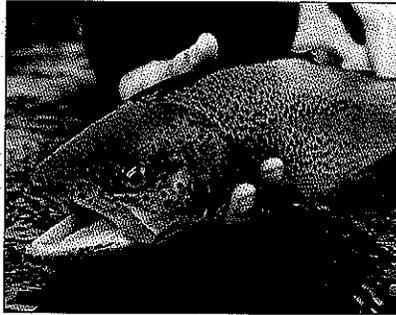


AQUACULTURE: Part of Reinventing Michigan



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Quality of Life (QOL) Participants

- **Jodi Gruner**, Economic Development, MI Department of Agriculture and Rural Development (MDARD)
- **Dave Fiedler**, Regulatory Affairs Officer, Department of Environmental Quality (DEQ)
- **Ed Eisch**, Platte River State Fish Hatchery, Department of Natural Resources (DNR)
- **Christine Alexander**, Water Resources Division, DEQ
- **Tarek Buckmaster**, Water Resources Division, DEQ



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Definition

Aquaculture means the commercial husbandry of aquaculture species on the approved list of aquaculture species, including but not limited to the culturing, producing, growing, using propagating, harvesting, transporting, importing, exporting, or marketing of aquaculture products under an appropriate permit or registration.



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Types of Aquaculture

PONDS



4

Types of Aquaculture

FLOW THROUGH



A black and white photograph showing a long, narrow, rectangular concrete channel filled with water. The channel is divided into sections by low concrete walls. The water appears to be flowing through the channel. The background shows some trees and a building.

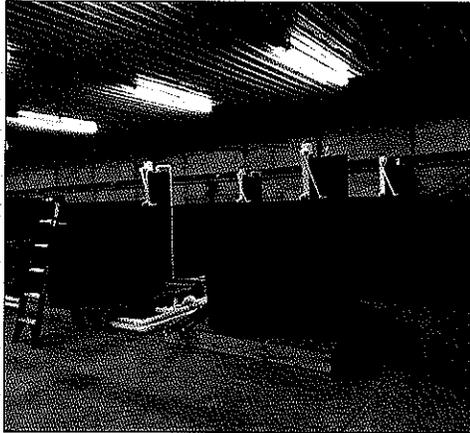
5



Quality of Life
DEER HARBOR
MICHIGAN

Types of Aquaculture

RECIRCULATING AQUACULTURE SYSTEMS (RAS)



A black and white photograph of an indoor aquaculture facility. The room is dark with several bright overhead lights. There are several large, rectangular tanks or containers arranged in rows. Some tanks have equipment attached to them, including what looks like a ladder and some piping. The floor is concrete.

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Aquaculture Industry Value

- Worldwide, aquaculture provides more than 50% of the fish we consume. The U.S. imports 85-90% of its seafood. A national seafood trade deficit over \$10 billion annually.
- Americans consume 4.5 billion lbs. of seafood annually.
- Michigan aquaculture can grow from \$5 million annually with 100 jobs to over \$100 million with 1,500 jobs.



By 2050

- World's population will reach 9.1 billion
- Food production must increase 70% to meet growing demand of an expanding population
- 70% of world's population will be urban – 49% today



Aquaculture Background

- Michigan aquaculture focuses on raising fish for bait, stocking ponds, fee fishing, and food.
- Aquaculture can become a major agricultural contributor to the state and add to the strength of our “locally grown” markets.
- Demand of local grocers and institutional buyers.



Why Michigan?

- The proximity to large market areas and population centers in US and Canada
- Water supply
- Modern technologies: Water reuse, Solids capture, create a sustainable segment of the agriculture industry
- Systems in place to expand industry and processing sector.



Michigan Aquaculture Advantages

- Can meet the supply chain needs

```

    graph LR
      Eggs --> NurseryFacility[Nursery Facility]
      StockingFry[Stocking Fry] --> NurseryFacility
      NurseryFacility --> GrowOutFacility[Grow out Facility]
      GrowOutFacility --> ProcessingFacility[Processing Facility]
      ProcessingFacility --> MarketOptions[Market Options]
      MarketOptions --> BuyLocal[Buy Local]
      MarketOptions --> Domestic[Domestic]
      MarketOptions --> Exporting[Exporting]
  
```

- Connections for:
 - Egg/stocking fry
 - Aquaculture systems
 - Feed Sources
 - Fish Health/Veterinarians
 - Michigan Fish Processors
 - Michigan Fish Processing Equipment Manufacturers
 - Fish Waste Options
 - Michigan Marketing Options
 - Construction Firms

Quality of Life
DOE CAN HELP

Aquaculture Licensing

OVERVIEW OF REGULATIONS:

- **Authority:** MI Aquaculture Development Act (199 PA 1996)
- **Agency:** MDARD
- **Applicability:** Ponds, Flow Through, RAS,
- **Two Types:** Aquaculture Facility Registration and Aquaculture Research Permit
- **Cost:** Traditional Registration \$100 new/\$75 renewal and Research \$250 new/\$100 renewal
- **Purpose:** fish health, plans for disposal of dead fish, barriers in place to prevent escape, and recordkeeping

Quality of Life
DOE CAN HELP

Aquaculture Licensing

OVERVIEW OF REGULATIONS:

- **License Types**
 - Traditional – 43
 - Research -1
- **Uses**
 - Planting Stock - 24
 - Dressed Fish – 5
 - Food Production - 15
 - Fee Fishing – 12
- **Types**
 - Ponds - 25
 - Flow Through - 14
 - RAS – 5

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Aquaculture Facility Locations



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National Pollutant Discharge Elimination System (NPDES)

OVERVIEW OF REGULATIONS:

- **Authority:** Part 31, Water Resources Protection (1994 PA 451)
- **Agency:** DEQ
- **Applicability:** Ponds and Flow Through producing > 20,000 lbs. fish/year
- **Fee:** \$400 application fee/\$600 annual permit fee
- **Renewal:** Every 5 years
- **Requirements:** Public comment and hearing
- **MiWaters:** Electronic Permit Submittal



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National Pollutant Discharge Elimination System (NPDES)

OVERVIEW OF REGULATIONS:

- **Water Quality Based Effluent Limitations**
 - Protection of the water body
- **Industry Specific Standards**
 - Concentrated Aquatic Animal Production - USEPA
 - Best Management Practices
 - Production > 100,000 lbs. fish
- **Antidegradation**
 - Justifiable Benefits
 - Alternatives Researched



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National Pollutant Discharge Elimination System (NPDES)

OVERVIEW OF REGULATIONS:

Three facilities are permitted under NPDES

1. Grayling Fish Hatchery - Grayling
2. Harrietta Hills Trout Farm - Harrietta
3. Indian Brook Trout Farm - Jackson



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Water Withdrawal Permit

OVERVIEW OF REGULATIONS:

- **Authority:** Part 327, Great Lakes Preservation (1994 PA 451)
- **Agency:** Water Resources Division, DEQ
- **Cost:** \$2000 application fee
- **Applicability:** > 2,000,000 gallons/day
- **Purpose:** Evaluate potential impacts to water resources as a result of a proposed withdrawal



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Aquaculture in Michigan

ENGAGEMENT:

- Quality of Life Agencies: DNR, MDARD, and DEQ
- Michigan Economic Development Corporation
- Michigan Aquaculture Association
- Michigan State University Extension
- Michigan Farm Bureau
- Michigan Sea Grant
- Originz, LLC



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QOL Commercial Aquaculture Team

ENGAGEMENT:

- Representatives from DEQ, MDARD and DEQ
- Eliminate silos
- Meet biweekly
- Address current issues
- Subset of team meets with startup businesses to address requirements



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Continuing Efforts

- Senate Bill 0768 signed into law by Governor Snyder demonstrating the commitment to grow aquaculture.
- Continued commitment by the QOL directors to streamline process.
- Continuous collaboration with MEDC and QOL workgroup to review potential projects.
- Michigan Agriculture Environmental Assurance Program Standards for Aquaculture
- Kudos to Michigan

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QUESTIONS



Department of
Agriculture & Rural Development



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