



Maine Aquaculture Association

Code of Practice

Recommended Code of Practice for Aquaculture in Maine

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Section One ♦ Introduction

Maine communities have a long tradition of harvesting the resources that grow in our clean, cold water. Maine's water farmers and their families are helping preserve this heritage of working waterfronts and communities linked to the sea. Our water farmers make their living on and literally in the water every day. Healthy ecosystems with high water quality and diverse habitats are critical to the health and growth of the animals we grow.

Maine's marine farms are actively monitored and regulated by seventeen federal, regional and state authorities. Depending on the type of farm operated, farmers must obtain between five and fourteen federal and state permits before they begin operations. It is typically one to three years from the time a farmer applies for these permits before any animals can be stocked on the farm.

The Maine Aquaculture Association (MAA) and its member growers are deeply committed to environmental stewardship, animal welfare and good citizenship. Members continually strive to develop and implement operational practices that reduce environmental impacts, improve animal welfare and respond to local community concerns while maintaining their economic viability. As part of these efforts and in addition to the normal permitting and monitoring requirements, the association and its members have developed this Code of Practice. The code is intended to establish minimum operational standards and recommendations for member operations. The code is based on an underlying philosophy that healthy food production is important and can be successfully achieved without significant negative environmental impacts. The code seeks to achieve a balance between the best interests of the environment, the fish and shellfish grown and our need for a reliable, safe and nutritious food supply.

All human activities effect and alter the natural landscape. The MAA Code of Practice recognizes that changes are as inherent in aquaculture as in many other activities that humans undertake. The purpose of the code is to ensure that member operating practices produce the most benign changes possible. The MAA Code of Practice is based on the United Nations Food and Agriculture Organization Code of Conduct for Responsible Fisheries. In addition, more than 40 other codes of practice, best management practice programs, environmental policies and certification programs were reviewed. A number of components from these documents were integrated into the MAA Code of Practice.

This code requires our members to analyze their actions and determine what aspects of their operations may involve some risk to the environment or animal welfare. The code further requires members to take actions to control these risks. For risks that are beyond a farmer's ability to control, the farmer is asked to review the risk and any potential environmental impacts to determine if the risk is acceptable or if alternative plans can be made.

Although this code is voluntary it forms the basis for a number of cooperative agreements that MAA members have developed and ratified. These agreements are mandatory, legally binding documents that MAA members must sign. The agreements address specific environmental or social issues and are designed to implement the recommendations of this Code of Practice. The agreements may take the form of Best Management Practices or Local Area Management Agreements. The agreements bind MAA members to operating to a set of minimum standards or protocols that have been collectively developed by the growers. These agreements are dynamic documents that are regularly updated to reflect the latest methods, technologies and science.

Administrative Note

Nothing contained in this Code of Practice or any MAA cooperative agreement or MAA Best Management Practices document is intended to create the relationship of principal and agent, partnership, or joint venture between MAA Members. This document and any associated cooperative agreements or best management practice documents are intended solely for the purpose of animal health and welfare management, environmental management and responsible community participation. This document and any associated cooperative agreements or best management practice documents are in no way intended to coordinate production or business strategies for the purposes of price or market influences.

Many aspects of aquaculture require permission by a special license or permit and other activities are regulated by a local, state or federal authority. Compliance with all applicable requirements, whether local, state or federal or other, is a basic requirement of water farming in a sustainable and responsible manner. It is implicit within this Code of Practice that all participants in the industry take responsibility to determine what requirements apply and to comply with those requirements. This is a basic underpinning of responsible aquaculture.

Environmental Policy

Statement of the policy to which participants subscribe

Guiding Principles

A series of statements that set the tone for the program.

Code of Practice

May be binding under civil law. Sets standards for group activities describing how the activity may be best accomplished or managed.

Bay Management Agreement/Local Area Management Agreement

A cooperative agreement between growers regarding management of on-farm technical issues.

Best Management Practices

Contain the technical guidelines for accomplishing the activity to the highest level of all standards.

Environmental Management System

Including planning, assessment, implementation, operation, record keeping, corrective actions and verification.

Section Two ♦ Environmental Policy

It is the policy of the MAA and its members to act as responsible stewards of the environment. As aquatic farmers, we have a strong vested interest in healthy aquatic ecosystems, high water quality and a clean environment. While recognizing that all human activities have environmental impacts, association members are committed to minimizing possible adverse impacts from their activities. We seek to promote responsible development and management of the Maine Aquaculture sector in order to assure the production of high quality food while respecting environmental considerations and consumer demands. It is the policy of MAA and its members to continually seek to achieve long-term economic viability and competitiveness while maintaining our commitment to environmental sustainability and stewardship. Members of the association will implement this policy by their development and adherence to a Code of Practice based on the Guiding Principles for Responsible Aquaculture in Maine

Section Three ♦ Guiding Principles for Responsible Aquaculture in Maine

The Maine Guiding Principles for Responsible Aquaculture in Maine addresses the responsibility of the aquaculturist to the environment, the fish, shellfish and sea vegetables grown, and the consumer. Among the goals to be achieved through these measures are environmental, economic and social sustainability.

Companies, individuals and other groups that engage in aquaculture, singularly and collectively:

1. Shall consult and collaborate with federal, state and local authorities for the development and implementation of policies, laws, regulations, practices and procedures necessary and practicable to achieve, environmental, economic, and social sustainability of aquaculture operations.
2. Shall consult and co-operate with other aquaculture producers and sectoral suppliers for the development of and agreement on common standards and objectives.
3. Shall plan and operate aquaculture sites whose characteristics are compatible with long-term sustainable operation with acceptable ecological effects.
4. Shall plan and operate aquaculture sites in a manner that conserves water resources.
5. Shall respect appropriate considerations for species welfare that apply to the species being raised.
6. Shall take such measures as are appropriate to avoid disease outbreaks and implement regulated containment procedures should a disease outbreak occur.
7. Shall take all reasonable steps to ascertain that permissible introductions of exotic species are done in a responsible manner and in accordance with appropriate regulations.
8. Shall take all reasonable steps to ascertain that permissible transfers of species across jurisdictional lines is done in a responsible manner and in accordance with appropriate regulations.
9. Shall use therapeutic agents in accordance with applicable regulation and best management practices.

10. Shall dispose of waste and chemicals in a manner that does not constitute a hazard to human health and the environment and in accordance with the appropriate regulation.
11. Shall co-operate with those involved in research, technological development and training activities that seek to improve the social and environmental compatibility of aquaculture.
12. Shall implement improvements in technology and in management where such advances are economically possible and can assist the sustainability of the activity and improve the social and environmental compatibility of aquaculture.
13. Shall make the best efforts to produce products of the highest quality at all stages of the aquaculture process.
14. Shall strive to benefit local economies through diversification of the local economy, promotion of employment, contributions to the tax base and infrastructure.

Section Four ♦ Conserving Water Resources

4.1 General

4.2 Shellfish and finfish growers rely on clean, consistent and abundant water supplies. The health, welfare and quality of the animals and products produced by our farms are directly impacted by water quality. Different growing and processing activities utilize different sources and types of water.

4.3 Make every effort to ensure that all uses of water will be optimized to minimize water use per production unit.

4.4 Review each water source with respect to the impacts of their use on, power consumption, source size and recharge rate, public health, other users and water quality in discharge zones.

4.5 Consider the impacts of their operations on water sources when selecting sites for their operations. Every attempt will be made to select sites that optimize water use and reduce potential impacts on water sources.

4.6 Use only disinfection and cleaning agents approved by EPA and USDA and used in accordance with manufacturers recommendations and in applications for which the agent is approved by EPA, USDA and/or MEDEP.

4.7 Minimize discharge of disinfection and cleaning agents into aquatic environments. Consideration should

be given to the use of approved natural disinfection and cleaning agents.

4.8 Review and optimize water use and treatment methods. Where practicable, attempt to maximize water reuse and recirculation. Consider impacts on power consumption, animal welfare and any natural resource consumption required during additional equipment manufacturing and installation.

4.9 Finfish Growers

4.9.1 Where practicable, reduce potential impacts on water quality by utilization of new technologies designed to reduce discharges.

4.9.2 Seek to minimize discharges through optimization of feed formulations, feeding methods, selective breeding and employee training.

4.9.3 In cooperation with feed manufacturers, seek to minimize the use of fishmeal and oil through increased use of alternative protein and lipid sources.

4.9.4 Utilize integrated pest management techniques and aggressive biosecurity programs to minimize the use of chemical therapeutants and disinfectants.

4.10 Finfish-Freshwater

4.10.1 Develop facility specific water budgets that identify how water is

used, where losses may occur and potential methods for conservation.

4.11 Finfish-Saltwater

4.11.1 Select sites with good water exchange that are not depositional environments. Existing operations in depositional environments will work cooperatively with the Department of Marine Resources to identify alternate sites and expedite lease site relocation.

4.11.2 Carefully consider water circulation patterns on lease sites and seek to optimize gear placements so as to maximize water exchange.

4.11.3 Strive to use gear and production strategies that minimize or eliminate the need for on-site washdown and rinsing to reduce biofouling.

4.11.4 Strongly consider the practicality and potential for polyculture using shellfish and/or marine plants to reduce potential discharge of nutrients and particulate matter. Where practicable co-locate shellfish, marine plant and finfish farms in order to maximize production synergies and reduce potential water quality impacts. When considering polyculture growers will consider possible impacts on biosecurity, worker health and safety, public health and water circulation patterns.

4.12 Shellfish Growers

4.12.1 Hatcheries

4.12.2 Utilize integrated pest management techniques and aggressive

biosecurity programs to minimize the use of chemical therapeutants and disinfectants.

4.12.3 Hatcheries receiving animals or gametes from outside the facility shall determine the disease status of the source location and stock. For stocks or locations free of diseases of regulatory concern under Maine State regulations, no hatchery effluent treatment is required. For stocks or locations known to be positive for any diseases of regulatory concern hatcheries shall at a minimum treat their effluent discharge water to minimize the risk of pathogen discharge. Every attempt will be made to source only animals and gametes from stocks or locations shown to be free from diseases of regulatory concern.

4.12.4 In the event of the need to dispose of excess cultured algae or shellfish larvae into the marine environment, every effort will be made to ensure that stocks from non-local sources are rendered non-viable before discharge.

4.12.5 Comply with all applicable state and federal wastewater discharge standards and regulations.

4.13 nurseries and Growout

4.13.1 During site selection or expansion, careful consideration should be given to primary productivity levels and the extent of existing farmed and wild shellstock resources in the immediate surrounding area.

4.13.2 Strive to use gear and production strategies that minimize or eliminate

the need for on-site washdown and rinsing to reduce biofouling.

4.13.3 Strive to use harvesting methods that minimize the re-suspension of bottom sediments.

4.13.4 Carefully consider water circulation patterns on lease sites and seek to optimize gear placement so as to minimize circulation pattern disruptions.

4.14 Processors

4.14.1 Develop facility-specific water budgets that identify how water is used, where losses may be occurring and possible methods for conservation. Water budgets should consider whether the use of salt water or fresh water for a particular processing function is more environmentally responsible and

what if any public health considerations may exist if a change in water type is proposed.

4.14.2 Continuously strive to review and optimize water use and treatment methods in order to reduce use and effluent discharges. Where practicable attempt to maximize water reuse and recirculation. When examining water reuse and recirculation consider impacts on power consumption, and public health and any natural resource consumption required during additional equipment manufacturing and installation.

4.14.3 Comply with all applicable state and federal wastewater discharge standards and regulations.

Section Five ♦ Proactive Animal Health Management

- 5.1 General.** Aquatic animal health is impacted by the interaction between three factors, the animals' condition, the animals' environment and the presence or absence of a disease agent. Farmers have the ability to influence these factors to varying degrees. Proactive animal health management seeks to minimize the risk of disease through optimizing the condition of the animal being cultured and providing the best possible environmental conditions for that animal. Disease agents occur naturally in the environment and continually challenge both wild and farmed animals. Farms that utilize operational practices that produce high condition animals in good, clean environmental conditions will be best able to resist these disease challenges. Sometimes natural disease challenges overwhelm even these farms and farmers must change their production methods in response to a particular disease. This is part of the natural evolution of farming techniques. In a new field such as aquaculture these events may occur more frequently because farmers are still learning how to farm in water with new types of animals.
- 5.2 Strive to improve husbandry and farm management practices. This can minimize disease risks and maximize animal performance and welfare.
- 5.3 Minimize animal stress through appropriate site selection, culture and harvest methods and production strategies.
- 5.4 Develop effective and timely communication among growers within the same bay or estuary as a tool in reducing individual and collective risk levels.
- 5.5 Growers operating in the same local area should agree on a clear set of procedures and criteria that guide individual growers on when and how they should share information on disease incidents, animal performance and environmental conditions. These guidelines may also assist in reducing the risk of distribution of incorrect information.
- 5.6 Wherever practicable, third party biosecurity audits should be conducted to impartially identify sources, vectors and relative risk levels for potential disease agents.
- 5.7 Increase audit frequency for operations that have consistently poor performance on biosecurity audits.
- 5.8 Care should be taken during site selection and daily operations to minimize the risk of negative impacts on farm animals from off farm human activities such as oil, chemical and sewage spills, fertilizer, herbicide and pesticide runoff or overspray.
- 5.9 Establish and use proactive integrated predator deterrence and integrated pest management to minimize farm animal stress and maximize animal health and welfare.

5.10 Work cooperatively with state and federal agencies to assist in surveying the distribution and prevalence of disease agents in wild populations

5.11 Finfish All member marine finfish growers shall operate according to the standards and best management practices established by local Bay Management Area Groups. These groups develop and implement a Bay Management Area Fish

Health and Biosecurity Plan according to the standards outlined in the Maine Aquaculture Association Finfish Bay Management Agreement.

5.12 Shellfish All member shellfish growers shall operate according to the standards and best management practices established under the MAA Shellfish Health and Biosecurity Guidelines. These guidelines are developed by the MAA Shellfish Health Committee.

Section Six ♦ Waste Management

- 6.1 General:** All human activities generate waste. In order to effectively manage, use and dispose of wastes generated during aquaculture activities farmers should conduct a systematic review of their operations and develop a waste management plan. This plan should:
- 6.2 Identify all wastes generated on a site or from a facility. Wastes should also be classified with respect to any risks associated with their collection and appropriate disposal.
- 6.3 Minimize the generation of all waste types.
- 6.4 Whenever possible encourage reuse and/or recycling of waste except in cases where human or animal health may be compromised.
- 6.5 Containment and disposal methods must be clearly outlined and must be designed to minimize any human or animal health risks associated with the waste.
- 6.6 Waste management should consider:
- a) Human waste;
 - b) Seed bags, scrap rope and netting;
 - c) Fish and shellfish mortalities;
 - d) Packaging materials;
 - e) Any chemical or fuel spills; and,
 - f) Sharps.

Section Seven ♦ Grow Out and Husbandry Practices Designed to Optimize Use of Aquatic Resources

- 7.1 General.** Farms should conduct a systematic review of their current operations and identify any documented environmental impacts. When considering modifications to existing farming methods, growers should include a review of the type and extent of probable environmental impacts that may occur as a result of the new methods.
- 7.2 Site Selection**
- 7.2.1** During the site selection process any probable environmental impacts of the proposed type of aquaculture operation should be identified. The potential extent of the probable impacts should be estimated. Potential methods of prevention and/or mitigation should be clearly outlined. A careful comparison of the environmental impacts of these prevention or mitigation strategies and the selection of an alternative site should be conducted. In the event that the environmental impacts of the prevention or mitigation strategies are greater than the selection of an alternative site, the alternative site should be selected. Impacts on worker safety, product quality, and animal welfare should also be considered during the alternative site review.
- 7.2.2** Care should be used in selecting hatchery, nursery, and growout sites to ensure that site characteristics are optimal for the species to be cultured. Sites that optimize water use and minimize stress on the animal should be selected.
- 7.2.3** Sites with frequent, extreme weather or sea state conditions that would limit the grower's access to farm animals should be avoided.
- 7.2.4** In selecting a culture site care should be taken to avoid areas that historically had frequent harmful algal blooms.
- 7.2.5** Potential shellfish sites should be reviewed for primary productivity levels to ensure adequate food sources are available.
- 7.2.6** Thorough baseline site surveys should be conducted in order to characterize the marine habitat, ecosystem and hydrographic conditions that prevail on the site. Baseline site surveys should include a characterization of the seasonal variation in the above characteristics.
- 7.2.7** Land-based sites must be in compliance with all applicable local, state and federal land use requirements.
- 7.2.8** Care should be taken to select land-based sites to minimize the impact on natural eco-systems.
- 7.3 Site Management**
- 7.3.1** In developing water and land-based sites consideration should be given to use of alternative building materials and methods designed to reduce environmental impacts.
- 7.3.2** Sites should be clearly marked and in full compliance with US Coast Guard and Maine Department of

- Marine Resources lease marking regulations.
- 7.3.3 Sites should be regularly examined to assess their condition.
- 7.3.4 Growers should keep adequate environmental and husbandry records that allow an examination of the potential impacts of environmental conditions and production practices on the site condition, animal performance and animal health.
- 7.3.5 When developing production plans, careful consideration should be given to site fallowing and site rotation as methods of reducing environmental impacts and increasing biosecurity.
- 7.4 **Stock Sources** Growers should make every effort to verify that stock or gametes purchased for on growing are in compliance with all relevant animal health regulations. Where applicable growers should request and retain on file copies of any applicable stock or facility animal health and biosecurity inspections and audits.
- 7.5 **Cultured Sources**
- 7.5.1 Hatcheries who purchase gametes or larvae for juvenile production should make every effort to buy from hatcheries or broodstock facilities that operate according to this Code of Practice and The MAA Shellfish Health and Biosecurity Guidelines, and/or the MAA Finfish Bay Management Agreement
- 7.5.2 Growers who purchase juvenile animals to stock their growout sites should make every effort to source
- stocking animals from hatcheries or nursery sites that operate according to this Code of Practice and The MAA Shellfish Health and Biosecurity Guidelines, and/or the MAA Finfish Bay Management Agreement.
- 7.5.3 Any animals coming from outside the State of Maine must meet Maine regulations concerning importation and animal health.
- 7.5.4 Hatcheries and nurseries should not sell clinically diseased animals. In addition, hatcheries should not sell animals that have tested positive for diseases of regulatory concern. Hatcheries and nurseries should only sell animals that are in compliance with all appropriate state and federal animal health regulations.
- 7.5.5 Shellfish hatcheries and nurseries should only sell animals that are in compliance with the MAA Shellfish Health and Biosecurity Guidelines.
- 7.6 **Wild Sources**
- 7.6.1 Hatcheries, nursery or growout sites that collect wild juveniles for ongrowing shall operate in compliance with all the appropriate fisheries management regulations.
- 7.6.2 Operators who collect wild juveniles will make every effort to ensure that their collection activities, methods and gear do not compromise the sustainability of the wild resource population; do not cause significant negative environmental impacts.
- 7.6.3 Operators who collect wild juveniles will make every effort to ensure that their collection methods and

locations do not compromise the health of the wild source stock or the health and welfare of any existing farm stocks on the facility or site that the wild juveniles are being transferred to.

7.7 Farming Practices

- 7.7.1 When conducting activities such as but not limited to, stocking/seeding, harvesting, feeding, grading, thinning, transfer, cleaning, and/or gear maintenance all standard operating procedures should include diligent efforts to minimize probable environmental impacts. These efforts should prioritize proactive prevention of probable environmental impacts. Impacts on worker safety, product quality, and animal welfare should also be considered during the planning and implementation of any prevention and/or mitigation efforts.
- 7.7.2 Feeding practices: Some forms of aquatic farming require the active feeding of farm animals. When active feeding is required care should be taken to ensure feed composition and quality meets the nutritional needs of the species being grown. Feed storage and delivery methods should be such that all animals have access to adequate amounts of nutritious, balanced and hygienic feed.
- 7.7.3 In operations where active feeding involves feed amounts that have the potential to cause significant environmental impacts farm operators must monitor feed consumption and animal behavior regularly. Care must be taken to minimize feed wastage and optimize

feed conversion rates. Feed formulations which increase digestive efficiency and reduce feed conversion rates should be prioritized. Wherever practicable, monitoring technologies such as video, Doppler or sonar sensors should be used to actively monitor feed consumption and reduce wastage rates. Where possible monitoring methods should be actively linked to feeding control systems to ensure active feedback signals designed to reduce feed wastage.

- 7.7.4 Comprehensive stocking and production strategies that optimize production while minimizing environmental impacts should be used. Production planning should include a systematic review of any probable environmental impacts that would be associated with a particular production plan or method.
- 7.7.5 When designing, constructing and/or installing farm gear and equipment, care should be taken to reduce the risk of gear failure and loss. All farm gear and equipment should be regularly inspected and maintained.
- 7.7.6 When installing farm gear on a site careful consideration should be given to the method of deployment and anchoring and specific site location that will reduce probable environmental impacts without compromising worker safety, product quality, and animal welfare.

7.8 Harvesting Practices

- 7.8.1 Continuously strive to improve harvest methods in order to reduce

environmental impact and improve animal welfare.

- 7.8.2 Strive to reduce animal stress and when necessary euthanize animals humanely.
- 7.8.3 Harvest procedures and equipment shall be designed and operated in a fashion that reduces biosecurity risks and is in accordance with the MAA Finfish Bay Management Agreement or MAA Shellfish Health and Biosecurity Guidelines.
- 7.8.4 Harvesting equipment should be designed and operated in a manner that reduces impacts on natural benthic communities.
- 7.8.5 Harvest procedures and equipment shall be designed and operated in a fashion that reduces any associated discharges with possible negative environmental impacts.
- 7.8.6 Harvest and post-harvest vessel and equipment clean up procedures should minimize any wastes discharged overboard.

7.9 Predator Deterrence

- 7.9.1 Predators will occasionally attempt to attack farm animals. Predator attacks may cause mortalities or sub-lethal stress. Farmers should determine the most likely local predators for the species they are growing and what local predator distribution and migratory patterns are. Farmers should study the predator's ecology, behavior and life history in order to better understand any potential interactions between farm animals and the predator. Based on this understanding farmers should

develop, species specific, integrated predator deterrence plans. These plans should identify the potential predator, outline any proposed deterrence measures and how they relate to the predator's ecology, life history or behavior, and explain how any deterrents and operational practices are used to minimize the potential for predator attacks.

- 7.9.2 Consider the distribution and prevalence of potential predators when selecting sites. Where practicable, farmers should select farm sites away from high predator concentrations or migratory routes.
- 7.9.3 When developing deterrents, farmers should emphasize methods that are humane, provide direct conditioning signals to predators and are effective behavior modifiers.
- 7.9.4 Develop multiple deterrents and use them in such a manner that predators do not become acclimated to the deterrents.
- 7.9.5 Deterrents should be used in combination with operational practices and production strategies that take into account predator life cycles and ecology in order to minimize the potential for interactions between farm animals and predators.
- 7.9.6 Share information on predator prevalence and farm attacks within local bay management areas.
- 7.9.7 When using deterrents, farmers should comply with all appropriate state and federal regulations.

7.9.8 Encourage and support research on predator behavior and practical methods of deterrence.

7.10 Pest Management

7.10.1 Pests will occasionally attempt to attack and infest farm animals or structures. Pest attacks may cause mortalities, sub-lethal stress or damage farm structures. Farmers should determine the most likely local pests and study their ecology and life histories in order to better understand how to prevent or reduce attacks and infestation levels. Based on this understanding farmers should develop, species specific, integrated pest management plans. These plans should identify the potential pest, outline any proposed management strategies, indicate how the strategy relates to the pest's biology and ecology, and explain how any the proposed management strategies reduce the potential for pest attacks.

7.10.2 Consider the distribution and prevalence of potential pests when selecting sites. Where practicable farmers should select farm sites away from high pest concentrations.

7.10.3 Develop multiple pest management methods and use them in such a manner that reduces the risk that pests develop resistance or acclimate to the management methods employed.

7.10.4 Consider site fallowing and rotation as a method of reducing the risk of pest infestation.

7.10.5 When possible farmers should use animal strains that exhibit resistance to pests. Pest management methods should be used in combination with operational practices and production strategies that take into account pest life cycles and ecology in order to maximize the effectiveness of the pest management methods.

7.10.6 Pest management methods should include BMPs that will reduce the need for use of chemicals or medications.

7.10.7 Share information on pest prevalence and infestation levels within local bay management areas.

7.10.8 Coordinate pest management actions within local bay management areas.

7.10.9 When using integrated pest management methods, comply with all appropriate state and federal regulations.

7.10.10 Encourage and support research on pest biology and practical methods of pest management.

7.10.11 Support the continued development of alternative therapeutant and management methods in order to reduce chemical use and the development of possible resistance and minimize chemical use.

Section Eight ♦ Animal Welfare

8.1 General

8.2 Farm animal welfare is the responsibility of the farmer and farm workers. Good animal welfare is based on good husbandry methods appropriate to the biological characteristics of the animals cultured and environmental conditions.

8.3 Animal welfare can be impacted both by factors that are under a farmer's control and factors that are not. For factors that can be controlled by the farmer every effort should be made to ensure that animal welfare is protected. For factors beyond the farmer's direct control, operational practices may have to be adjusted in order to offset any impacts on animal welfare.

8.4 When selecting farm sites care should be taken to insure that the environmental conditions on the site are appropriate for the species being considered for culture.

8.5 Staff farms with sufficient numbers of farm workers with adequate training and experience in order to be able to:

- a. Recognize whether animals are in good health,
- b. Understand the significance of behavioral changes, and;
- c. Identify environmental changes or conditions that may compromise the welfare of the animals.

8.4 Appropriate stocking densities shall be determined based on species, age, sex, live weight, health and behavioral and physiological needs. Where appropriate consideration shall be given to the relationship between stocking density, water quality, available food sources and any impact that reduced densities may have on cannibalism and aggressive territorial behavior.

8.6 Regularly inspect animals and their enclosures or culture locations. Inspections should be conducted in a manner that minimizes disturbance to animals. Inspections should focus on factors that may adversely affect animal welfare and signs of abnormal behavior, injury or poor health.

8.7 If animals are behaving abnormally, are injured, or in poor health, the person responsible for their care should act promptly to establish the cause and take immediate remedial action. If necessary, the assistance of a veterinarian or qualified aquatic animal health professional should be sought.

8.8 Dead or dying animals should be removed as soon as possible in a way that does not adversely affect the welfare of those remaining.

8.9 In facilities in which animal welfare is dependant on the effective operation of mechanical systems, an alarm system should be in place. Such facilities should also have adequate response measures in place

- in the event of power or equipment failures.
- 8.10 Animals should be handled in ways that minimize stress. The design, construction and maintenance of enclosures, buildings and equipment shall be such that they take into account animal welfare. Minimize the risk of injuries or stress, facilitate management of farm stocks, allow regular stock inspection, are appropriate to the weather conditions and surroundings in which they are used, assist in the prevention of predation and disease and allow for easy maintenance of good hygiene and water quality.
- 8.11 Provided sufficient space for animals to move about. Appropriate stocking densities shall be determined based on species, age, sex, live weight, health and behavioral and physiological needs. Where appropriate consideration shall be given to the relationship between stocking density, water quality, available food sources and any impact that reduced densities may have on cannibalism and aggressive territorial behavior.
- 8.12 Optimal water circulation should be provided to ensure an adequate supply of clean water and oxygen.
- 8.13 Harvesting techniques should include humane slaughter methods that minimize animal stress.
- 8.14 Care shall be taken to ensure that shellfish do not remain in direct sunlight or out of water for extended periods prior to refrigeration.
- 8.15 Care taken to ensure that fish and shellfish are not subjected to excessive mechanical vibration or noise levels.
- 8.16 Drugs and therapeutants shall not be used to compensate for poor hygienic conditions.
- 8.17 To minimize risk of stress or injury review procedures and equipment prior to the handling or transport of any animals.
- 8.18 Prior to the handling or transport of live fish appropriate feed deprivation periods shall be employed in order to reduce metabolism and excretion of waste products during handling or transport. The length of any food deprivation period shall be appropriate to the species and take into account relevant environmental conditions.
- 8.19 Fish and shellfish should be handled gently when transferring from one conveyance or container to another.
- 8.20 During grading or transfer operations, care should be taken to ensure animals are handled quickly with minimal jarring or bruising.
- 8.21 In the event that live fish need to be handled in order to conduct biological sampling, monitoring or spawning consideration will be given to the possible benefits of sedation. If sedation is employed care shall be taken to ensure that anesthetic dosage rates are effective and adequate oxygen levels and water flow rates are maintained throughout anesthesia and recovery.

Section Nine ♦ Marine Transportation

9.1 General

9.2 Navigation

9.2.1 Persons operating vessels should be familiar with the area to be navigated. Charts should be used.

9.2.2 Notify responsible persons on shore of your plans. Let them know where you plan to go, when you will be back, and the names of those on board.

9.2.3 Operate only under appropriate weather conditions.

9.2.4 Keep boat in good repair. Use of a calendar system can be helpful in tracking preventative maintenance.

9.2.5 Maintain appropriate vessel insurance.

9.2.6 Register vessels with appropriate authorities.

9.2.7 Ensure that U.S. Coast Guard and state requirements are met, such as use of PFDs, horn, fire extinguisher, number of persons on board, etc.

9.2.8 Ensure adequate time for scheduled work. Hastily completed tasks may cause safety and environmental risks.

9.2.9 Providing a means of boat-to-shore communications will increase safety and efficiency.

9.3 Boat Operations

9.3.1 Follow posted speeds and hours of operation.

9.3.2 Ensure adequate water depth under vessel

9.3.3 Avoid near-shore, early AM weekend trips unless required by tide, weather conditions, or other emergency. When careening vessels avoid sensitive aquatic plant or animal areas.

9.3.4 Muffle excess noise. Ensure that engines have operating mufflers in use and ensure that radios are played at a reasonable volume.

9.3.5 Avoid wakes near shore or moored boats. Excess wakes disturb property owners and recreational participants and can cause property damage and safety issues.

9.3.6 Dispose of trash properly.

9.3.7 Protection of Waterways from Marine Chemicals

9.3.8 Fuel only at approved fueling stations.

9.3.9 Report fuel or oil spills to fueling station operator.

9.3.10 Report on board spills and leaks to captain of vessel, and clean up/repair as appropriate.

9.3.11 Have approved Marine Sanitation Device (MSD) on board.

9.3.12 Require crew and passengers to use MSD.

9.3.13 Dispose of MSD waste in approved manner. Do not dump over board.

9.3.14 Bottom paint boats in accordance with state and coast guard recommendations.

9.3.15 Use only other chemicals that are EPA approved, use sparingly

9.3.16 When replacing engines, consider acquisition of more efficient, cleaner engines.

9.4 Use of Public Landings

9.4.1 Obtain permission for any off-hours use.

9.4.2 Be organized and ready to launch or unload.

9.4.3 Allow space for other vehicles, do not block the ramp, and clear the ramp rapidly.

9.4.4 Do not monopolize facilities.

9.4.5 Demonstrate good seamanship, proper use of PFDs and other equipment.

9.4.6 Assist recreational boaters when appropriate.

9.4.7 Park no closer than necessary. Leave prime parking places for recreationalists who may have impairments.

9.4.8 Contain refuse and dispose of properly.

9.5 Visitors

9.5.1 Explain plan for cruise to visitors.

9.5.2 Instruct on any biosecurity measures.

9.5.3 Orient visitors to vessel facilities and safety procedures.

9.5.4 Explain general ground rules to visitors. Ensure that guests are familiar with use of MSD, life preserver, survival suit, etc.

9.5.5 Ensure visitors are properly attired and equipped with PFDs.

Section Ten ♦ Land Transportation

10.1 General

- 10.2 Ensure that vehicles and drivers are in compliance with local, state and federal requirements.
- 10.3 Instruct drivers to utilize reasonable practices to minimize noise from the vehicle, such as courteous use of horn, limited and appropriate use of jake brakes, and refrigeration units on standby.
- 10.4 Encourage waiting drivers to minimize noise from radios and other mechanical systems.
- 10.5 Observe seasonal weight restrictions
- 10.6 Drainage from an operating trailer or truck box may have adverse environmental impacts. Confine drainage or schedule cleaning, loading and other activities to minimize drainage from the trailer or box while underway.
- 10.7 Make reasonable attempts to minimize use of loud vehicles particularly during night and early morning hours.

Section Eleven ♦ Community Leadership

11.1 General Aquaculturists are a part of Maine’s maritime and agricultural heritage and play an important role in the economic diversification of communities. Members take seriously their obligation to co-exist with local culture.

11.2 Community Support

11.2.1 Participate in local affairs.

11.2.2 Support local infrastructure through donations and participation.

11.2.3 Investigate all complaints received by the firm in a timely manner.

11.2.4 Keep a record of complaints, investigation results and corrective actions taken.

11.2.5 Consider a company policy that commits to supporting agricultural practices and vendors that are environmentally sensitive. The company will derive loyalty in the community and among its vendors.

11.3 Social Compatibility

11.3.1 Be sensitive to character of local community.

11.3.2 Shape business operations to blend with local community culture.

11.3.3 Whenever possible render assistance to fellow marine resource users.

11.3.4 Support and participate in developing new mechanisms for the reduction of noise, light, odor and visual profile.

11.3.5 While planning and conducting operations consider other marine resource users and try to minimize conflicts over space, gear and shore facilities. The following should be considered

a). Noise:

i) Where possible, minimize noise generated by operations.

ii) Ensure that equipment mufflers are operational and effective.

iii) Volume levels on radios and intercoms should be set at levels that allow effective communication but do not unduly impinge on neighbors.

iv) Audible alarm sensors should be set at levels that accomplish their purpose without triggering overly frequent alarms.

v) Equipment such as blowers, generators, and water pumps may need sound baffles that are in excess of standard manufacturer installed muffles.

vi) Worker safety must not be compromised during the design and operation of such above specification sound baffles that worker safety is not compromised and performance, operation, safety and integrity of the

original equipment must be maintained. Special attention should be given to the potential for fire hazards.

b). Light:

i) Where possible, minimize the intensity and amount of light in use.

ii) Avoid lighting conditions that jeopardize worker safety, animal welfare or that cause navigational hazards.

iii) Wherever possible cut off light fixtures should be used. With the exception of lighting required by the United States Coast Guard for marking of lease sites and floating gear, every effort should be made to reduce the amount and intensity of light beyond lease or property boundaries.

c). Odor:

i) The generation of odors should be minimized through proper waste storage and disposal.

ii) If wastes are stored adequate provisions should be in place to prevent waste deterioration and access by pests or vermin.

iii) Odor should be prevented and controlled by proper site, vessel and truck hygiene and maintenance.

d). Hours of Operation:

i) The nature of working with tides, live animals and transportation schedules may require unusual operating timeframes.

ii) Where possible, conform to local norms for operational hours. When necessary to operate outside normal operating hours, make every attempt to reduce the potential impacts by vigilance to noise and light issues.

d). Visual Profile:

i) Investigate alternative means of reducing visual profile. This may be accomplished through the use of non-traditional colors or materials for gear and shoreside facilities.

ii) Consideration should be given to shapes, forms profiles, materials and/or colors that are consistent with the traditional maritime heritage of the Maine Coast.

iii) In areas with little or no land based human activity, further consideration should be given to methods designed to facilitate structures “blending into” the natural landscape. In considering such methods, care should be taken that navigational hazards are not increased due to reduced visibility.

11.4 Commitment to the Community

11.4.1 Stable employment and environmental conditions are of prime importance to the local community. Sound business planning and operations are critical to achieving these conditions.

11.5 Communications

11.5.1 Effective and regular communications with neighbors directly impacted by farm operations can be an effective method of

facilitating good community relations. Regular efforts should be made to talk with neighbors and listen to any concerns they may have. Sincere efforts to address their concerns should be made. Any problems associated with these efforts should be shared with neighbors in order to help them understand why their concerns are difficult to address.

11.5.2 Growers should consider conducting an annual open house to educate the community about their products and operations; or forming a community advisory committee, comprised of a variety of community members to provide periodic feedback concerning the firm's operations.

Section Twelve ♦ Employee Development

12.1 General Maine's aquaculture industry is poised to become a recognized leader in socially and environmentally responsible business practices. Successful management of the dual bottom line of profitability and environmental responsibility is an obtainable achievement within the industry.

12.2 Training

12.2.1 Personnel should be properly trained for each activity they undertake.

12.2.2 Training and staff development should be proactive. Training should take place in anticipation of the need, rather than reacting to situations.

12.2.3 Staff should have an understanding of the importance/impact of their activity on the environment

12.2.4 Management must create an environment where staff feels free to make suggestions for operational improvements

12.2.5 Staff should be encouraged to report adverse impacts or accidents so that remedial action may be taken promptly.

12.2.6 Encourage and support employees who wish to obtain outside education or training in areas related to their positions or the company's mission.

12.3 Entrepreneurial Leadership and Citizenship

12.3.1 Mentor employees to be good community leaders.

12.3.2 Provide training/adopt procedures to establish and maintain beneficial community relations.

12.4 Personnel Requirements

12.4.1 Staff must be provided the appropriate training and equipment to complete their responsibilities.

12.5 Employee health and safety

12.5.1 Firms must ensure that all local, state and federal health and safety requirements are fulfilled.

12.5.2 Provide first aid and emergency medical equipment at all work sites, on vessels and in vehicles.

12.5.3 Keep first aid supplies and other emergency equipment in good working order at all locations.

12.5.4 Management must create an environment in which it is clear that proper health and safety practices are of prime importance. Employees must be comfortable making recommendations for improvements in this area.

12.5.5 Reasonable precautions must be taken to ensure that any employee with a disease in the communicable stage which may be transmissible

through food is excluded from working in any capacity in which the employee may come in contact with food, food contact surfaces, or where the employee may discharge bodily waste to the environment. The diseases that are transmissible through food workers are determined by the U.S. Centers for Disease Control and Prevention, in compliance with the Americans with Disabilities Act, and published in the *Federal Register*.

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