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Environmental Assessment of *Shellfish* Aquaculture Projects

Environmental assessment is a management tool directed at identification, evaluation, and mitigation of potential impacts on important environmental values. An environmental assessment conducted under the *Canadian Environmental Assessment Act* is also directed at investigating how the environment can affect a project.

There are several specific environmental concerns, including cumulative environmental effects, to consider in any environmental assessment of proposed shellfish aquaculture projects. Environment Canada participates in an environmental assessment by providing scientific knowledge and advice related to the department's mandate of pollution prevention, migratory birds, species at risk, environmental quality, and weather. Environment Canada's expertise in these areas can assist proponents and other regulatory agencies in selecting suitable sites and establishing how negative environmental impacts can be best mitigated during all phases of a project.

When considering the full project life cycle, siting and design, site preparation and installation of equipment, operation and maintenance, decommissioning and environmental management plans, emphasis should be placed on opportunities to avoid adverse environmental effects.

1. SITING AND DESIGN

...as a critical first step, identify potential constraints that could result in significant adverse environmental impacts which, in turn, could also undermine the future success of the project itself...

Activities Influencing Site Quality and Project Viability

- Point source (e.g. effluent from a pipe) and non-point sources of pollution (e.g. land runoff, bank erosion)
- Current and potential water-based activities and uses (e.g. boating, swimming, fishing)
- Disposal at sea

Environmental Factors Influencing Site Suitability

- Water quality in relation to the *Shellfish Harvesting Classification*
- Water quality in relation to relevant water quality objectives and guidelines
- Sea state, ice dynamics and climatic information

Presence of Migratory Birds and Species at Risk

- Environmentally significant areas (e.g. Migratory Bird Sanctuaries, National Wildlife Areas, RAMSAR sites)
- Habitats supporting species at risk
- Habitats supporting high concentrations of migratory birds, including birds which could feed on the crop

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2. SITE PREPARATION AND INSTALLATION OF EQUIPMENT

...take advantage of existing infrastructure where possible and consider alternative construction materials, techniques and schedules...

Interaction with Migratory Birds and Species at Risk

- Timing of activities in relation to sensitive periods (e.g. nesting, migration)
- Location of activities in relation to sensitive habitats (e.g. nesting, feeding areas)

Project Activities Influencing Environmental Quality

- Disturbance and removal of soil, sediment and vegetation (e.g. construction of a dock)
- Spills or releases of hazardous products
- Solid waste

3. OPERATION AND MAINTENANCE

...use best management practices reflecting opportunities to avoid adverse environmental effects including pollution prevention...

Project Effects on Environmental Quality

- Changes in phytoplankton and benthic distribution and abundance

Interaction with Migratory Birds and Species at Risk

- Disturbance and changes in bird activity and distribution
- Birds feeding on the crop

4. DECOMMISSIONING

...progressively restore environmental quality at the site during all project phases...

Project Effects on Environmental Quality, Migratory Birds and Species at Risk

- Long-term or irreversible habitat degradation and contamination
- Abandonment of equipment and physical structures

5. ENVIRONMENTAL MANAGEMENT PLANS

After considering these issues and answering the questions raised, if the site is deemed appropriate, **operational** and **environmental management plans** should be developed. These plans should be based on the necessary mitigation and follow-up measures identified to verify and address impact predictions.

Mitigation should be considered in a hierarchical sequence for the full project life cycle:

Avoidance
Reduction/Minimization
Compensation

Incorporation of mitigation measures and best management practices will help ensure that the aquaculture facility is designed, operated, maintained and decommissioned, in an environmentally sustainable manner.

For more detailed information, please refer to the document Environmental Assessment of Shellfish Aquaculture Projects: Guidelines for Consideration of Environment Canada Expertise, or contact:

Environmental Assessment Section Atlantic Region	Web site: http://www.atl.ec.gc.ca
Environmental Assessment Section Québec Region	Web site: http://www.qc.ec.gc.ca
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