
	174	Pacific Yacht Basin	40	0	30	0				
	175	Fairliners Marina	95	0	0	0				
	176	Hylebos Boat Haven	90	60	7	0				
	177	Ole & Dicks Boat House	143	100	27	0				
	178	Harbor Marina Yacht Basin	76	163	0	6				
	179	Tyce Marina	435	0	10	0				
	180	Sundgren's Yacht Sales								
	181	Bayshore Marina & Boatlockers								
	182	Carling Boat Club								
	184	Pick's Cove Marina	98	***	10	10				
	185	Totem Yacht Club								
	186	Crows Nest Marina								
	187	Viking Yacht Club								
	188	Firecrest Yacht Club								
	190	The Boat Barn	15	20	0	2				
	191	Gig Harbor Marina	105	10	0	0				
	192	Marina West	50	0	0	0				
	193	Pleasurecraft Marina	54	0	0	0				
	194	Tiderunner Inc.	15	0	0	0				
	195	Peninsula Yacht Basin	112	0	9	0				
Snohomish	196	Wave Toppers Yacht Club**								
	197	Andy's Boathouse					0	21	0	0
	198	Boat Loft	0	21	0	0				
	199	Laebugten Wharf, Inc.	0	250	0	0				
	200	Norma Beach Boathouse					0	60	0	0
	201	Port of Edmonds	684	175	0	0				
	202	McConnell's Boathouse					0	66	72	0
	203	Everett Boathouse & Marina	0	150	0	0				
	204	Port of Everett 14th St. Marina	924	0	35	35				
	205	Hat Island Marina	18	0	35	24				
	206	Dagmar's Landing								
	207	Ceddes Marina	75	75	3	2				
	208	Seacrest Boat Moorage								
	209	Pilchuck Boat Club								
	210	Bryant Hardware and Implement Co.								

*Pleasure Boat Moorages. Source: OIW2/.

**Not mapped.

***Dry moorage available.

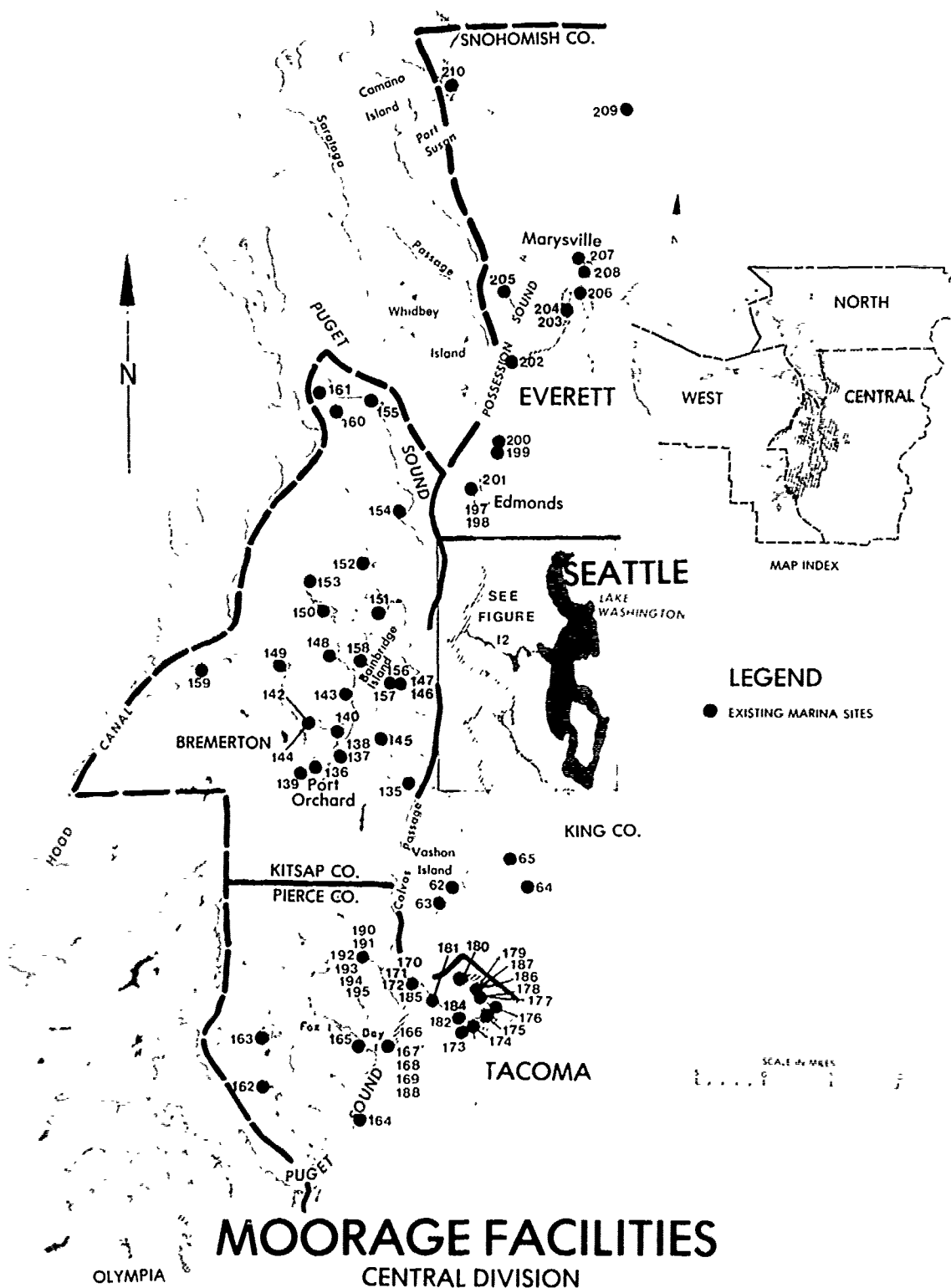


FIGURE 11

FIGURE 12

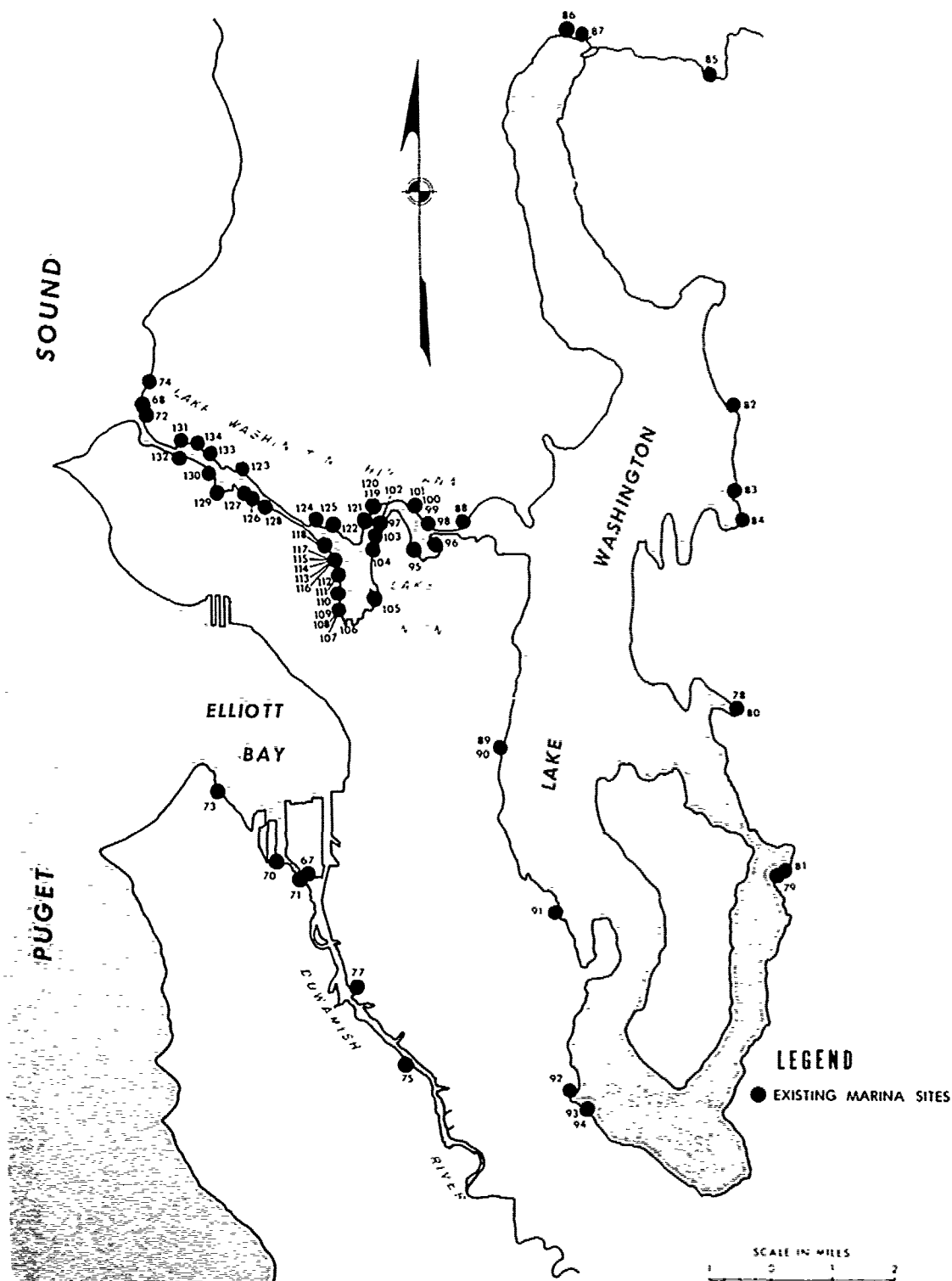
MOORAGE FACILITIES - SEATTLE AREA

County	Facility Number	Facility Name	All Year Facilities				Summer Only Facilities			
			Wet	Dry	Nonslip	Transient	Wet	Dry	Nonslip	Transient
King	66	Cactus Yacht Club**								
	67	Duwamish Waterway Assoc.	105	0	0	0				
	68	Hobie Cats NW					0	30	0	0
	69	Holiday Sailors Cruising Club **								
	70	Ole & Charlie's High & Dry Co.	0	122	0	0				
	71	Pioneer Marine Yard	70	0	4	0				
	72	Ray's Boathouse Fishing Resort	0	110	0	0				
	73	Seacrest Marina***	100	60	0	8				
	74	Shilshole Bay Marina	1,513	85	27	27				
	75	South Park Marina	90	85	33	0				
	76	Tideriders Boat Club**								
	77	Truax Machine Works	18	0	5	0				
	78	Bellevue Yacht Basin	55	0	0	0				
	79	Kester Bros.								
	80	Meydenbauer Bay Yacht Club	105	0	0	10				
	81	Newport Yacht Basin Inc.	415	0	0	0				
	82	Miss Bay Marina	66	0	0	0				
	83	Yarrow Bay Marina	15	6	9	0				
	84	Yarrow Bay Tennis & Sailing Club	42	0	0	0				
	85	Down River Marina	33	20	0	1				
	86	Davidson's Uplake Marina Inc.	146	40	2	0				
	87	Kenmore Marina	20							
	88	UW Yacht Club	0	0	20	0				
	89	Leschi Moorage	198	65	0	0				
	90	Lake Wash. Yacht Basin Inc.	37	30	0	0				
	91	Lakewood Boathouse	127	0	0	3				
	92	Parkshore Marina	178	0	0	0				
	93	Rainier Beach Moorage & Boat Rentals	0	0	7	5				
	94	Aqua Marina	90	8	5	0				
	95	Queen City Yacht Club	198	0	0	0				
	96	Seattle Yacht Club	134	20						
	97	NW Boatowners Assoc., Inc.								
	98	Jensen Motor-Boat Co.								
	99	University Boat Sales	130	0	8	2				
	100	Timmerman's Marine Painting Inc.	16	2	0	0				
	101	Boat Street Marina	32	0	3	0				
	102	Thunderbird Marina	56	0	5	0				
	103	Cadranell Yacht Landing	107	0	0	0				
	104	Union Harbor	27	0	5	2				
	105	Lake Union Drydock Co.	0	0	25	0				
	106	Admiralty of Seattle	30	0	8	0				
	107	Latitude 47	26	0	0	0				
	108	Marina Mart	270	0	0	0				
	109	McGinnis Yacht Sales	144	0	2	3				
	110	Newport Yacht Basin	50	0	0	0				
	111	Elks Yacht Club								
	112	Wilson Marine Service	11	0	2	0				
	113	Boatworld C.C.R. Marine Inc.	154	0	10	0				
	114	Western Yacht Sales	38	0	0	0				
	115	Westlake Inc.	17	0	0	0				
	116	Westlake Building	12	0	0	0				
	117	Commercial Marine Const. Co.	100	0	23	0				
	118	Chris Berg, Inc.	127	0	0	0				
	119	Seattle Yacht Sales	160	50	0	0				
	120	Puget Sound Yacht Club	0	0	9	3				
	121	Westshore Marine Services	66	0	7	0				
	122	Tillicum Marina, Inc.	55	0	0	0				
	123	Katila Marina	50	40	7	6				
	124	Fremont Boat & Tugboat Co.	0	0	93	0				
	125	Northlake Marina	58	5	0	2				
	126	Ewing Street Moorings	50	0	0	0				
	127	Leco Marine, Inc.	60	0	0	0				
	128	Wheeler Yacht Sales	85	0	10	0				
	130	Salmon Bay Marina	147	4	3	1				
	131	McGinnis Marine Service, Inc.	86	0	20	0				
	132	Lockhaven Marina, Inc.	75	0	43	0				
	133	Sagstad Marina, Inc.	53	0	0	0				
	134	Stimson Marina	199	0	40	0				

*Pleasure Boat Moorages. Source: OIW^{3/}.

**Not mapped.

***Since the OIW survey, all wet moorages have been removed and dry moorage is available for about 85 boats less than 20 feet long.



MOORAGE FACILITIES SEATTLE AREA

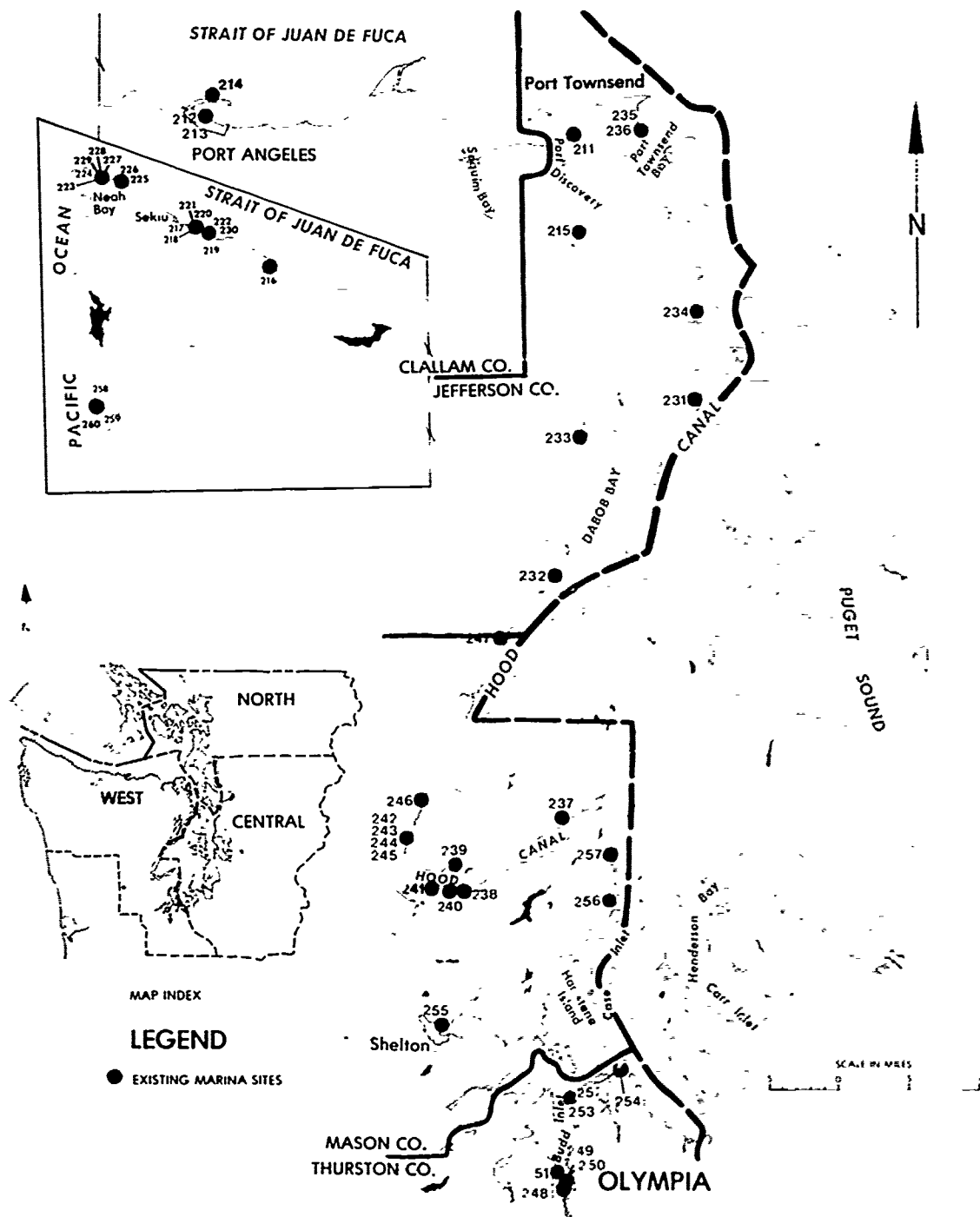
FIGURE 12

FIGURE 13

MOORAGE FACILITIES - WEST DIVISION

County	Facility Number	Facility Name	All Year Facilities				Summer Only Facilities			
			Wet	Dry	Nonslip	Transient	Wet	Dry	Nonslip	Transient
Clallam	211	Cape George Colony Club	100	0	0	0				
	212	Port Angeles Boat Haven	538	0	21	21				
	213	Port Angeles Ship Yard								
	214	Thunderbird Boathouse					0	0	15	3
	215	Discovery Bay Lodge	0	0	13	13				
	216	Silver King Resort					72	60	0	0
	217	Van Riper's Resort					0	0	56	56
	218	Rice's Resort					0	0	500	500
	219	Olson's Resort					120	0	500	0
	220	Curleys Resort					0	0	15	13
	221	Seiku Cove Inn					0	0	13	13
	222	Coho Resort					0	30	30	26
	223	Big Salmon Fishing Resort					0	10	113	57
	224	Morten's Resort								
	225	Peter's Neah Bay Resort					0	0	13	13
	226	Snow Creek Salmon, Inc.					0	40	13	0
	227	Makah Resort	28	0	0	5				
	228	Farwest Fishing Resort					0	0	5	0
	229	Mel's Resort					150	0	0	0
	230	Thunderbird Resort								
Jefferson	231	Bridgehaven Marina	22	0	0	0				
	232	Pleasant Harbor Marina	190	0	20	92				
	233	Quilcene Boat Haven	38	0	2	0				
	234	Port Ludlow Marina	89	0	27	27				
	235	Point Hudson Marina	70	0	20	0				
	236	Port Townsend Boat Haven	364	90	57	0				
	237	Port of Allyn Northshore Dock	0	0	0	0				
Mason	238	Alderbrook Inn	0	0	7	7				
	239	Sandy's Resort					15	20	7	7
	240	Hood Canal Yacht Basin	23	60	3	3				
	241	Union Marina	0	200	0	0				
	242	Hoodsport Marina	19	0	5	2				
	243	Port of Hoodsport	3	0	0	10				
	244	Stay And Play Resort								
	245	Sunrise Motel Resort	20	0	0	0				
	246	Rest-A-While Resort	0	30	0	0				
	247	Beacon Point Resort & Boathouse	3	20	0	0				
Thurston	248	Olympia Yacht Club	225	15	0					
	249	Olympia Marina	132	42	0	12				
	250	Fiddlehead Marina	46	0	8	0				
	251	West Bay Marina	402	0	7	7				
	252	Puget Marina	10	0	0	0				
	253	Boston Harbor Marina	35	0	0	8				
	254	Zittel's Marina	152	28	1	13				
	255	Shelton Marina					84	0	10	4
Mason	256	O's Fairharbor Marina								
	257	Port of Allyn Dock	0	0	7	7				
Clallam	258	Chinook Resort					35			1
	259	Harley's Resort					60		20	
	260	Surf Resort					45	10		

*Pleasure Boat Moorages. Source: OIWI.



MOORAGE FACILITIES WEST DIVISION

FIGURE 13

Table 13

Pleasure Boat Rental Moorages
Puget Sound Study Area - 1978

Location	Summer Only			All Year			TOTAL
	Wet	Dry	Total	Wet	Dry	Total	
<u>North Division</u>							
Subarea*: 1	12	6	18	1,308	712	2,020**	2,038**
2	36		36	1,018	106	1,124	1,160
3				1,935	379	2,314	2,314
4				531	196	727	727
	48	6	54	4,792	1,393	6,185	6,239
<u>Central Division</u>							
Subarea: 5	3	147	150	1,774	879	2,653	2,803
6		30	30	7,499	811	8,310	8,340
7	22	0	22	2,134	1,337	3,471	3,493
10	106	0	106	1,825	149	1,974	2,080
	131	177	308	13,232	3,176	16,408	16,716
<u>West Division</u>							
Subarea: 8				1,018	85	1,103	1,103
9	22	20	42	192	310	502	544
11	737	140	877	28	0	28	905
12	15	0	15	1,571	90	1,661	1,676
	774	160	934	2,809	485	3,294	4,228
						Total	27,183

*Subareas are shown in figure 2.

**Without Point Roberts, which is used primarily by Canadian boaters.

results were then expressed in terms of permanent slips. Demand estimates were based in part on preferences expressed if current (1979) prices prevailed. Increasing prices of rental moorage could affect demand, but to what extent it is not possible to determine.*

The second method estimates moorage demand in each subarea as equal to the 1978 use of existing permanent moorage plus the number of people on waiting lists for permanent moorage. Moorage supply was surveyed in 1978 by the OIW.³⁷ The results of this OIW survey were combined with supplementary data prepared by the Corps of Engineers to cover marinas which did not respond to the OIW survey to provide estimates of moorage supply by subarea and season. The OIW survey also surveyed marina waiting lists for permanent moorage. Combining the OIW and Corps of Engineers on data moorage supply plus persons on waiting lists provided the estimate of moorage demand by subarea.

The waiting list for the Port of Seattle's Shilshole Bay Marina was spot-checked on a random basis by telephone. Although none of those contacted indicated they had placed their name on other waiting lists, it is possible some potential boaters do. However, the fact that a deposit (\$50 at Shilshole and \$40 at Des Moines marinas) is required tends to reduce this practice. The average waiting period of about 17 months (see OIW report ³⁷) discourages a sizeable population of would-be boaters from even bothering to sign up at an existing marina. In some instances, the waiting period is as much as 5 years or more. Therefore, the use of waiting lists as a means of estimating demand was felt to be reasonable. Also, latent demand may compensate for those few that have indicated a desire for moorage at more than one marina.

Table 14 presents estimates of moorage demand by county and season under the two methods. The demand estimates under the questionnaire survey method were generally greater than the corresponding estimates under the second method (use plus waiting list). This is to be expected since the use plus waiting list estimates are generally conservative estimates of demand. Use plus waiting list represents an expressed current market demand at the time of the inquiry. This method does not include the latent demand--demand which is inactive, unexpressed, or unknown. The questionnaire survey estimates represented individuals included in the use plus waiting list estimates plus latent demand for moorage. The cases in which the questionnaire survey procedure results in a lower estimate of demand were assumed to be a reflection of sampling error arising from an incomplete enumeration of the entire boating population within that county.

Temporary and Transient Moorage Demand

Only questionnaire survey responses were used to derive estimates for temporary and transient rental moorage demand. These are shown by

*Substantial relative moorage fee increases could reduce rental moorage demand and its growth. Also, with increasing moorage fees and purchase prices of pleasure craft, an increasing trend in joint boat ownerships is possible.

Table 14

Alternative Estimates of Pleasure Boat Rental Moorage Demand
Puget Sound Study Area - 1978

		Season and Estimating Method			
		Summer		Winter	
Division and County	Subarea	Question- naire Survey*	Use Plus Waiting List**	Question- naire Survey*	Use Plus Waiting List**
North					
Whatcom	(1)	800	2,104***	1,199	2,066***
San Juan	(2)	3,195	1,202	2,397	1,029
Skagit	(3)	3,995	3,088	2,797	3,065
Island	(4)	400	1,040	0	1,018
Central					
Snohomish	(5)	7,557	3,420	7,157	3,391
King	(6)	29,081	10,526	30,679	10,249
Pierce	(7)	10,753	4,214	11,153	4,437
Kitsap	(10)	3,196	2,412	3,196	1,575
West					
Thurston	(8)	1,199	1,075	1,199	1,086
Mason	(9)	1,199	425	1,598	373
West Clallam	(11)				
Jefferson		400	699	0	0
East Clallam	(12)				
Jefferson		3,596	1,890	2,398	1,845

*Number of permanent slips demanded.

**Number of permanent slips in use plus permanent slips requested by those signed up on moorage waiting lists. Marinas used exclusively for commercial craft have been excluded from the analysis.

***Without Point Roberts, which is used primarily by Canadian boaters.

season in table 15. Data from the questionnaire survey reveals that an average of 3 days per year are spent in transient moorage by boaters using moorage facilities in the winter. Similarly, an average of 3 days per year are spent in transient moorage by those using these facilities in the summer. Summer temporary moorage users average 13 days per year and winter temporary moorage users average 14 days per year.

Table 15

Estimates of Temporary and Transient Rental Moorage Demand
Puget Sound Study Area - 1978

Division and County	Summer		Winter	
	Temporary Demand*	Transient Demand**	Temporary Demand*	Transient Demand**
North				
Whatcom	400	799	400	0
San Juan	11,553	11,553	2,397	2,397
Skagit	3,579	2,797	799	0
Island	7,974	5,576	1,998	1,598
Central				
Snohomish	2,797	2,397	1,199	799
King	7,574	4,777	4,378	3,978
Pierce	5,177	1,598	3,179	1,598
Kitsap	4,777	7,175	1,998	3,179
West				
Thurston	1,199	1,598	799	1,199
Mason	1,998	1,998	1,199	0
West Clallam				
Jefferson	7,574	1,998	1,199	799
East Clallam				
Jefferson	5,177	3,579	1,598	400

*Number of slips demanded for temporary moorage (moored 4 to 29 days).

**Number of slips demanded for transient moorage (moored 1 to 3 days).

Equivalent Permanent Need

Tables 16 and 17 provide estimates of moorage needs for summer and winter seasons, respectively. Moorage need is defined as total moorage demand less supply of existing moorages. Permanent demand was combined with temporary demand and transient demand converted to equivalent permanent demand by dividing each by a factor of 10. This ratio, used in a 1964 California study,¹¹ was considered to be appropriate for application to the study area based upon contacts with marina operators. It was found that marina operators are able to generate as much or more revenue from moorages set aside for transient or temporary use as they can if these moorages were limited to all-year use, based on current moorage fees. Also, using transient and temporary use data from the survey and prevailing moorage fees, it can be shown that an allocation of one moorage for 10 transient or 10 temporary demand will result in

revenue equal to that which can be gained by renting the moorage on a permanent basis. This is true even if the transient and temporary moorage has an occupancy rate of only 50 percent. Occupancy rates of marinas contacted were well in excess of this percentage.

In tables 16 and 17, the number of permanent slips demanded was based on values from table 14. In most instances, the average of the two estimates was used. Where the use plus waiting list estimate was the larger of the two demand estimates then this value was used. As shown in table 16, during the summer, the study area has a pleasure boat rental moorage demand of about 60,400 or more than twice the 1978 equivalent permanent slips inventory (approximately 33,200 additional). During the winter the apparent need is for 26,400 additional equivalent permanent slips (table 17). The greatest need is in the Central Division, with highly urbanized King County requiring over one-half the total need. Seasonal variation is very evident for both the North and West Divisions where summer demand is more than twice that of winter.

Table 18 presents the results of the questionnaire survey concerning the types of rental moorage preferred for summer and winter permanent, temporary, and transient moorage use in the study area. The distributions of preferences among moorage types for permanent winter and permanent summer use are very similar. Over 40 percent of respondents in those categories preferred wet open moorage and about one-quarter preferred wet covered moorage. There were some differences in the temporary summer and temporary winter distributions. Almost 85 percent of respondents desiring temporary summer facilities preferred wet open moorage. Of those wanting temporary winter facilities, only 68 percent preferred wet open moorage while 15 percent preferred dry covered and 11 percent preferred wet covered moorage. With transient summer and winter use, wet open moorage was overwhelmingly preferred.

Future Rental Moorage Needs

Future rental moorage need by division in the study area was projected based on expected moorage demand. Moorage demand was assumed to increase in proportion to the projected increase in total pleasure craft (see chapter 3). It was assumed that the existing 1978 relative proportions of summer and winter moorage demands in each division will remain fixed. The resulting forecasts of need, based on the medium projections of pleasure craft growth, by division for the years 1978, 1980, 1990, and 2000 are shown in figure 14 for summer and winter moorage. For the Puget Sound area as a whole, summer need is expected to grow from 33,200 permanent-equivalent slips in 1978, to 76,000 slips by the year 2000, while winter need is expected to grow from 26,300 permanent-equivalent slips in 1978 to 61,000 by the year 2000 (figure 15).

For information on the economic history, problems, and opportunities of the boat moorage industry in responding to the need for additional facilities, see the Washington Sea Grant report, The Moorage Industry in Washington's Coastal Zone.^{12/}

Table 16

Pleasure Boat Rental Moorage Need - Summer
Puget Sound Study Area - 1978

Division and County	Permanent Slips Demanded	Temp. Demand* (Perm. Equiv.)	Trans. Demand* (Perm. Equiv.)	Total Demand	Existing Moorage	Need
North						
Whatcom	2,104	40	80	2,224	2,038**	186
San Juan	2,199	1,155	1,155	4,509	1,160	3,349
Skagit	3,542	358	280	4,180	2,314	1,866
Island	1,040	797	558	2,395	727	1,668
			Subtotals	13,308	6,239	7,069
Central						
Snohomish	5,489	280	240	6,009	2,803	3,206
King	19,804	757	478	21,039	8,340	12,699
Pierce	7,484	518	160	8,162	3,493	4,669
Kitsap	2,804	478	718	4,000	2,080	1,920
			Subtotals	39,210	16,716	22,494
West						
Thurston	1,137	120	160	1,417	1,103	314
Mason	812	200	200	1,212	544	668
West Clallam						
Jefferson	699	757	200	1,656	905	751
East Clallam						
Jefferson	2,743	518	358	3,619	1,676	1,943
			Subtotals	7,904	4,228	3,676
			Totals	60,422	27,183	33,239

*Number of permanent-equivalent slips demanded. Temporary and transient moorage demand for summer and winter facilities was converted to equivalent permanent demand by allowing one permanent moorage facility for 10 temporary or 10 transient rental moorage users.

**Without Point Roberts, which is used primarily by Canadian boaters.

Table 17

Pleasure Boat Rental Moorage Need - Winter
Puget Sound Study Area - 1978

Division and County	Permanent Slips Demanded	Temp. Demand* (Perm. Equiv.)	Trans. Demand* (Perm. Equiv.)	Total Demand	Existing Moorage	Need
North						
Whatcom	2,066	40	0	2,106	2,020**	86
San Juan	1,713	240	240	2,193	1,124	1,069
Skagit	3,065	80	0	3,145	2,314	831
Island	1,018	200	160	1,378	727	651
			Subtotals	8,822	6,185	2,637
Central						
Snohomish	5,274	120	80	5,474	2,653	2,821
King	20,464	438	398	21,300	8,310	12,990
Pierce	7,795	318	160	8,273	3,471	4,802
Kitsap	2,886	200	318	3,404	1,974	1,430
			Subtotals	38,451	16,408	22,043
West						
Thurston	1,143	80	120	1,343	1,103	240
Mason	986	120	0	1,106	502	604
West Clallam						
Jefferson	0	120	80	200	28	172
East Clallam						
Jefferson	2,122	160	40	2,322	1,661	661
			Subtotals	4,971	3,294	1,677
			Totals	52,244	25,887	26,357

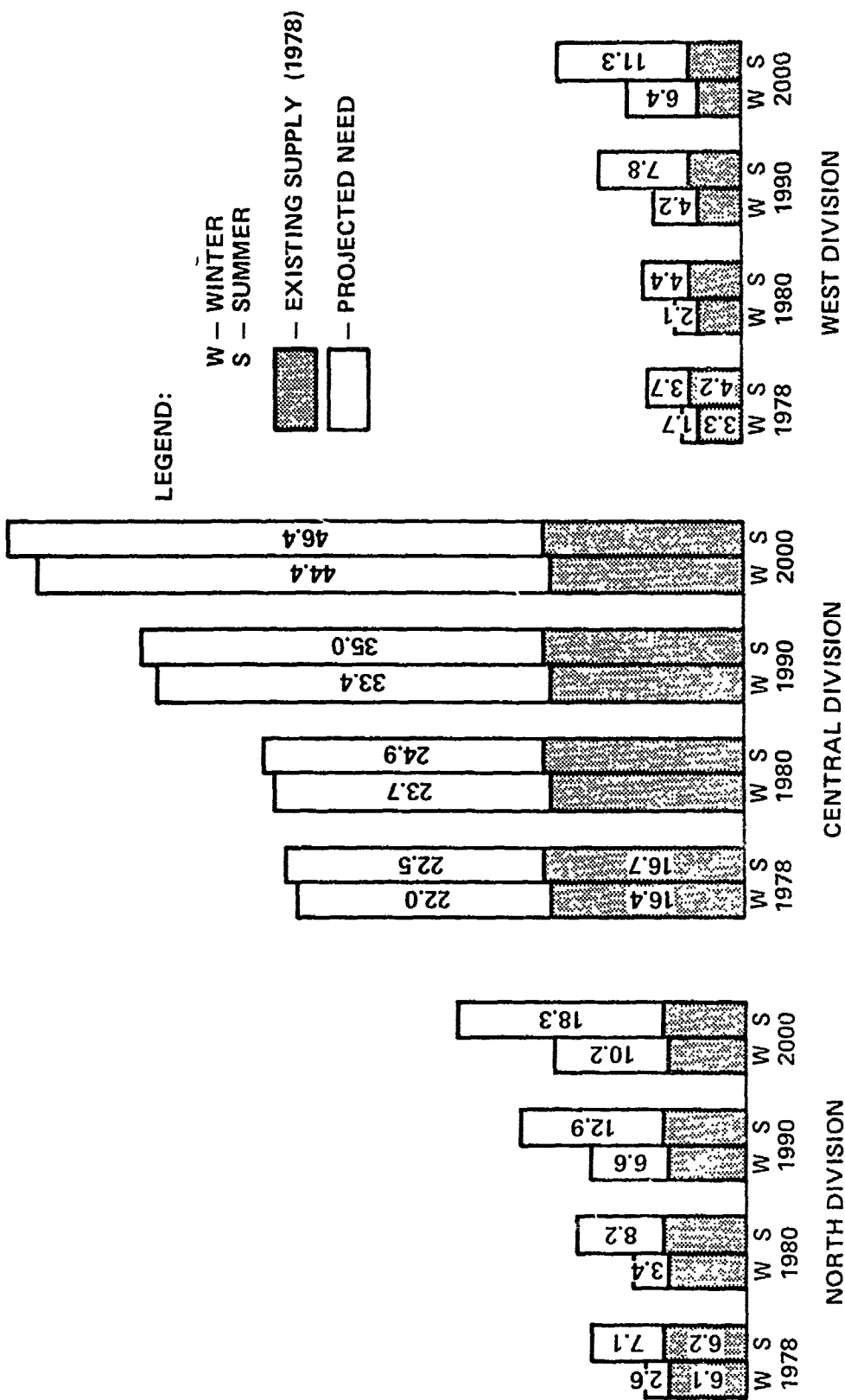
*See footnote for table 16

**See footnote for table 16

Table 18

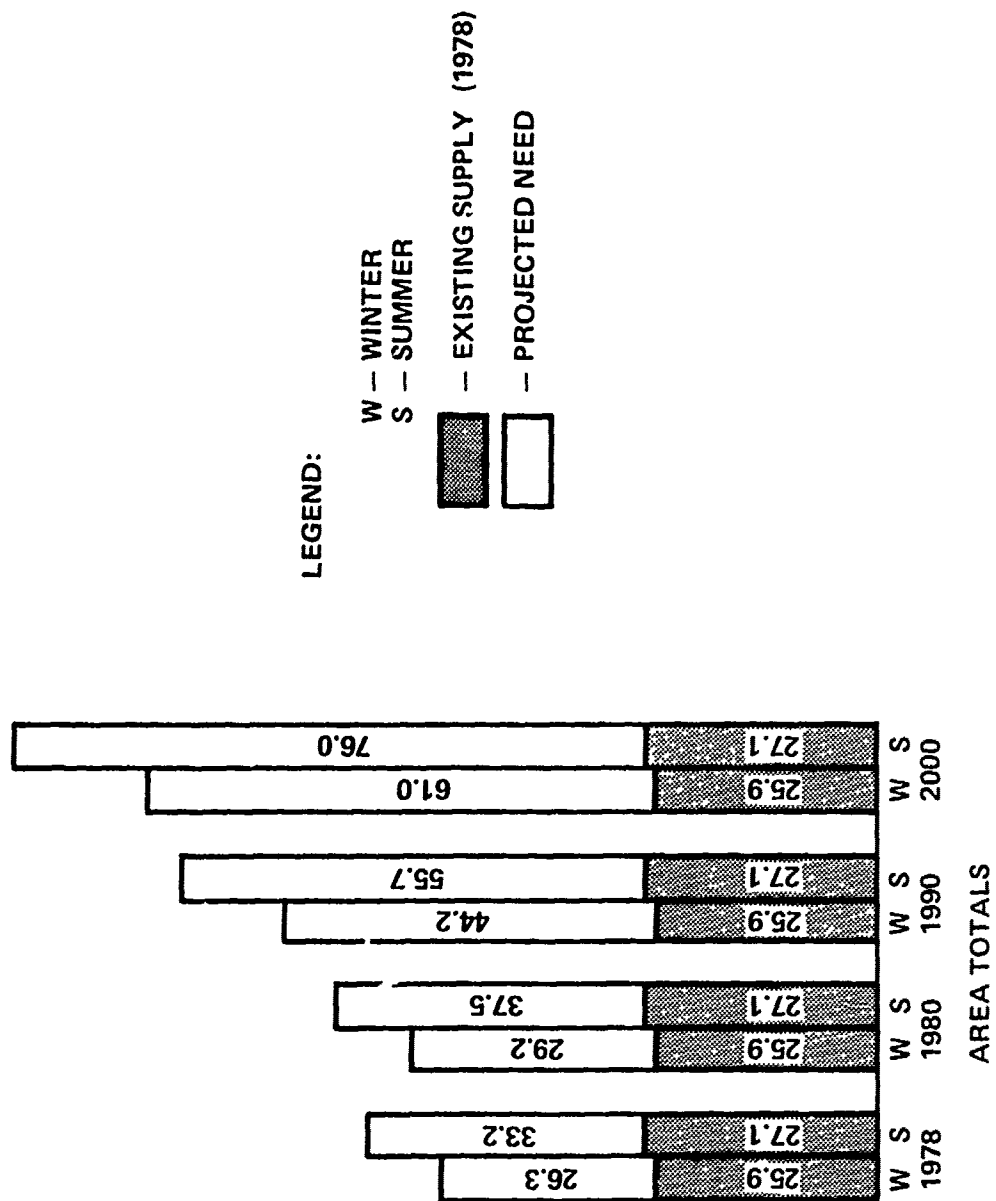
Pleasure Boat
Types of Rental Moorage Demanded
Puget Sound Study Area - 1978

Type of Moorage	Type of Demand (Percent)					
	Permanent Summer	Temporary Summer	Transient Summer	Permanent Winter	Temporary Winter	Transient Winter
Wet Inclosed	13	3	2	14	6	0
Wet Covered	26	9	0	25	11	0
Wet Open	43	84	98	42	68	100
Dry Covered	16	3	0	18	15	0
Dry Open	<u>2</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>
Totals	100	100	100	100	100	100



RENTAL MOORAGE:
EXISTING SUPPLY AND PROJECTED NEED BY DIVISION, 1978 -- 2000
(1000'S OF PERMANENT -- EQUIVALENT SLIPS)

Figure 14



RENTAL MOORAGE:
EXISTING SUPPLY AND PROJECTED NEED
PUGET SOUND STUDY AREA, 1978 — 2000
(1000'S OF PERMANENT — EQUIVALENT SLIPS)

Figure 15

CHAPTER 5
Marina Development
Potential and Evaluation

CHAPTER 5 - MARINA DEVELOPMENT POTENTIAL AND EVALUATION

Site Analysis Limitations

While the use of dry storage of recreational boats could help alleviate some of the moorage shortage, this report focuses on new wet moorage sites or suggests expansion of existing marinas. Examination of all possible Puget Sound area moorage sites was beyond the scope of this study. However, the 142 sites which were considered are felt to offer a reasonable assessment of the potential for increasing wet moorage supply in the area. The number of potential marina sites considered precluded extensive design and environmental studies. It is the responsibility of the developer to present plans to the regulatory agencies and work out under their guidance any modifications necessary for approval, possibly including studies to determine environmental impacts. A helpful guide to planning a project for successful agency review is Northwest Marine Trade Association's Marina Development Handbook.^{13/}

Site Selection Procedure

The following seven-step procedure led to the identification of potential new marina sites to help satisfy moorage demand:

Step 1. Review 1968 and 1970 Corps of Engineers Reports. In addition to a questionnaire survey, the 1968 study^{1/} included an evaluation of potential marina areas. Approximately 200 miles of shoreline were found to be potentially feasible for marina development, based upon an extensive examination of 2,350 miles of shoreline for the study area. Shoreline areas appearing feasible for development were noted after considering such factors as wind and wave conditions, channel depths required for the proposed marina, dredging requirements, and beach material composition.

The shoreline areas considered in the 1968 report were evaluated by the Corps of Engineers in more detail, and the results were published in a 1970 multiagency navigation report for the Puget Sound region.^{2/} Ninety-three specific marina sites were identified in the 1970 report. Site details included estimates of the potential number of wet moorages, necessary marina and upland service areas (acres), a tentative schedule of development, and a preliminary estimate of benefits and costs for each site's navigation facilities (breakwater, entrance channels, turning basins, and navigation aids). Remaining marina costs were not evaluated. The 1970 report was quite extensive and, therefore, served as a logical reference in identifying potential marina sites for the current pleasure boating study.

Step 2. Develop Objectives for Marina Site Identification in Current Pleasure Boating Study. At the outset of the current pleasure boating study effort, it was generally agreed that, due to the various topics to be addressed, only limited data could be developed for each potential

marina site. The decision was made early in the study to divide the site data into two primary categories, design and environmental, and to develop a similar level of detail for each. The Corps would be responsible for the design data, while environmental evaluation would be a cooperative effort between the Corps (lead role) and various agencies (support roles). Reflecting these considerations, the decision was made to use the list of 93 sites as a starting point from which to add or subtract new sites.

Step 3. Solicit Agency Input. Various water resources management agencies have established criteria and/or policies for evaluating boating facilities, including marinas (see appendix C for further discussion). For example, on the Federal level, the Corps of Engineers issues permits for development in navigable waters and undertakes small boat harbor studies. The U.S. Coast Guard is responsible for navigation aids in navigable waters. The Environmental Protection Agency (EPA) publishes water quality guidelines and standards and issues permits. The National Marine Fisheries Service evaluates Federal development proposals for impacts on endangered species. The Fish and Wildlife Service, with specific policies for review of marinas, prepares reports evaluating the impacts of Federal projects on the fish and wildlife environment.

Various Washington State agencies are responsible for evaluating marina-related proposals and assessing the impacts on public and private interests with these proposals. These agencies include the Departments of Ecology, Game, Fisheries, Natural Resources, Social and Health Services, the Parks and Recreation Commission, and the Office of Archeology and Historic Preservation.

Local governments review proposals and issue permits for development and also provide planning data to the potential marina developer.

The next step was to solicit agency comments on the list of 93 marina sites. An interagency meeting was subsequently conducted in October 1978 with the following participants:

Federal Agencies

Corps of Engineers, Seattle District
U.S. Coast Guard, Boating Safety Division
National Marine Fisheries Service, National Oceanic and Atmospheric Administration
U.S. Fish and Wildlife Service
U.S. Environmental Protection Agency

Washington State Agencies

State Parks and Recreation Commission
Department of Ecology

Washington State Agencies (con.)

Department of Social and Health Services
Department of Fisheries
Department of Game
Department of Natural Resources

The decision was made at this meeting that all 93 sites would remain on the initial list, and agencies would be given the opportunity to state specific environmental concerns for objectionable sites. General agreement was also reached on the environmental factors that would be used to screen potential marina sites.

Step 4. Receive Agency Feedback on 93 Marina Sites. Following the October 1978 interagency meeting, the same agencies were asked to comment on the environmental factors to be used in screening potential marina sites, and to provide their respective agency criteria, standards, permits, etc., required for marina development. The Corps of Engineers' letter requesting agency feedback along with agency responses is presented in appendix B.

The agencies' environmental screening of the marina sites resulted in the following categories:

- o Sites whose environmental character would be moderately impacted by marina development (A sites).
- o Sites for which additional marina design information is required in order to assess environmental impacts (B sites).
- o Sites for which a marina development would conflict with existing land use plans or where significant environmental impacts are anticipated (C sites).

Marina sites in categories A and B would receive conceptual design analysis, while those in the C category would receive no further evaluation. Table 19 summarizes the types of agency input.

Step 5. Coordinate with U.S. Fish and Wildlife Service (FWS). Under a transfer funding agreement with the Corps of Engineers, the FWS reviewed the initial list of 93 potential sites and provided data on fish and wildlife resources that could be impacted by development of the sites. The FWS also requested the consideration of an additional number of potential small boat harbor sites, focusing on a range of 100-150 boat capacity. This FWS request for a Corps evaluation of smaller capacity marinas was prompted by inquiries to the FWS from private developers. The 1970 navigation study^{2/} had emphasized large scale potential projects.

Step 6. Add Marina Sites Under Corps of Engineers Consideration. The list of sites was also expanded to include marinas currently or soon to be studied in detail by the Corps, under the congressional authority of Section 107 of the 1960 River and Harbor Act, as amended.

Table 19

Federal and State Agency Input to Initial Marina Site List

<u>Agency</u>	<u>Input</u>
<u>Federal</u>	
National Oceanic & Atmospheric Administration	Matrix describing shoreline master program designation, existing facilities, and plans at many sites.
Fish and Wildlife Service	Description of certain marina sites describing key biological factors. FWS report which provides more detailed biological information on all sites plus general information on water quality, planning designations, flora and fauna for many of the sites.
Environmental Protection Agency	Matrix which includes general impact evaluation on flushing and circulation, temperature, dissolved oxygen, and wetlands.
<u>Washington State</u>	
Parks and Recreation Commission	Some information regarding permits required for marina development by Port District.
Department of Ecology	Matrix describing general impact evaluations for environmental parameters.
Department of Social and Health Services	List of marina sites that are located near commercial shellfish grounds.
Department of Fisheries	Table of fishery resources and criteria. Used as a general indicator for presence of key species. Information is presently being modified, but is useful for determining potential impacts.
Department of Game	Description of some marina sites describing aquatic life and policy for environmental management of marinas. Matrix describing general impact evaluations for environmental parameters.
Department of Natural Resources	Matrix describing general impact evaluation for environmental parameters.

Step 7. Solicit Input from County Planning Agencies. In January 1980, the Corps of Engineers contacted 37 local planning departments and/or commissions, requesting comments on a list of potential small boat harbor sites for consistency with local development plans, including the Shoreline Management Program. The Corps letter is included in appendix B.

Table 20 identifies those local agencies who responded to the request for input. Based on these responses, the list of potential small boat harbor sites was expanded to its present status of 142. Marina sites included at the request of the FWS and local agencies, and those added for current or proposed Corps of Engineers studies, were placed in category D. Sites in this category received preliminary engineering design but did not receive environmental evaluation from all the agencies participating in the study. The following distribution of the 142 marina sites was achieved:

<u>Marina Site Categorization</u>					
<u>Division</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>Totals</u>
North	7	12	24	9	52
Central	8	7	18	17	50
West	<u>2</u>	<u>3</u>	<u>15</u>	<u>20</u>	<u>40</u>
Totals	17	22	57	46	142

Table 20

List of Local Agencies Responding to Expanded Marina Sites List

<u>Counties</u>	<u>Cities</u>	<u>Port Districts</u>
Clallam	Anacortes	South Whidbey Island
Island	Bremerton	
Jefferson	Edmonds	
King	Langley	
Mason	Oak Harbor	
Pierce	Port Townsend	
Snohomish	Seattle	
Thurston	Sequim	
Whatcom	Tacoma	

Sites Considered

Figures 16 (North Division), 17 (Central Division), and 18 (West Division) identify the sites considered for this study.

FIGURE 16

POTENTIAL FOR DEVELOPMENT NORTH DIVISION

<u>County</u>	<u>Site Number</u>	<u>Environmental Category**</u>	<u>Site Name</u>
Whatcom	1	C	Point Roberts East
	2	C	Birch Bay
	3	B	Blaine Addition
San Juan	4	C	Sucia Island - Fossil Bay
	5	C	Waldron Island - Cowlitz Bay
	6	C	Orcas Island - East Sound
	7	B	Stuart Island - Reid Harbor
	8	D	Spieden Island
	9	B	Orcas Island - Massacre Bay
	10	C	Henry Island - Nelson Bay
	11	B	San Juan Island - Roche Harbor
	12	C	Shaw Island - Squaw Bay
	13	C	Orcas Island - Grindstone Harbor
Skagit San Juan	14	B	Orcas Island - Deer Point
	15	A	Sinclair Island - East
Skagit	16	D	Mitchell Bay
	17	C	Shaw Island - Parks Bay
San Juan	18	C	William Point - Padilla Bay
	19	C	Samish Bay - North End
	20	A	Anacortes Addition
	21	A	Guemes Island SW
	22	B	Decatur Island - Fauntleroy Point
	23	B	Blakely Island - Armitage Island
	24	C	Lopez Island - Shoal Bay
	25	B	Lopez Island - Fisherman Bay
	26	D	Turn Island
	27	C	San Juan Island - Friday Harbor
Skagit Island	28	A	Friday Harbor Addition
	29	C	San Juan Island - False Bay
	30	C	San Juan Island - Griffin Bay
	31	B	Lopez Island - Outer Bay
	32	C	Lopez Island - Hunter Bay
	33	C	Burrows Bay
	34	C	Skagit Bay - Dugwalla Bay
	35	B	La Conner - Marthas Bay (Indian Bay)
	36	C	Point Partridge
	37	D	Whidbey Island - West Beach
Skagit Island	38	A	Oak Harbor - South
	39	A	Oak Harbor - North
	40	B	Skagit Bay - Utsalady
	41	C	Port Susan - Camano Island
	42	D	Camano Island - Onamac Point
	43	D	Whidbey Island - Race Lagoon
	44	C	Penn Cove
	45	D	Whidbey Island - Keystone
	46	D	Camano Island - Mabana
	47	A	Langley - Sunrise Beach
Whatcom	48	C	Holmes Harbor
	49	D	Admiralty Inlet - Mutiny Bay
	50	C	Useless Bay - Maxwellton
	51	B	Cultus Bay Expansion
	82	C	Hale Passage - East

*For additional information see figure 18 - site evaluation, in back cover pocket.

**Represents designation of site based on environmental agency screening results in 1979:

- A. No initial environmental agency opposition to marina development at site.
- B. Initial environmental agency concern over portion of site.
- C. Environmental agency opposition to site, or development prohibited by Shoreline Management Act or local land use plans.
- D. Sites added at request of Fish and Wildlife Service or by Corps of Engineers and have not been screened by environmental agencies.

FIGURE 17

POTENTIAL FOR DEVELOPMENT
CENTRAL DIVISION

<u>County</u>	<u>Site Number</u>	<u>Environmental Category**</u>	<u>Site Name</u>
Snohomish	52	C	Port Susan - Warm Beach
	53	C	Tulalip Bay
	54	B	Priest Point West - Everett
	55	D	Snohomish Delta - Everett
	56	C	Tract Q - Snohomish Delta
	57	C	Mukilteo
	58	B	Mukilteo South
	59	D	Harbour Pointe
	60	C	Norma Beach - North
	61	C	Meadowdale
	62	C	Edmonds North
	63	C	Picnic Point - North
	64	C	Wells Point - Edmonds
King	65	C	Golden Gardens - North
	66	C	Fort Lawton - North
	67	D	Magnolia - West
	68	C	Fort Lawton - South
	69	A	Elliott Bay - Magnolia - East
	70	A	Elliott Bay - Pier 54
	71	A	Seacrest - West Seattle
	72	D	East Passage - Three Tree Point
	73	D	East Passage - Des Moines
	74	D	Maury Island
	75	C	Dumas Bay
Pierce	76	B	Hylebos Waterway
	77	A	Ruston Way
	78	C	Point Defiance
	79	A	Titlow Lagoon
	80	A	Day Island
	81	C	Nisqually Flats - East
Kitsap	83	D	Colvos Passage - Olalla
	84	D	Port Orchard
	85	A	Manchester
	86	D	West Blake Island
	87	C	Bainbridge Island - Lynwood Center
	88	A	Brownsville
	89	D	Port Washington Narrows - Tracyton
	90	B	Dyes Inlet - Silverdale - Windy Point North
	91	D	Burke Bay - North of Bremerton
	92	B	Bainbridge Island - Fletcher Bay
	93	B	Bainbridge Island - Murden Cove
	94	C	Hood Canal - Anderson Cove
	95	C	Hood Canal - Warrenville
	96	D	Poulsbo - Liberty Bay
Pierce	97	D	North Bainbridge Island
	98	D	Agate Passage
	99	D	Point Jefferson
	100	D	Kingston - Appletree Cove
	101	B	Hood Canal - Coon Bay
	102	D	Case Inlet - Northeast

*For additional site information see figure 19 - site evaluation, in back cover pocket.

**Represents designation of site based on environmental agency screening results in 1979:

- A. No initial environmental agency opposition to marina development at site.
- B. Initial environmental agency concern over portion of site.
- C. Environmental agency opposition to site, or development prohibited by Shoreline Management Act or local land use plans.
- D. Sites added at request of Fish and Wildlife Service or by Corps. of Engineers and have not been screened by environmental agencies.

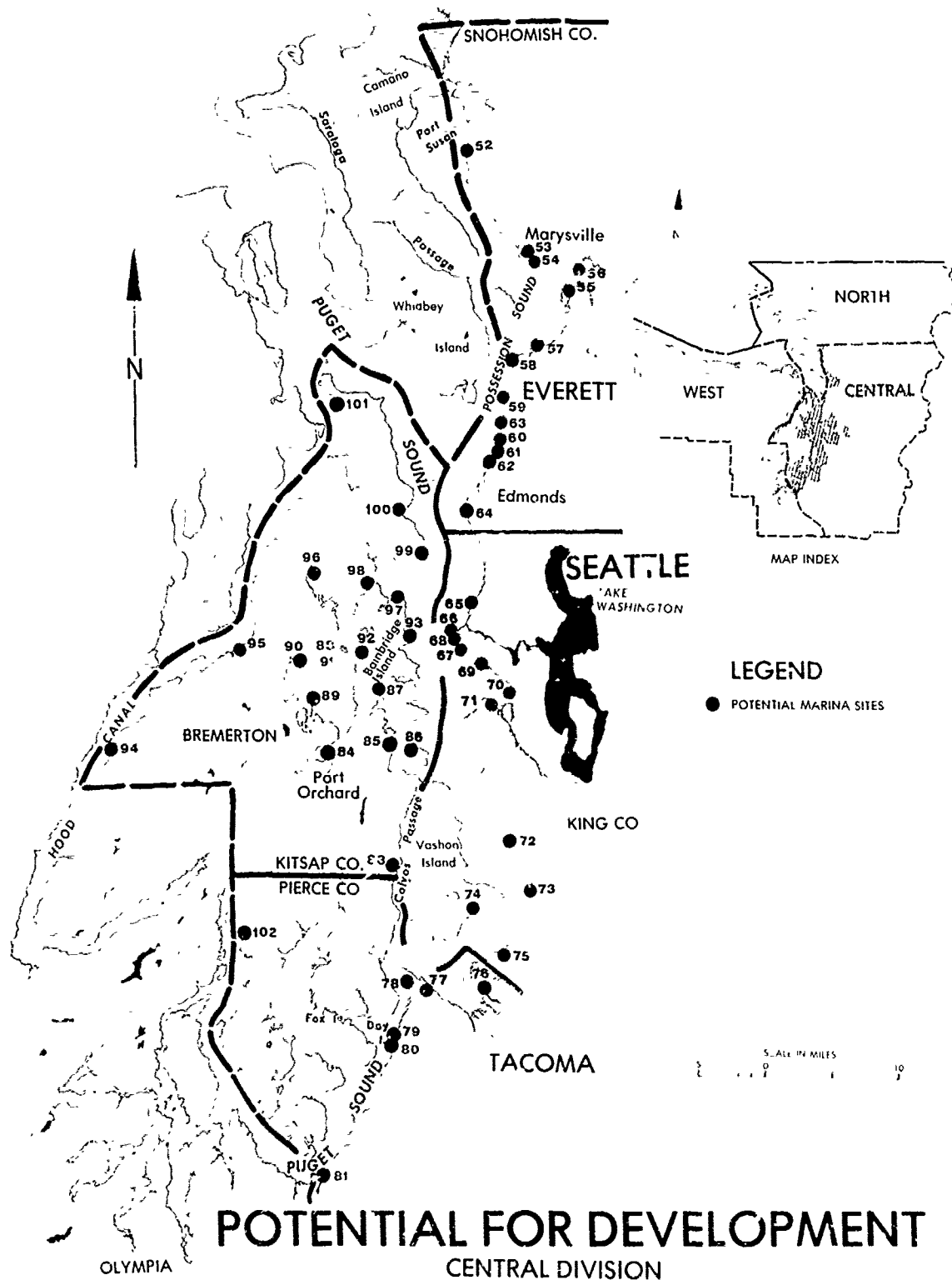


FIGURE 17

FIGURE 18

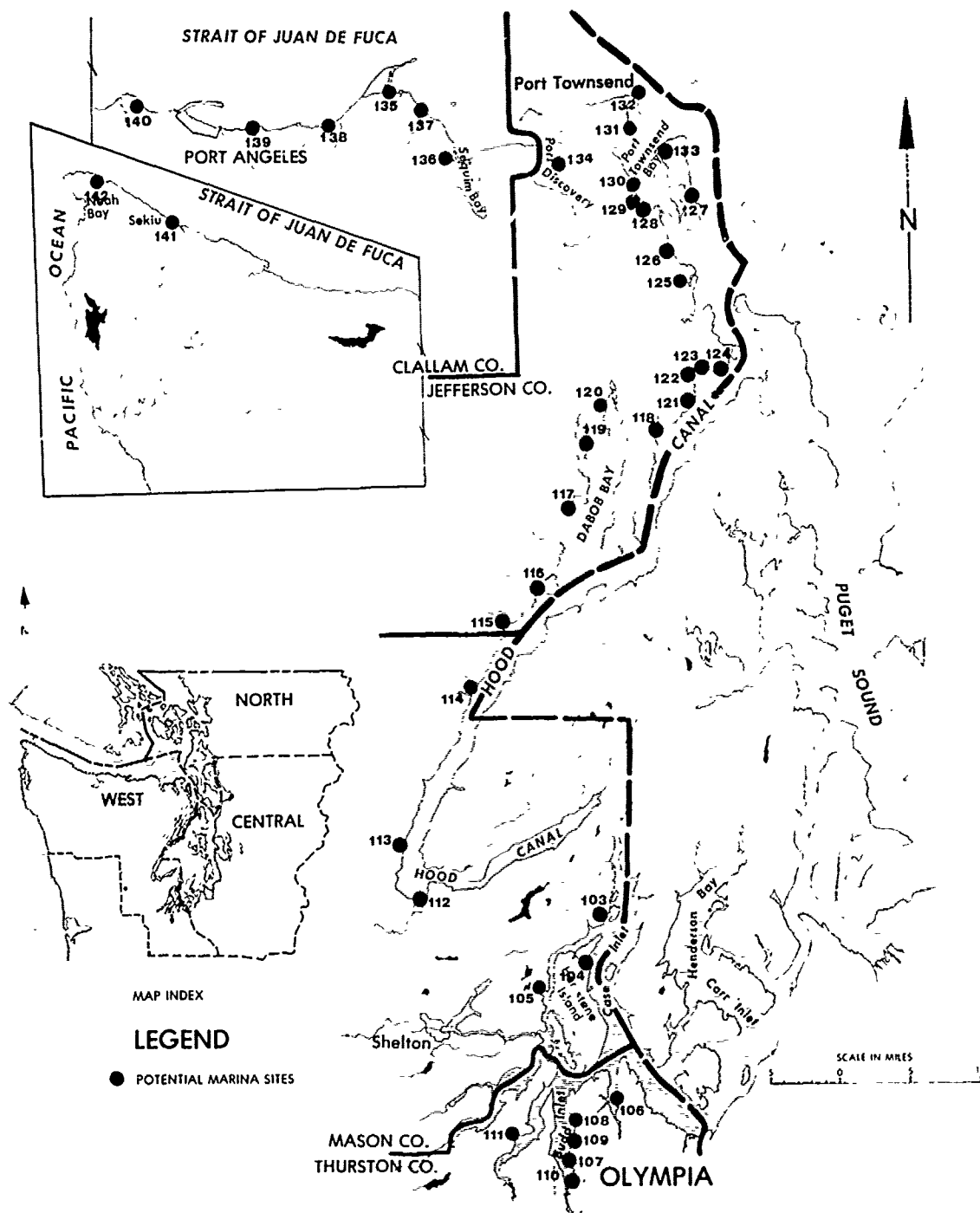
POTENTIAL FOR DEVELOPMENT
WEST DIVISION

<u>County</u>	<u>Site Number</u>	<u>Environmental Category**</u>	<u>Site Name</u>
Mason	103	D	Stretch Island
	104	D	Hartstene Island
	105	D	Pickering Passage - Graham Point
Thurston	106	C	Henderson Inlet
	107	D	Budd Inlet - Priest Point
	108	B	Budd Inlet - Gull Harbor
	109	C	Budd Inlet East
	110	A	East Bay
	111	D	Eld Inlet - Flap Jack Point
Mason	112	C	Hood Canal - Union Bay
	113	B	Hoodsport
Jefferson	114	D	Hood Canal - Hamma Hamma - Eldon
	115	D	Hood Canal - Triton Cove
	116	C	Hood Canal - Duckabush River
	117	D	Right Smart Cove
	118	C	Hood Canal - Thorndyke Bay
	119	C	Quilcene Bay - East Side
	120	D	Hood Canal - Dabob Bay
	121	D	Bridgehaven
	122	D	Hood Canal - Squamish Harbor
	123	D	Hood Canal - Termination Point
	124	C	Hood Canal - Bywater Bay
	125	C	Mats Mats
	126	C	Oak Bay
	127	B	Marrowstone Island - East Side
	128	D	Lower Hadlock
	129	D	Irondale
	130	C	Kala Point
	131	A	Port Townsend
	132	D	Point Wilson
Clallam	133	D	Marrowstone Island - Kilisut Harbor
	134	C	Port Discovery - Beckett Point
	135	C	Dungeness - Sequim
	136	C	Sequim Bay West
	137	C	Dungeness River - East
	138	C	Green Point - East
	139	D	East Port Angeles - Morse Creek
	140	C	Elwha River - East
	141	D	Sekiu
	142	D	Neah Bay

*For additional site information see figure 20 - site evaluation, in back cover pocket.

**Represents designation of site based on environmental agency screening results in 1979:

- A. No initial environmental agency opposition to marina development at site.
- B. Initial environmental agency concern over portion of site.
- C. Environmental agency opposition to site, or development prohibited by Shoreline Management Act or local land use plans.
- D. Sites added at request of Fish and Wildlife Service or by Corps of Engineers and have not been screened by environmental agencies.



POTENTIAL FOR DEVELOPMENT WEST DIVISION

FIGURE 18

Site Design.

a. Marina Planning. Under Section 107 of the 1960 River and Harbor Act, as amended, the Corps of Engineers involvement in pleasure boating marina development is limited by congressional authority to the design, construction, and maintenance of general navigation facilities, including breakwaters, and entrance and access channels (see appendix C). A brochure explaining the Section 107 program^{14/} is available from the Corps upon request.

Marina planning from a Corps of Engineers perspective is, therefore, restricted. The remainder of the marina features (i.e., moorage floats, parking lots, and other shoreside improvements) are local responsibilities. From the viewpoint of the local interest or private developer, numerous factors would be considered in marina planning, including such economic and social considerations as:

- o the quality and type of access roads and anticipated vehicular traffic,
- o marina recreation and public access possibilities,
- o population density of areas adjacent to proposed marina sites and marina impact on such populations,
- o existing or anticipated marina-related commercial/industrial activities, and
- o sources of funds.

In the Puget Sound study area there is an increasing demand by the non-boating public for access to water for recreational fishing and sightseeing. In response to this need public fishing piers have been built recently at Edmonds and Des Moines and two more are planned, one at Tacoma and one at Seattle. Current Corps of Engineers marina projects, too, include plans for public and fishing access to breakwaters, thus making the facilities available to all who care to use them. Future developers are encouraged to provide water access to those who do not own boats. In some cases public approval or agency permits are more likely to be granted if public access facilities are included in the plans. Examples of such facilities are viewpoints, parking, promenades, seating, pedestrian ramps from shore to breakwater, provisions for the handicapped, rest stations, educational displays, fishing rails, bait and fish cleaning stations, artificial reefs to attract fish, etc.

The following discussion focuses on the marina design and environmental analysis undertaken for this study.

b. Marina Siting. Natural conditions and existing structures were considered in seeking to reduce costs and/or increase effectiveness.

Some of the characteristics considered favorable were natural protection, natural depths, useable upland area, existing facilities, and lessened environmental impacts. Ideal conditions were rarely found therefore, combinations of the above qualities were used in site selection where possible.

c. Marina Size - Land and Water. The area available at each site was determined by examination of aerial photographs, topographic and hydrographic maps, and by the potential usage and population of the surrounding area. The average harbor with all slip moorage can berth about 35 to 50 boats per acre. This general calculation was used to estimate the number of potential boats which could be accommodated at a site. The estimate applies to a mix of boat sizes.

Slip arrangements vary, usually for best conformance to the basin and size of boats expected to berth there. The most common arrangement is a series of piers perpendicular to the bulkhead and extending to a pierhead line, with finger piers extending at right angles from the piers on either side. For this study, slip dimensions and distances between piers were determined using calculations based on a maximum boat length of 40 feet and width of 12 feet.

Fill acreages for marina support were roughly calculated depending on how much useable upland of the proper elevation existed at each site. Aerial photographs and topographic and hydrographic maps were again used to make these determinations. Accurate quantities can only be developed after detailed studies are done at each site. However, as a general rule, the major requirement at a marina is for parking, which averages about 90 cars per acre. About three vehicle spaces are needed for every four boats being berthed. Once the parking area requirements have been determined, they should be multiplied by four to obtain the total minimum land area required for a complete marina.

d. Marina Exposure and Protection. The degree of exposure of the potential marina site was determined by estimating wave heights based on generalized area data. A site was viewed as having some natural protection if wave heights were below 3 feet and exposed if wave heights were 3 feet and above. More refined calculations would be required to obtain site specific wave height data suitable for detailed marina design.

The main factors used to determine wave heights for this study were the direction which each site faces, its exposure to an open stretch of water (fetch length), and the velocity of wind to which it is subject. In most cases, some form of breakwater is needed for protection against waves, whether a site is naturally exposed or protected.

Three types of breakwater were considered in this study: (1) rubblemound, (2) timber pile, and (3) floating. The rubblemound breakwater consists of randomly placed stones protected with a cover layer of individually positioned stones. Economic considerations usually limit the

depth for which a rubblemound breakwater can be designed. Rubblemound breakwaters provide the best wave protection and are more easily maintained and repaired than other breakwater types.

Timber pile protective structures are often used in areas of relatively low wave height. They differ from rubblemound structures in that they may fail or be severely damaged by a single wave of more than design proportions. Timber pile breakwaters have their best stability in relatively shallow water depths.

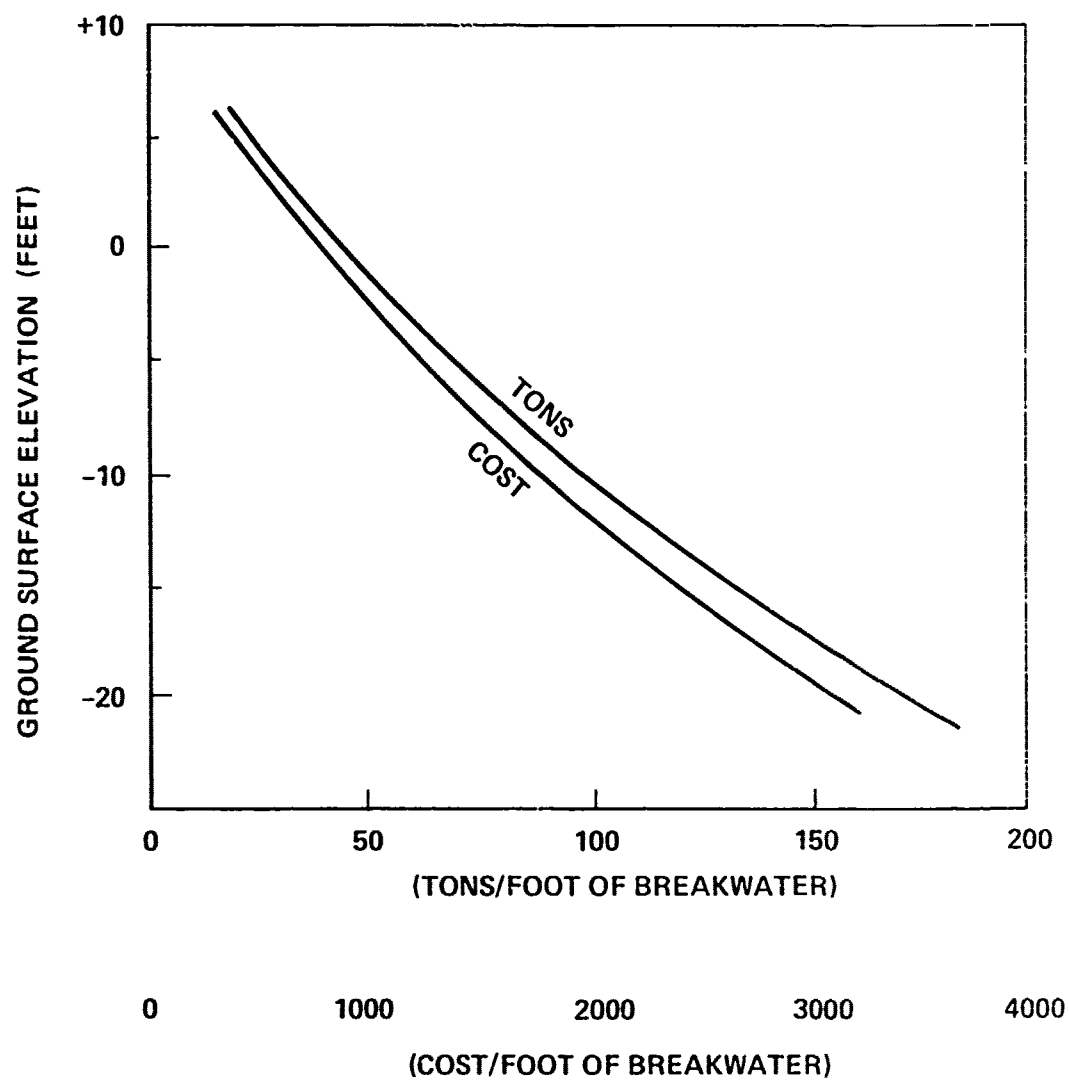
Floating breakwater design is a relatively new concept and can consist of concrete modules, posttensioned together; one-piece concrete floats; or even used tires fastened together. Floating breakwaters are about the only cost effective alternative for deep water marina sites. As a rule-of-thumb, sites with depth of water greater than 20 to 30 feet at low tide are not economically justified for rubblemound or timber pile breakwaters. Floating breakwaters will allow transmission of waves into a marina and should only be considered for areas that already have some protection from wave action.

Many of the new floating breakwater designs have not been tested in actual conditions over a long period of time. The Corps of Engineers is currently designing floating breakwaters for the East Bay (No. 110), Friday Harbor (No. 28), Brownsville (No. 88), and Seacrest (No. 71) Marinas. The numbers associated with these marinas represent the respective locations within figures 16, 17, and 18.

The precise positioning of a breakwater usually requires careful study. In the absence of other controlling factors, the alinement should be roughly normal to the primary direction of wave approach to intercept the maximum amount of wave energy with the shortest possible length of structure. The breakwater should be as close to shore as possible because as the depth increases the cost increases. All of the above factors are reflected in the breakwater design at each moorage location. Costs of breakwaters vary. Figures 19 and 20 represent the conceptual costs of the rubblemound and floating structures.

e. Dredging and Channel Size. The positioning of protective breakwater structures helped to determine the location and size of the opening to a marina harbor and, therefore, the character of waves and currents in the breakwater entrance channel. Channels should be as straight as possible, and where bends have to be made, they should be made gradually. The width of the entrance and access channels depends primarily on the number and size of vessels using them. For this study, an average width of 100 feet was used. For small boat traffic, a minimum navigable width of 50 feet or roughly five times the beam of the largest class of craft expected to use the harbor should be provided.

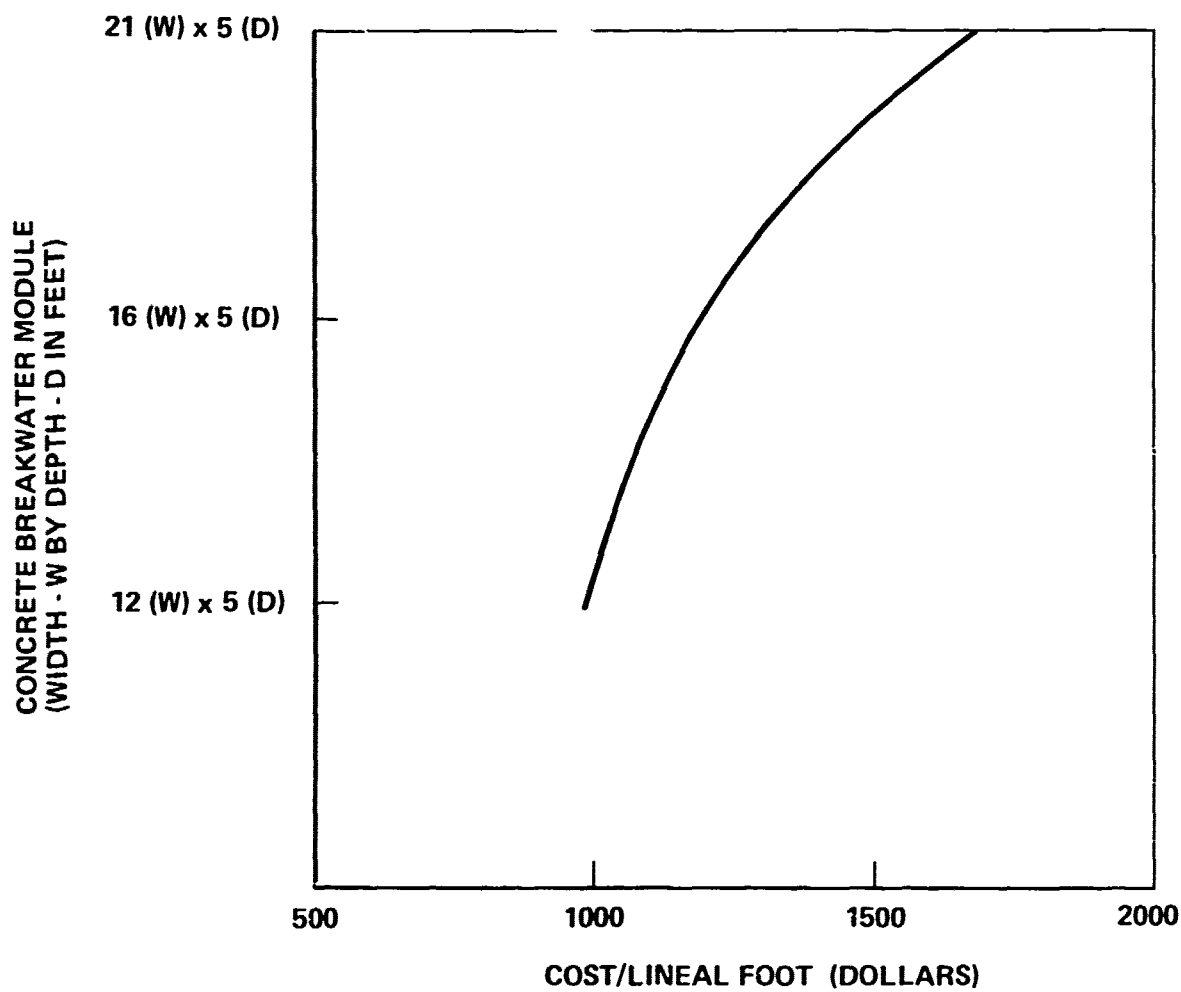
Channel depth is usually measured from mean lower low water (MLLW) datum and depends on many factors, including sizes and types of vessels,



RUBBLEMOUND BREAKWATER – CONCEPTUAL UNIT COSTS *

Figure 19

*Based on Puget Sound area construction with quarry rock and armor cover of 1,000 to 3,000 pound pieces. Costs reflect December 1979 price levels.



CONCRETE FLOATING BREAKWATER – CONCEPTUAL UNIT COSTS *

Figure 20

* Costs will vary with depth and type of anchoring system. Costs reflect December 1979 price levels.

travel speed, and wave magnitude. Travel speeds govern the degree of squat or additional draft required when a vessel is in motion. An over-depth of 1 foot in soft material and 2 feet in rock should be allowed for dredging irregularities. The channel depth should be the sum of (1) the draft, (2) squat, (3) one-half the wave height, and (4) over-depth. A minimum of 6 feet is suggested for channel depth. Twelve feet below MLLW was used as the dredging depth for access and entrance channels at each potential site.

The interior basin depth requirements for the small-craft harbors were determined generally by the same criteria applied to entrance and basin approach channels, the average depth being -12 feet MLLW.

For this study, estimated costs for dredging the channels and moorage area ranged from \$2.00 to \$5.00 with sometimes as much as \$10.00 per cubic yard (1980 prices) depending on soil conditions, dredge and disposal method, dredge haul distance, and quantities. Quantities were calculated using available topographic and hydrographic maps which showed the existing depth. Environmental and social concerns can also affect the cost of dredging and should be considered when developing cost estimates.

Site Environmental Evaluation

Table 19 identifies the environmental data input received from certain Federal and state agencies during the course of the study. The information provided by other agencies ranged from detailed description to general categorizations. In this respect, the information is not uniform. The Fish and Wildlife Service provided a report which includes fish and wildlife species identification for most sites as well as some floral and faunal descriptions, water quality information, planning designations, and geologic and geographic considerations.

The environmental information presented in the site evaluation matrixes should be considered as preliminary in nature. The parameters that were included in this study do not allow for a complete evaluation of impacts to fish and wildlife resources. It is also beyond the scope of this study to include analyses of cumulative and secondary impacts. Most sites under actual consideration for study and implementation would require a greater effort that would include not only more detailed, but broader information under the National Environmental Policy Act and other pertinent legislation. For some of the sites classified as A or B, unforeseen and possibly severe impacts may come to light as engineering features are detailed and presented to environmental agencies for approval. The agencies may require design modifications or additions to modify undesirable effects on living organisms or water quality. The State Department of Ecology, for instance, has a policy of requiring sanitary pumpout facilities for boats and shoreside restrooms at new marina projects. See below the comments of environmental agencies regarding the very preliminary nature of their examination of these sites.

The environmental parameters (developed as a result of agency agreement) and the conceptual environmental evaluation for each marina site appear in the matrixes in the back cover of the report. The matrixes also reflect input from county, city, and port districts within the study area. Definitions of environmental terminology are included in the glossary.

Agency Environmental Concerns

Agency policies and concerns, including permit requirements associated with marina development, are presented in appendix C. Data from the following agencies has been included:

Federal

Environmental Protection Agency
National Marine Fisheries Service
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers

Washington State

Department of Social and Health Services
Department of Fisheries
Department of Ecology
Department of Game
Department of Natural Resources
Parks and Recreation Commission

Local agency policies and programs were not addressed for the study area due to the number of agencies involved. Addresses of county planning departments, along with those of Federal and state contacts, are listed in appendix B, part 2.

Public and Agency Review Comments

Public and agency correspondence received during the initial phase of the study are contained in appendix B. The draft report was distributed in August 1980 to over 300 agencies, legislators, Indian tribes, environmental and special interest groups and individuals. The 20 response letters received are not reproduced here because of their bulk, but are available upon request at the Seattle District Office, 4735 East Marginal Way South, Seattle, Washington 98124. Suggestions and corrections were incorporated into the final report with other comments and responses summarized below.

FEDERAL AGENCIES

Heritage Conservation and Recreation Service (HCRS)

Comment: HCRS recommends that the Corps check its boating participation figures with those developed by the Washington State Interagency Committee for Outdoor Recreation (IAC) in its own survey.

Response: Since the IAC county totals included boating participation in lakes and rivers outside Puget Sound and associated boating waters, a direct comparison of the Corps figures with the IAC figures was not possible.

Heritage Conservation and Recreation Service, Interagency Archeological Services:

Comment: We recommend that you evaluate potential impacts to cultural resources for each marina site through consultation with the Washington State Office of Archaeology and Historic Preservation and/or have Corps archeologist do so with information from Archeological Research Center's site files.

Response: The Recreational Boat Moorage Study is intended as a preliminary planning aid for those interested in moorage facility development. This report does not exempt developers from Section 10/404 permit requirements, nor will it lead to Corps of Engineers marina project construction. The usual studies and reviews of effects on cultural resources will still be required in conformance with existing laws and regulations.

Environmental Protection Agency

Comment: We believe the report will be a valuable planning aid to guide future marina development in the Puget Sound area. It should be understood, however, that the assessment of impacts for the potential marina sites listed in the report is only preliminary. Our agency's position on a particular proposal will depend to a very large extent on the specific site and plans for the marina. EPA recommends developers design breakwater and moorage basin dredging to maximize water exchange and circulation. Shoreline fills should be minimized or avoided.

Response: Noted.

STATE AGENCIES

Department of Ecology

Comment: Water quality is excellent or very good at all but a very few locations as noted in the matrix. Extent of construction, primarily amount and configuration of dredging, is the major factor influencing water quality both during construction and during subsequent marina use. Poor marina design configurations, especially for sites dredged into shallow or upland areas, may likely result in extremely poor water quality within the marina. Coliform problems are expected at most marina locations, unless adequate and reliable sewage disposal facilities are made available to the boating public. This includes both shoreside toilet facilities and pumpout/dump stations, where upland disposal facilities are capable of treating such wastes (see pumpout requirements, appendix C).

Response: Noted.

Department of Fisheries

Comment: As specific plans are developed for design and construction of individual marinas, we anticipate reviewing them. Design features, currently uncatalogued resources, or water quality considerations may make a site unacceptable although it has not been placed in the "C" category in your report. We must reserve the right to find any given site and design unacceptable when the specifics are provided to us. Some of the "B" sites probably should be placed in the "C" category. For example, several of the sites require dredging and list spawning herring as present. These would be unacceptable unless redesigned to eliminate the dredging.

Response: Noted.

Department of Game

Comment: Because potential exists for serious environmental problems at all sites, the "A" and "B" sites in the report should be given more extensive examination. The "A" and "B" absence of comment (in the matrix) by the Department of Game does not mean lack of impact but means that further effort is required to determine impacts, e.g., bottom sampling may be necessary to discover effect of dredging on shorebird and fish food resources.

Response: Noted.

Parks and Recreation Commission

Comment: A number of survey questions have not been treated in the text. We believe that each of these questions can supply needed valuable data and request that each one be analyzed and reported on.

Response: The questionnaire was formulated in cooperation with the staff of the Coastal Resources Program of Washington Sea Grant, University of Washington, and covered topics broader than the scope of the Corps of Engineers report. However, additional information has been presented from the questionnaire on boat launching demand (see chapter 6). Detailed analysis of the questionnaire responses is available upon request from Mr. Robert F. Goodwin, Coastal Resources Program, 3731 University Way Northeast, Seattle, Washington 98105 or from Navigation and Coastal Planning Section, U.S. Army Corps of Engineers, Seattle District, 4375 East Marginal Way South, Seattle, Washington 98124.

Office of Archaeology and Historic Preservation

Comment: The document includes no consideration of the cultural environment and since impact potential exists it should be revised to

include a discussion of known historical and archaeological resources, measures taken or proposed to identify such resources, impacts which may be anticipated to occur to identified or unidentified cultural resources as a result of the actions proposed under the plan, and proposals to avoid or mitigate these impacts.

Response: See response to Heritage Conservation and Recreation Service, Interagency Archeology Services.

LOCAL AGENCIES

Port of Bremerton

Comment: The Port recommends that the report study the restraints against construction of marinas and moorages; shorelines management requirements; restrictive zonings of shorelines; restriction on dredging, bulkheads, landfills; opposition by special interest groups; exorbitant harbor area and tideland lease rates; etc. Recommendations could then be made to modify the effects of the above restraints and to encourage the construction of new moorage facilities.

Response: See the Washington Sea Grant report, The Moorage Industry in Washington's Coastal Zone^{12/} which addresses problems affecting moorage development and gives recommendations for modifying the restraints.

Port of Coupeville

Comment: There appeared to be little recognition, except for a sentence on page 24, given to the rapidly escalating costs of petroleum products, which presage trends toward more diesel engine usage (versus gasoline), lower power engines, smaller and/or more efficient hulls, greater use of sail, and shorter boating trips. These trends probably did not reflect in the 1978 questionnaire results.

Response: The 1978 questionnaire response represents a snapshot in time and does not fully reflect the above trends. Uncertainties regarding future fuel prices, moorage fees, and general economic conditions are other factors which could impact pleasure boat use. However, it was beyond the scope of this study to speculate on the impact of these factors. The selection of a conservative growth rate reflects an attempt to recognize some of these uncertainties.

City of Sequim

Comment: The city of Sequim questions the placement of No. 83, Sequim Bay - West under type C, potential sites with agency opposition. We wish to question this classification and ask that it be recategorized to type B. Regarding a marina at this site, there have been numerous

hearings and hours of testimony. The preponderance of people in our area feel a strong need for a facility at this site, and highly favor its utilization as a marina.

Response: The classification of potential marina sites was made on the basis of the preliminary assessments provided to us by the environmental agencies. Each agency's position on a particular site may change according to the actual proposed marina design, construction plans, mitigating measures proposed, etc. However, these positions will not be known until more detailed plans are presented to the agencies by the developers. Agencies should be contacted directly for further information.

Port District of South Whidbey

Comment: Our Commission would like to reserve comment on your placement of Deer Lagoon (Useless Bay) and Holmes Harbor proposed small boat harbor sites in a type C category. We believe the depth of the study may be quite inadequate to prove the economic usefulness of the two sites. We would also like to consider these sites in full comparison with other possible sites you may have selected for the screening process.

Response: See response to city of Sequim above.

Additional Sites Suggested

The following sites not evaluated in this report were suggested for possible moorage facility development. Due to the limited scope of the Corps study, other potential sites no doubt exist. However, the over 140 sites evaluated were considered representative of design and environmental factors encountered in the study area. For further information on the sites below, regulatory and environmental agencies should be contacted directly.

<u>Site</u>	<u>Suggested by</u>
Cornet Bay, North Whidbey Island	Island County Planning Department
Ship Harbor, North Fidalgo Island	Port of Anacortes
Brown's Point, North Commencement Bay	Pierce County Planning Department
Sunnyside Park, Steilacoom	Pierce County Planning Department

PRIVATE INDIVIDUALS

Ms. Benella Caminiti

Comment: Public access for non-boat owners is the last item to be considered but in terms of need is the greatest. Why are the priorities reversed? Why are the relatively inexpensive facilities that fishermen need (recreational fishing from land) ignored, while the recreational fishing from boats is given priority and funding?

Response: Public access to water for fishing and recreation is being given more consideration today and previously, e.g., the construction/planning of four fishing piers at Edmonds, Des Moines, Tacoma, and Seattle. Current Corps of Engineers funded marina projects include public access provisions.

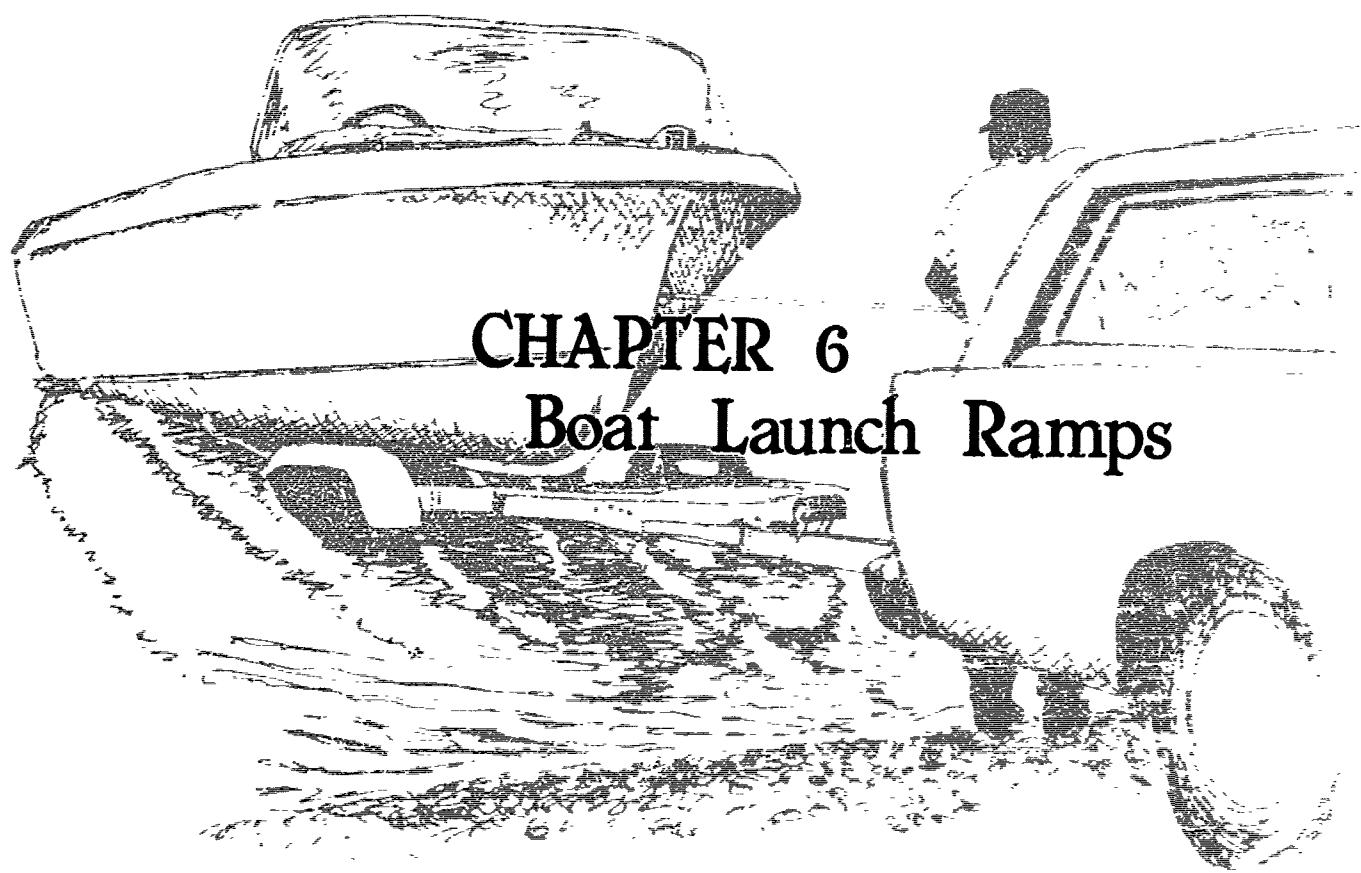
Comment: If 64 percent of the respondents now trailer their boats, have boats capable of being trailered (page A-26), the first order of business should be to find sites for the increase of boat launch ramps and NOT costly marinas, built at the expense of the vast majority who do not own boats.

Response: While this report does recognize the need for additional launch ramps, locating specific sites for launching facilities was beyond the scope of this study. Many, if not all, of the sites listed for potential marina development would also be suitable for launch ramps. Some sites would need protection from wind generated waves.

(NOTE: Many of Ms. Caminiti's suggestions were incorporated into the final report, including additional information on boat launch ramps. See chapter 6.)

Sources of Additional Information

Additional information on specific marina sites, on the procedures necessary to obtain marina development permits, or on agency policies and concerns associated with marina planning and development may be obtained from the sources identified in appendix C, part 2.



CHAPTER 6

Boat Launch Ramps

CHAPTER 6 - BOAT LAUNCH RAMPS

Launch Ramp Demand

The majority of questionnaire respondents having boats less than 27 feet long used a launch ramp one or more times in 1978. Boat owners using launching facilities are a significant portion of the boating population (58 percent of boaters surveyed state-wide trailered their boats in 1978). Reference to the 1978 OIW survey^{3/} indicates that in the study area there are about twice as many launch ramps available as in 1968. Still, comments in the questionnaire survey indicate a continuing need for additional hoists and launch ramps, especially in the well populated areas of Puget Sound. Many respondents complained about congestion and waiting periods of as much as 3 hours at existing ramps during such peak use times as late Sunday afternoon in sunny weather. In addition to building new facilities it was suggested that existing ramps be enlarged to multi-lane ramps and that public ramps be built at all waterfront parks and under more bridges.

Table 21, developed from the questionnaire survey, shows the estimated number of boaters using launch ramps and the average number of launchings per boater for each month of 1978 in the subareas indicated. While this report does not make estimates of need for launching facilities because the necessary supply data for analysis by launch ramp lane was not available,* table 21 can be helpful in assessing launch ramp demand for a particular subarea. In Snohomish County, for example, the number of launchings that occurred is found by multiplying the number of boaters using the facilities by the average number of launchings per boater. In January there were 396 launchings (396×1); in June there were 47,536 launchings ($5,942 \times 8$). Totalling the figures for 12 months gives 183,005 launchings for 1978. Assuming a 365-day boating season, the average day use for the county was 499 launchings ($183,005 \div 365$). Perhaps 75 percent of this activity would occur on weekends or holidays. Using ratios established in the 1966 Pleasure Boating Study, one ramp should be provided for 40 launchings during a peak day and 8 launchings during an average day. The 499 launchings per average day translates into a demand for 62 lanes ($499 \div 8$). The OIW moorage survey lists 18 existing launch ramp sites in the county. Dividing 62 by 18 gives an average of 3 lanes per launch ramp. It is unlikely that many of the sites have more than one lane. The prospective developer can canvass the sites to determine the actual number of lanes already available and compare that figure to the 1978 demand of 62 lanes derived from table 21. There is an apparent need for additional launch ramps in Snohomish County.

*OIW report^{3/} does provide information on existing boat launching ramps in the study area but not the number of lanes per ramp.

Table 21
Use of Boat Launch Ramps by Month and Subarea, 1978

SUBAREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Whatcom 1	1,980 5	2,377 4	1,188 10	3,565 5	7,527 5	5,942 5	6,735 5	6,339 5	5,546 5	2,773 5	2,377 4	2,773 4
San Juan 2	0 0	0 0	396 1	1,980 2	1,585 7	1,188 3	2,377 5	1,585 8	2,379 3	1,188 8	0 0	0 0
Skagit 3	396 1	396 1	396 1	0 0	396 1	1,188 1	1,980 1	1,188 3	792 1	0 0	0 0	0 0
Island 4	792 4	396 6	792 4	792 5	1,188 5	2,377 4	2,377 5	2,377 4	792 4	792 5	396 5	396 5
Snohomish 5	396 1	396 1	396 1	1,188 3	3,565 8	5,942 8	6,339 7	3,962 6	4,358 4	3,962 4	792 3	396 1
King 6	3,565 2	2,773 2	5,150 3	7,923 2	10,300 4	13,469 4	15,054 5	13,866 5	11,092 4	5,546 3	2,377 3	2,377 3
Pierce 7	2,377 4	2,377 4	2,377 3	5,546 3	7,923 3	7,527 4	9,111 5	8,319 5	7,527 4	4,358 2	3,169 3	1,980 4
Thurston 8	0 0	0 0	396 2	1,188 3	3,565 3	2,377 5	3,169 4	2,377 5	2,773 3	792 3	0 0	0 0
Mason 9	0 0	0 0	792 2	1,585 3	3,565 3	1,585 5	1,585 4	2,773 3	2,377 3	396 2	396 2	396 2
Kitsap 10	2,377 2	1,980 2	3,169 2	4,754 2	3,962 3	5,150 3	5,150 4	4,754 4	3,169 5	3,565 4	1,980 3	1,188 2
W. Clallam 11 W. Jefferson	0 0	396 2	792 4	396 7	1,585 4	3,565 4	4,358 4	7,527 3	2,773 3	396 2	0 0	0 0
E. Clallam 12 E. Jefferson	1,585 2	792 3	792 7	3,169 3	3,169 4	3,565 5	3,962 5	4,754 5	3,962 4	2,377 4	1,585 5	1,980 4

KEY: 1980 - Estimated number of boaters using facilities.
5 - Average number of launchings per boater.

Launch Ramp Design

The launch ramp crunch could be alleviated if more existing moorages and all new moorage development included launching facilities. The size of boats presently being trailered gives some guidance for planning hoists and ramps. According to the survey, 60 percent of those who said they ordinarily trailer their largest boat had boats in the 16- to 20-foot range. Thirteen percent had boats 21 to 26 feet long, but only a few trailered a boat longer than 26 feet.

Boaters commenting in the questionnaire survey were dissatisfied with some of the existing launch ramp facilities and wanted them upgraded. They asked for multi-lane ramps with adequate parking for boat trailers and with side docks reserved for tying up while boarding and while moving the trailer to and from the parking area. Multi-lane launching does not proceed efficiently unless there is enough tie-up dock space to serve several lanes at a time. At some locations there is need for breakwater protection adjacent to the ramps. The difficulties encountered during rough water tend to aggravate congestion at ramps as well as increase boat damage and personal injury potential. Boaters encounter delays at some ramps at low tides or at low lake level if the end of the concrete apron is short of the water and an exposed soft bottom exists. A sandy beach off the end of the ramp will usually support vehicles while launching at times of low water.

Glossary

GLOSSARY

AUXILIARY SAILBOATS - Sailboat powered by auxiliary motors.

BENTHIC ORGANISMS - Aquatic, bottom-dwelling organisms. These include sessile animals such as barnacles and sponges, creeping forms such as snails, and burrowing forms, such as worms and clams.

BIOLOGICAL OXYGEN DEMAND (BOD) - The amount of oxygen required to stabilize the demands from aerobic biochemical action in the decomposition of organic matter. This is not the amount required to completely oxidize all organic matter, but rather the volume necessary to restore balance between oxidation and bacterial activity.

BOAT HARBOR - An area of water protected to a degree sufficient to provide safe moorage for small craft, including both recreational and commercial vessels. A small boat harbor may contain a number of marinas or constitute a single moorage basin in itself.

CIRCULATION - The internal mixing process of water within a basin caused by interaction of tidal effects and basin geometry. Circulation is normally described by specific water speed and direction as a function of tide phase.

COLIFORM - Any of a number of organisms common to the intestinal tract of man and animals whose presence in waste water is an indication of pollution. An index of the purity of water is based upon a count of its coliform bacteria.

COVERED WET MOORAGE - Water moorage with overhead cover.

DEMAND - A term expressing marine facility use by pleasure boatowners or indicated use if facilities were available.

DISSOLVED OXYGEN (DO) - The oxygen freely available in water that is necessary for the life of fish and other aquatic organisms.

DIVISIONS - The study area was subdivided to coincide essentially with the three divisions examined in the economic study of Puget Sound and Adjacent Waters by Consultant Services Corporation. The North Division consists of the counties of Whatcom, San Juan, Skagit, and Island. The Central Division consists of Snohomish, King, Kitsap, and Pierce Counties. The West Division consists of Thurston, Mason, Jefferson, Clallam, Kitsap, and Pierce Counties.

DOCUMENTED BOAT - A boat of over 5 net tons capacity formerly documented through the Bureau of Customs, now documented through the Coast Guard.

FAUNA - The entire animal life of a region.

FISHERIES - The total fish population.

FLORA - The entire plant life of a region.

FLUSHING - The exchange of basin waters with an outside water source. The rate of flushing is usually expressed as the percent of water in the basin exchanged on each tidal cycle.

HARBOR OF REFUGE - A temporary haven for small craft in distress or seeking shelter from approaching storms; also a safe place of rest and replenishment for transient boats.

INBOARDS - Inboard powered vessels, including those craft classed as inboard-outboard.

INORGANIC POLLUTANTS - Pollutants from nonliving things, or all pollutants without elemental carbon.

MARINA - A marine development having moorages. Other facilities may be available, including repair facilities, bait, tackle, and general supply services. Restaurants and hotels or motels are often part of a modern marina complex.

MEAN LOWER LOW WATER (MLLW) - The average height of all the lower low waters recorded over a 19-year period, or a computed equivalent period. It is usually associated with a tide exhibiting mixed characteristics.

MOORAGE FACILITY - One or more piers, wharfs, floats, or permanently anchored buoys to which boats can be secured and left in the water for storage purposes; or land or deck storage areas used with hoists or inclined railways.

NAVIGABLE WATERS OF THE UNITED STATES - Those waters of the United States subject to the ebb and flow of the tide shoreward to mean high water mark (mean higher high water mark on the Pacific Coast), and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce.

NEED - A term used to indicate additional marina facilities required to satisfy a given level of pleasure boatowner demand.

NONSLIP MOORAGE - Moorage along a pier or float assigned by lineal feet. In this report, nonslip moorage was converted to equivalent slip moorage by assuming that 30 lineal feet equal one slip.

OPEN DRY MOORAGE - Moorage on land or on the deck of a pier and exposed to the weather.

OPEN WET MOORAGE - Water moorage exposed to the weather.

ORGANIC POLLUTANTS - Pollutants from living organisms, or all pollutants that contain elemental carbon.

OUTBOARDS - Outboard powered pleasure craft.

PERMANENT MOORAGE - A place where a boat is kept more than 1 month.

PREDATORS - Living organisms that prey on other organisms.

PUBLIC AND PRIVATE MARINE FACILITIES - Public facilities refer to marine facilities operated by public agencies such as the state, counties, cities, and ports for use by the general public. Private facilities refer to marine facilities operated for profit by private ownership. They are available for general public use.

PUGET SOUND STUDY AREA - The 12 counties in northwestern Washington bordering Puget Sound and adjacent waters. These consist of Whatcom, San Juan, Island, Skagit, Snohomish, King, Pierce, Kitsap, Thurston, Mason, Jefferson, and Clallam Counties. Only Puget Sound and adjacent saltwaters were examined with reference to marine facilities and boating demand. Lake Washington, Lake Union, and the Lake Washington Ship Canal were included as an extension of Puget Sound.

REGISTERED BOAT - An undocumented craft propelled by an engine, used on navigable waters of the United States, and registered by the United States Coast Guard, as required by the Federal Boating Act of 1958.

SEDIMENTATION - Process in which materials carried in suspension by a flowing body of water ultimately settle to the bottom after the water loses its velocity.

SQUAT - The increase in draft due to vessel movement, wave action, and/or the transition from saltwater to freshwater.

SUBAREAS - Each of the divisions was subdivided for questionnaire distribution purposes into four subareas, which, with exception of the West Division, coincided with county boundaries.

SUMMER MOORAGE - A moorage used from mid-April to mid-September. This type may or may not require breakwater protection from wind generated wave action.

TEMPORARY MOORAGE - A place where a boat is kept from 4 to 29 days.

TRANSIENT MOORAGE - A place where a boat is kept 1 to 3 days.

WILDLIFE - Undomesticated animals and birds.

WINTER MOORAGE - A moorage used from mid-September to mid-April which usually requires breakwater or sheltered inlet protection from winter storm generated wave action.

YACHT CLUBS - Privately owned marine facilities used by a select segment of the public.



REFERENCES

REFERENCES

The following sources were used in the development of the main report. The number shown to the left of each item is the reference number shown in the main report.

1/Department of the Army, U.S. Army Corps of Engineers, Seattle District, Seattle, Washington and Northwest Region, Bureau of Outdoor Recreation, Seattle, Washington. Pleasure Boating Study. 1968.

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3/Oceanographic Institute of Washington, Seattle, Washington. Survey of Marine Boat Launching and Moorage Facilities in Washington. 1978.

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6/Washington State Department of Natural Resources, Olympia, Washington. Your Public Beaches. 1978.

7/The forecasts were derived, with extensions, principally from Norman Saunders, "The United States Economy to 1990: Two Projections for Growth," Monthly Labor Review, December 1978.

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11/Leeds, Hill, and Jewitt, Inc., California Small Craft Harbors and Facilities Plan. 1964.

12/Goodwin, Robert F., and Stokes, Robert L., Coastal Resources Program, University of Washington, Seattle, Washington. The Moorage Industry in Washington's Coastal Zone, Draft Report. 1980.

13/Northwest Marine Trade Association, Seattle, Washington. Marina Development Handbook. 1980.

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APPENDIXES

APPENDIX A
**Recreational Boating
Questionnaire Survey**

APPENDIX A -- RECREATIONAL BOATING QUESTIONNAIRE SURVEY

<u>Item</u>	<u>Page</u>
Joint University of Washington/Corps of Engineers Press Release	A-1
Questionnaire Survey	A-2
Followup Letter	A-23
Summary Report of Questionnaire Responses	A-24
Methodology Used in Developing Sample Size for Questionnaire	A-30

CURRENT MARINE RESEARCH & ACTIVITIES...

6/5/79
Release date

BOATING SURVEY TO ASSESS REGION'S NEEDS

A boating survey questionnaire will be mailed to several thousand boat owners beginning June 6. Responses to the questionnaire will be used to determine current activities of recreational boaters in the Puget Sound region, as well as needs and trends for the future.

The survey is a joint effort of the Coastal Resources Program of Washington Sea Grant and the Army Corps of Engineers, Seattle District. According to Robert F. Goodwin of the Coastal Resources Program, "The purpose of this survey is to discover the potential demand for boat moorage and compare this with existing facilities, which we know are in short supply."

The Army Corps of Engineers is in the process of preparing a report that will update their 1968 Puget Sound Pleasure Boating Study. The current Corps effort will determine the boating facility needs and identify potential pleasure boat moorage sites within the Puget Sound region. The results of this questionnaire will assist the Corps in their update effort.

Recipients of the questionnaire will be asked the number and type of boats they own; the frequency and kind of use; the fuel required; the original cost of each boat and the current market value. They will also be asked to describe the geographic area of the boat's use; the present type of moorage; the location and kind of moorage they would prefer if available; use of launching facilities, parks, and other amenities; average number in boating party; and boating expenditures broken down by several categories.

Participants will be asked to respond within two weeks, and a report summarizing the responses will be made available by the end of the year. Results of the survey, as well as the Army Corps of Engineers update study will assist local, state, and federal agencies, the moorage industry, financial institutions, and others to address the needs of the recreational boater in the Puget Sound region.



UNIVERSITY OF WASHINGTON
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Seattle, Washington 98105

FOR FURTHER INFORMATION CONTACT:
Carol Ovens (206)543-6600.

6 JUN 1979

SMALLCRAFT HARBORS RESEARCH ADVISORY GROUP

Dear Boater:

As a recreational boater, you are undoubtedly aware of the steady growth in boating activities over the past ten years. This growth is likely to continue since the Pacific Northwest is an increasingly popular region in which to live. This growth will place additional demands on existing boating facilities and will create demands for new boating facilities. To help plan intelligently to meet the increasing demands on boating facilities, the agencies and industries that are responsible for the planning, management, construction and operation of boating facilities need your help. They need to know what problems you face as a boater, what facilities you currently use, what facilities you would like to see built, and what economic impact the recreational boater has on Washington State's economy.

To assist the numerous agencies that are involved with boating, the Washington Sea Grant Marine Advisory Program is conducting a cooperative study of recreational boating in Washington and northwest Oregon. This questionnaire is an integral part of the study and will play an important role in the planning of new boating facilities in the Pacific Northwest.

This questionnaire is being sent to a randomly chosen sample of registered boat owners in Washington and northwest Oregon. We realize that some questions may be hard to answer, but we ask you to please answer all questions that apply to you. Return the questionnaire to the University of Washington in the enclosed stamped, self-addressed envelope. Your response will be held in strict confidence. Only statistical summaries will be made public.

Sincerely yours,

Stanley R. Murphy
Director, Washington
Sea Grant Program

SMALLCRAFT HARBORS RESEARCH ADVISORY GROUP

List of Participating Institutions

A. Government Agencies

1. State

- Department of Natural Resources
- Department of Ecology
- State Parks and Recreation Commission
- Interagency Committee for Outdoor Recreation
- Department of Commerce and Economic Development
- Department of Social and Health Services
- Department of Fisheries

2. Federal

- U.S. Army Corps of Engineers
- U.S. Coast Guard
- Heritage Conservation and Recreation Service
- National Park Service

B. Ports

- Washington Public Ports Association

C. Boating Industries

- Northwest Marine Trade Association

D. Academic

- University of Washington
- Washington State University
Cooperative Extension Service

IF YOU DO NOT OWN A BOAT, PLEASE CHECK THIS BOX ☐ AND RETURN THE QUESTIONNAIRE TO US. THANK YOU.

TO BEGIN, WE WOULD LIKE TO ASK SOME QUESTIONS THAT WILL HELP US UNDERSTAND THE PROBLEMS YOU FACE AS A BOATER.

1. Comparing your current boating experience with when you first purchased a boat, describe how the following conditions have changed. Circle the number which best reflects your feeling about each condition.

	<u>Much Better</u>	<u>Better</u>	<u>The Same</u>	<u>Worse</u>	<u>Much Worse</u>
a. Boat design and performance	1	2	3	4	5
b. Quality of boating facilities	1	2	3	4	5
c. Moorage availability	1	2	3	4	5
d. Behavior of other boaters	1	2	3	4	5
e. Safety of boating	1	2	3	4	5
f. Overall quality of boating experience	1	2	3	4	5

2. What do you think should be the minimum legal requirement(s) for operating a power boat? Check all of the categories that you feel should be applied.

- a. No requirement _____
- b. Minimum age requirement (specify age in years) _____
- c. Minimum age requirement with boat length, boat type, or horsepower limitations _____
- d. Completion of a boating safety course _____
- e. State licensing examination _____
- f. Coast Guard licensing examination _____
- g. Other (please specify) _____

NEXT WE WOULD LIKE A DESCRIPTION OF YOUR BOAT(S). PLEASE CHECK THE APPROPRIATE BOXES FOR THE BOAT(S) YOU CURRENTLY OWN. PLEASE INCLUDE ONLY POWER BOATS OR SAIL BOATS WITH AUXILIARY MOTORS.

	<u>Largest Boat</u>	<u>Second Largest Boat</u>	<u>Third Largest Boat</u>
3. Length			
a. Less than 12 feet	_____	_____	_____
b. 12 thru 15 feet	_____	_____	_____
c. 16 thru 20 feet	_____	_____	_____
d. 21 thru 26 feet	_____	_____	_____
e. 27 thru 32 feet	_____	_____	_____
f. 33 thru 39 feet	_____	_____	_____
g. 40 thru 50 feet	_____	_____	_____
h. 51 thru 65 feet	_____	_____	_____
i. Over 65 feet	_____	_____	_____
4. Is the beam (width) of your boat 8 feet or more?			
a. Yes	_____	_____	_____
b. No	_____	_____	_____
5. Type			
a. Inboard	_____	_____	_____
b. Inboard/outdrive	_____	_____	_____
c. Outboard	_____	_____	_____
d. Sailboat	_____	_____	_____
e. Other (please specify)	_____	_____	_____

	<u>Largest Boat</u>	<u>Second Largest Boat</u>	<u>Third Largest Boat</u>
6. Fuel used			
a. Gasoline	_____	_____	_____
b. Diesel	_____	_____	_____
c. Other (please specify)	_____	_____	_____
7. Construction of hull			
a. Wood	_____	_____	_____
b. Steel	_____	_____	_____
c. Aluminum	_____	_____	_____
d. Fiberglass	_____	_____	_____
e. Ferro cement	_____	_____	_____
f. Other (please specify)	_____	_____	_____
8. Main engine horsepower			
a. 10 horsepower or under	_____	_____	_____
b. 11 to 25 horsepower	_____	_____	_____
c. 26 to 50 horsepower	_____	_____	_____
d. 51 to 80 horsepower	_____	_____	_____
e. 81 to 130 horsepower	_____	_____	_____
f. 131 to 200 horsepower	_____	_____	_____
g. 201 to 300 horsepower	_____	_____	_____
h. Over 301 horsepower	_____	_____	_____
9. Do you normally trailer your boat?			
a. Yes	_____	_____	_____
b. No	_____	_____	_____

	<u>Largest Boat</u>	<u>Second Largest Boat</u>	<u>Third Largest Boat</u>
10. Age of boat			
a. 1 year or less	_____	_____	_____
b. 2 years	_____	_____	_____
c. 3 years	_____	_____	_____
d. 4 years	_____	_____	_____
e. 5 years	_____	_____	_____
f. 6 to 10 years	_____	_____	_____
g. 11 to 25 years	_____	_____	_____
h. 26 years or older	_____	_____	_____
11. Year you acquired your boat			
a. 1978	_____	_____	_____
b. 1977	_____	_____	_____
c. 1976	_____	_____	_____
d. 1975	_____	_____	_____
e. 1974	_____	_____	_____
f. 1973	_____	_____	_____
g. 1968 to 1972	_____	_____	_____
h. 1963 to 1967	_____	_____	_____
i. 1962 or earlier	_____	_____	_____
12. Cost of your boat when you acquired it (Round your answer to the nearest one hundred dollars)	_____	_____	_____
13. Current market value of your boat (Round your answer to the nearest one hundred dollars)	_____	_____	_____

THIS SECTION OF THE SURVEY ASKS QUESTIONS ABOUT YOUR PRESENT AND FUTURE USE OF MOORAGE OR STORAGE FACILITIES. PLEASE REFER TO THE MAP WHEN ANSWERING THE QUESTIONS THAT ASK FOR MAP AREA NUMBERS.

MAP AREAS

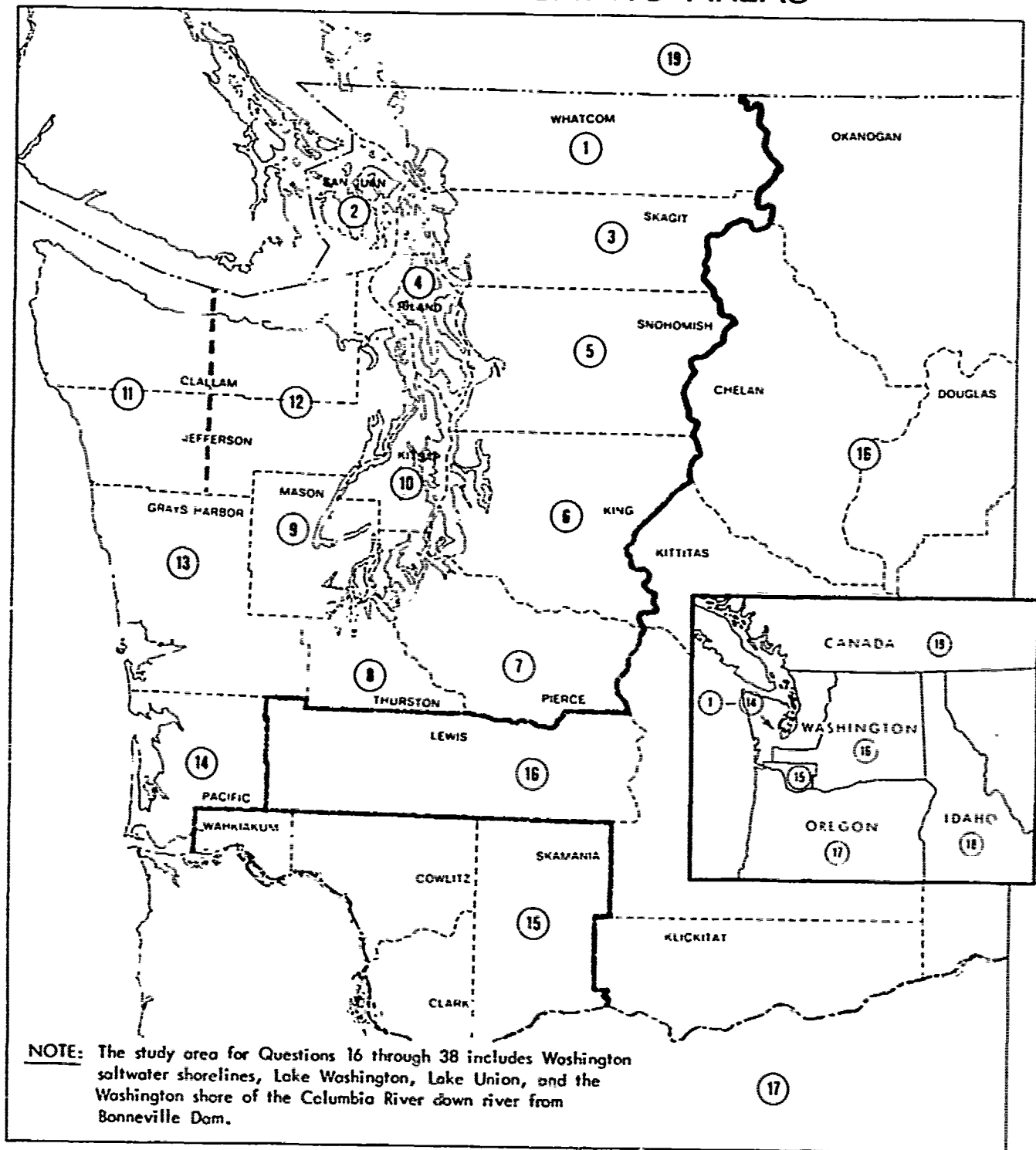
- | | |
|---------------------|--|
| 1. Whatcom County | 11. West Clallam/Jefferson Counties |
| 2. San Juan County | 12. East Clallam/Jefferson Counties |
| 3. Skagit County | 13. Grays Harbor County |
| 4. Island County | 14. Pacific County |
| 5. Snohomish County | 15. Columbia River (excluding Oregon and Pacific County, WA) |
| 6. King County | 16. Rest of Washington |
| 7. Pierce County | 17. Oregon |
| 8. Thurston County | 18. Idaho |
| 9. Mason County | 19. Canada |
| 10. Kitsap County | 20. Other |

FOR QUESTIONS THAT ASK FOR "TYPE OF MOORAGE FACILITY USED", PLEASE REFER TO THE FOLLOWING LIST OF MOORAGE FACILITIES. MOORAGE INCLUDES WET MOORAGE AND DRY STORAGE NEAR THE WATER, AT YOUR HOME, OR IN A MINI-WAREHOUSE.

MOORAGE/STORAGE FACILITIES

- A. Wet enclosed
- B. Wet covered
- C. Wet open
- D. Dry covered
- E. Dry open
- F. Home
- G. Mini-warehouse
- H. Other

RECREATIONAL BOATING AREAS



MAP AREAS

- | | |
|-----------------------------------|--|
| 1. Whatcom County | 12. E. Clallam/Jefferson Counties |
| 2. San Juan County | 13. Grays Harbor County |
| 3. Skagit County | 14. Pacific County |
| 4. Island County | 15. Columbia River (excluding Oregon and Pacific County, WA) |
| 5. Snohomish County | 16. Rest of Washington |
| 6. King County | 17. Oregon |
| 7. Pierce County | 18. Idaho |
| 8. Thurston County | 19. Canada |
| 9. Mason County | 20. Other |
| 10. Kitsap County | |
| 11. W. Clallam/Jefferson Counties | |

MOORAGE / STORAGE FACILITIES

- | |
|-------------------|
| A. Wet enclosed |
| B. Wet covered |
| C. Wet open |
| D. Dry covered |
| E. Dry Open |
| F. Home |
| G. Mini-warehouse |
| H. Other |

14. Please circle the number that represents the map area in which you lived in 1978.

AREA
NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
 17 18 19 20

15. Please circle every number that represents a map area in which you owned or used a second home or vacation home in 1978.

AREA
NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
 17 18 19 20

THE STUDY AREA FOR THE NEXT SECTION INCLUDES WASHINGTON SALT-WATER SHORE-LINES, LAKE WASHINGTON, LAKE UNION, AND THE WASHINGTON SHORE OF THE COLUMBIA RIVER DOWN RIVER FROM BONNEVILLE DAM

IF YOU DID NOT MOOR OR STORE YOUR BOAT IN THE STUDY AREA IN 1978, PLEASE SKIP TO QUESTION 23.

IF YOU DID MOOR YOUR BOAT IN THE STUDY AREA IN 1978, PLEASE ANSWER QUESTIONS 16 THRU 22.

PRESENT MOORAGE IN STUDY AREA

PERMANENT MOORAGE (30 days or more)

IF YOU DID NOT MOOR OR STORE YOUR LARGEST BOAT IN ONE AREA FOR THE ENTIRE YEAR IN 1978, PLEASE SKIP TO QUESTION 17.

16. Please circle the number and letter which designates the map area and the type of moorage facility in which you used permanent moorage for your largest boat for the entire 1978 year.

AREA
NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

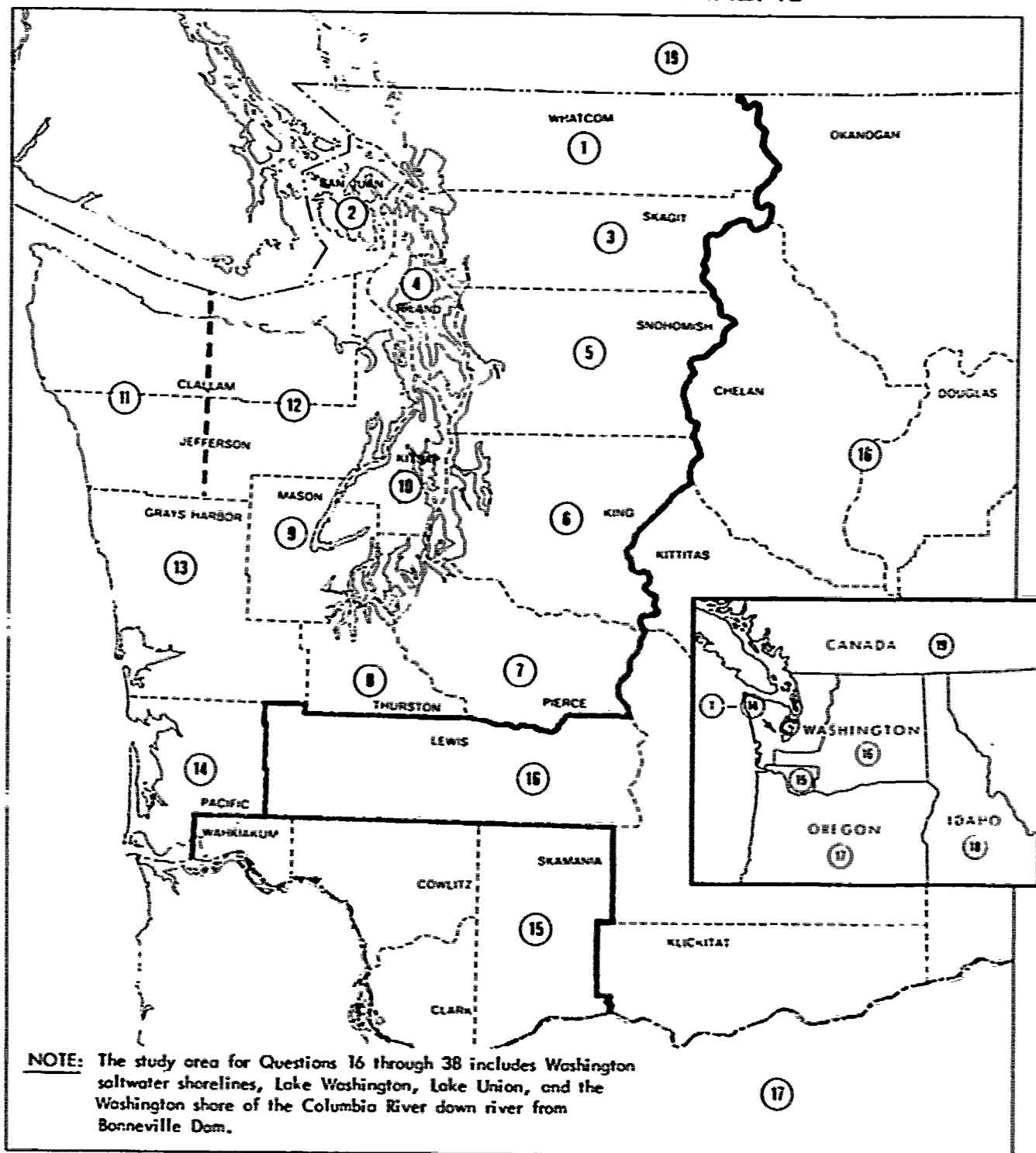
TYPE OF
FACILITY A B C D E F G H

17. Please circle the number and letter which designates the map area and the type of moorage facility in which you used permanent moorage for your largest boat in the summer (mid-April to mid-September of 1978).

AREA
NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TYPE OF
FACILITY A B C D E F G H

RECREATIONAL BOATING AREAS



MAP AREAS

- | | |
|-----------------------------------|--|
| 1. Whatcom County | 12. E. Clallam/Jefferson Counties |
| 2. San Juan County | 13. Grays Harbor County |
| 3. Skagit County | 14. Pacific County |
| 4. Island County | 15. Columbia River (excluding Oregon and Pacific County, WA) |
| 5. Snohomish County | 16. Rest of Washington |
| 6. King County | 17. Oregon |
| 7. Pierce County | 18. Idaho |
| 8. Thurston County | 19. Canada |
| 9. Mason County | 20. Other |
| 10. Kitsap County | |
| 11. W. Clallam/Jefferson Counties | |

MOORAGE / STORAGE FACILITIES

- A. Wet enclosed
- B. Wet covered
- C. Wet open
- D. Dry covered
- E. Dry Open
- F. Home
- G. Mini-warehouse
- H. Other

18. Please circle the number and letter which designates the map area and the type of moorage facility in which you used permanent moorage for your largest boat in the winter (mid-September to mid-April) of 1978.

AREA
NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TYPE OF
FACILITY A B C D E F G H

TEMPORARY MOORAGE (4-29 days)

19. Please indicate the total number of days and the type of moorage facility in which you used temporary moorage for your largest boat during the summer (mid-April to mid-September) of 1978.

AREA NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NUMBER OF DAYS															
TYPE OF FACILITY															

20. Please indicate the total number of days and the type of moorage facility in which you used temporary moorage for your largest boat during the winter (mid-September to mid-April) of 1978.

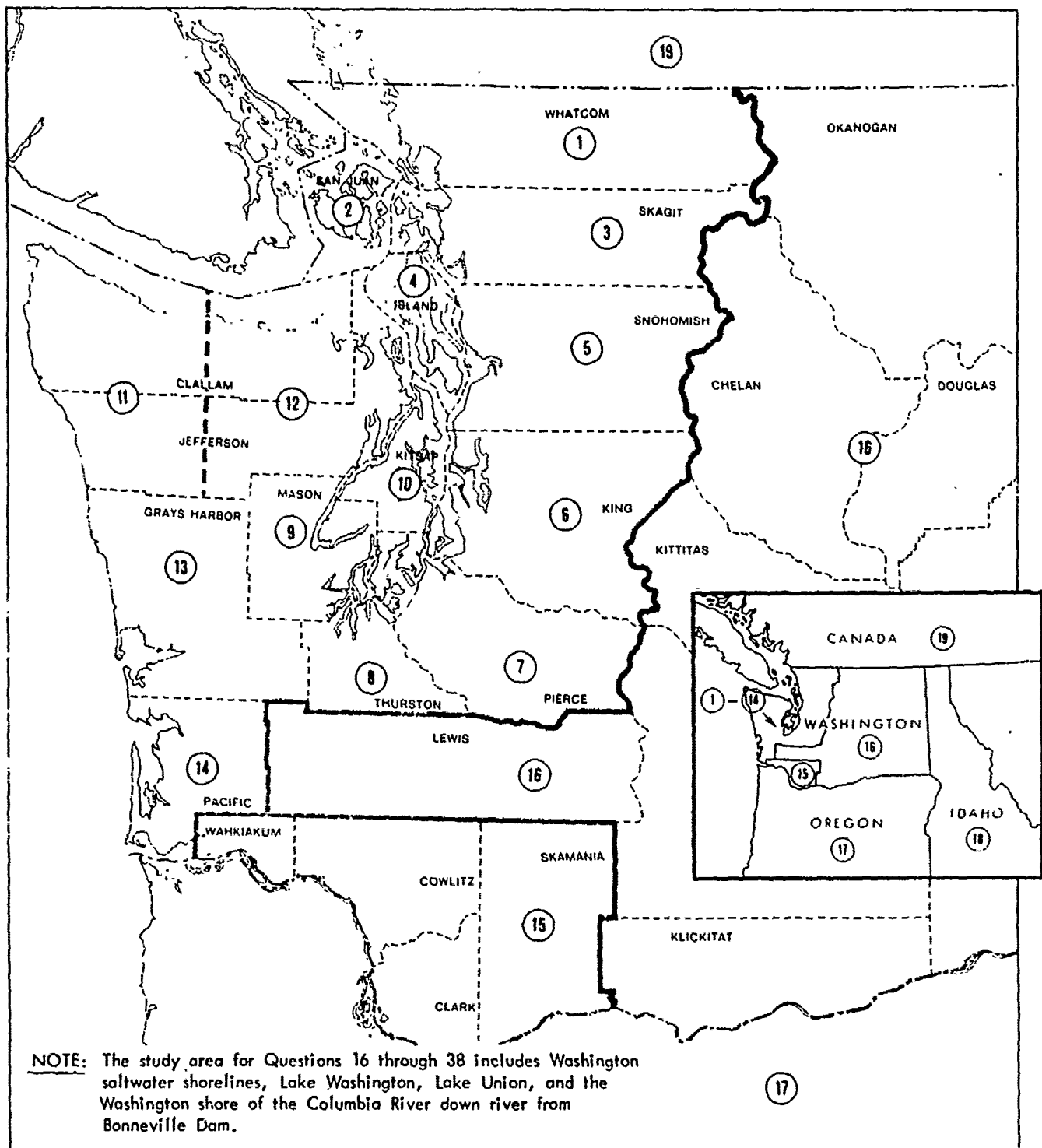
AREA NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NUMBER OF DAYS															
TYPE OF FACILITY															

TRANSIENT MOORAGE (1-3 days)

21. Please indicate the total number of nights and the type of moorage facility in which you used transient moorage for your largest boat during the summer (mid-April to mid-September) of 1978.

AREA NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NUMBER OF DAYS															
TYPE OF FACILITY															

RECREATIONAL BOATING AREAS



MAP AREAS

- | | |
|-----------------------------------|--|
| 1. Whatcom County | 12. E. Clallam/Jefferson Counties |
| 2. San Juan County | 13. Grays Harbor County |
| 3. Skagit County | 14. Pacific County |
| 4. Island County | 15. Columbia River (excluding Oregon and Pacific County, WA) |
| 5. Snohomish County | 16. Rest of Washington |
| 6. King County | 17. Oregon |
| 7. Pierce County | 18. Idaho |
| 8. Thurston County | 19. Canada |
| 9. Mason County | 20. Other |
| 10. Kitsap County | |
| 11. W. Clallam/Jefferson Counties | |

MOORAGE / STORAGE FACILITIES

- A. Wet enclosed
- B. Wet covered
- C. Wet open
- D. Dry covered
- E. Dry Open
- F. Home
- G. Mini-warehouse
- H. Other

22. Please indicate the total number of nights and the type of moorage facility in which you used transient moorage for your largest boat during the winter (mid-September to mid-April) of 1978.

AREA NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NUMBER OF DAYS															
TYPE OF FACILITY															

FUTURE MOORAGE IN STUDY AREA

IF YOUR FUTURE MOORAGE PLANS DO NOT INCLUDE MOORING YOUR BOAT IN THE STUDY AREA, PLEASE SKIP TO QUESTION 30. THE STUDY AREA INCLUDES WASHINGTON SALT-WATER SHORELINES, LAKE WASHINGTON, LAKE UNION, AND THE WASHINGTON SHORE OF THE COLUMBIA RIVER DOWN RIVER FROM BONNEVILLE DAM.

23. Please circle every number and letter that designates the map area and the type of moorage facility in which you are currently on a waiting list for available moorage.

AREA
NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TYPE OF
FACILITY A B C D E F G H

QUESTIONS 24 TO 28 ARE CONCERNED WITH THE MOORAGE FACILITIES YOU WOULD USE IF SPACE WERE AVAILABLE AND CURRENT PRICES PREVAILED.

PERMANENT MOORAGE (30 days or more)

24. Please circle the number and letter which designates the map area and type of moorage facility in which you would use permanent moorage for your largest boat during the entire year.

AREA
NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

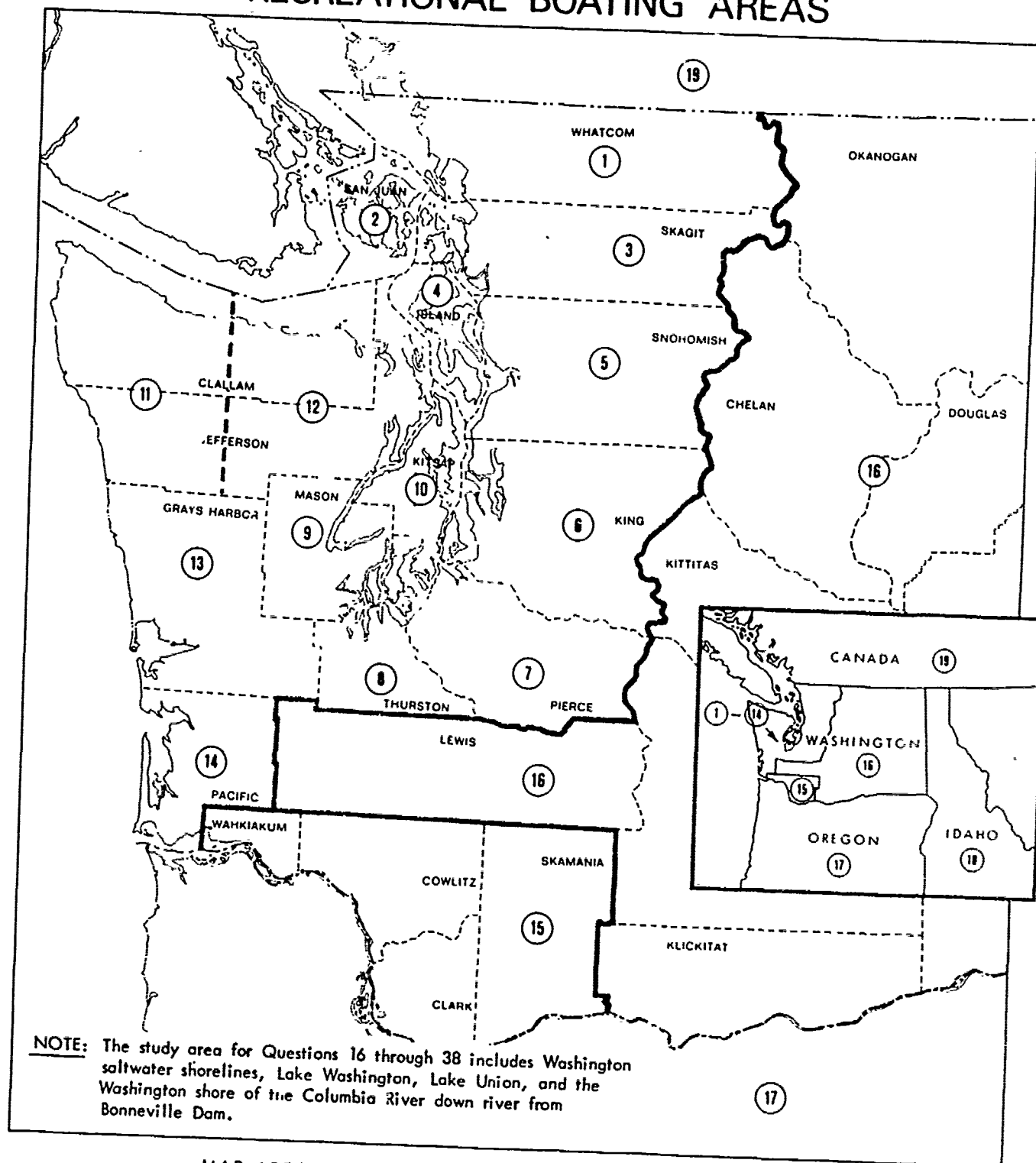
TYPE OF
FACILITY A B C D E F G H

25. Please circle the number and letter which designates the map area and type of moorage facility in which you would use permanent moorage for your largest boat during the summer (mid-April to mid-September).

AREA
NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TYPE OF
FACILITY A B C D E F G H

RECREATIONAL BOATING AREAS



MAP AREAS

- | | |
|-----------------------------------|--|
| 1. Whatcom County | 12. E. Clallam/Jefferson Counties |
| 2. San Juan County | 13. Grays Harbor County |
| 3. Skagit County | 14. Pacific County |
| 4. Island County | 15. Columbia River (excluding Oregon and Pacific County, WA) |
| 5. Snohomish County | 16. Rest of Washington |
| 6. King County | 17. Oregon |
| 7. Pierce County | 18. Idaho |
| 8. Thurston County | 19. Canada |
| 9. Mason County | 20. Other |
| 10. Kitsap County | |
| 11. W. Clallam/Jefferson Counties | |

MOORAGE / STORAGE FACILITIES

- A. Wet enclosed
- B. Wet covered
- C. Wet open
- D. Dry covered
- E. Dry Open
- F. Home
- G. Mini-warehouse
- H. Other

26. Please circle the number and letter which designates the map area and type of moorage facility in which you would use permanent moorage for your largest boat during the winter (mid-September to mid-April).

AREA

NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TYPE OF

FACILITY A B C D E F G H

TEMPORARY MOORAGE (4-29 days)

27. Please circle every number and letter which designates the map area and type of moorage facility in which you would use temporary moorage for your largest boat during the summer (mid-April to mid-September).

AREA

NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TYPE OF

FACILITY A B C D E F G H

28. Please circle every number and letter which designates the map area and type of moorage facility in which you would use temporary moorage for your largest boat during the winter (mid-September to mid-April).

AREA

NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TYPE OF

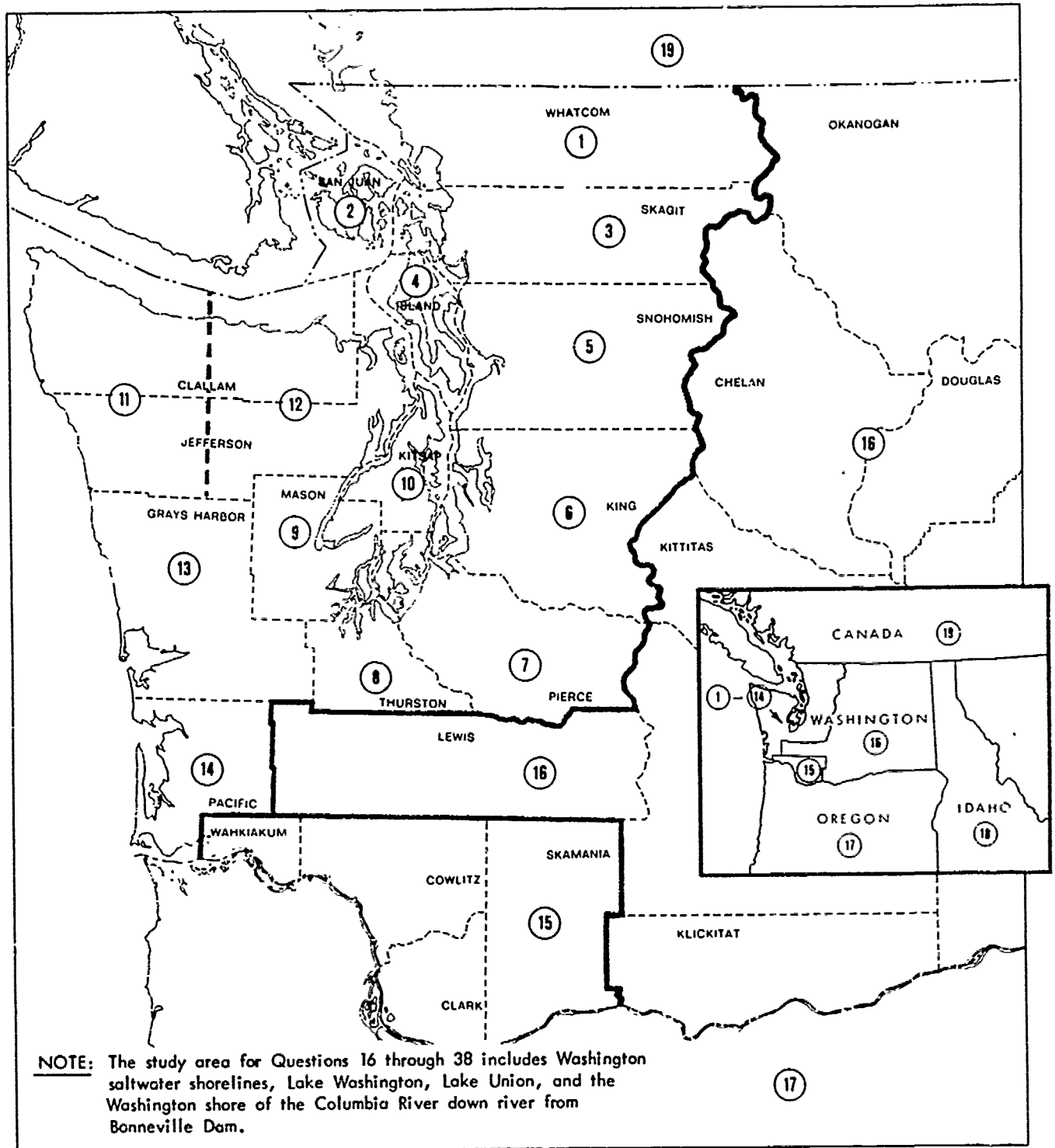
FACILITY A B C D E F G H

NEXT, WE WOULD LIKE TO ASK QUESTIONS RELATED TO HOW YOU USE YOUR BOATS.

29. List, by months, the approximate number of days your boat(s) was (were) operated during 1978 within the study area.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
LARGEST BOAT												
SECOND LARGEST BOAT												
THIRD LARGEST BOAT												

RECREATIONAL BOATING AREAS



MAP AREAS

- | | |
|-----------------------------------|--|
| 1. Whatcom County | 12. E. Clallam/Jefferson Counties |
| 2. San Juan County | 13. Grays Harbor County |
| 3. Skagit County | 14. Pacific County |
| 4. Island County | 15. Columbia River (excluding Oregon and Pacific County, WA) |
| 5. Snohomish County | 16. Rest of Washington |
| 6. King County | 17. Oregon |
| 7. Pierce County | 18. Idaho |
| 8. Thurston County | 19. Canada |
| 9. Mason County | 20. Other |
| 10. Kitsap County | |
| 11. W. Clallam/Jefferson Counties | |

MOORAGE / STORAGE FACILITIES

- A. Wet enclosed
- B. Wet covered
- C. Wet open
- D. Dry covered
- E. Dry Open
- F. Home
- G. Mini-warehouse
- H. Other

30. List, by months, the approximate number of days your boat(s) was (were) operated during 1978 outside the study area.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
LARGEST BOAT												
SECOND LARGEST BOAT												
THIRD LARGEST BOAT												

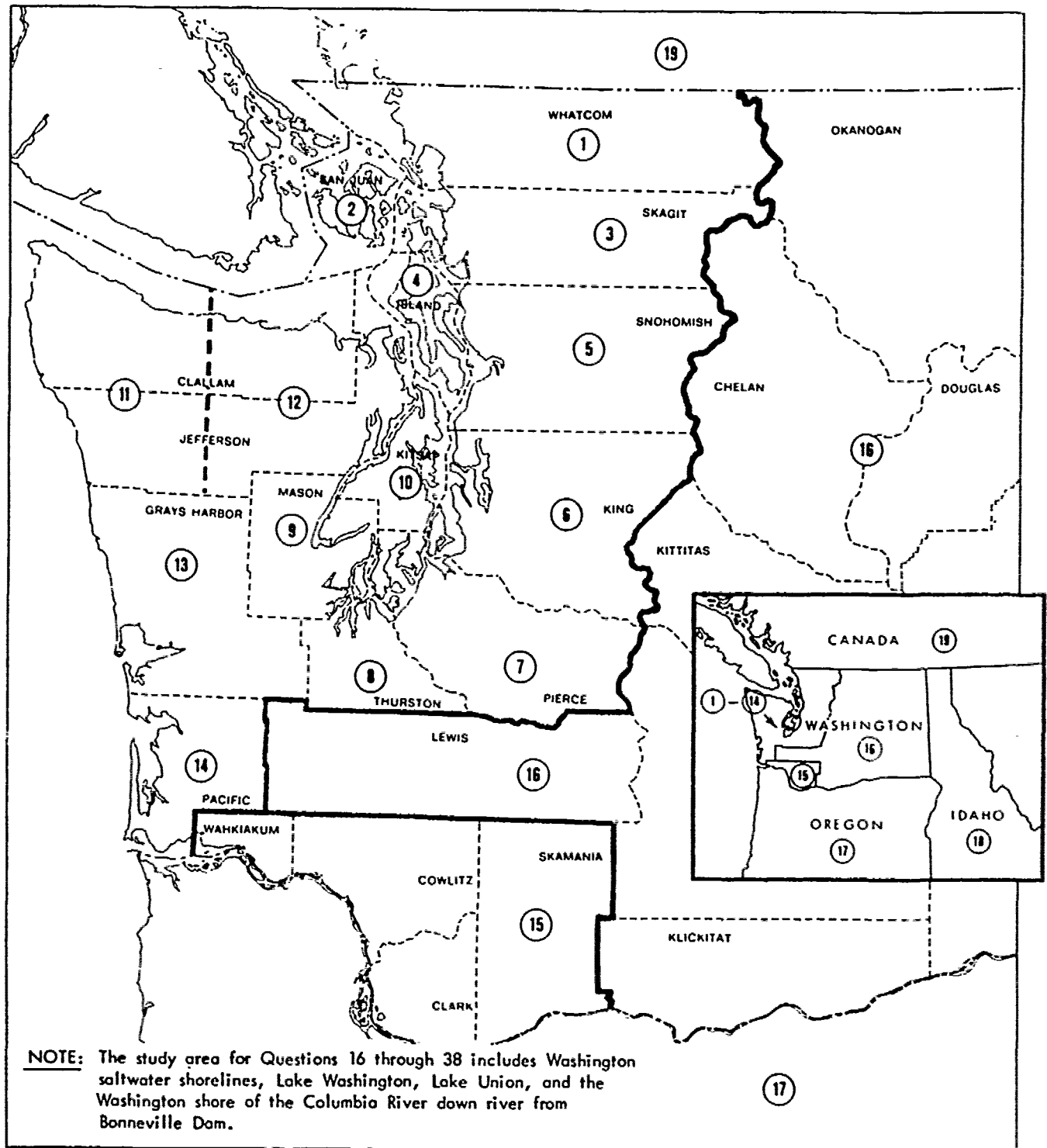
31. If you rented, leased, or loaned your largest boat during 1978, please list by month the approximate number of days your largest boat was used by others.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
LARGEST BOAT												

32. Referring to the map, list, by months, the number of occasions you used a launch ramp during 1978 within the study area.

NUMBER OF LAUNCHINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MAP AREA 1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

RECREATIONAL BOATING AREAS



MAP AREAS

- | | |
|-----------------------------------|--|
| 1. Whatcom County | 12. E. Clallam/Jefferson Counties |
| 2. San Juan County | 13. Grays Harbor County |
| 3. Skagit County | 14. Pacific County |
| 4. Island County | 15. Columbia River (excluding Oregon and Pacific County, WA) |
| 5. Snohomish County | |
| 6. King County | 16. Rest of Washington |
| 7. Pierce County | 17. Oregon |
| 8. Thurston County | 18. Idaho |
| 9. Mason County | 19. Canada |
| 10. Kitsap County | 20. Other |
| 11. W. Clallam/Jefferson Counties | |

MOORAGE / STORAGE FACILITIES

- A. Wet enclosed
- B. Wet covered
- C. Wet open
- D. Dry covered
- E. Dry Open
- F. Home
- G. Mini-warehouse
- H. Other

33. Referring to the map, list, by map area, the total number of occasions you visited a public shoreline park or underwater park by boat within the study area during 1978.

MAP AREA NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NUMBER OF VISITS															

34. If you stayed overnight in your boat at a public shoreline park, within the study area, please indicate the total number of nights you spent aboard your boat for each map area.

MAP AREA NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NUMBER OF NIGHTS															

35. What is the usual number of people in your boating party? (Circle one)

1 2 3 4 5 6 7 8 9 or more

AN IMPORTANT MATTER OF CONERN IS DEBRIS CONTROL AND OBSTACLE REMOVAL

36. Did your boat incur any damage while used in 1978?

a. Yes _____

b. No _____

37. For each damage incident, indicate the map area number where the damage occurred and the amount of the damage.

<u>CAUSE OF DAMAGE</u>	<u>AREA NUMBER</u>	<u>DOLLAR AMOUNT TO NEAREST \$10</u>
a. Collision with another vessel or dock	_____	_____
b. Grounding or hitting rocks	_____	_____
c. Logs or deadheads	_____	_____
d. Stationary debris	_____	_____
e. Small floating debris (less than five feet long)	_____	_____
f. Launching or transporting boat	_____	_____
g. Other (please specify) _____	_____	_____
_____	_____	_____

A VERY IMPORTANT PART OF THIS STUDY IS MEASURING THE IMPACT OF RECREATIONAL BOATING ON THE WASHINGTON STATE ECONOMY. TO DO THIS, WE NEED INFORMATION ABOUT YOUR BOATING EXPENDITURES AND YOUR INCOME. REMEMBER, YOUR RESPONSES WILL BE HELD IN STRICT CONFIDENCE.

38. During 1978, how much did you spend in the state of Washington in the following boating related expenses? Please round your estimates to the nearest ten dollars.

- a. _____ Insurance
- b. _____ Permanent (30 days or more) moorage and storage charges for boat
- c. _____ Temporary (4 to 29 days) moorage and storage charges for boat
- d. _____ Transient (1 to 3 days) moorage and storage charges for boat
- e. _____ Launch and ramp fees
- f. _____ Fuel and lubricants
- g. _____ Accessories (for example: navigation, communication, or other boating equipment)
- h. _____ Maintenance and repair: parts and materials
- i. _____ Maintenance and repair: labor
- j. _____ Groceries and beverages consumed on board
- k. _____ Tolls and fees for ferries, campgrounds, and bridges that were associated with boating trips
- l. _____ Automobile expenses associated with boating trips
- m. _____ Other boating expenses

39. In what state was your largest boat purchased? _____

40. In what state was your largest boat manufactured? _____

41. Please circle the letter which best describes your total household income, before taxes, in thousands of dollars.

- | | | |
|-------------------------|-------------------------|-------------------------|
| a. \$10,000 or less | d. \$20,001 to \$25,000 | g. \$35,001 to \$40,000 |
| b. \$10,001 to \$15,000 | e. \$25,001 to \$30,000 | h. \$40,001 to \$45,000 |
| c. \$15,001 to \$20,000 | f. \$30,001 to \$35,000 | i. \$45,001 or more |

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)	(62)	(63)	(64)	(65)	(66)	(67)	(68)	(69)	(70)	(71)	(72)	(73)	(74)	(75)	(76)	(77)	(78)	(79)	(80)	(81)	(82)	(83)	(84)	(85)	(86)	(87)	(88)	(89)	(90)	(91)	(92)	(93)	(94)	(95)	(96)	(97)	(98)	(99)	(100)	(101)	(102)	(103)	(104)	(105)	(106)	(107)	(108)	(109)	(110)	(111)	(112)	(113)	(114)	(115)	(116)	(117)	(118)	(119)	(120)	(121)	(122)	(123)	(124)	(125)	(126)	(127)	(128)	(129)	(130)	(131)	(132)	(133)	(134)	(135)	(136)	(137)	(138)	(139)	(140)	(141)	(142)	(143)	(144)	(145)	(146)	(147)	(148)	(149)	(150)	(151)	(152)	(153)	(154)	(155)	(156)	(157)	(158)	(159)	(160)	(161)	(162)	(163)	(164)	(165)	(166)	(167)	(168)	(169)	(170)	(171)	(172)	(173)	(174)	(175)	(176)	(177)	(178)	(179)	(180)	(181)	(182)	(183)	(184)	(185)	(186)	(187)	(188)	(189)	(190)	(191)	(192)	(193)	(194)	(195)	(196)	(197)	(198)	(199)	(200)	(201)	(202)	(203)	(204)	(205)	(206)	(207)	(208)	(209)	(210)	(211)	(212)	(213)	(214)	(215)	(216)	(217)	(218)	(219)	(220)	(221)	(222)	(223)	(224)	(225)	(226)	(227)	(228)	(229)	(230)	(231)	(232)	(233)	(234)	(235)	(236)	(237)	(238)	(239)	(240)	(241)	(242)	(243)	(244)	(245)	(246)	(247)	(248)	(249)	(250)	(251)	(252)	(253)	(254)	(255)	(256)	(257)	(258)	(259)	(260)	(261)	(262)	(263)	(264)	(265)	(266)	(267)	(268)	(269)	(270)	(271)	(272)	(273)	(274)	(275)	(276)	(277)	(278)	(279)	(280)	(281)	(282)	(283)	(284)	(285)	(286)	(287)	(288)	(289)	(290)	(291)	(292)	(293)	(294)	(295)	(296)	(297)	(298)	(299)	(300)	(301)	(302)	(303)	(304)	(305)	(306)	(307)	(308)	(309)	(310)	(311)	(312)	(313)	(314)	(315)	(316)	(317)	(318)	(319)	(320)	(321)	(322)	(323)	(324)	(325)	(326)	(327)	(328)	(329)	(330)	(331)	(332)	(333)	(334)	(335)	(336)	(337)	(338)	(339)	(340)	(341)	(342)	(343)	(344)	(345)	(346)	(347)	(348)	(349)	(350)	(351)	(352)	(353)	(354)	(355)	(356)	(357)	(358)	(359)	(360)	(361)	(362)	(363)	(364)	(365)	(366)	(367)	(368)	(369)	(370)	(371)	(372)	(373)	(374)	(375)	(376)	(377)	(378)	(379)	(380)	(381)	(382)	(383)	(384)	(385)	(386)	(387)	(388)	(389)	(390)	(391)	(392)	(393)	(394)	(395)	(396)	(397)	(398)	(399)	(400)	(401)	(402)	(403)	(404)	(405)	(406)	(407)	(408)	(409)	(410)	(411)	(412)	(413)	(414)	(415)	(416)	(417)	(418)	(419)	(420)	(421)	(422)	(423)	(424)	(425)	(426)	(427)	(428)	(429)	(430)	(431)	(432)	(433)	(434)	(435)	(436)	(437)	(438)	(439)	(440)	(441)	(442)	(443)	(444)	(445)	(446)	(447)	(448)	(449)	(450)	(451)	(452)	(453)	(454)	(455)	(456)	(457)	(458)	(459)	(460)	(461)	(462)	(463)	(464)	(465)	(466)	(467)	(468)	(469)	(470)	(471)	(472)	(473)	(474)	(475)	(476)	(477)	(478)	(479)	(480)	(481)	(482)	(483)	(484)	(485)	(486)	(487)	(488)	(489)	(490)	(491)	(492)	(493)	(494)	(495)	(496)	(497)	(498)	(499)	(500)	(501)	(502)	(503)	(504)	(505)	(506)	(507)	(508)	(509)	(510)	(511)	(512)	(513)	(514)	(515)	(516)	(517)	(518)	(519)	(520)	(521)	(522)	(523)	(52
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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

34



DIVISION OF MARINE RESOURCES

UNIVERSITY OF WASHINGTON • A SEA GRANT COLLEGE

11 July 1979

Dear Boater:

Two weeks ago we sent you a recreational boating survey questionnaire. To insure your anonymity, the questionnaires are deliberately unidentifiable; so we cannot know whether you have responded. If you have, we sincerely thank you and hundreds of your boating colleagues who responded so quickly and thoroughly to our survey.

If you have set aside the questionnaire until you have more time, may we ask you to complete your response and mail it back to us as soon as possible in the self-addressed, stamped envelope we enclosed. The information you give us about your boating needs is essential for planning future recreational boating facilities.

We wish you a happy and safe boating season!

Sincerely,

Stanley R. Murphy
Director, Washington
Sea Grant Program

SRM:bkw



DIVISION OF MARINE RESOURCES

UNIVERSITY OF WASHINGTON • A SEA GRANT COLLEGE

October 22, 1979

Dear Boater:

A few months ago you completed a questionnaire regarding your recreational boating activities in the Pacific Northwest. This questionnaire is an integral part of several studies being conducted through Washington Sea Grant's Smallcraft Harbors Research Advisory Group (SCHRAG) whose membership includes the agencies and industries responsible for the planning, management, construction and operation of boating facilities.* The statistical analysis of the returned questionnaires has been completed and a summary is enclosed for your information.

This statistical summary report was prepared by the U.S. Army Corps of Engineers, Seattle District. The Corps is incorporating this and other information obtained from the questionnaire into a report which will provide data to be used in the planning and development of future small boat facilities. This report will be an update of the Pleasure Boating Study, Puget Sound and Adjacent Waters, November, 1968.

Thank you for taking the time and effort to complete the questionnaire. Your answers are extremely valuable in developing a further understanding of boating in the Pacific Northwest.

Sincerely,

Stanley R. Murphy, Director
Washington Sea Grant

SRM:RG:s1

Enclosure

* See overleaf for a list of SCHRAG members

SMALLCRAFT HARBORS RESEARCH ADVISORY GROUP

List of Participating Institutions

A. Government Agencies

1. State

- Department of Natural Resources
- Department of Ecology
- State Parks and Recreation Commission
- Interagency Committee for Outdoor Recreation
- Department of Commerce and Economic Development
- Department of Social and Health Services
- Department of Fisheries

2. Federal

- U.S. Army Corps of Engineers
- U.S. Coast Guard
- Heritage Conservation and Recreation Service
- National Park Service

B. Ports

- Washington Public Ports Association

C. Boating Industries

- Northwest Marine Trade Association

D. Academic

- University of Washington
- Washington State University
Cooperative Extension Service

SELECTIVE STATISTICAL SUMMARY
OF RECREATIONAL BOAT USE QUESTIONNAIRE
OCTOBER 1979

Boat characteristics and boat facility demand by season and location were derived from a questionnaire survey of registered boatowners residing in Washington and northwest Oregon. Information was obtained on type of pleasure craft owned, multiple boat ownership, seasonal use, demand for moorage and launching ramp facilities, public shoreline park use, amount of boat damage incurred in 1978 and boating expenditures in 1978. A random sample of 2,500 boaters was drawn from the U.S. Coast Guard register and the Oregon State Marine Board boat register. Nearly 600 questionnaires (24 percent) were returned. After subtracting those respondents who no longer own a boat, a total of 439 questionnaires remained, which formed the sample size used in the statistical analysis.

Boat characteristics were requested for the largest boat, second largest boat and third largest boat. Statistical data on boat characteristics presented in this selective summary are for the largest boat or a total of 439 craft.

1. Approximately 40 percent of respondents were multiple boatowners; 33 percent owned two boats and 7 percent owned three boats.
2. Fifty-two percent of pleasure craft owners surveyed owned outboards, 26 percent owned inboard/outdrive, 12 percent owned inboards and sailboats account for the remaining 10 percent.
3. About 72 percent of pleasure boat hulls were composed of fiberglass, 14 percent wood, 13 percent aluminum and the remaining 1 percent of steel and other material.
4. Sixty-four percent of the boatowners surveyed normally trailered their boats.
5. Average length by type of pleasure boat was as follows:

<u>Boat Type</u>	<u>Model Class (Feet)</u>
Inboard	21-26
Inboard/Outdrive	16-20
Outboard	16-20
Sailboat	21-26

6. The age distribution of the pleasure craft surveyed was as follows:

<u>Age</u>	<u>Percent of Total</u>
1 year or less	6
2 years	6
3 years	11
4 years	6
5 years	8
6 to 10 years	32
11 to 25 years	29
26 years or older	2
TOTAL	100

A-26

7. The average cost of pleasure craft when acquired and the average current market value of these same boats, by type of boat, was as follows:

<u>Boat Type</u>	<u>Mean Values</u>	
	<u>Cost when Acquired</u>	<u>Current Market Value</u>
Inboard	\$21,923	\$29,891
Inboard/Outdrive	\$7,860	\$8,054
Outboard	\$2,007	\$1,634
Sailboat	\$20,741	\$25,300
For entire sample	\$7,687	\$9,397

8. Present moorage/storage use in the study area¹ for all boats surveyed is shown below:

<u>Moorage/Storage Facility</u>	<u>Percent of Responses</u>
Wet Enclosed	4
Wet Covered	11
Wet Open	34
Dry Covered	6
Dry Open	4
Home	40
Other	1
TOTAL	100

9. Desired future moorage/storage facilities in the study area¹ assuming space availability and current prices were as follows:

<u>Moorage/Storage Facility</u>	<u>Percent of Responses</u>
Wet Enclosed	8
Wet Covered	21
Wet Open	31
Dry Covered	11
Dry Open	1
Home	28
Other	-
TOTAL	100

¹Includes Washington saltwater shorelines, Lake Washington, Lake Union and the Washington shore of the Columbia River downriver from Bonneville Dam.

- 10.. The average number of days respondents operated their boats during 1978 within the study area is shown below by month:

<u>Month</u>	<u>Mean Number of Boating Days in 1978</u>
January	4.33
February	4.41
March	5.31
April	5.97
May	7.14
June	9.68
July	12.25
August	12.41
September	8.91
October	5.67
November	4.66
December	4.64

11. Nineteen percent of pleasure craft owners surveyed incurred damage to their boats in 1978. The most frequently given cause of damage was hitting logs or deadheads.
12. The number of people in a usual boating party in 1978 ranged from 1 to 22. The distribution of responses was as follows:

<u>Number of People in Party</u>	<u>Percent of Responses</u>
1	2
2	36
3	22
4	30
5	5
6	3
More than 6	2
TOTAL	100

13. The following tabulation shows the average boating related expenditures in the state of Washington during 1978:

<u>Type of Expenditure</u>	<u>Mean Value</u>
Insurance	\$241
Permanent Moorage/Storage	\$528
Temporary Moorage/Storage	\$60
Transient Moorage/Storage	\$43
Launch and Ramp Fees	\$35
Fuel and Lubricants	\$229
Boating Accessories	\$356
Maintenance and Repair (Parts)	\$265
Maintenance and Repair (Labor)	\$299
Groceries and Beverages	\$212
Tools/Fees for Ferries, Campgrounds, etc.	\$57
Boating Related Automobile Expenses	\$187
Other Boating Expenses	\$154
TOTAL	\$2,666

14. The distribution of total household income of all respondents was as follows:

<u>Income Class</u>	<u>Percent of Respondents</u>
\$10,000 or less	7
\$10,001 to \$15,000	6
\$15,001 to \$20,000	12
\$20,001 to \$25,000	18
\$25,001 to \$30,000	15
\$30,001 to \$35,000	12
\$35,001 to \$40,000	9
\$40,001 to \$45,000	7
\$45,001 or more	14
TOTAL	100

Methodology Used in Developing Sample Size for Questionnaire. The questionnaire survey was prepared by the Washington Sea Grant Marine Advisory Program in cooperation with the Seattle District Corps of Engineers. The initial draft was circulated to interested parties and, on the basis of their comments, revisions were made. The draft questionnaire was then field tested by Corps and Sea Grant personnel on approximately twenty arbitrarily selected members of the boating population. A final revision of the questionnaire was made after the field test.

After estimating the numbers of boaters who would respond to the questionnaire, the variability of response, and acceptable limits and size of sampling error, Sea Grant selected a sample size of 2,500 as appropriate for the survey. A computer program was developed to draw a random sample of 2,500 boat owners from the Coast Guard list of registered boats in Washington State combined with the boats registered with the Oregon State Marine Board in Multnomah, Washington, and Clackamas Counties in Oregon. The questionnaire was then mailed to this sample with an explanatory letter. About two weeks after the initial mailing, a second letter was sent to the entire sample with an additional request to respond for those who had not already done so.

Nearly 600 questionnaires (24 percent) were returned. After subtracting those respondents who no longer owned a boat, a total of 439 questionnaires remained. Each questionnaire was then edited for errors and consistency and coded for computer tabulation. The Statistical Package for the Social Sciences (SPSS) program was selected for the statistical analysis.

APPENDIX B

Correspondence

APPENDIX B - CORRESPONDENCE

This appendix contains copies of public and agency correspondence received during the first phase of the study. The following table of contents identifies the location of public and agency correspondence within this appendix.

Federal and State Agency Coordination on Marina Sites Evaluation

<u>Letter</u>	<u>Page</u>
Letter to U.S. Fish and Wildlife Service, et al. 2 August 1978	B-1
Letter to U.S. Coast Guard, et al. 20 November 1978	B-5
Letter From Environmental Protection Agency 9 January 1979	B-15
Letter From National Marine Fisheries Service 29 January 1979	B-17
Letter From U.S. Fish and Wildlife Service 29 March 1979	B-19
Letter From U.S. Fish and Wildlife Service 6 June 1979	B-26
Letter From Washington State Department of Social and Health Services 12 January 1979	B-27
Letter From Washington State Department of Fisheries 12 March 1979	B-28
Letter From Washington State Parks and Recreation Commission 6 December 1978	B-34
Letter From Washington State Department of Natural Resources 26 December 1978	B-35
Letter From Washington State Department of Natural Resources 8 January 1979	B-38

Federal and State Agency Coordination on Marina Sites Evaluation (con.)

<u>Letter</u>	<u>Page</u>
Letter From Washington State Department of Ecology 10 January 1979	B-39
Letter From Washington State Department of Game 9 February 1979	B-45

Local Agency Coordination on Marina Sites Evaluation

Letter to Island County Planning Department, et al. 22 January 1980	B-52
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Letters of response not reproduced due to their bulk (19 letters of response). Copies are available upon request. Local agencies responding to the 22 January 1980 Corps of Engineers letter are identified on page 53 of the main report.

Public and Agency Comments on Draft Report Twenty letters of response were received during the review period in August and September 1980. Many of these are summarized on page 66 and following. The letters are not reproduced because of their bulk, but are available upon request from the Seattle District Office, Corps of Engineers.

2 Aug 1978

Joseph Blum, Area Manager
U.S. Fish and Wildlife Service
Building A
2625 Parkmont Lane
Olympia, Washington 98502

Dear Mr. Blum:

We are in the process of conducting a Boat Facility Study - Puget Sound and Adjacent Waters. This study will be an update of the 1968 Pleasure Boating Study which was incorporated into a larger comprehensive study on navigation in Puget Sound. A description of the project is attached as inclosure 1.

The study will serve planners and developers as a guide for future and more detailed studies. Therefore, we would appreciate your participation in this study to make it as comprehensive as possible. We are interested in any particular concerns that you feel we should specifically address. We would also appreciate designation of someone in your agency we can work with during this study. In order to assure complete consideration of your input to this study, we would appreciate a response by 18 August 1978.

As part of this study, we will be requesting the criteria you used for marina development. Then a list of potential sites will be sent to you, at which time you can apply your criteria standards and concerns.

Should you have any questions regarding environmental concerns, please contact 2d Lt. Alice Tosdorf, telephone FTS 399-3628, or Mr. John Welch, study manager, telephone FTS 399-3653, who will be working on this study. This same request has been sent to those individuals listed on inclosure 2.

Sincerely,

2 Incl
As stated

WILLIAM J. SPURLOCK
Chief, Flood Plain Management and
Urban Studies

PROJECT DESCRIPTION
BOAT FACILITY STUDY
PUGET SOUND AND ADJACENT WATERS

The Puget Sound area is located in northwestern Washington and contains 13,200 square miles of land, 800 square miles of freshwater, and an inland sea of 2,500 square miles. Puget Sound has about 2,350 miles of shoreline and innumerable islands, bays, and inlets which attract extensive pleasure boat cruising. The climate, wind, and wave conditions combined, make this inland sea a pleasure to small craft operators and recreationists.

Section 209 of the 1962 Flood Control Act (Public Law 87-874) was the authorizing document for a Puget Sound Comprehensive Study completed in 1971. A 1968 Pleasure Boating Study was input to this comprehensive study. This Boat Facility Study is an update of the 1968 Pleasure Boating Study and will serve as a guide for planners and developers and background information for subsequent detailed studies.

The original study identified the need for small boat basin development by a market analysis of moorage facilities through a demand analysis and an inventory of existing facilities in the mid-1960's. The entire shoreline of Puget Sound was examined to locate sites suitable for marina facility development. Shoreline areas appearing feasible for development were noted after considering approach depths, dredging requirements, land access, parking area, and beach material composition. Conditions have changed considerably since the 1968 Pleasure Boating Study. The Federal Government has passed the National Environmental Policy Act and the Coastal Zone Management Act. The State of Washington has passed a State Environmental Policy Act and Shoreline Management Act. These legislations will have an impact on shoreline utilization and small boat facility development.

An inventory of existing boating moorages and other facilities will be undertaken by field reconnaissance and interviews with marina operators. Current moorage facility demand will be determined by means of a questionnaire to sample boat owners registered with the U.S. Coast Guard. Future demand and need will be determined on the basis of or relationship to the economic indicators of population, employment, gross regional product, and per capita income. A determination will be made of the need for dry moorage facilities to compensate for limited potential wet moorage sites.

Potential marina sites identified in the 1968 Pleasure Boating Study will be screened based on current environmental and economic conditions and the Washington State Coastal Management Program. New potential sites will be determined. All potential sites will be analyzed for size and determined if there is a need for breakwater protection. A synopsis of environmental concerns and an economic analysis will be made for each site.

SAME CORRESPONDENCE SENT TO:

FEDERAL

Joseph Blum, Area Manager
U.S. Fish and Wildlife Service
Building A
2625 Parkmont Lane
Olympia, Washington 98502

Donald P. Dubois, Regional Administrator
U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101

Mr. George Snyder
National Marine Fisheries Service
Northwest Fisheries Center
2725 Montlake Boulevard East
Seattle, Washington 98112

Mr. Garland Gordan
Interagency Archeological Service
Heritage Conservation and
Recreation Service
Post Office Box 3602
San Francisco, California 94102

Rear Admiral Charles E. Larkin
Commander
Thirteenth Coast Guard District
915 Second Avenue
Seattle, Washington 98174

STATE:

Wilbur G. Hallauer, Director
Department of Ecology
State of Washington
Olympia, Washington 98504

Mr. Bert L. Cole
Commissioner of Public Lands
Department of Natural Resources
Public Lands Building
Olympia, Washington 98504

Gordon Sandison, Director
Department of Fisheries
State of Washington
115 General Administration Building
Olympia, Washington 98504

Ralph W. Larson, Director
Department of Game
State of Washington
600 North Capitol Way
Olympia, Washington 98504

Charles Odegaard, Director
Washington State Parks and
Recreation Commission
Thurston Airdustrial Center
Post Office Box 1128
Olympia, Washington 98504

Gloria Tarver, Environmental Coordinator
Department of Social and
Health Services
Water Supply and Waste Section
Mail Stop LD-11
Olympia, Washington 98504

Copy furnished w/incl:
Robert McCormick, Manager
Northwest Regional Office
Washington Department of
Ecology
4350 - 150th Northwest
Redmond, Washington 98502

20 Nov 1978

Lieutenant (jg) Rex A. Auker
Assistant Director of Auxiliary
Boating Safety Division
Thirteenth Coast Guard District
915 Second Avenue
Seattle, Washington 98174

Dear Lieutenant Auker:

On 24 October 1978, an interagency meeting was held to discuss our Boat Facility Study plan of study. At this meeting it was agreed to furnish your agency a list of all the potential sites which we were able to identify from the 1968 Pleasure Boating Study. Inclosed is this list of sites which have been reviewed for conflicts with local, city, or county shoreline master programs (inclosure 1). Also included are vicinity maps and a table of environmental factors which we feel should be kept in mind when considering the sites' potential for development. Please add to the list any sites which you feel should be considered. Included on the table is a simple evaluation notation which you may wish to use. Feel free to use any other method you think would be a better way to present your concerns in identifying sites which could be significantly impacted by marinas. As was discussed at the meeting, this should be a preliminary review within your agency utilizing in-house data and the expertise of your personnel.

The Boat Facility Study report will also include information on necessary Federal and State permits for marina development. Accordingly, we request your agency's criteria, standards, and permits (if any) required before an individual can develop a marina in a particular location. An example format showing U.S. Army Corps of Engineers' permits is attached as inclosure 2.

A copy of our memo for record on the 24 October meeting summarizing what was discussed and what agreements were reached is also attached (inclosure 3). If the information stated in this memo differs from your interpretation of discussions at the meeting, please inform us.

NPSN-PL-ER

Lieutenant (jg) Rex A. Auker

20 NOV 1978

As was discussed at the interagency meeting, we would appreciate your review comments by 12 January 1979. This same request has been sent to those individuals listed on inclosure 4.

Should you have any questions, please contact Lieutenant Tolsdorf, Environmental Coordinator, at telephone (206) 764-3628, FTS 399-3628 or Mr. John Welch, Study Manager, at telephone (206) 764-3653, FTS 399-3653.

Sincerely yours,

SIDNEY KNUTSON, P.E.
Asst. Chief, Engineering Division

4 Incl
As stated

(The first page of the Environmental Factors list is reproduced; however, the remainder of inclosure 1 is not included due to its bulk. It is available upon request.)

Encl 1

ENVIRONMENTAL FACTORS

Potential Sites (1969 Study)	Flushing	Circulation	Sedimentation	Fisheries	Benthic Organisms	Wildlife	Endangered Species	BOO (Biological Oxygen Demand)	Coliform	Organic Pollutants	Inorganic Pollutants	Dissolved Oxygen	Metals
<u>100%ack - Sumas Basin</u>													
1. Birch Bay													
2. Bellinham Addition													
3. Hale Passage - East													
4. Samish Bay - North End													
5. Skaine Addition													
6. Point Roberts - East													
<u>Skagit - Sanish Basins</u>													
7. Acacortes Addition													
8. Podilla Bay - William Point													
9. Sinclair Island - East													
10. James Island - SW													
11. Surfers Bay													
12. LaCarter - Indian Bay													

- = No Impact
- ◐ = Minimal Impact
- = High Impact

SAMPLE FORMAT

Permits Required for Marina Development

<u>Agency</u>	<u>Type of Permit</u>	<u>Why is Permit Needed</u>	<u>Approximate Length of Time Before Permit Issued</u>	<u>Remarks/Explanations</u>
U.S. Army Corps of Engineers	Section 10 of the River and Harbor Act of 1899 (30 STAT 1151; 33 USC 403)	When placing structures and working in or affecting navigable waters of the U.S.	Approximately 60 days minimum - maximum unknown	Section 10 and Section 404 are usually given as a combined permit when plans require both actions
	Section 404 - Federal Water Pollution Control Act, Amended 1972 (PL 92-500, 86 STAT 1816; 33 USC 1344)	When discharging dredge or fill material into waters of the U.S.		
	Section 103 - Marine Protection, Research and Sanctuaries Act, as amended (PL 92-532; 86 STAT 1052; 33 USC 1413)	Transportation of dredged material for the purpose of dumping it into ocean waters		

Permits Required for Marina Development

<u>Agency</u>	<u>Type of Permit</u>	<u>Why is Permit Needed</u>	<u>Approximate Length of Time Before Permit Issued</u>	<u>Remarks/Explanations</u>
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MEMO FOR: RECORD

SUBJECT: Boat Facility Study - Puget Sound and Adjacent Waters

1. On 24 October an interagency meeting was held in the large Engineering Division Conference Room at the District on the above subject. Those who attended are shown on inclosure 1.
2. Study Manager, John Welch, started off the meeting with a description of the project. He stated that the study had two purposes - one was to identify the need for wet moorage and the second to identify potential sites in the Puget Sound and Adjacent Waters area. The need for wet moorage will be determined by a market analysis. The market analysis was further broken down. A questionnaire will determine the demand for moorage. An inventory of existing marinas (which included marinas currently under permit processes and those which are considering expansion) has been made by the Oceanographic Institute of Washington.
3. The second purpose of the study is to identify potential marina sites in Puget Sound and Adjacent Waters. Currently our approach to this part of the study has been to review the potential sites listed in the 1968 Pleasure Boating Study in three ways. First, the list was compared to the draft inventory of existing or planned marinas as determined by the Oceanographic Institute. Then the list was screened with the Corps permits. Finally, the sites were checked against the local, city or county shoreline master programs to determine which of them are not consistent with shoreline master programs.
4. We now feel that the study has approached the point where applicable state and Federal agencies should be commenting on the potential sites. Inclosure 2 is a questionnaire we proposed at this meeting. The proposed questionnaire requested agencies standards and criteria for marina development; agencies permit requirements and their evaluation of the potential sites. We requested that the agencies comment on this system to find out if they were willing to do such a questionnaire. Everyone was in agreement that a questionnaire approach was good. However, many of the attendees requested that table 2 of inclosure 2 (potential site evaluation) be combined with the present potential sites list. The attendees were also in agreement that a symbol type of evaluation system could work.

Incl 3

SUBJECT: Boat Facility Study - Puget Sound and Adjacent Waters

5. We explained to the attendees that the list of potential sites would first be reviewed by them for their comments then that list would go to the respective local government. These two reviews would then go back to the state and Federal agencies for final evaluation and review. Many questions were brought up concerning which sites would remain on the list. It was decided that all sites would remain on the list. However, those sites which both the agencies and local governments feel are poor sites and any sites where the agencies and local governments differ will be annotated in the chart. Explanations of the problems at those sites would appear in a remark column or an appendix of some sort. The reasoning for this action was the fact that technological advances or changes in policies could possibly make poor sites into better sites in the future.

6. The tentative schedule for the list of sites to be reviewed is as follows:

State & Federal Agency Review - returned to Corps sometime in January - February; schedule a meeting.

Local Government Review - return review to Corps - March-April.

Final State & Federal Agency
Review - summer.

7. As a result of this meeting it was decided that the state and Federal agencies involved would receive the potential site list in the format of an evaluation table along with the evaluation system. They will be asked to review the potential sites using the evaluation system, comment on the evaluation system and try to utilize as much as possible their respective expertise and in-house data reserving any necessary field investigation until their final review of the list.

2 Incl
as

ALICE TOLSDORF

SAME CORRESPONDENCE SENT TO:

Lieutenant (jg) Rex A. Auker
Assistant Director of Auxiliary
Boating Safety Division
Thirteen Coast Guard District
915 Second Avenue
Seattle, Washington 98174

Mr. Charles Walters
National Marine Fisheries Service
Environmental & Technical Services
Division
Post Office Box 4332
Portland, Oregon 97208

Mr. Clifford Soderstrom
National Marine Fisheries Service
Environmental & Technical Services
Division
Post Office Box 4332
Portland, Oregon 97208

Mr. Rex Van Wormer
U.S. Fish and Wildlife Service
Building A
2625 Parkmont Lane
Olympia, Washington 98502

Mr. Ron Lee
U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101

Mr. Duane Karna
U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101

William Bush, Chief
Research & Long Range Planning
Washington State Parks and
Recreation Commission
Post Office Box 1128
Olympia, Washington 98504

Mr. Dennis Lundblad
Office of Comprehensive Programs
Department of Ecology
State of Washington
Olympia, Washington 98504

Incl 3

SAME CORRESPONDENCE SENT TO:

Mr. Jack Lilja
Department of Social and Health
Services
Food and Housing Section
Mail Stop LD-11
Olympia, Washington 98504

Ms. Mary Lou Mills
Department of Fisheries
State of Washington
115 General Administration building
Olympia, Washington 98504

Mr. William A. Johnson
Department of Natural Resources
Marine Land Management Division
Olympia, Washington 98504

Mr. Johnathan Gilstrom
Department of Game
State of Washington
600 North Capitol Way
Olympia, Washington 98504



U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO
ATTN OF: Mail Stop 521

JAN 9 1979

Mr. Sidney Knutson
Assistant Chief, Engineering Division
Seattle District, C/E
P. O. Box C-3755
Seattle, Washington 98124

Re: Boating Facility Study - Puget Sound and Adjacent Waters

Dear Mr. Knutson:

We are providing a unified response to your agency's November 20 and December 28, 1978 requests for environmental evaluations of potential marina development sites for the above referenced study.

Enclosed is a partially completed copy of the table of environmental factors. The table was modified somewhat as indicated for evaluation notations and parameters evaluated. Also, we did not evaluate marinas that have been approved for construction by the Corps or proposals which appeared not to be in compliance with the local Shoreline Master Programs.

For the proposed expansion of the Blaine marina, we indicated that a physical hydraulic model test should be required. This evaluation test may also be required for other marinas depending on their specific design and location.

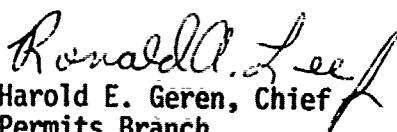
Our evaluation notations for flushing and circulation usually represent projections for marinas with solid breakwaters. The assessment of these two factors would be more positive if floating breakwaters were used instead of solid rock structures. Further, the extent of water exchange in a marina is largely dependent on the configuration of the breakwaters and the basin.

Our evaluation of marinas is on a case-by-case basis with particular emphasis on non-degradation of water quality standards. In accordance with existing Agency policy, we will not approve of a marina which will result in further degradation of water quality if background water quality does not meet standards. In this evaluation, entrance alignment, basin

profile and aspect and tidal prism ratios are important design factors which do impact water exchange. Exchange coefficients at neap, mid and spring tides as simulated in a physical hydraulic model are also very useful indicators of the flushing capability of a basin.

As previously discussed, EPA personnel will be available for further coordination on your study.

Sincerely,


Harold E. Geren, Chief
Permits Branch

Enclosure

cc: USFWS
NMFS
WDE
WDF
WDG



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Environmental & Technical Services Division
P. O. Box 4332, Portland, Oregon 97208

January 29, 1979

FNW5:CS

Colonel John A. Poteat
District Engineer, Seattle District
Corps of Engineers
P. O. Box C-3755
Seattle, Washington 98124

Dear Colonel Poteat:

We have reviewed the attached Boat Facility Study forms that Sidney Knutson of your staff sent to us with his November 20, 1978, letter. We were requested to fill in these forms in a cursory way so that the Corps of Engineers would have a means of determining environmental information that would be needed to complete the study. A copy of the forms with information that we have is attached.

The letter also requested our agency's criteria, standards, and permits (if any) required before an individual can develop a marina in a particular location. We do not require permits from our agency, nor do we have published criteria that applicants observe when applying for a Corps of Engineers permit.

We do have standards by which we evaluate each application. Rather than "cookbook" our review however, we feel we can be more responsible to the applicant and the local resources by a case-by-case review of each proposal. In general, we consider proposals for:

- Aquatic resource impacts
- Water dependency
- Alternatives (both in location and on-site construction techniques)
- "Consistency" with the Washington Coastal Zone Management Program

The National Marine Fisheries Service tends to be restrictive when defining the terms "water-dependent" and "water-related." We interpret water-dependency of an activity as one which can function only on, in, or adjacent to water areas; i.e., one which requires direct access to the water. We consider water-related activities as those which are not directly dependent upon access to the water but which provide goods or services that are directly associated with water-dependent land or waterway use, and which if not located adjacent to water, would result in a public loss of quality in the foods or services offered.



Residences, parking lots, spoil and dump sites, road and highways, restaurants, businesses, factories, motels, and trailer parks are not generally considered dependent on or related to water location need.

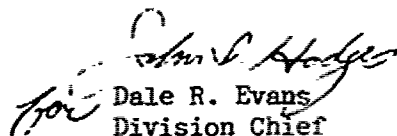
When we review Corps of Engineers Public Notices concerning applications for permits under Section 10 of the River and Harbor Act of 1899 or Section 404 of the Clean Water Act of 1977 we consider alternatives to the proposal which would impact to a lesser degree aquatic resources for which National Marine Fisheries Service bears responsibility. We may suggest that the applicant consider the alternatives before we submit our comments or recommendations to the Corps on the Public Notice.

We may review a proposal and determine that the completed project would cause significant impact to aquatic resources or their supporting habitat. Our agency normally does not recommend approval or authorization of projects or activities that are not water-dependent or water-related that could damage existing habitat of living marine, estuarine, or anadromous fishery resources. Habitat in these instances is considered to be spawning areas, rearing areas, food-producing areas, or other areas necessary for the survival of aquatic resources.

We may recommend mitigation or restoration for projects to replace habitat essential for ecosystem viability. Marinas proposed for Washington must be "consistent" with Washington's Coastal Zone Management Program before we can recommend a permit for the project. Such "consistency" is required under the Federal Coastal Zone Management Act as interpreted by Washington's Coastal Zone Management Program and certified by the local entity whose Shoreline Master Program has jurisdiction at the site.

We look forward to additional meetings to complete the Boat Facility Study in a timely manner.

Sincerely,


Dale R. Evans
Division Chief

Attachment

cc: Lieutenant Tolsdorf,
Environmental Coordinator, CE



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
2625 Parkmont Lane, S.W., Bldg. B-3
Olympia, Washington 98502

March 29, 1979

Colonel John A. Poteat, Jr.
District Engineer
Seattle District, Corps of Engineers
P.O. Box C-3755
Seattle, Washington 98124
ATTN: Lt. Tolsdorf

Re: Boat Facility Study

Dear Colonel Poteat:

This is our planning aid letter containing preliminary information and baseline data on your Boat Facility Study for Puget Sound, Washington. This letter also fulfills a portion of the information requested in Mr. Spurdocks August 2, 1978 letter. It is being submitted in partial fulfillment of Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq). Our comments address only a portion of the project sites per the Scope of Work FY 79 b.(3) requirements.

During CE-FWS coordination funding meetings in August and September 1978, we notified your ERS office that the proposed \$1,000 funding transfer was inadequate and that the level of funding would have to be renegotiated when the project objectives were limited to a select number of projects. At this time it was agreed that FWS would supply a designated report, which was to be generated with Service funds. This report was considered of high enough priority to justify expenditures of time and money because of the contribution it would make to our permit review program.

Since that time two major projects have been given precedent over our baseline data collecting. Therefore, our report only contains that data collected before a change in priorities and information collected using CE transfer funds. The \$1,000, minus the 38 percent overhead, only covered our attendance at required meetings and some preliminary data searching in areas where there is no site specific information.

To meet our commitment to a handbook on marina sites will require more time and a commitment of additional funding. We hope to complete our objective; however, because of funding and priorities we will not be able



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to meet CE deadlines. We anticipate this level of product will require approximately 85 work days to complete. If the Corps requests this level of data within a given timeframe it will require an additional transfer of funds. The levels of funding for different levels of product are attached as appendix 1.

Project Description:

The Boat Facility is intended to update the 1968 Puget Sound Pleasure Boating Study, Puget Sound and Adjacent Waters. The purpose is to update data on boating facility needs and identify potential sites for moorages. When completed the study will supply a report that will provide planners and other interested parties with a basis for determining demands for moorages, launching ramps and other facilities of importance to pleasure boaters. It will also, alert them to the environmental concerns and possible constraints to construction of marinas at specified sites.

Results and Conclusions:

With few exceptions, there is insufficient site specific information to make the determinations requested in Mr. Spurdocks letter. Some of the sites are difficult to evaluate without the exact location, i.e. certain portions of identified bays may be shallow, have good vegetative cover, and would require dredging to support a marina; while another portion may have a good channel, deeper water, good flushing and no vegetation.

Even with more time and funding to collect data, we will only be able to supply baseline information and general impact concerns. Because of high natural values we will be able to recommend against development in certain sites. However, before we can make a determination of site specific impacts we will need the following information:

1. the design and size of the marina;
2. the exact location of the marina within a bay;
3. the relationship between the proposed marina and adjacent marinas;
4. the relationship between the proposed marina and upland developments dependent or associated with the marina.

Once this information is available we will need to conduct onsite evaluations to determine:

1. water depths and dredging needs for the proposal;
2. water quality evaluations, flushing characteristics of the site, and

possible water quality problems that will occur with development;

3. biological parameters, i.e. aquatic vegetation, benthic organisms, shellfish, fish, and adjacent upland vegetation and wildlife values;
4. effects removal or alteration of the plant communities will have on specific fish and wildlife species.

In general, areas which are presently undeveloped should be considered the least desirable for marina construction, although there are areas where expansion of existing marinas would have more impact than construction in some undeveloped sites nearby. Certain existing marinas should not only be restricted from expanding but efforts should be made to phase out their activities and move them to less valuable fish and wildlife habitats.

Specific Sites:

The enclosed information is biological and in most instances does not refer to impacts since we do not believe there is sufficient information both on type developments or biological parameters to make that determination. Absence of comment does not indicate a lack of fish and wildlife resources, only a lack of data, or time to collect the data. The numbers coincide with the numbers assigned in Mr. Spurdocks August 22, 1978 letter.

1. Birch Bay: This area is noted for its shallow expanses of eelgrass. Waterfowl, particularly black brant, use the area for wintering. The outer northernmost beaches are herring spawning areas and the beach and bay bottom areas immediately adjacent to Birch Bay State Park are public shellfishing areas for dungeness crab and oysters. There is authorized pot fishing for crabs in the outer bay. This area is also a shoreline statewide significance.
2. Bellingham Bay: This area has been so degraded the additional development will probably have little impact. See DNR marine atlas for other values.
3. Hale Passage: The exact location of the suggested site was difficult to determine. The eastern shore of Lummie Island is shallow, and beaches are known herring spawning sites. Shallow waters are heavily used by juvenile salmon passing through from Nooksack, Skagit and Frazer River systems. Certain areas of the shallows support geoducks, and littleneck clams and crabs. The area is a major waterfowl concentration area. Black brant use on scattered eelgrass beds is extensive. See DNR atlas for further information.

We would recommend against marina development on the east side of Lummi Island.

4. Samish Bay: This is a very important eelgrass area which supports excellent populations of waterfowl, particularly black brant. It is an important commercial oyster area. The lower bay contains numerous shorebirds. Peregrines, bald eagles and great blue herons use the area. Any development would have to be done in a manner to not disturb endangered species activities or to destroy eelgrass beds.
5. Blaine: For resource values see Kovacks Dreamboat EIS and EIS for the new marina development.
6. Pt. Roberts: Development is not allowed under Shoreline Master Program. See Pt. Roberts Marina EIS for resource values.
7. Anacortes Addition: Cap Sante Marina can be expanded south to barge the terminal. The area south of existing marina is highly polluted with wood debris.
8. Padilla Bay: Shoreline of statewide significance. It is probably the most valuable black brant bay in Puget Sound. Extensive eelgrass beds are present. It is a salmon fry migration area. A large heron rookery occurs inland on Samish Spit. The area is being considered for acquisition by State or Federal agencies as wildlife area and no developments should be allowed in Padilla Bay.
9. Sinclair Island: The east side of island has eelgrass beds and supports wintering waterfowl, including harlequin, old squaw and black brant. Properly planned development would probably be acceptable.
10. Guemes Island: Development would have minimal impact to wildlife. No other data are available.
11. LaConner: See CE Swinomish Channel Maintenance dredging EIS for resource data. Many juvenile salmon pass through the area. Much of the area is Indian land.
13. Cultus Bay Expansion: Much of area is shallow with eelgrass beds. Development should avoid destruction of eelgrass. See DNR atlas and Puget Sound Herring Survey for further resource information. This area should be evaluated closely before allowing any development.
14. Oak Harbor N: This is a good wintering waterfowl area (see DNR atlas). Development would probably have minimal impact on wildlife. No specific data on fish.

15. Oak Harbor S: We suspect the area contains smelt spawning beaches. Impacts cannot be determined with available data.
16. Langley-Sunrise Beach: This area has a sandcobble bottom with littoral erosion and scouring occurring. Development could probably have minimal impacts if done correctly.
17. Useless Bay: A recent wildlife survey by SCS (C. B. Clements, Olympia office) found this area to be a highly significant wildlife area. It contains eelgrass and shallows. There is good waterfowl use, particularly during winter.
18. Penn Cove: See EIS Penn Cove Associates. U.S. Fish and Wildlife Service opposed development of a marina at this site because of poor water quality and circulation. It is a mussel culture area with high wildlife values.
19. Skagit Bay - Dugulla Bay through 44 Point Defiance: The only information we have at this time was received from WDG and is presented in their February 9, 1979 letter.
46. See East Bay Coordination Act Report - DOE Water Quality Report states that DO will be insufficient. Fish kills could occur where there are no fish kills now.
47. Gull Harbor - Budd Inlet East: Heavy waterfowl and shorebird use occurs in the area. Shellfish beds and commercial oysters are present. It is a very shallow area which would require dredging. U.S. Fish and Wildlife Service believes this area should not be developed.
48. Johnson Point - Henderson Inlet: These beaches support smelt spawning. There is high waterfowl and shorebird use in the area. Additional developments would have to be very specific in location and engineering designs.
50. Elwa River West: The Elwa River is a highly productive salmon stream. Efforts are underway to create bypass structures on the two upstream dams which would enhance salmon, steelhead and searun cutthroat runs. Any activity that would detract from salmon migrations would be opposed.
51. Dungeness - Existing trailer launch: Inner Bay supports a commercial oyster operation. Beaches and inner bay have significant shellfish (horse clams, geoducks, mud clams, and butter clams) beds and receive heavy public use. The area is a National Wildlife Refuge. Inner Bay contains major eelgrass beds and supports heavy waterfowl use,

particularly black brant, scaup, oldsquaw, scoter spp., and harlequin. Deadman Spit is a known Canada goose nesting site. Sea mammal activity is high. Major octopus area is located along the east side of Deadman Spit. The U.S. Fish and Wildlife Service believes no new developments should be allowed and existing slip should be eliminated because of dredging needs and conflict with high natural values.

52. Green Point - Clallam County Park Area: Steep bluffs would prohibit access and any modification of bluff faces could cut off natural sediment drift to Dungeness Spit which would destroy its ability to survive. Dungeness Spit would become another Ediz Hook. No development should occur anywhere between Port Angeles and Dungeness Spit unless it can be demonstrated with geologic studies that it would not effect natural sediment drift.
58. San Juan Island - Roche Harbor: Parts of Roche Harbor are developed with a resort and large commercial boat dock. The area could support increased boat facilities.
65. Lupez Island - Fisherman's Bay: This area has questionable water quality due to limited flushing. Dredging would reduce existing fish and wildlife values.
66. Friday Harbor: See Friday Harbor Marina EIS for baseline data.
74. Port Discovery - Beckett Point: There is good waterfowl use in general area.
75. Sequim Bay West - Pitship Point: This is the Sequim Bay Marina proposed site. See Sequim Bay EIS for baseline data.
76. Port Townsend: Existing port development is expanding to dry land storages.
77. Oak Bay: Bay contains an excellent marsh with good waterfowl use. You can assume all marsh related species and values are present.
79. Hoodsport: There is an existing commercial marina. Public shellfishing, commercial clam and oyster production occur in the immediate vicinity. Additional development would have to be specific in location and design.
86. Hood Canal - Coon Bay: There is an existing small dock and a pending permit application to expand the facility. The area is a natural shallow water bay which requires periodic dredging to maintain boating access. There is a possibility of water quality problems.

We have contracts with OIW for data collection in conjunction with 11 Section 404 permit applications. Recommendations on developments will depend on OIW data.

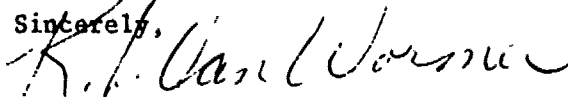
87. Marrowstone Island - East Side: The area supports good eelgrass beds, is very shallow, and would require dredging for marina. Because of possible destruction to eelgrass USFWS would recommend against developments.

89. Thorndyke Bay: Although this has been scratched we will submit comments because of the natural resource values in the area.

The area is in the 1974 DOE Sanctuary Package and has been considered for acquisition under the Unique Ecosystems Program. The area behind the spit has a brackish water marsh in the upper reaches and good eelgrass stands in the open water. Waterfowl use is excellent. The marsh and the stream entering the marsh support, coho, chum, and chinook salmon, steelhead and searun cutthroat trout.

91. Hood Canal - Anderson Cove: This area contains good eelgrass beds, beaches and bay bottom which support shellfish. The beach is a DNR public use area.

Sincerely,



for George L. Capp
Field Supervisor



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
2625 Parkmont Lane, S.W., Bldg. B-3
Olympia, WA 98502

June 6, 1979

Colonel John A. Poteat
District Engineer
Seattle District, Corps of Engineers
P.O. Box C-3755
Seattle, WA 98124

Re: Boat Facility Study

Dear Colonel Poteat:

We have inspected the list of potential marina sites submitted by your agency on April 30, 1979. We are very supportive of this program and the effort the Corps is expending on the evaluation of large, i.e. 100 plus boat, marinas. However, our agency is extremely concerned about the impacts of smaller multiple boat marinas that could be constructed in small coves and other protected areas that are now havens for waterfowl, salmon, and other fish and wildlife resources.

We encourage you to expand your program to handle smaller proposals, some which may not require an environmental statement as a means of developing a complete comprehensive program. We are enclosing a list of 50 sites which we believe have development potential and are of concern to us.

In FY 1979 we were inadequately funded to complete the initial stages of the project without utilizing Service funds. To complete our evaluations of the initial project and supply baseline information, interpretation and evaluation on the identified 50 sites will require additional transfer funds per our agreements under the Coordination Act.

Thank you for your consideration of these sites.

Sincerely,

George L. Capp
Field Supervisor

Attachment



Save Energy and *Serve America!*



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF SOCIAL AND HEALTH SERVICES
Olympia, Washington 98504

January 12, 1979

Sidney Knutson, P.E.
Assistant Chief
Engineering Division
Corps of Engineers
P.O. Box C-3755
Seattle, Washington 98124

Dear Mr. Knutson:

I have reviewed the list of potential marina sites and have listed below those areas that are located near commercial shellfish grounds. Development of marinas at these sites may have an adverse impact on the commercial shellfish resource. The degree of impact is dependent upon a number of factors such as the marina size, exact location, boat traffic patterns, water circulation, etc. A more detailed evaluation of each site would have to be undertaken in order to determine if a particular shellfish growing area might be subject to decertification by this agency as a result of marina development.

<u>Size No.</u>	<u>Location</u>
3	Hale Passage - East
8	Padilla Bay - William Point
17	Useless Bay - Maxwellton
18	Penn Cove
20	Port Susan - Camano Island
22	Point Partridge
28	Port Susan - Warm Beach
74	Port Discovery - Beckett Point
75	Sequim Bay - West
77	Oak Bay
78	Mats Mats
79	Hoodsport
80	Quilcene Bay - East side
86	Hood Canal - Coon Bay
88	Hood Canal - Bywater Bay
89	Hood Canal - Thorndyke Bay
90	Hood Canal - Warrentville
91	Hood Canal - Anderson Cove
92	Hood Canal - Duckabush River
93	Hood Canal - Union
-	Holmes Harbor - Freeland

Sincerely,

FOOD AND HOUSING SECTION

Jack Lilja

Jack Lilja, P.S.
Advisory Sanitarian

JL:jh



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF FISHERIES

115 General Administration Building, Olympia, Washington 98504

206/753-6600

March 12, 1979

U. S. Army Corps of Engineers
Seattle District
P. O. Box G 3755
Seattle, Washington 98124

Attention: Mr. John Welch

Gentlemen:

Corps of Engineers Puget Sound Boat Facility Study

This letter is in response to your request for this Department's concerns regarding potential marina sites in the marine waters of Puget Sound. Enclosed is a table listing the resources under this Department's jurisdiction which can be found in the general locale of each site. This is only a preliminary table with the information obtained from published resource atlases. Personnel in our marinefish, shellfish and salmon divisions will review this table and a more detailed and informative copy, with the inclusion of possible impacts, will be forthcoming. Our first review has dealt only with resource occurrence not water quality. In reviewing actual proposals we may have water quality concerns, however.

In developing the attached table, we have listed resources as present if they occur in the general area (i.e. within a given Bay or in the vicinity of the number on the Corps letter maps). Where the resources are a distance from the site, we followed the notation with a question mark. Many of these should be clarified as our internal review continues.

We note with interest that the Port Williams site is not included as a separate location in the Sequim Bay area. Since Port Williams (Alternative 5 in the NEPA Sequim Bay Marina Environmental Impact Statement) is located immediately outside the Bay, it entails minimal potential impacts on the fishery resources of the area and should be listed separately.

Also enclosed are copies of our criteria which are utilized when reviewing proposed projects in marine waters. Please note that the enclosed criteria for herring spawning beaches is only a draft copy. In addition, the criteria governing the design of marinas is presently being modified by Department personnel and will include a section on marina siting related to foodfish and shellfish resources.

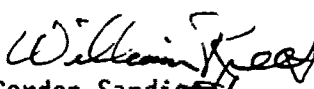
It is the requirement of this department that any person or government agency wishing to perform work in the marine waters of this state must first obtain the written approval of the Department of Fisheries and Game. This involves

Mr. John Welch
March 12, 1979
Page 2

submitting complete plans and specifications of the proposed work for review. The approximate time period for our permit review process may be as short as 2 - 4 weeks and can extend to an unknown amount of time if there are resource problems with the proposal.

I hope this information will be of some help and if you have any further questions please contact Mary Lou Mills at 753-0576.

Sincerely,


Gordon Sandison
Director

Enclosures

cc: Lieutenant Tolsdorf, COE

kn

	Herring	Smelt	Crab	Shrimp	Intertidal Shellfish	Subtidal geoducks	Oyster	Littleneck	Butter Clams
1. Birch Bay	X	0	X	0	X	0	0	0	0
2. Bellingham Addition	0	0	0	0	0	0	0	X?	0
3. Hale Passage East	X	0	X	0	X	0	0	0	0
4. Samish Bay -N. end	X	0	0	0	X	0	X	0	0
5. Blaine Addition	X	0	X	0	X?	0	X	0	0
6. Point Roberts-East	X	0	X	0	0	0	0	0	0
//////////Skagit-Samish Basins//////////									
7. Anacortes Addition	0	0	X	0	0	0	0	0	0
8. Padilla Bay-William Pt.	X	0	0	0	X?	0	X	0	0
9. Sinclair Inlet	0	0	0	0	0	X	0	X	X
10. Guemes Island	0	0	0	0	0	0	0	0	0
11. Burrows Bay	0	0	0	X	0	0	0	0	0
12. LaConner-Indian Bay	X	0	0	0	0	0	X	0	0
//////////Whidbey-Camano Island//////////									
13. Cultus Bay Exp.	0	0	X	0	X	X	0	0	0
14. Oak Harbor-North	0	0	0	0	0	0	0	0	0
15. Oak Harbor-South	0	X	0	0	0	0	0	0	0
16. Langley-Sunrise Beach	0	0	0	X	0	X	0	0	0
17. Useless Bay-Maxwelton	0	0	X	0	X	X	0	0	0
18. Penn Cove	0	X	0	0	X	X?	0	X?	X?
19. Skagit Bay-Dugwalla Bay	X	X?	X	0	0	0	0	0	0
20. Port Susan-Camano Island	0	X	X	0	0	0	0	0	0
21. Skagit Bay-Utsladdy	0	X	X	0	X	X?	0	0	0
22. Point Partridge	0	0	0	0	0	X	0	0	0
//////////Snohomish Basin//////////									
23. Tulalip Bay	0	0	X	0	0	X?	0	0	0
24. Priest Point West	0	0	X	0	0	X?	0	0	0
25. Truet Q	0	0	0?	0	0	0	0	0	0

	Herring	Smelt	Crab	Shrimp	Intertidal shellfish	Subtidal geoducks	Oyster	Littleneck	Butter clams
26. Mukilteo	0	0	X	0	0	0	0	0	0
27. Picnic Point	0	0	X	0	0	0	0	0	0
28. Port Susan-Warm Beach	0	0	X	0	X	0	0	0	0
29. Mukilteo South	0	0	X	0	X	0	0	0	0
30. Norma Beach-North	0	0	X	0	X?	X	0	0	0
31. Meadowdale	0	0	X?	0	X	X	0	0	0
32. Edmonds N.	0	0	0	0	X	X	0	0	0
////////Cedar-green Basins////////									
33. Wells Pt. Edmonds	0	0	0	0	X	X	0	0	0
34. Golden Gardens N.	0	0	0	0	0	X	0	0	0
35. Ft. Lawton N.	0	0	0	0	0	0	0	0	0
36. Ft. Lawton S.	0	0	0	0	0	X	0	0	0
37. Elliott Bay-Pier 54	0	0	0	X	0	0	0	0	0
38. Elliott Bay Magnolia Bluff	0	0	0	X	0	0	0	0	0
39. Seacrest Marina-Add.	0	0	0	X	0	0	0	0	0
////////Puyallup Basin////////									
40. Hylebos Waterway	0	0	0	0	0	0	0	0	0
41. Dumas Bay	0	0	0	0	0	X	0	0	0
42. Titlow Lagoon	0	0	0	0	0	X	0	0	0
43. Day Island	0	0	0	0	0	X	0	0	0
44. Pt. Defiance	0	0	0	0	0	0	0	0	0
45. Ruston Way	0	0	0	0	0	0	0	0	0
////////Nisqually- Deschutes Basin////////									
46. Olympia-E. Bay	0	X	0	0	X	0	0	0	0
47. Budd Inlet-E.	0	X	0	0	X	X?	0	0	0
48. Henderson Inlet	0	X	0	0	X	X	X	0	0
49. Nisqually Flats-E.	0	0	X	0	0	X	X	0	0

	Herring	Smelt	Crab	Shrimp	Intertidal shellfish	Subtidal geoducks	Oyster	Littleneck	Butter clams
/////////Elwha Dungeness Basin/////////									
50. Elwha River-East	0	0	X?	0	0	0	0	0	0
51. Dungeness River-East	0	X?	X	0	X	X	X	0	X?
52. East Green Point	0	0	0	0	0	X	0	X	X
53. Dungeness Sequim	0	X	X	0	X	X	X	0	0
/////////San Juan Islands/////////									
54. Stuart Island-Reid Harb.	0	0	0	0	X	0	0	0	0
55. Waldron Island-Cowlitz B.	X	0	0	0	X	0	0	0	0
56. Sucia-Fossil Bay	0	0	X	0	X	0	0	0	0
57. Henry Isl-Nelson Bay	X	0	X?	0	0	0	0	0	0
58. San Juan Isl-Roche Harb.	X	0	X	0	X	0	0	0	0
59. Orcas Island-Deer Point	0	0	0	0	0	0	0	0	0
60. Blakely Is-Armitage Is.	0	0	0	X	0	0	0	0	0
61. Decatur Is.-Fauntleroy Pt.	0	0	0	X?	0	0	0	0	0
62. Lopez Is.-Shoal Bay	X	0	X	X	0	X	0	0	0
63. Lopez Is.-Hunter's Bay	X	0	X	X	X	0	0	0	0
64. Lopez Is.-Mackaye Harb.	0	0	0	0	X	0	0	0	X?
65. Lopez Is.-Fisherman's Bay	0	0	0	0	X	0	0	0	0
66. San Juan Is.-Fri. Harb.	0	0	0	0	0	0	0	0	0
67. San Juan Is.-False Bay	0	0	0	0	0	0	0	0	0
68. San Juan Is. -Griffin Bay	0	0	0	0	0	0	0	0	0
69. Shaw Island-Parks Bay	0	0	0	0	0	0	0	0	0
70. Shaw Island-Squaw Bay	0	0	0	0	0	0	0	0	0
71. Orcas Is.-Massacre Bay	X	0	0	X?	0	0	0	0	0
72. Orcas Is.-Grindstone Harb.	0	0	0	X	0	0	0	0	0
73. Orcas Is.-East Sound	X	0	X	0	X	0	0	0	0

	Herring	Smelt	Crab	Shrimp	Intertidal shellfish	Subtidal geoducks	Oyster	Littleneck	Butter clams
//////////West Sound Basin//////////									
74. Port Discovery-Beckett Pt.	X	0	0	0	X	X	0	0	0
75. Sequim Bay-West	X	0	0	0	X	X	X	X	X
76. Port Townsend	0	0	X	0	0	X	0	0	0
77. Oak Bay	0	0	0	0	X	X	0	0	0
78. Mats Mats	0	0	0	0	X	0	0	X	X
79. Hoodspout	0	0	X	X	X	X	X	0	0
80. Quilcene Bay-East Side	X	0	X	0	0	0	X	0	0
81. Manchester	0	0	0	0	0	X	0	0	0
82. Bainbridge Is.-Lynnwood Ctr.	0	0	0	0	0	X	0	X	X
83. Bainbridge Is.-Muden Cove	0	0	0	0	0	0	0	X?	X?
84. Bainbridge Is.-Fletcher Bay	X?	0	0	0	0	X	0	0	0
85. Dyes Inlet	0	X	0	0	X	0	X	X	X
86. Hood Canal-Coon Bay	0	0	0	0	0	X?	0	0	0
87. Marrowstone Is.-East Side	0	0	0	0	0	0	0	X	X
88. Hood Canal-By Water Bay	0	0	X	0	X	X	0	X	X
89. Hood Canal-Thorndyke Bay	0	0	0	0	X	X	X	0	0
90. Hood Canal-Warrentville	0	0	X	0	0	X	X	0	0
91. Hood Canal-Anderson Cove	0	0	0	X	X	X	X	0	X
92. Hood Canal-Duckabush River	X	0	X	0	X	0	X	0	X
93. Hood Canal-Union	0	0	X	X	X	X	X	0	0

0 = Resource not present in significant quantities.

X = Impactable resource present in the vicinity of the proposed site.



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

WASHINGTON STATE PARKS AND RECREATION COMMISSION

7150 Clearwater Lane, Olympia, Washington 98504

M.S. KY-11

206/753 5755

December 6, 1978

Lieutenant Alice Tolsdorf
Department of the Army
Seattle District Office
Corps of Engineers
P. O. Box C-3755
Seattle, Washington 98124

Ref: NPSEN-PL-ER

Dear Alice:

Thank you for your recent letter inviting our review and comments on the boating facilities portion of the updated Pleasure Boating Study.

I have attached information regarding permits required for Marina Development by Port Districts. Should you have any questions please feel free to contact me at any time.

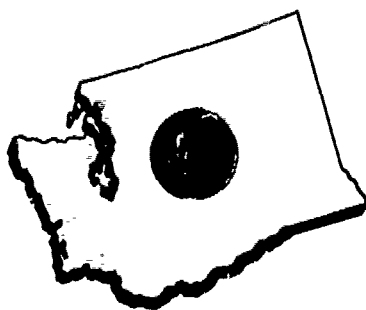
We have reviewed the other data furnished and do not wish to make any comment on them at this time.

Sincerely,

William A. Bush, Chief
Research and Long Range Planning

WAB:dg

Attachment



STATE OF WASHINGTON
Department of
Natural Resources

COMMISSIONER
BERT L. COLE

R. A. BESWICK
SUPERVISOR

OLYMPIA, WASHINGTON
98504

December 26, 1978



Sidney Knutson PE
Corps of Engineers
P. O. Box C-3755
Seattle, WA. 98124

Re: NPSEN-PL-ER



Dear Mr. Knutson:

In regard to your Boat Facility Study, you requested that we comment on environmental factors associated with potential sites and provide our agency's criteria, standards, permits, etc. required for marina development.



Enclosed please find:

- 1) Table of Environmental Factors with our comments.
- 2) Department of Natural Resources "permits" required for marina development in your suggested format.
- 3) Copy of Department of Natural Resources Marina Design Policies. These are only applicable to the design of marinas to be located on State owned land. They would not apply where a marina is to be located on private tide or shore land.



Thank you for the opportunity for input. Please keep us advised of further developments or future interagency meetings.



Very truly yours,



BERT L. COLE
Commissioner of Public Lands



[Signature]
WILLIAM A. JOHNSON
Supervisor
Division of Marine Land Management

WAJ/nr
Enclosures
cc: Dave Jamison

AN EQUAL OPPORTUNITY EMPLOYER

Permits Required for Marina Development

<u>Agency</u>	<u>Type of Permit</u>	<u>Why is Permit Needed</u>	<u>Approximate Length of Time Before Permit Issued</u>	<u>Remarks/Explanations</u>
Dept. of Natural Resources	Lease	For withdrawal from public use of state owned tide, shore, or bed lands, a lease with rental is required. Not applicable if land is privately owned.	Minimum - 90 days Maximum - unknown	See DNR Marine Design Policy attached.

State of Washington
Department of Natural Resources
Marina and Moorage Design Policies

Open moorage will be preferred in relatively undeveloped areas and locations where view preservation is desirable, and/or where leisure activities are prevalent.

Covered moorage may be considered in highly developed areas and locations having a commercial environment.

Enclosed moorage will be confined to areas of an industrial character where there is a minimum of esthetic concern.

In general covered moorage will be preferred to enclosed moorage and open moorage will be preferred to covered moorage.

View encumbrance from enclosed moorage is to be avoided in those areas where views are an important element in the local environment.

Moorage should be designed so as to be compatible with the local environment and to minimize adverse esthetic impacts.

In order to minimize the impact of moorage demand on natural shorelines, large marina developments in urban areas will be fostered in preference to numerous small marinas widely distributed.

Anchorage suitable for both residential and transient use should be identified in appropriate locations so as to reduce dependence on developed marinas.

Acceptable locations for marina development, properly distributed, should be identified to meet projected public need during the next 30 years.

The use of floating breakwaters shall be encouraged as protective structures rather than using solid fills.

Open Moorage: Moorage slips and mooring floats are completely open sides and top.

Covered: Slips and mooring floats are covered by a single roof with no dividing walls.

Enclosed: Completely enclosed roof side and end walls. Boathouse i.e., similar to a car garage.

WAJ/nr
4/4/77

STATE OF WASHINGTON

Department of
Natural Resources

COMMISSIONER
BERT L. COLE

R. A. DESWICK
SUPERVISOR

OLYMPIA, WASHINGTON
98504

January 8, 1979

Steven F. Dice
Chief, Environmental Resources Section
Seattle District, Corps of Engineers
P. O. Box C-3755
Seattle, Washington 98124

Dear Dr. Dice:

I am responding to your letter of December 28, 1978 regarding an environmental assessment of Holmes Harbor (freeland site) for a marina. Based on the matrix you supplied earlier, my comments are as follows:

flushing	moderate impact
circulation	moderate impact
sedimentation	no impact
fisheries	high impact
benthic organisms	high impact
wild life	high impact
wetlands	high impact

These comments, as well as those forwarded in a letter by William A. Johnson of December 26, 1978, are preliminary and subject to on site inspection, as well as a more detailed review when specific plans are known.

Very truly yours,

BERT L. COLE
Commissioner of Public Lands

DAVID JAMISON
Division of Marine Land Management

DJ/nr

AN EQUAL OPPORTUNITY EMPLOYER

B-38



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF ECOLOGY

Olympia, Washington 98504

206/753-2800

Mail Stop PV-11

January 10, 1979

Mr. Sidney Knutson
Seattle District
Corps of Engineers
Department of the Army
P. O. Box C-3755
Seattle, Washington 98124

Dear Mr. Knutson:

Enclosed is the information you requested for your preliminary work on the Boat Facility Study.

We have filled in the environmental factors table and listed the necessary state permits needed for marina development. The reference materials used for our assessments are:

- a. The Coastal Zone Atlas of Washington
- b. Washington Coastal Areas of Major Biological Significance - Baseline Study November 1977
- c. Washington Marine Atlas 1974, 1977 -
Department of Natural Resources

Because the list of sites which you provided was too general to determine specific locations, our information should not be used to make site specific decisions. Additionally, the design chosen for an individual marina is critical and can affect each one of the environmental factors listed on your study format. Since it is difficult to generalize the environmental factors associated with marinas, the Department of Ecology recommends that this information be used very carefully.

Should you have any questions after you have reviewed the information, please contact me at 753-2844.

Sincerely,

Dennis L. Lundblad
Division Supervisor

DLL:bjw

Enclosure

(Corps Marina Study)
(December 15, 1978)

Methodology

The reference materials used to interpret the environmental factors at each potential marina site are:

1. The Coastal Zone Atlas of Washington
2. Washington Coastal Areas of Major Biological Significance - Baseline Study November 1977
3. Department of Natural Resources - Washington Marine Atlas 1974, 1977

Criteria developed to interpret each environmental factor are as follows:

Fishing:

This was based on bathymetry, current pattern, exposure, river import and tidal pattern. The general area was considered together with the specific location.

Circulation:

Based upon bathymetry, current patterns, and exposure.

Sedimentation:

Based primarily on sediment transport potential from the Coastal Zone Atlas. When the Coastal Zone Atlas was not used, probable sediment sources such as rivers or beach erosion were examined.

Fisheries and Benthic Organisms:

Extracted from Washington Coastal Areas of Major Biological Significance.

Wildlife:

Extracted from Washington Coastal Areas of Major Biological Significance.

Predation:

This was not interpreted; there were difficulties in identifying the wildlife predators and the prey.

Chemical Parameters of BOD, DO, Organics, Inorganics, Coliform:

These were extracted from the Department of Ecology Water Quality Standards and classification.

Wetlands:

Extracted from Coastal Zone Atlas where applicable, or the consideration of low-lying topography and the proximity of development.

Glossary of Environmental Factors

Flushing

The time required for an amount of water or air current equal to its volume to pass through its inlet.

Circulation

Free movement of a body of water from one destination to another through a given volume or area, usually by a closed circular pattern.

Sedimentation

Materials carried in suspension by a flowing body of water which will ultimately settle to the bottom after the water loses its velocity.

Fisheries

The total game fish population.

Benthic Organisms

Aquatic bottom dwelling organisms found with the bottom material of a lake or stream.

Wildlife

Undomesticated animals and birds.

Predation

Living organisms that prey on other organisms.

Biological Oxygen Demand (BOD)

The oxygen used in meeting the metabolic needs of aerobic micro-organisms in water rich in organic matter.

Coliform

Any of a number of organisms common to the intestinal tract of man and animals whose presence in waste water is an indication of pollution. An index of the purity of water is based upon a count of its coliform bacteria.

Organic Pollutants

Pollutants from living organisms, or all pollutants that contain elemental carbon.

Inorganic Pollutants

Pollutants from non-living things, or all pollutants without elemental carbon.

Dissolved Oxygen

The oxygen freely available in water that is necessary for the life of fish and other aquatic organisms.

Glossary
Page 2

Wetlands.

The lands extending inland from a water body for a specific distance. This area includes marshes, bogs, swamps, river deltas, flood plains, etc. associated with the body of water.

Permits Required for Marina Development

Agency	Type of Permit	Why is Permit Needed	Approximate Length of Time Before Permit Issued	Remarks/Explanations
Department of Ecology	Surface or Ground Water Rights RCW 90.03.250 RCW 90.44.050	For the appropriation of surface or ground water in a marina development	90 days	Department of Ecology has the jurisdiction to approve or deny this permit.
	Water Quality Certification FWCA Section 401	When a marina proposes to discharge or affect the quality of navigable waters	90 days plus time to collect water quality data, physical modeling, and marina configuration	Department of Ecology and EPA have the jurisdiction to approve or deny this permit.
	Water Quality Standard Modification WAC 173-201-038 (8E)	When the construction of a marina will cause short term degradation of water quality below the state standard	90 days	DOE has the jurisdiction to approve or deny this permit.
	Waste Water Facilities Plan Approval RCW 90.48 Section 110 WAC 173-240	When the construction of the waste water treatment or other sewage facilities discharge pollutants to the state waters	30 days	DOE and the Department of Social and Health Services have the jurisdiction to deny or approve the project.
	Conditional Use WAC 173-14-140 RCW 90.58.140 (12)	When a marina allows specified activity not identified in the Master Program	90 days	Local government and the DOE have the jurisdiction to approve or deny this permit.

Permits Required for Marina Development

Agency	Type of Permit	Why is Permit Needed	Approximate Length of Time Before Permit Issued	Remarks/Explanations
Department of Ecology	Variance WAC 173-14-150	This grants relief to marina development from performance standards set forth in the Master Program	90 days	Local government and the DOE have the jurisdiction to approve or deny this permit.
	NPDES RCW 90.48 WAC 173-220	This is required to control the discharge of waste water from marina facilities into surface waters	90 days	The DOE and EPA have the jurisdiction to deny or approve the program.
	Shorelands Master Program Revision RCW 90.58.090	To review all local government master program on marinas that impact shorelines of the state	30 days	Local government and DOE have the jurisdiction to approve or deny this permit
	Flood Control Zone RCW 86.16	To minimize flood damage by regulating development in flood hazard areas (zones)	30 days	DOE issues or denies permits in the 18 flood control zones, King and Clark Counties administer their own programs.



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF GAME

600 North Capitol Way/Olympia, Washington 98504

206/753-5700

February 9, 1979

Lieutenant Alice Tolsdorf
Department of the Army
Seattle District Corps of Engineers
P.O. Box C-3755
Seattle, Washington 98124

RE: Boat Facility Study-Puget
Sound and Adjacent Waters

Lieutenant Tolsdorf:

You requested information on potential marina sites. Our agency has the following information available.

General Information or Comments on the Study:

We assume that information you wish to receive is to obtain a reduced number of sites for serious consideration. We also assume that more detailed ecological evaluations will be made later.

Some of the sites are difficult to evaluate without the exact locations. Some potential sites could contain a kelp bed, an eelgrass bed, or an unvegetated area, depending on the exact location, with each area yielding a somewhat different impact. In some cases the exact location could place the marina in sand or mud sediments, in which case the flushing, circulation or sedimentation characteristics would be altered. The design of marina could influence the degree of the impacts on fish and wildlife. In areas with the same resource value, a marina that requires more dredging or filling, or both, would have greater impacts.

We find that the list of parameters (flushing, circulation, etc.) do not allow a complete evaluation of impacts to fish and wildlife. Other factors that need to be evaluated include:

1. The cumulative impacts of several marinas built in close proximity. For example, if all marinas proposed for the San Juan Islands were built, the impacts on wildlife would be severe.
2. Loss of fishing opportunity. Private marinas can commit the shoreline and reduce public access and fishing.

3. Intertidal fills. Fills in intertidal areas can result in serious impacts to wildlife. Studies by our agency in Grays Harbor estuary show that wildlife populations were reduced as fills covered food organisms.
4. Type and quality of vegetation found on site. Eelgrass, kelp, algae, and fresh water macrophytes are important links in fish and wildlife food chains.
5. Designated or planned land uses. In addition to County Shoreline designations, comprehensive plan designations and descriptions of adjacent lands would describe present and planned land uses. They could demonstrate whether a proposal would set precedent or stimulate other development.
6. Secondary impacts away from the marina sites. Increased boat traffic on Puget Sound affects wildlife. It has been suggested that boat traffic has been a factor in the disappearance of some harbor seal populations. As more boats are allowed on the sound, other species may be decreased or eliminated. We hope this study can be part of long range plan determining the ecological limits to boating on Puget Sound and adjacent waters.

In general, areas which are presently undeveloped should be considered the least desirable for marina construction. Because of high natural values some areas should not be considered; some examples are: Thorndyke Bay, Dukabush River, and Bywater Bay.

We appreciate the intent of your study since it has the potential of eliminating costly, last minute studies and lawsuits. Areas least acceptable for marina development can be pointed out and future conflicts avoided.

Specific Sites:

The absence of comment does not indicate a lack of impact. It means that further effort is required to make a determination of potential impacts. Where intertidal vegetation is known, it is noted under wetlands. Removal of vegetation by marina construction or expansion would result in reduced primary production affecting invertebrates and other animals that depend on aquatic vegetation and detritus as a food source. Reductions of these animals would occur both at the site and at adjacent areas.

1. Birch Bay major impacts on fisheries, wildlife

- | | |
|--|--|
| | predation and wetlands (eelgrass) |
| 3. Hale Passage East | major impacts on fisheries and wetlands (eelgrass) |
| 4. Samish Bay North End | major impacts on fisheries, benthic organisms, wildlife, predation and wetlands (eelgrass) |
| 8. Padilla Bay William Point | major impacts on benthic organisms, wildlife, predation and wetlands (kelp) |
| 9. Burrows Bay | major impacts on wetlands (kelp) |
| 18. Penn Cove | major impacts on fisheries (mussel culture) and wildlife |
| 19. Skagit Bay Dugulla Bay | major impacts on fisheries, benthic organisms, wildlife and predation |
| 20. Port Susan Camano Island | major impacts on fisheries (shellfish culture) and eelgrass |
| 22. Point Partridge | major impact on benthic organisms, wildlife, predation and wetlands (algae and kelp) |
| 22.a. Added site Holmes Harbor (Freeland site) | major impacts on benthic organisms, wildlife, fisheries (oyster, geoduck, hard-shell clams, salmon, bottom fish herring, mussel culture) and wetlands (eelgrass) |
| 26. Mukilteo | major impacts on wetlands (eelgrass) |
| 27. Picnic Point North | major impacts on wetlands (eelgrass) |
| 28. Port Susan Warm Beach | major impacts on fisheries (shellfish) |
| 29. Mukilteo South | some impacts on fisheries (public beach and shellfish) |
| 31. Meadowdale | major impact on wetlands (eelgrass) |
| 32. Edmonds North | major impacts on wetlands (eelgrass) |
| 33. Wells Point Edmonds | major impact on wetlands (kelp) |

34. Golden Garden North major impact on fisheries and benthic organisms (public shellfish) and wetlands (eelgrass)
35. Fort Lawton North some impacts on wetlands (eelgrass and algae)
36. Fort Lawton South some impacts on fisheries (public beach) and wetlands (eelgrass)
38. Elliott Bay Magnolia Bluff some impacts on wetlands (algae)
40. Hylebos Waterway major impact on fisheries and some impact on wetlands (salt marsh)
41. Dumas Bay major impacts on wildlife and wetlands (eelgrass)
42. Titlow Lagoon some impact on wetlands (kelp)
43. Day Island some impact on wetlands (salt marsh)
44. Point Defiance major impact on fisheries, benthic organisms, wildlife, predation, and wetlands (kelp)
49. Nisqually Flats-East major impacts on wildlife, predation and wetlands (eelgrass)
50. Elwha River East major impacts on wildlife, predation and wetlands (kelp)
51. Dungeness River-East major impacts on fisheries, benthic organisms, wildlife, predation and wetlands (eelgrass)
52. East Green Point major impact on wetlands (eelgrass)
53. Dungeness Sequim major impact on fisheries, wildlife, predation and wetlands (eelgrass)
55. Waldron Island Coultz Bay major impact on wildlife, predation and wetlands (eelgrass)
56. Sucia Island Fossil Bay major impacts on wildlife, predation, and wetlands (eelgrass)
57. Henry Island Nelson Bay major impacts on benthic organisms and wetlands (eelgrass and marsh)

Page 5
Lieutenant Tolsdorf
February 9, 1979

58. San Juan Island
Roche Harbor major impact wetland (eelgrass)
59. Orcas Island
Deer Point major impacts on wildlife, predation and wetlands (kelp)
60. Blakely Island
Armitage Island major impacts on wildlife, predation and wetlands (eelgrass)
61. Decature Island
Fauntleroy Point major impacts on wildlife, predation and wetlands (eelgrass)
62. Lopez Island
Shoal Bay major impact on wildlife, predation and wetlands (eelgrass and kelp)
63. Lopez Island
Hunter's Bay major impacts on wildlife, predation and wetlands (eelgrass)
64. Lopez Island
Mackaye Harbor major impact on wetlands (eelgrass)
65. Lopez Island
Fisherman's Bay major impact on wetlands (eelgrass)
66. San Juan Island
Friday Island major impact on wetlands (eelgrass)
67. San Juan Island
False Bay major impacts on benthic organisms, wildlife, predation and wetlands (eelgrass)
68. San Juan Island
Griffen Bay major impacts on wetlands (eelgrass)
69. Shaw Island
Parks Bay major impacts on wildlife, predation and wetlands (eelgrass)
70. Shaw Island
Saw Bay major impacts on wildlife, predation and (critical habitat for osprey) and wetlands (eelgrass)
71. Orcas Island
Massacre Bay major impacts on fisheries, wildlife, predation, and wetlands (eelgrass)
72. Orcas Island
Grindstone Harbor major impacts on wildlife and predation

73. Orcas Island major impacts on fisheries and wetlands
East Sound (eelgrass)
74. Port Discovery major impact on fisheries and wetlands
Beckett Point (eelgrass)
75. Sequim Bay major impacts on wildlife, predation and
West wetlands (eelgrass)
77. Oak Bay major impacts on wildlife, predation
and wetlands (eelgrass and marsh)
78. Mats Mats major impact in wetlands (eelgrass)
80. Quilcence major impacts on fisheries, benthic
Bay East Side organisms, wildlife, predation and wetlands
(eelgrass)
92. Bainbridge major impacts on wildlife and wetlands
Island Lynn-wood Center (eelgrass)
83. Bainbridge major impact on wetlands (eelgrass)
Island Munden Cove
84. Bainbridge major impacts on fisheries
Island Fletcher Bay
88. Hood Canal very major impacts on fisheries (public
By Water Bay shellfish) benthic organisms, wildlife,
predation and wetlands (marsh and eelgrass)
89. Hood Canal very major impacts on fisheries (public
Thorndyke shellfish), benthic organisms, wildlife
Bay (bald eagles, osprey, and valuable water-
fowl), predation and wetlands (marsh/eelgrass)
90. Hood Canal major impacts on wildlife, predation and
Warrenville wetlands (marsh and eelgrass)
91. Hood Canal major impacts on fisheries, benthic
Anderson organisms, wildlife, predation and
Cove wetlands (marsh and eelgrass)
92. Hood Canal very major impacts on fisheries (com-
Duckabush mercial oysters, salmonids, public shell-
River fish) benthic organisms, wildlife (harbor
seals, waterfowl), predation and wetlands
(marsh and eelgrass)

Page 7
Lieutenant Tolsdorf
February 9, 1979

93. Hood Canal major impacts on fisheries (oyster,
at Union salmonids) and wildlife

We will continue to compile information on the various locations. We left blank those areas we were not familiar with. Because we did not respond does not indicate a paucity of resources or concern and interest by our agency.

We hope you find our comments helpful. If you have any questions, please call us at 753-3319.

Sincerely,

THE DEPARTMENT OF GAME

Bob Zeigler

Bob Zeigler, Applied Ecologist
Habitat Management Division

BZ:jd

cc: Regional Managers
Agencies

22 JAN 1980

Island County Planning Department
Post Office Box 698
Coupeville, Washington 98239

Gentlemen:

The purpose of this letter is twofold: (1) to inform you of the U.S. Army Corps of Engineers current pleasure boating study and (2) to request your review and comments on potential small boat harbor sites that have been identified in your area of Puget Sound.

The pleasure boating study, which began in 1978, encompasses the Puget Sound region and is scheduled for completion in the fall of 1980. It will culminate in a report which will present information on existing and future moorage demands as well as potential small boat harbor sites with the range of from 100 to 1,000 boat capacity. Reconnaissance level evaluations are being made of potential sites focusing primarily on the need for breakwater protection.

Enclosures 1 and 2 list and depict, respectively, the 129 sites under consideration. The list was partially generated from a similar pleasure boating study, which resulted in a 1968 report jointly prepared by the Corps of Engineers, Washington State Department of Commerce and Economic Development, and Washington State Parks and Recreation Commission. At that time, the sites identified were either undeveloped or were existing marinas with an expansion potential.

Our current pleasure boating study is reexamining the sites contained in the 1968 report, as well as an additional number of sites identified in 1979 by the U.S. Fish and Wildlife Service (FWS). It is not feasible for us to address all potential marina sites within the scope of this current study; however, we do feel that the 129 sites offer a reasonable examination of the potential for increases in small boat moorage within the region.

Sites 1 through 92 have already received a preliminary environmental screening by several Federal and state agencies. In addition to the

NPSEN-PL-NC

Island County Planning Department

FWS, the list of Federal agencies includes the Environmental Protection Agency and the National Oceanographic and Atmospheric Administration. On the Washington State level, we have received input from the Departments of Natural Resources, Social and Health Services, Fisheries, Game, and Ecology, as well as the State Parks and Recreation Commission.

As a result of this initial environmental agency screening, the 129 sites have been categorized as type A, B, C or D, which are defined as follows:

a. Type A: No initial environmental agency opposition to marina development as site (sites 1-13).

b. Type B: Initial environmental agency concern over a portion of the site. Further environmental agency review will be solicited after the design analysis of the potential marina sites has been accomplished (sites 14-35).

c. Type C: Environmental agency opposition to site, or development prohibited by Shoreline Management Act. Therefore, no further site analysis for potential marinas in this area will be undertaken (sites 36-92).

d. Type D: Sites 92 through 129 have not been evaluated by the environmental agencies as yet.

We are interested in obtaining your agency's views on the sites under consideration within your jurisdiction. Please indicate whether or not you or another agency or a private interest are considering a marina at one of the identified potential sites. If so, please provide details of a contact person, and let us know if any of the sites conflict with existing and/or proposed land-use plans (i.e., zoning, shoreline master program). If a site is in conflict with one of the plans, would you please indicate the nature of this conflict. The screening of the potential sites for the environmental concerns is the initial task that we are undertaking in addressing each site and is, therefore, an extremely important activity.

In order to meet our completion schedule, we need your response by 15 February 1980. If you wish a copy of our final report, please reflect this in your response.

NPSN-PL-NC

Island County Planning Department

Please contact Mr. Andrew Maser, Pleasure Boating Study Manager, at telephone (206) 763-3653, if you have any questions. A similar letter has been forwarded to those agencies listed in inclosure 3.

Sincerely,

3 Incl
As stated

FRANK L. URABECK, P. E.
Ch. Navigation & Coastal
Planning Section

POTENTIAL SMALL BOAT HARBOR SITES
PLEASURE BOATING STUDY

Type A - Potential Sites

No Initial Agency Opposition

1. Anacortes Addition
- 1a. Brownsville 1/
2. Day Island
- 2a. East Bay 1/
3. Elliott Bay - Magnolia Bluff
4. Elliott Bay - Pier 54
- 4a. Friday Harbor Addition 1/
5. Guemes Island SW.
6. Langley-Sunrise Beach
7. Manchester
8. Oak Harbor - North
9. Oak Harbor - South
10. Port Townsend
11. Ruston Way
- 11a. Seacrest, West Seattle 1/
12. Sinclair Island - East
13. Titlow Lagoon

Type B - Potential Sites

Initial Agency Concern Over Portion of Sites

14. Bainbridge Island - Fletcher Bay
15. Bainbridge Island - Murden Cove
16. Blaine Addition
17. Blakely Island - Armitage Island
18. Budd Inlet - Gull Harbor
19. Priest Point West, Everett
20. Cultus Bay Expansion
21. Decatur Island - Fauntleroy Point
22. Dyes Inlet - Silverdale - Windy Point North
23. Hood Canal - Coon Bay
24. Hood Canal - Hoodspout
25. Hylebos Waterway
26. La Conner - Marthas Bay (Indian Bay)
27. Lopez Island - Fisherman Bay
28. Lopez Island - Mackeye Point
29. Marrowstone Island - East Side
30. Mukilteo South
31. Orcas Island - Deer Point
32. Orcas Island - Massacre Bay
33. San Juan Island - Roche Harbor
34. Skagit Bay - Utsalady
35. Stuart Island - Reid Harbor

1/U.S. Army Corps of Engineers, Seattle District, is currently conducting detailed project report studies for marinas at these sites.

INCL 1

Type C - Potential Sites
Agency Opposition to Sites

36. Useless Bay Maxwellton
37. Bainbridge Island - Lynwood Center
38. Birch Bay
39. Budd Inlet East
40. Burrows Bay
41. Dumas Bay
42. Dungeness River - East
43. Dungeness Sequim
44. East Green Point
45. Edmonds North
46. Elwha River East
47. Fort Lawton - North
48. Fort Lawton - South
49. Golden Gardens - North
50. Hale Passage - East
51. Henderson Inlet
52. Henry Island - Nelson Bay
53. Holmes Harbor
54. Hood Canal - Anderson Cove
55. Hood Canal - Bywater Bay
56. Hood Canal - Duckabush River
57. Hood Canal - Thorndyke Bay
58. Hood Canal - Union Bay
59. Hood Canal - Warrentville
60. Lopez Island - Hunter's Bay
61. Lopez Island - Shoal Bay
62. Mats Mats
63. Meadowdale
64. Mukilteo
65. Nisqually Flats - East
66. Norma Beach North
67. Oak Bay
68. Orcas Island - East Sound
69. Orcas Island - Grindstone Harbor
70. Penn Cove
71. Picnic Point - North
72. Point Defiance
73. Point Partridge
74. Point Roberts East
75. Port Discovery - Beckett Point
76. Port Susan - Camano Island
77. Port Susan - Warm Beach
78. Quilcene Bay, East Side
79. San Juan Island - False Bay
80. San Juan Island - Friday Harbor

INCL 1

81. San Juan Island - Griffin Bay
82. Samish Bay North End
83. Sequim Bay - West
84. Shaw Island - Parks Bay
85. Shaw Island - Squaw Bay
86. Skagit Bay - Dugualla Bay
87. Sucia Island - Fossil Bay
88. Tulalip Bay
89. Tract Q
90. Waldron Island - Cowlitz Bay
91. Wells Point - Edmonds
92. William Point, Padilla Bay

Type D

U.S. Fish and Wildlife Suggested Sites

93. Admiralty Inlet, Mutiny Bay
94. Agate Passage
- 94a. Budd Inlet, Priest Point
95. Burke Bay, North of Bremerton
96. Camano Island, Mahana
97. Camano Island, Onamac Point
98. Case Inlet NE
99. Colvos Passage, Olalla
100. East Passage Des Moines
101. East Passage, Three Tree Point
102. East Port Angeles, Morse Creek
103. Eld Inlet, Flap Jack Point
104. Hartstene Island
105. Hood Canal - Dabob Bay
106. Hood Canal - Hama Hama Eldon
107. Hood Canal - Squamish Harbor
108. Hood Canal - Termination Point
109. Indian Island - Kilisut Harbor
110. Kingston, Appletree Cove
111. Liberty Bay
112. Maury Island
113. North Bainbridge Island
114. Pickering Passage - Graham Point
115. Port Orchard
116. Port Townsend
117. Port Washington Narrows, Tracyton
118. Point Jefferson
119. West Point Seattle
120. Snohomish Delta
121. Spieden Island
122. Stretch Island
123. Turn Island

- 124. West Blake Island
- 125. Whidbey Island - Keystone
- 126. Whidbey Island - Race Lagoon
- 127. Whidbey Island - West Reach
- 128. Neah Bay 1/
- 129. Sekiu 1/

1/Corps reconnaissance studies pending.

SAME CORRESPONDENCE SENT TO:

Island County Planning Department
Post Office Box 698
Coupeville, Washington 98239

Director
Kitsap County Planning Commission
Kitsap County Courthouse
Port Orchard, Washington 98366

Director
San Juan County Planning Department
Post Office Box 947
Friday Harbor, Washington 98250

Director
King County Planning Department
King County Courthouse
Seattle, Washington 98104

Director
Skagit County Planning Department
218 County Administration Building
Mount Vernon, Washington 98273

Director
Pierce County Planning Commission
742 County-City Building
Tacoma, Washington 98402

Director
Jefferson County Planning Department
Jefferson County Courthouse
Port Townsend, Washington 98368

Director
Whatcom County Planning Commission
Whatcom County Courthouse
Bellingham, Washington 98225

Director
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Everett, Washington 98201

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Post Office Box 547
Anacortes, Washington 98221

Planning Commission Chairman
Seattle City Hall
Seattle Municipal Building
Seattle, Washington 98104

Planning Commission Chairman
Tacoma City Hall
930 Tacoma Avenue South
Tacoma, Washington 98402

Planning Commission Chairman
Langley Town Hall
Post Office Box 366
Langley, Washington 98260

Planning Commission Chairman
Oak Harbor City Hall
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Oak Harbor, Washington 98277

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Planning Commission Chairman
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Planning Commission Chairman
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Mukilteo, Washington 98275

Planning Commission Chairman
Marysville City Hall
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Marysville, Washington 98270

Planning Commission Chairman
Sequim City Hall
Post Office Box 295
Sequim, Washington 98382

Planning Commission Chairman
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Civic Center
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Planning Commission Chairman
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Tacoma, Washington 98407

Planning Director
Bremerton City Hall
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Planning Director
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Everett, Washington 98201

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City of Seattle
400 Yesler Building, 3rd Floor
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Miss Cynthia Maisel
Acting Director
Office of Policy and Evaluation
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Chairman
Board of Park Commissions
City of Seattle
610 Municipal Building
Seattle, Washington 98104

APPENDIX C

Agency Policies and Programs for Marina Development and Evaluation

APPENDIX C - AGENCY POLICIES AND PROGRAMS FOR MARINA DEVELOPMENT AND EVALUATION

This appendix is divided into two parts. Part 1 describes the permitting and review responsibility of Federal, state, and local Government entities involved with marina development and evaluation. Part 2 identifies the published agency policies and criteria associated with marina development and evaluation. Suggested agency contact sources are also identified in the event more specific information is desired.

Part 1 - Agency Permit Requirements for Marina Development

<u>Laws and Regulations</u>	<u>Agency</u>	<u>Agency Permit and Review Authorities</u>
	<u>FEDERAL</u>	
River and Harbor Act of 1899, Section 10	Corps of Engineers (COE)	Issues permits for development requiring work or placing structures in navigable waters of the United States
	U.S. Coast Guard (USCG)	Responsible for navigation aids in navigable waters. Regulates construction of bridges or crossings over navigable water.
Clean Water Act Section 404	COE	Issues permits for the discharge of dredged or fill material into the waters of the United States.
	Environmental Protection Agency (EPA)	Disposal sites for the discharge of dredged or fill material must meet EPA guidelines. Can deny or restrict use if adverse effects on shellfish beds, fisheries areas (including spawning and breeding), wildlife, recreation areas, endangered species, benthic life, or wetlands.
Clean Water Act Title III - Standards and Enforcement	EPA	Establishes water quality standards and effluent limitations.

Part 1 - Agency Permit Requirements (con.)

<u>Laws and Regulations</u>	<u>Agency</u>	<u>Agency Permit and Review Authorities</u>
	<u>FEDERAL (con.)</u>	
Title IV - Permits and Licenses	EPA	Regulates effluent discharge into navigable waters. (Will also review for air quality and toxic substances.)
Endangered Species Act	National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (FWS)	Reviews Federal projects and Federal permits for potential impact on endangered species. May designate "Critical Habitats" (unique, scarce, high productivity, substance recreation value, unique geology), where development is not allowed.
Coastal Zone Management Act (CZMA), Sections 305 and 306	NMFS	Reviews proposed development for "Areas of Particular Concern."
Marine Protection, Research and Sanctuaries Act of 1972 Section 103	COE	Issues permits for transportation of dredged material for the purpose of dumping it into ocean water.
Marine Protection, Research and Sanctuaries Act of 1972 (Section 102)	EPA	Issues permits for ocean dumping.
Fish and Wildlife Coordination Act and Reorganization Plan (No. 4)	NMFS	Administers Environmental Assessment Program to review Federal projects. Its objective is to conserve, protect, and enhance marine, estuarine, and anadromous fish habitats.

Part 1 - Agency Permit Requirements (con.)

<u>Laws and Regulations</u>	<u>Agency</u>	<u>Agency Permit and Review Authorities</u>
	<u>FEDERAL (con.)</u>	
Fish and Wildlife Coordination Act	FWS	Reviews Federal projects and all Federal permits modifying or controlling any body of water/guidelines for review - CFR 40 231, 12/1/75; also has specific policies for review of marinas. Discourages use of biologically productive wetlands and shallows.
National Environmental Policy Act (NEPA)	EPA	Examines major Federal actions for primary impacts affecting the biological environment and secondary impacts, such as induced growth.
National Environmental Policy Act (NEPA)	All Federal Agencies	Every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment should include a detailed environmental impact statement by the responsible official (Section 4332, Part C).
National Historic Preservation Act, Implementing Regulation 36 CFR Part 800	COE, Advisory Council on Historic Preservation (ACHP)	COE considers effect of its activities (issuance of Section 10/404 permits, construction, etc.) on properties in or eligible for National Register of Historic Places; affords ACHP and State Historic Preservation Officer opportunity to comment on project plans.

Part 1 - Agency Permit Requirements (con.)

<u>Laws and Regulations</u>	<u>Agency</u>	<u>Agency Permit and Review Authorities</u>
	<u>FEDERAL</u> (con.)	
American Indian Religious Freedom Act	COE	Consults local Native American leaders to determine that marina plans do not restrict access to a currently used religious site or cemetery, or interfere with use of religious substances (ceremonial foods, feathers of certain species, etc.)
	<u>STATE</u>	
Clean Water Act (CWA) (Section 401)	Washington Department of Ecology (WDE)	Under RCW 90.48.260, WDE is designated State Water Pollution Control Agency. Must certify that all discharges into navigable waters meet CWA (Sections 301, 302, 306, and 307) water quality standards.
Clean Water Act (National Pollution Elimination Discharge System)	WDE	Under WAC 173-220 and RCW 90.48.110, grants permits for pollutant discharges into navigable waters.
Variance WAC 173-14-150	WDE	May grant relief to marina development from performance standards set forth in the master program developed for shorelines of statewide significance by local governments in cooperation with the state under RCW 90.58.020.
Shoreline Management Act (SMA)	WDE	Mainly concerned with permits in areas designated "shorelines of statewide significance;" must issue certification of compliance. Review usually done on a local level, though

Part 1 - Agency Permit Requirements (con.)

<u>Laws and Regulations</u>	<u>Agency</u>	<u>Agency Permit and Review Authorities</u>
	<u>STATE (con.)</u>	
		permit from DOE required for specific activities. (Construction of marinas is included here.) (SEPA guidelines (WAC 197-10) are useful framework for environmental evaluation.)
Flood Control Zone RCW 86-16 Water Quality Standard Modification	WDE	Minimizes flood damage by regulating development in flood hazard areas.
Surface or ground water rights RCW 90.03.250, RCW 90.44.050	WDE	Issues permits for the appropriation of surface or ground water in a marina development.
RCW 72.20.100	Washington Department of Game (WDG)	Has environmental review authority to disclose its concerns regarding protection of game habitat, resources, and real estate.
RCW Title 75 and 75.20.100	Washington Department of Fisheries (WDF) and WDG	Must grant permits for all hydraulic projects. Especially concerned with review of applications for marina construction with regard to protection and enhancement of fish habitat, including shellfish beds and spawning and rearing of various food fish; has set timing restrictions on silt producing activities. WDF has developed criteria for design of marinas, bulkheads, and landfills in Puget Sound and adjacent waters for protection of fish and shellfish resources (1071, revised 1974). Has identified some surf smelt spawning areas.

Part 1 - Agency Permit Requirements (con.)

<u>Laws and Regulations</u>	<u>Agency</u>	<u>Agency Permit and Review Authorities</u>
	<u>STATE (con.)</u>	
State Comprehensive Outdoor Recreation and Open Space Plan (SCORi)	Interagency Committee for Outdoor Recreation (IAC)	Reviews proposed marinas for consistency with goals and policies of SCORP.
RCW 352.32.180	Parks and Recreation Commission (PKS)	Reviews permit activities to determine if water degradation will occur in waters over and adjacent to parks' jurisdictional boundaries.
RCW 43.51.220	PKS	Authorizes PKS to establish small boat basins (marinas) on Puget Sound. Also has detailed design criteria for the location and design of boat launching ramps.
WAC 173-201-038 (8E)	WDE	Requires permit if construction of marina will cause short-term degradation of water quality below the state standard.
Conditional Use WAC 173-14-140, RCW 90.58.190 (12)	WDE	Requires permit when a marina allows specified activity not identified in the master program.
RCW 43.30, 76, and 79 WAC 332	Washington Department of Natural Resources (DNR)	Requires DNR to practice good environmental and conservation techniques. Basis for formation of their policies for marina design. Agency must also issue dredging permit for removal of rock, gravel, sand, and silt from state-owned marine lands. Also must issue leases for withdrawal of state-owned lands from public use.

Part 1 - Agency Permit Requirements (con.)

<u>Laws and Regulations</u>	<u>Agency</u>	<u>Agency Permit and Review Authorities</u>
	<u>STATE (con.)</u>	
Substitute House Bill 70 Chapter 195 (1977)	Office of Archeology and Historic Preservation (OAHP)	Prohibits any digging or activity at an archeological or historic site without a permit from OAHP. All permits are reviewed for any effects on historic or archeological sites.
Goals and Policies for Regional Development (1977)	Puget Sound Council of Governments	Covers King, Pierce, Kitsap, and Snohomish Counties. All COE permits reviewed for consistency with regional development plan policies, especially those concerned with the natural environment.

LOCAL GOVERNMENT

Issues shoreline management permits for marinas within its jurisdiction. The documents used for permit review include the local comprehensive plan, the shoreline master program, and the zoning laws for each jurisdiction. There are also a number of ancillary documents describing policies and plans for specific aquatic activities which are used by each jurisdiction during the review of certain permits. A listing of every policy, document, and comprehensive plan for each local jurisdiction in the Puget Sound study area is beyond the scope of this work. Instead, in part 2, a listing has been compiled which will serve as a reference guide for people who would like more detailed information on local plans and policies.

Part 2 - Agency Policies and Programs Associated With Marina Development

Agency and Contact Source

Federal

Department of the Army
Corps of Engineers (COE)
Office of the Chief of Engineers
Washington, D.C. 20314

U.S. Army Corps of Engineers, Seattle District
Post Office Box C-3755
Seattle, Washington 98124

Policy/Program

Date of Information

COE has two basic programs relating to marina development:

August 1980

1. A COE permit is required for construction, excavation, or discharge of dredged material into the nation's waters. A specific permit process has been established, including agency review of the marina development proposal. Further information is available in a COE publication on the permit-program (see 15/ in references section of main report).

2. The COE also undertakes studies involving recreational small boat marinas, under specific congressional authorization. Under the authority of Section 107 of the 1960 River and Harbor Act, as amended, the COE may study the feasibility of providing general navigation facilities for small boat harbors, including protective breakwaters and entrance and access channels leading to anchorage and/or berthing areas. The remaining marina features (i.e. moorage floats) are the responsibility of local interests. The Corps small boat harbor (marina) studies traditionally include the preparation of detailed design and cost, economic, and environmental data associated with the overall marina project. COE studies under Section 107 authority are initiated at the specific request of public agencies. COE studies of marinas are not accomplished for private projects. A COE brochure addresses the Section 107 program (see 14/ in references section of main report).

August 1980

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NMFS)
Environmental and Technical Services Division
Post Office Box 4332
Portland, Oregon 97208

While NMFS does not require permits for marina development and does not have published criteria that applicants observe when applying for a Corps of Engineers' permit, NMFS does have standards by which they evaluate applications on a case-by-case basis.

NMFS letter,
29 January 1979
(see B-17)

NMFS considers the following when evaluating marina proposals: aquatic resource impacts; water dependency, alternatives to marina location and construction techniques; and consistency with the Washington Coastal Zone Management Program. NMFS does not normally recommend approval or authorization of projects that are not water-dependent or water-related that could damage existing habitat of living marine, estuarine, or anadromous fishery resources. Mitigation or restoration may be required for projects to replace habitats essential for ecosystem viability.

NMFS letter,
29 January 1979
(see B-17)

Part 2 - Agency Policies and Programs Associated With Marina Development (con.)

Agency and Contact Source

U.S. Department of the Interior
Fish and Wildlife Service (FWS)
Ecological Services
2625 Parkmont Lane SW., Building B-3
Olympia Washington 98502

Policy/Program

When reviewing marina applications, traditionally under the Corps of Engineers' permit review process, FWS normally requires the following site specific information:

1. the design and size of the marina;
2. the exact location of the marina within a bay;
3. the relationship between the proposed marina and upland developments dependent on or associated with the marina.

Once this information is available, we will need to conduct onsite evaluations to determine:

1. water depths and dredging needs for the proposal;
2. water quality evaluations, flushing characteristics of the site, and possible water quality problems that will occur with development;
3. biological parameters, i.e., aquatic vegetation, benthic organisms, shellfish, fish, and adjacent upland vegetation and wildlife values;
4. effects removal or alteration of the plant communities will have on specific fish and wildlife species.

FWS will not approve a marina that will have significant impacts on (1) major aquatic resource values such as wetlands, intertidal mudflats, or eelgrass beds or the fish or wildlife that inhabit these areas, (2) endangered species, or (3) water quality. Filling or overwater structures for support facilities such as parking, non-water dependent shops, or office buildings will be discouraged. Development at sites that will require routine maintenance dredging will also be discouraged. Expansion of existing marinas or development in industrialized or developed areas will be encouraged over new developments in undeveloped areas. When applicable, dryland boat storage is preferable in most instances to wet moorages.

EPA evaluates marinas on a case-by-case basis with particular emphasis on nondegradation of water quality standards. EPA will not approve a marina which will result in further degradation of water quality if background water quality does not meet standards.

U.S. Environmental Protection Agency (EPA)
Region X
Permits Branch
1200 Sixth Avenue
Seattle, Washington 98101

Date of Information

FWS letter,
29 January 1979
(see B-19)

FWS letter,
28 August 1980

EPA letter,
9 January 1979
(see B-15)

Part 2 - Agency Policies and Programs Associated With Marina Development

Agency and Contact Source

EPA (con.)

Policy/Program

In general, areas which are presently undeveloped should be considered the least desirable for marina construction, although there are areas where expansion of existing marinas would have more impact than construction in some undeveloped sites nearby. Certain existing marinas should not only be restricted from expanding, but efforts should be made to phase out their activities and move them to less valuable fish and wildlife habitats.

In developing specific plans for a marina, EPA recommends that emphasis be placed on two general design factors which can significantly affect the environmental impacts of a proposed project. First, since marinas are areas where aquatic resources are exposed to water-borne pollutants introduced by marina activities, the breakwater and basin dredging should be designed to maximize water exchange and circulation within the dredged basin. Secondly, shoreline fills should be minimized or avoided whenever practicable. In those cases where there is a demonstrated need for filling and no reasonable alternative exists, the impact of the fill on aquatic resources can be reduced by designing the waterward edge of the fill in accordance with Washington Department of Fisheries' bulk-head and land fill criteria.

Washington State

Department of Social and Health
Services (DSHS)
Food and Housing Section
Olympia, Washington 98504

Department of Fisheries (WDF)
115 General Administration Building
Olympia, Washington 98504

EPA letter,
4 September 1980

DSHS letter, 1979
12 January
(see B-27)

WDF letter,
12 March 1979
(see B-28)

WDF has published criteria which they utilize when reviewing proposed projects in marine waters. Examples include:

1. Criteria Governing the Design of Bulkheads, Landfills, and Marinas in Puget Sound, Hood Canal, and Strait of Juan de Fuca For Protection of Fish and Shellfish Resources (1971).
2. Bulkhead Criteria for Surf Smelt (Hypomesus pretiosus) Spawning Beaches in Puget Sound, Hood Canal, Strait of Juan de Fuca, San Juan Islands, and the Strait of Georgia (June 1977).

Part 2 - Agency Policies and Programs Associated With Marina Development

Agency and Contact Source

WDF (con.)

Policy/Program

Date of Information

3. Criteria for the Protection of Pacific Herring (Clupea harengus pallasi) Spawning Substrate in Puget Sound, Hood Canal, Strait of Juan de Fuca, San Juan Islands, and the Strait of Georgia (Draft Publication).

WDF stipulates that persons or agencies seeking to perform work in Washington State marine waters must obtain written approval from WDF and Washington Department of Game.

There are several items which WDF typically looks for in reviewing proposed marinas. Proper design may lessen some of the impacts. Others can only be avoided by properly locating the facility.

WDF letter,
24 September 1980

1. Surf smelt beach. The Department of Fisheries has criteria relating to protection of surf smelt beaches.
2. Herring spawning areas. Dredging and disruption of the vegetative substrate is not permitted in documented herring spawning areas.
3. Loss of clam resources. We are concerned over decartification by the State Department of Social and Health Services and direct loss due to dredging or filling.
4. Factors relating to juvenile salmonid survival. These include both water quality and migrational considerations as well as food organism impacts.
5. Intense commercial fishing at the site. This may lead to conflicts with the increased boat traffic to the marina.

Parks and Recreation Commission (PRC)
Research and Long Range Planning
7150 Glenwater Lane
Olympia, Washington 98504

PRC has information on permits required for marina development by port districts.

PRC letter,
6 December 1978
(see B-34)

Department of Natural Resources (DNR)
Division of Marine Land Management
Olympia, Washington 98504

DNR has established the following policies applicable to the design of marinas and moorages on state-owned land. These policies do not apply for proposed marinas on private tide or shoreland:

DNR letter,
15 September 1980

1. Open moorage will be preferred in relatively undeveloped areas and locations where view preservation is desirable and/or where leisure activities are prevalent.

Part 2 - Agency Policies and Programs Associated With Marina Development

Agency and Contact Source

DNR (con.)

Policy/Program

Date of Information

2. Covered moorage may be considered in highly developed areas and locations having a commercial environment.
3. Inclosed moorage will be confined to areas of an industrial character where there is a minimum of esthetic concern.
4. In general, covered moorage will be preferred to inclosed moorage and open moorage will be preferred to covered moorage.
5. View encumbrance from inclosed moorage is to be avoided in those areas where views are an important element in the local environment.
6. Moorage should be designed so as to be compatible with the local environment and to minimize adverse esthetic impacts.
7. In order to minimize the impact of moorage demand on natural shorelines, large marina developments in urban areas will be fostered in preference to numerous small marinas widely distributed.
8. Anchorages suitable for both residential and transient use should be identified in appropriate locations so as to provide additional moorage space.
9. Acceptable locations for marina development, properly distributed, should be identified to meet projected public need during the next 30 years.
10. The use of floating breakwaters shall be encouraged as protective structures rather than using solid fills.
11. Dry moorage facilities (stacked dry boat storage) shall be considered as an alternative to wet storage in those locations where such storage will:
 - a. Significantly reduce environmental or land use impacts within the water area - the immediate shoreline.
 - b. Reduce the need for expansion of existing wet storage when such expansion would significantly impact the environment or adjacent land use.
12. Upland sewage disposal approved by local government and appropriate state agencies is required for all vessels used as a residence at a marina or other location.

DNR letter,
26 August 1980

Open Moorage: Moorage slips and mooring floats are completely open sides and top.

Covered: Slips and mooring floats are covered by a single roof with no dividing walls.

Inclosed: Completely inclosed roof side and end walls. Boathouse, i.e., similar to a car garage.

Part 2 - Agency Policies and Programs Associated With Marina Development

Agency and Contact Source

Department of Ecology (WDE)
Olympia, Washington 98504

Policy/Program

WDE has published (in draft form) the following marina development policy statement:

Date of Information

WDE letter,
10 January 1979
(see B-39)

Marina Locations Guideline

Boat storage facilities play a significant role in enabling a large segment of the state's population to enjoy the varied recreational opportunities of Washington's shoreline resource. It is estimated that by the year 2000, more than half a million recreational boats will be operating in the state's waters. At the same time, the demand for boat storage facilities will continue to increase with the rising boating population.

The Shoreline Management Act of 1971 recognizes the important role boat storage facilities play in providing access to the state's waters, and further recognizes that marinas, in particular, are water dependent. Accordingly, marinas are considered to be a preferred use of the state's shorelines.

The following policies are considered appropriate to accommodate the ever-increasing demand for recreational boating facilities in a manner which will encourage their development while minimizing adverse impacts on the natural systems of the shoreline resource.

1. Recognizing limitations on shoreline space and impacts on shoreline resources, the use of dry storage of recreational boats should play a more important role in providing boat access to the state's waters. Boat launching ramps, hoists, and marine railways provide a preferred alternative to wet storage, and proposed marina development should include provisions for dry storage facilities or demonstrate that such an alternative is infeasible.

2. Marinas catering to meet large regional demand for permanent storage should locate in heavily populated areas where shorelines have been historically developed. Selection of specific marina sites within these urbanized shoreline areas should take the following into consideration:

a. Expansion of existing marinas should be encouraged over the addition of new marina sites. When new sites are considered, sufficient evidence should be presented to show that existing marinas are inadequate and cannot be expanded to meet regional demand.

Part 2 - Agency Policies and Programs Associated With Marina Development

Date of Information

Policy/Program

WDE (con.)

Agency and Contact Source

b. Priority for new marinas should be given to areas which have the capability of providing the necessary services to support the marina facility, including access roads or streets, adequate upland parking and trailer storage area, water and sewer service, power supplies, and communication networks.

c. Marinas should be located in areas appropriately designated under local Shoreline Master Programs. Priority should be given in the following descending order in accordance with adopted "environmental designations": Urban, Suburban, and Rural. Marina locations in areas designated conveyancy (sic) or natural should be strictly limited.

d. Priority should be given to potential marina sites in deteriorated areas in need of restoration where channel depths are such that commercial activity is no longer feasible.

3. It is acknowledged that the need for marinas exists in smaller towns and rural outlying areas, where for the purposes of reaching a productive sports fishery, for short-term moorage at recreational destinations, or for some other similar water dependent activity, small-scale marinas are determined to be highly appropriate and preferred shoreline uses. The following should be considered when identifying potential marina sites outside the major urban population areas:

a. Nonurbanized sites should be considered for small-scale marinas where embayments or protected areas have sufficient depths to provide for moorage without necessitating dredge, fill, or major channel maintenance activities. The size of the marina facility should be scaled to the size of the embayment or protected area.

b. Applicants for new marina development in rural areas should demonstrate that local or regional need exists to accommodate access to water-dependent activities.

4. The design and location of boat storage facilities must be given careful consideration so that potential adverse impacts on water quality or fish and wildlife habitat are avoided or mitigated. The following general policies pertain to both urban and rural marina sites:

Agency and Contact Source

WDE (con.)

Part 2 - Agency Policies and Programs Associated With Marina Development

Policy/Program

Date of Information

- a. Since marinas have a high potential for adverse impacts on water quality, potential marina sites should include the consideration of tidal currents and flushing action. Shallow-water embayments with poor flushing action should not be considered for marina sites. (WAC 173-16-060(5)(e).)
- b. Priority for new marina sites should be given to areas which are low in marine productivity (fish and shellfish resources, waterfowl, and mammal habitat areas). (WAC 173-16-060(5)(a).(b).)
- c. Marinas should not be located in areas which exhibit a high degree of geohydraulic activity, since their establishment could adversely affect the natural processes of erosion, littoral drift and/or beach accretion (sic). Further, areas which have been identified as hazardous due to storm tides, high winds, or flooding should not be considered as potential marina sites.
- d. Marinas should be located and designed so their structures, other features, and operations will be aesthetically compatible with or will enhance the area visually affected, and will not unreasonably impair shoreline views of local residents and user groups. (WAC 173-16-060(5)(b).)
- e. Priority should be given to new marina sites which will not result in conflicts with neighboring water/land uses. Specifically, marinas should not be located where their use would conflict with established aquaculture activities, water-dependent commercial uses, commercial navigation or fishing, or areas commonly used for swimming.
- f. Special attention should be given to the design and development of operational procedures for fuel handling and storage in order to minimize accidental spillage and provide satisfactory means for handling those spills that do occur. (WAC 173-16-060(5)(d).)
- g. New marina facilities should be designed to accommodate public access (sic) and enjoyment of the shoreline location, including provisions for walkways, view points, and restroom facilities, etc.

Part 2 - Agency Policies and Programs Associated With Marina Development

Agency and Contact Source

WDE (con.)

Policy/Program

h. Dredging in coastal waters for recreational boating facilities should be limited to the minimum necessary for new entrance channels to reach basins dredged out of dry land areas; for deepening water a few feet in existing and proposed berthing areas; and for maintenance dredging. Dredging or filling coastal wetland areas to accommodate new or expanded recreational facilities should be prohibited.

5. Urban areas should undertake investigations with Coastal Zone Management funding for the determination of potential siting and capability within harbor areas.

6. WDE requires all new marina construction, or additions to existing marinas, to include provision of sanitary pumpout facilities to serve marine sanitation devices onboard. This requirement is a condition of approval of the Corps of Engineers Section 10 permit and the Water Quality Certification for the project, if required.

Department of Game (WDG)
Habitat Management Division
600 North Capitol Way
Olympia, Washington 98504

WDG is concerned with various aspects of marina development and recommends the following policies:

1. Marinas should be located in areas that are already developed. Marinas planned for sites such as Tacoma's city waterway or the Seattle area Duwamish waterway (excluding shallow water areas and Kellogg Island) would be preferred.
2. Marinas should avoid undeveloped areas.
3. Marinas should avoid sites with high resource value (shellfish areas, eelgrass or kelp beds, salt marsh, freshwater marsh, areas supporting freshwater macrophytes) and critical habitats such as eagle nest sites.
4. They should avoid areas where flushing would be a problem and water quality impacts would result.
5. Marinas should be sited and designed to minimize the need for filling and the need for initial and maintenance dredgings. Filling in intertidal areas, especially for nonwater dependent areas such as parking, should be prohibited.
6. Marinas, docks, and piers should be designed so they do not interfere with sports, commercial, or tribal fishing.
7. Marinas should be consistent use in the areas they are planned for. They should conform to master plans, comprehensive plans and local ordinances.

WDG letter,
3 August 1979
(see WDG letter
dated 9 February
1979, page B-45 for
additional concerns

Local Agency Contacts for Marina Development Information

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Post Office Box 698
Coupeville, Washington 98239
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Seattle, Washington 98104

Director
Jefferson County Planning Department
Jefferson County Courthouse
Port Townsend, Washington 98368

Director
Clallam County Planning Department
Post Office Box 430
Port Angeles, Washington 98362

Planning Commission Chairman
Marysville City Hall
514 Delta Avenue
Marysville, Washington 98270

Planning Commission Chairman
Friday Harbor Town Hall
Post Office Box 219
Friday Harbor, Washington 98250

Planning Director
Bremerton City Hall
239 Fourth Street
Bremerton, Washington 98310

Director
Snohomish County Planning Department
Snohomish County Courthouse
Everett, Washington 98201

Planning Commission Chairman
Tacoma City Hall
930 Tacoma Avenue South
Tacoma, Washington 98402

Planning Commission Chairman
Port Townsend City Hall
540 Water Street
Port Townsend, Washington 98368

Director
Kitsap County Planning Commission
Kitsap County Courthouse
Friday Harbor, Washington 98250

Director
Skagit County Planning Department
218 County Administration Building
Mount Vernon, Washington 98273

Director
Whatcom County Planning Commission
Whatcom County Courthouse
Bellingham, Washington 98225

Planning Commission Chairman
Port Angeles City Hall
140 West Front Street
Port Angeles, Washington 98362

Planning Commission Chairman
Sequim City Hall
Post Office Box 295
Sequim, Washington 98382

Planning Commission Chairman
Poulsbo City Hall
Jensen Way
Poulsbo, Washington 98370

Planning Director
Everett City Hall
3002 Wetmore
Everett, Washington 98201

Planning Commission Chairman
Anacortes City Hall
Post Office Box 547
Anacortes, Washington 98221

Planning Commission Chairman
Langley Town Hall
Post Office Box 366
Langley, Washington 98260

Planning Commission Chairman
Blaine City Hall
344 "H" Street
Blaine, Washington 98230

Director
San Juan County Planning Department
Post Office Box 947

Director
Pierce County Planning Commission
742 County-City Building
Tacoma, Washington 98402

Director
Thurston County Planning Agency
Thurston County Courthouse Annex
Olympia, Washington 98501

Planning Commission Chairman
Mukilteo City Hall
Third and Park Street
Mukilteo, Washington 98275

Planning Commission Chairman
Edmonds City Hall
Civic Center
Edmonds, Washington 98020

Planning Commission Chairman
Ruston Town Hall
5117 North Winnifred
Tacoma, Washington 98407

Mason Regional Planning Council
Post Office Box 186
Shelton, Washington 98584

Planning Commission Chairman
Seattle City Hall
Seattle Municipal Building
Seattle, Washington 98104

Planning Commission Chairman
Oak Harbor City Hall
3075 300th Avenue West
Oak Harbor, Washington 98277

Planning Commission Chairman
Olympia City Hall
Post Office Box 1967
Olympia, Washington 98507

EXISTING FACILITIES

POTENTIAL NEW MARINA DESIGN CONSIDERATIONS

[illegible]

POTENTIAL
ENVIRONME

TYPE AND LENGTH OF BREAKWATER	APPROX. EXISTING DEPTH OF WATER AT BREAKWATER (FEET)	SHORESIDE LANDFILL REQUIRED (ACRES)	APPROXIMATE DREDGING REQUIRED (CHANNELS & MOORAGE AREA TO -12 MLLW)	WATER QUALITY					AVIAN FAUNA/HABITAT	FISHERIES	
				POTENTIAL IMPACTS W/ MARINA DEVELOP.						IMPACTABLE RESOURCES	IMPACTABLE RES.
EXISTING	FLUSHING	CIRCULATION	SEDIMENTATION	OTHER							
				CLASS A 3/ -F&WS 10/	0 WDNR 0 WDE MINIMAL EPA	0 WDNR 0 WDE EPA	0 WDNR 0 WDE	0 BOD, DO, COLIFORMS, ORGANICS, INORGANICS TEMP, DO: MINIMAL-EPA	CRIT. HABITAT FOR SNOW GOOSE, MALLARD PIN- TAIL, AM. WIGEON, CANADA GOOSE, BL. BRANT -F&WS SEE REMARKS	CRAB-WDF 0/	0 WDNR 0 WDE SALMON, JACK SMELT, SEAKUN CUT- THROAT TROUT, COMM. OTTER TEAWL-F&WS
				CLASS A 3/	0 WDE 0 WDNR NORTH; SOUTH; -EPA	0 WDNR 0 WDNR NORTH; SOUTH; -EPA	0 WDE 0 WDNR	0 DO, INORGAN- ICS; 0 BOD, COLIFORMS, ORGANICS, WDE TEMP, DO: MINIMAL NORTH, MAJOR SOUTH-EPA	DUNLINS, SANDPEPERS, MALLARDS, SHOVELERS, HERONS, GREYS, MERGANSERS -U/	1) CRAB-WDF STEELHEAD U/ COMMERCIAL SALMON-WDF	0 WDNR 0 WDE TULALIP TRIBE, WDA ENHANCEMENT, POSSIBLE MAJOR HATCHERY PLAN
				CLASS A 3/	0 WDNR 0 WDE MINIMAL -EPA	0 WDNR 0 WDE MINIMAL -EPA	0 WDNR 0 WDE	0 BOD, DO, COLIFORMS, INORGANICS, ORGANICS, -WDE TEMP, DO: MINIMAL -EPA		1) CRAB-WDF ENGLISH SOLE U/ COMMERCIAL SALMON-WDF 2) WDF HATCHERY ON S. RIVER, SEE 53 (2)	0 WDNR 0 WDE
BREAK- WATER EXISTS		10.0	500,000 CY	CLASS B OR C -F&WS					MAJOR WATERFOWL AREA-WDNR SEE REMARKS	POTENTIAL FOR SIGNIFI- CANT IMPACT U/	CRAB, SAL- MON, SEAKUN CUTTHROAT TROUT, CRIT. AREA FOR AM. SHAD- F&WS
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, COLIFORMS, ORGANICS, -WDE		COMMERCIAL SALMON AREA -WDF SEE 53 (2) SEE 54 (2)	0 WDE 0 WDNR
				CLASS A 3/ OR A-F&WS	0 WDNR 0 WDE MINIMAL -EPA	0 WDNR 0 WDE EPA	0 WDNR 0 WDE	0 BOD, DO, INORGANICS, COLIFORMS, -WDE TEMP, DO: MINIMAL -EPA		CRAB-WDF SALMON, BOTTOM, FISH- ING, COMM. OTTER, TEAWL -F&WS	0 WDNR 0 WDE COMM. SALMON SEE 54
1500 FEET RUBBLE	-2 FEET		150,000 CY	CLASS A 3/ OR A-F&WS	MINIMAL -EPA 0 WDE 0 WDNR	0 EPA 0 WDE 0 WDNR	0 WDE 0 WDNR	0 TEMP, DO: MINIMAL -EPA 0 BOD, DO, ORGANICS, INORGANICS, COLIFORMS, -WDE		CRAB-WDF SALMON, BOTTOM, FISHING, COMM. OTTER TEAWL -F&WS	0 WDE 0 WDNR COMM. SALMON
1000 FEET RUBBLE 13/	-10 FEET 13/	1 13/	100,000 CY 13/								
2000 FEET RUBBLE	-9 FEET	7 OF TIDE- LANDS	100,000 CY								
				CLASS A 3/	0 WDNR 0 WDE	0 WDNR 0 WDE	0 WDNR 0 WDE	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE
				CLASS A 3/	0 WDNR 0 WDE	0 WDNR 0 WDE	0 WDNR 0 WDE	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS, -WDE		CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR
				CLASS A 3/	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0				

POTENTIAL NEW MARINA SITES ENVIRONMENTAL CONSIDERATIONS

FISHERIES	BENTHIC ORGANISMS	AQUATIC VEGETATION	WETLANDS	WILDLIFE		WDE
IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES		SHORELINE MASTER PROGRAM DESIGNATION
				ENDANGERED SPECIES		
CRAB-WDF SALMON, SURF SMELT, SEARUN CUT-THROAT TROUT, COMM. OTTER TRAWL-F&WS	0 WDNR 0 WDE COMM. SALMON, WDF HATCHERY, STILLWATER RIVER, FUTURE TULIP TRIBE INDIAN HATCHERY	0 WDNR 0 WDE MAJOR SHELLFISH-FISH-WDG-8/ POTENTIAL IMPACT ON COMMERCIAL SHELLFISH-WDE-1	EELGRASS -F&WS	SALT MARSH, TIDAL FLATS II, 0 WDNR 0 WDE MINIMAL -EPA	BALD EAGLE -F&WS 0 WDNR 0 WDE	CONSERVANCY/SUBURBAN; MARINA USE CONDITIONAL
CRAB-WDF STEELHEAD II/ SALMON-WDF TULIP TRIBE WDF ENHANCEMENT PROJECT, MAJOR HATCHERY PLANNED,	0 WDNR 0 WDE POSSIBLE SHELLFISH, POSSIBLE TRIBAL CULTURE AREA	0 WDE 0 WDNR		0 WDE 0 WDNR MINIMAL NORTH; SOUTH -EPA	0 WDE 0 WDNR	
CRAB-WDF ENGLISH SOLE II/ COMMERCIAL SALMON-WDF WDF HATCHERY ON SKYANNA RIVER, SEE #53 (2),	0 WDNR 0 WDE	0 WDNR 0 WDE		0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE	CONSERVANCY
CRAB, SALMON SEARUN CUT-THROAT TROUT, COMM. AREA FOR AM. SHAD-F&WS	PILYMAETS AMPHIPODS -F&WS	EELGRASS -F&WS	TIDAL FLATS, SALT MARSH -F&WS	EXTENSIVE KAPPA FOR USE OF AREA II/	BALD EAGLE II/	MARINA USE NOT PERMITTED-URBAN
COMMERCIAL SALMON AREA -WDF SEE 53 (2) SEE 54 (2)	0 WDE 0 CENBS -WDNR	0 WDE 0 WDNR		0 WDE 0 WDNR	0 WDE 0 WDNR	MARINA USE NOT PERMITTED
CRAB-WDF SALMON, BOTTOM FISHING, COMM. OTTER TRAWL -F&WS	0 WDNR 0 WDE COMMERCIAL SALMON-WDF SEE 54 (2)	SUBTIDAL II/ GEODUCKS -WDNR INTERSTITIAL HARD SHELL CLAMS-F&WS	EELGRASS MAJOR-WDG -WDG	0 WDNR 0 WDE MINIMAL -EPA	0 WDNR 0 WDE	CONSERVANCY; MARINA USE CONDITIONAL
CRAB-WDF SALMON, BOTTOM FISHING, COMM. OTTER TRAWL -F&WS	0 WDE 0 WDNR COMMERCIAL SALMON-WDF	INTERSTITIAL SHELLFISH -WDF SUBTIDAL II/ GEODUCKS -F&WS POSSIBLE BUTTER CLAMS AND LITTORINE	EELGRASS -F&WS	MINIMAL -EPA 0 WDE 0 WDNR	0 WDE 0 WDNR	CONSERVANCY; MARINA USE CONDITIONAL
CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR	INTERSTITIAL SHELLFISH, SUBTIDAL II/ GEODUCKS -WDF POSSIBLE COMMERCIAL SUBTIDAL GEODUCK HARVEST AREA	SEAGRASS, ALGAL COMMUNITIES II/	0 WDNR 0 WDE	0 WDNR 0 WDE	MARINA USE NOT PERMITTED
CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE	INTERSTITIAL SHELLFISH, SUBTIDAL II/ GEODUCKS -WDF SEE #60 (2)	EELGRASS MAJOR-WDG -WDG ALGAL COMMUNITIES II/	0 WDE 0 WDNR	0 WDE 0 WDNR	MARINA USE NOT PERMITTED
CRAB COMMERCIAL SALMON AREA -WDF	0 WDE	INTERSTITIAL SHELLFISH, SUBTIDAL II/ GEODUCKS -WDF SEE #60 (2)	EELGRASS MAJOR-WDG -WDG	0 WDNR 0 WDE	0 WDNR 0 WDE	MARINA USE NOT PERMITTED
CRAB-WDF COMMERCIAL SALMON AREA -WDF	0 WDE 0 WDNR	SOFT SHELL CLAMS, SUBTIDAL GEODUCKS -WDF	EELGRASS MAJOR-WDG -WDG ALGAL COMMUNITIES II/	0 WDE 0 WDNR	0 WDE 0 WDNR	MARINA USE NOT PERMITTED
COMMERCIAL SALMON AREA -WDF	0 WDNR 0 WDE	INTERSTITIAL SHELLFISH, SUBTIDAL II/ GEODUCKS -WDF SEE #60 (2)	KELP-WDG MAJOR-WDG	0 WDNR 0 WDE MINIMAL -EPA	0 WDNR 0 WDE	
COMMERCIAL SALMON AREA, POSSIBLE CRAB -WDF	MAJOR-WDG 0 WDE 0 WDNR	SUBTIDAL GEODUCKS -WDF POSSIBLE CRAB SEE #60 (2)	EELGRASS MAJOR-WDG -WDG	MINIMAL -EPA 0 WDE 0 WDNR	0 WDE 0 WDNR	

14

WILDLIFE			REMARKS	
WILDLIFE		WDE	LOCATION	THIS PAGE IS BEST QUALITY REPRODUCTION FROM COPY FURNISHED TO BDC
WILDLIFE	WILDLIFE	SHORELINE MASTER PROGRAM DESIGNATION	SECTION, TOWNSHIP, RANGE, U.S. QUADRANGLE MAP	
WILDLIFE	WILDLIFE	CONSERVANCY/ SUBURBAN; MARINA USE CONDITIONAL	SEC. 24, T31N, R3E STANWOOD	ALSO CRITICAL HABITAT FOR DUNLIN, HERRON'S GOLDENEYE, BUFFLEHEAD, OLD SQUAW, CANVASBACK, COMMON GOLDENEYE SCOTERS, W. SANDPIPER AND BALD EAGLE. GT. BLUE HERON - F&WS.
BALD EAGLE - FEWS	WDE WDE		SEC. 27, T30N, R4E TULALIP	NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS TO WATER QUALITY, SEDIMENTATION PATTERNS, CRAB & STEELHEAD HABITAT, BENTHIC ORGANISMS, WETLANDS & UPLAND WILDLIFE.
	WDE WDE	CONSERVANCY	SEC. 35, T30N, R4E TULALIP	NO DESIGN WAS CONSIDERED DUE TO STEEP BANK, NO EXIST. FACILITIES, HIGH SILTATION, EXPOSURE TO WIND & WAVES, NO ACCESS, & PROXIMITY TO RESIDENTIAL AREAS. SNOHOMISH COUNTY OPPOSES MARINA AT SITE
BALD EAGLE - 12		MARINA USE NOT PERMITTED - URBAN	SEC. 18, T29N, R5 EVERETT	1) PART OF FILLED AREA COULD BE USED FOR CARGO HANDLING, MARINA SUPPORT. 2) SNOHOMISH CO. REQUIRES REZONE, COND. USE PERMIT, SHORELINE MGMT. SUBSTANTIAL DEV. PERMIT
	WDE WDE	MARINA USE NOT PERMITTED	SEC. 4, T29N, R5E MARYSVILLE	NO MARINA DESIGN CONSIDERED: POTENTIALLY SIGNIF. IMPACTS TO WATER QUALITY, CRAB HABITAT, BENTHIC ORGANISMS & WILDLIFE. 2) SEE SITE 60 REMARK #1.
	WDE WDE	CONSERVANCY: MARINA USE CONDITIONAL	SEC. 34, T29N, R4E MUKILTEO	NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS TO WATER QUALITY, CRAB HABITAT, FISHERIES, BENTHIC ORGANISMS AND WILDLIFE.
	WDE WDE	CONSERVANCY: MARINA USE CONDITIONAL	SEC. 4, T28N, R4E MUKILTEO	SITE VERY EXPOSED; EXIST. LAUNCH RAMP SUBJECT TO TURBULENT WAVE ACTION.
			SEC. 20, T28N, R4E MUKILTEO	1) MARINA MIGHT IMPACT CURRENT LITTORAL DRIFT PATTERN, STARVING BEACHES NORTH OF SITE. 2) SITE CONSIDERED AT REQUEST OF LOCALS.
	WDE WDE	MARINA USE NOT PERMITTED	SEC. 32, T28N, R4E EDMONDS E	MARINA DESIGN NOT UNDERTAKEN AS MARINA DEVELOPMENT AT THIS SITE CONFLICTS WITH SAMP.
	WDE WDE	MARINA USE NOT PERMITTED	SEC. 5, T27N, R4E EDMONDS E	SEE REMARKS FOR SITE 60 (#1) SEE REMARKS FOR SITE 58
	WDE WDE	MARINA USE NOT PERMITTED	SEC. 23, 24, T27N, R3E EDMONDS E, W	SEE REMARKS FOR SITE 60 (#1) SEE REMARKS FOR SITE 58
	WDE WDE	MARINA USE NOT PERMITTED	SEC. 29, 30, T23N, R4E MUKILTEO	SEE REMARKS FOR SITE 60 (#1) SEE REMARKS FOR SITE 52
	WDE WDE		SEC. 2, T26N, R3E EDMONDS E	NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS TO WATER QUALITY, BENTHIC ORGANISMS & WETLANDS.
	WDE WDE		SEC. 35, T26N, R3E SHILSHOLE BAY	NO MARINA DESIGN CONSIDERED: POTENTIALLY SIGNIF. IMPACTS TO WATER QUALITY, FISHERIES, BENTHIC ORGANISMS, WETLANDS & UPLAND WILDLIFE.

[illegible]

- 5/ Washington Department of Ecology; input - January 10, 1979, October 6, 1980.
- 6/ Washington Department of Fisheries; input - March 12, 1979, September 24, 1980.
- 7/ U.S. Environmental Protection Agency; input - January 9, 1979, September 4, 1980.
(Notations for flushing and circulation usually represent projections for marinas with solid breakwaters).
- 8/ Washington Department of Game; input - November 15, 1979.
- 9/ Washington Department of Social and Health Services; input - January 12, 1979.
- 10/ U.S. Fish And Wildlife Service; input - November 27, 1979.
- 11/ Washington Department of Ecology. Coastal Zone Atlas of Washington, Vol's 1,2,3.
- 12/ Rex Van Wormer, F6ES, Olympia, Washington - personal communication, May 1980.
- 13/ The Corps of Engineers (COE) considered two potential marinas for this area.
- 14/ In 1979 the state legislature changed the inshore boundary for geoduck harvesting mile offshore to 200 yards offshore or the -18 foot depth contour, whichever is further shore. As a result, many locations shown in the matrix will have geoduck harvest that could be affected by marina construction; Washington Department of Fisheries

NOTE: THE ENGINEERING AND ENVIRONMENTAL ASSESSMENT STUDIES ARE BEING CONDUCTED AND THE RESULTS PRESENTED IN THIS REPORT ARE UNFORESEEN AND POSSIBLY SEVERE IMPACTS.

COMMERCIAL SALMON AREA -WDF	○ WDNR ● WDE	INTERTIDAL SHELLFISH -WDF	○ WDNR ● WDE	EELGRASS, SOME IMPACT ALGAE-WDG -WDG	○ WDNR ● WDE		○ WDNR ● WDE	MARINA USE NOT PERMITTED
COMM. OTTER TRAWL, SEA-RUN CUT-THROAT TROUT, SALMON, CRIT. AREA SKATE -F&WS	COMMERCIAL SALMON AREA -WDF	SUBTIDAL GEODUCKS -F&WS						CONSERVANCY: MARINA USE CONDITIONAL
COMMERCIAL SALMON AREA -WDF	○ WDNR ● WDE SOME IM-PACTS-WDG	SUBTIDAL GEODUCKS, INTERTIDAL GEODUCKS -WDF	○ WDNR ● WDE	EELGRASS -WDG SOME IM-PACT-WDG	○ WDNR ● WDE		○ WDNR ● WDE	MARINA USE NOT PERMITTED
HERRING, CRIT. AREA FOR LONG-NOSE SKATE -F&WS	○ WDE ○ WDNR	SHRIMP -WDF	○ WDE ○ WDNR	ALGAE-WDG SOME IMPACT-WDG	○ EPA ○ WDE ○ WDNR		○ WDE ○ WDNR	URBAN/DEVELOP: MARINA USE PERMITTED
HERRING, CRIT. AREA FOR LONG-NOSE SKATE -F&WS	○ WDNR ○ WDE	SHRIMP -WDF	○ WDNR ○ WDE		○ WDNR ○ WDE ○ EPA		○ WDNR ○ WDE	URBAN/DEVELOP: MARINA USE PERMITTED
	○ WDE ○ WDNR	SHRIMP -WDF	○ WDE ○ WDNR		○ EPA ○ WDE ○ WDNR		○ WDE ○ WDNR	
COMM. OTTER TRAWL, SEA-RUN CUT-THROAT TROUT -F&WS		SUBTIDAL GEODUCKS, CLAMS -F&WS		EELGRASS -F&WS				
COMM. OTTER TRAWL, SEA-RUN CUT-THROAT TROUT, SALMON -F&WS		INTERTIDAL HARDSHELL CLAMS, SUBTIDAL GEODUCKS -F&WS		EELGRASS -F&WS				
COMM. OTTER TRAWL, SALMON, CRIT. AREA FOR PACIFIC HERRING -F&WS		SUBTIDAL GEODUCKS -F&WS						
SEA-RUN CUT-THROAT TROUT, SALMON, COMM. OTTER TRAWL-F&WS, COMMERCIAL SALMON AREA -WDF	○ WDE ○ WDNR	SUBTIDAL GEODUCKS -WDF, INTERTIDAL HARDSHELL CLAMS -F&WS	○ WDE ○ WDNR	EELGRASS -WDG, MAJOR-WDG	MINIMAL -EPA ○ WDE ○ WDNR		MAJOR -WDG ○ WDE ○ WDNR	

POTENTIAL FOR CENTRAL

FIGURE 17 - SIT PAGE

AND ENVIRONMENTAL ASSESSMENTS SHOWN IN THIS MATRIX ARE PRELIMINARY AND SUBJECT TO CHANGE. POSSIBLY SEVERE IMPACTS MAY COME TO LIGHT AS MARINA ENGINEERING AND ENVIRONMENTAL STUDIES AND THE RESULTS PRESENTED TO REGULATORY AGENCIES FOR APPROVAL.

IMPACT WDG	OWNR SW	OWNR WDE	MARINA USE NOT PERMIT- TED	SEC. 9, T25N, R3E SHILSHOLE BAY	1) SEE REMARKS FOR SITE 60 (1)
			CONSER- VANCY: MARINA USE CON- DITIONAL	SEC. 22, T25N, R3E SHILSHOLE BAY	1) SEE REMARKS FOR SITE 69
IMP- WDG	OWNR WDE	OWNR WDE	MARINA USE NOT PERMIT- TED	SEC. 16, T25N, R3E SHILSHOLE BAY	1) SEE REMARKS FOR SITE 60 (1)
IMP- WDG	EPA WDE OWNR	WDE OWNR	URBAN/ DEVELOP- MENT: MARINA USE PER- MIT- TED	SEC. 26, T25N, R3E SHILSHOLE BAY	1) CORPS STUDIED SITE UNDER S.B. HARBOR, ELLIOTT BAY, SEATTLE HARBOR, PROJECT IN 1974. THE SEACREST ALTERNATIVE WAS CHOSEN FROM THIS STUDY. CITY WAS OPPOSED TO SITE AT THAT TIME.
	OWNR WDE EPA	OWNR WDE	URBAN/ STABLE MARINA USE PER- MIT- TED	SEC. 6, T24N, R4E SEATTLE SOUTH	1) MARINA DESIGN WAS CONSIDERED BECAUSE OF HIGH BREAKWATER COSTS AND LACK OF PROPER SPACE.
	EPA WDE OWNR	WDE OWNR		SEC. 11, T24N, R3E DUWAMISH RD.	1) WDE CURRENTLY IN DETAILED PROJECT RE- PORT (DPR) STAGE OF STUDYING SEACREST MARINA.
				SEC. 36, T23N, R3E SEC. 31, T23N, R3E DES MOINES	SEE REMARK (2) SITE 75
				SEC. 17, T22N, R4E DES MOINES	1) SMALL CREEK RUNS THROUGH GULLY AND OUTLETS THROUGH SMALL BOAT BASIN SITE. 1) SEE REMARK (2) SITE 75
				SEC. 28, T22N, R3E TACOMA N.	1) KING COUNTY IS NOT CONSIDERING A SMALL BOAT MARINA AT THE SITE. 1) LOW USAGE SITE
IMP- WDG	MINIMAL EPA WDE OWNR	MAJOR WDG WDE OWNR		SEC. 11, T21N, R3E TACOMA N.	1) NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS TO WATER QUALITY, BENTHIC ORGANISMS AND WILDLIFE. 1) KING COUNTY IS NOT CONSIDERING A SMALL BOAT HARBOR AT THIS SITE.

POTENTIAL FOR DEVELOPMENT CENTRAL DIVISION

FIGURE 17 - SITE EVALUATION PAGE 1 OF 2

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EXISTING FACILITIES

POTENTIAL NEW MARINA SITE
DESIGN CONSIDERATIONS

COUNTY	SITE NUMBER INITIAL SITE EVAL.	SITE NAME	EXISTING CONDITIONS AT SITE				NEW MARINA POTENTIAL WAVE CLIMATE AT SITE				TYPE AND LENGTH OF BREAKWATER	APPROX. DEPTH AT BREAKWATER
			CURRENT LAND USE	UTILITIES & ROAD ACCESS AVAILABLE	OTHER	EXISTING MARINAS AT SITE	ESTIMATED NUMBER OF BOATS	APPROXIMATE MARINA MOORAGE AREA (ACRES)	EXPOSED: WAVE HEIGHT GREATER THAN THREE FEET	PROTECTED: WAVE HEIGHT THREE FEET OR LESS		
PIERCE	76 B	HYLEBOS WATERWAY	COMMERCIAL	ALL AT OR NEAR SITE		OLE & DICKS BOAT HOUSE - 170 SLIPS HARBOR MARINA YACHT BASIN - 52 SLIPS SEE REMARKS (1)						
PIERCE	77 A	RUSTON WAY	COMMERCIAL/RESIDENTIAL	ALL AT OR NEAR SITE		(1) NEARBY - WATERS MAR. - 167 SLIPS. (2) SITE LOCATED SECE TRIOMA SMELTER AND N. OF N 46A ST.	180 300 12/	4 6.5 12/	YES	NO	900 FEET RUBBLE E 1500 FEET RUBBLE 12/	-15
PIERCE	78 C	POINT DEFIANCE										
PIERCE	79 A	TITLEW LAGOON	PARK	MOST NEAR SITE		SITE LOCATED N OF TITLEW BEACH PARK	700	7	YES	NO	1500 FEET FLOATING CAL RUBBLE	-20
PIERCE	80 A	DAY ISLAND	COMMERCIAL/INDUSTRIAL	ALL AT OR NEAR SITE	PLAN INVOLVES EXPANSION OF EXISTING DAY ISLAND MARINA	YES - DAY ISLAND MARINA - 101 SLIPS; BALMAN'S MARINA	90 ADDITIONAL MOORAGES	2.0 ADDITIONAL	NO	YES	NONE REQUIRED - NATURAL PROTECTION	
PIERCE	81 C	NISQUALLY FLATS - EAST										
KITSAP	83 D	COLVOS PASSAGE - OLALLA-ANDERSON PT.	RURAL/NATURAL	UNIMPROVED ROAD ONLY NEARBY		SITE LOCATED S OF ANDERSON COVE AND N OF LIGHTHOUSE.	150	3.5	YES	NO	1000 FEET FLOATING	AV OF IF
KITSAP	84 D	PORT ORCHARD	COMMERCIAL	ALL AT OR NEAR SITE	PLAN INVOLVES EXPANDING ADJACENT TO PORT ORCHARD YACHT CLUB	PORT ORCHARD MARINA - 7 SLIPS; SULLIVAN'S BOAT WORKS - 120 SLIPS; SINGO INLET YACHT CLUB	300	7.4	NO	YES	1200 FEET FLOATING	-1
KITSAP	85 A	MANCHESTER	COMMERCIAL	MOST NEAR SITE		PORT HAS SHORT PIER	325	7.2	YES	NO	1500 FEET RUBBLE OR FLOATING	AV OF IF
KITSAP	86 D	WEST BLAKE ISLAND	NATURAL/STATE MARINE PARK	NONE AT SITE	TOURISTS COME FOR INDIAN SALMON BAKES AT TILLI-UM VILLAGE	SITE LOCATED AT NW POINT OF ISLAND	170	3.7	YES	NO	1500 FEET FLOATING	-
KITSAP	87 C	BAINBRIDGE ISLAND - LYNNWOOD CENTER										
KITSAP	88 A	BROWN'S VILLE	COMMERCIAL	ALL AT OR NEAR SITE	PLAN INVOLVES RELOCATING OF EXISTING BROWN'S VILLE MARINA TO SEAWATER	BROWN'S VILLE MARINA - 265 SLIPS			NO	YES	850 FEET FLOATING	-
KITSAP	89 D	PORT WASHINGTON NARROWS - TRACYTON	RESIDENTIAL/RURAL	SOME UTILITIES NEARBY - ROADS AVAILABLE	USEAGE MAY BE LOW HERE	NEARBY BREMER-TON YACHT CLUB - 105 SLIPS (private)	300	4	NO	YES	1000 FEET FLOATING	-
KITSAP	90 B	DYE'S INLET - WINDY POINT NORTH	RURAL/RESIDENTIAL	ROADS & MOST UTILITIES NEAR	PLAN INVOLVES RELOCATING RESIDENCES	NONE AT SITE	800	4	NO	YES	1200 FEET FLOATING OR FIXED	-
KITSAP		DYE'S INLET - SILVERDALE	COMMERCIAL	ALL AT OR NEAR SITE	WITHIN WALKING DISTANCE OF TOWN	TWO PUBLIC BOAT RAMPAS NEAR SITE	150 600 5/	3.3 12.7 5/	YES	NO	500 FEET FLOATING OR FIXED 500 FEET FLOATING OR FIXED 5/	-
KITSAP	91	SPRUE CAY				BROWN'S						

[illegible]

INITIAL NEW MARINA SITES ENVIRONMENTAL CONSIDERATIONS

SERIES	BENTHIC ORGANISMS	AQUATIC VEGETATION	WETLANDS	WILDLIFE		WDE SHORELINE MASTER PROGRAM DESIGNATION	LOCATION
				IMPACTABLE RESOURCES	ENDANGERED SPECIES		
TO WDNR WDE MAJOR-WDG NON AREA-WDE ON MARINE PROJECT	IMPACTABLE RESOURCES WDNR WDE	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES SALT MARSH - WDG OWDNR WDE SME IMPACT - WDG			OWDNR WDE	SEC. 22, 21, T21 TACOMA SITE BORDERED BY AND MARINE W
WDE WDNR	GEODUCKS, WDE INTERSTITIAL HARD SHELL CLAMS - F&WS		MINIMAL - EPA WDE OWDNR	SOUTH YASSEN CRIT. FOUR RIVER OTTER - F&WS		OWDNR WDE	SEC. 24, T21N TACOMA
WDNR WDE MAJOR-WDG	WDNR WDE MAJOR-WDG	KELP-WDG. MAJOR-WI EELGRASS - F&WS	OWDNR WDE	SILVER- HAIR BAT - F&WS	BALD EAGLE - F&WS	OWDNR WDE MAJOR - WDG	SEC. 15, T21N GIG HARBOR
WDNR WDE	SUBTIDAL GEODUCKS, WDE POSSIBLE INTERSTITIAL SHELLFISH LITTLE NECK BUTTERFLY - WDF	KELP-WDG. SOME IM- PACT-WDG	OWDNR WDE	CRIT. AREA FOR HARBOR SEAL - F&WS		OWDNR WDE	SEC. 4, T20N STEILA CO
WDE WDNR	SUBTIDAL GEODUCKS, WDE - WDF		SALT MARSH - WDG SOME IMPACT - WDG WDE OWDNR	CRIT. AREA FOR HARBOR SEALS - F&WS		WDE WDNR	SEC. 9, T20N STEILA CO
WDNR WDE CREEK	SUBTIDAL GEODUCKS, WDE OYSTERS-WDF		EELGRASS - WDG OWDNR WDE MAJOR - WDG			WDNR WDE MAJOR - WDG	SEC. 27, T1N NISQUALUM
	SUBTIDAL GEODUCKS, INTERSTITIAL HARD SHELL CLAMS, SCALLOPS - F&WS	EELGRASS - F&WS					SEC. 34, T23N OLALLUM
	LITTLE NECK BUTTERFLY CLAMS - F&WS	EELGRASS - F&WS					SEC. 25, 26, T2 BREMERTON
WDE	SUBTIDAL GEODUCKS, WDE INTERSTITIAL SHELLFISH - WDF		OWDNR WDE	AREA CRITICAL FOR RIVER OTTER - F&WS		OWDNR WDE	SEC. 22, T2N BREMERTON
	INTERSTITIAL HARD SHELL CLAMS, SUB- TIDAL GEO- DUCKS - F&WS	EELGRASS - F&WS		AREA CRITICAL FOR RIVER OTTER - F&WS			SEC. 26, T2N BREMERTON
WDE	SUBTIDAL GEODUCKS, WDE LITTLE NECK, BUTTERFLY CLAMS-WDF	EELGRASS MAJOR - WDG - WDF	WDE WDNR			MAJOR - WDG WDE WDNR	SEC. 4, T24N BREMERTON
WDF	CRABS, CLAMS, POLYCHAETES - COE		ADJACENT MUDFLAT AND SALT MARSH - COE	EXTEN- SIVE USE BY RIVER OTTER - COE			SEC. 13, T25 SUQUAMICH
	INTERSTITIAL HARD SHELL CLAMS - F&WS				BALD EAGLE - F&WS		SEC. 3, T24 BREMERTON SITE LOCATED FROM BASS
WDE WDNR	INTERSTITIAL SHELLFISH, OYSTERS, LITTLE NECK, BUTTERFLY CLAMS - WDF	EELGRASS - F&WS	SALT MARSH - F&WS WDE WDNR		BALD EAGLE - F&WS	WDE WDNR	SEC. 21, 28, T23 POULSBORO, BREMERTON

REMARKS

VEGETATION	WETLANDS	WILDLIFE	WDE	LOCATION		
IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	SHORELINE MASTER PROGRAM DESIGNATION	SECTION, TOWNSHIP, QUADRANGLE MAP		
	SALT MARSH - WDG OWDNR WDE SOME IMPACT - WDG		OWDNR WDE	URBAN: MARINA USE PERMITTED	SEC. 22, 27, T21N, R3E TACOMA N SITE BORDERED BY 11TH ST AND MARINEVIEW DR.	APPROVED FOR CONSTRUCTION-EPA THE CITY OF TACOMA IS STUDYING FEASIBILITY OF BOAT LAUNCH RAMP HERE
	MINIMAL - EPA OWDNR WDE	SOUTH VASHON JOINT FOR RIVER OTTER - F&WS	OWDNR WDE	URBAN: MARINA USE PERMITTED	SEC. 24, T21N, R2E TACOMA	1) CITY OF TACOMA PREPARING DRAFT RUSTON WAY DESIGN PLAN. 2) PRELIMINARY STUDIES BY COE IN 1978: TOO COSTLY DUE TO HIGH EXPOSURE, DEEP WATER.
MAJOR - WDG	OWDNR WDE	SILVER-HAIRED BAT - F&WS	BALD EAGLE - F&WS OWDNR WDE MAJOR - WDG	CONSERVANCY: MARINA USE PROHIBITED - WDF 9-30-80	SEC. 15, T21N, R2E GIG HARBOR	NO MARINA DESIGN WAS CONSIDERED: POTENTIALLY SIGNIF. IMPACT TO WATER QUALITY, FISHERIES, BENTHIC ORGANISMS, WETLANDS, EELGRASS; AN IMPORTANT HABITAT OF SILVER HAIRIED BAT, BALD EAGLE.
SOME IM-PACT - WDG	OWDNR WDE	JE. AREA FOR HAKPOK SEAL - F&WS	OWDNR WDE	CONSERVANCY: MARINA USE PROHIBITED - WDF 9-30-80	SEC. 4, T20N, R2E STEILACOOM	2) CITY OF TACOMA: WEST SLOPE TOO STEEP FOR ACCESS. SEE SITE 76, REMARK # 2. SEE SITE 77, REMARK # 2.
	SALT MARSH - WDG SOME IMPACT - WDG OWDNR WDE	CRIT. AREA FOR HARBOR SEALS - F&WS	OWDNR WDE	CONSERVANCY: MARINA EXPANSION PROHIBITED - WDE	SEC. 9, T20N, R2E STEILACOOM	PIERCE COUNTY: "LIKELY IMPACT TO SURROUNDING RESIDENTIAL USES." 2) TITLUM - DAY ISLAND SMALL BOAT BASIN WAS STUDIED AT RECON. LEVEL BY COE, BUT STUDY WAS TERMINATED AT LOCAL SPONSOR'S REQUEST.
	EELGRASS - WDG OWDNR WDE MAJOR - WDG		OWDNR WDE MAJOR - WDG	MARINA USE NOT PERMITTED	SEC. 27, T19N, R1E NISQUALLY	MARINA DESIGN NOT UNDERTAKEN AS MARINA DEVELOPMENT AT THIS SITE CONFLICTS WITH SMP.
					SEC. 34, T23N, R2E OLALLA	1) PLANS MAY IMPACT EXISTING HOMES
					SEC. 25, 26, T24N, R1E BREMERTON W.	
	OWDNR WDE	AREA CRITICAL FOR RIVER OTTER - F&WS	OWDNR WDE		SEC. 22, T24N, R2E BREMERTON EAST	
		AREA CRITICAL FOR RIVER OTTER - F&WS			SEC. 26, T24N, R2E BREMERTON EAST	
MAJOR - WDG	OWDNR WDE		MAJOR - WDG OWDNR WDE	SEMI-RURAL: MARINA USE PERMITTED	SEC. 4, T24N, R2E BREMERTON EAST	NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS TO WATER QUALITY, WATER FOWL, FISHERIES, BENTHIC ORGANISMS, WETLANDS AND EELGRASS BEDS, WILDLIFE.
	ADJACENT MUDFLAT AND SALT MARSH - COE	EXTENSIVE USE BY RIVER OTTER - COE			SEC. 13, T25N, R1E SUQUAMISH	COE CURRENTLY CONDUCTING DPR STAGE STUDIES OF BREAKWATER REPLACEMENT. FINAL DPR IS SCHEDULED FOR SUBMISSION TO HIGHER AUTHORITY IN SEPT 1981.
		BALD EAGLE - F&WS			SEC. 3, T24, R1E BREMERTON WEST SITE LOCATED ACROSS FROM BASS PT.	PRIVATE RESIDENCES MAY BE IMPACTED.
	SALT MARSH - F&WS OWDNR WDE	BALD EAGLE - F&WS	OWDNR WDE	RURAL: MARINA USE PERMITTED	SEC. 21, 28, T25N, R1E POULSBORO, BREMERTON W.	
					SEC. 13, 24, T25N, R1E	BREWSTER MARINA BREAKWATER REPLACEMENT STUDY BY COE IS AT HEAD OF

		SILVERDALE		SITE	DISTANCE OF TOWN	NEAR SITE	600 5/	12.4 5/			2000 FEET FLOATING OR FIXED 5/
KITSAP	91 D	BURKE BAY - NORTH OF BREMER TON				BROWN'S VILLAGE MARINA - 265 SLIPS NEARBY					
KITSAP	92 B	BAINBRIDGE ISLAND - FLETCHER BAY	RESIDENTIAL/RURAL	ROAD ACCESS ONLY	POSSIBLE RELOCATIONS NECESSARY	SITE LOCATED ON SOUTH SHORE OF FLETCHER BAY	150	3	NO	YES	321 FEET RUBBLE
KITSAP	93 B	BAINBRIDGE ISLAND - MURDEN COVE	RESIDENTIAL/RURAL	ROAD ACCESS ONLY		SITE LOCATED ON NORTH SHORE OF MURDEN COVE	500 200 5/	12 4.5 5/	NO	YES	1500 FEET RUBBLE + 400 FEET FLOATING 500 FEET RUBBLE + 400 FEET FLOATING 5/
KITSAP	94 C	HOOD CANAL - ANDERSON COVE									
KITSAP	95 C	HOOD CANAL - WARRENVILLE									
KITSAP	96 D	POULSBY - LIBERTY BAY	COMMERCIAL	ALL AT OR NEAR SITE	PLAN INVOLVES EXPANSION OF EXISTING MARINA	PART OF POULSBY - 241 SLIPS	330	5.2	NO	YES	1000 FEET FLOATING OR FIXED
KITSAP	97 D	NORTH BAINBRIDGE ISLAND	RURAL/RESIDENTIAL	ROAD ACCESS & RESIDENCE UTILITIES ONLY		BOAT LAUNCH AT FAY BAINBRIDGE STATE PARK (SEE REMARK 2)	140	3.1	NO	YES	NATURAL PROTECTION
KITSAP	98 D	AGATE PASSAGE	RESIDENTIAL	MOST AT OR NEAR SITE	SUQUAMISH INDIAN LAND	PUBLIC BOATPICK & LAUNCH ONLY	130	2.8	NO	YES	1100 FEET RUBBLE OR FLOATING
KITSAP	99 D	POINT JEFFERSON	RURAL	ROADS NEARBY	MAY BE ON NAVY OR INDIAN PROPERTY	SITE LOCATED SOUTH OF NAVAL RESERVATION	350	5.7	YES	NO	900 FEET FIXED
KITSAP	100 D	KINGSTON - APPLE TREE COVE	COMMERCIAL	ALL AT OR NEAR SITE	FERRY TERMINAL NEAR SITE. PLAN INVOLVES EXPANSION OF KINGSTON MARINA	KINGSTON COVE MARINA - 331 SLIPS	400	9.0	NO	YES	700 FEET RUBBLE WITH BOAT RAMP
KITSAP	101 D	HOOD CANAL - COON BAY	RURAL/RESIDENTIAL	ROADS & MOST UTILITIES NEARBY	AREA HIGHLY RESIDENTIAL	DRIFTWOOD KEY CLUB NEARBY (PRIVATE); POINT NO. 1 NEARBY	200	4	YES	NO	1000 FEET RUBBLE
PIERCE	102 D	CASE INLET NE - ROCKY BAY	RURAL/RESIDENTIAL	ROADS NEARBY, BUT RESIDENCE UTILITIES ONLY		SITE LOCATED ON NE SHORE OF ROCKY BAY	180 180 5/	4.1 4.5 5/	YES NO	NO	900 FEET RUBBLE 900 FEET RUBBLE 5/
		VAUGHN BAY				BOAT LAUNCH NEARBY	185	4.1	NO	YES	900 FEET RUBBLE

1/ Represents designation of site based on results of agency screening in 1979:

- A - No initial environmental agency opposition to marina development at site.
- B - Initial environmental agency concern over portion of site.
- C - Environmental agency opposition to site, or development prohibited by Shoreline Management Act.
- D - Site added at request of U.S. Fish and Wildlife Service or by Corps of Engineers and have not been screened by environmental agencies.

3/ Water Quality

Class AA
Class A
Class B
Class C

2/ Estimated impact of marina development on resources at site:

- No impact
- Moderate impact
- High impact

4/ Rex Van Wagon

5/ The Corps of Engineers

6/ Washington

7/ Langley Channel

5

3000 FEET FLOATING OR FIXED 5/	0 5/		370,000 CY 5/	CLASS AA - F&WS	WDE	WDE	WDE	DISSOLVED OXYGEN - EPA COLIFORM, TEMP. ORGANICS - WDE	COMM. HERRING SALMON, MAJOR SPAWN AREA CRIT. FOK, BIG- LONG NOSE SKATE - F&WS
301 FEET RUBBLE	0	2	100,000 CY	CLASS AA - F&WS	WDE EPA	WDE EPA	WDE	BOD, DO, ORGANICS, INORGANICS, COLIFORMS, - WDE TEMP. DISSOLVED OXYGEN - EPA	HERRING - CRIT. AREA FOK BIG- LONG NOSE SKATE - F&WS
1500 FEET RUBBLE + 400 FEET FLOATING 800 FEET RUBBLE + 400 FEET FLOATING 5/	AVERAGE OF 10 FEET 4.5 AVERAGE OF 6 FEET 5/ 2.0 5/		250,000 CY 150,000 CY 5/	CLASS AA - F&WS	WDE WDE EPA	WDE WDE EPA	WDE WDE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS, TEMP. WDE DISSOLVED OXYGEN - EPA	HERRING SPAWN AREA, SALMON, CRIT. - F&WS COMMERCIAL SALMON AREA - WDE
				CLASS AA - F&WS	WDE WDE EPA	WDE WDE EPA	WDE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS, - WDE TEMP. DISSOLVED OXYGEN - EPA	OTTER TRAWL, SALMON - F&WS COMMERCIAL SALMON AREA MAJOR ENHANCEMENT SKYDIVER R. AND WDE - WDE HATE
				CLASS AA 3/	WDE WDE	WDE WDE	WDE WDE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS, - WDE TEMP. DISSOLVED OXYGEN - EPA	CRAB COMMERCIAL SALMON AREA - WDE
1000 FEET FLOATING OR FIXED	- 20 FEET	1.5	200,000 CY	CLASS AA - F&WS	WDE	WDE	WDE	COLIFORM TEMP. ORGANICS - WDE	MAJOR WATER FOWL AREA - WDE WATER FOWL W. GREBE - F&WS
NATURAL PROTECTION		2.0	180,000 CY	CLASS AA - F&WS	WDE	WDE	WDE	COLIFORM TEMP. - WDE	COMM. HER- RING - OTTER TRAWL, SALMON, CRAB, HER- RING SPAWN AREA - F&WS
1100 FEET RUBBLE OR FLOATING	AVERAGE OF 6 FEET		100,000 CY	CLASS AA 3/		WDE		COLIFORM - WDE	COMM. HER- RING - SPOT SALMON BOTTOM FISHING HERRING SPAWN AREA - F&WS
900 FEET FIXED	0	12.0	180,000 CY	CLASS AA - F&WS		WDE	WDE	COLIFORM - WDE	COMM. OTTER TRAWL, SALMON, CRAB, SPORTS BOT- TOM FISHING - F&WS
700 FEET RUBBLE WITH BOAT RAMP	0	5	300,000 CY	CLASS AA - F&WS	WDE	WDE	WDE	COLIFORM, TEMP. ORGANICS - WDE	CRAB, COMM. OTTER TRAWL - F&WS COMMERCIAL SALMON AREA - WDE
1000 FEET RUBBLE	0	2.5	100,000 CY	CLASS AA - F&WS	WDE WDE EPA	WDE WDE EPA	WDE	BOD, DO, ORGANICS, COLIFORMS, INORGANICS, - WDE TEMP. DISSOLVED OXYGEN - EPA	GOLDEN EYES HORNED GREBE GULLS, WADERS PUFFLE HEAD, CORMORANTS
900 FEET RUBBLE		2.3	150,000 CY	CLASS AA - F&WS					MAJOR WATER FOWL AREA - WDE W. GREBE WATER FOWL - F&WS
900 FEET RUBBLE 5/	0 5/	2.4 5/	200,000 CY 5/						BEAR CUT- THROAT TROUT CRIT. AREA FOR HERRING, COMM. OTTER TRAWL - F&WS
500 FEET RUBBLE 5/	- 50 FEET		150,000 CY						

3/ Water Quality Rating, Washington State Water Quality Standards, Dept. of Ecology, Olympia, Washington, December 15, 1979:

Class AA - Extraordinary
Class A - Excellent
Class B - Good
Class C - Fair

4/ Rex Van Wormer, F&WS, Olympia, Washington - personal communication, May 1980.

5/ The Corps of Engineers (COE) considered two potential marinas for this area.

6/ Washington Department of Ecology. Coastal Zone Atlas of Washington, Vol's. 1,2,3,4. May 1979.

7/ Langley Chamber of Commerce has indicated that permanent moorage in this area is high priority.

8/ In 1979 the state legislature changed the definition of "nearshore" from 100 yards offshore to 200 yards offshore. As a result, many locations shown on this map may be affected by marina construction.

NOTE: THE ENGINEERING AND ENVIRONMENTAL STUDIES CONDUCTED FOR THIS PROJECT WERE UNFORESEEN AND POSSIBLY SEVERE ARE CONDUCTED AND THE RESULTS WILL BE REPORTED TO THE APPROPRIATE AGENCIES.

6

COMM. HERRING, SALMON, MAJOR HERRING SPAWN AREA, CRIT. FOR BIG & LONG NOSE SKATE - F&WS		SUBTIDAL GEODUCKS - F&WS							
HERRING - WDE CRIT. AREA FOR BIG & LONG NOSE SKATE - F&WS COMMERCIAL SALMON AREA - WDE	OWDNR OWDE MAJOR-WDG	SUBTIDAL GEODUCKS - WDE POTENTIAL CULTURE AREA	WDNR WDE	ALGAL COMMUNITIES 4/	OWDNR OWDE EPA		BALD EAGLE - F&WS	WDNR WDE	FURRY MARINA USE PERMITTED
HERRING SPAWN AREA, SALMON, CRIT. F&WS COMMERCIAL SALMON AREA - WDE	OWDE	LITTLENECKS - WDE SUBTIDAL GEODUCKS - F&WS POSSIBLE INTERTIDAL SHELLFISH, POTENTIAL CULTURE AREA	OWDE GEODUCKS - WDNR	EELGRASS MAJOR - WDG	OWDE OWDNR EPA		BALD EAGLE - F&WS	OWDE OWDNR	UNSERVING SEMI-RURAL MARINA USE CONDITIONAL PERMITTED
OTTER TRAWL, SALMON - F&WS COMMERCIAL SALMON AREA MAJOR ENHANCEMENT PLANNED - WDF & WDG HATCHERIES.	OWDNR OWDE MAJOR-WDG	SHRIMP INTERTIDAL SHELLFISH, SUBTIDAL GEODUCKS, OYSTERS, BUTTER CLAMS - WDF POTENTIAL IMPACT TO COMM. SHELLFISH - WDSHS MAJOR - WDG	WDNR WDE POTENTIAL IMPACT TO COMM. SHELLFISH - WDSHS MAJOR - WDG	EELGRASS MAJOR - WDG	OWDNR OWDE MAJOR - WDG EPA	MARSH - WDG	RIVER OTTER 4/	BALD EAGLE - F&WS WDNR WDE MAJOR - WDG	UNSERVING MARINA USE CONDITIONAL
CRAB, COMMERCIAL SALMON AREA - WDF	OWDE	SUBTIDAL GEODUCKS, OYSTERS - WDF POTENTIAL IMPACT TO COMM. SHELLFISH - WDSHS WDE GEODUCKS - WDNR		EELGRASS MAJOR - WDG	MAJOR - WDG OWDE OWDNR	MARSH MAJOR - WDG		MAJOR - WDG OWDE OWDNR	DEVELOPMENT PROHIBITED BY SMP - EPA
HERRING SPAWN AREA, MAJOR SPAWN AREA FOR SURF SMELT - F&WS		OYSTER SUBTIDAL GEODUCKS, BUTTER CLAMS, LITTLENECKS - F&WS		EELGRASS - F&WS			CRIT. AREA FOR RIVER OTTER - F&WS		
COMM. HERRING, OTTER TRAWL, SALMON, CRAB, HERRING SPAWN AREA - F&WS		SUBTIDAL GEODUCKS, HARD SHELL CLAMS - F&WS		EELGRASS - F&WS					
COMM. HERRING, SPORTS SALMON, BOTTOM FISHING, HERRING SPAWN AREA - F&WS		SUBTIDAL GEODUCKS, LITTLENECKS, BUTTER CLAMS - F&WS		EELGRASS - F&WS			CRIT. AREA FOR RIVER OTTER - F&WS		
COMM. OTTER TRAWL, SALMON, CRAB, SPORTS BOTTOM FISHING - F&WS		SUBTIDAL BUTTER CLAMS, LITTLENECKS, GEODUCKS - F&WS HARD SHELL CLAMS MAJOR - WDE							
CRAB, COMM. OTTER TRAWL - F&WS COMMERCIAL SALMON AREA - WDF		SHRIMP SUBTIDAL GEODUCKS - F&WS							
CRIT. HERRING AREA, SALMON COMM. OTTER TRAWL CUTTHROAT TROUT - F&WS	OWDE	GHOST SHRIMP, CLAMS, OYSTERS, POLYCHAETES, ANEMONES, SCALLOPS - F&WS SUBTIDAL GEODUCKS - WDF POTENTIAL IMPACT ON COMM. SHELLFISH - WDSHS COMM. GEODUCK BEDS - WDF	GEODUCKS - WDNR WDE	ENTERO-MORPHA SP. (INTERTIDAL ALGAE), SALICORNIA SP. - F&WS	OWDNR OWDE EPA			OWDNR OWDE	SEMI-RURAL MARINA USE PERMITTED
SEAFOOD CUTTHROAT TROUT, CRIT. AREA FOR HERRING, COMM. OTTER TRAWL - F&WS		OYSTER SUBTIDAL GEODUCKS, HARD SHELL CLAMS - F&WS					CRIT. AREA FOR RIVER OTTER - F&WS		

state legislature changed the inshore boundary for geoduck harvesting from 1/4 mile 200 yards offshore or the 18 foot depth contour, whichever is farther offshore. many locations shown in the matrix will have geoduck harvest potential that could be affected by marina construction; Washington Department of Fisheries, September 1980.

POTENTIAL FOR CENTRAL

ENGINEERING AND ENVIRONMENTAL ASSESSMENTS SHOWN IN THIS MATRIX ARE PRELIMINARY AND SUBJECT TO CHANGE. and possibly severe impacts may come to light as marina engineering and environmental studies are conducted and the results presented to regulatory agencies for approval.

FIGURE 17 - SIT

						SEC. 13, 24, T25N, R1E SUQUAMISH	BREHNSVILLE MARINA BREAKWATER REPLACEMENT STUDY BY COE IS AT HEAD OF BUNKE BAY AND COULD MEET THIS NEED.
	○ WDNR ● WDE ● EPA	BALD EAGLE -F&WS	○ WDNR ● WDE	FARM: MARINA USE PERMITTED	SEC. 20, T25N, R2E SUQUAMISH		HIGH SILTATION DUE TO LITTORAL DRIFT & RIVER MOUTH DEPOSITION COULD LEAD TO HIGH MAINTENANCE COSTS.
MAJOR - WDG	○ WDE ○ WDNR ● EPA	BALD EAGLE -F&WS	○ WDNR ● WDE	CONSERVANCY/SEMI-RURAL: MARINA USE CONDITIONAL/PERMITTED	SEC. 14, T25N, R2E SUQUAMISH		HIGH SILTATION AREA RIVER MTH, COULD LEAD TO HIGH MAINTENANCE COSTS.
MAJOR - WDG	MARSH - WDG ● WDNR ● WDE MAJOR - WDG ● EPA	RIVER OTTER 4/	BALD EAGLE -F&WS	○ WDNR ● WDE MAJOR - WDG	SEC. 10, T24N, R2W HOLLY		NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACT TO WATER QUALITY, FISHERIES, BENTHIC ORGANISMS, WETLANDS AND EELGRASS BEDS, AND WILDLIFE. IMPORTANT HABITAT AREA FOR RIVER OTTER AND BALD EAGLE.
MAJOR - WDG	MARSH - WDG MAJOR - WDG ● WDE ○ WDNR			MAJOR - WDG ● WDE ○ WDNR	SEC. 14, T25N, R1W SEADECK		NO MARINA DESIGN WAS CONSIDERED. POTENTIALLY SIGNIF. IMPACTS TO WATER QUALITY, WETLANDS, EELGRASS, CRAB HABITAT, BENTHIC ORGANISMS, WILDLIFE.
		CEIT. AREA FOR RIVER OTTER -F&WS			SEC. 23, T26N, R1E POULSBORO		EXISTING BREAKWATER MAY REQUIRE REHABILITATION.
					SEC. 35, T26N, R2E SUQUAMISH		HIGH ENTRANCE CHANNEL MAINTENANCE REQUIREMENTS. (2) SITE LOCATED JUST SW OF LIGHTHOUSE ON POINT MONROE.
		CEIT. AREA FOR RIVER OTTER -F&WS			SEC. 21, T26N, R2E SUQUAMISH LOCATED SW & SUQUAMISH & NE OF LIGHTHOUSE		
					SEC. 7, 10, T26N, R3E EDMONDS EAST		
					SEC. 26, 35, 34, T27N, R2E EDMONDS EAST		MAY DISRUPT EXISTING BUILDINGS
MAJOR - WDG SP. (TIDAL AREA) -F&WS	○ WDNR ● WDE ● EPA		○ WDNR ● WDE	SEMI-RURAL: MARINA USE PERMITTED	SEC. 19, T28N, R2E HANSVILLE		SITE LOCATED WEST OF CEDON BAY.
		CEIT. AREA FOR RIVER OTTER -F&WS			SEC. 27, 34, T22N, R1W VAUGHN VAUGHN BAY SITE IS ON NORTH SHORE OF BAY		PIERCE COUNTY PERMITS MARINAS HERE. 2) VAUGHN BAY: GOOD CIRCULATION, FLUEN-ING. SPIT AT NORTH IS PUBLIC CLAM BED WITH BOAT ACCESS ONLY. 3) ROCKY BAY: FLUENING/CIRC. PROBLEMS POSS.

POTENTIAL FOR DEVELOPMENT

CENTRAL DIVISION

FIGURE 17 - SITE EVALUATION

PAGE 2 OF 2

8

EXISTING FACILITIES						POTENTIAL NEW MARINA SITE DESIGN CONSIDERATIONS					
COUNTY	SITE NUMBER INITIAL SITE EVAL	SITE NAME	EXISTING CONDITIONS AT SITE				NEW MARINA POTENTIAL		WAVE CLIMATE AT SITE		TYPE AND LENGTH OF BREAKWATER
			CURRENT LAND USE	UTILITIES & ROADS AVAILABLE	OTHER	EXISTING MARINAS AT SITE	ESTIMATED NUMBER OF BOATS	APPROXIMATE MARINA MOORAGE AREA (ACRES)	EXPOSED: WAVE HEIGHT GREATER THAN THREE FEET	PROTECTED: WAVE HEIGHT THREE FEET OR LESS	
MASON	103 D	STRETCH ISLAND	RURAL/ NATURAL SEE REMARK (2)	ROAD ACCESS NEARBY		SITE LOCATED ON WEST SHORE OF ISLAND	100	2.2	NO	YES	700 FEET FLOATING OR FIXED
MASON	104 D	HARTSTONE ISLAND-FUDGE PT.	NATURAL	NONE AT/NEAR SITE	SITE LOCATED IN/OF FUDGE POINT		400	8.3	YES	NO	2600 FEET RUBBLE
		JARREL COVE	STATE PARK	SOME AVAILABLE	SITE LOCATED ON E SHORE OF COVE		150	3.5	NO	YES	500 FEET FLOATING
MASON	105 D	PICKERING PASSAGE- GRAHAM POINT	NATURAL/ RURAL SEE REMARKS	ROADS NEARBY	SITE IS NEAR OLD FERRY TERMINAL SITE IS NEAR HARTSTONE ISLAND BRIDGE (3)		170 150 (3)	3.7 3.0 (3)	NO	YES	1500 FEET FLOATING 500 FEET FLOATING OR RUBBLE
THURSTON	106 C	HENDERSON INLET									
THURSTON	107 D	BUDD INLET- PRIEST POINT	NATURAL/ PARKS	MOST NEARBY, ROAD ACCESS AVAILABLE	SITE AT PRIEST POINT PARK		180 180 (3)	4 4 (3)	NO	YES	500 FEET FLOATING OR FIXED 500 FEET FLOATING OR FIXED
THURSTON	108 B	BUDD INLET- GULL HARBOR	RURAL/ RESIDENTIAL	ROAD ACCESS NEARBY	EAST BAY CURRENTLY BEING STUDIED BY COE	BOSTON HARBOR MARINA - 43 SLIPS, OLYMPIA MARINA - 144 SLIPS, 174 SLIPS, 174 SLIPS, 174 SLIPS	1000 13.5 (3)	3.0 2.8 (3)	NO	YES	300 FEET FLOATING 500 FEET FIXED (3)
THURSTON	109 C	BUDD INLET EAST	PARTLY WITHIN PRIEST PT. PARK. RESIDENTIAL	MOST NEARBY		Boston Harbor Marina 43 slips Olympia Marina 144 slips	1500	61	NO	YES	3,400
THURSTON	110 A	EAST BAY	COMMERCIAL/INDUSTRIAL	ALL AT OR NEAR SITE		OLYMPIA MARINA NEARBY - 144 SLIPS	800	31.3	NO	YES	100 FEET FLOATING
THURSTON	111 D	ELD INLET- FLAPJACK POINT	NATURAL/ RESIDENTIAL	SOME DEVELOPMENT REQUIRED	PUBLIC BOAT RAMP AT YOUNG COVE	SITE LOCATED ON SOUTH SHORE OF YOUNG COVE.	170	3.7	NO	YES	NATURAL PROTECTION
MASON	112 C	HOOD CANAL- UNION BAY	RESIDENTIAL/COMMERCIAL			UNION MARINA AND UNION YACHT CLUB					
MASON	113 B	HOOD CANAL- HOODSPORT	COMMERCIAL/RESIDENTIAL	ALL AT OR NEAR SITE		HOODSPORT MARINA - 40 SLIPS, HOODSPORT MARINA - 12 SLIPS, BEHIND 113 SLIPS	200	4	YES	NO	1500 FEET RUBBLE
MASON	114 D	HOOD CANAL- HAMMA HAMMA- ELDON	NATURAL/ RURAL	NONE AT SITE, ROAD NEARBY		SITE LOCATED NORTH OF CUNNINGHAM PT.	340	7.5	YES	NO	5000 FEET RUBBLE
JEFFERSON	115	HOOD CANAL- TRITON COVE	RESIDENTIAL/ RURAL	RESIDENTIAL ROADS & UTILITIES ONLY	RELOCATION OF FERRY DEVICES MAY BE A PROBLEM		120	2.7	NO	YES	800 FEET FLOATING OR FIXED
JEFFERSON	116 C	HOOD CANAL- DUCKBUSH RIVER									
JEFFERSON	117	RIGHT SMART COVE				SITE LOCATED SOUTH OF RT. 100					

POTENTIAL N ENVIRONMENT

TYPE AND LENGTH OF BREAKWATER	APPROX. EXISTING DEPTH OF WATER AT BREAKWATER (MLLW)	SHORESIDE LANDFILL REQUIRED (ACRES)	APPROXIMATE DREDGING REQUIRED (CHANNELS & MOORAGE AREA TO 12' MLLW)	EXISTING	WATER QUALITY POTENTIAL IMPACTS W/ MARINA DEVELOP.				AVIAN FAUNA/HABITAT	FISHERIES
					FLUSHING	CIRCULATION	SEDIMENTATION	OTHER		
160 FEET FLOATING OR FIXED	0	1.1	90,000 CY	CLASS AA 3/ - F&WS 10/					MAJOR WATERFOWL AREA - WDNR 5/ W. GREBE, WATERFOWL - F&WS	COMM. HERRING, OTHER TRAWL, SEARUN CUTTHROAT TROUT - F&WS
2000 FEET RUBBLE	AVERAGE OF - 9 FEET	6	150,000 CY	CLASS AA OR A - F&WS					W. GREBE, WATERFOWL - F&WS	COMM. HERRING, SEARUN CUTTHROAT TROUT - F&WS
500 FEET FLOATING	AVERAGE OF - 18 FEET	1	25,000 CY							
1500 FEET FLOATING	- 20 FEET	2.3	40,000 CY	CLASS A - F&WS					W. GREBE, WATERFOWL - F&WS	COMM. HERRING - F&WS
500 FEET FLOATING OR RUBBLE 13/	- 5 FEET 13/	2.0 13/	50,000 CY 13/							
					01 WDNR 0 WDE 13/	0 WDNR 0 WDE 13/	0 WDNR 0 WDE 13/	0 BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE		SMELT - WDF 6/ 0 WDNR 0 WDE
500 FEET FLOATING OR FIXED	- 3 FEET	2.5	130,000 CY	CLASS A - F&WS					MAJOR WATERFOWL AREA - WDNR 1/ IMP AREA FOR CANINE - BACK WATERFOWL, GREBE - F&WS	SALMON, SEARUN CUTTHROAT TROUT, MAJOR SURF SMELT SPAWN AREA - F&WS
500 FEET FLOATING OR FIXED 13/	0 13/	2.2 13/	200,000 CY 13/						IMP AREA FOR CANINE - VASCULAR - F&WS MAJOR WATERFOWL AREA - WDNR	DISPERSED - DUE TO DIS TURBANCE OF FOOD ORGANISMS 12/
300 FEET FLOATING	- 20 FEET	20	50,000 CY	CLASS A - F&WS					IMP AREA FOR CANINE - VASCULAR - F&WS MAJOR WATERFOWL AREA - WDNR	SALMON, SEARUN CUTTHROAT, TROUT, HERRING, CRAYFISH, SMELT SPAWN AREA - F&WS
300 FEET FIXED 13/	0 13/	1	130,000 CY 13/							
3,400		19	2,500,000	CLASS B, HEAVILY POLLUTED SEDIMENTS, SUMMER LOW IN DO, HIGH TEMPS - F&WS	0 WDNR 0 WDE 0 EPA 13/	0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE 0 EPA	0 BOD, DO, INORGANICS, ORGANICS, COLIFORMS - WDE 0 TEMP, DO	IMP AREA FOR WATERFOWL - F&WS, ESP. CANINE - F&WS RHINO, GULL - LET 8/	SMELT - WDF 0 WDNR 0 WDE
700 FEET FLOATING	AVERAGE OF 0 FEET	53.4	1,175,000 CY	CLASS B NUTRIENT-RICH HIGH SALINE, TEMPS TO 18% SUMMER DO LOW	0 EPA 0 WDE 0 WDNR	0 EPA 0 WDE 0 WDNR	0 WDE 0 WDNR	0 TEMP, DO - EPA 0 BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE	SCALP, CANINE, RICE, BAY, GULL, BARNACLE GULLS, SHELLFISH	0 COE
NATURAL PROTECTION		1	180,000 CY	CLASS A - F&WS					IMP AREA FOR W. GREBE - F&WS MAJOR WATERFOWL AREA - WDNR	SMELT - WDF 0 WDNR 0 WDE
				CLASS AA - F&WS	0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE	0 ORGANICS 0 BOD, DO, COLIFORMS, INORGANICS - WDE TEMP, DISSOLVED OXYGEN - EPA	MAJOR WATERFOWL AREA - WDNR	0 WDE, 0 WDNR 0 WDE
1500 FEET RUBBLE	- 3 FEET	2.3	100,000 CY	CLASS AA - F&WS	0 WDE 0 WDNR	0 WDE 0 WDNR	0 WDE 0 WDNR	0 BOD, DO, ORGANICS, INORGANICS, COLIFORMS - WDE		0 WDE
500 FEET RUBBLE	AVERAGE OF - 6 FEET	6	120,000 CY	CLASS AA - F&WS					MAJOR WATERFOWL AREA - WDNR W. GREBE, WATERFOWL, CRAYFISH	COMM. HERRING, OTHER TRAWL, SEARUN CUTTHROAT TROUT, SALMON, BOTTOM FISH - F&WS
800 FEET FLOATING OR FIXED	- 13 FEET	1.4	30,000 CY							
				CLASS A - F&WS	0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE	0 BOD, DO, ORGANICS, INORGANICS, COLIFORMS - WDE TEMP, DISSOLVED OXYGEN - EPA	WATERFOWL, CRAYFISH, SANDPIPER, DUCK, OTHER SHORE BIRDS 12/	VERY MAJOR WATERFOWL - WDE
										HERRING, CRAYFISH, SALMON - F&WS 0 WDNR 0 WDE 0 WDE

INITIAL NEW MARINA SITES ENVIRONMENTAL CONSIDERATIONS

SERIES	BENTHIC ORGANISMS	AQUATIC VEGETATION	WETLANDS	WILDLIFE	WDE	LOCATION
RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	SHORELINE MASTER PROGRAM DESIGNATION	SECTION TOWN RANGE U.S. QUADANGLE
	SUBTIDAL GEODUCKS, 14/ INTERTIDAL HARDSHELL CLAMS - F&WS			CRIT. AREA FOR RIVER OTTER - F&WS	URBAN ONLY	SEC. 8, T21N, R VAUGHN
	OYSTER, SUB-TIDAL GEO-DUCKS, INTERTIDAL HARDSHELL CLAMS - F&WS			CRIT. AREA FOR RIVER OTTER - F&WS	RURAL	SEC. 25, T21N VAUGHN, MASO
	CYSTERS, INTERTIDAL HARDSHELL CLAMS - F&WS			CRIT. AREA FOR RIVER OTTER - F&WS	URBAN ONLY	SEC. 4, T20N, MASON LAKE, SA
WDE WDE	INTERTIDAL SHELLFISH, SUBTIDAL GEODUCKS, CYSTERS, POSSIBLE LITTLENECKS - WDF		WDE WDE		MAN. NA USE N-T PERMIT- TED	SEC. 17, T19N, LONG BRAA
	SUBTIDAL GEODUCKS, INTERTIDAL HARDSHELL CLAMS - F&WS	SMELT SPAWN- ING AREA - WDF				CLAIM 53, T18N, TUMWAT
	CYSTERS, SUBTIDAL GEODUCKS, INTERTIDAL HARDSHELL CLAMS, SHRIMP - F&WS	LOSS OF LONG TAIL RE- DICTION - POSSIBLE WDSHS - DELETION				SEC. 26, T17N, TUMWAT, SOUTH SHORE GULL HARB
WDE WDE	INTERTIDAL SHELLFISH, SUBTIDAL GEODUCKS, POSSIBLE LITTLENECK BUTTERCLAMS - WDF		SALT MARSH - F&WS	WDE WDE EPA	WDE WDE	CLAIMS 37, 38, 39, 40, 41, 42, TUMWAT
WDE WDE COE	INTERTIDAL SHELLFISH, SUBTIDAL GEODUCKS, ACORN BARNACLES, COE, MUSSELS, SHARP COROPHUM SP., POLYCHAETE WORMS, BRITTLESTARS - COE	SALICORNIA SP., ULVA OR MONO- STROMA SP., ENTEROMORPHA SP., FULUS SP., MAT-LIKE BROWNISH MICROSCOPIC ALGAE - COE	MUDFLATS - COE	EPA WDE WDE COE	WDE WDE COE	OLYMPIA TUMWAT
	CYSTERS, SUBTIDAL GEODUCKS, 14/ INTERTIDAL HARDSHELL CLAMS - F&WS		TIDAL FLAT & SALT MARSH - F&WS	SEA LIG		SEC. 30, T19N, SQUAXIN IS
WDE MAJOR: SAL- MONIDS - WDG- 8/	SHRIMP, INTER- TIDAL SHELLFISH, SUBTIDAL GEODUCKS, OYSTER - WDF	LEI - 11 - 5 SIGNIFICANT F&WS - 12/	WDE WDE	CRIT. AREA FOR RIVER OTTER - F&WS	WDE WDE	SEC. 31, T22N, POTLAT
WDE	SHRIMP, INTER- TIDAL SHELLFISH, SUBTIDAL GEODUCKS, CYSTERS, LITTLENECKS, BUTTERCLAMS - WDF	LEI - 11 - 5 SIGNIFICANT F&WS - 12/	WDE WDE	CRIT. AREA FOR RIVER OTTER - F&WS	WDE WDE	SEC. 12, 13, T2 POTLAT, SOUTH SIDE RIVER
COMMERCIAL SALMON AREA - WDF	SHRIMP, CYSTERS, SUBTIDAL GEODUCKS - F&WS		TIDAL FLAT & SALT MARSH - F&WS	CRIT. AREA FOR RIVER OTTER - F&WS	URBAN ONLY	SEC. 23, T24N, THE BROD
	SUBTIDAL HARD SHELL CLAMS, SUBTIDAL GEODUCK - WDF					SEC. 31, T25N, BRINN, NORTH OF NEA
WDE WDE WDE WDE WDE	INTERTIDAL SHELLFISH, CYSTERS, BUTTER CLAMS, LITTLENECKS, SHRIMP, COMMERCIAL GEODUCK HARVEST - POSSIBLE	LEI - 11 - 5 SIGNIFICANT F&WS - 12/	WDE WDE WDE WDE WDE	CRIT. AREA FOR RIVER OTTER - F&WS	WDE WDE WDE WDE WDE	SEC. 21, 22, T2, BRINN
						SEC. 24, T26

[illegible]

JEFFERSON	117	RIGHT SMART COVE				SITE LOCATED SOUTH OF RT. SMART COVE AND WEST OF WA WA PT.					
JEFFERSON	118	HOOD CANAL - THORNDYKE BAY									
JEFFERSON	119	QUILCENE BAY - EAST SIDE									
JEFFERSON	120	HOOD CANAL - DABOB BAY	NATURAL/RURAL	NONE AT/NEAR SITE		SITE LOCATED ON WEST SHORE SOUTH OF DABOB.	200	4.5	YES	11-	100 FEET RUFFLE
JEFFERSON	121	BRIDGEHAVEN				LOCATED NEAR BRIDGEHAVEN MARINA, AT SOUTH POINT					
JEFFERSON	122	HOOD CANAL - SQUAMISH HARBOR	RURAL/RESIDENTIAL	NEAR NEARBY	WILL DISRUPT RESIDENTS	BRIDGE-HAVEN NEARBY - 22 LIPS SEE REMARKS	250	4.3	NO	YE	1700 FEET RUFFLE
JEFFERSON	123	HOOD CANAL - TERMINATION POINT	NATURAL/RURAL	ROAD ONLY TO SITE	SITE NEXT TO OLD HOOD CANAL BRIDGE SITE CONTAINS TRAILER - OVER SITE - STAT 1011		200	5.2	YES	NO	1400 FEET RUFFLE
JEFFERSON	124	HOOD CANAL - BYWATER BAY									
JEFFERSON	125	MATS MATS									

1/ Represents designation of site based on results of agency screening in 1979:

- A - No initial environmental agency opposition to marina development at site.
- B - Initial environmental agency concern over portion of site.
- C - Environmental agency opposition to site, or development prohibited by Shoreline Management Act.
- D - Site added at request of U.S. Fish and Wildlife Service or by Corps of Engineers and have not been screened by environmental agencies.

2/ Estimated impact of marina development on resources at site:

- No impact
- Moderate impact
- High impact

3/ Water Quality Rating, Washington State Water Quality Standards, Dept. of Ecology, Olympia, Washington, December 19, 1979:

- Class AA - Extraordinary
- Class A - Excellent
- Class B - Good
- Class C - Fair

4/ Washington

5/ Washington

6/ Washington

7/ U.S. Env
(Notation
with soli

8/ Washington

9/ Washington

10/ U.S. Fish

11/ Washington

12/ Rex Van W

13/ The Corps

14/ In 1979 ti
mile off
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				UNL - TIDIAL	
				SEC. 24, T26N, R2W BRINNON	
ALSH -WDE VERY MAJOR -WDE ● WDE ● WDNK		PALL EAGLE -WDE	VERY MAJOR -WDE ● WDE ● WDNK	DEVELOPMENT PROHIBITED BY SHORE LINE PROGRAM - EPA	SEC. 24, 25, T27N, R1W LOFALL SEE REMARK (1) - E 109 2. CRITICAL HABITAT FOR EF - 109 BEDS AND SH. EAGLE
● WDE ● WDNK ● EPA	CRIT. AREA FOR RIVER OTHER MAJOR SEAL - F90	CRIT. AREA FOR RIVER OTHER MAJOR SEAL - F90	MAJOR -WDE ● WDE ● WDNK	URBAN/ SUBURB - BAN: MARINA USE PERMIT- TED	SEC. 32, T27N, R1W QUILCENE 1) AREA USED BY CANYON BLK. (CAJ) GOLF COURSE, SCOTCH, WIDE, (CAJ) RIVER, AUKLET, BRANT, CO. (CAJ) ALORE 12
	CRIT. AREA FOR RIVER OTHER MAJOR SEAL - F90	CRIT. AREA FOR RIVER OTHER MAJOR SEAL - F90			SEC. 17, T27N, R1W QUILCENE 1) SEE REMARK (2) SITE 107 2) SITE CONTAINS MANY MINING SAND PITS, AND SEDIMENTATION
					SEC. 17, 20, T27N, R1E LOFALL SITE DESIGN NOT UNDERTAKEN DUE TO HEAVY SEDIMENTATION, HIGH BLUFFS (IN UPLANDS FOR MARINA SUPPORT AREA) AND SQUARISH SITE (NO. 122) NEARBY
	CRIT. AREA FOR RIVER OTHER MAJOR SEAL - F90				SEC. 4, T27N, R1E LOFALL 1) JEFFERSON - INDICATES NO. 122 FLIGHT WITH ALONG LAND OR WATER USE PLAYS OF REGAL - INS. 2) SITE LOCATED ON WEST SHORE, 1/4 TH OF R. 36 HAVEN MAP 11A
	CRIT. AREA FOR RIVER OTHER MAJOR SEAL - F90				SEC. 35, T28N, R1E & SEC. 2, T27N, R1E LOFALL SEE REMARK (1) SITE 122 ABOVE
ALSH -WDE VERY MAJOR -WDE ● WDE ● WDNK ● EPA			VERY MAJOR -WDE ● WDE ● WDNK	DEVELOP- MENT NOT ALLOWED BY SHORE LINE PROGRAM - EPA	SEC. 24, 35, T28N, R1E PORT LUDLOW SEE REMARK (1) SITE 129.
● WDE ● WDNK	PALL EAGLE -F90	● WDE ● WDNK	S. 2 BAN: MARINA USE PERMIT- TED		SEC. 23, T29N, R1E & SEC. 4, T28N, R1E PORT LUDLOW

POTENTIAL FOR DEVELOPMENT WEST DIVISION

FIGURE 18 - SITE EVALUATION
PAGE 1 OF 2

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EXISTING FACILITIES

POTENTIAL NEW MARINA S.
DESIGN CONSIDERATION

COUNTY	SITE NUMBER INITIAL SITE EVAL.	SITE NAME	EXISTING CONDITIONS AT SITE				NEW MARINA POTENTIAL		WAVE CLIMATE AT SITE		TYPE AND LENGTH OF BREAKWATER
			CURRENT LAND USE	UTILITIES & ROAD ACCESS AVAILABLE	OTHER	EXISTING MARINAS AT SITE	ESTIMATED NUMBER OF BUOYS	APPROXIMATE MARINA MOORAGE AREA (ACRES)	EXPOSED: WAVE HEIGHT GREATER THAN THREE FEET	PROTECTED: WAVE HEIGHT THREE FEET OR LESS	
JEFFERSON	126 C	OAK BAY									
JEFFERSON	127 B	MARROWSTONE ISLAND - EAST SIDE	RURAL / PARK	ROAD ACCESS AVAILABLE ONLY	EAST BEACH PARK AT SITE		200	4.5	YES	NO	1700 FEET RIBBLE
JEFFERSON	128 D	LOWER HADLOCK	RURAL / SMALL TOWN	MOST NEARBY		N. NE - PRIVATE DOCK NEARBY	150	3	NO	YES	800 FEET FLOATING
JEFFERSON	129 D	IRONDALE	RURAL / RESIDENTIAL		SITE LOCATED SOUTH OF KALA PT. AND N. OF IRONDALE	NO NE	140	3.2	NO	YES	1100 FEET FLOATING
JEFFERSON	130 D	KALA POINT	RURAL	ROAD NEARBY, RESIDENTIAL UTILITIES ONLY	SITE LOCATED NORTH OF KALA PT.	DOCK AT SITE. PRIVATE?	300	7	YES	NO	500 FEET FIXED 1100 FEET FLOATING
JEFFERSON	131 A	PORT TOWNSEND - A	COMMERCIAL	ALL AT OR NEAR SITE	PLAN WOOD BARN & BOAT HAVEN	PORT TOWNSEND BOAT HAVEN - TWO SLIPS	350	8	YES	NO	1500 FEET RIBBLE OR FLOATING
		B	COMMERCIAL INDUSTRIAL	ALL AT OR NEAR SITE	REQUIRES REFRIG. GARGE TERMINAL RE-LOADER		600	15	YES	NO	2000 FEET RIBBLE OR FLOATING
JEFFERSON	132 D	POINT WILSON	FORT WILSON MILITARY RESERVATION	MOST NEARBY	VERY EXPOSED	LOCATED WEST OF PT WILSON LIGHTHOUSE			YES	NO	
JEFFERSON	133 D	MARROWSTONE IS. KILISNOA HARBOR	NATURAL / PARK	ROAD ACCESS, MOST UTILITIES NEARBY	SITE AT FOOT FLAGLER STATE PARK	LOCATED EAST OF MARROWSTONE LIGHTHOUSE	200	4.5	YES	NO	1600 FEET RIBBLE
JEFFERSON	134 C	PORT DISCOVERY - BELKETT POINT									
CLALLAM	135 C	DUNGENESS - SEQUIM									
CLALLAM	136 C	SEQUIM BAY WEST									
CLALLAM	137 C	DUNGENESS RIVER - EAST									
CLALLAM	138 C	GREEN POINT - EAST									
CLALLAM	139 D	EAST PORT ANGELES - MORSE CREEK	RURAL / RESIDENTIAL	NO NEAR SITE, SEE REMARKS NEARBY	SEE REMARKS	PORT ANGELES PLAT HAVEN - SEQUIM SLIP - TWO SLIPS - BOAT	210	8.5	YES	NO	200 FEET RIBBLE

POTENTIAL NEW MARINA SITES DESIGN CONSIDERATIONS

POTENTIAL MARINA SITES	WAVE CLIMATE AT SITE		TYPE AND LENGTH OF BREAKWATER	APPROX. EXISTING DEPTH OF WATER AT BREAKWATER (M.L.W.)	SHORESIDE LANDFILL REQUIREMENTS (MILES)	APPROXIMATE DREDGING REQUIRED (CHANNELS & MOORING AREA TO 12 M.L.W.)	WATER QUALITY POTENTIAL IMPACTS W/ MARINA DEVELOP.					AVIAN FAUNA/HABITAT
	EXPOSED: WAVE HEIGHT GREATER THAN THREE FEET	PROTECTED: WAVE HEIGHT THREE FEET OR LESS					EXISTING	FLUSHING	CIRCULATION	SEDIMENTATION	OTHER	
							CLASS AA3 - F&WS	OWDE OWDNR EPA	OWDE OWDNR EPA	OWDE OWDNR	BOD, DO, INORGANICS, COLIFORMS, WDE, DISSOLVED OXYGEN, TEMP - EPA	IMP. AREA FOR NESTING - BALD EAGLES, OTHER BIRDS, W. GREBE, WATERFOWL, BRANT - F&WS
5	YES	NO	1700 FEET RUBBLE	-3 FEET	2	150,000 CY	CLASS AA1 - F&WS	OWDE OWDNR EPA	OWDE OWDNR EPA	OWDE OWDNR	BOD, DO, INORGANICS, COLIFORMS, WDE, DISSOLVED OXYGEN, TEMP - EPA	IMPORTANT FEEDING & REST AREA - SEE REMARKS - F&WS
3	NO	YES	800 FEET FLOATING	-3 FEET	1.5 OF TIDE - LANDS	10,000 CY						
2	NO	YES	1100 FEET FLOATING	-16 FEET	3.5 OF TIDE - LANDS	50,000 CY						
7	YES	NO	500 FEET AVERAGE OF 15 FEET FIXED, 1100 FEET FIXED, 1100 FEET FLOATING - AVERAGE OF 12 FEET AT FLOATING		9 0.5 OF TIDE - LANDS							
8	YES	NO	1500 FEET RUBBLE OR FLOATING	-18 FEET	3	200,000 CY	CLASS A - F&WS	OWDNR OWDE EPA	OWDNR OWDE EPA	OWDNR OWDE	BOD, DO, INORGANICS, COLIFORMS, WDE, DISSOLVED OXYGEN - EPA	IMP. RESTING, FEEDING AREA - GOLDENEYE, OLD SQUAW, BUFFLEHEAD, RHINO AUKLET, CRITICAL AREA FOR CANVASBACK - F&WS
15	YES	NO	2000 FEET RUBBLE OR FLOATING	-12 FEET	7	500,000 CY						
	YES	NO										
4	YES	NO	1500 FEET RUBBLE	-6 FEET	2	60,000 CY	CLASS AA1 - F&WS	OWDNR OWDE EPA	OWDNR OWDE EPA	OWDNR OWDE	BOD, DO, INORGANICS, COLIFORMS, WDE, DISSOLVED OXYGEN, TEMP - EPA	CRIT. AREA FOR BALD EAGLE, N. GREBE, WATERFOWL, BRANT - F&WS
							CLASS AA3 - F&WS	OWDNR OWDE EPA	OWDNR OWDE EPA	OWDNR OWDE	BOD, DO, INORGANICS, COLIFORMS, WDE, DISSOLVED OXYGEN, TEMP - EPA	NESTING RHINO AUKLET, COM. MGRANTS, GULL-LEMONS, PUFFIN, GLAUCOUS-WINGED GULLS, W. GREBE, OSPREY - F&WS
							CLASS AA3 - F&WS	OWDNR OWDE EPA	OWDNR OWDE EPA	OWDNR OWDE	BOD, DO, INORGANICS, COLIFORMS, WDE, DISSOLVED OXYGEN, TEMP - EPA	MALLARD, W. GREBE, PIN-TAIL BRANT, CANVASBACK, BUFFLEHEAD, WIGEON - F&WS
							CLASS AA1 - F&WS	OWDNR OWDE EPA	OWDNR OWDE EPA	OWDNR OWDE	BOD, DO, INORGANICS, COLIFORMS, WDE, DISSOLVED OXYGEN, TEMP - EPA	BRANT RHINO AUKLET, CAN. DA GEESE, CRIT. FOR W. GREBE, MALLARD, PINTAIL - F&WS
							CLASS AA1 - F&WS	OWDNR OWDE EPA	OWDNR OWDE EPA	OWDNR OWDE	BOD, DO, INORGANICS, COLIFORMS, WDE, DISSOLVED OXYGEN, TEMP - EPA	IMP. AREA FOR BRANT RHINO AUKLET, SAND-PIPER, DUNLIN, SANDERLING, FLEVER GULL, DEERWATER, BRANT, OLD SQUAW - F&WS
							CLASS AA3 - F&WS	OWDNR OWDE EPA	OWDNR OWDE EPA	OWDNR OWDE	BOD, DO, INORGANICS, COLIFORMS, WDE, DISSOLVED OXYGEN, TEMP - EPA	RED-NECKED GREBE, RHINO AUKLET, LOON - F&WS
6	YES	NO	2000 FEET RUBBLE	-4 FEET	5.1	180,000 CY	CLASS AA1 - F&WS					RED-NECKED GREBE, PALLAS EMULE - F&WS

POTENTIAL NEW MARINA SITES ENVIRONMENTAL CONSIDERATIONS

AVIAN FAUNA/HABITAT	FISHERIES	PENTHIC ORGANISMS	AQUATIC VEGETATION	WETLANDS	WILDLIFE
IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES
IMP. AREA FOR NESTING - BALD EAGLES, OTHER BIRDS, WIGREBE, WATERFOWL, BRANT - FEWS	COMM. OTTER, TRAWLING, SALMON - FEWS, -WDF	INTER. T. A. - POT ADVERSE IMPACT TO SUBTIDAL GEO. SHELLFISH, COMM. SHELL - FEWS, -WDF, LITTLENECKS, BUTTERCLAMS, -WDF	EELGRASS MAJOR - WDG -WDF	MARSH MAJOR - WDG -WDF, SALICORN - WDG, DIS - WDNR, TIDALS, FJWS	HARBOUR SEALS - FEWS, BAL. EAG - F
IMPORTANT FEEDING & RESTING AREA - SEE REMARKS - FEWS	COMM. OTTER, TRAWLING, SALMON, CRIT. AREA FOR HERRING AND SURF & LONG FIN SMELT - FEWS, TRUE COD, HARD SHELL CLAMS - WDF	LITTLENECKS, BUTTERCLAMS - WDF, CLAMS - WDNR	EELGRASS - FEWS	WIDE, OWDNR	SEALS - FEWS, BAL. EAG - F
	TRUE COD - WDF				
	TRUE COD, HARDSHELL CLAMS - WDF				
IMP. RESTING, FEEDING AREA FOR GOLDENEYE, OLD SQUAM, SCOTER, RUFFLEND, RHINO AUKLET. CRITICAL AREA FOR CANVASBACK, KING, GUILLEMOT - FEWS	CRAB - WDF, COMM. OTTER, TRAWLING, SALMON, CRIT. AREA FOR HERRING AND SURF & LONG FIN SMELT - FEWS, TRUE COD, GEODUCKS CLAMS - WDF	SUBTIDAL GEO. SHELLFISH, COMM. SHELL - WDNR, WIDE	KELP - FEWS	WIDE, WDNR	CRIT. AREA FOR RIVER EAG, OTTER - FEWS, BAL. EAG - F
CRIT. AREA FOR BALD EAGLE, WIGREBE, WATERFOWL, BRANT - FEWS	HEKING, SEAKIN, CRAB, CRIT. AREA FOR SURF & LONG FIN SMELT, TRUE COD, GEODUCKS CLAMS - WDF	HARDSHELL CLAMS, SUBTIDAL GEO. SHELLFISH, DUCKS, OYSTERS - FEWS	EELGRASS - FEWS		BAL. EAG - F
RESTING, RHINO AUKLET, COR. PORRANTS, GULLS, REMOTS, PUFFINS, FLAUCOS, WINGED GULLS, WIGREBE, SPREY - FEWS	HEKING, SALMON, SEA - RUN, CRAB, TRUE COD, CRIT. AREA FOR TRAWLING - FEWS	INTER. T. A. SHELLFISH, SUBTIDAL GEO. SHELLFISH, DUCKS, LITTLENECKS, BUTTERCLAMS - WDF	EELGRASS MAJOR - WDG -WDF, KELP - FEWS	TIDAL MUD FLATS - FEWS, WIDE	BAL. EAG - F
MALLARD, SCOTER, WIGREBE, PIN, TAIL BRANT, CANVASBACK, RUFFLEHEAD, NIGEON - FEWS	SMELT, CRAB - WDF, HEKING - WDF, MAJOR - WDG	INTER. T. A. SHELLFISH, SUBTIDAL GEO. SHELLFISH, DUCKS, OYSTERS, BUTTERCLAMS - WDF	EELGRASS MAJOR - WDG -WDF, SEAGRASS - WDF	WIDE, WDNR	
BRANT, RHINO AUKLET, CAN. GEESE, CRIT. FOR W. WIGREBE, MALLARD, PINTAIL - FEWS	HEKING, SALMON, SEA - RUN, CRAB, CRIT. AREA FOR TRAWLING - FEWS	INTER. T. A. SHELLFISH, SUBTIDAL GEO. SHELLFISH, DUCKS, OYSTERS, BUTTERCLAMS - WDF	EELGRASS MAJOR - WDG -WDF, KELP - FEWS	TIDAL MUD FLATS, SALT MARSH - FEWS, WDNR	CRIT. AREA FOR RIVER EAG, OTTER - FEWS, BAL. EAG - F
IMP. AREA FOR BRANT, RHINO AUKLET, SANDP. DUNLIN, ANDERLING, GOV. GULL, ENEYE, SCOTER, RUFFLEHEAD, W. WIGREBE - FEWS	WIGREBE, SALMON, CRAB, CRIT. AREA FOR TRAWLING - FEWS, CRIT. AREA FOR HALIBUT - FEWS	INTER. T. A. SHELLFISH, SUBTIDAL GEO. SHELLFISH, DUCKS, OYSTERS, BUTTERCLAMS - WDF	EELGRASS MAJOR - WDG -WDF	SALT MARSH, TIDAL MUD FLATS - FEWS, WDNR	CRIT. AREA FOR RIVER EAG, OTTER - FEWS, BAL. EAG - F
RED-NECKED GREESE, RHINO AUKLET, LOON - FEWS	CRAB, ANA - WDF, DIPOMOUS FISH - WDF	WIGREBE, SALMON, CRAB, CRIT. AREA FOR TRAWLING - FEWS, CRIT. AREA FOR HALIBUT - FEWS	EELGRASS MAJOR - WDG -WDF, KELP - FEWS	WIDE, WDNR	CRIT. AREA FOR RIVER EAG, OTTER - FEWS, BAL. EAG - F
RED-NECKED GREESE, BALD EAGLE - FEWS	SALMON, CRAB, CRIT. AREA FOR TRAWLING - FEWS, CRIT. AREA FOR HALIBUT - FEWS	SUBTIDAL GEO. SHELLFISH, DUCKS, OYSTERS, BUTTERCLAMS - WDF			BAL. EAG - F

						REMARKS		
VEGETATION	WETLANDS	WILDLIFE		WDE	LOCATION			
RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES		SHORELINE MASTER PROGRAM DESIGNATION	SECTION, TOWNSHIP, RANGE, U.S.G.S. QUADRANGLE MAP			
		ENDANGERED SPECIES						
MAJOR-WDG	MARSH -WDG JALICORN -WDG DIS -WDG T. CHLIS, -WDG F&WS	MAJOR -WDG -WDG WDNR	HARBOR SEALS -F&WS	BALD EAGLE -F&WS	MAJOR -WDG -WDG WDNR EPA	CONSERVANCY: MARINA USE CONDITIONAL	SEC. 7, T29N, R1E NORDLAND	1) NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACT TO WATER QUALITY, WILDLIFE, WATERFOWL FISHERIES WETLANDS AND EELGRASS BEDS IMPORTANT AREA FOR BALD EAGLES AND HARBOR SEALS.
	OWDNR OWDNR	SEALS -F&WS	BALD EAGLE -F&WS	OWDNR OWDNR	CONSERVANCY: MARINA USE CONDITIONAL	SEC. 28, T30N, R1E NORDLAND	1) HMP. AREA FOR GOLDENEYES, BUFFLEHEADS, SCOTERS, OLD SQUAW RHINO AUKLET. CRIT. AREA FOR CANVASBACK. - F&WS 2) JEFFERSON CO: DEV. OF SITE MUST ACCOMMODATE NAT. HYDRAULICS. 3) LITTORAL DRIFT, EXPOSURE UNFAVORABLE.	
						SEC. 1, T29N, R1W NORDLAND PT. TOWNSEND S.		
						SEC. 35, T30N, R1W PORT TOWNSEND S.		
						SEC. 10, 11, T30N, R1W PORT TOWNSEND S.		
	OWDNR OWDNR	CRIT AREA FOR RIVER OTTER -F&WS	BALD EAGLE -F&WS	OWDNR OWDNR EPA	URBAN: MARINA USE PERMITTED	SEC. 10, 11, T30N, R1W PORT TOWNSEND S.	JEFFERSON CO: "EXIST. MARINA. IN BE EXPANDED TO WEST BUT NO FORMAL PLANS EXIST. THIS SITE DOES NOT CONFLICT WITH LOCAL PLANS FOR DREDGINGS."	
						SEC. 24, 35, T31N, R1W PORT TOWNSEND N.	1) JEFFERSON COUNTY INDICATES THAT NO CONFLICTS EXIST.	
			BALD EAGLE -F&WS			SEC. 18, T30N, R1E NORDLAND	JEFFERSON CO: "LIMITED EXPANSION OF MOORAGES AT PT FLAGLER DOES NOT CONFLICT WITH PLANS OR REGULATIONS IN ADJ. AREA, BUT PREFERENCE WOULD BE GIVEN COMMERCIAL CLAM HARVESTING."	
MAJOR-WDG	TIDAL MUD FLATS -F&WS	OWDNR OWDNR	BALD EAGLE -F&WS	OWDNR OWDNR	CONSERVANCY: MARINA USE CONDITIONAL	SEC. 24, T30N, R2W GARDNER	NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS TO COMMERCIAL SHELLFISH WETLAND, WATER QUALITY AND BALD EAGLE HABITAT	
MAJOR-WDG		OWDNR OWDNR		OWDNR OWDNR MAJOR -WDG	MARINA USE NOT PERMITTED	CL 30, T31N, R3W CL 41, T31N, R4W DUNGENESS	1) MARINA DESIGN NOT UNDERTAKEN BECAUSE MARINA USE CONFLICTS WITH SMP. 2) CLALLUM COUNTY NOT CONSIDERING THIS SITE FOR A MARINA	
MAJOR-WDG	TIDAL MUD FLATS, SALT MARSH -F&WS	OWDNR OWDNR		OWDNR OWDNR MAJOR -WDG	SUBURBAN: MARINA USE PERMITTED	SEC. 22, 21, T30N, R3W SEG 11M	1) NO MARINA DESIGN CONSIDERED: POTENT. SIGNIF. IMPACTS TO WATER QUALITY, WILDLIFE, BENTHIC ORGANISMS, WETLANDS, EELGRASS 2) SEE SITE 35 (2). 3) CITY OF D M FAVORS SITE 1 & MAR. 1A.	
MAJOR-WDG	SALT MARSH, TIDAL MUD FLATS -F&WS	OWDNR OWDNR	CRIT AREA FOR HARBOR SEAL, RIVER OTTER -F&WS OCTOPUS 4)	BALD EAGLE -F&WS PERC. GRAY FALCON 4)	OWDNR OWDNR MAJOR -WDG	RURAL: MARINA USE PERMITTED	SEC. 31 32, T32N, R3W DUNGENESS	1) NO MARINA DESIGN WAS CONSIDERED: POTENT SIGNIF. IMPACTS TO WATER QUAL, AVIAN FAUNA, BENTH. ORG, WETLANDS, EELGRASS. CRIT. HABITAT FOR CRAB 2) SEE SITE 135, REMARK 2.
MAJOR-WDG		OWDNR OWDNR	CIT. HARBOR SEAL, OCTOPUS 4)		OWDNR OWDNR	MARINA USE NOT PERMITTED	SEC. 6, 7, T30N, R4E HORSE CREEK, CARLSBORO	1) SEE SITE 135, REMARK 1 2) AREA DESIGNATED AS TRAIL FARM IN NORTHERN TIER PIPELINE APPLICATION.
			BALD EAGLE -F&WS				SEC. 5, 6, 7, T30N, R5W HORSE CREEK SITE WEST OF MOUTH	1) SEE SITE 135, REMARK 2. 2) POSS PROBLEMS: INSTABILITY OF RIVER CHANNEL & HIGH BLUFFS; SEDIMENTATION PROBLEMS.

[illegible]

Communication - May 1980.

5/	BOTTOM FISH. CRIT. AREA FOR PACIFIC HALIBUT - FEWS	GEODUKKS MARCEHELL CLAMS - WDF	CLAMS, SUB- TIDAL GEO- D. - FEWS			- FEWS
	WAB-WDF SALMON COMM. OTTER TRAIL - FEW STEELHEAD SEAKRILL THICAT 5/	O WDNR	TIDAL GEODUKKS 5/ ● WDNR - FEWS ● NDE	KE. P-WD. MAJOR-WDG	SALT MARSH 5/ ● WDNR ● NDE	MAJ
				KE. P. 5/		

IMINARY AND SUBJECT TO CHANGE.
ing and environmental studies

POTENT

FIGURE

			- FEWS		MORSE CREEK SITE WEST OF MOUTH OF MORSE CREEK	29 POSS. PROBLEMS: CHANNEL & HIGH BLUFFS; SEDIMENTA- TION PROBLEMS
MAJOR - WDG	SALT MARSH 3/	○ WDV ● WDE	○ WDN MAJOR - WDG	RURAL: MARINA USE PER- MITTED	SEC 35, T 31N, R 1W ANGELES PT	1) NO MARINA DESIGN CONSIDERED. POTENT. SIGNIF. IMPACTS TO WTR QUAL., BENTHIC ORG., WETLANDS, WILDLIFE 2) F&WS PLANS ENHANCEMENT OF SALMON, CUTT'WATER RUMS BY BYPASSING 2 DAMS UPSTREAM 3) SEE SITE 130, REMARK 2.
				URBAN: MARINA USE PER- MITTED	SEC 18, 19, T 32N, R 12W CLALLAM BAY SITE LOCATED EAST OF SERIU	
				MAKAI TRIBAL LAND	SEC 10, 11, T 33N, R 15W CAPE FLATTERY	COE HAS BEEN CONTACTED BY MAKAI TRIBAL (JUNKIL) REGARDING STUDY OF POTENTIAL MARINA IN NEAR BAY.

POTENTIAL FOR DEVELOPMENT WEST DIVISION

FIGURE 18 - SITE EVALUATION

EXISTING FACILITIES

POTENTIAL NEW MARINA SITE
DESIGN CONSIDERATION

COUNTY	SITE NO. INITIAL SITE EVAL	SITE NAME	EXISTING CONDITIONS AT SITE				NEW MARINA POTENTIAL		WAVE CLIMATE AT SITE		TYPE AND LENGTH OF BREAKWATER
			CURRENT LAND USE	UTILITIES & ROAD ACCESS AVAILABLE	OTHER	EXISTING MARINAS AT SITE	ESTIMATED NUMBER OF BOATS	APPROXIMATE MOORAGE AREA (ACRES)	EXPOSED: WAVE HEIGHT GREATER THAN THREE FEET	PROTECTED: WAVE HEIGHT THREE FEET OR LESS	
WHATCOM	1 C	POINT ROBERTS - EAST									
WHATCOM	2 C	BIRCH BAY				YES - 18 SLIPS					
WHATCOM	3 B	BLAINE ADDITION	COMMERCIAL	ALL AT OR NEAR SITE	PLAN IN- VOLVES EXISTING BLAINE BOAT HARBOR EXPANSION	YES - 385 SLIPS	500 EXPANSION OF EXISTING BLAINE SMALL BOAT HARBOR	12.0	110	YES	EXISTING
SAN JUAN	4 C	SUCIA ISLAND - FOSSIL BAY									
SAN JUAN	5 C	WALDRON ISLAND - COWLITZ BAY									
SAN JUAN	6 C	ORCAS ISLAND - EAST SOUND									
SAN JUAN	7 B	STUART ISLAND - REID HARBOR	NATURAL ALB. HARBOR STATE PARK	NONE AT SITE. ROAD NEAR BY.	PRIVATE AIRSTRIP OTHERWISE EGATS ONLY ACCESS TO ISLAND	EXISTING DOCK & FLANTS	115 60 B/ SEE RETURN 3)	2.5 1.5 B/	YES	NO	
SAN JUAN	8 D	SPIEDEN ISLAND	NATURAL	NONE	PRIVATE AIRSTRIP	SMALL PRIVATE DOCK					
SAN JUAN	9 C	ORCAS ISLAND - MASSAQUE BAY	RURAL/ RESIDENTIAL /NATURAL	NEXT NEAR SITE	PETER SITE AT WEST SOUND THAN AT MASSAQUE BAY	YES - WEST SOUND MARINA - 127 SLIPS THIS NEW SITE IS NE OF SHEEP ISLAND IN WEST SOUND	180	4	NO	1E	600 FEET FURPLE ON FLANTING
SAN JUAN	10 C	HENRY ISLAND - NELSON BAY									
SAN JUAN	11 D	SAN JUAN ISLAND - ROCHE HARBOR	RURAL/ COMMERCIAL RESORT	ALL FACIL- ITIES AT SITE		YES - ROCHE HARBOR RESORT - 154 SLIPS	150	3.5	NO	1E	FLANTING PRELIM. WATER MAY BE REQUIRED
SAN JUAN	12 C	SHAW ISLAND - SQUAW BAY									
SAN JUAN	13 C	ORCAS ISLAND - GRINDSTONE HARBOR									
SAN JUAN	14 B	ORCAS ISLAND - DEER POINT	RURAL/ NATURAL	RIMZ ACCESS ONLY	AIRPORT AND FERRY SERVICE TO ISLAND		7.0	8.0	YES	NE	2.5 FB SUGAR PLANTING 3.5 FEET RISIN

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SAN JUAN	14 B	ADAMS ISLAND - DRUM POINT	RURAL/ NATURAL	ROAD ACCESS NEARBY	WILDLIFE AND FISH SERVICE TO ISLAND	150 13/ SEE REMARK 2)	3.0 13/			RUBBLE & FLOATING 300 FEET RUBBLE OF FLO. 41. NS 13/	
SKAGIT	15 A	SINCLAIR ISLAND - EAST	RURAL	ROAD ACCESS NEARBY		200 SITE LOCATED ON SOUTHEAST SIDE OF SINCLAIR ISLAND, NORTH OF SINCLAIR ISLAND LIGHT	4.5	YES	NO	130 FEET RUBBLE	
SAN JUAN	16 D	MITCHELL BAY	RURAL/ COMMERCIAL	MOIST AT COASTLINE SITE	PLAN CON- SISTS OF EXPANSION OF EXISTING MARINA. PERMIT IS CURRENTLY UNDER REVIEW BY CORP.	YES - SHUG HARBOR MARINA EXPANSION OF EXISTING SHUG HARBOR MARINA 100 SLIPS	2	NO	YES		
SAN JUAN	17 C	SHAW ISLAND - PARKS BAY									
SKAGIT	18 C	WILLIAM POINT - PADILLA BAY									
SKAGIT	19 C	SAMISH BAY - NORTH END									
SKAGIT	20 A	ANACORTES ADDITION	COMMERCIAL / 12 NATURAL	YES - ALL AT OF NORTH SITE	PLAN IN- VOLVES EXPANSION OF EXIST- ING MARINA	YES - CAP- SANTO SMALL BOAT HAVEN - 491 SLIPS	140 ADD'L MOORAGES 3 ADD'L 450 ADD'L MOORAGES 13/ 10 ADD'L 13/	NO	YES	ADEQUATE BLEAK - WATER EXIST- ING MARINA	
SKAGIT	21 A	GUEMES ISLANDS IN	RURAL/ RESIDENTIAL	NONE AT SITE. PO- TENTIAL FOR PRO- BLEMS WITH SEWER & WATER	PRIVATE FERRY SERVICE TO ANACORTES AREA	NONE	100 SITE NEXT TO KELLY'S POINT, NEAR SOUTH SHORE DRIVE	2.3	YES	NO	1100 FEET RUBBLE & FLOATING
SAN JUAN	22 B	DECATUR ISLAND - FAUNTLEURY POINT	RURAL/ RESIDENTIAL		LANDING STRIP ON ISLAND		200 SITE 1/4 MILE SOUTH OF FAUNTLEURY POINT	7	YES	NO	1200 FEET RUBBLE
SAN JUAN	23 B	BLAKELY ISLAND - ARMITAGE ISLAND	RURAL	ROAD ACCESS NEARBY	NO FERRY ACCESS TO ISLAND		125 SITE ON BLAKELY ISLAND ACROSS FROM ARMITAGE ISLAND	2.8	YES	NO	700 FEET FIXED
SAN JUAN	24 C	LOPEZ ISLAND - SHOAL BAY									
SAN JUAN	25 B	LOPEZ ISLAND - FISHERMAN BAY	RURAL/ RESIDENTIAL	NONE AT SITE. ROADS NEARBY.		YES - THE ISLANDER LOPEZ - 6" SLIPS	300 180 13/ SEE REMARK 3)	6 40 13/	NO	YES	
SAN JUAN	26 D	TURN ISLAND	NATIONAL WILDLIFE REFUGE / STATE PARK	TOILET FACILITY CAMPING & FACILITIES ONLY	SMALL DOCK FRIDAY HARBOR SANTUAN ISLAND NEARBY	50 SITE ON SOUTHERN SIDE OF TURN ISLAND, NEAR FACILITY AREA CAMPING	1.0	YES	NO	250 FEET FIXED	

1/ Represents designation of site based on results of agency screening in 1979:

- A - No initial environmental agency opposition to marina development at site.
- B - Initial environmental agency concern over portion of site.
- C - Environmental agency opposition to site, or development prohibited by Shoreline Management Act.
- D - Site added at request of U.S. Fish and Wildlife Service or by Corps of Engineers and have not been screened by environmental agencies.

2/ Estimated impact of marina development on resources at site:

- No impact
- Moderate impact
- High impact

NOTE: THE ENGINEERING AND ENVIRONMENTAL ASSESSMENTS SHOWN IN THIS MATRIX ARE PRELIMINARY AND SUBJECT TO CHANGE. Unforeseen and possibly severe impacts may come to light as marina engineering and environmental studies

3/ Water Quality

- Class AA
- Class A
- Class B
- Class C

4/ Washington

5/ Washington

6/ Washington

7/ U.S. Env

(Notations
with solid

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14. In 1979 the state legislature changed the inshore mile offshore to 200 yards offshore or the -18 foot shore. As a result, many locations shown in the that could be affected by marina construction; Wa

7/ U.S. Environmental Protection Agency; input - January 9, 1979, September 4, 1980. (Notations for flushing and circulation usually represent projections for marinas with solid breakwaters).

of Game; input - November 15, 1979.

of Social and Health Services; input - January 12, 1979.

Service; input - November 27, 1979.

of Ecology. Coastal Zone Atlas of Washington, Vol's 1,2,3,4. May 1979.

Olympia, Washington - personal communication, May 1980.

rs (COE) considered two potential marinas for this area.

islatore changed the inshore boundary for geoduck harvesting from 1/4
yards offshore or the -18 foot depth contour, whichever is farther off-
many locations shown in the matrix will have geoduck harvest potential
ed by marina construction; Washington Department of Fisheries, Sept. 1980

POTENTIAL
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FIGURE 16

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			MAJOR - WDG	BLAKELY ISLAND	2) SEE REMARK 2) FOR SITE 4
	WDNR WDE	HARBOUR SEALS - F&WS	WDNR WDE	RURAL: MARINA USE PERMITTED SEC. 10, 15, T36N, R1E CYPRESS ISLAND	NO FERRY ACCESS TO SITE, LACK OF MARINA SUPPORT FACILITIES
				SEC. 35, T36N, R4W ROCHE HARBOR	
MAJOR - WDG	WDNR WDE		WDNR WDE MAJOR - WDG	MAKINA USE NOT PERMITTED SEC. 32, T36N, R2W SHAW ISLAND	SEE REMARK 1) FOR SITE 1
MAJOR - WDG	WDNR WDE		WDNR WDE MAJOR - WDG	SEC. 37, 34, T36N, R2E ANACORTES N.	NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS ON WATER QUALITY, WETLANDS, BENTHIC ORGANISMS, AND UPLAND WILDLIKE POPULATIONS
	WDNR WDE	BALD EAGLE, PEREGRINE, GRINSEY	WDNR WDE MAJOR - WDG	SEC. 7, 8, T36N, R3E BELLINGHAM S.	NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS ON WATER QUALITY, WETLANDS, SEDIMENTATION PATTERNS, HERRING POPULATIONS, BENTHIC ORGANISMS, AND INTRUSION INTO CRITICAL HABITAT AREA FOR BALD EAGLES AND PEREGRINE FALCONS.
	SALT MARSH - F&WS WDNR WDE MINIMAL - EPA	SEALS - BALD EAGLE - F&WS	WDNR WDE	CONSERVANCY: MARINA USE CONDITIONAL SEC. 18, T35N, R2E ANACORTES N	POTENTIAL EXPANSION OF CAP SANTE MARINA WOULD CONFORM TO LOCAL PLANS AND REGS. COE ISSUED DREDGING PERMIT FOR CAP SANTE WTWY, FWS INDICATES AREN SOUTH OF CAP SANTE MARINA HIGHLY POLLUTED WITH WOOD DEBRIS.
	WDNR WDE MINIMAL - EPA	BALD EAGLE - FEWS	WDNR WDE	RURAL: MARINA USE PERMITTED SEC. 14, T35N, R1E CYPRESS ISLAND	ADDITIONALLY, IMP WINTER FEEDING AREA FOR SCORPIONANTS, DIVING JACKS, GULLS, AND ALBIS IN LG. NUMBERS. CRITICAL WATERFOWL AREA - FEWS 2) FWS INDICATES THAT MARINA DEVELOPMENT WOULD HAVE MINIMAL IMPACT TO WILDLIFE.
MAJOR - WDG	WDNR WDE	CENTRAL AREA FOR RIVER OTTER - F&WS	WDNR WDE MAJOR - WDG	CONSERVANCY: MARINA USE CONDITIONAL SEC. 15, 22, T35N, R1W BLAKELY ISLAND	1) SEE REMARK 2) FOR SITE 4
MAJOR - WDG	WDNR WDE	VERTICAL AREA FOR RIVER OTTER - F&WS	WDNR WDE MAJOR - WDG	SUBURBAN: MARINA USE PERMITTED SEC. 10, T35N, R1W BLAKELY ISLAND	1) SEE REMARK 2) FOR SITE 4)
MAJOR - WDG	WDNR WDE	BALD EAGLE - FEWS	WDNR WDE MAJOR - WDG	CONSERVANCY: SUBURBAN: MARINA USE CONDITIONAL PERMITTED SEC. 1, T35N, R2W BLAKELY IS, SHAW IS	NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS ON WATER QUALITY, WETLANDS, EELGRASS BEDS, BENTHIC ORGANISMS, HERRING POPULATIONS AND BALD EAGLE HABITAT. (SEE REMARK 2) FOR SITE 4
MAJOR - WDG	WDNR WDE MINIMAL - EPA	BALD EAGLE - FEWS	WDNR WDE	SUBURBAN: MARINA USE PERMITTED SEC. 22, T35N, R2W SHAW ISLAND	1) MAJOR WATER FOWL AREA - WDN 2) SEE REMARK 2) FOR SITE 4 3) SITE LOCATED NEAR ENTRANCE TO FISHERMAN BAY
		HARBOUR SEALS, BALD EAGLE, PEREGRINE, GRINSEY, CENTRAL AREA FOR RIVER OTTER - F&WS		SEC. 13, T35N, R2W SHAW ISLAND	1) SEE REMARK 2) FOR SITE 4 3) SEE REMARK 1) FOR SITE 16

POTENTIAL FOR DEVELOPMENT

NORTH DIVISION

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FIGURE 16 - SITE EVALUATION

EXISTING FACILITIES

POTENTIAL NEW MARINA SITE DESIGN CONSIDERATION

COUNTY	SITE NO. INITIAL SITE EVALY	SITE NAME	EXISTING CONDITIONS AT SITE				NEW MARINA POTENTIAL		WAVE CLIMATE AT SITE		TYPE AND LENGTH OF BREAKWATER
			CURRENT LAND USE	UTILITIES & ROAD ACCESS AVAILABLE	OTHER	EXISTING MARINAS AT SITE	ESTIMATED NUMBER OF BOATS	APPROXIMATE MARINA MOORAGE AREA (ACRES)	EXPOSED WAVE HEIGHT GREATER THAN THREE FEET	PROTECTED WAVE HEIGHT THREE FEET OR LESS	
SAN JUAN	27 C	SAN JUAN ISLAND - FRIDAY HARBOR									
SAN JUAN	28 A	FRIDAY HARBOR ADDITION	COMMERCIAL	YES - ALL ARE AT OR NEAR SITE	PLAN INVOLVES EXPANSION OF EXISTING FRIDAY HARBOR MARINA	YES - FRIDAY HARBOR MARINA - 287 SLIPS	338 ADD'L MOORAGES	20	NO	YES	1000 FEET FLOATING
SAN JUAN	29 C	SAN JUAN ISLAND - FALSE BAY									
SAN JUAN	30 C	SAN JUAN ISLAND - GRIFFIN BAY									
SAN JUAN	31 B	LOPEZ ISLAND - OUTER BAY	RURAL / PARK / RESIDENTIAL	NONE AT SITE, ROAD ACCESS ONLY.	ADJOINS COUNTY PARK		300 100 5/ SEE REMARK 5	6 2.2 5/	NO	YES	1000 FEET RUBBLE 100 FEET RUBBLE
SAN JUAN	32 C	LOPEZ ISLAND - HUNTER'S BAY									
SKAGIT	33 C	BURROWS BAY									
ISLAND	34 C	SKAGIT BAY - DUGWALLA BAY									
SKAGIT	35 B	LA COINER - MARTINS BAY (INDIAN BAY)	RURAL / RESIDENTIAL	ALL NEAR SITE	POSSIBLY ON INDIAN RESERVATION. MAY INVOLVE RELOCATION OF HOUSES	SHELTING BAY MARINA, PRIVATE YACHT CLUB - 301 SLIPS	200 SITE ON EASTERN SIDE OF MARTINS BAY EAST OF FISHERMAN ISLAND	5.7	YES	NO	900 FEET RUBBLE
ISLAND	36 C	POINT PARTRIDGE									
ISLAND	37 D	WHIDBEY ISLAND - WEST BEACH	NATURAL / RURAL	NONE AT SITE, ROAD NEARBY.	AMALTY IN EEL		25 SITE SOUTH OF WEST POINT, APPROXIMATELY 1 MILE	7	YES	NO	200 FEET FIXED
ISLAND	38 A	OAK HARBOR - SOUTH	COMMERCIAL / PARK	NONE AT SITE, ROAD NEARBY	ALL TRAIL, BOAT RAMP AT SITE.	NONE AT SITE, CAN HARBO MARINA NEARBY.	5 1 - 5/ SEE REMARK 2	12 4 5/	YES	NO	1500 FEET FLOATING 600 FEET FLOATING
ISLAND	39 A	OAK HARBOR - NORTH	COMMERCIAL	ALL AT OR NEAR SITE	PLANS INVOLVE EXPANSION OF EXISTING OAK HARBOR MARINA	YES - 1 MARINA, 1 MARINA - 383 SLIPS	5 1 - 5/ SEE REMARK 3	11.0 4 - 5/	YES	NO	600 FEET FLOATING 400 FEET FLOATING EXISTING BREAKWATER
ISLAND	40 B	SKAGIT BAY - MTSALADY	NATURAL BLUFFS / RESIDENTIAL	NONE AT SITE, ROAD NEARBY		YES - 1 MARINA, 1 MARINA - 150 SLIPS	150 5/	25	NO	YES	600 FEET RUBBLE

IAL NEW MARINA SITES N CONSIDERATIONS

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CLIMATE AT SITE		TYPE AND LENGTH OF BREAKWATER	APPROXIMATE DEPTH OF WATER AT BREAKWATER (ALLW)	SHORESIDE LANDFILL REQUIRED (ACRES)	APPROXIMATE DREDGING REQUIRED (CHANNELS & MOORAGE AREA TO 12' ALLW)	WATER QUALITY					AVIAN FAUNA/HABITAT	
USED: HEIGHT LESS THAN 3 FEET	PROTECTED: WAVE HEIGHT THREE FEET OR LESS					POTENTIAL IMPACTS W/ MARINA DEVELOPMENT					IMPACTABLE RESOURCES	IMI
						EXISTING	FLUSHING	CIRCULATION	SEDIMENTATION	OTHER		
						CLASS AA - F&WS	W DNR W DE	W DNR W DE	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE	COOPER'S HAWK BALD EAGLE - F&WS	SALM. BOTTO FISH - F - W
NO	YES	1000 FEET FLOATING	AVERAGE DE-40 FEET			CLASS AA - F&WS	W COE W COE	W COE	W COE	TEMPORARY TURBIDITY DURING CONSTRUCTION - COE COLIFORM - WDE	BALD EAGLE GOLDEN EAGLE OSPREY, PEREGRINE, FALCON * NOT IN PROJECT AREA ON ISLAND TRUMPETER SWANS COOPER'S HAWK COE	SALM. BOTTO FISH - COE
						CLASS AA 3/	W DNR W DE	W DNR W DE	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE	SCALP SCISSOR, GREBS 14/ LOONS 14/	COMM. SALM. AREA
						CLASS AA 3/	W DNR W DE	W DNR W DE	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE		COMM. SALM. AREA
NO	YES	1000 FEET RUBBLE 700 FEET RUBBLE 5/	0 0 5/	3 7 5/	70,000 CY 50,000 CY 5/	CLASS AA - F&WS	W DNR W DE MINIMAL - EPA	W DNR W DE MINIMAL - EPA	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE DO, TEMP: MINIMAL - EPA	CRIT AREA FOR BALD EAGLE - F&WS	SPOTS BOTTO ING -
						CLASS AM - F&WS	W DNR W DE EPA	W DNR W DE EPA	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE TEMP. DO: MINIMAL - EPA	CRIT. AREA FOR BALD AND GOLDEN EAGLES - F&WS MAJOR WATER-FOWL AREA - W DNR	HERRING CRAB BOTTO FISH -
						CLASS AA 3/	W DNR W DE	W DNR W DE	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE		COMM. SALM. AREA
						CLASS A 3/	W DE W DNR	W DE W DNR	W DE W DNR	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE	BLACK BRANT 6/	1) HERRING CRAB 2) MAJOR WATER FOWL AREA
YES	NO	900 FEET RUBBLE	0		400,000 CY	CLASS A 3/	W DNR W DE EPA 2	W DNR W DE EPA	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE TEMP. DO: MINIMAL - EPA		HERRING CRAB - W SEE ADD
						CLASS AA 3/	W DE W DNR	W DE W DNR	W DE W DNR	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE		COMM. SALM. AREA
YES	NO	500 FEET FIXED	6 FEET	1.0	250,000 CY	CLASS AA - F&WS	W DNR W DE	W DNR W DE	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE	W. GREBE, WATERFOWL - F&WS	COMM. SALM. FISH COMM. TIDE FISH
YES	NO	1500 FEET FLOATING 800 FEET RUBBLE 5/	0 0 5/		350,000 CY 150,000 CY 5/	CLASS AA - F&WS	W DNR W DE MINIMAL - EPA	W DNR W DE MINIMAL - EPA	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE TEMP. DO: MINIMAL - EPA		SMELT - W - ALAN BOTTO ING AREA SMELT
YES	NO	900 FEET FLOATING 400 FEET RUBBLE (EXTENSIVE EXISTING BREAKWATER)	AVERAGE 11 FEET AVERAGE 12 FEET 5/	2.3	250,000 CY 250,000 CY 5/	CLASS A - F&WS	W EPA W DE W DNR	W EPA W DE W DNR	W WIE W WIE W DNR	TEMP. DO: MINIMAL - EPA BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE	W. GREBE, WATERFOWL - F&WS	CRIT. FOR S. SALM. BOTTO ING SEE
NO	YES	800 FEET RUBBLE	0	1.1	100,000 CY	CLASS A - F&WS	W DNR W DE MINIMAL	W DNR W DE MINIMAL	W DNR W DE	BOD, DO, COLIFORMS, ORGANICS, INORGANICS - WDE	AREA IMP. FOR W. GREBE, BALD EAGLE - F&WS	SMELT - W SALM. RUN CH

WATERWAY/HABITAT	FISHERIES	BENTHIC ORGANISMS	AQUATIC VEGETATION	WETLANDS	WILDLIFE
IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES
					ENDANGERED SPECIES
1. SALMON, BOTTOM FISHING - F&WS - WDF	0 WDNR 0 WDE	0 WDNR 0 WDE	EELGRASS MAJOR - WDG KELP-F&WS	0 WDNR 0 WDE	AREA UNIT FOR RIVER OTTER - F&WS BALD EAGLE - F&WS 0 WDNR 0 WDE
2. COE * NOT IN PROJECT AREA, ON ISLAND	SALMON, BOTTOM FISHING - COE	POLYCHAETES, CLAMS, SHRIMP, CRABS AND OTHER INVERTEBRATES - COE	EELGRASS, ALGAE, MUD, STRAW, LAMINARIA, ECTOCARPUS (ALGAE), ABUNDANT DIATOMS - COE	0 COE	RIVER OTTER - COE BALD EAGLE, PEREGRINE FALCON - COE 0 MIN. MAJOR
3. COMMERCIAL SALMON AREA - WDF	0 WDNR 0 WDE	0 WDNR 0 WDE MAJOR - WDG	EELGRASS MAJOR - WDG - WDG	0 WDNR 0 WDE	0 WDNR 0 WDE MAJOR - WDG
4. COMMERCIAL SALMON AREA - WDF	0 WDNR 0 WDE	0 WDNR 0 WDE	EELGRASS MAJOR - WDG - WDG	0 WDNR 0 WDE	0 WDNR 0 WDE
5. SPORTS & BOTTOM FISHING - F&WS	0 WDNR 0 WDE	INTERSTITIAL SHELLFISH, BUTTER CLAMS - WDF	EELGRASS MAJOR - WDG - WDG	0 WDNR 0 WDE	0 WDNR 0 WDE BALD EAGLE - F&WS
6. HERRING CRAB - WDF BOTTOM FISHING - F&WS	0 HERRING - WDNR 0 WDE	INTERSTITIAL SHELLFISH, SHRIMP - WDF	EELGRASS MAJOR - WDG - WDG	0 WDNR 0 WDE	0 WDNR 0 WDE BALD EAGLE - F&WS
7. COMMERCIAL SALMON AREA - WDF	0 WDNR 0 WDE	SHRIMP, POSSIBLE LITTLENICKS - WDF	KELP - WDG - MAJOR - WDG	0 WDNR 0 WDE	0 WDNR 0 WDE
8. HERRING, SMELT, CRAB MAJOR - WDG SURF SMELT - WDNR PROJECT PLANNED - WDF	0 WDNR 0 WDE 0 WDNR	POSSIBLE INTERSTITIAL SHELLFISH, LITTLENICKS - WDF POTENTIAL RAFT CULTURE AREA	EELGRASS 6/	0 WDE 0 WDNR	0 WDNR 0 WDE MAJOR - WDG
9. HERRING - WDF SEE #39, 2 ABOVE	0 WDNR 0 WDE	GYNETES - WDF		0 WDNR 0 WDE	0 WDNR 0 WDE
10. COMMERCIAL SALMON AREA - WDF	0 WDE	SUBTILAL GEODUCKS - W, F POTENTIAL ALGAL VEGETATION IMPACT ON COMMERCIAL SHELLFISH - WDSMS MAJOR - WDG 0 WDE 0 GEODUCKS - WDNR	ALGAE, KELP - WDG - WDG	0 WDE 0 WDNR	0 WDNR 0 WDE MAJOR - WDG
11. COMM. SALMON FISHING, COMM. OTTER TRAWL F&WS		SUBTILAL GEODUCKS 8/ - 1 & WS SUBTILAL HARD SHELL CLAMS - WDF			
12. SMELT - WDF SALMON, BOTTOM FISHING, CRIT. AREA FOR SMELT - F&WS	0 WDNR 0 WDE SEE 44, 2 BELOW			0 WDNR 0 WDE	0 WDNR 0 WDE
13. CRIT. AREA FOR SALMON, BOTTOM FISHING - F&WS SEE 44, 2 BELOW	0 WDE 0 WDNR			0 WDNR 0 WDE 0 WDNR	0 WDNR 0 WDE 0 WDNR
14. SMELT CRAB - WDF SALMON, SEA-RUN CUTTHROAT TROUT AREA CRIT. FOR	0 SURF SMELT - WDNR 0 WDE SEE 39, 2	INTERSTITIAL SHELLFISH, SUBTILAL GEODUCKS, LITTLENICKS - WDF POTENTIAL RAFT		0 WDNR 0 WDE	0 WDNR 0 WDE BALD EAGLE - F&WS

REMARKS

VEGETATION	WETLANDS	WILDLIFE		WDE	LOCATION		
E RESOURCES	IMPACTABLE RESOURCES	IMPACTABLE RESOURCES		SHORELINE MASTER PROGRAM DESIGNATION	SECTION, TOWNSHIP, RANGE, U.S.G.S. QUADRANGLE MAP		
			ENDANGERED SPECIES				
MAJOR - WDG	0 WDNR 0 WDE	AREA SUIT FOR RIVER OTTER - FEWS	BALD EAGLE - FEWS	0 WDNR 0 WDE	MARINA USE NOT PERMITTED	SEC. 11, 12, T35N, R3W FRIDAY HARBOR NORTH OF EXISTING MARINA.	1) MARINA DESIGN NOT UNDERTAKEN: CONFLICTS WITH SMP 2) SAN JUAN COUNTY DID NOT RESPOND TO COE LETTERS REQUESTING COMMENTS.
0 COE	0 COE	RIVER OTTER - COE	BALD EAGLE PEREGRINE FALCON - COE	0 MINI-MAL * ON ISLAND NOT PROTECTED		SEC. 12, T35N, R3W FRIDAY HARBOR THIS SITE IS LOCATED SOUTH OF SITE 27	1) COE CURRENTLY CONDUCTING DETAILED PROJECT REPORT STUDY FOR EXPANSION OF SPIRAL BOAT HARBOR. DRAFT REPORT SCHEDULED FOR AGENCY REVIEW IN DEC. 80.
MAJOR - WDG	0 WDNR 0 WDE			0 WDNR 0 WDE MAJOR - WDG	MARINA USE NOT PERMITTED	SEC. 33, T35N, R3W FALSE BAY	MARINA DESIGN NOT UNDERTAKEN, AS MARINA USE CONFLICTS WITH SMP. 2) SEE REMARK 2) FOR SITE 27.
MAJOR - WDG	0 WDNR 0 WDE			0 WDNR 0 WDE	MARINA USE NOT PERMITTED	SEC. 1, T34N, R3W FALSE BAY	1) SEE REMARK 1) FOR SITE 27. 2) SEE REMARK 2) FOR SITE 27.
MAJOR - WDG	0 WDNR 0 WDE		PALM EAGLE - FEWS	0 WDNR 0 WDE	UNSECTED MARINA USE CONDITIONAL	SEC. 24, T34N, R2W RICHARDSON	1) SEE REMARK 2) FOR SITE 27 2) SITE NEXT TO RABE BEACH COUNTY PARK
MAJOR - WDG	0 WDNR 0 WDE		BALD EAGLE - FEWS	0 WDNR 0 WDE MAJOR - WDG	SUBURBAN MARINA USE PERMITTED	SEC. 6, 7, T34N, R1W LOPEZ PASS	1) NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY SIGNIFICANT IMPACTS TO WATER QUALITY, WETLANDS AND DELTAIC HABITAT AND INTERUSION INTO CRITICAL HABITAT FOR SHALFISH, SARIMP AND WILDLIFE 2) SEE REMARK 2) FOR SITE 27
MAJOR - WDG	0 WDNR 0 WDE			0 WDNR 0 WDE	MARINA USE NOT PERMITTED	SEC. 2, 16, T34N, R1E DECEPTION PASS	SEE REMARK 1) FOR SITE 1
	SALT MARSH, ALGAL COMMUNITIES 61 0 WDE 0 WDNR			MAJOR - WDG 0 WDE 0 WDNR	MARINA USE NOT PERMITTED	SEC. 7, 8, T33N, R2E CRESCENT HARBOR	SEE REMARK 1) FOR SITE 1
	0 WDNR 0 WDE			0 WDNR 0 WDE		SEC. 2, T33N, R2E ANACORTES SOUTH CRESCENT HARBOR	POTENTIAL FILTATION AND BANK STABILITY PROBLEMS
MAJOR - WDG	0 WDE 0 WDNR			MAJOR - WDG 0 WDE 0 WDNR	MARINA USE NOT PERMITTED	SEC. 25, T32N, R1W PORT TOWNSEND N.	1) SEE REMARKS FOR SITE 1 2) ISLAND COUNTY UNABLE TO ASSESS CONSISTENCY OF POTENTIAL MARINA AT THIS SITE WITHOUT ADDITIONAL DATA.
						SEC. 34, T34N, R1E DECEPTION PASS	1) SEE REMARK 2) FOR SITE 36 2) SITE WILL BE EVALUATED FOR ENVIRONMENTAL CONCERNS DURING AGENCY REVIEW OF DRAFT REPORT.
	0 WDNR 0 WDE	MAJOR - WDG - FEWS		0 WDNR 0 WDE	SHORELINE MASTER PROGRAM DESIGNATION	SEC. 2, T32N, R1E OAK HARBOR	1) SEE REMARK 2) FOR SITE 36 2) SITE IS ADJACENT TO BEACH PARK BOAT RAMP. 3) CITY OF OAK HARBOR HAS NO MARINA DEVELOPMENT REQUESTS FOR THIS SITE
	MAJOR - WDG - FEWS 0 WDE 0 WDNR	MAJOR - WDG - FEWS		0 WDNR 0 WDE	SHORELINE MASTER PROGRAM DESIGNATION	SEC. 1, 12, T32N, R1E OAK HARBOR	1) SEE REMARK 2) FOR SITE 36 2) SITE IS EXPANSION OF EXISTING MARINA 3) CITY OF OAK HARBOR CONSIDERS A SITE ADJACENTLY NORTH OF HARBOR TO OFFER ALTERNATIVES.
	0 WDNR 0 WDE	BALD EAGLE - FEWS		0 WDNR 0 WDE	SHORELINE MASTER PROGRAM DESIGNATION	SEC. 24, T32N, R2E UTSALADY	1) SEE REMARK 2) FOR SITE 36. 2) SITE'S ADJACENT TO UTSALADY PT.

ISLAND	40 B	SKAGIT BAY- WTSALADY	NATURAL BLUFFS/ RESIDENTIAL	NONE AT SITE, ROAD NEARBY	YES-TAN- NOD CAN- AND PRI- VATE YACHT CLUB UN- DER CON- STRUCTION NEAR BY	150 300 5/ SEE REMARK 3	3.5 6.0 5/	NO	YES	800 FEET RUBBLE 1200 FEET RUBBLE 5/
ISLAND	41 C	POINT SUERH- CAMANO ISLAND								
ISLAND	42 D	CAMANO ISLAND- ONAMAC POINT	RESIDEN- TIAL/ CONSERVAN- CY	MIST NEARBY	NEW WATER SOURCE NEE: TO BE DEVEL- OPED	360	8	YES	NO	1900 FEET RUBBLE
ISLAND	43 D	WHISKEY ISLAND- RALE LAGOON	RURAL	NEARBY/ ADDITIONAL REQUIRED		200	4.6	NO	YES	50 FEET FIXED
ISLAND	44 C	PLENN COVE								
ISLAND	45 D	WHISKEY ISLAND- KEISTONE	PORT JACET STATE PARK, ISLAND CITY KEY- STONE UNDER WATER PUMP AT SITE	MADE WATER PUMP SEWER AT OR NEAR SITE	FERRY FRAY P.O. T. DONT SEND DOG INSIDE KEYSTONE HARBOR	75 SITE AT HEAD OF KEYSTONE HARBOR, CARP SITE FERRY LANDING	1.3	YES	NO	150 FEET FIXED
ISLAND	46 D	CAMANO ISLAND- MARANA	RURAL/ RESIDEN- TIAL	MIST NEAR BY, ROAD AVAILABLE TO SITE DENSE WATER POTENTIAL HOLDERS		350	5.5	YES	NO	140 FEET RUBBLE
ISLAND	47 A	LAIGLEY- SUNRISE BEACH	COMMERCIAL	YES-MOST ARE AT OR NEAR SITE	YES-CITY OF LANG- LEY DOCK	400 200 5/ SEE REMARK 3	9.0 4.5 5/	YES	NO	1500 FEET RUBBLE OR FLOATING 1000 FEET RUBBLE OR FLOATING 5/
ISLAND	48 C	HOLMES HARBOR								
ISLAND	49 C	ADMIRALTY INLET- MUTINY BAY	RESIDEN- TIAL/ RURAL	MIST AT OR NEAR SITE	YES- MUTINY BAY RESORT - 15 SLIPS	200 200 5/	4.0 4.0 5/	YES	NO	1600 FEET RUBBLE 1500 FEET RUBBLE 5/
ISLAND	50 C	WISELESS BAY- MAXWELTON								
ISLAND	51 B	CULTUS BAY EXPANSION	RURAL AND RESIDENTIAL	ALL NEARBY	SANDY HOOK PRIVATE YACHT CLUB- TO WET SLIPS	225 SITE AT HEAD OF CULTUS BAY	5	NO	YES	NONE REQUIRED
WHATCOM	82 C	HALE PASSAGE- EAST								

1/ Represents designation of site based on results of agency screening in 1979:

- A - No initial environmental agency opposition to marina development at site.
- B - Initial environmental agency concern over portion of site.
- C - Environmental agency opposition to site, or development prohibited by Shoreline Management Act.
- D - Site added at request of U.S. Fish and Wildlife Service or by Corps of Engineers and have not been screened by environmental agencies.

2/ Estimated impact of marina development on resources at site:

- No impact
- Moderate impact
- High impact

3/ Water Quality

Class A
Class A
Class B
Class C

4/ Rev Van W

5/ The Corps

6/ Washington

7/ Langley C

NO	YES	800 FEET RUBBLE	0	1.1	100,000 CY	CLASS A - F&WS	0 WDNR 0 WDE MINIMAL - EPA	0 WDNR 0 WDE MINIMAL - EPA	0 WDNR 0 WDE	0 BOD, DO, COLIFORMS, ORGANICS, INORGANICS, TEMP, DO: MINIMAL - EPA	AREA IMP. FOR W. GREBE, BALD EAGLE. - F&WS MAJOR WATER-FOWL AREA - WDNR
		1200 FEET RUBBLE 5/	0 5/	3 5/	150,000 CY 5/	CLASS A 3/	0 EPA 0 WDE 0 WDNR	0 EPA 0 WDE 0 WDNR	0 WDE 0 WDNR	0 TEMP, DO - EPA 0 BOD, DO, COLIFORMS, INORGANICS, ORGANICS - WDE	
YES	NO	1900 FEET RUBBLE	-15 FEET		150,000 CY	CLASS A - F&WS					MAJOR WATERFOWL AREA - WDNR
NO	YES	500 FEET FILL		MINIMAL	200,000 CY	CLASS A - F&WS					MAJOR WATER-FOWL AREA - WDNR, CRIT. FOR BALD EAGLE - F&WS SEE REMARKS
						CLASS A 3/	0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE	0 INORGANICS, BOD, DO, COLIFORMS, ORGANICS, TEMP, DO - EPA	5. SURFACED CL. TURNSTONE, SOFTER BUFFLEHEAD, GOLDEN-EYE, CANAS-BACK 6/
YES	NO	150 FEET FILL				CLASS A - F&WS					MAJOR WATER FOWL AREA - WDNR
YES	NO	1400 FEET RUBBLE	0		120,000 CY	CLASS A - F&WS					CRIT. AREA FOR BALD EAGLE. IMP. FOR COMMON & SANDPEWS, GOLDEN-EYE, SEE REMARKS.
YES	NO	1500 FEET AVERAGE RUBBLE OR FLOATING 1000 FEET AVERAGE RUBBLE OR FLOATING 5/	7 -12 FEET 5/		50,000 CY 50,000 CY 5/	CLASS A - F&WS	MINIMAL - EPA 0 WDE 0 WDNR	MINIMAL - EPA 0 WDE 0 WDNR	0 WDE 0 WDNR	TEMP, DO: MINIMAL - EPA 0 BOD, DO, COLIFORMS, ORGANICS, INORGANICS, TEMP, DO: - WDE	IMP. AREA FOR COMMON & SANDPEWS, GOLDEN-EYE, BUFFLEHEAD, OLD SQUAW, WHITE-WINGED, SURF SCOTER - F&WS
						CL 4 - 5	0 WDE 0 EPA	0 WDE 0 EPA	0 WDE	0 BOD, DO, COLIFORMS, ORGANICS, INORGANICS, TEMP, DO: - EPA	IMP. AREA FOR COMMON & SANDPEWS, GOLDEN-EYE, BUFFLEHEAD, OLD SQUAW, SCOTER, BALD EAGLE - F&WS SEE REMARKS
YES	NO	1600 FEET RUBBLE	-2 FEET		150,000 CY	CLASS AA 3/					SEE REMARKS BALD EAGLE - F&WS
		1500 FEET RUBBLE 5/	0 5/	2 5/	150,000 CY 5/	CLASS AA - F&WS	0 WDNR 0 WDE MINIMAL - EPA	0 WDNR 0 WDE MINIMAL - EPA	0 WDNR 0 WDE	0 BOD, DO, COLIFORMS, ORGANICS, INORGANICS, TEMP, DO: MINIMAL - EPA	MAJOR WATER-FOWL AREA - CRIT. HATCH - WDNR NESTING BALD EAGLE, W. GREBE - F&WS
NO	YES	NONE REQUIRED	N/A	2.5		CLASS AA - F&WS	0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE 0 EPA	0 WDNR 0 WDE	0 BOD, DO, COLIFORMS, ORGANICS, INORGANICS, TEMP, DO: - WDE	MAJOR WATER-FOWL AREA - WDNR BALD EAGLE, HERON FEEDING AREA 4/
						CLASS AA OR A - F&WS	MINIMAL - EPA 0 WDNR 0 WDE	MINIMAL - EPA 0 WDNR 0 WDE	0 WDNR 0 WDE	0 TEMP, DO: MINIMAL - EPA 0 BOD, DO, INORGANICS, COLIFORMS, ORGANICS - WDE	MAJOR WATER-FOWL AREA - WDNR NESTING BALD EAGLES - F&WS SEE REMARKS.

In 1979: 3/ Water Quality Rating, Washington State Water Quality Standards, Dept. of Ecology, Olympia, Washington, December 19, 1979:

ent at site.

ited by

Corps of

ies.

Class AA - Extraordinary
Class A - Excellent
Class B - Good
Class C - Fair

4/ Rex Van Wormer, F&WS, Olympia, Washington - personal communication, May 1980.

5/ The Corps of Engineers (COE) considered two potential marinas for this area.

6/ Washington Department of Ecology. Coastal Zone Atlas of Washington, Vol's. 1,2,3,4. May 1979

7/ Langley Chamber of Commerce has indicated that permanent moorage in this area is high priority.

8/ In 1979 the state led offshore to 700 yards. As a result, many led be affected by marit

NOTE: THE ENGINEERING Unforeseen and p are conducted an

	WDMR WDE		BALD EAGLE -FEWS	WDR WDE	RESIDENTIAL MARINA USE PERMITTED	UTSALADY	1) SEE REMARK 2) FOR SITE 36
WDG	EPA WDE WDNR			WDE WDNR		SEC. 7, 18, T31N, R3E JUNIPER BEACH	1) SEE REMARK 2) FOR SITE 36 2) NO MARINA DESIGN WAS CONSIDERED DUE TO POTENTIALLY ST. FLICENT IMPACTS TO WATER QUALITY, FIS. RESOURCES, ISLANDS AND WILDLIFE.
						SEC. 10, T31N, R2E CAMANO	1) SEE REMARK 2) FOR SITE 36 2) SEE REMARK 2) FOR SITE 37
			BALD EAGLE -FEWS			SEC. 7, T31N, R2E CAMANO	1) A IMP. FOR COMMON & BAY W'S G. PENEYE BUFFLEHEAD, OLD SWAN, WHITE-WINGED & SAFF SCOTER-FWS 2) SEE REMARK 2) FOR SITE 36 3) POTENTIAL FLUSHING PROBLEMS. 4) SEE REMARK 2) FOR SITE 37
	WDMR WDE EPA			WDMR WDE MAJOR		SEC. 32, T32N, R1E COUPEVILLE	SEE REMARK 2) FOR SITE 36
						SEC. 22, T31N, R1E COUPEVILLE	1) SEE REMARK 2) FOR SITE 36 2) SEE REMARK 2) FOR SITE 37
			BALD EAGLE -FEWS			SEC. 10, 13, T30N, R3E LANGLEY	1) ALSO IMP. FOR BUFFLEHEAD, OLD SWAN, WHITE-WINGED & SAFF SCOTER-FWS 2) SEE REMARK 2) FOR SITES 36 AND 37 3) SITE EXPOSED, SOME EROSION OF ADJACENT LANDS PROBABLE. STEEP BLUFFS MAY BE UNSTABLE.
	MINIMAL EPA WDE WDNR			WDE WDNR	URBAN MARINA USE PERMITTED	SEC. 34, T30N, R3E LANGLEY	1) SEE REMARK 2) FOR SITE 36 2) SMALL BOAT BASIN FOR THIS SITE STUDIED BY COG. IN 1971. DETAILED STUDIES NOT PURSUED DUE TO LACK OF LOCAL FUNDING AVAILABLE. 3) SEE FOOTNOTE 1/
WDG	WDE EPA	RIVER OTTER -FEWS	BALD EAGLE -FEWS	WDE MAJOR WDG		SEC. 14, 35, T30N, R2E FREELAND	1) MAJOR WATERFOWL AREA - WDMR THEREFORE, MARINA DESIGN NOT UNDERTAKEN 2) SEE REMARK 2) FOR SITE 36 3) PORT DISTRICT OF SOUTH WHIDBEY ISLAND DESIRES ADDITIONAL COG. STUDIES AT THIS SITE
			BALD EAGLE -FEWS			SEC. 16, T29N, R2E FREELAND	1) SEE REMARK 2) FOR SITES 36 AND 37 2) SITES LOCATED IN MID-MUTINY BAY
	TIDAL MUD FLAT, SALT MARSH -FEWS WDE		BALD EAGLE -FEWS	WDMR WDE	URBAN MARINA USE PERMITTED	SEC. 5, T28N, R3E MAXWELTON	1) SEE REMARK 2) FOR SITE 36 2) SEE REMARK 3) FOR SITE 48
	TIDAL MUD FLAT, SALT MARSH -FEWS WDE MINIMAL EPA		BALD EAGLE -FEWS	WDMR WDE	RURAL CONSERVANCY MARINA USE PERMITTED CONDITIONAL	SEC. 14, T28N, R3E MAXWELTON	SEE REMARK 2) FOR SITE 36 HIGH SILTATION AREA. MAINTENANCE MAY BE HIGH. FLUSHING AND CIRCULATION MAY BE PROBLEM.
WDG	WDMR WDE		BALD EAGLE -FEWS	WDMR WDE	CONSERVANCY MARINA USE CONDITIONAL	SEC. 34, T30N, R1E SEC. 2, 3, T37N, R1E ANACORTES 1951	1) IMPORTANT AREA FOR BRANT, GREBS, LOONS, CORMORANTS, DIVING, DUCKS, ALBIDS, GULLS -FEWS 2) MAJOR WATERFOWL AREA - FWS. THEREFORE MARINA DESIGN NOT UNDERTAKEN

POTENTIAL FOR DEVELOPMENT NORTH DIVISION

FIGURE 16 - SITE EVALUATION