

Reference Manual For Oyster Aquaculturists

Agriculture and Aquaculture

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INTRODUCTION

When it comes to the Maritime provinces, the activity that immediately springs to mind is fishing. New Brunswick has a well-established fishery. The harvesting of a number of species of fish and crustaceans generates considerable economic spinoffs along the entire east coast as well as in the Bay of Fundy area. Snow crab, lobster, and herring top the list in terms of monetary value.

Aquaculture has become a major industry in New Brunswick. In 2001, Atlantic salmon production yielded revenues of about \$223 million. Shellfish aquaculture is gaining ground as well. Mussel production exceeds 1,000 metric tons and is expanding rapidly.

Oyster aquaculture had been attracting the interest of oyster producers for several years but was unable to really stand out. Then, the development of a new rearing method changed the industry's profile. Rearing in oyster bags gave a boost to oyster aquaculture on New Brunswick's east coast.

The New Brunswick Department of Agriculture, Fisheries and Aquaculture has always supported the development of this industry. Over time, it became increasingly necessary to write a reference guide for oyster aquaculturists because the *Oysterculturist Manual* (Ferguson, 1984) only partly fulfilled its role of providing information.

This manual is intended for a novice clientele and includes a section on oyster biology. The information presented covers the basics regarding this species. For more detailed information, it would be advisable to consult specialized manuals. This document looks as well at such topics as site selection, rearing methods, spat supply, and production plans.

SITE SELECTION

A good site must offer both protection and food. It is therefore important to measure all the physical parameters affecting site quality on the basis of the rearing method being considered. The main parameters that make it possible to assess the true potential of a site are as follows:

SURFACE AREA

Obviously, the size of a site has to meet production requirements. Oyster aquaculturists must obtain an aquaculture lease for a site from the New Brunswick Department of Agriculture, Fisheries and Aquaculture. They may apply for a location suited to aquaculture that has the required dimensions and has never been designated as an aquaculture site before. They may also apply for vacant lots. In that case, it is sometimes necessary to combine several non-adjacent lots to obtain the surface area necessary for the production being contemplated.

CURRENTS

In most of the estuaries on New Brunswick's east coast, the velocity of the currents is not high. It generally provides good water exchange. Sometimes a strong wind combined with a tidal current can cause fairly violent eddies. The situation must be carefully assessed. If, however, the currents are truly weak, water exchange could be insufficient to meet the requirements of a sizeable rearing operation. Slower growth and silting can result from such a phenomenon.

PREVAILING WINDS

The prevailing winds can interfere considerably with certain types of rearing operations. The winds create a surface wave that has an impact on off-bottom rearing equipment and can harm new oyster growth. If the prevailing winds persist, annual growth is reduced significantly. In the past, strong winds have washed ashore oysters reared on shallow sites. It is therefore necessary to select sites that are sheltered from the prevailing winds. If this is not possible, the use of a breakwater may be recommended. An effective breakwater remains to be developed.

ACCESSIBILITY

The distance between the rearing site and the offloading site can be a major constraint to the management of aquaculture operations. Fuel costs will be proportionate to the distance to be covered.

Certain sites are hard to get to at low tide. Oyster aquaculturists therefore have to adapt to the tidal cycle, which does not always keep traditional hours.

DEPTH

Depth should be assessed on the basis of rearing requirements. The storage of oyster aquaculture equipment on the sea bottom during the winter is limited by depth. The space required between the bottom and the surface below the layer of ice at low tide must therefore be calculated. This calculation must take into account maximum ice thickness (Figure 14).

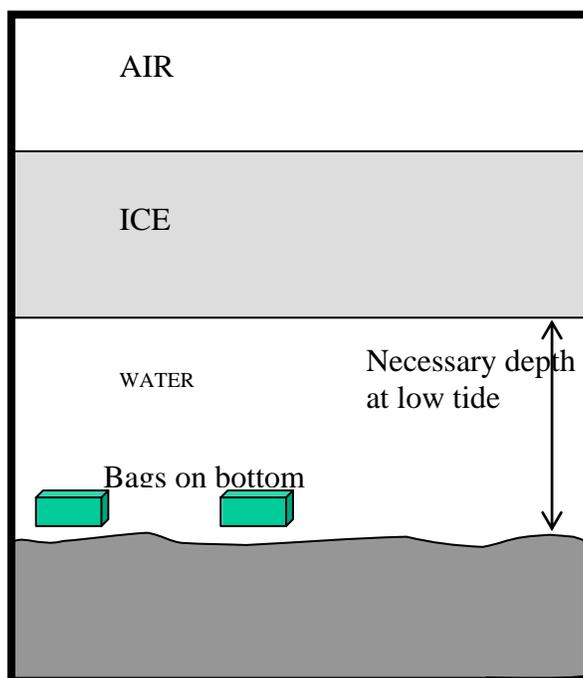


Figure 14 Arrangement of bags on the bottom during the winter

The arrow indicates the distance to be calculated for safe overwintering.

During the summer, the site's depth is determined on the basis of the work method and the type of rearing. On a shallow site, work can be done on foot, whereas deeper sites require the use of a boat or a work platform.

RIPARIAN OWNERS AND OTHER USERS

Oyster aquaculture is expanding rapidly and takes place in an environment – the sea – where people engage in a wide range of commercial and recreational activities and there are sensitive ecosystems.

Aquaculturists seeking to obtain a site on which to practise modern oyster aquaculture must take these factors into account. They should look first for sites that interfere with other users as little as possible.

GROWING AREA CLASSIFICATION

Three classifications are used in the Canadian Shellfish Sanitation Program: “Approved,” “Conditionally Approved,” and “Closed.” Each classification is related to the bacteriological quality of the growing waters, the actual and potential sources of pollution, and to some extent, the shellfish resource utilization of the area.

Approved Growing Areas

General definition - shellfish growing areas may be designated as “Approved” if the following conditions are met:

- a) the area is not contaminated with faecal material, poisonous or deleterious substances or marine biotoxins to the extent that consumption of the shellfish might be hazardous;
- b) the median or geometric mean faecal coliform Most Probable Number (MPN) of the water does not exceed 14/100 mL, and not more than 10% of the samples exceed a faecal coliform MPN of 43/100 mL, for a five-tube decimal dilution test.

Conditionally Approved Growing Areas

General definition - shellfish growing areas may be designated as “Conditionally Approved” if the following conditions are met:

- a) during those times when harvesting is permitted, the area meets all of the requirements of an “Approved” area;
- b) conditions which preclude harvesting in areas designated “Conditionally Approved” must be:
 - 1) easily identified by routine measurement and reporting; and
 - 2) predictable and/or controllable.

Closed Growing Areas

General definition - shellfish growing areas are designated as “Closed” under any of the following conditions:

- a) the area is contaminated with faecal material, poisonous and deleterious substances to the extent that consumption of the shellfish might be hazardous;
- b) the median faecal coliform Most Probable Number (MPN) of the water exceeds 14/100 mL, and/or more than 10% of the samples exceed a faecal coliform MPN of 43/100 mL, for a five-tube decimal dilution test;
- c) the paralytic shellfish poison (PSP) concentration is 80 micrograms per 100 grams (80 µg/100 g) and/or amnesic shellfish poisoning (ASP) concentration is 20

micrograms per gram (20 µg/g) of edible portion of raw shellfish meat, or other neurotoxic shellfish poison is found in detectable levels (taken from the Canadian Shellfish Sanitation Program – *Manual of Operations* – Growing Area Survey and Classification).

Unclassified Growing Areas

Unclassified growing areas are managed as closed growing areas because no sampling has been done there for classification purposes. The current leasing policy of the New Brunswick Department of Agriculture, Fisheries and Aquaculture does not authorize the obtaining of leases in unclassified growing areas.

LEASES AND LICENCES

You are the lessee of a site if you hold an aquaculture licence in good standing issued by the Province of New Brunswick and you have your lease in your possession. To obtain these documents, you must apply to the New Brunswick Department of Agriculture, Fisheries and Aquaculture. Applying for an aquaculture licence or a site lease requires a monetary investment.

The steps in the process that cost money are as follows:

- Applying for an aquaculture site;
- Applying for an aquaculture licence;
- Taking out newspaper ads.

If the application is approved and a site may be allocated, the costs are as follows:

- Cost of surveying the site;
- Annual cost of lease;
- Annual cost of aquaculture licence.

A number of resource persons with different federal and provincial departments have to evaluate your application for an aquaculture site and licence. The process is therefore relatively long. All applications relating to sites on which rearing structures are to be placed will require an environmental impact assessment in order to meet the standards of the *Canadian Environmental Assessment Act*. Submission of an application does not necessarily mean the application will be approved. The final decision is based on the review of the application.

SITE MARKING

When you lease an aquaculture site, you are responsible for identifying the precise boundaries of the site. Site marking policies have been established by the Canadian Coast Guard (CCG) and take precedence over the marking policies of the New Brunswick Department of Agriculture, Fisheries and Aquaculture. In the event of a CCG exemption, the provincial policies will apply.

These policies pertain to the size, shape, and colour of the buoys that must be used. They describe the anchoring methods and the criteria concerning spacing between the buoys. In addition, they specify what information must be printed on the buoys.