

AQUACULTURE NOTE



Grant Support

Developing a Mariculture Business in Alaska

Information and Resources

Ray RaLonde
Brian Paust



Alaska Sea Grant College Program
1993 • Aquaculture Note No. 15



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Information and Resources



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Part I: Permits & Business Planning

Introduction

Starting a mariculture business is an exciting process, but it can be a confusing and frustrating endeavor. The mariculture industry is regulated by several state agencies, and federal agencies are often involved depending on the location and facility. This publication is a list of resources on mariculture and is intended to provide you with the introductory information needed to enter this promising industry.

In Alaska, the term *mariculture* (which is defined as the culture of marine organisms) commonly refers to the culture of shellfish and seaweeds. Finfish farming—raising the fish in confined pens to market size—is illegal in the state, although salmon ranching—releasing the fish into the wild for later harvest—is permitted.

Initial Contacts

When you start a mariculture business, several items of basic information must be collected to test the feasibility of your project and to complete the aquatic farm permit application. The information you gather will provide a foundation for the future development of your business. The Alaska Sea Grant Marine Advisory Program publishes a newsletter that contains current information on what is happening in Alaska mariculture. If you would like to be on the mailing list for the newsletter or if you have any questions concerning a proposed mariculture venture, an excellent initial contact is:

Ray RaLonde

Aquaculture Specialist

Univ. of Alaska Marine Advisory Program

2221 E. Northern Lights Blvd., Suite 110

Anchorage, AK 99508-4140

(907) 274-9691 • Fax (907) 277-5242

You may also wish to contact the Marine Advisory office closest to the location of your proposed project for additional information concerning regional mariculture opportunities. The list of regional offices is as follows:

- Geri Hoffman** **Univ. of Alaska Marine Advisory Program**
Kuskokwim Campus
P.O. Box 368
Bethel, AK 99559
(907) 543-4515 • Fax (907) 543-4527
- Terry Johnson** **Marine Advisory Agent**
Univ. of Alaska Marine Advisory Program
P.O. Box 1549
Dillingham, AK 99576
(907) 842-1265 • Fax (907) 842-5692
- Hank Pennington** **Marine Advisory Agent**
Fishery Industrial Technology Center
900 Trident Way
Kodiak, AK 99615
(907) 486-1514 • Fax (907) 486-1540
- Doug Coughenower** **Marine Advisory Agent**
Univ. of Alaska Marine Advisory Program
4014 Lake Street, Suite 201B
Homer, AK 99603
(907) 235-5643 • Fax (907) 235-6048
- Rick Steiner** **Marine Advisory Agent**
Univ. of Alaska Marine Advisory Program
P.O. Box 830
Cordova, AK 99574
(907) 424-3446 • Fax (907) 424-5246
- Dolly Garza** **Marine Advisory Agent**
Univ. of Alaska Marine Advisory Program
1297 Seward Ave.
Sitka, AK 99835
(907) 747-3988 • Fax (907) 747-1443
- Brian Paust** **Marine Advisory Agent**
Univ. of Alaska Marine Advisory Program
P.O. Box 1329
Petersburg, AK 99833
(907) 772-3381 • Fax (907) 772-4431

Permit Application

To start an aquatic farm in Alaska, you must first apply for and receive permits from the State of Alaska. Permit applications are available from the Alaska Department of Fish and Game (ADF&G) and the Department of Natural Resources (DNR). The permit application packet includes instructions, illustrations, and examples to assist you through the more difficult parts of the application. The information packet also contains a step-by-step outline of the permit review process.

There are two basic permit types available. One is called a Site Suitability Permit and can be applied for throughout the year. This permit is intended only to allow testing the feasibility of a site or several sites for aquaculture potential, and it is limited to one year. Other permits are required to actually operate an aquatic farm. You may only apply for an aquatic farm permit during a specified filing period. DNR establishes an annual 60-day application period for these permits. Contact the mariculture coordinator from either agency to determine the type of permit needed for your project and the dates of the current permit filing period. The State of Alaska contacts are:

Jim Cochran

Mariculture Coordinator
Alaska Dept. of Fish and Game
Div. of Commercial Fisheries Management
and Development
P.O. Box 25526
Juneau, AK 99802-5526
(907) 465-6150 • Fax (907) 465-4168

Janetta Pritchard

Mariculture Permit Coordinator
Alaska Dept. of Natural Resources
Div. of Land and Water Management
3601 C Street
P.O. Box 107005
Anchorage, AK 99510-7005
(907) 762-2270 • Fax (907) 561-0221

Maps and Charts

As part of your permit application, you will need to include a map of your site. Nautical charts are available from the National Oceanic and Atmospheric Administration (NOAA) Chart Sales Office in Anchorage. If you do not know the chart number you need, ask for the chart catalog titled "United States, Alaska and Aleutian Islands, Catalog Number 3," available from NOAA at no charge. All nautical charts cost \$14.00 and can be purchased by phone with a credit card. U.S. Forest Service maps

are also available for \$2.00 from your local ranger district, or they can be purchased from the Anchorage office. U.S. Geological Survey quad maps (1:63, 360 scale) are also required. Maps are available through:

NOAA/NOS
Chart Sales Office
222 W. 7th Ave. #38
Anchorage, AK 99513-7574
(907) 271-3065

U.S. Forest Service
201 E. 9th Ave., Suite 206
Anchorage, AK 99501
(907) 271-2500

U.S. Geological Survey
Earth Science Information Center
4230 University Drive
Room 101
Anchorage, AK 99508-4664
(907) 786-7011

Additional Management Contacts

After you file your permit application, a number of state and federal agencies will scrutinize your plan to determine its environmental, economic, social, and land use impacts. From time to time, various agency representatives may contact you with questions about certain aspects of your application and business development proposal. These agencies may also be important for you to contact prior to permit application. As an example, if you think the site you selected may have an impact on marine mammals, you should contact the U.S. Department of Fish and Wildlife and the National Marine Fisheries Service to assess their concern before you apply for a permit. Making early contacts will save you much time and trouble later on in the application process.

In many of the agencies that follow, there is no single person who specializes in aquaculture issues. Initial contact persons are listed for some.

U.S. Environmental Protection Agency
222 West 7th Ave.
Anchorage, AK 99513
(907) 271-5083 • Fax (907) 271-3424

Water quality standards and discharge permits.

National Marine Fisheries Service
Habitat Div.
P.O. Box 21668
Juneau, AK 99802
(907) 586-7645 • Fax (907) 586-7131

Habitat impacts on federal lands.

Office of the Governor
Div. of Governmental Coordination
P.O. Box AW
Juneau, AK 99811-0165
(907) 465-3562 • Fax (907) 465-3075

Coordinates permit application screening.

Dick Barrett, Director
Palmer Laboratory
Alaska Dept. of Environmental Conservation
500 South Alaska Street
Palmer, AK 99645
(907) 745-3236 • Fax (907) 745-8125

Laboratory responsible for water quality testing, seafood quality testing, and paralytic shellfish poison and domoic acid toxin screening.

Mike Ostasz, Shellfish Coordinator
Alaska Dept. of Environmental Conservation
Div. of Environmental Health
800 East Dimond Blvd.
Anchorage, AK 99515
(907) 349-7343 • Fax (907) 349-4715

Principal sanitarians who direct the shellfish sanitation program for the State of Alaska. Responsible for certifying aquatic farm sites for water-quality requirements.

Ted Meyers, Shellfish Pathologist
Southeast Pathology Laboratory
Alaska Dept. of Fish and Game
P.O. Box 3-2000
Juneau, AK 99802
(907) 465-3577 • Fax (907) 465-3510

This laboratory specializes in shellfish pathology.

U.S. Army Corps of Engineers

Alaska District

P.O. Box 898

Anchorage, AK 99506

(907) 753-2716 • (800) 478-2712 • Fax (907) 753-5567

*Responsible for permitting any shoreline modifications and for maintaining passable and safe navigation routes in coastal areas.***U.S. Coast Guard**

P.O. Box 3-5000

Juneau, AK 99802

(907) 586-7755 • Fax (907) 586-7379

*Responsible for monitoring navigation, proper marking, and safety concerns with structures placed in coastal areas.***U.S. Fish and Wildlife Service**

1011 East Tudor Road

Anchorage, AK 99503

(907) 786-3359 (migratory birds)

(907) 786-3394 (marine mammals)

*Responsible for protection and management of wildlife under federal jurisdiction.***U.S. Forest Service**

Wildlife and Fisheries

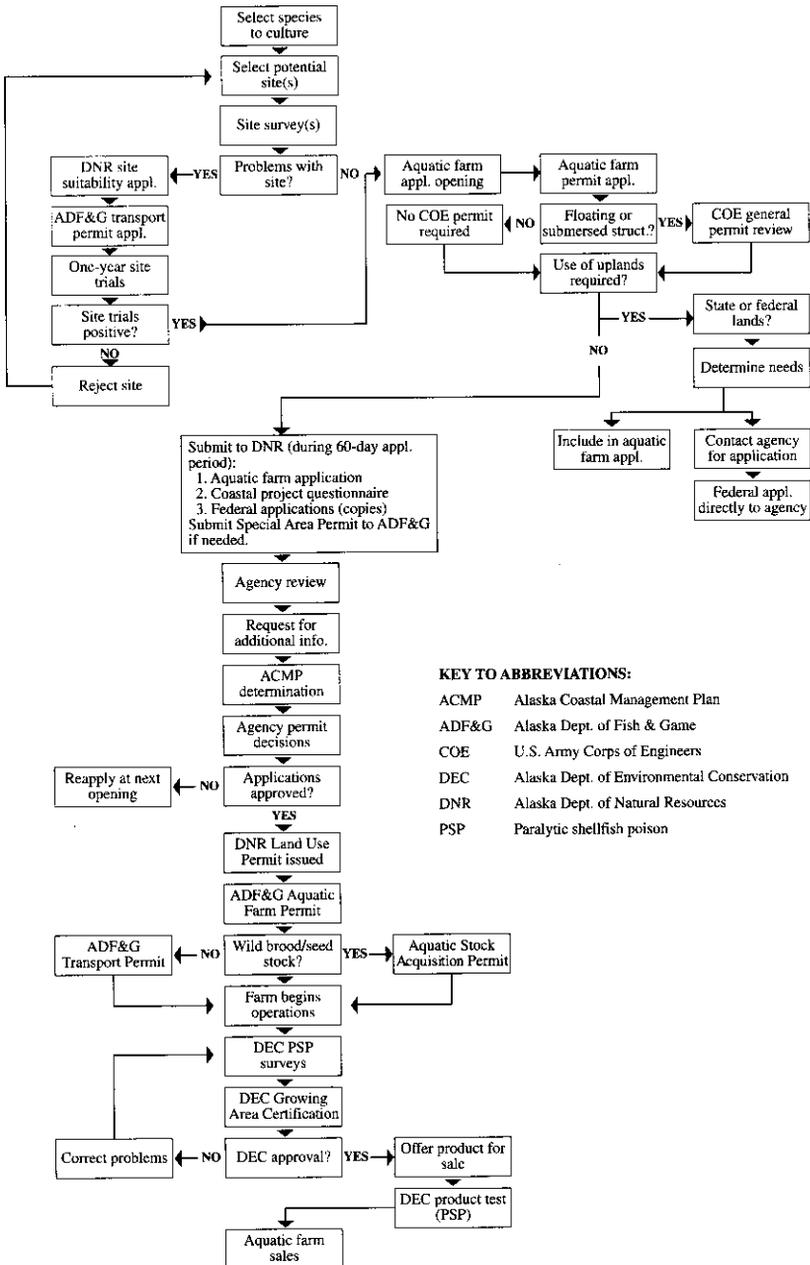
P.O. Box 21628

Juneau, AK 99802

(907) 586-8752 • Fax 586-7840

Responsible for managing the U.S. national forests. This agency may be the uplands manager adjacent to your site.

Permit Flow Diagram



- KEY TO ABBREVIATIONS:**
- ACMP Alaska Coastal Management Plan
 - ADF&G Alaska Dept. of Fish & Game
 - COE U.S. Army Corps of Engineers
 - DEC Alaska Dept. of Environmental Conservation
 - DNR Alaska Dept. of Natural Resources
 - PSP Paralytic shellfish poison

General Planning

In addition to a variety of state and federal regulations, the site of your proposed aquatic farm may also be subject to a number of regional and local regulations. The site may be located in an area that has an established Coastal Zone Management Plan. The Department of Natural Resources (DNR) will develop an abbreviated management plan for any site not included within a Coastal Zone Management Plan area. It is essential that you maintain close contact with DNR representatives so they can effectively assist you.

Coastal Zone Management Plans can be obtained from the following sources:

**Office of the Governor
Div. of Governmental Coordination
P.O. Box AW
Juneau, AK 99811-0165
(907) 465-3562 • Fax (907) 465-3075**

**Alaska Resources Library
222 W. 7th Ave., #36
Anchorage, AK 99513
(907) 271-5025 • Fax (907) 271-5965**

They are also available at the regional offices of DNR, your local library, and community or borough zoning offices.

DNR also has Area Plans throughout the state, and the Alaska Department of Fish and Game has several Special Area Management Plans. You need to investigate whether any of these affect your plans for constructing an aquatic farm at your proposed location.

To determine the potential for land- and water-use conflicts, you need to find out who owns the adjacent uplands and the designated land use for the uplands and tidelands in the vicinity of your proposed site. As the applicant, you must know these potential conflicts early in the permitting process to avoid delays in permit processing, confrontation with other resource users, and possible exposure to litigation.

The aquatic farm permit application process requires you to specify the owners of the uplands adjacent to your site. These individuals, businesses, or agencies should be contacted directly, using a verifiable means, as soon as possible to determine their concerns about the location of a farm adjacent to their property. Even if an upland owner is not a permanent resident of the area, contact is still essential. You must remember that an important survival skill in this business is the ability to communicate with other marine resource users. Your success in receiving a permit is dependent upon the cooperation of upland

property owners and other marine resource users. The reference volume *Who's Planning Alaska: The Alaska Planning Directory, 1991* (\$2.50) may help you to identify the organization responsible for managing the uplands adjacent to your site. Copies can be obtained from various sources, including your local library, local Cooperative Extension Service office, or the following:

**Cooperative Extension Service
Univ. of Alaska Fairbanks
P.O. Box 756180
Fairbanks, AK 99775-6180
(907) 474-7268 • Fax (907) 474-6369**

The existing farmers are an important resource for you. You should visit several farms, talk to farmers about their operation, and attend shellfish farming association meetings such as the Alaskan Shellfish Growers Association, the Kachemak Bay Mariculture Association, and the Pacific Coast Oyster Growers Association. Practical information is available simply by asking people in the business. A list of existing aquatic farmers is available from the Mariculture Coordinator of the Alaska Department of Fish and Game and the Aquaculture Specialist of the University of Alaska Marine Advisory Program.

The Alaska Department of Environmental Conservation (DEC) is responsible for seafood sanitation and safety regulations. Shellfish farms are required to pass a water quality test for initial mariculture site certification and must undergo annual water quality testing during operation. In addition, harvested shellfish are tested for the presence of paralytic shellfish poison and domoic acid toxins. Fees are charged to the farmer for DEC services. The current fee schedule is:

| | |
|---|-----------------|
| Initial mariculture site certification | \$325.00 |
| Mariculture site recertification | \$150.00 |

In addition, fees are required for shellfish harvesters, shippers, packers, and re-packers.

Many other state, federal, and private organizations have land management responsibilities. As a result, there is much confusion about the roles these agencies play in land management. Additional information about the land management responsibilities of various agencies can be found in *Who's Planning Alaska: The Alaska Planning Directory, 1991*.

Business Planning

The site selection and permit application processes are among the first steps required for developing an aquatic farm. Business planning is another important initial step. Many aquatic farmers begin by developing a feasibility study, and from that study they draft a preliminary business plan. A feasibility study is a scaled-down version of your intended operation. It is recommended because with a smaller investment you can test the biological and economic feasibility of your site for aquatic farming. Every farm operation will be a little different, and these minor differences can make or break the operation. There is nothing like working with actual data from your farm to determine its economic viability. It is important to remember that to complete an adequate feasibility study, the costs of various stages of the operation must be determined, particularly the expense of labor needed to operate the facility. To design a feasibility study, use the business plan outline and remember to keep accurate, thorough records.

Even though a complete business plan is not required in the permit application, potential aquatic farmers should seriously consider developing one. The permit application does require that you draw up a project development outline. This part of the application should not be interpreted as being an adequate business plan. The sobering reality is that you are starting a marine-oriented business where profit margins and market opportunities are very constrained or subject to considerable volatility. The novice farmer must be well-instructed and financed. In other words, the job of planning a mariculture business must be done properly the first time. There will be little opportunity for mid-course corrections to save a failing business. You must develop an accurate and thorough business plan.

Various instructional manuals are available that will help you work your way through the business planning steps. The actual time expenditure required for the completion of a mariculture business plan need not be extensive. Once committed to the task of writing a planning document, most prospective farmers find themselves able to produce an adequate document within five days. This effort is not just an enjoyable mental exercise, but is also essential for the success of your project. The omission of this planning step is a major cause of business failure. The business plan is fairly simple in structure and usually contains the following components:

Contents of a Business Plan

- Title
- Statement of Purpose
- Executive Summary
- The Business
 - History
 - Business description
 - Species
 - Product form (live, shucked, value-added)
 - Culture technology
- Market
 - Market description
 - Marketing strategy
- Competition
- Operations
 - Start-up
 - Development schedule
 - Production tasks
- Management (who will manage the facility and how)
- Research and development
- Personnel
 - List of team members and their experience
- Risk factors
 - Production-related
 - Marketing-related
 - Methods of risk reduction
- Financial information
 - Facilities and equipment costs
 - Operating costs
 - Method of financing
 - Source and amount
- Financial analysis
 - Break-even analysis
 - Pro forma balance sheet
 - Pro forma income statement
 - Pro forma cash flow
 - Historical financial statements
 - Equity capitalization
 - Debt capitalization
- Supporting documents

For many aquatic farmers, this type of plan may seem overwhelming. The most difficult and least understood part of the plan is the financial analysis section. You may need the assistance of an accountant to complete this section. You probably have the remaining information needed, or it is readily available.

Business Publications

The following list of introductory business planning materials will provide you with the basic information needed for the construction of a business plan. Although some of these references are intended for use in the planning of fish farming ventures, the information is generic in nature and useful for all types of aquatic farming. Your local library will also have a selection of business development and business plan construction manuals. Small business planning centers, the Cooperative Extension Service, and Marine Advisory Program offices are also good sources of assistance.

Economic Evaluation of Investment Decisions for Aquaculture Enterprises.

Developing an Aquaculture Business Proposal.

Aquaculture Record Keeping.

Marketing Management in Aquaculture.

Financial Management.

These aquaculture economic fact sheets can be obtained from the Marine Advisory Program in Anchorage. The fact sheets and more business planning information also are available from:

Dept. of Agricultural and Applied Economics
Barre Hall
Clemson University
Clemson, SC 29634-0355
(803) 656-5789 • Fax (803) 656-5746

Establishing a Business in Alaska. (\$3.00)

Alaska Small Business Planning Guide. (\$3.00)

Alaska Business Development Center
Univ. of Alaska
430 West 7th Ave., Suite 110
Anchorage, AK 99501
(907) 274-7232 • (800) 478-7232
Fax (907) 274-9524

The center also sponsors several business education workshops. Call for a schedule.

Setting Up a Small Aquaculture Business in Alaska.

Alaska Small Business Development Center
Univ. of Alaska Southeast
School of Business and Public Administration
Juneau, AK 99801
(907) 463-3789

Western Region Aquaculture Industry Situation and Outlook Report.

Contains information on market outlook for shellfish products, including selling prices of shellfish.

Western Regional Aquaculture Center
School of Fisheries, WH-10
Univ. of Washington
Seattle, WA 98195
(206) 543-4290 • Fax (206) 685-7471

Finances

An important part of the business planning process involves the capitalization of the aquatic farm project. Where will the necessary funds come from? Will the project be sufficiently small to permit you to use personal funds or will borrowed money be required? Have you considered other funding options such as securing a partner or forming a small corporation? Whatever your decision might be, conservative financial planning is encouraged. You should be cautious about accepting any level of debt, particularly at the beginning of your project—a time when you are least able to support interest payments. Because you are venturing into a business where income from sales may take two years or longer, you should be in a financial position where you can afford the wait.

The development of the proposed project should proceed in a step-wise manner and should include the completion of a pilot project before any attempt is made to move into full-scale production. This will help to establish the level and schedule of funding required. For advice on the proper sequencing of a mariculture project, contact the Marine Advisory Program office in Anchorage. For most independent farmers, once the site and the farmer have successfully passed through the pilot phase of the project, the acquisition of investment capital will become a major consideration.

Financial Directories

Numerous small-business financial directories are available. The following volumes review various sources of funding.

Aquaculture: A Guide to Federal Government Programs.

National Agricultural Library
Aquaculture Information Center (USDA)
10301 Baltimore Blvd., Room 304
Beltsville, MD 20705-2351
(301) 504-5558 • Fax (301) 504-5472

Funding an Aquatic Farm Business in Alaska.

Published through the Alaskan Shellfish Growers Association.

Sources of Fishing Industry Loans and Business Development Information.

Copies of both publications are available through:

Ray RaLonde, Aquaculture Specialist
Univ. of Alaska Marine Advisory Program
2221 E. Northern Lights Blvd., Suite 110
Anchorage, AK 99508-4140
(907) 274-9691 • Fax (907) 277-5242

Sources of Economic Assistance

The culture of marine species such as bivalves and marine algae are currently defined as nontraditional industries in the State of Alaska. As such, they lack extensive track records that provide some indication of their financial viability. As a consequence, the prospective farmer is faced with an uphill battle in obtaining any level of financial support. Although this situation is changing, you are cautioned that progress will be slow. Progress *will* occur: The state administration has declared economic development to be a key part of stabilizing the Alaska economy. But the critical point is that only limited financial support currently is available to the aquatic farmer. (If you doubt this, just talk to your local banker about an aquaculture loan.) In most cases this will mean that the farmer will need to start small and rely on personal or family sources of investment capital.

There are a number of sources for financial assistance and advice useful to Alaska farmers. Most provide advisory assistance only, but some can provide grant or loan support. You are also reminded to check for local sources of assistance. The University of Alaska and the State of Alaska support a number of business development centers around the state. An extensive contact list is available from the Marine Advisory Program. This directory, *Sources of Fishing Industry Loans and*

Business Development Information, should be used in conjunction with the previously mentioned U.S. Department of Agriculture publication, *Aquaculture: A Guide to Federal Government Programs*. A few fortunate farmers may find their projects are within regional jurisdictions that offer economic incentives for aquaculture development. Remember to contact local or regional economic planning officials. These contacts include the following:

Alaska Dept. of Commerce and
Economic Development
Div. of Investments
P.O. Box DI
Juneau, AK 99811
(907) 465-2510 • Fax (907) 790-2781

Alaska Dept. of Community and Regional Affairs
P.O. Box 112100
Juneau, AK 99811
(907) 465-4890 • Fax (907) 465-3212

Alaska Fisheries Development Foundation
508 West 2nd Ave.
Anchorage, AK 99501
(907) 276-7315 • Fax (907) 278-2140

Alaska Science and Technology Foundation
550 West 7th Ave., Suite 360
Anchorage, AK 99501
(907) 272-4333 • Fax (907) 274-6228

Alaska Seafood Marketing Institute
1111 West 8th Street
Juneau, AK 99801
(907) 586-2902 • Fax (907) 463-3273

Bering Sea Fishermen's Assoc.
725 Christiansen Drive
Anchorage, AK 99501
(907) 279-6519 • Fax (907) 258-6688

Serg Astra, Bureau of Indian Affairs
P.O. Box 3-8000
Juneau, AK 99802
(907) 586-7177 • Fax (907) 586-7169

Commercial Fishing and Agriculture Bank
2250 Denali Street
Anchorage, AK 99503
(907) 276-2007 • Fax (907) 279-7913

National Coastal Resources Research
and Development Institute
528 S.W. Mill Street, Suite 220
P.O. Box 751
Portland, OR 97207
(503) 725-5725 • Fax (503) 725-5709

Disaster Relief for Aquatic Farms

Aquatic farmers have recently been added to the list of enterprises that qualify for the U.S. Department of Agriculture disaster relief program. This is not a windfall government profit program! Although there are many details yet to be worked out, the program does stipulate the following conditions to receive assistance:

1. You must know your expected production level.
2. The disaster level is the production that exceeds 40% of the crop loss.
3. The damage to the crop is caused by a natural disaster, which can also include conditions that deteriorate the quality of the crop. This includes insect damage.
4. You must make an annual gross income of less than \$2,000,000.
5. Annual payment must not exceed \$100,000.
6. It is not necessary to have crop insurance.

One very important feature of the law is that there must be documentation of the crop size and future projections. More information about the program is available through your local Agricultural Stabilization and Conservation Service (ASCS) office. The contacts are given below:

Tommy Sevens
Homer County ASCS
4014 Lake St.
Homer, AK 99603
235-8176

From Portage Glacier (southeast of Anchorage) to the end of the Aleutians.

Lee Necimovich
Palmer County ASCS
268 E. Fireweed, Suite 3
Palmer, AK 99645
745-4271 • 1-800-478-4271

From Portage Glacier to southeastern Alaska.

Part II: References & Resources

Publications

A vast array of technical and biological information has been published about the shellfish and marine algae culture industries. It is easy to become overwhelmed by this literature base. A limited number of introductory and review manuals are listed below. These manuals provide technical information on a number of important shellfish aquaculture topics. Among these subjects are the full range of culture methods, ranging from suspended culture to bottom culture. When reading technical information, please keep in mind that bottom culture, the traditional method of planting shellfish directly on the bottom, is currently of questionable legality in Alaska. Culture methods favored by Alaska farmers include rack-and-bag culture in the intertidal zone and suspended or floating culture in deeper waters. The Alaska industry has placed considerable emphasis on various forms of suspended culture, including the use of bags, lantern nets, and stacks of trays suspended from floating longlines and rafts.

Most of these volumes contain extensive bibliographies and lists of suggested reading. There are several strategies for obtaining copies of these references. The simplest method is to request them from your local library by way of inter-library loan. Books printed in many parts of the world are easily available through this method. A more direct method is to purchase copies from the publisher or from your local bookstore. Most of these volumes are listed in the current ordering catalogs or *Books in Print* available at your local library. You are encouraged to develop a personal reference library consisting of these introductory and other more definitive reference publications describing the aquatic farming industry. You will notice that some of the listed publications appear to be directed at the culture of a single species in which you have no interest. Do not overlook these publications: Several of these species-specific publications have been included in this list because of their general value to the topic of shellfish aquaculture. For example, even though you may be interested in the topic of oyster aquaculture, do not overlook *Scallop Farming*, written by Hardy. This volume contains a veritable flood of practical information of interest to anyone using suspended culture. These references are followed by the acquisition source.

Shellfish Culture

Boghen, A.D., 1989. *Cold-water Aquaculture in Atlantic Canada*. (\$44.00)

Canadian Institute for Research on
Regional Development
Univ. of Moncton
Taillon Bldg., Rm. No. 292
Moncton, New Brunswick E1A 3E9
(506) 858-4467 • Fax (506) 858-4123

Clime, R. and D. Hamill, 1981. *Growing Oysters and Mussels in Maine*.
(\$5.75)

Coastal Enterprises, Inc.
141 Front Street
Bath, ME 04530

Cullenberg, P. and J. Bolger, 1991. *Shellfish in Your Front Yard: Healthy
Food from Healthy Waters*.

Washington Sea Grant Program
3716 Brooklyn Ave. N.E.
Seattle, WA 98105
(206) 543-6600 • Fax (206) 685-0380

Elston, R.A., 1990. *Mollusc Diseases: Guide for the Shellfish Farmer*.

Univ. of Washington Press
P.O. Box 50096
Seattle, WA 98145
(800) 441-4115 • Fax (800) 669-7993

Magoon, C. and R. Vining, 1981. *Introduction to Shellfish Aquaculture in
the Puget Sound Region*. (\$5.40)

Washington Dept. of Natural Resources
Photo and Map Sales
Olympia, WA 98504
(206) 902-1234 • Fax (206) 902-1779

Milne, P.H., 1972. *Fish and Shellfish Farming in Coastal Waters*.

Fish News Books
Blackwell Scientific Publications Inc.
3 Cambridge Center
Cambridge, MA 02142

Morse, D.E., K.K. Chew, and R. Mann, 1984. *Recent Innovations in Cultivation of Pacific Molluscs*. *Aquaculture* Vol. 39:1-404.

Request via inter-library loan.

Nosho, T. and K.K. Chew, 1991. *Remote Setting Nursery Culture for Shellfish Growers*. (\$9.95)

Washington Sea Grant Program
3716 Brooklyn Ave. N.E.
Seattle, WA 98105
(206) 543-6600 • Fax (206) 685-0380

Quayle, D.B. and G.F. Newkirk, 1989. *Farming Bivalve Molluscs: Methods for Study and Development*. *Advances in World Aquaculture*, Vol. One. (\$45.00 plus \$5.00 shipping)

The World Aquaculture Society
143 JM Parker Coliseum
Louisiana State Univ.
Baton Rouge, LA 70803
(504) 388-3137 • Fax (504) 388-3493

Walne, P.R., 1974. *Culture of Bivalve Molluscs: 50 Years' Experience at Conwy*.

Fish News Books
Blackwell Scientific Publications Inc.
3 Cambridge Center
Cambridge, MA 02142

Oyster Culture

BIM, 1982. *Aquaculture Explained. Booklet No. 3: Growing Oysters*.

Bord Lascaigh Mhara (Irish Sea Fisheries Board)
Hume House
Pembroke Road
Dublin 4, Ireland

Korringa, P., 1976. *Farming the Cupped Oyster of the Genus Crassostrea: Developments in Aquaculture and Fisheries Science*, Vol. Two.

Matthiessen, G.C., 1989. *Small-scale Oyster Farming: A Manual*. (\$4.00 plus \$2.50 for shipping and handling)

National Coastal Resources Research
and Development Institute
528 S.W. Mill Street, Suite 220
P.O. Box 751
Portland, OR 97207
(503) 725-5725 • Fax (503) 725-5709

Nosho, T., 1989. *Small-scale Oyster Farming for Pleasure and Profit*. (\$1.25)

Washington Sea Grant Program
3716 Brooklyn Ave. N.E.
Seattle, WA 98105
(206) 543-6600 • Fax (206) 685-0380

Quayle, D.B., 1988. *Pacific Oyster Culture in British Columbia*. Canadian Bulletin of Fisheries and Aquatic Sciences No. 218. (\$18.00 plus \$1.55 handling)

Quayle, D.B., 1971. *Pacific Oyster Raft Culture in British Columbia*. Bulletin No. 178.

Canadian Government Publishing Centre
Supply and Services
Ottawa, Ontario K1A 0S9

Quayle, D.B., 1980. *Tropical Oysters: Culture and Methods*.

International Development Research Centre
P.O. Box 8500
Ottawa, Ontario K1G 3H9

Roland, W.G. and T.A. Broadley, 1990. *A Manual for Producing Oyster Seed by Remote Setting*.

Ministry of Agriculture, Fisheries and Food
808 Douglas Street
Victoria, B.C. V8W 2Z7
(604) 387-5121 • Fax (604) 356-7280

Spencer, B.E., 1990. *Cultivation of Pacific Oysters*. Laboratory Leaflet No. 63.

Ministry of Agriculture, Fisheries and Food
Fisheries Laboratory
Benarth Road
Conwy, Gwynedd, England LL32 8UB
0492-593883 • Fax 0492-592123

Mussel Culture

Clime, R. and D. Hamill, 1981. *Growing Oysters and Mussels in Maine*. (\$5.75)

Coastal Enterprises, Inc.
141 Front Street
Bath, ME 04530

Lutz, R.A., 1985. *Mussel Culture and Harvest: A North American Perspective*. Elsevier Scientific Publishing Company Inc.

Argent Chemical Laboratories
8702 152nd Ave. N.E.
Redmond, WA 98052
(800) 426-6258

Lutz, R.A., 1988. *Raft Cultivation of Mussels in Maine Waters—Its Practicability, Feasibility and Possible Advantages*.

Maine Sea Grant
Univ. of Maine at Orono
30 Coburn Hall
Orono, ME 04469
(207) 581-1440

Skidmore, D. and K.K. Chew, 1985. *Mussel Aquaculture in Puget Sound*. (\$5.00)

Washington Sea Grant Program
3716 Brooklyn Ave. N.E.
Seattle, WA 98105
(206) 543-6600 • Fax (206) 685-0380

Scallop Culture

Hardy, D., 1991. *Scallop Farming*. (\$69.00)

This book has many good chapters, including one dealing specifically with the design and anchoring of a longline system for the suspended culture of shellfish.

Argent Chemical Laboratories
8702 152nd Ave. N.E.
Redmond, WA 98052
(800) 426-6258 • (206) 885-3777

Swann, C., 1989. *An Introduction to Scallop Farming*.

May be necessary to request this volume via inter-library loan.

Kevgor Aquasystems
(604) 224-2485

Clam Culture

Malinowski, S., 1986. *Small-scale Farming of the Hard Clam on Long Island, New York.*

The New York State Urban Development Corp.
1515 Broadway
New York, NY 10036

Manzi, J. and Castagna, M.(Ed.). *Clam Mariculture in North America.* Developments in Aquaculture and Fisheries Science No. 19, Elsevier Science Publishing Company Inc. (\$134.00)

Argent Chemical Laboratories
8702 152nd Ave. N.E.
Redmond, WA 98052
(800) 426-6258

Province of British Columbia, 1993. *Aquaculture Industry Development Report: Estimated Costs and Returns for a Clam Grow-out Enterprise.*

Ministry of Agriculture, Fisheries and Food
Aquaculture and Commercial Fisheries Branch
808 Douglas Street
Victoria, B.C. V8W 2Z7
(604) 387-5121 • Fax (604) 356-7280

Seaweed Culture

Bird, K.T. and P.H. Benson (Ed.), 1987. *Seaweed Cultivation for Renewable Resources.* Developments in Aquaculture and Fisheries Science No. 16, Elsevier Science Publishing Company Inc.

Argent Chemical Laboratories
8702 152nd Ave. N.E.
Redmond, WA 98052
(800) 426-6258

Olson, W.M., 1987. *Seaweed Cultivation in Minamikayabe, Hokkaido, Japan: Potential for Similar Mariculture in Southeastern Alaska.* Alaska Sea Grant Marine Advisory Bulletin No. 27 (\$1.50)

Alaska Sea Grant College Program
Univ. of Alaska
Fairbanks, AK 99775
(907) 474-6707 • Fax (907) 474-6285

Quality Control and Sanitation Publications

National Shellfish Sanitation Program Manual of Operations:

Part 1. Sanitation of Shellfish Growing Areas.

Part 2. Sanitation of Harvesting, Processing, and Distribution.

Do Your Own Plant Inspection—A Guide to Self Inspection for the Shellfish Shipper or Processor.

Shellfish Sanitation Branch
Center for Food Safety and Applied Nutrition
Food and Drug Administration
200 C Street S.W. (HFF-513)
Washington, DC 20204
(202) 254-3971/3972 • Fax (202) 254-3892/3986

Mariculture in Alaska

The literature base describing the Alaska aquaculture industry has begun a period of rapid development. A number of farmers, agency workers, and university staff members are now in the process of drafting a variety of reports and manuals that will be of value to the prospective farmer. The best strategy for keeping track of regional aquaculture developments is to subscribe to a number of leading aquaculture periodicals and to become a member of your local aquaculture or mariculture association. The Alaskan Shellfish Growers Association represents aquatic farmers in this state. The University of Alaska aquaculture specialist publishes a regular newsletter that should be helpful to those attempting to keep abreast of current developments.

The current *accessible* literature dealing with aquaculture development in Alaska is rather thin because funding has not been made available for publication of aquaculture projects for general distribution. However, those items that are available are of considerable value. In addition to providing technical information, these publications also *provide perspectives on the historical development of the industry.* Most prospective farmers are preoccupied with current strategies and future trends. However, when becoming a member of an industry that has occasionally been troubled by a variety of political storms, it is important to know where the industry has been. The roots of this industry are of interest.

The following list of reference volumes, accompanied by the acquisition source, will provide you with technical and historical information. Some of these volumes are out of print. If you encounter acquisition problems, contact the Aquaculture Specialist (Ray RaLonde) at the Marine Advisory Program office in Anchorage.

Alaska Dept. of Natural Resources, 1988. *Etolin Island Area Mariculture Pilot Project*. (\$10.00)

This publication describes a variety of planning approaches used by state agencies and provides a good literature review of several culture topics, including environmental impacts. It does not describe culture techniques and strategies.

Alaska Dept. of Natural Resources
Div. of Land and Water Management
400 Willoughby Ave., Suite 400
Juneau, AK 99801-1000
(907) 465-3400 • Fax (907) 586-2754

Alaskan Shellfish Growers Association, 1993. *Alaska Oysters: Maintaining Quality from Harvest to Halfshell, a Quality Assurance Manual for Alaska Oyster Growers*.

Univ. of Alaska Marine Advisory Program
2221 E. Northern Lights Blvd.
Anchorage, AK 99508-4140
(907) 274-9691 • Fax (907) 277-5242
Anchorage, Alaska 99508-4140

Else, P.V., B.C. Paust, and D.M. Burns, 1987. *Alaska Oyster Grower's Manual*. Third Edition. Alaska Sea Grant Marine Advisory Bulletin No. 17. (out of print; \$7.00 for photocopies)

A bit outdated. The surface tray culture system is not recommended for Alaska and the permitting requirements have been revised. Volume has good information on biology, site selection, and culture techniques.

Alaska Sea Grant College Program
Univ. of Alaska
Fairbanks, AK 99775
(907) 474-6707 • Fax (907) 474-6285

Hemming, J. and N. Hemming, 1984. *Blue Mussel Mariculture in Kachemak Bay, Alaska*. Alaska Office of Commercial Fisheries Development, Juneau, Alaska.

Alaska Resources Library
222 W. 7th Ave., #36
Anchorage, AK 99513
(907) 271-5025 • Fax (907) 271-5965

Keller, S. (Ed.), 1988. *Fourth Alaska Aquaculture Conference*. Alaska Sea Grant Report No. 88-04. (\$8.00)

Has culture techniques for several species of shellfish and marine algae.

Alaska Sea Grant College Program
Univ. of Alaska
Fairbanks, AK 99775
(907) 474-6707 • Fax (907) 474-6285

Kodiak Area Native Association and Overseas Fishery Cooperation Foundation of Japan, 1989. *Final Report of the Scallop Mariculture Feasibility Study, Kodiak Island Alaska 1987-1988*.

This is the final report of a joint scallop spat collection feasibility project sponsored by Alaska and Japan. The goal of the project was to determine if wild spat collection techniques used in Japan could be applied to capture weathervane scallop spat. The project was unsuccessful, but good information can be gleaned from the report.

Mariculture Coordinator
Alaska Dept. of Fish and Game
Div. of Commercial Fisheries Management and Development
P.O. Box 25526
Juneau, AK 99802-5526
(907) 465-4160 • Fax (907) 465-4168

Painter, R. and M. Kaill, 1991. *Yakutat Mariculture Project: Final Report to the City of Yakutat*.

This publication deals most extensively with the economics of aquaculture at a farm site in Yakutat, Alaska. An effort is made to extend the data to the costs of construction and operation of various size oyster and blue mussel farms. Limited copies of this manual are available.

Alaska Dept. of Community and Regional Affairs
Community Block Grant Director
P.O. Box BC
Juneau, AK 99811
(907) 465-4890 • Fax (907) 465-3212

or

Rodger Painter
Sea Culture of Alaska
130 Seward St. Suite 504
Juneau, AK 99801
(907) 463-3600 • Fax (907) 463-3601

Rabung, S.H., 1990. *A Comparison of Two Rearing Sites for Giant Kelp Macrocytis Integrifolia in Sitka Sound, Alaska*. Alaska Sea Grant Report No. 90-02. (\$3.50)

Alaska Sea Grant College Program
Univ. of Alaska
Fairbanks, Alaska 99775
(907) 474-6707 • Fax (907) 474-6285

Stekoll, M., 1989. *Mariculture of Kelp, Macrocytis, in Southeast Alaska*. Northwest Environment Journal 5:141-143.

Stekoll, M., and P. Else, 1990. *Cultivation of Macrocytis integrifolia, (Laminariales, Phaeophyta) in Southeastern Alaska Waters*. Hydrobiologia 204/205:445-451.

Additional information concerning the culture of marine algae is available from the author.

Stekoll, M., and P. Else, 1992. *The Feasibility of Macrocytis Mariculture in Southeast Alaska*. Report to the State of Alaska, OFCF, and NCRI.

Michael S. Stekoll
Juneau Center for Fisheries and Ocean Sciences
Univ. of Alaska
11120 Glacier Highway
Juneau, AK 99801
(907) 789-4441 • Fax (907) 789-4447

Bibliographies

A number of aquaculture bibliographies are available to you. These publications cover a variety of practical topics and are frequently species-specific in content. Other volumes cover a particular technology issue; hatchery production, for example. Several readily available shellfish aquaculture bibliographies are listed below. The local Marine Advisory Agent or Mariculture Specialist also has extensive files containing a wide variety of reference information that is available to you for the asking or for a nominal charge to cover copying costs.

Another method of locating specific technical information is through the use of a computerized literature search. Your local librarian can assist you in completing this type of search. You also have access to the National Agricultural Library, address and phone number listed below, who will perform a computer search based on keywords you supply. Computer literature searches are particularly useful when you are attempting to locate information dealing with very specific topics. If you wish to use a computer search service, you should be prepared with a list of specific keywords. An example of keywords would be *Pacific oyster, culture, and larva*, if you wanted information on the

culture of Pacific oyster larva. Keep in mind that the service takes time and can be expensive. Be sure to ask if there is a fee for the service.

Many bibliographies are indexed and annotated. Entries are listed under different practical topics; *shellfish nursery culture*, for example. It is an easy matter to search a publication for the topic or subtopic of interest to you and to locate a number of publications that describe some aspect of the subject that you are interested in. If you are fortunate enough to find yourself in a large library, many of the listed publications will be found in the library's collection. Other listings can be obtained by inter-library loan. Ask your librarian for assistance. If you are unable to locate some important item of information, contact your local Marine Advisory Program or regional aquaculture association representatives for assistance. You might also consider contacting senior members of this industry. These experienced farmers are the bearers of a wealth of practical information. An important survival skill in this industry is the willingness to ask questions.

Several useful bibliographies are:

Aquaculture: Economics and Marketing. (January 1979–February 1991)
QB 91-85

Mollusk Culture. (January 1985-July 1990) QB 9091

Aquaculture. (January 1992)

Practical Aquaculture Literature II: A Bibliography.

National Agricultural Library
Aquaculture Information Center (USDA)
10301 Baltimore Blvd., Room 304
Beltsville, MD 20705-2351
(301) 504-5558 • Fax (301) 504-5472

Kerns, C., 1987. *Where to Get More Information on Small-Scale Aquaculture.* Alaska Sea Grant Aquaculture Note No. 9. (\$1.00)

Kerns, C., 1987. *Where to Get More Information on Scallop Aquaculture.* Alaska Sea Grant Aquaculture Note No. 10. (\$1.00)

Kerns, C., 1987. *Where to Get More Information on Farming of Marine Algae in High Latitude Waters.* Alaska Sea Grant Aquaculture Note No. 11. (\$1.50)

Alaska Sea Grant College Program
Univ. of Alaska
Fairbanks, AK 99775
(907) 474-6707 • Fax (907) 474-6285

Aquaculture Product Catalogs and Directories

Supply catalogs and industry directories are extremely useful references and can be used to locate suppliers of a wide variety of products and services. Appendices contained within a number of these publications list additional information such as seed suppliers, agency contacts, aquaculture associations, marketing contacts, and related information. Another good source of equipment suppliers is through advertisements in trade periodicals. The catalogs are listed here to assist you in the planning of your farming business. The Marine Advisory Program does not endorse the products and services listed in these publications.

Be certain to obtain the current year of these directories and catalogs.

Aquaculture Magazine: Buyer's Guide and Industry Directory. (\$15.00)
Aquaculture Magazine.

Subscription Dept.
P.O. Box 2329
Asheville, NC 28802
(704) 254-7334 • Fax (704) 253-0677

Northern Aquaculture—Annual Buyers Guide. (\$7.50)

Northern Aquaculture
4611 William Head Road
Victoria, B.C. V9B 5T7
(604) 478-9209 • Fax (604) 478-1184

Asian Fisheries Directory.

Asian Fisheries Society
MC P.O. Box 1501
Makati
Metro Manila, Philippines

International Aquaculture Trade Directory.

European Aquaculture Society
EAS Secretariat
Coupure Rechts 168
B-9000 Gent, Belgium
32-91-23-7722 • Fax 32-91-23-7604

Trade Periodicals

Aquaculture Europe.

European Aquaculture Society
EAS Secretariat
Coupure Rechts 168
B-9000 Gent, Belgium
32-91-23-7722 • Fax 32-91-23-7604

Aquaculture Magazine.

Subscription Dept.
P.O. Box 2329
Asheville, NC 28802
(704) 254-7334 • Fax (704) 253-0677

Aquaculture Outlook and Situation.

U.S. Dept. of Agriculture
Economics and Statistics Service
National Economics Div.
Washington, DC 20250
(301) 725-7937 • (800) 9996779

Aquanews: Aquaculture News for Alaska.

Univ. of Alaska Marine Advisory Program
2221 E. Northern Lights Blvd., Suite 110
Anchorage, AK 99508
(907) 274-9691 • Fax (907) 277-5242

Bulletin of the Aquaculture Association of Canada.

Aquaculture Assoc. of Canada
P.O. Box 1987
St. Andrews, New Brunswick E0G 2X0
(506) 529-4766 • Fax (506) 529-4274

Fish Farm News.

R.R. #4, Site 465, C-37
Courtenay, B.C. V9N 7J3
(604) 338-2455 • Fax (604) 338-2466

Fish Farming International.

21 John Street
London WC1N 2BP England

Harmful Algae News.

Intergovernmental Oceanographic Commission
UNESCO
1 rue Miollis
75015 Paris, France
(33-1) 4568-4016 • Fax (33-1) 4056-9316

Journal of the World Aquaculture Society.

Louisiana State University
143 JM Parker Coliseum
Baton Rouge, LA 70803
(504) 388-3137 • Fax (504) 388-3493

Northern Aquaculture.

4611 William Head Road
Victoria, B.C. V9B 5T7
(604) 478-9209 • Fax (604) 478-1184

Out of the Shell.

Mollusc Culture Network
Biology Dept.
Dalhousie Univ.
Halifax, Nova Scotia B3H 4J1
(902) 494-3610 • Fax (902) 494-3736

Red Tide Newsletter.

Sherkin Island Marine Station
Sherkin Island
County Cork, Ireland
353-28-20187 • Fax 353-28-20407

Directory of Agencies and Associations

Organizations Involved in Aquaculture

The organizations that follow can provide a wide range of valuable information and services, from addressing specific topic areas to accessing general information. These organizations are actively involved in aquaculture endeavors. It is strongly recommended that you maintain regular contact and request to be added to their mailing list.

Jerry Dzugan Director
 Alaska Marine Safety Education Assoc.
 P.O. Box 2592
 Sitka, AK 99835
 (907) 747-3287

Ron Dearborn Director
 Alaska Sea Grant College Program
 Univ. of Alaska
 Fairbanks, AK 99775
 (907) 474-7086 • Fax (907) 474-6285

Kevin O'Sullivan Marketing
 Alaska Seafood Marketing Institute
 1111 West 8th Street, Suite 100
 Juneau, AK 99801
 (907) 586-2902 • Fax (907) 463-3273

ASMI does no marketing for aquatic farms, but can be a source for obtaining seafood marketing strategies.

Aquaculture Information Center
 National Agricultural Library (USDA)
 10301 Baltimore Blvd., Room 304
 Beltsville, MD 20705-2351
 (301) 504-5558 • Fax (301) 504-5472

Ministry of Agriculture, Fisheries and Food
 Aquaculture and Commercial Fisheries Branch
 808 Douglas Street
 Victoria, B.C. V8W 2Z7
 (604) 387-5121 • Fax (604) 356-7280

Chuck Crapo Fishery Industrial Technology Center
 (Seafood Technology)
 Univ. of Alaska
 900 Trident Way
 Kodiak, AK 99615
 (907) 486-1515 • Fax (907) 486-1540

Good source for information on seafood handling and quality control.

Interstate Shellfish Sanitation Conference
 Water Quality Program
 2500 Broening Highway
 Baltimore, MD 21224
 (410) 631-3902 • Fax (410) 633-0456

ISSC publishes information on sanitation regulations for culture and handling of seafood products.

Shellfish Sanitation Branch
 Center for Food Safety and Applied Nutrition
 Food and Drug Administration
 200 C Street S.W. (HFF-513)
 Washington, DC 20204
 (202) 254-3971/3972 • Fax (202) 254-3982/3986

Gary Jensen

USDA Extension Service—Aquaculture
 U.S. Dept. of Agriculture
 Room 3863 South Building
 Washington, DC 20250
 (202) 447-5468 • Fax (202) 475-5289

*This office is also in regular contact with Ray RaLonde,
 Marine Advisory Program Aquaculture Specialist.*

Kenneth Chew

Director
 Western Regional Aquaculture Center
 School of Fisheries, WH-10
 Univ. of Washington
 Seattle, WA 98195
 (206) 543-4290 • Fax (206) 685-7471

*Ray RaLonde, Marine Advisory Program Aquaculture
 Specialist, is a representative on the Western Regional
 Aquaculture Consortium and has direct contact with the
 center.*

Aquaculture Associations

You are encouraged to become a member of your local mariculture association. It is also a good idea to become a member of other regional aquaculture associations. These organizations publish regular newsletters that are replete with information ranging from technical innovations to market trends. The costs associated with these extended memberships are often minimal. The associations of greatest interest to Alaska farmers are flagged in this partial list of regional aquaculture associations:

- Alaskan Shellfish Growers Assoc.
 P.O. Box 7
 Moose Pass, AK 99631
 (907) 288-3667 • Fax (907) 288-3667
Membership fee \$40.00
- Aquaculture Assoc. of British Columbia
 Site 52, Compartment 103
 5331 Hammond Bay Road
 Nanaimo, B.C. V9S 5N7
 (604) 758-2922

Aquaculture Assoc. of Canada
P.O. Box 1987
St. Andrews, New Brunswick E0G 2X0
(506) 529-4766 • Fax (506) 529-4274

Aquaculture Council
National Fisheries Institute
2000 M Street N.W.
Washington, DC 20036
(202) 296-5090 • Fax (202) 296-3663

Association of Scottish Shellfish Growers
Tigh Na Speir
Connel
Argyll PA37 1PX Scotland

- ▶ British Columbia Shellfish Growers Assoc.
807 Shorewood Drive
Parksville, B.C. V9P 1S1
(604) 248-3899 • Fax (604) 248-3899

California Aquaculture Assoc.
P.O. Box 1004
Niland, California 92257
(619) 348-0547

European Aquaculture Society
EAS Secretariat
Coupure Rechts 168
B-9000 Gent, Belgium
32-91-23-7722 • Fax 32-91-23-7604

Irish Aquaculture Assoc.
P.O. Box 16, Crofton Road
Dun Laoghaire
County Dublin, Ireland

Japan Fisheries Assoc.
Sankaido Building, 1-9-13
Akasaka, Minatoku
Tokyo, Japan

- Kachemak Shellfish Mariculture Assoc.
P.O. Box 2274
Homer, AK 99603
*Membership fees \$25.00 for permitted farmers and
\$10.00 for associate membership.*

National Shellfisheries Assoc.
 Dept. of Biological Sciences
 Univ. of New Orleans
 New Orleans, LA 70148
 (504) 286-7042

- Pacific Coast Oyster Growers Assoc.
 1023 South Adams Street
 Olympia, WA 98501
 (206) 459-2828 • Fax (206) 459-2829

Membership fee starts at \$175.00 and increases with production level of farm.

Shellfish Association of Great Britain
 Fishmongers' Hall
 London Bridge
 London EC4R 9EL England

Shellfish Institute of North America
 National Fisheries Institute
 2000 M Street N.W.
 Washington, DC 20036
 (202) 296-5170

- World Aquaculture Society
 Louisiana State University
 143 JM Parker Coliseum
 Baton Rouge, LA 70803
 (504) 388-3137 • Fax (504) 388-3493

Shellfish Seed Sources

A sizable number of bivalve hatcheries are currently operating along the West Coast of North America. There are no bivalve shellfish hatcheries operating in Alaska, although two operations are now in the early planning stages. Alaska farmers are dependent on seed from outside sources. The majority of the hatcheries in the Pacific Northwest and British Columbia produce Pacific oyster seed. These hatcheries also produce other seed products, including Manila clams, European oysters, Japanese scallops, and other species.

State laws place stringent limits on the type and source of seed that can be cultured in state waters. The State of Alaska permits only the importation of certified Pacific oyster seed that is under 20 millimeters in length. Oyster seed must also be certified to be free of various diseases and parasitic organisms by the invertebrate pathology lab of the Alaska Dept. of Fish and Game. A list of currently certified shellfish hatcheries and nurseries is available from:

Jim Cochran Mariculture Coordinator
Alaska Dept. of Fish and Game
Div. of Commercial Fisheries Management and
Development
P.O. Box 25526
Juneau, AK 99802-5526
(907) 465-6150 • Fax (907) 465-4168

Two of the major suppliers of Pacific oyster seed to Alaska farmers are listed below:

Kuiper Mariculture, Inc.
P.O. Box 507
Bayside, CA 95524
(707) 822-9057 • Fax (707) 822-3632

Westcott Bay Sea Farms
4071 Westcott Drive
Friday Harbor, WA 98250
(206) 378-2489 • Fax (206) 378-6388

Permits are issued to shellfish hatcheries under the stipulation that they follow a specified production plan developed by ADF&G. Hatcheries are routinely inspected to determine if they are complying with the terms of the plan. If a hatchery is found in noncompliance, its shellfish import permit can be revoked. Before you place an order, be certain that the shellfish hatchery is currently certified to ship into Alaska. Contact ADF&G to determine a hatchery's permit status.

Aquaculture Training Programs

A wide variety of training programs is available to individuals entering this industry. Courses range from short workshops to graduate degree programs. Contact your local Marine Advisory Program office or academic counselor for additional information. The following individuals can provide helpful information:

Ray RaLonde Aquaculture Specialist
Univ. of Alaska Marine Advisory Program
2221 E. Northern Lights Blvd., Suite 110
Anchorage, AK 99508
(907) 274-9691 • Fax (907) 277-5242

Brian Paust Marine Advisory Agent
Univ. of Alaska Marine Advisory Program
P.O. Box 1329
Petersburg, AK 99833
(907) 772-3381 • Fax (907) 772-4431



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SCHOOL OF FISHERIES AND OCEAN SCIENCES