

# HOOD CANAL COORDINATING COUNCIL

JULY 15, 1988

## FINAL REPORT

G0088041

### HOOD CANAL SHELLFISH AND RECREATION STUDY

### HOOD CANAL VIDEO PROJECT

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1988

PUBLISHED BY [REDACTED]  
[REDACTED] WASHINGTON COUNTY DEPARTMENT OF COMMUNITY DEVELOPMENT  
DIVISION STREET • PORT ORCHARD, WASHINGTON 98366



Hood Canal Coordinating Council,

STATUS REPORT  
HOOD CANAL COORDINATING COUNCIL  
COASTAL ZONE MANAGEMENT GRANT

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NOV 4 1987

Abstract

Title: Hood Canal Project Completion Report

Author: Hood Canal Coordinating Council

Subject: This report summarizes the activities of the Hood Canal Coordinating Council toward accomplishing a Recreational opportunities study and a video tape presentation of the Coordinating Councils work toward development of a process by which three Counties and Two Tribal Nations should consider the care and development of land and water resources associated with Hood Canal.

Date: June 30, 1988

Departments:

Department of Ecology, Kitsap County, Jefferson County, Mason County, Clallam Indian Tribe, Skokomish Indian Tribe, and the Point No Point Treaty Council.

Source of Copies:

Copies may be obtained from the Kitsap County Department of Community Development, 614 Division, Port Orchard, Washington 98366.

WDOE Project Number: G 0088041

Series Number: 03

Number of Pages:

Abstract:

The Priority Goal of the Hood Canal Coordinating Council is to preserve and maintain water quality within Hood Canal. The various jurisdictions that exist along the shores of Hood Canal realized that to accomplish the goal of preserving that water quality a coordinated approach was going to have to be a priority for all of them. In addition to setting this goal the jurisdictions realized that the relation ship of a great many actions by the counties and tribes were involved and that goals and policies for each of these areas and concerns would be necessary to guide the jurisdictions along there collective path. This process and the associated resources they have sought to preserve and maintain is the subject of the Hood Canal video Tape presentation. During this process areas for more study were identified. One of which was to study commercial and recreational opportunities through out the Canal and identify areas where more use could compatibly occur.

## STATUS REPORT

### Project Title:

Development of Hood Canal Resource Planning Video and Analysis of Economic and Environmental Impacts of Expanded Recreational Access and Related Shellfish Harvesting on the Canal.

### Project Description:

The Hood Canal Coordinating Council's Grant Project consists of the following two work elements:

Element 1: An analysis of economic and environmental impacts associated with increased recreational access and Commercial shellfish production.

The intent of this work element is to determine the full economic value of both the recreational; and commercial shell fish harvest in Hood Canal and the environmental and economic impacts of increasing recreational access to the Canal. The Council will work with treaty tribes, local, state and federal agencies, economic development councils as well as private industry.

### Task 1:

Work with the three county Economic Development Councils to develop guidelines for the study and its use, distribution and potential funding participation.

Status: The program director of the Hood Canal Coordinating Council meet with representative of the Economic development Councils of Mason, Jefferson and Kitsap County to determine how much participation both financial and physical the Economic Development Councils desired after reviewing the scope of work for the project. The Economic Development Councils desired to act as an advisory committee to review the progress on the project and offered any information that was available from the Economic Development Council and their members for use by the student intern to be utilized. Guidelines for the study and its use were discussed with the student intern. Distribution of the study was agreed to be to members of the advisory group first before recommendation to the Council and broad distribution to the general public. The study was intended for distribution to the public as part of the Hood Canal Coordinating Council work program. The Economic Development council of Mason County volunteered their Council members to match the Grant to be used in kind and to assist in the gathering of new information, area surveys if necessary and for sample presentations of the study before release. The advisory committee has meet to review information presented by the student intern and has been polled by phone on critical concerns repeatedly. First, they reviewed and commented on the original scope of work and student intern's proposal to meet that scope of work. Secondly, they have reviewed the work as it has progressed in draft form. Finally they have commented on the final presentation of the study in conjunction with the Hood Canal Coordinating Council staff.

Task 2:

Work with area colleges and/or available environmental intern programs to provide staff skilled in recreational economics and environmental issues. Develop an agreement and hire by contract.

Status: The Hood Canal Coordinating Council staff advertized for services in the local paper and placed notices with the area colleges requesting students who might be interested to contact the Hood Canal Coordinating Council Staff. The Puget Sound Water Quality Authority was also notified and the Department of Ecology as well as The National Environmental Intern Program (EIP) Northwest. Four qualified applicants were reviewed by the Hood Canal Coordinating Council Staff and executive board and a recommendation made to the full Council to hire an Intern for the project. Attachment "A" includes the contract with Steven Boessow for the Study utilizing the Scope of Work Coordinated with the Economic Development Councils/ Tribal Advisory Committee.

Task 3:

Work with intern to develop an analysis of recreational and commercial shell fish activity on Hood Canal identifying where, when, how much and who uses these resources as well as dollars spent by categories direct and indirect.

Status: The Hood Canal Coordinating Council Program Director worked with the intern to develop and analysis of recreational and commercial shellfish activity on Hood Canal. Information from the Mason County Economic Development council as well as an Environmental Impact Statement prepared for an aquaculture project in Kitsap County greatly advanced this project. Inventories available from the Department of Fisheries, Department of Wildlife, and Department of Social and Health Services as well as information from the three County Planning and health departments was reviewed, compiled and digested in order to develop sufficient data to begin to identify where, when and how much these resources are used and by whom. Information from the Washington State Department of Trade and Economic Development was used to identify and estimate the amount of money spent by users of these resources. Local information by personal interview and on site survey by the intern and other persons was very helpful in establishing the where, when and how much of the cash flow that is direct or indirect within the Hood Canal region and that is attributable to the shellfish and recreational interest. Staff meet through out the period on at least a monthly basis to review progress reports of the intern during the completion of the project. Attachment "B" contains the outline of the draft report of the Intern presented to the Advisory committee.

Task 4:

Identify conflicting uses of the Canal, locations, user and other interest groups, significant resource areas and review data with agencies and tribes in relationship to goals and policies of the HCCC.

Status: Uses of the Canal were mapped by the intern and staff of the Hood Canal Coordinating Council early on in the process utilizing land use maps of the Counties, Department of Ecology Coastal Zone Atlas and personal knowledge of participants on the Advisory committee. The intern and Staff of the Hood Canal Coordinating Council then met with tribal representative to compare notes on land uses and to identify conflicting uses with tribal fishing and other resource activities. Staff also worked with boaters and recreational users including scuba divers, clam diggers, and oysters growers on a formal survey as well as an informal basis by doing personal interviews on conflicting activities at various locations during on site surveys of recreational opportunities. The intern then developed an analysis in relation to the Hood Canal Coordinating Council Goals and policies for presentation to the Council.

Task 5:

Identify and existing local and state programs and policies affecting Hood Canal resource management and analyze strengths and weaknesses and recommend improvements.

Status: The Intern meet with representatives of the State Departments of Ecology, Parks, Fisheries, and Game to identify existing local and state programs and policies affecting Hood Canal resource management. Members of the local Oyster and Shellfish industries were more than willing to cooperate in a critique of programs and to provide individual insight. It is difficult from these comments to sort out the "stories" from the actual impacts but some conclusions about these programs and recommendations for improvements have been made and are included. The draft study outline is included as attachment "B".

Task 6:

Identify economic and environmental impacts of shellfish harvesting by recreational and commercial users. Estimate impacts of increased recreational and commercial use and identify criteria for appropriate locations.

Status: The intern utilized a number of County Environmental Impact studies as well as information from the Department of Ecology, Department of Social and Health Services, and The Department of Agriculture and graduate papers available from the University of Washington, and Evergreen College. Comparing regional figures with the slight amount of local information that is available from tribal and State sources that is directly attributable to the Hood Canal region. An estimate of impacts of harvesting of recreational and commercial users in a general way is possible. Increased use can then be estimated in a similar manner but with much less reliability due to the scarcity of specific information. What data is available has been noted and for future reference the sources identified so that as better information is made available the accuracy of the estimates tested and refined for future use. The final intern's report is attached by this reference as EXHIBIT "F".

ELEMENT 2: Development of a hood canal resources planning video

The Hood Canal Coordinating Council will develop a video tape presentation depicting the unique role the Council has planned in dealing with the difficult regional problems at the local level. Emphasis will be on the environmental features (geology, hydrologic and habitat) and the benefits of local cooperation.

Task 1:

Identify consultant interested in preparing video.

Status: The Hood Canal Coordinating Council published a Request for proposal and received four written proposals which were reviewed by the full Council and a selection made.

Task 2:

Develop and execute contract for the production of video.

Status: The Firm of North Pacific Film and Tape was selected by the full Council to provide a video tape. The Consultant Contract, budget and schedule is included as attachment "C".

Task 3:

Develop concept of video presentation and present to Hood Canal Coordinating Council including proposed visual and verbal concepts.

Status: The Hood Canal Coordinating Council requested that the Applicants for the video project include the proposed presentation and verbal concept for the consideration of receipt of the contract such that different concepts and ideas could be developed quickly and the decision as to both concept selection and consultant completed in a timely manner so that additional time would be available to the consultant to accomplish the final product. The visual and verbal concept then became the scope of work of the consultant Contract. The scope of work is included in the contract attachment "C".

Task 4:

Identify activities to be video taped and select appropriate visual presentation.

Status: The Hood Canal Coordinating Council Program Director worked with the Consultant to identify activities to be video taped which included activities of the tribes, and volunteers as well as those of the Council and Staff of the Jurisdictions as they went about the task of improving water quality and identifying resources important to the Council. Since emphasis is placed upon geology, hydrology and habitat the resources of tribal biologist and activities of the tribes toward habitat enhancement were of particular interest. The activities of community groups that were involved in monitoring, creek enhancement and establishing base line studies were thought to be most interesting if the tape is to be used for presentation for encouraging other groups to be actively involved in maintaining water quality in other areas or even to continue to encourage citizen participation among residents along and surrounding Hood Canal.

Task 5:

Develop Sound Track and Key to visual.

Status: The preliminary sound tract was prepared by the Consultant and reviewed by members of the Hood Canal Coordinating Council's Education Committee. The Consultant then keyed the sound tract to the visual presentation and has shown the preliminary tape to the key persons on the Education Committee prior to final preparation of a draft to the Executive Committee of the Council. A written description of the draft tape is attached as attachment "D".

Task 6:

Review draft video with executive committee.

Status: The Executive Board reviewed the draft video during June 1988 and developed a schedule for presentations to the full HCCC. The Education Committee was directed to establish a schedule for review of the final video with the Economic Development Councils of the Three Counties and to utilize the Video at Hood Canal Coordinating Council Exhibits at the Kitsap County Fair August, 1988, Mason County Fair, August 1988, and Jefferson County Fair. The Shelton, Washington Oyster feast in October 1989 was also suggested as well as the Oceans Festival currently proposed for April, 1989 at the Kitsap Pavilion, Bremerton, Washington.

Task 7:

Present final video to Hood Canal Coordinating Council.

Status: The Hood Canal Coordinating Council received the final video and six copies at the Hood Canal Coordinating Council July 1989 meeting. The Public was encouraged to attend and notices of the availability of the tape presentation were distributed such that additional community groups may utilize the video presentation. The Council has contracted under a separate program for the services of The Adopt A Beach program to identify and train volunteers for use in monitoring local streams, and for work with area farmers and tribal agencies in the Hood Canal Area such that the use of the video for such training and education purposes has received many screenings. The video tape is attached by this reference as attachment "E" but is under separate cover.

APPENDIX

A STEVEN BOESSOW CONTRACT  
B DRAFT SHELLFISH AND RECREATION STUDY OUTLINE  
C NORTH PACIFIC FILM AND TAPE CONTRACT  
D DRAFT VIDEO SOUNDTRACK TEXT  
E ABSTRACT FOR VIDEO TAPE UNDER SEPARATE COVER  
F FINAL SHELLFISH AND RECREATION STUDY

APPENDIX A  
STEVEN BOESSOW CONTRACT

## AGREEMENT FOR CONSULTANT SERVICES

THIS AGREEMENT, made by and between Kitsap County, 614 Division, Port Orchard, WA hereinafter referred to as "COUNTY", and STEVEN N. BOESSOW, hereinafter referred to as "CONSULTANT", residing at 1406 N. Puget Olympia, Washington 98506.

### WITNESSETH

IN CONSIDERATION of the mutual covenants and conditions herein contained the parties do hereby agree as follows:

#### 1. General

COUNTY engages CONSULTANT to furnish the services hereinafter mentioned upon the covenants and conditions of this Agreement, at the compensation herein stipulated, and CONSULTANT accepts said engagement upon said terms.

#### 2. Duties of CONSULTANT: Services to be Performed by CONSULTANT

CONSULTANT shall perform such duties and services as are listed on EXHIBIT 'A' attached hereto, signed by the parties, hereby referred to and made a part hereof by reference. Said services shall be performed in accordance with the time frame specified in EXHIBIT 'A'.

#### 3. Services or Materials to be Performed or Furnished by COUNTY

COUNTY shall perform such services or furnish such materials to CONSULTANT in connection with the performance of this Agreement as set forth on EXHIBIT 'B', attached hereto signed by the parties, hereby referred to and made a part hereof by reference. If there are no entries on said EXHIBIT 'B', it is agreed that COUNTY shall not be required to provide any services or furnish any materials to CONSULTANT in connection with this Agreement. Unless otherwise provided on EXHIBIT 'B', all said services and materials will be furnished by COUNTY to CONSULTANT without cost to CONSULTANT.

#### 4. Payment by COUNTY, Time and Manner of Payment

COUNTY shall pay CONSULTANT for all services to be rendered by it and all materials to be furnished by it under this Agreement, the amount specifically set forth and in the manner specifically set forth on EXHIBIT 'C', attached hereto, signed by the parties, hereby referred to and made a part hereof by reference. CONSULTANT agrees to accept said sum as full compensation for all services due under this Agreement.

#### 5. Additional Work

The CONSULTANT shall be entitled to extra compensation for services or materials not otherwise required under this Agreement, provided the COUNTY shall first have requested such extra services or materials in writing, but in no event shall COUNTY be liable for payment unless the amount of such extra compensation shall first have been agreed to in writing by COUNTY.

6. Professional Skill

CONSULTANT represents that he is skilled in the professional calling necessary to perform the work agreed to be done by it under this Agreement. COUNTY relies upon the skill of CONSULTANT to do and perform its work in the most skillful manner, and CONSULTANT agrees to thus perform its work, and the acceptance of its work by COUNTY shall not operate as a release of CONSULTANT from said Agreement.

7. Prohibited Interest

No member, officer, or employee of COUNTY shall have any interest, direct or indirect, in this Agreement or in the proceeds thereof.

8. Equal Employment Opportunity

CONSULTANT shall not discriminate against any employee or applicant for employment because of race, creed, color or national origin.

9. Compliance with Laws

CONSULTANT shall endeavor to comply with all Federal, State and local laws, statutes, ordinances, rules and regulations and the orders and decrees of any courts or administrative bodies or tribunals in any manner affecting the performance of the Agreement.

10. Independent Contractor

CONSULTANT is acting as an independent contractor in furnishing the services or materials and performing the work required by this Agreement and is not an agent, servant or employee of COUNTY.

11. Indemnity

CONSULTANT agrees to indemnify and save harmless COUNTY their officers and employees from any and all costs, expenses, claims, liabilities or damages, known or unknown, to persons or property heretofore or hereafter arising out of or in any way connected with the negligent acts, errors or omissions of the CONSULTANT, its officers, employees, agents, contractors, subcontractors or any officer, agent, or employee thereof for work performed under this Agreement.

12. Insurance: Workers Compensation

CONSULTANT agrees to comply with all State requirements relating to Workers' Compensation Insurance.

13. County Representative

The Planning Department of COUNTY, through Clyde Stricklin, shall represent COUNTY in all matters pertaining to the services to be rendered under this Agreement; all requirements of COUNTY pertaining to the services and materials to be rendered under this Agreement shall be coordinated through said COUNTY representative.

14. Consultant Representative

The President of CONSULTANT shall represent CONSULTANT in all matters pertaining to the services and materials to be rendered under this Agreement all requirements of CONSULTANT pertaining to the services or materials to be rendered under this Agreement shall be coordinated through the CONSULTANT representative.

15. Notices

Unless otherwise provided herein, all notices required hereunder shall be given by certified mail, postage prepaid and addressed to the party at the address indicated in the opening paragraph of this Agreement provided, however, that in lieu thereof, notice may be given by personal delivery to the party at said address.

16. Reports

Unless otherwise provided herein, the CONSULTANT shall submit written progress reports to the COUNTY with each billing statement.

17. Title to Documents

All original calculations, design notes, reports and other material or documents developed or used by the CONSULTANT and its subcontractors in connection with the performance of this Agreement shall be the property of the COUNTY and shall be made available to the COUNTY by the CONSULTANT as follows:

A. Completion of Agreement:

As provided in EXHIBIT 'A' and EXHIBIT 'C' and, upon completion of the terms of this Agreement, the CONSULTANT shall furnish the required number of copies of its Reports and quality reproducible transparencies of all drawings and maps in a form acceptable to the COUNTY. All reports, documents, and materials shall bear the name of the CONSULTANT.

B. Termination of Agreement:

Upon receipt of a notice of termination, pursuant to the terms of the Agreement, the CONSULTANT shall: (1) promptly discontinue all services

affected (unless the notice directs otherwise); (2) promptly notify all subcontractors and/or others providing related services to discontinue those services accordingly; and, (3) deliver in a satisfactory form to the COUNTY copies of data, drawings, specifications, reports, estimates, summaries, and such other information and materials as may have been accumulated by the CONSULTANT and his subcontractors in performing this Agreement.

C. Use of Documents:

The intended use of these documents, reports, and materials is to provide CONSULTANT services, said work program more fully set forth in EXHIBIT 'A'. The CONSULTANT will not be liable for the re-use of these documents, reports, and materials for any use other than that intended use, without the expressed written consent of CONSULTANT.

18. Assignment:

Neither party shall assign or sublet any portion of this Agreement without the written consent of the other party in writing.

19. Termination

Without limitation to such rights or remedies as COUNTY shall otherwise have by law, COUNTY shall also have the right to terminate this Agreement for any reason upon written notice to CONSULTANT. In the event of such termination, CONSULTANT shall be compensated for the actual services performed or materials furnished through the date of receipt of notification from COUNTY to terminate.

20. Schedule and Completion of Studies

The CONSULTANT shall commence work authorized by this Agreement following its execution. All work authorized by this Agreement shall be satisfactorily completed five (5) months following its execution.

21. Best Professional Effort

The CONSULTANT acknowledges that the performances and services provided herein are important elements of this Agreement; accordingly the CONSULTANT shall put forth its best professional effort to complete the work in accordance with the schedule provided.

22. Entire Agreement; Amendment

This writing constitutes the entire Agreement between the parties relating to the services to be performed or materials to be furnished hereunder. No modification hereof shall be effective unless and until such modification is evidenced by writing signed by all parties to this Agreement.

23. Miscellaneous

All covenants herein shall be conditions. Time shall be of the essence. Failure on the part of either party to enforce any provision of this Agreement

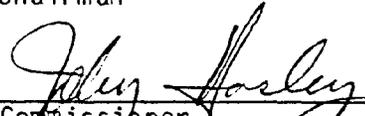
shall not be construed as a waiver or the right to compel enforcement of such provision or any other provision. The singular number shall include the plural, and the masculine gender shall include the feminine gender and neuter gender whenever the context of this Agreement permits.

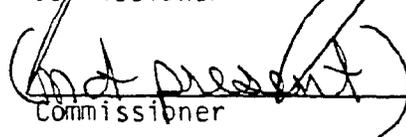
24. In the event legal action is instituted between COUNTY and CONSULTANT arising out of this Agreement the prevailing party shall be entitled to recover, in addition to costs, a reasonable attorney fee to be determined by the court, including an appellate court.

IN WITNESS WHEREOF, the parties have hereunto set their hands the day and year first above written.

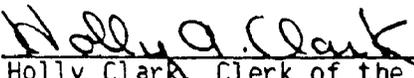
BOARD OF COUNTY COMMISSIONERS  
KITSAP COUNTY, WA

  
\_\_\_\_\_  
Chairman

  
\_\_\_\_\_  
Commissioner

  
\_\_\_\_\_  
Commissioner

ATTEST:

  
\_\_\_\_\_  
Holly Clark, Clerk of the Board

CONSULTANT

BY:   
\_\_\_\_\_

Attachments:

EXHIBIT 'A' CONSULTANT Services

EXHIBIT 'B' COUNTY Services

EXHIBIT 'C' Compensation Amount and Manner

The CONSULTANT certifies that it complies with all State requirements relating to Worker's Compensation Insurance as required in CONSULTANT Agreement.

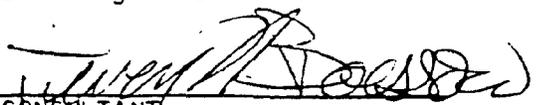
BY:   
\_\_\_\_\_  
CONSULTANT

EXHIBIT 'A'  
SCOPE OF SERVICES

A. RECREATION STUDY -- Consultant will conduct research on the environmental and economic impacts of water-based recreational activities in the Hood Canal watershed. Research will be presented to the full Council in June of 1988 in the form of a written report and oral testimony to the Council.

Consultant will work with an advisory group of state, local and tribal governments, ports and economic development councils, in developing the research guidelines for the project. Particular attention shall be given to assisting counties in gathering information to update local parks and recreation plans.

Consultant will keep a record of activities and expenses and will report weekly to the Program Director on the progress of the project. The following information will be included in the final report:

Part I -- Abstract, overview and introduction.

Part II -- Current recreational uses of the Canal: descriptions of activities, agencies with management/enforcement responsibilities; seasons; openings; access sites; inventories of facilities.

Part III -- Economic impacts to the Watershed: licenses, fees, state funding, local businesses (convenience stores, lodging and services.) Included also in this section would be local costs to provide services, such as emergency services, road and public dock maintenance and repair, traffic control, garbage/sewage disposal, and enforcement activities.

Part IV -- Environmental impacts from recreational activities. This probably will be based on theoretical impacts, more than specifically identified or documented impacts, and should include a discussion of both impacts and mitigative measures currently taken or identified as successful. Closures, with possible causes, on recreational shellfish beaches should be discussed.

Part V -- Questionnaire results. A questionnaire will be developed with the assistance of the advisory group to determine local recreational uses and needs. Results will be used in forming recommendations for long-term recreational planning.

Part VII -- Findings and recommendations. To also be included in this section would be identification, if needed, of additional access sites to the Canal, and potential funding sources; synthesis with HCCC Shellfish Study; and recommendations to the Council for further action/investigation.

Part VIII -- Bibliography

B. SHELLFISH STUDY -- Consultant will conduct research on the economic value of commercial and recreational shellfish harvest in the Hood Canal watershed. Research will be presented to the full Council in June of 1988 in the form of a written report and oral testimony to the Council.

Consultant will work with an advisory group of state, local and tribal governments, ports and economic development councils, in developing the research guidelines for the project. The Mason County EDC has conducted a similar study and has donated all findings and original research materials to the Council to assist in this study. The Point-no-Point Treaty Council also has data that will be used in the study. Consultant will conduct surveys of existing economic data and literature and survey/interview shellfish growers, tribal fishermen and people involved in recreational harvest.

Consultant will keep a record of activities and expenses and will report weekly to the Program Director on the progress of the project. Written monthly reports will be submitted with vouchers. The following information will be included in the final report:

PART I -- Introduction: Abstract, statement of purpose and methodology.

PART II -- Overview and narrative on historical use of the Canal for shellfish harvest. To be included would be a discussion of tribal harvest activities, treaty rights and the Boldt decision. (Section on tribal activities to be the responsibility of HCCC Program Director.)

PART III -- Present activity, harvest site identification, economic value and species.

PART IV -- Physical properties of the Canal as they impact growing/harvest conditions.

PART V -- Potential for increasing harvest, habitat enhancement and aquaculture techniques.

PART VI -- Threats to resource, including water quality data from county/tribal surveys, regulatory inadequacies and closures.

PART VII -- Survey results and analysis.

PART VIII -- Findings/recommendations.

PART IX -- Bibliography

### C. END PRODUCTS AND TIMELINE

1. Preliminary advisory group meetings shall be held no later

than March 30, 1988.

2. Questionnaires shall be approved by advisory groups no later than April 15th.

3. Draft reports shall be submitted to the Council no later than May 30th.

4. Minutes of all advisory board meetings shall be submitted along with regular monthly reports.

EXHIBIT 'B'  
COUNTY SERVICES

the COUNTY will provide the CONSULTANT with the resources necessary to perform the services outlined in this Agreement and which are agreed to by the Hood Canal Coordinating Council.

These services to be provided by COUNTY may include the use of meeting rooms and access to information and staff.

EXHIBIT 'C'  
COMPENSATION AMOUNT AND MANNER

Upon submittal of products and progress reports by task on County forms, setting out actual hours worked and allowable expenses meeting the requirements set forth in the State of Washington's "Financial Guidelines for Grants Management", CONSULTANT shall be reimbursed as follows:

The contract sum paid to the CONSULTANT shall be the total sum of Six Thousand Dollars(\$,6000.00). Payments shall be monthly for five months at One Thousand, Two Hundred Dollars.

In addition, the CONSULTANT will be reimbursed by the COUNTY for all expenses incurred in the performance of the services outlined in this Agreement. This is not to be over Two Hundred Dollars(\$200.00) per month without advanced permission from the COUNTY. CONSULTANT agrees to make every effort to keep these expenses to a minimum.

APPENDIX B  
DRAFT SHELLFISH AND RECREATION STUDY OUTLINE

# Shellfish

## PART 1: INTRODUCTION

- I. Contents
- II. Abstract
- III. Introduction
- IV. Methods

## PART 2: HISTORICAL NARRATIVE

- I. Historical Uses of Hood Canal
  - A. Tribal
    - 1. Locations
    - 2. Species
  - B. Non-Indian
    - 1. Locations ✓
    - 2. Species ✓
  - C. Changes in Species
    - 1. Olympia > Pacific > Olympia Oyster
    - 2. Manila and Softshell Clams
- II. Indian Rights
  - A. Past Treaties
  - B. Past Tribal Harvests
  - C. Boldt and Boldt II Decision
- III. Geological History
  - A. Formation of H C
  - B. Current and Flushing Characteristics
  - C. Substrate and Shoreline Make-up

## PART 3: PRESENT ACTIVITY

- I. Harvest
    - A. Site Identification
      - 1. Sites presently under cultivation
      - 2. Licensed, but not used
      - 3. Unlicensed with potential
      - 4. Traditional Indian Harvests
      - 5. Decertified or Uncertifiable
    - B. Economic Value
      - 1. From Individual Species
      - 2. From the Fishery as a Whole
      - 3. To the Surrounding areas
    - C. Species- Descriptions/Life History
      - 1. Manila Clams
      - 2. Butter Clams
      - 3. Horse Clams
      - 4. Geoduc
      - 5. Eastern Softshell Clams
      - 6. Pacific Oyster
      - 7. Olympia Oyster
      - 8. Shrimp (commercial?)
    - D. Methods
      - 1. Of Harvest
      - 2. Of Raising
      - 3. Of Breeding/Seeding
- created in other areas*
- done*
- done*

## PART 4: FUTURE OUTLOOK

- I. Increasing Harvests ✓

- A. Better Habitat Management ✓
  - B. Efficient Aquaculture Techniques ✓
  - C. Improved Species ✓
    - 1. Triploid Oysters ✓
    - 2. Hardier, More resilient Strains ✓
  - D. Additional Species ✓
    - 1. Scallops ✓
    - 2. Mussels ✓
- II. Threats to Resource
- A. Water Quality ✓
  - B. Regulatory Inadequacies ✓
  - C. Predators ✓
  - D. Increasing Populations ✓

PART 5: SURVEY

- I. Survey Results ✓

PART 6: CONCLUSION (Same as for Recreation)

- I. Findings and Recommendations
- II. Appendices
  - A. Questionnaire
  - B. Relevant Documents
    - 1. Boldt and Boldt II
    - 2. Maps
    - 3. Charts and Graphs
- III. Bibliography

# RECREATION

## PART 1: INTRODUCTION

- I. Contents
- II. Abstract
- III. Introduction
- IV. Methods

## PART 2: TYPES OF RECREATION

- I. Recreational uses of Hood Canal
  - A. Shellfish
    - 1. Oysters
    - 2. Manila Clams
    - 3. Horse Clams
    - 4. Butter Clams
    - 5. Geoduc
    - 6. Shrimp
    - 7. Crab
  - B. Boating
  - C. Fishing
    - 1. Salmon
    - 2. Bottomfish
    - 3. Freshwater
  - D. Passive activities
    - 1. Beachcombing
    - 2. Hiking
    - 3. Camping
- II. Management/Enforcement
  - A. Regulatory agencies
    - 1. Shellfish
    - 2. Fish
    - 3. Boating
      - a. licensing
      - b. enforcement
  - B. Seasons and Restrictions
    - 1. All Marine Wildlife
  - C. Laws and Requirements
    - 1. Boats
- III. Facilities
  - A. Marinas
    - 1. Size and Scope of operation
    - 2. Amenities
    - 3. location
  - B. Boat Ramps
  - C. Campgrounds
    - 1. Size
    - 2. Amenities
    - 3. Limitations
    - 4. Location
  - D. Access Sites
    - 1. Type of access
      - a. Boat only
      - b. Walk/Boat only
      - c. Nearby Parking

2. Location of Access
3. Discription
4. Limitations

### PART 3: TOURIST RELATED IMPACTS AND BENIFITS

#### I. Economic Benifits to the Region

- A. License Fees
- B. Direct travel related spending
- C. Taxes
- D. State Spending

#### II. Economic Impacts

- A. Road Maintenance
- B. Public Dock and Ramp Maintenance
- C. Traffic Control
- D. Garbage Disposal
- E. Sewage Disposal
- F. Emergency Services
  1. Ambulance
  2. Fire
  3. Police
- G. Non-Emergency Enforcement
  1. Routine Police Calls
  2. Fish and Shellfish Enforcement
  3. Boating Enforcement

#### III. Environmental Impacts

- A. Septic Systems
- B. Boats
  1. Oil
  2. Sewage
  3. Garbage
- C. Marinas
  1. Boat Pollution
  2. Traffic
  3. Human Activity
- D. Human Activity
  1. Disturbing to Wildlife
  2. Squashes and Tramples
- E. Stormwater
  1. Road Runoff
    - a. oil
    - b. toxins
  2. Building Runoff
  3. Agriculture/grounds Runoff
    - a. fertilizer
    - b. pesticides
    - c. herbicides
    - d. erosion
- F. Shellfish Closures
  1. Fecal Choliform
    - a. failing septic systems

- b. improper waste disposal (boats)
- c. seals
- 2. Locations
- 3. Standards for Closure

#### IV. Controlling Environmental Degradation

- A. Boater Education
  - 1. Use of MSD's
  - 2. Oil Disposal
  - 3. Understanding Marine Ecosystems
- B. Adherence to Strict Planning Policy
  - 1. Approved Septic Systems
  - 2. Proper Placement of Shoreline Improvements
  - 3. Strict Zoning Codes
- C. Shoreline and Upland Land Owners Education
  - 1. Dangers of Household Chemicals
  - 2. Dangers of Yard Care Chemicals
- D. Tourist Education
  - 1. Respect Wildlife
  - 2. Understand H C's Ecosystems
  - 3. Understand Game Regulations
- E. Consistent Enforcement
  - 1. Shellfish and Fish Takes
  - 2. Littering and Dumping (boats)
  - 3. All Septic Systems and Pump-out Stations

#### PART 4: QUESTIONNAIRE

#### PART 5: CONCLUSION

- I. Findings and Recommendations
- II. Appendices
  - A. Bibliography
  - B. Copies of Questionnaires
  - C. Copies of relevant Documents

APPENDIX C  
NORTH PACIFIC FILM AND TAPE CONTRACT

AGREEMENT FOR SERVICES

FOR

HOOD CANAL COORDINATION COUNCIL VIDEO

THIS AGREEMENT, made this 28 day of December, 1987 by and between Kitsap County, Port Orchard, Washington, hereinafter referred to as "COUNTY", and North Pacific Film and Tape, 108 South Jackson, Suite 201, Seattle, Washington 98104, hereinafter referred to as "CONSULTANT".

WITNESSETH

IN CONSIDERATION of the mutual covenants and conditions herein contained the parties do hereby agree as follows:

1. General

COUNTY engages CONSULTANT to furnish the services hereinafter mentioned upon the covenants and conditions of this Agreement, at the compensation herein stipulated, and CONSULTANT accepts said engagement upon said terms.

2. Duties of CONSULTANT: Services to be Performed by CONSULTANT

CONSULTANT shall perform such duties and services are listed on ATTACHMENT 'A' enclosed, signed by the parties, hereby referred to and made a part hereof by reference. Said services shall be performed in accordance with the time frame specified.

3. Services or Materials to be Performed or Furnished by COUNTY

COUNTY shall perform such services or furnish such materials to CONSULTANT in connection with the performance of this Agreement as set forth on ATTACHMENT 'B', enclosed, signed by the parties, hereby referred to and made a part hereof by reference. If there are no entries on said ATTACHMENT 'B', it is agreed that COUNTY shall not be required to provide any services or furnish any materials to CONSULTANT in connection with this Agreement, Unless otherwise provided on ATTACHMENT 'B', all said services and materials will be furnished by COUNTY to CONSULTANT without cost to CONSULTANT.

4. Payment by COUNTY, Time and Manner of Payment

COUNTY shall pay CONSULTANT for all services to be rendered by it and all materials to be furnished by it under this Agreement, the amount specifically set forth and in the manner specifically set forth on ATTACHMENT 'C', attached hereto, signed by the parties, hereby referred to and made a part hereof by reference. CONSULTANT agrees to accept said sum as full compensation for all services due under this Agreement.

5. Additional Work

The CONSULTANT shall be entitled to extra compensation for services or materials not otherwise required under this AGREEMENT, provided the COUNTY shall first have requested such extra services or materials in writing, but in no event shall COUNTY be liable for payment unless the amount of such extra compensation shall first have agreed to in writing by COUNTY.

6. Skills to be Provided by CONSULTANT

CONSULTANT represents that it is skilled in the calling necessary to perform the work agreed to be done by it under this Agreement. COUNTY relies upon the skill of CONSULTANT to do and perform its work in the most skillful manner, and CONSULTANT agrees to thus perform its work, and the acceptance of its work by COUNTY shall not operate as a release of CONSULTANT from said Agreement.

7. Prohibited Interest

No member, officer, or employee of COUNTY shall have any interest, direct or indirect, in this Agreement or in the proceeds thereof.

8. Equal Employment Opportunity

CONSULTANT shall not discriminate against any employee or applicant for employment because of race, creed, color or national origin.

9. Compliance with Laws

CONSULTANT shall endeavor to comply with all Federal, State and County laws, statutes, ordinances, rules and regulations and the orders and decrees of any courts or administrative bodies or tribunals in any manner affecting the performance of the Agreement.

10. Independent Contractor

CONSULTANT agrees that it is acting as an independent contractor in furnishing the services or materials and performing the work required by this Agreement and is not an agent, servant or employee of COUNTY.

11. Indemnity

CONSULTANT agrees to indemnify and save harmless COUNTY their officers and employees from any and all costs, expenses, claims liabilities or damages, known or unknown, to persons or property heretofore or hereafter arising out of or in any way connected with the negligent acts, errors or omissions of the CONSULTANT.

12. Insurance: Workers Compensation

CONSULTANT agrees to comply with all State requirements relating to Workers' Compensation Insurance.

13. COUNTY representative

The Kitsap County Department of Community Development, through Clyde Stricklin, shall represent COUNTY in all matters pertaining to the services to be rendered under this Agreement; all requirements of COUNTY pertaining to the services and materials to be rendered under this Agreement shall be coordinated through the said COUNTY representative.

14. CONSULTANT representative

Tom Putnam shall represent CONSULTANT in all matters pertaining to the services and materials to be rendered under this Agreement, all requirements of CONSULTANT pertaining to the services or materials to be rendered under this Agreement shall be coordinated through the CONSULTANT representative.

15. Notices

Unless otherwise provided herein, all notices required hereunder shall be given by certified mail, postage prepaid and addressed to the party at the address indicated in the opening paragraph of this Agreement provided, however, that in lieu thereof, notice may be given by personal delivery to the party at said address:

16. Reports

Unless otherwise provided herein, the CONSULTANT shall submit written progress reports to the County as set out in Attachment 'A'.

17. Title to Documents

All original reports and other material or documents developed or used by the CONSULTANT in connection with the performance of this Agreement shall be the property of the COUNTY and shall be made available to the COUNTY by the CONSULTANT.

18. Assignment

Neither party shall assign or sublet any portion of this Agreement without the written consent of the other party.

19. Termination

Without limitation to such rights or remedies as COUNTY shall otherwise have by law, COUNTY shall also have the right to terminate this Agreement for any reason upon written notice to CONSULTANT. In the event of such termination, CONSULTANT shall be compensated for the actual services performed or materials furnished through the date of receipt of notification from COUNTY representative.

20. Schedule and Completion of Studies

The CONSULTANT shall commence work authorized by this Agreement following its execution. All work authorized by this Agreement shall be completed to the County's satisfaction by June 30, 1989.

21. Best Professional Effort

The CONSULTANT acknowledges that its performances and services are important elements of this Agreement; accordingly the CONSULTANT shall put forth its best professional effort to complete the work in accordance with the schedule provided.

22. Entire Agreement; Amendment

This writing constitutes the entire Agreement between the parties relating to the services to be performed or materials to be furnished hereunder. No modification hereof shall be effective unless and until such modification is evidenced by writing signed by all parties to this Agreement.

23. Miscellaneous

All covenants herein shall be conditions. Time shall be of the essence. Failure on the part of either party to enforce any provision of this Agreement shall not be construed as waiver or the right to compel enforcement of such provision or any other provision. The singular number shall include the plural, and the masculine gender shall include the feminine gender and neuter gender whenever the context of this Agreement permits.

IN WITNESS WHEREOF, the parties have hereunto set their hands this 28th day of December, 1987.

KITSAP COUNTY

BY: [Signature]

Acting CHAIRMAN  
BY: KITSAP COUNTY BOARD OF COMMISSIONERS

EXHIBITS:

EXHIBIT 'A' Consultant Services

EXHIBIT 'B' County Services

EXHIBIT 'C' Compensation

CONSULTANT

BY: Thomas A Putnam

The CONSULTANT certifies that it complies with all State requirements relating the Worker's Compensation Insurance as required in CONSULTANT'S Agreement.

Tom Putnam  
Tom Putnam  
North Pacific Film and Tape

ATTACHMENT 'A'

SCOPE OF WORK

HOOD CANAL VIDEO PROJECT  
RECOMMENDED APPROACH

As described in the RFP, the Hood Canal Video is a hybrid. It will be primarily an informative piece, yet in order to capture the hearts and minds of the audience, a sense of place and ecology should be established.

The primary goal will be to convey the history, organization, cooperative nature, and effectiveness of the Hood Canal Coordinating Council. This must be done in the context of ecological integrity of the region as a whole and the Hood Canal in particular.

Attention must also be paid to the diverse interests and groups involved in this cooperative effort. These interests must be identified. A preliminary survey suggests communities, local governments, economic interests such as timber and fisheries, Indian tribes, and recreational interests as all having an important stake in decision-making around Hood Canal.

We recommend attention to several specific details:

1. Watershed issues and impacts. A watershed analysis will tie together both east and west sides of the Canal, and promotes a holistic view.
2. One or two specific case studies of the work of the HCCC. It would be useful if they involved several of the previously mentioned interest groups, and if they emphasize first, how a cooperative approach was necessary to solve a problem, and second, how the HCCC assisted in the solution.

Specific recommended procedures are as follows:

1. PRE-PRODUCTION

- a. Orientation- Producer learns the history of the Hood Canal Coordinating Council (and Hood Canal), attends one or more meetings, and visits sites for location shooting.
- b. Consultation- Identify primary issues and outlook for the video, primarily revolving around the watershed/nonpoint pollution concerns.

As described in the RFP, focus should be on identifying geographical and environmental significance of the Hood Canal watershed and present issues threatening the Canal's ecosystem.

Also identify major sources and resources: Local governments, tribes, timber, fish, and recreation interests, etc.

Identify primary interviews, probably one from each interest group.

Research one or two major case studies which illustrate the structure, operation, and issues the Council is involved with, and how it operates.

- c. Write script and production outline in consultation with Council members and staff.

PRODUCTION: All material will be shot in high quality video or shot in film and transferred to video for final edit.

1. On-site footage and interviews
2. Survey existing footage resources for cost-effectiveness. North Pacific has some excellent footage of cost-effectiveness. North Pacific has some excellent footage of Puget Sound in general and of watershed related items. We also have access to underwater footage which might be desirable.

POST-PRODUCTION: Editing, mixing, and dubbing

1. Editing: Roughcut, finecut stages will be major points of review by Council and Staff.
2. Music and sound effects will be added at final sound mix.

TIMELINE AND PRODUCTION SCHEDULE:

MONTH 1	MONTH 2	MONTH 3
-----		
Orientation Research and script	Location Photography	
	Editing-----	
		Roughcut Review
		Finecut Review
		Narration and Effects
		Dub Tape copies

PRODUCTIONS FACTORS

A. GOALS

- \* educated the audience about the structure, activities and purposes of the Hood Canal Coordinating Council.
- \* Provide general enlightenment on the integrity and complexity of the Hood Canal and its relationship to Puget Sound, to the forest ecosystem, and to local geomorphology and hydrology.
- \* stimulate local action in other watersheds by providing a model.
- \* recognize and perhaps enhance the cooperative effort among diverse groups mentioned earlier in promoting effective actions to help solve nonpoint pollution problems around Hood Canal.
- \* elucidate the management strategies used by the Council for cooperative resource planning.

B. BUDGET: The bid for the video is \$12,000.

Comment: Producing a ten-to-twelve minute video for this budget will require precision, and dictates an expository rather than documentary approach. It

will have to be well scripted and conservatively shot, rather than a documentary approach which allows for shooting large amounts of material and lets the story tell itself.

## NONPOINT POLLUTION ISSUES

Nonpoint pollution is the result of numerous individual and collective actions, most of which are not perceived by the public as having any connection to water quality.

The problems of nonpoint pollution are both diffuse and overlapping. They are both urban and rural, and it is difficult to measure relative contributions from various sources as well as to prioritize strategies for prevention. It is a problem which must be attacked simultaneously on many fronts.

Some factors: septic tanks, logging practices, farming practices, urban runoff, household hazardous wastes, and airborne pollution. It would seem probable that rural factors are more in evidence than urban-related ones in Hood Canal.

The recently concluded Timber/Fish/Wildlife agreement suggests that much of the problem lies in factors rooted in awareness and communication. Integrative policies are just beginning to be adopted. Practices in diverse areas have not been aware of those in other areas. This is a feature in which communication in general can make the difference, and hopefully the video will point this out and promote such communication itself.

Due to the magnitude and complexity of the public education task involved in nonpoint pollution, and the technical, social, and political aspects of the Hood Canal Coordinating Council's activities, a primary factor in the effective production will be substantial research and coordination with the Council's technical staff.

The producer should be chosen partially on the company's ability to do the research, on its background in environmental issues, and its familiarity with the complex factors involved in nonpoint pollution.

North Pacific has demonstrated such capabilities in previous work.

ATTACHMENT 'B'

COUNTY SERVICES

The County has contracted with Lela Hilton-Perez to coordinate activities of the Hood Canal Coordination Council. Lela Hilton-Perez will work with the consultant to provide background information and to obtain information necessary to complete the project.

ATTACHMENT 'C'

COMPENSATION AMOUNT AND SERVICES

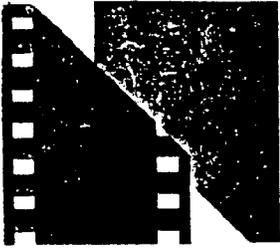
Contract sum to be paid to the consultant shall be the total sum of twelve thousand dollars (\$12,000.00). Payments shall be made upon completion of each phase of the project. Phases are identified in the scope of work as:

Phases:

I.	Start Up:	\$3,000
II.	Orientation	
	Research and Script*	\$3,000
III.	Location Photography*	
	Editing	\$3,000
IV.	Rough Cut Review	\$3,000
	Fine Cut Review*	
	Narration and Effects	
	Dub Tape Copies*	
		<u>\$12,000</u>

\*Materials to be furnished

APPENDIX D  
DRAFT VIDEO SOUND TRACT TEXT



# NORTH PACIFIC FILM & TAPE

---

108 South Jackson Suite 201 Seattle, Washington 98104 (206) 623-2130 623-3151

HOOD CANAL VIDEO SCRIPT

DRAFT WITH CORRECTIONS

March 18, 1988

Contact: Tom Putnam

North Pacific Film and Tape  
108 South Jackson, Suite 201  
Seattle, WA 98104

(206) 623-3151

DRAFT

DRAFT

DRAFT

SCRIPT: HOOD CANAL VIDEO

AUDIO

VISUALS

I. INTRODUCTION:

NARRATOR:

In the Hood Canal, water ties everything together. Human activities-- from aquaculture, fishing, and recreation-- to agriculture and forestry, either affect or are affected by the quality of water.

Farmers, fishermen, tourists, residents, and native peoples all have a vital interest in keeping Hood Canal's waters and watershed clean.

In a landscape which can include conflicts between resource exploitation and habitat preservation, between shellfish growers and small farmers, between indigenous peoples and local governments, to name only a few, it is important to remember the common values of beauty and ecological integrity which bind residents of the Hood Canal region together.

II. DESCRIPTION OF HOOD CANAL:

Three interview segments:

1. Aesthetic/Recreational- e.g., resident on beach:

"We have a special place here. It's natural, it's quiet-- it's a reminder of how beautiful nature can be..."

Wetlands with early morning sun reflected in the web of small waterways

Waterfall

Shellfish gatherers at low tide

Logging  
Fishing boats

Resource groups

Wildlife

Scenic Beauty, perhaps Walker Mountain overlook

Resident on Beach

2. Economic: e.g., shellfish grower:

"There have been a number of closures of shellfish harvest areas in the past few years...that's something new. Our industry depends on clean water...We have to work to keep development and pollution from ruining the biological resources..."

Commercial shellfish grower/harvester at workplace

3. Environmental/Indigenous people:

"In the space of a few years, we've seen the beginnings of damage to the environment and to the resources. With care and education, we can preserve the area for future generations..."

Native American in illustrative setting

A. PHYSICAL DESCRIPTION:

NARRATOR:

The Hood Canal is a 61-mile long fishhook-shaped fjord forming the westernmost boundary of the Puget Sound Basin.

Map showing Hood Canal Location

The canal possesses rich geological diversity. Forested and snowcapped mountains ranging up to 8,000 feet lie to the west. These mountains are drained by five major river systems.

Aerial shot of Hood Canal, showing forests and mountains

Low lying hills surround the water to the south and east, where a majority of development has occurred.

River and river delta

Bordering the Canal are:

South Canal area showing bulkheads and homes

two Indian Reservations, the Port Gamble/Klallam in the north, and the Skokomish in the south;

Shots of reservations

a large military installation-- the Navy's Submarine Base at Bangor;

Bangor sub base if available

several fish hatcheries; county, state and federal parks;

Fish hatchery

shellfish growing and seed-producing facilities;

Park

a Department of Fisheries shellfish laboratory;

Commercial shellfish operation

recreation facilities, a sawmill, hydroelectric installations, and permanent as well as vacation homes.

Shellfish lab

sawmill, Tacoma City Light installation, homes

B. RESOURCES:

The Hood Canal hosts a rich diversity of wildlife and biological resources. Estuarine areas function as scenic and recreation areas, and provide flood reduction, pollution control, fish and wildlife support, storm and erosion control, water supplies, and education and research areas.

Economic resources include shellfish growing and harvesting, with the potential for doubling production.

Oysters, clams, shrimp, geoducks, crabs, and smelt are harvested both commercially and recreationally.

Timber harvest provides many jobs and contributes to the Hood Canal's economic base.

Above all, Hood Canal is a watershed. The quality of water depends on activities from the crest of the mountains to the bottom of the Canal. In the upland areas, development, farming, and timber practices all have effects on water quality.

It is vital that all residents of the Canal understand the ways that everything is connected to everything else.

III. PROBLEMS:

INTERVIEW:

Compared to some other areas in greater Puget Sound, Hood Canal is still in relatively good shape. But there are problems.

There is a growing awareness of the Canal's vulnerability to water pollution.

Rapid population growth has led to nonpoint pollution from failing septic tanks, poor farming practices, and erosion and siltation from building sites.

Shellfish closures have increased, threatening recreation and commercial harvest. Declining populations of salmon and bottom fish have been noted.

Although the average depth of the Canal is between 500 and 600 feet, shallow sills located near the mouth prevent good circulation and vertical mixing of water. Hood Canal takes much longer than other Puget Sound embayments to complete an exchange of sea water.

Scenery

Wildlife

Fishing

River estuary, probably  
Dosewallips

Oyster and clam harvest

Shrimping

Running water during  
rainstorm

Mountains

Stream near farm

Wetlands

South shore homes

Septic tank pumping

Erosion and siltation

Shellfish closure sign

Mouth of Canal, open  
water

The economic base of Hood Canal depends largely on biological diversity, and on reconciling activities which are sometimes in conflict with each other.

A. INTENSIVE POPULATION AND DEVELOPMENT PRESSURES

NARRATOR:

The pristine beauty of the Hood Canal has made it a vacation and tourist destination for many years. But more and more people are making it a permanent home. The conversion of vacation homes to permanent residences and the development of the tourist industry are leading to increasing population pressures on the environment. Population doubled in the shoreline areas of Hood Canal between 1970 and 1980. Many places in the Basin also have steep slopes and poor soils which increase the Canal's vulnerability to pollution.

Tourist and recreation activities

The problems of failing septic systems are compounded by soil conditions, leading to increasing bacterial contamination of the waterways. The estuarine areas most affected are often the most fertile grounds for shellfish culture. Nine areas of the canal have been restricted for shellfish harvest.

New Housing and construction

Crowded shoreline homes

Septic tank maintenance

Poor farming practices, animal manure, siltation and household chemicals contribute to contamination of the Canal.

Wetlands near river mouth

Polluted stream

Marinas

Stream siltation

Untreated sewage and other wastes from boats and marinas is another problem.

Trash on shore

Another source of pollution is soil erosion, siltation and flooding from poor forest practices and road building.

Besides threatening resource production, such conditions threaten wildlife habitat and degrade the qualities of the environment that make it attractive to tourism.

Aerials of south shore area showing development

IV. SOLUTIONS:

NARRATOR:

The Hood Canal is thus caught in the modern dilemma common to many areas of great beauty and productivity: economic development to provide homes and jobs leads to a degradation of the beauty which attracts people in the first place.

Ultimately, the problems are not entirely solvable. But aggressive actions are being taken to protect and enhance water quality in the Canal, and to preserve its unique beauty and diversity.

Monitoring

Fishing

The complexity of the problems requires cooperative planning and resource management, and so the Hood Canal Coordinating Council was formed in 1985.

HCCC MEETING

The aims of the Council are long-range planning, intergovernmental coordination, and citizen involvement and education. The membership and history of the Hood Canal Coordinating Council reflect the region's diversity and some of its conflicts. Members consist of representatives from county governments, tribes, and the Puget Sound Water Quality Authority. It is the union of tribal, local and state government interests, and the determination to replace antagonism with communication and cooperation, that has made the Council unique.

Closeup of individual representatives to the Council

INTERVIEWS: What are some of the accomplishments of the Council? (Possible answers: Communication and networking; Adoption of Hood Canal Planning Policy; Public Education and awareness.)

On-camera interview with Council member(s)

Why has it been successful? (Possible answers: first time some members have worked together, from coordination of local government septic tank practices to discussion of tribal concerns.)

ALSO: initiation of studies to gather more information to locate pollution sources and speed clean-up.

Slides of early meetings, if available

NARRATOR: The first phase of the Council's activities focused on self-education and evaluation of the Canal's problems. The second phase included setting priorities and making recommendations, culminating in the Hood Canal Regional Planning Policy.

Cover of HC Regional Plan

Some recommendations in the Planning Policy included the following:

Pumping and maintenance of septic tanks

1. On-site sewage facilities in the Hood Canal Watershed should be inspected, and pumped if necessary, every three to five years.

Houses and bulkheads on shore

Minimum standards should be developed by local governments for design, siting,

construction, and maintenance of on-site sewage systems and alternative technologies. Existing systems should be upgraded when possible if they do not meet such standards.

2. Best-management practices for agriculture should be keyed to water quality protection as well as production. Measures may include fencing of animals away from streams and waterways, careful application of fertilizers and pesticides, and minimal interference of runoff with natural waterways.

3. For forestry activities, Best Management Practices should be developed which emphasize protection of habitat, wildlife, and instream and downstream resources. The recently concluded TIMBER/FISH/WILDLIFE agreement reinforces the Forest Practices Act as the source for Best Management Practices.

4. New and expanded marinas should be required to have pump-out facilities and disposal facilities for portable toilets. Incentives should be developed for installation and improvement of marine sanitation devices. Siting of new marinas and expansion of existing ones should CONSIDER impact on local shellfish resources and other sensitive areas. THE HOOD CANAL COORDINATING COUNCIL IS SPONSORING A BOATER EDUCATION PROGRAM TO HELP BOATERS UNDERSTAND HOW THEY CAN HELP PREVENT POLLUTION ON THE CANAL.

5. County Shoreline Master Plans should develop and incorporate minimum standards for protection of regional water quality and water-based resources and activities.

6. In developing long range planning for Hood Canal, local agencies should pay particular attention to shellfish protection.

7. The local planning process should also include emphasis on identification and preservation of wetlands and other biologically significant areas. PRIVATE LAND TRUSTS LIKE THE HOOD CANAL LAND TRUST WETLAND HAVE A GREAT POTENTIAL FOR PROTECTING WILDLIFE HABITAT.

Best management practices for agriculture, like animals fenced away from streams

Forest practices illustrative of best management practices.

Marina scenes

Shoreline development with water obvious in shot

shellfish gathering

wetlands, wildlife

Oil recycling station

APPENDIX A: SHOT/LOCATION LIST

AQUACULTURE- Oysters, clams, shrimp, etc.  
Agriculture- animals near streams  
Fishing, shellfish harvest  
Recreation- boating, marinas, hiking  
Forestry- logging activities and impacts  
Monitoring- sampling, testing  
Rapid population development (near shoreline or waterway)  
Tribal activities, including fishing  
Sawmill at Port Gamble  
Shellfish Research Lab at Point Whitney, Dabob Bay  
Mt. Walker Scenic Overlook  
Aerial photography  
Seals, wildlife  
Wetlands, estuaries, rivers  
Land Trust at Lynch Cove  
Fish hatcheries  
Sign of shellfish closure  
Septic tank work, inspection and pumping  
Soil erosion  
HCCC meeting  
Naval Base at Bangor  
Hood Canal Bridge  
Olympic Mountains

APPENDIX B: Potential Interviews (Partial List)

County reps to HCCC  
Tribal Reps to HCCC  
Margery Redmond  
Steve Ralph  
Harold Wiktsen, oyster grower  
Indians: future generations/myth-allegory  
Timber Industry rep e.g. Mike Yeager-- re: TFW  
Shoreline resident

APPENDIX C: REQUIRED RESOURCES

Contact with interest group reps like timber, fishing, developers, etc.-- will be more specific later

8. Alternatives should be investigated for disposal AND SOURCE CONTROL of household hazardous wastes such as motor oil, pesticides, insecticides, etc.

9. The achievement of these and other goals will depend very heavily on the education, involvement, and cooperation of the residents of Hood Canal. The Hood Canal Coordinating Council, County governments, TRIBES, and local Conservation Districts will all work to educate citizens to voluntary compliance with good practices.

INTERVIEW: "We need to take measures now to preserve and protect our environment. The Council's activities and the unprecedented effort at cooperation and coordination of local planning and management efforts give us the opportunity to take control of our own destiny. If we fail, we're going to see outside entities like the state and Federal Government come in and do it for us."

#### V. SUMMARY:

NARRATOR:

Establishment of the Hood Canal Coordinating Council has been an innovative attempt to address problems locally, in a spirit of cooperation, among groups and interests that have traditionally been in conflict.

Substantial progress has been made. But the very nature of the problems mean that they will be present virtually forever. The importance of local cooperation and communication is paramount. Sacrifices must be made, and at times individuals will be called on to work for the interests of the common good.

This is the accommodation which nature demands; it is also a measure of the worth of the treasure that is the Hood Canal.

Shot showing crowd of residents; e.g., opening day of shrimp season

People on streets, in parks, etc.

On-camera interview

Cover in interview or location shots

APPENDIX E

ABSTRACT FOR VIDEO TAPE UNDER SEPARATE COVER

Abstract

Title: Hood Canal Video Project  
Author: North Pacific Film and Tape  
Subject: The Development of the Hood Canal Coordinating Council and the Resources they seek to preserve.  
Date: July 15,1988  
Departments: Washington State Department of Ecology, Kitsap County, Mason County, Jefferson County, Clallum Indian Tribe, Skokomish Indian Tribe and the Point No Point Treaty Council.

Source of Copies:

Copies may be obtained from the Kitsap County Department of Community Development, 614 Division Street, Port Orchard, Washington 98366.

WDOE Project Number: G 0088041

Series Number: V1

Number of Pages: N/A

Abstract: An educational and yet very scenic video tape containing many photographic examples of the resources of Hood Canal that the jurisdictions that exist along the shore have chosen to preserve and the identified difficulties encountered along the way to a coordinated policy for growth and development.

APPENDIX F  
FINAL SHELLFISH AND RECREATION STUDY

SHELLFISH AND RECREATION INDUSTRIES OF HOOD CANAL

PREPARED FOR THE HOOD CANAL COORDINATING COUNCIL  
BY  
STEVEN BOESSOW

The preparation of this report was financially aided through a grant from the Washington State Department of Ecology with funds obtained from the National Oceanic and Atmospheric Administration, and appropriated from Section 306 of the Coastal Zone Management Act of 1972.

ABSTRACT

Title: SHELLFISH AND RECREATIONAL RESOURCES OF HOOD CANAL  
Author: Steven Boessow  
Subject: This report identifies the available information on shellfish and recreation activities within Hood Canal.  
Date: July 15, 1988  
Departments: Department of Ecology, Kitsap County, Jefferson County, Mason County, Clallum County, Skokomish Indian Tribe, and the Point No Point Treaty Council.

Source of Copies:

Copies may be obtained from the Kitsap County Department of Community Development, 614 Division, Port Orchard, Washington 98366.

WDOE Project Number: G 0088041

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Abstract: The study of shellfish and recreational resources of Hood Canal is divided into two parts. PART I is titled the "ECONOMIC REVIEW OF THE SHELLFISH AQUACULTURE INDUSTRY". This report defines the current (1988) shell fish aquaculture industry and it's needs through use of a survey of the local aquaculturist, and previous studies and research. It is intended that this study be used in conjunction with other documents to assist local governments to help plan for shoreline and upland development. PART II is titled "THE RECREATION INDUSTRY : AN OVERVIEW". This report defines the water based recreational activities and identifies economic benefits and impacts related to these activities. Where possible, suggestions have been made as to what is needed to maintain the resources of the Canal and what specific information is needed to facilitate future study.

PART I: ECONOMIC REVIEW OF THE SHELLFISH AQUACULTURE INDUSTRY

## INTRODUCTION

Shellfish aquaculture has been a major industry in some areas of Washington, including Hood Canal. In order to protect the industry from encroachment by developers, pollution, and restrictive aquaculture guidelines county and state agencies must have accurate, current information on the needs of the industry.

There are few industries which rely so heavily on access to clean, unpolluted waters, and relatively rural settings. As the region grows and the economic climates change it becomes more and more difficult to ensure that water quality standards can be met. It will take the efforts of all concerned to draft a plan for the future that meets the regions desire for growth while protecting the local shellfish industry.

This report will define the current shellfish aquaculture industry and it's needs through use of results of a survey of the local aquaculturists, and through previous studies and research. It is intended that this study be used in conjunction with other documents to allow local governments access to information to help plan for shoreline and upland development.

## HARVEST SITES

In 1987 there were 91 shellfish farms registered with the Washington State Department of Fisheries. This includes registration by tideland owners who do not or only sporadically market their shellfish.

Most of the shellfish are grown in Dabob and Quilcene Bays, many others are located in the Brinnon area and across the canal around Seabeck. Other growing areas include Belfair, Lilliwaup, Hama Hama, and Fishermens Harbor. The Farms have concentrated in these areas mainly because the tide flats are suitable to production level aquaculture, and because, in the case of Dabob Bay, water circulation prevents oyster spat from drifting far, increasing chances for large sets.

According to the survey of growers done for this study, up to 21.5% of the registered shellfish growers do not market their shellfish. Some are willing but lack the information to get started, others feel that registering their beaches gives them more protection or rights against poaching or trespassing, still others have had bad experiences in getting started or leasing out their tidelands. These registered tidelands represent a potential resource of presumably productive beaches. As suitable bottom culture grounds make up a minority of Hood Canal's coastline this is a resource to look into.

If the selected growers are representational of all of the growers then there is perhaps some 3413 acres or more of tidelands currently under cultivation for one or more species in Hood Canal. The majority of this land is privately owned. It is

unknown how much land is available or suitable for aquaculture. A lot of Suitable tideland is held by the Department of Natural Resources (DNR), Washington State Department of Parks, and other local, state, and federal agencies, and is reserved for recreational harvest. Still more is either privately owned in small parcels, or part of community beaches and reserved for private use.

Three areas on the canal have been restricted or have had commercial shellfish harvests closed altogether. Though this represents a small area compared to that of the canal it is significant because these areas are in or near some very rich, yet very sensitive shellfish beds.

Closures or restrictions are the result of high levels of fecal coliform, an easily detected organism that is used by DSHS to indicate the presence of other, more harmful pathogens in the water. DSHS monitors all commercial shellfish growing areas and several recreational sites. When a problem is discovered then closer, more frequent monitoring occurs.

The tip of Lynch Cove in southern Hood Canal is closed to all commercial shellfish harvesting. This has affected at least 2 growers and caused concern that the problem may spread. Additional monitoring of the water is being done to pin-point the sources and correct the problems. Several on site sewage systems (septic tanks) were known to be malfunctioning and other possible sources were guessed at, including runoff from pastured livestock, boating activity, and feces from marine birds and mammals.

The headwaters of Quilcene Bay are also closed. The same types of sources (non-point source) are responsible here as in Lynch Cove. There are about six growers within close proximity of the closed area, and many more in the area just outside of Quilcene Bay.

Unlike the closed areas, Dosewallips is restricted. This means shellfish may be harvested but must be transferred to an approved site for cleansing several weeks before being sold. Cleansing takes place as the shellfish eat in clean waters. Two commercial sites exist in the area, and the Point No Point treaty tribes harvest clams and oysters from the tidelands at Dosewallips State Park.

## LIFE HISTORY & DISCRPTION OF COMMERCIAL SPECIES

### OYSTERS-

#### Olympia Oyster- Ostrea lurida

The Olympia oyster is in a class called the flat oysters. It is a small grayish oyster, about 5 cm long. Flat oysters have an unusual (among shellfish) life history, in that males release the sperm into the water column but fertilization occurs in the females shell and she later releases free swimming larvae. The larvae remain free swimming for several weeks and then settle onto a solid surface, usually a rock or another oyster shell.

The Olympia oyster is susceptible to dessication and is found in tide pools, under rocks, and, when cultured, in diked ponds. Before the turn of the century Olympia oysters formed reefs along the mouthes of streams. These layers of oysters helped to control their temperature and reduce water loss. These reefs were quickly destroyed by early settlers, who had to then build dikes and ponds to raise suitable numbers of oysters.

#### Pacific oyster- Crassostrea gigas

The First Pacific oysters arrived in Washington State from Japan in the 1920's, after the decline of the Olympia oyster. The Pacific is a large, hardy, cupped oyster, meaning it is about as different from an Olympia as oysters can get. In the Spring, as the water warms, the Pacific oysters "ripen". Then when the temperature rises suddenly, spawning is triggered, and this spawning triggers others to spawn. Unlike in the Olympia, fertilization takes place in the water where the larvae quickly hatch and start their planktonic lifestyle. They remain free

swimming for about 3 weeks and then settle onto rocks or shell.

Pacifics can survive nearly up to the mean high tide level, and can withstand temperature extremes and fluctuations, as well as brackish water. It's shell is all white and heavily fluted, often twisted and mishapen from growing in clumps with other oysters. It grows to over 25 cm, but it is harvested at many sizes depending on the intended use.

## CLAMS

Though each species of clam differs slightly in its spawning time or temperature requirements, their basic life cycle remains the same. Warm spring temperatures ripen the sexually mature clams, and then a sudden rise in temperature or the spawn of other clams triggers the release of sperm and eggs in the water. Fertilization takes place in the water where the eggs soon hatch into free swimming larvae. Several weeks and several larval stages later the larvae loses the ability to swim and must find a suitable habitat to settle in. Proper substrate is only one consideration for site selection, as certain clams do not settle in areas of high concentrations of adults of the same species.

### Manila clam- Tapes japonica

The Manila, or Japanese littleneck clam is an accidental import brought in with Pacific oyster seed. It is a hardshell clam about 7 cm across, marked with dark patches on a grayish shell. It has both radial and concentric ridges, with the radial ridges being the more prominent. Manila clams are found right up to the mean high tide level in gravel or mixed mud, sand, and gravel. Although it does reproduce naturally in Washington waters, many growers supplement nature with hatchery raised seed.

### Native littleneck- Protothaca staminea

This small hardshell clam resembles the Manila in looks and habitat. It has both radial and concentric ridges on the shell, which is a grayish white with no dark patches. The native littleneck is found below the mean high tide level of gravel and

mixed gravel beaches. This clam was the mainstay of the steamer clam industry until the introduction of the Manila, and still is harvested and sold by some clam and oyster growers.

Butter clam- Saxidomus giganteus

The butter clam is found in mixed sand, mud, and gravel beaches from about the +1 foot tide level, subtidally to about 60 feet deep. The shell is chalky white with only concentric lines marking the surface. It will dig as deep as 30 cm into the substrate, making harvesting butter clams more time consuming than "steamers", but offering them greater protection against predators and weather conditions.

Horse clam- gaper clam- Tresus capax

This large clam is found as deep as 50 cm in mud or sandy mud. Its' common name, gaper clam, refers to the gap present at the siphon when the shell is closed. The siphon, coarse and leathery at the tip, almost, but not quite fits completely into the shell when retracted. The shell can reach about 20 cm across, and is chalky white with a brown periostracum (the thin flaky material present on the outer edges of the shell).

Geoduck- Panopea generosa

The shell of this giant of a clam is no larger than that of the horse clam, but the siphon, when retracted may still extend out 25 cm or so. Consequently, the geoduck can be found as deep as 75 cm down in the mud. It is typically a subtidal clam, reaching depths of greater than 155 feet, though it may be found on the beach during extremely low tides. The shell is elongated

and slightly squared looking. It is white with a yellowish periostracum. These clams are harvested in underwater lots, leased by the Department of Natural resources.

## SCALLOPS

Though most scallops are hermaphroditic, the four species found in Hood Canal all have separate sexes. They spawn, like many other bivalves, by releasing sperm and eggs into the water to be fertilized. They then go through a free swimming stage, in which the shell is forming, before settling on the bottom. After they settle they may remain semi-mobile like the pink scallops or anchor themselves to a rock or other solid object like the rock scallop.

Scallop aquaculture is very rare in this state. In fact the only scallop farm in Washington is in the water off Point Hannon in northern Hood Canal. They raise all four of the species of scallop common to the area, and are cooperating with State biologists and the University of Washington to help expand the understanding of scallops and to refine methods of culture in this relatively new industry.

### Pink scallops- Clamys hastata & C rubida

Pink scallops are the smallest scallops in Washington waters. They have uneven "ears", one being larger than the other, and are usually encrusted with a light yellow sponge on their upper shell. They rest on the surface of sand or gravel substrates to about 180 feet. As juveniles they may attach themselves, by means of bysuss threads, to the bottom. As they grow they release their anchors and become able to move, sort of, by rapidly opening and closing their shells. This "jet" propulsion is used when they sense danger.

Weatherwane scallop- Pecten caurinus

Weatherwane scallops are characterized by their even, or same sized "ears", and their large size (to 15 cm). They rest on mud or sand bottoms to 300 feet and are only known in a few areas of the state, one of which is northern Hood Canal.

Rock scallop- Hinnites giganteus

After the free swimming stage, the rock scallop cements itself to a boulder or rock ledge, and stays there for life. Rock scallops have a thick heavy shell often encrusted with other organisms, and partially eaten at by burrowing worms. It can grow to over 15 cm and has a very large adductor mussel. The size of the adductor mussel and the relatively short time it takes to mature makes this scallop a likely candidate for successful aquaculture.

## AQUACULTURE TECHNIQUES

### OYSTER

The majority of oyster growers in Hood Canal use bottom culture and rely on hand harvesting. By virtue of operating on the canal, oyster growers are taking advantage of the large Pacific oyster sets that the area is known for. Some supplement this by seeding their beach with hatchery seed, and others set out cultch and collect their own seed.

SEED: There are several ways of gathering oyster seed. The most common, and the most economical for the average grower, is setting out racks from which oyster shells, or culch, are hung. The shells may be in net bags, or wired to ropes, and are then placed on the lowest parts of the tidelands when the oysters are spawning. The oysters set on the shells at a rate of 10 to over 100 per shell, and may then be set out on the beach, as is, or separated and grown individually. Some Hood Canal growers specialize in selling just the seed to growers in and out of the canal.

One grower uses permanently mounted racks to collect seed for his oyster farm in Skagit County, where the oysters grow much faster than in the canal. Several growers operate hatcheries, where seawater is pumped through tanks and temperature is controlled to bring the oysters into spawning condition. This method has the advantage of being able to raise specific species or strains of species, and to raise triploid, or sexless oysters, that have the advantage of not spawning, thus being marketable all year long.

**BOTTOM CULTURE:** Bottom culture is the term used for any shellfish grown on or in the beach itself. At its simplest the beach is simply harvested of whatever oysters happen to grow there. For higher production, or in marginal tidelands, the beach may be built up with gravel and shell. In the past, dikes were built to hold back water for Olympia oysters. Some beaches are even treated with the pesticide Sevin to kill ghost shrimp, which loosen the mudflats, and suffocate the oysters.

There are several levels of intensity that bottom culture may represent. As a general rule, an increase in the level of intensity or complication should bring with it an increase in the density or size of the oyster in order to be worthwhile.

**STACKING TRAYS & RACK AND TRAY:** In protected bays and areas where the substrate is not suitable for oyster production, rack and tray or stacking tray culture may be used. In rack and tray methods, a wooden or rebar rack is placed out on the beach at the desired tide level. Attached to the rack is either a mesh bag or tray filled with individual oysters of the same size. This has the advantage of being up off of the beach, free from predators and siltation. They are easily harvested and ideally will remain fairly even in size. Some of the drawbacks are that being up off the beach and held together in bags, they are susceptible to heavy wave action and being fouled with seaweeds and flotsam. They are also more time consuming, as the oysters must be transferred to different bags as they grow, and the bags must periodically be cleaned of algae, and other marine life that impedes water circulation.

Stacking trays are similar in principle to rack and tray culture. Thin trays are stocked with individual oysters and then stacked 10 or so high and strapped together. These stacks of trays are set out at the desired tide level either on the surface or on a rack or support. Stacking trays offer the same advantages and drawbacks rack and tray culture.

Both methods offer benefits to those with beaches too soft or too irregular for bottom culture, and they allow an increase in production for the amount of land used. Like other types of aquaculture, an increase in the complexity and cost of the culture method should be balanced by an increase in productivity of the tidelands.

**RAFTS & LONGLINES:** Lantern or pearl nets suspended from rafts or longlines offer the ability to raise oysters offshore in areas with little or no beach. They also protect the oysters from predation, while producing a faster growing, very marketable oyster. However the additional equipment needed is expensive, and much of the labor is done from boats or floating platforms. They are more susceptible to bad weather and fouling by seaweeds, mussels, and other organisms. Special permits and leases are required, and there is often opposition to placing floating structures over fishing grounds or in navigation lanes. Floating oyster culture probably isn't practical for Hood Canal for a variety of reasons; Much of the canal is unprotected from high winds that can uproot floating structures, and due to the slow growth of Hood Canal oysters, the payback period for the

additional equipment is often extended beyond what is reasonable.

**STAKE CULTURE:** Stake culture has been used in this State, in muddy or silty tideflats. The method involves driving a wooden or plastic stake into the ground so that it extends about eight inches above the bottom. Then a single cultch shell with seed is secured to the top of the post where the oysters grow to size.

an alternative method uses rows of stakes with a rope attached across the top of each stake, and cultch shells inserted into the strands of the rope. precautions must be taken to properly position and secure the ropes, as the weight of the rope and growing oysters are susceptible to wind and waves. Although both of these methods keep the oyster off of the bottom they are still able to be taken by predators, either from above by diving birds, or from below by oyster drills and sea stars that are still able to climb the stakes.

There are many variations of all of these methods in use throughout the world. Many local growers have modified these, or invented their own methods to fit the species and the region. also, as technology advances and shellfish becomes more in demand, we can expect to see more and better ways to raise more oysters.

## CLAMS

Although several species of clams are harvested in Hood Canal, only the Manila is cultured intensively. Also the Manila is the only clam with readily available hatchery seed.

Experiments with floating and suspended clam culture have been done, but so far the only method practiced in Washington is bottom culture.

To increase the yield from a piece of land growers use two basic practices, control the predators, and enhance the habitat. Predators such as moon snails and sea stars, and competitors such as mussels are usually picked off the beach by hand. Crows, gulls, scoters, and others are deterred by placing netting over newly seeded beach. Manila and littleneck beds are also regularly turned over to aerate and clean out the gravel. If needed pea gravel may be brought in to produce a suitable habitat for the clams. One method of increasing the numbers of some species of clams is to harvest the larger ones. Geoduck spat in particular will not settle where there are already large concentrations of adult geoducks. The same may also be true of other species as well.

Because clams live in, rather than on the substrate, they are less suited to the various methods employed in oyster aquaculture. The most probable areas for advancement will come from improving hatchery methods for seed production, and perhaps in the development of improved strains of clam that grow faster or live longer out of the water.

Except for the geoduck, harvesting clams is done by hand.

in the case of shallow clams like the Manila and the littleneck a rake, or clam fork may be used. deeper clams like the horse and butter must be dug out. Geoduck harvesting employs more complicated methods. Divers, working from a boat, use water jets to dig out the geoducks, and then pick them out by hand. Rather than harvesting owned tracts of land, geoduck harvestors must obtain leases on subtidal lots controled by the Department of Natural Resources.

## SCALLOPS

Scallops are currently being raised in lantern nets and pearl nets attached to lines and bouys (longlines). Though the project is small, the owners have met with some success and have plans for improving and enlarging their operation. There is definitely the potential for greater yeilds, as methods of raising spat in tanks, and collecting them in the wild are improved.

ARVESTS- 1981

SPECIES	AREA	TYPE*	LBS**	EACH	WASHINGTON
Butter Clam	upper	1	3091		13482
Geoduck	upper	1	147353	116268	3924074
	lower	1	591	435	
Native littleneck	upper	1	18005		107974
	upper	2	860		
	central	1	1055		
	central	2	2321		
	lower	1	0		
	lower	2	526		
Manila	upper	1	155274		
	upper	2	402		
	central	1	0		
	central	2	1291		
	lower	1	637		
	lower	2	0		
Pacific oyster	upper	1	71257	8143	1562862
	central	1	112234	12826	
	lower	1	2566	293	

\* 1- Commercial harvests from registered shellfish farms.  
 2- Commercial tribal harvests.

\*\* weights for clams include the shell. Weights for oysters are  
 meat only.

HARVESTS- 1982

SPECIES	AREA	TYPE*	LBS**	EA	WASHINGTON
Butter Clam	all		0		9174
Geoducks	all		0		331766
Native littlenecks	upper	1	2591		40589
	upper	2	198		
	central	1	0		
	middle	2	140		
Manila	upper	1	36015		1372880
	upper	2	0		
	central	1	0		
	central	2	553		
Pacific oyster	upper	1	186506	21314	1830484
	central	1	110710	12652	
	lower	1	7277	831	

\* 1- Commercial harvests from registered shellfish growers  
 2- commercial tribal harvests

\*\* weights for clams include the shell. Weights for oysters  
 are meats only

HARVESTS- 1983

SPECIES	AREA	TYPE*	LBS**	EACH	WASHINGTON
Butter Clams	upper	1	1300		24712
	central	1	261		
Geoduck	all		0		3176653
Native littleneck	upper	1	0		88607
	upper	2	412		
	central	1	150		
	central	2	32		
	lower	1	0		
	lower	2	144		
Manila	upper	1	38210		1637244
	upper	2	0		
Pacific oysters	upper	1	229706	26294	2272419
	central	1	180412	20617	
	lower	1	9338	1067	

\* 1- Commercial harvests from registered shellfish growers.  
 2- Commercial tribal harvests.

\*\* weights for clams include the shell. Weights for oysters  
 are meats only.

HARVEST- 1984

SPECIES	AREA	TYPE*	LBS**	EACH	WASHINGTON
Butter clam	all		0		3681
Geoducks	all		0		3316391
Native littleneck	upper	1	494		20595
	upper	2	0		
Manila	upper	1	44518		2305244
	upper	2	0		
	central	1	162		
	central	2	129		
	lower	1	0		
	lower	2	90		
Pacific	upper	1	570060	65147	2282855
	central	1	149055	17034	
	lower	1	39311	4492	

\* 1- Commercial harvests from registered shellfish growers.  
2- Commercial tribal harvests.

\*\* weights for clams include shell. weights for oysters are meats only.

HARVESTS- 1985

SPECIES	AREA	TYPE*	LBS**	EACH	WASHINGTON
Butter clam	central	1	7373		8740
Geoduck	central	1	50558	21867	3358385
Native littleneck	upper	1	2477		161712
	upper	2	1672		
	central	1	0		
	central	2	196		
	lower	1	0		
	lower	2	1875		
Manila	upper	1	36725		2831300
	upper	2	73168		
	central	1	55791		
	central	2	537		
	lower	1	0		
	lower	2	430		
Pacific oyster	upper	1	36725	53127	2327248
	upper	2	3763	429	
	central	1	165667	18932	
	central	2	0		
	lower	1	139016	15887	

\* 1- Commercial harvests from registered shellfish growers.  
 2- Commercial tribal harvests.

HARVESTS- 1986

SPECIES	AREA	TYPE*	POUNDS**	EACH	WASHINGTON
Butter clam	upper	1	1180		3129
	upper	2	71		
	central	1	1787		
	central	2	91		
Horse clam	upper	1	446		446
Geoduck	central	1	119496	57346	1866605
Native littleneck	upper	1	357		68652
	upper	2	15838		
	central	1	0		
	central	2	8567		
	lower	1	0		
	lower	2	868		
Manila	upper	1	95136		1413509
	upper	2	168195		
	central	1	76757		
	central	2	62364		
	lower	1	0		
	lower	2	20880		
Pacific oyster	upper	1	230648	26358	1289977
	upper	2	28265	3229	
	central	1	136412	15589	
	central	2	5435	621	
	lower	1	29239	3341	
	lower	2	23890	2729	

\* 1- Commercial harvests from registered shellfish growers.  
2- Commercial tribal harvests.

\*\* weights for clams include shell. Weights for oysters are for meats only.

## FUTURE OUTLOOK FOR SHELLFISH INDUSTRY

### INCREASING HARVESTS

As the demand for quality fresh seafood increases, so too will harvests. At least that is the plan of some of Hood Canal shellfish growers. For many of the small growers, increasing their tidelands yield means spending more time working the shellfish, or paying somebody else to do it. Often they choose to under-produce just to keep the business manageable.

Most of the oyster growers interviewed for this study felt that they could sell more than they currently grow, but what they are currently selling was planted three to five years ago. This means that they must predict up to five years in advance what the market conditions are going to be. Also, growers who depend on natural sets to restock their beach may have a lot of shellfish from one year-class and very few from others. The latter can be overcome by seeding the beach with hatchery seed or culch, to offer a stable and consistent product to buyers. The former, predicting economic trends in advance, is more difficult but most reports show that Americans are eating more seafoods, and demanding fresher and higher quality seafoods. This translates into increased sales for those who are able to increase production.

Because Hood Canal is so exposed to the weather, and because shellfish grow slower in the canal than in other areas, floating aquaculture is not as economical at this time. This means that production increases must come from better management of bottom culture techniques, and from increasing the acreage devoted to

aquaculture. The most room for improvement is from the small part-time operations. Typically they lack the funds, time, and expertise needed to keep their beds producing to their potential.

A likely method for increasing the productivity of the canal is to expand the typical oyster and clam industry, and include other types of shellfish. Scallops are already being tried on a small scale, and have met with some success. Blue mussels, abundant in the northwest, are being raised in many areas throughout the world, including Puget Sound. It seems reasonable to assume they may have potential in Hood Canal. Oyster growers have available faster growing strains, able to withstand harsher conditions, and offering better taste. Some of these strains, such as the Kumamoto oyster, will not spawn in the colder waters of Washington, making them marketable year round. Another way to sell whole oysters year round is to raise triploid or "sexless" oysters. At present these are available only to growers with spawning tanks, and none of these growers have made the seed available commercially. Perhaps a new industry could be developed supplying triploid seed to interested growers.

If an increase in the productivity of the canal is desired or expected then the aquaculturists must feel secure that they can expand and invest time and money with a reasonable chance that they will not be forced out by increased fees, stricter regulations, or deteriorating water quality. Many of the smaller growers or licensed growers who are non-commercial do not maximize the use of their tidelands simply because they either do not understand the entire permit process, or they want better

assurances from the state that they will be able to raise shellfish, and sell them, without the threat of land disputes, pollution, excess regulation, and shoreline development.

## THREATS TO THE RESOURCE

### POLLUTION

Pollution is the number one threat to commercial shellfish growers in Hood Canal, and elsewhere in the state. The effects of pollution go beyond the actual closing of beaches. As more attention is focused on polluted shellfish beds, and the subsequent health risks, the public will become more wary of unprocessed or fresh seafood. Also, the harder growers must work to find clean water, either for grow-out or cleansing, the higher prices will have to go.

In the past industrial wastes, mostly pulp mills, were the prime concern of shellfish growers. The pollutants killed the larvae, decimating some of the most productive areas. Today the pollutants are from human and livestock wastes. Far from killing the shellfish, these wastes are a nutrient source on which the shellfish thrive and grow. However these shellfish may then harbor pathogens dangerous if ingested. The Department of Social and Health Services (DSHS) is the agency responsible for monitoring the water and approving beaches for commercial harvests. They report that the most likely causes of the closures and restriction in Hood Canal are from failing and improperly installed septic systems, high concentrations of boating activity, improper care of livestock and other farm animals, and marine fowl and mammals. Proper planning at the local level, and changing the public's attitudes toward the responsibilities of land ownership are critical to the long term success of any clean-up measures, and to preventing further

degradation.

#### PREDATORS

Predators are a concern in any aquaculture site, though they are one of the more controllable problems faced. The oyster drill is of state-wide concern. It was accidentally imported, like the Manila clam, with Pacific oyster seed from Japan. Seed and oysters heading out of the canal to be planted must have transport permits certifying that they are free from oyster drills. Other predators, such as sea stars and moon snails may be picked off of beds at low tide and disposed of. If population densities are too high, or too much land is involved netting and fencing can be used with measured success.

Birds can be a problem, eating small oysters and clams. Barrow's goldeneye, gulls, scoters, and crows have all been implicated in damaging shellfish beds. Netting can be placed down over freshly seeded clam beds. The best protection for serious bird problems is floating aquaculture using lantern or pearl nets or one of the methods involving mesh bags or trays.

Crabs prey on small clams and oysters, and to some extent on larger clams when they can dig them out. Crabs can be harder to control as most aquaculturists will rarely see them up on the beach. Trapping them, or perhaps mesh fencing should keep the problem manageable.

#### REGULATORY PROCESS

Some of the people in the survey complained that state and local governments were over-regulating the shellfish industry. They voiced concerns that they were being needlessly subjected to

long, often expensive permit and leasing requirements.

An example of what some complained was unfair and expensive was a policy requiring those leasing tidelands to pay to have the the land surveyed and staked. Most felt this was the responsibility of the state, and that that was what some of the lease payments should be going toward.

The rising costs of permits is a concern to some growers. One report is that a Department of Ecology permit for discharge of seawater from hatching tanks has risen 1400% to \$1500 in one year. The irony of this situation, says the grower, is that his operation is considered the same, in terms of permits and requirements, as a pulp mill.

Some policies and fees are in need of revision. But for the most part, the licensing, certification, and permit process does serve the best interests of the grower, the public, and the environment.

Survey:

Total Registered Shellfish Farmers-	91
Total Number Surveyed	51
Percentage Surveyed	56%

Breakdown of surveyed license holders

Out Of Business	6	11.8%
Non-Commercial	11	21.5%
Commercial	34	66.7%

Number of growers for each species listed

Pacific Oyster	32	94.1%
Kumamoto Oyster	1	2.9%
Olympia Oyster	2	5.9%
Manila Clam	8	23.5%
Native Littleneck Clam	2	5.9%
Butter Clam	1	2.9%
Eastern Softshell Clam	1	2.9%
Mussels	1	2.9%
Scallops	1	2.9%

Average of 1.4 species per grower

# of species grown	# of growers	Percent of growers
1	25	73.4%
2	4	11.7%
3	4	11.7%
4	0	0
5	1	2.6%

MARKETS

	County <sup>1</sup>	Washington	U.S.	Foriegn
# of Growers				
Supplying Market <sup>2</sup>	17	19	5	1

1- Much of the product sold within the county is sold to larger growers acting as wholesalers, the ultimate destination being outside of the county.

2- Some growers supply several markets

Breakdown of primary (first round) sales markets. These percentages include growers supplying both wholesale and retail markets.

Wholesale	73.9%
Retail	26.1%

Production

Has production increased or decreased over the past five years?

	# of Growers	Percentage
Increased	15	57.7%
Decreased	5	19.2%
Same	6	23.1%

Total number of respondents- 26

Problems

Please indicate the major obstacles you have faced in trying to develop your aquaculture business?

	# of Growers	percentage
Permits State Regs DHS	14	28.6%
Pollution	9	18.4%
Poaching/Vandalism	7	14.3%
Indians Treaty Rights	6	12.2%
Climate	5	10.2%
No Obstacles	4	8.1%
Other	4	8.1%

Tideland Area

acres owned	806.9	# of Owners	22
acres Leased	215.1	# of Leasors	5
Total acreage	1022.1	# of Growers	25*
Acreage Under Cultivation	606.2/59.3%		

Upland Acreage  
Used for Processing, 34+/-  
Sales, etc...

average = 5.7 acres per grower

# of growers Utilizing Upland Acreage	6
---------------------------------------	---

Employees

# of Employees (FTE)	# of Growers	Percentage
< 1	15	44.1%
1-5	14	41.2%
6-10	4	11.8%
> 10	1	2.9%

# of Employees (actual)	# of Employers
0	11
1 PT	2
2 PT	2
3 PT	2
1 FT	3
2 FT	2
3 FT	2
5 FT	1
6 FT	1
10 FT	1
3 S	1
7 S	2
7 FT-6 S	1
4 FT-8 PT-13 S	1
2 FT-3 PT	1

FT=Full Time PT=Part Time S=Seasonal

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1. What are your aquaculture products?

	Species	Estimated 1987 production
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

\*For production figures, please specify \_\_\_\_\_

2. Briefly explain the methods you use to grow your aquaculture products (include the culture system, substrates, etc.)

3. Briefly explain methods used to harvest your products

4. Briefly describe the aquaculture products you market

5. Indicate market locations of your aquaculture products and describe the market

	Market location	Market volume
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

6. How would you describe the overall quality of your products? (include details on quality control, etc.)

Upland acres managed in order to avoid avoidance

8. Number of full-time permanent employees?

9. Number of part-time or seasonal employees?

Indicate below the months you use seasonal workers, how many you hire, and if they are full-time (FT) or part-time (PT).

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

10. Indicate the composition of your labor force. Use number and FT or PT.

laborer  
technician (2 year vocational training)  
technologist ( Bachelor of Science Degree)  
Scientist (Masters or PhD)

11. How would you rate the availability of labor for aquaculture? Good Fair Poor

12. Has your production increased or decreased over the past five years? How much?

13. Please specify the reasons for growth or decline in production (ie. disease, unstable markets, regulations).

14. Do you see your production increasing or decreasing over the next five years?

What type of...

What type of culture techniques would you employ?

16. Do you have the capability to increase production if new markets were identified?

if no, why not?

17. Please indicate the major obstacles you have faced in trying to develop your aquaculture business.

18. Please indicate the major issues you feel aquaculturists on Hood Canal and in Washington will face in the future. Briefly explain why.

19. Are you familiar with the County's Shoreline Master Plan? Do you feel it promotes and protects aquaculture? give examples

20. Please comment on state environmental legislation, where you feel it is strong, where you feel it is weak, and what changes you would like to see

21. Please comment on land use regulations, where they are strong and weak, and where you would make changes.

PART II: THE RECREATION INDUSTRY: AN OVERVIEW

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## INTRODUCTION

Hood Canal has long been a destination for travelers seeking an afternoon picnic, a weekend getaway, or a long vacation. Attracted by the pristine waters and undeveloped shorelines tourists now make up a large industry on the canal. It is important to know who chooses to visit the canal, why, and what effects they have upon the economy and the environment.

This report will define the water based recreational activities on Hood Canal and explain the economic benefits and impacts related to these activities. Where possible, suggestions have been made such as to how best to maintain the environmental integrity of the canal, and what specific information should the counties keep in order to facilitate future reports.

## RECREATION ON HOOD CANAL

Hood Canal offers many miles of shoreline, hiking trails, a variety of lodging services, and some of the best shellfishing in the State. People using Hood Canal are drawn by its features, facilities, and the close proximity to Seattle, Tacoma, and Everett which make it convenient for day or weekend trips.

Hood Canal has numerous public beaches with oysters and clams available for picking or digging. In addition there are crab and the Hood Canal Spot Shrimp. The Spot Shrimp have become an industry for the canal, attracting thousands of people from all over the northwest and beyond. The season is short, usually about 5 weeks, but the numbers of people and the services and equipment they require can mean economic survival to small marinas and resorts.

Divers frequent Hood Canal for the deep, clean water and the abundant fishes and invertebrates. Although divers are restricted from taking oysters, they may collect scallops, crab, and bottomfish. Many divers choose to not take fish or shellfish, but dive only for the sites. One of the characteristics that make diving in the canal so interesting is the sheer underwater cliffs formed by the same glaciation that carved out the canal. Divers can often find these walls within swimming distance from shore.

Boating has always been a popular activity on Hood Canal. Any given summer day one can see a variety of boats from sail and rowboats to small outboards and large cabin

cruisers. Boaters can enjoy free moorage at several public parks as well as privately operated moorage facilities complete with fuel, stores, and other amenities. Also available only to boaters are the numerous parks that are boat access only. These are often just tidelands without upland facilities, but they offer a more private or less populated area to gather shellfish and beachcomb.

Fishing on Hood Canal is a popular sport encompassing many age and skill levels. By far the most exciting and alluring of the game fish is the Chinook or King Salmon. It's large size and excellent eating attract many anglers during their migration back to their home streams. Coho and steelhead are also fish that attract a lot of attention. Fish that are only recently coming into their own, in terms of anglers attention and recognition by Department of Fisheries, are bottomfish. Bottomfish consist of all cod, lingcod, greenling, flounder, sole, sculpins, rockfish, seapearch, and related species. 1988 is the first year that a license is needed for the taking of bottomfish. In the past size and limit restrictions were also much more liberal or non-existent. Lately there has been the realization that the bottomfish is a major sport fishery in need of protection and regulation.

The Hood Canal watershed, consisting of much of the upland area on the west side of the canal, contains miles of hiking trails for day and overnight hikes. Olympic National Park and several other recreational areas hold numerous

rivers and streams for rafting, kayaking, or fishing. Many lakes and Cushman Reservoir also offer boating and fishing.

The variety of water based activities available on and around Hood Canal are broad enough to attract a wide range of people with different needs and interests. It's close proximity to major metropolotin areas and the long stretches of undeveloped shoreline add to the popularity of Hood Canal. As more developement takes place in other parts of Puget Sound, and more pressure is felt by growing populations it seems sure that Hood Canal will benefit from the increased market for year round customers.

## PARKS, TIDELANDS, AND PUBLIC ACCESS SITES

Hood Canal has at least 45 public parks, ramps, or access sites directly on Hood Canal. These range from full service campgrounds to limited access tidelands. Similarly the canal's upland areas also have recreational options that include backpacking, trailer camping, fishing and boating.

About 35% of the public parks and tidelands are boat access only. Most of these are tidelands managed by the Department of Natural Resources (DNR), some have upland areas and picnic or camping facilities and are maintained as State Parks. Limited access tidelands are not well known or well marked so that they don't always receive the same volume other areas might, this makes them all the more inviting to those who use them.

The majority of campgrounds and tidelands on the canal are accessible by car, bike, or boat and are well used during the summer months. During the shrimp season, and on some weekends, all campsites are full and campers make use of some of the roadside pull-outs as campgrounds. likewise, moorage stays full during peak season and weekends also.

Public moorage is limited, with about 56 slips or bouys available throughout the canal. Many boats also anchor just offshore of public beaches and parks. On the other hand, private marinas offer over 350 wet, overnight slips. When transient and dry moorage is taken into account the number jumps to 663 spaces. Because information was not available on one of the marinas it is likely that the number is somewhat greater.

Figure 1. Parks, tidelands and public access sites- Mason County

	Acres	Picnic	Camp- sites	Boat Launch (lanes)	Moorage	Access*	Shoreline (ft)
Port of Allyn Boat Ramp				1		C	30
Belfair State Park	59.8	47	184			C	3520
Twanoh State Park	174.7	111	62	3	11	C	2867
Harvey Rendsland State Park	8.0					F	1405
Hood Canal Recreational Park	4.7	30		2		C	1000
Hood Canal Salmon Hatchery	10.0					C	600
Hoodsport, Beach 43						C	2951
Potlatch State Park	57	82	37		5	C	9570
Union Public Launching Area	1.0			2		C	30
Dewatto Bay, Beach 41A						B	514
Beach 41B						B	713
Hood Canal, Beach 46						B	1643
Beach 47						B	900
Beach 48						B	9072
Jorsted Creek Beach						F	
Lilliwaup Public Beach						C	900
Lilliwaup Tide- lands State Park						C	4122

\* B= Boat access only  
 F= Walk-in access only  
 C= Accessible by car

Figure 2. Parks, tidelands, and public access sites- Kitsap  
County

	Acres	Picnic	Camp- sites	Boat Launch (lanes)	Moorage	Access*	Shoreline (ft)
Foulweather Bluff, Beach 64						B	3364
Teekaleet Bluff	3	10				C	
Salisbury Point County Park	5.6	10		3		C	520
Kitsap Memorial State Park	57.6	72	56			C	1797
Scenic Beach State Park	71.2	78	50			C	1600
Anderson Cove, Beach 40						B	2145

\* B= Boat access only  
C= Accessible by car

Figure 3. Parks, tidelands, and public access sites- Jefferson County.

	Acres	Picnic	Camp- sites	Boat Launch (lanes)	Moorage	Access*	Shoreline (ft)
Bolton Peninsula, beach 56						B	2400
Broad Spit	2					B	1000
Bywater State Park	134.6					C	21944
Case Shoal, Beach 59A						B	
Hicks County Park	0.7	1		1		C	460
Mats Mats Bay Boat Launch				1		C	40
Quilcene Boat haven		2		2	30	C	100
Shine Tidelands			20	3		C	1500
Squamish Harbor, Beach 59						B	1335
White Rock	71					C	1500
Jackson Cove, Beach 55						B	2791
Dosewallips State Park	424.5	35	155			C	5250
Flapjack Cove Tidelands, Beach 54						C	567
H.J. Carroll State Park	2.8					C	650
Pleasant Harbor State Park	0.8				10	C	100
Right Smart Cove State Park	2.8					C	100
Seal rock Campground	30	10	35			C	2700
Triton Cove, Beach 50						B	2610

JEFFERSON COUNTY (Cont.)

	Acres	Picnic	Camp- sites	Boat Launch (lanes)	Moorage	Access*	Shoreline (ft)
Point Whitney Tidelands	10			1		C	2000
Tabook Point, Beach 57						B	3280
Toandos Peninsula, Beach 57B						B	12050
Toandos Tidelands State Park						B	10455

\* B= Boat access only  
C= Accessible by Car

## MOORAGE

Hood Canal offers a wide variety of moorage options, from full service slips to mooring bouys. The summer boating season can easily fill all available facilities and create long lines at the boat launches. Resorts and marinas offering boat launches are rare, as are fuel and other necessessities. Another lack in the area of services is a pump-out station. The nearest one is at Port Ludlow, and is reporedly little used.

There are currently nine marinas open to the public, operating in the Canal. Services and size vary but most offer at least some slips, although a few have only dry storage.

One common complaint, heard by boaters and local merchants alike, is the need for more boat launches on the canal. There are, in fact, ten boat ramps with a combined total of 19 lanes. There are also three boat hoists, all privately operated. By far the largest majority of ramps are in south Hood Canal, where between Port of Allyn Public Boat Ramp and Hood Canal Recrational Park there are four launches and 8 lanes. Outside of south Hood Canal the nearest public launches are Salisbury Point County Park in Kitsap County, and Point Whitney Tidelands in Dabob Bay. The boat launch at Mats Mats Bay boat launch is actually just outside of Hood Canal, but it is close enough to be of use to the recreation sites in northern Hood Canal. It is possible that the need for more launches can, at least in part, be filled by expanding existing sites to include more lanes.

Figure 4. Marinas and services on Hood Canal.

RESORT NAME	[ SLIPS	MOORAGE TRANSIENT	DRY	RAMP* ]	FUEL
Pleasant Harbor Marina	65	0	0	0	0
Port of Hoodsport	10	10	0	0	0
Rest-A-While Resort	0	0	46	H	0
Sunrise Motel & Resort	35	0	0	0	0
Beacon Point Boathouse	3	0	20	H	0
Quilcene Boat Launch	unknown				
Seabeck Marine Inc.	181	0	0	H	Y
Sandy's Tahuya Resort	15	8	20	1	Y
Hood Canal Marina Corp.	50	10	190	0	Y

\* numbers indicates number of lanes on boat ramp  
 "H" indicates a boat lift facility

Figure 5. County moorage figures for 1978.

	Wet Slips	Dry Slips	Average Price/ft. Public	Private	Revenues*
Mason	198	330	\$.69	\$2.06	\$72204
Kitsap	1787	149	\$.96	\$1.27	\$667040
Jefferson	851	90	\$.68	\$1.41	\$311016

\*- Estimated revenues for wet, open moorage only. Does not include transient receipts, groceries, or services.

## SPORT FISHING IN THE HOOD CANAL REGION

### LICENSES AND FEES

Licenses are required for taking all fresh and saltwater fishes and shrimp. The fees and durations of each license vary according to the status of the license holder (resident, non-resident, senior, etc...). The following will give a brief description of each license, for further explanations please consult either SALMON, SHELLFISH, BOTTOMFISH SPORT FISHING GUIDE distributed by Washington State Department of Fisheries, or Game Fish Regulations distributed by Washinton Department of Wildlife.

This year (1988), for the first time, Department of Fisheries (DOF) will require a license for taking of all saltwater foodfishes, including those taken while SCUBA diving. A seperate card is required for salmon, and another license for Hood Canal Spot Shrimp.

The Department of Wildlife (DOW) controls the licensing and management of freshwater fishes, landlocked salmon (Kokanee), and steelhead. In addition to the regular fishing license, a special permit is required to fish for steelhead.

### REGULATIONS

The following is a list of species commonly sought in Hood Canal and it's tributaries, and the seasons and limits pertaining to each species.

#### SALTWATER- DEPARIMENT OF FISHERIES

Bottomfish- Open entire year.

- 15 fish per day.

- Not more than 5 may be rockfish.

- Not more than 10 may be surfperch.

- Lingcod count towards the limit.

Lingcod- Open April 15 to May 31.

- One fish per day.
- Minimum size- 22 inches
- Any size for SCUBA divers.

Salmon- Daily limit 3

- Open year round except:
  - Dabob Bay Open August 16 through April 14.
  - Waters within 100 feet of Finch Creek closed.
  - Waters within 100 feet of the Seabeck Highway NW Big Beef Creek Bridge are closed August through November.
  - Waters within 100 yards of the confluence of the Enetai Hatchery outfall creek and saltwater are closed at all times.
- Minimum size 22 inches- Chinook only.
- No minimum size on other salmon.

Oysters- Daily limit 18

- Leave oyster shell on beach.
- Do not take oysters in water two feet or deeper.
- Open September 16 through July 14 except as follows
  - Bywater Bay State Tidelands, part of the tidelands open May 16 through July 14.
  - Hoodspoint Salmon Hatchery open May 16 through July 14.
  - Kitsap Memorial State Park open May 16 through June 15.
  - Scenic Beach State Park closed until April 15, 1989.
  - Seal Rock Campground open May 16 through July 14.

Clams- Geoduck- Daily limit of 3.

- Horse - Daily limit of 7
- Manila- Daily limit of 40
  - Minimum size of 1.5 inches.
- Native Littleneck- Daily limit of 40
  - Minimum size of 1.5 inches.
- Butter- Daily limit of 40.
  - Minimum size of 1.5 inches.

\* All clamming is open year round except in Twanoh State Park where the season is January 1 through June 15.

Crab- Dungeness- Open year round except for pots.

- Open July 15 to April 15 for crab pots.
- Daily limit of six crabs.
- Minimum size of Six inches.
- No taking of softshell crabs.
- Red Rock - Daily limit, 12 crabs.
  - No size limit.
  - No sex restriction.

Hood Canal Shrimp- Season opens 3rd Saturday in May- 9:00 AM.  
- Limit of 10 pounds in the shell.  
- Minimum mesh size for pots- 1/2"

Mussels- Daily limit 10 pounds in the shell.

Pink scallops- Daily limit 20 pounds or-  
- 10 quarts in the shell.

Weatherwane scallops- daily limit of 12.  
- Must be over 4 inches.

Rock scallops- Daily limit of 12.

FRESHWATER- DEPARTMENT OF WILDLIFE

Bass- Daily limit 10- not more than 3 over 17".

Trout- Daily limit 8.

- not more than 2 may be over 12" if taken from rivers,  
streams, or beaver ponds.

- Minimum size 8" in rivers, streams, and beaver ponds.

- No minimum size in lakes or ponds.

- In addition to daily limit, 2 steelhead over 20" may  
be kept.

note- additional regulations for specific rivers and lakes  
should be read.

Whitefish- Daily limit 15.

- No minimum size.

All Other Fish- No restrictions.

## MASON, KITSAP, AND JEFFERSON COUNTY TOURIST FIGURES

Travel and recreation figures for Hood Canal specifically are hard to come by. However information on the individual counties is available. Except for the Spot Shrimp fishery, most activities on the canal could also be enjoyed in other parts of Puget Sound. Any figures that include the whole county are going to be misleading because each county has a different percentage of usable shoreline bordering Hood canal.

Kitsap County was the top county on the canal bringing in \$33 million in travel related revenues. Presumably a significant portion of that money was spent on the east side of the county where the majority of tourist and recreational facilities are. It should not be overlooked however that the close proximity to Hood Canal of a large number of tourists is a potential market resource.

Mason County rated second in tourist related expenses with \$13.5 million. In the case of Mason County, a significant amount of the revenue can be attributed to Hood Canal. Much of the county's recreational shoreline extends through the most popular and well used portion of Hood Canal.

Jefferson County followed Mason with \$12.8 million in tourist revenues. While Jefferson County contains the largest number of public shoreline recreational parks and facilities it also has a lot of shoreline outside of Hood Canal. Part of Jefferson's tourist revenues come from the open coast, the Straits of Juan de Fuca, and Admiralty Inlet.

when each county is analyzed for the number of tourist

facilities and ratio of Hood Canal shoreline to other shorelines, it appears that the figures change. Mason County and then Jefferson County make up the majority of income generating shoreline followed by Kitsap County whose primary travel facilities lie in the main part of Puget Sound.

Tourism and travel are growing in Washington State, and across the nation. State Park attendance is up 4%, National Park attendance is up 17%. Olympic National Park recorded one of the largest increases in the nation with 16% for 1986. An estimated 3.5 million people used the park which resides partly in the Hood Canal watershed. This is good news for businesses on the canal who then have a ready market of travelers to cater to.

Tourism is the fourth largest industry in Washinton, second largest in the nation. With 50% of northwest residents vacationing in the northwest, and travelers entering the state in record numbers it is fair to believe that with even modest advertising and marketing Hood Canal can continue to offer exceptional recreational opportunities without losing it's rural flavor.

	MASON	KITSAP	JEFFERSON	WASHINGTON	'85-'86 CHANGE
Hotels	15	25	15	1300	UP 12%
Eating/ Drinking est.	69	218	58	8000	UP 5%
Service Stations	15	41	11	1800	N/C
Recreation services	12	36	0	2400	UP 8%

Figure 6. Travel related businesses- 1986.

	MASON	KITSAP	JEFFERSON	WASHINGTON
Travel Expenditures	\$13.5 m	\$33 m	\$12.8 m	\$3.4 b
Travel-Generated Payroll	\$3.2 m	\$7.7 m	\$2.2 m	\$680 m
Travel-Generated Employment (FTE)	375	1000	325	85000
State Tax Receipts	\$730 t	\$2 m	\$670 t	\$135 m
Local Room Tax	\$26 t	\$150 t	\$84 t	\$8.0 m

t= Thousand    m= Million    b= Billion

Figure 7. Economic figures from travel related business- 1986.

## EMPLOYMENT

Employment in the Hood Canal region is in part dependant upon the tourist industry. An estimated 1700 (FTE) travel related jobs are held in the three counties bordering Hood Canal. While this sounds impressive it does not give the complete picture of employment in the area.

Employment figures given in full time equivalence (FTE) actually indicate a larger workforce. Many service industry jobs are seasonal, serving boaters and other vacationers during the peak summer season. The summer months see a large increase in restaraunt staff, maids, sales clerks, resort and park attendants, and other unskilled jobs. Many of these jobs are held by non-resident students, and others from outside the county. Some of the economic benifits of increased employment in the county are lost as the employees leave the area to spend their money.

Employment Security records show a consistent pattern of increased employment during the summer, and decreased employment during the winter. They also show an increase in the labor force inconsistent with local unemployment figures. This inconsistency would account for non-residents and high school students entering the labor force temporarily. Kitsap Dounty is the one exception to this trend. Part of that is due to the much larger work force, and the nature of the jobs available in Kitsap county. Many residents commute to Seattle and vicinity, or work for one of the two Naval Bases in Kitsap County. For this reason employment statistics do

not show any significant seasonal variation there.

Seasonal labor is not limited to the tourist industry. In Mason County aquaculture and logging also require some seasonal help. The fact that part of the employment figures for tourism are for part-time and seasonal help does not diminish the positive impact tourism has on the Hood Canal region. However it needs to be noted that seasonal and low level jobs are not as beneficial to the region or the people as some employment figures would indicate.

Figure 8. MASON COUNTY EMPLOYMENT- 1986

	Labor Force	Employment	Unemployment	Percent
JAN	12130	10702	1410	11.6%
FEB	12070	10740	1330	11.0
MAR	12220	10970	1250	10.2
APR	12560	11320	1240	9.9
MAY	12530	11360	1170	9.3
JUN	12790	11640	1150	9.0
JUL	13130	11910	1220	9.3
AUG	13220	12070	1150	8.7
SEP	12950	11840	1110	8.6
OCT	13320	12210	1110	8.3
NOV	13570	12400	1170	8.6
DEC	13170	11900	1270	9.6
ANNUAL AVERAGE	12810	11590	1220	9.5

Figure 9., KITSAP COUNTY EMPLOYMENT- 1986

	Labor Force	Employment	Unemployment	Percent
JAN	69900	65500	4400	6.38
FEB	69000	64700	4300	6.2
MAR	69400	65000	4400	6.3
APR	69600	65200	4400	6.3
MAY	69600	65500	4300	6.2
JUN	70300	65800	4500	6.4
JUL	70900	66200	4700	6.6
AUG	70900	66400	4500	6.3
SEP	70600	66200	4400	6.2
OCT	70900	66400	4500	6.3
NOV	70500	66200	4300	6.1
DEC	70400	66100	4300	6.1
ANNUAL AVERAGE	70200	65800	4400	6.3

Figure 10. JEFFERSON COUNTY EMPLOYMENT- 1986

	Labor Force	Employment	Unemployment	Percent
JAN	7080	6360	720	10.2%
FEB	7030	6340	690	9.8
MAR	7130	6450	680	9.5
APR	7410	6760	650	8.8
MAY	7670	7050	620	8.1
JUN	7780	7210	570	7.3
JUL	8360	7780	580	6.9
AUG	8520	7920	600	7.0
SEP	8530	7980	550	6.4
OCT	8160	7530	630	7.7
NOV	8060	7360	700	8.7
DEC	7600	6920	680	8.9
ANNUAL AVERAGE	7780	7140	640	8.2

## ECONOMIC IMPACTS OF TOURISM ON COUNTY SERVICES

Tourists passing through the Hood Canal area, or staying for a weekend or longer use to some extent the services provided by the counties. Usually this is in the form of garbage disposal, road use, county park use, or other common uses. Occasionally police, fire, emergency medical, search and rescue or other major services are required. The establishment and maintenance of these services is paid for mostly by county residents through local taxes.

I could not determine the number of emergency responses attributed to non-residents as these figures are not collected. Also un-attainable are figures on the percentage of use of roads and parks by non-residents, and their relative maintenance costs. It could be presumed that the taxes and salaries generated by the local travel industry helps compensate for the cost of providing police, fire, and medical services to non-residents.

Garbage disposal is becoming a major issue in the '80's. Landfills are filling up. Toxic chemicals are leaching out. Costs for transport and disposal are going up. Often the businesses who are paying for disposal of the garbage did not sell products being thrown away. Weekend travelers often pack food, soft drinks, disposable diapers, etc... specifically to avoid having to purchase these items while on their trip. These costs are born both by the businesses who pay to have their trash disposed of and the counties who must find reasonably safe and available areas to use as landfills.

Because such information is usefull to the Hood Canal

Coordinating Council, and potentially to individual counties and businesses, I feel there is a need for a system of recording the costs to provide county services by area. This would allow, for instance, information on park maintenance costs from the Hood Canal area of Jefferson County to be considered separately from the ocean beaches area. It would also be helpful to have a breakdown of the number of emergency responses related to residents and non-residents. With this information real figures on the price the county pays for tourism could be more accurately tallied.

### **ENVIRONMENTAL IMPACTS**

Environmental Impacts directly related to recreational activities are not easy to identify, and even less easy to document. Human activity on and near the water may have detrimental effects ranging from the obvious, such as discarded waste, to the less obvious but often equally important effects of disturbing breeding or feeding wildlife solely by the volume of people present in an area.

### **HUMAN ACTIVITY**

Boating, beachcombing, shellfishing, even the mere presence of humans can have some impact on wildlife. Disturbing traditional feeding or breeding grounds of some birds has been implicated in lower birth rates, causing stress on already threatened species. One of the attractions of Hood Canal is the pristine shorelines and variety of wildlife. An understanding of the biology of the areas sensitive wildlife and the identification of important feeding and breeding grounds are significant steps in keeping the canal diverse and productive.

### **BOATS**

One of the most visible forms of pollution is garbage thrown from cars, boats, docks, and almost anywhere else people congregate. Besides being an eyesore, most garbage contains a large amount of plastic. Plastic, in the form of bags, packing material, six-pack rings, and other containers has been implicated in the deaths of marine mammals, birds, and even some fishes. Unlike other forms of garbage, plastic floats, and may take years to break down at all.

Oil from 2 cycle outboards, and bilgewater is a continuing problem that grows as recreational boating increases in popularity. Besides being unsightly, the oil coats the water with a thin layer which blocks the transfer of oxygen from the atmosphere to the water, thus choking off some surface dwelling organisms. Some of the most sensitive to this type of pollution are plankton and planktonic larvae. The effects of this are twofold, many fish and invertebrates depend on these tiny organisms as a food source, and some of the plankton are the larvae of commercially and recreationally important organisms such as crabs, shellfish, and some fishes.

Engine oil also contains metals and other particles toxic to marine life that are picked up in the process of lubricating and cleaning the moving parts of the engine. Some of these toxins can enter from the sediments into plants and then into the bodies of whatever eats those plants. The dangers of this become apparent as the toxins move up the food web into secondary carnivores such as seals and birds of prey. Toxins stored in their fat tissues and released into their blood stream can create significant drops in the birth rates, and can decimate entire populations of animals.

Boater education and services concerning the dangers and proper disposal of waste oil are important steps in reducing the levels of oil and related products entering into the water.

Marine toilets with holding tanks, porta-potties, and Marine Sanitation devices (MSD's) are common on many mid to large size boats. One of the primary concerns with most on board toilets is

the lack of treatment and the lack of control over where the sewage is released. Ideally holding tanks and porta-potties are emptied at a pump-out station at a marina or port, however the only pump-out facilities in Hood Canal are in Port Ludlow and Pleasant Harbor Marina, and both are reported to be used very little. Second to a pump-out station would be to empty the holding tank into deep fast moving water where it can be quickly diluted. Unfortunately, many boaters find it more convenient to empty the holding tank when at anchor, or to by-pass the holding tank altogether, and just flush out the sewage every time the head is used. When this happens in protected bays or shallow waters (common areas for shellfish sites) then the pathogens are able to survive long enough to be ingested by organisms, sometimes shellfish, and can make their way back to a human host. Detection of boaters as a source of bacterial pollution is difficult at best because boats are so mobile, and bacterial pollution can have many sources.

Marine Sanitation Devices (MSD's) are an alternative to either dumping polluting wastes, or having to find and use a working pump-out facility. MSD's offer treatment of sewage, using chlorine or other chemicals, before it is released into the water. The cost of such systems is beyond the means of most boat owners but for those who can afford them the benefits are worth the cost.

The problem of improper use of on board sewage requires more than just more pump-out stations. The boating public needs to be informed and reminded of the dangers of bacterial pollution.

Pressure from boating clubs, magazines, and even fellow boaters is needed to change the perception that boaters wastes don't contribute to the overall pollution of our waters.

#### **STORMWATER**

Water entering into roadside ditches, storm drains, or running off the land into streams or other waterways is typically termed stormwater. Ideally the precipitation from which the runoff came is clean and pure. When the water flows over roads, parking lots, pastures, agricultural lands, and yards, it picks up anything light enough or small enough and carries it along. The danger comes when the substances picked up are harmful to the environment.

Runoff from roads and parking lots carries oil and other petroleum products, heavy metals such as lead, and whatever refuse may have been dumped along the road. Car finishes and paints, chrome plating, and tire wear also contribute to the overall buildup in stormwater.

Buildings also can contribute to the impurities in stormwater. Zinc from galvanized roofing nails, gutters, and downspouts are potential sources of pollution. Exterior paints, whether or not they contain lead, can contain coloring agents that are highly toxic and can enter into the water in the process of weathering.

Runoff from agricultural lands, pastures holding livestock, and from yards and gardens can contain large quantities of chemical and bacterial pollutants. Fertilizers and pesticides

applied to fields, gardens, and yards can be washed out through the soil and into ditches or streams. These chemicals remain unseen, only being detected by specialized laboratory tests, or at times by the damage they do.

Like harmful chemicals, bacterial pollution also must be detected by laboratory tests. The main sources of bacterial pollution are feces from warm blooded animals- livestock, chickens, family pets, marine mammals and birds, and humans. The bacterial contamination itself is not a threat to marine organisms, in fact many thrive on it, but once in the food web it becomes a danger to people who may inadvertently eat contaminated seafood. Proper animal husbandry, such as fencing streams and controlling runoff, should reduce the chances of livestock related contamination. Proper installation and maintenance of septic systems will do much to reduce the risk of contamination due to human wastes. In Hood Canal bacterial pollution, identified by the presence of fecal choliforms, is the sole source of shellfish beach closures.

All of the above mentioned forms of pollution fall under the term "non-point source" meaning that there is no single source or outfall from which they originate. Non-point source pollution is the hardest to act against because it is the hardest to identify. When sources are identified, the results are often clouded in arguments and blame. In truth it is the responsibility of all residents and visitors to act responsibly with regards to public and environmental health.

## CONCLUSION AND RECOMENDATIONS

Hood Canal faces some pivotal choices at this time. Demand for the canal is up. The surrounding area is seeing growth in population and employment. But at the same time Beaches are being closed to shellfishing due to pollution.

The number one problem faced by the region today is non-point source pollution. Rising numbers of full-time residents and tourists are operating cars and boats, and using overworked, out-of-date septic systems. This is combined with stormwater runoff and agricultural/livestock runoff to produce unsafe levels of bacteria along the shorelines. It cannot be stressed enough that public education is a key step in reducing the problem. But it should not stop there, the counties and the state need to set firm standards for septic systems, shoreline development, and animal control, and enforce and abide by those standards.

Regional Sewage Treatment plants would help to correct some of the problem by Treating wastes before they enter into the water. The cost for such systems, however, is very high, especially when servicing a largely rural area. Another option is to re-examine the septic tank regulations and how they are implemented. Much of the canal is set on basalt flows that do not perk. Permits should be withheld from unsatisfactory areas until arrangements can be made to find other types of sewage treatment or disposal methods.

Shorelines are especially sensitive to development. County zoning currently limits shoreline development. Where attention should be focused is on areas already developed, monitoring the

septic tanks and ensuring safe standards are met.

The tourist industry is growing, and Hood Canal is sharing in that growth, but local businesses and governments should not be too complacent. Identifying the needs of boaters and campers and targeting changes directly at those needs is going to be the challenge in the coming years. It is apparent that more moorage and boat launch facilities are needed. That need now needs to be turned into numbers and locations so that boat ramps and slips can keep up with demand.

I would like to conclude that more pump-out stations are needed on the canal, and they are, but the ones that already exist are not being used. Boater education and peer pressure are key steps before more pump-out stations will be effective.

The Hood Canal region has reached a crossroads where choices about the economic and environmental integrity must be made. Tourism and recreation can exist side by side with a clean environment, But not without the cooperation of businesses, government, and the people. The Hood Canal Coordinating Council and the Boaters Task Force are prime examples of multi-level involvement that can make real changes in the course of events in the region.

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