

MICHIGAN TROUT UNLIMITED

AQUACULTURE POLICY POSITION

PURPOSE:

The purpose of this document is to state Michigan Trout Unlimited's ("MITU") policy in regard to the growing aquaculture movement both within the waters of the State of Michigan and the Great Lakes. The State of Michigan's regulations are not adequate or satisfactory to protect Michigan's coldwater fisheries and their watersheds from aquaculture impacts. The risks posed are too great and the potential harms are devastating. Aquaculture occurs in three basic forms: closed pond systems, stream flow through systems, and open water net pen systems. Each comes with its own concerns and each will be discussed in sections of this policy.

MITU General Policy Concerning Aquaculture:

MITU does not support aquaculture in Michigan or the Great Lakes unless it is strictly regulated in a way that ensures no harm to Michigan's coldwater fisheries and their watersheds. This means that regulations for aquaculture must ensure that no impacts occur from this activity, and that all risks posed are eliminated. Private operations must not be subsidized by the public by allowing negative impacts or diminishment of our natural resources or the existing uses and benefits provided by our natural resources; nor shall the risks posed by aquaculture operations put our natural resources and their uses in any jeopardy.

Requirements to Ensure No Harm:

The following will list potential harms from aquaculture and MITU's current position on standards to prevent such harm.

1. Water Temperature and Dissolved Oxygen:

High water temperature and low dissolved oxygen impacts will mainly occur from stream flow through systems where diversions of flow from coldwater streams are shunted through raceways or ponds and discharged back into the same stream. This diversion can significantly increase temperature and reduce dissolved oxygen in the water that is discharged back into the stream. These discharges will directly impact coldwater fisheries and lower their abundances or extirpate them from miles of streams. With Great Lakes net penning, waste effluent and nutrients can create biological oxygen demand in surrounding waters leading to dissolved oxygen depletion and/or anoxic conditions.

a. Regulatory Standards to Prevent Increased Water Temperature:

- i. Water chillers must be made part of all flow through systems to ensure discharge water is at the same or lower temperature than intake water.**

- ii. Constant temperature monitors must be utilized to ensure the appropriate discharge temperature and close the system if temperatures increase above the intake temperature.
- b. Regulatory Standards to Prevent decreased Dissolved Oxygen.
 - i. Oxygen diffusers must be made part of all flow through systems to ensure discharge water is at the same or higher dissolved oxygen levels than intake water.
 - ii. Constant dissolved oxygen monitors must be utilized to ensure the appropriate discharge dissolved oxygen levels and closes the system if the dissolved oxygen decreases below the intake level.
 - iii. Waste effluent and nutrient pollution management requirements at both flow-through and net penning operations must ensure that dissolved oxygen depletion does not occur in waters outside of the aquaculture operations.

2. Nutrient Pollution:

Nutrient pollution can be introduced into the water bodies receiving the discharges of wastewaters from flow through systems or from open water net pen systems. Phosphorus is often the limiting nutrient in aquatic systems, and very small changes in the level of it can lead to significant changes to aquatic ecosystems. Nutrients from uneaten fish food and fish excrement will be the most significant source. In flow through systems discharges with excessive nutrients can lead to increases and shifts in algal communities, algae blooms, filamentous algae, less of some pollution intolerant aquatic invertebrates (like stoneflies, mayflies and caddisflies) and even less of certain stream fish populations (some research has documented brook trout density decreases with minor nutrient pollution). In open water net pen systems nutrients and waste would accumulate on the bottom, smothering benthic life, creating anoxic areas, or helping to stimulate dangerous Microcystis algae blooms that can render water unsafe for public use (similar to the problems occurring in Lake Erie due to nutrient pollution).

- a. Regulatory Standards for Nutrient Pollution:
 - i. Aquaculture operations must be required to take full responsibility for handling all nutrients created by their operations. Effluent nutrient levels should not exceed ambient intake levels.
 - ii. Aquaculture operations must collect solid waste and prevent solid waste from reaching Michigan inland lakes and streams or becoming free in the Great Lakes from open water net pens.
 - iii. Aquaculture operations must treat and remove all dissolved nutrients so that no nutrients are added to either Michigan inland lakes and streams or the Great Lakes.
 - iv. Flow-through systems must be required to take regular samples for solid waste and dissolved nutrients to ensure that neither type are discharged into Michigan's inland

- lakes and streams. Rigorous and robust sampling means and regimes must be prescribed by the state and conducted at the expense of the private operator.
- v. Open water net pen systems must have all appropriate safeguards to ensure that no solid waste or dissolved nutrients are added to the Great Lakes from the systems, and include monitoring systems sufficient to document such, and conducted at the expense of the private operator.

3. Antibiotics & Growth Hormones:

Addition of antibiotics and growth hormones to the fish food similar to other large-scale meat productions operations may be a desired practice for aquaculture operations. However, because aquaculture in pass through systems or open water net pen systems uses public waters those antibiotics and growth hormones will be released into public waters where they can affect natural bacterial communities dynamics and resistance (influencing frequency and severity of disease outbreaks), wild fish health and public drinking water supplies.

- a. Regulatory Standards for Antibiotics and Growth Hormones:
 - i. Open water net pen systems must not be allowed to release any antibiotics or growth hormones into the Great Lakes and to take all appropriate safeguards to ensure that none are released.
 - ii. Pass through systems must not be allowed to release any antibiotics or growth hormones into Michigan's inland lakes or streams.
 - iii. Requirements for regular monitoring for antibiotics and growth hormones to ensure that neither is discharged into Michigan's inland lakes and streams or Great Lakes must be in place.
 - iv. Examples of implementing these standards could include prohibiting any such chemicals from delivery via fish feed or water inoculation (leaving direct inoculation via injections to individual fish as a possible viable means).

4. Diseases:

Aquaculture poses two main direct vectors for disease introduction to wild fisheries. First, fish raised in a facility are often acquired from other places (spawned from brood stock kept specifically for that purpose) and may bring diseases with them (all net pen operations source fish from other facilities). Second, large and dense fish concentrations increase the probability of disease and the severity of disease outbreaks. Disease prevention regulations need to be commensurately rigorous compared with the cost of a collapse of the multi-billion dollar Michigan sport fishery.

- a. Regulatory Standards Concerning Disease:
 - i. Regular and rigorous disease testing must occur for all brood stock, and of all juvenile fish sourced for the operations.
 - ii. Regular and rigorous disease testing must occur for all types of aquaculture operations.

- iii. For all cases of disease outbreaks in any type of aquaculture operation, all fish must be immediately quarantined and destroyed, including immediate quarantine or isolation of all water leaving the aquaculture operation (flow-through or open water). This could include shutting off water inlet and outlets at flow-through operations, or deployment of disease impermeable booms for Great Lakes operations.
- iv. All aquaculture operations must be required to provide bonds to the State of Michigan sufficient to cover all costs of natural resource damages and harms to Michigan's sport fishery (including loss of use, effective response, and cost of long-term irreparable loss).

5. Escapement:

Fish escape from aquaculture facilities. Aquaculture escapement provides two categories of impacts. First, escapement can introduce new invasive and foreign species which can result in complete ecological imbalances (See Asian carp – a result of an insufficiently regulated aquaculture operation). Second, and more often under-assessed, is the introduction of domesticated gene pools from fish species that are found in nearby waters. The aquaculture industry utilizes purposeful genetic selection (or modification) for mass fish production which is inconsistent with our wild fish populations that have been honed for survival in the wild. Domesticated rainbow trout, for example, are common aquaculture species that perform well in dense populations and feed heavily in response to humans feeding them. Their genetic makeup varies widely from the wild steelhead strains in most of our coldwater tributaries. The traits selected for in domesticated rainbow trout versus wild rainbow trout or steelhead are largely mutually exclusive. Escapement dilutes wild gene pools and disrupts wild fish stocks from thriving. This fact is well studied and used in modern governmental aquaculture operations with goals of restoring wild fish stocks; as well as underpinning the MI DNR's own current procedures for steelhead production. Scientific literature available on the impacts of marine net pen escaped Atlantic salmon on wild Atlantic salmon stocks is available as well.

a. Regulatory Standards Concerning Escapement:

- i. All species not currently found in the Great Lakes region must be prohibited from use in flow-through and net penning operations in Michigan. Closed system aquaculture operations must be required to maintain safeguards to escapement of such species adequate to ensure all risk of them being introduced into the wild is eliminated. We have Asian carp because of this, and other popular aquaculture species such as tilapia pose equal risk for introduction and complete ecological imbalances.
- ii. All aquaculture operations with species currently found in the Great Lakes region must actively prevent escapement such that no aquaculture raised fish are allowed to escape from operations. Limited escape is not acceptable. Risk of escapement must be eliminated through regulation.

6. Interruption of Existing Uses:

Aquaculture operations may cause significant disruptions to recreational uses of our public waters. Open water net pen systems may result in interference with recreational boating and yachting, sportfishing, swimming and beach enjoyment, lakefront views, tribal fishers and state-licensed commercial fishers, and Great Lakes shipping channels. Flow-through systems may result in interference with canoers and kayakers, sportfishing, riverfront views, and tribal fishers. Michigan's waters have myriad existing uses, including rights to those uses afforded by property rights, public trust doctrine, Treaty rights, and numerous other basic legal structures. Additionally, our waters support Michigan's tourism economy, a 4 billion dollar plus annual sport fishery economy, and an incredible portion of local and state tax base through waterfront property owners. Diminishing or jeopardizing any of those uses and benefits of our waters would be short-sighted, irresponsible, and in many cases illegal.

- a. Regulatory Standards to Preserve Existing Uses:
 - i. Aquaculture operations must not interfere with, diminish, jeopardize or otherwise affect any other uses of Michigan's inland lakes and streams or the Great Lakes.

7. Regulatory Standards as a Whole:

MITU believes that the impacts and risks associated with aquaculture development in Michigan increase from closed-systems to flow-through systems, and again to net penning. Closed-systems, not without risks, offer the most viable and responsible means to aquaculture development in Michigan. Closed-systems may not be financially attractive to operators, due to the capital investments in infrastructure involved, but that infrastructure makes them less risky or damaging than flow-through or net penning operations. Those capital investments represent the business owner taking financial responsibility, at least in part, for the risks and impacts to public waters its business poses. The general regulatory standards MITU proposes should be uniformly applied to all aquaculture operations to ensure:

- a. The prevention of impact or risks to natural resources and their associated uses and benefits;
- b. The citizens of Michigan are not forced to subsidize the cost of certain kinds of aquaculture ventures by absorbing the impacts and risks they pose;
- c. All three kinds of aquaculture are held to the same consistent standards, thus preventing the public from subsidizing net penning or flow-through systems (by absorbing the avoidance of preventing impacts and risks) while simultaneously creating an economic disincentive for closed-system operations.

The State must establish regulatory standards prior to any additional aquaculture operations beginning in Michigan's inland lakes and streams or the Great Lakes. A robust independent monitoring and enforcement system completely funded by aquaculture industry permit fees must be implemented. Additionally, the operators must provide adequate bonding for abandonment, restoration and reclamation. The risks posed are significant and the potential harms are devastating.

The Executive Branch of the State of Michigan and its agencies must approach aquaculture with caution and come together to ensure that Michigan's recreational traditions, incredible water resources, and the benefits they provide to this State are protected. MITU believes that if the above protections are implemented then aquaculture may be able to co-exist with Michigan's well-established and valuable water uses.