

## MAA STRATEGIC AQUACULTURE PLAN FAQ'S

- 1. What is meant by the word: "seafood"?**  
For the purpose of this aquaculture plan, the word "seafood" simply includes any aquatic animal or plant that is produced in freshwater, saltwater, or brackish water systems, and can be consumed by humans.
- 2. What are the different types of fish production systems?**  
There are three basic types of aquaculture production systems: (1) *extensive* (rearing seafood in large bodies of water), (2) *intensive* (indoor tank production of seafood utilizing recirculating water systems), (3) *semi-intensive* (various combinations of the first two). Many variations exist between these basic types. Each has different methods for managing space, water, and energy. New production technologies for intensive fish farming are continually being developed and applied in many parts of the U.S. and hold much promise for Michigan aquaculture.
- 3. How is aquaculture waste managed?**  
Primarily, producers minimize fish wastes by feeding a correctly formulated, high quality, highly digestible feed. With proper facility design, wastes are easily collected and make excellent plant fertilizer!
- 4. Fish feeds are specialized, so are they sustainable and readily available?**  
Fish feed formulas are species and facility dependant. Commercial fish feeds are readily available on the national level from a number of feed mills. Current research efforts are focused on substituting other protein sources for the normally used fish meal, which originates from wild fish sources. Promising substitutes include soy products, algae, and fermentation wastes, all of which can be produced in Michigan.

- 5. What impact can aquaculture have on wild fish populations?**  
Proper facility design virtually eliminates the unintentional introduction of domestic fish into wild populations. Other methods to eliminate the chance of an inadvertent mix of wild and domestic fish stocks include: single-sex populations, production of sterile (triploid) fish, closed-loop indoor production systems, and rearing species such as tilapia and marine shrimp that cannot survive Michigan's climate and water conditions.
- 6. What is the status of aquaculture regulations?**  
Laws and regulations applied to fish production, fish health, and live fish transport are ever changing. Regulatory consistency is important to the development of aquaculture in Michigan. Aquaculture is agriculture, thus the Michigan Department of Agriculture and Rural Development (MDARD) is the logical agency to oversee aquaculture in Michigan.
- 7. Is Michigan's aquaculture potential for seafood production limited to only large-scale operations?**  
Certainly not. The MAA has historically represented mostly small producers but is encouraging the growth of the industry for both large and small operations. Many collaborative relationships can exist between large and small producers. The "locally-grown" phenomenon endorses small-scale facilities that would supply product to a smaller, localized area.

[MICHIGANAQUACULTURE.ORG](http://MICHIGANAQUACULTURE.ORG)  
EMAIL: [INFO@MICHIGANAQUACULTURE.ORG](mailto:INFO@MICHIGANAQUACULTURE.ORG)



## AQUACULTURE DEVELOPMENT

A Growing Need and Opportunity  
for an **Economic Boost**

WORLDWIDE,  
AQUACULTURE  
NOW PROVIDES  
MORE THAN  
**50%** OF THE  
FISH WE CONSUME

The Michigan Aquaculture Association (MAA) represents producers of fish and seafood that are grown in a safe and environmentally sensitive manner. The MAA supports and promotes a well-developed and sustainable aquaculture industry in the State of Michigan through building partnerships between the industry, universities, public agencies, and consumers.

While Michigan's past aquaculture production has focused mainly on fish for use as bait, pond stocking and fee fishing, the future growth of the aquaculture industry is in producing fish for human consumption. Worldwide, aquaculture now provides more than 50% of the fish we consume and the United States currently imports 84% of its seafood, contributing to national seafood trade deficit of over \$9.1 billion.



Michigan is well-positioned to expand aquaculture production. With an ample water supply and close proximity to the population centers of the US and Canada, aquaculture can be expanded to provide revenue and jobs throughout the state. With a targeted, systematic, and sustainable growth plan, aquaculture can become a major agricultural contributor to the state and add to the strength of our "locally grown" markets.



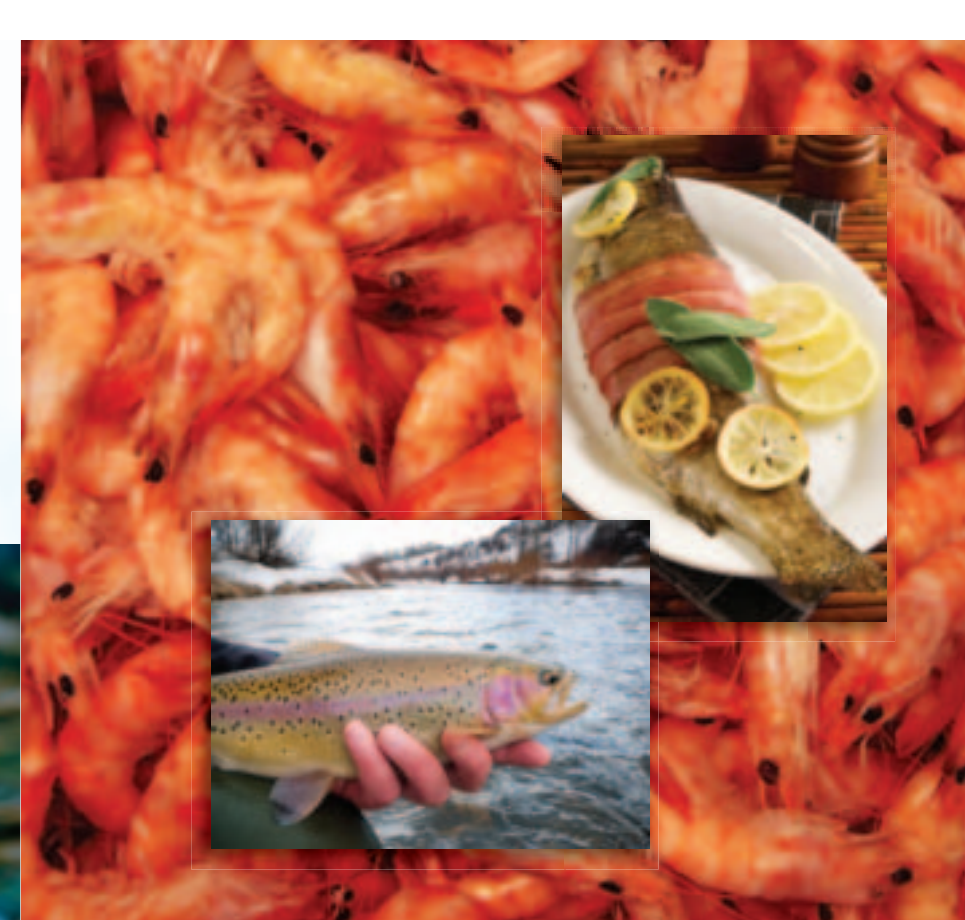


**MICHIGAN CAN GROW  
AQUACULTURE FROM CURRENT  
PRODUCTION OF \$5M AND 100  
DIRECT JOBS TO OVER \$100M  
AND 1500 JOBS**

The MAA believes Michigan can grow aquaculture from current production of \$5 million and 100 direct jobs to over \$100 million and 1500 jobs in the next ten years. By focusing on the three most developed markets: trout, shrimp, and tilapia, we believe we can begin a stepped approach whereby investments in the next two years would form the basis for growth to \$10-20 million within five years.

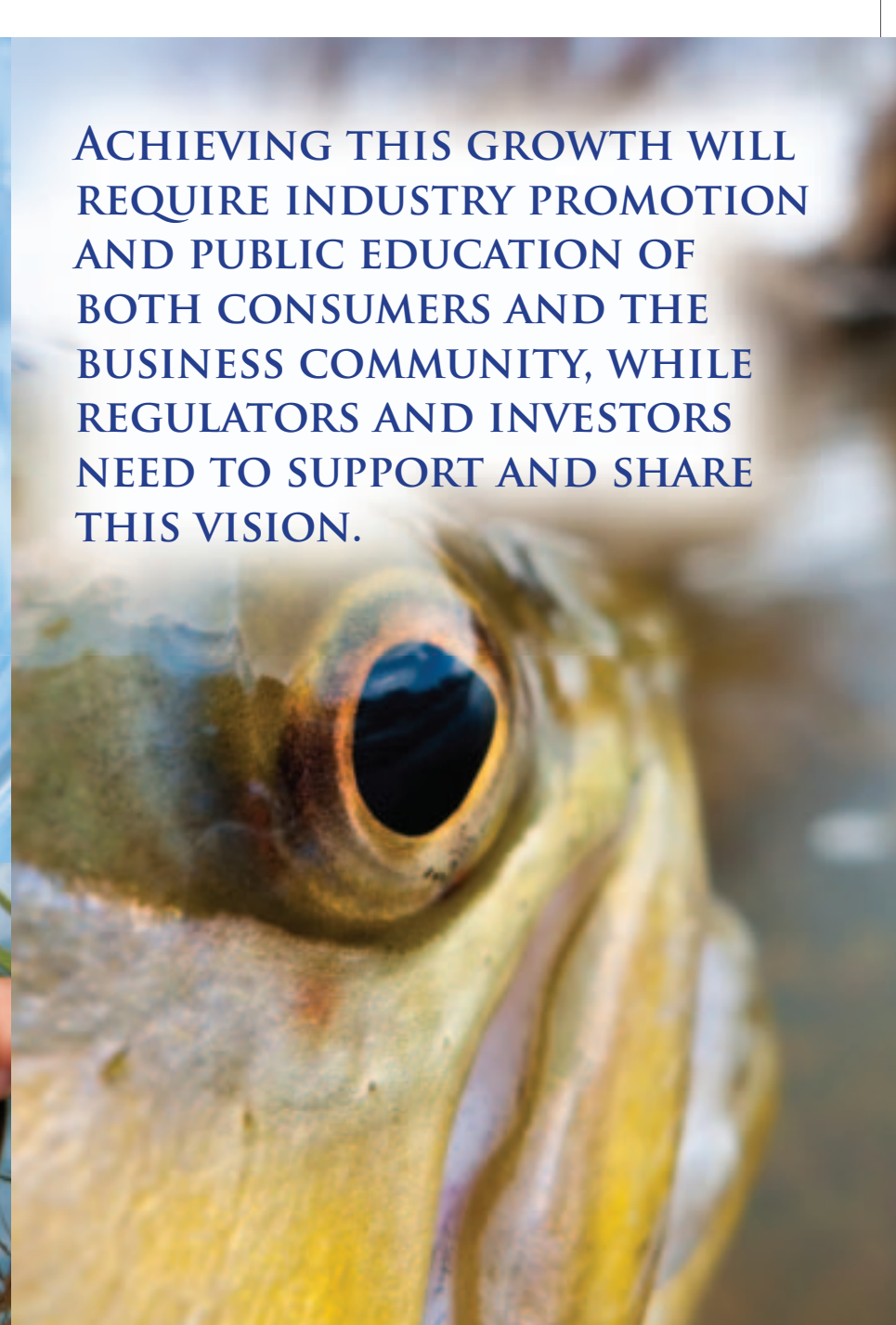
**MICHIGAN BORDERS 90%  
OF THE U.S. FRESHWATER  
SUPPLY AND 20% OF THE  
WORLD'S SUPPLY.**

**IN 2009, AMERICANS  
CONSUMED A TOTAL OF  
4.833 BILLION POUNDS OF  
SEAFOOD; 84% OF THAT WAS  
IMPORTED.**



Other species and further expansion would build from this base to provide the foundation for reaching the ten-year goal. Additional jobs in support of aquaculture could number 6000 in other sectors such as processing, equipment manufacturing, trucking, etc, based on an estimated 6:1 multiplier.

Achieving this growth will require industry promotion and public education of both consumers and the business community, while regulators and investors need to support and share this vision. Sustainable aquaculture is in its early stages of development and with high perceived risk and slow rates of return will require incentives such as 21st Century Job Funds, Renaissance Zones for Production, and other programs to attract investment capital. To further reduce risk, proven production models should be approved with minimal regulatory delay and confusion. Through the past efforts of the MAA, Michigan currently has an effective base for aquaculture regulation and we will continue to work to find ways to improve the cooperation between producers, investors, public agencies, and consumers.



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