WHAT IS THE REGULATORY COST BURDEN ON WISCONSIN BAITFISH/SPORTFISH FARMS?

Jonathan van Senten & Carole R. Engle
March 2018
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Thank you

A special thank you to all of the producers who participated for their time and for trusting us to maintain the confidentiality of their data.
AQUACULTURE REGULATIONS IN THE U.S.

FEDERAL

STATE

LOCAL
AQUACULTURE REGULATIONS

- Culture of Commercially Harvested Species
- Fish Health
- Interstate Transport
- Food Safety
- Environmental Management
- Legal and Labor Standards

1,300+ laws
U.S. had the 3rd most stringent set of regulations (Abate et al. 2016)

Calls for relief from the industry for decades (Anonymous 1979a and Gibson 1979b)

Evidence that regulatory environment can affect aquaculture growth and development (Asche and Roll, 2013)

A call for comprehensive analysis of regulatory costs (Engle and Stone 2013)
SURVEY DESIGN, METHODS, AND RESPONSE RATE

• Targeted top 13 production states for baitfish and sportfish

• **Designed and conducted as a census**

• Contact lists developed with aid from state extension specialists, aquaculture coordinators, associations, and state agencies

• Verification of producer status through telephone contact
SURVEY DESIGN, METHODS, AND RESPONSE RATE

- Alabama
- Arkansas
- Florida
- Illinois
- Kansas
- Louisiana
- New York
- North Carolina
- Ohio
- Pennsylvania
- Texas
- Virginia
- Wisconsin

74%
TOTAL REGULATORY COSTS ON U.S. BAITFISH/SPORTFISH FARMS

- Estimated Total Cost to the Industry is $12 million / Year
- Average National Cost of $148,554 / Farm
- Average National Cost of $2,988 / Acre
- 86% of Regulations are State Regulations
- Permits / Licenses = 1% of Regulatory Costs
- Indirect Costs = 99% of Regulatory Costs
- Small Farms Have Relatively Higher Costs Per Acre
- Environmental Management & Fish Health are the most expensive regulatory categories
COST OF REGULATIONS BY REGULATORY CATEGORY

- 14% Legal and Labor Standards
- 4% Interstate Transport
- 20% Fish Health
- 61% Environmental Management
- 1% Culture of Commercially Harvested Species

Regulations

- Efficiency of Production
- Farm Level
- Cost of Production
SO, WHAT ABOUT WISCONSIN?
WISCONSIN REGULATIONS

Ranking Challenges / Concerns

Ranking First

Identifying Regulations
Complying with Regulations
Health Certificate Processing
Feed Cost
Labor
Markets
Other
WISCONSIN REGULATIONS

Ranking Challenges / Concerns

Ranking First or Second

Identifying Regulations
Complying with Regulations
Health Certificate Processing
Feed Cost
Labor
Markets
Other
Have There Been Unexpected Changes?

100% of respondents said “Yes”
Are There States You Would Like To Ship Fish To But Cannot Because of Regulations?

100% of respondents said “Yes”
Do you receive notification of changes in regulation?

Do you receive annual reminders of permit renewals?
WISCONSIN COST OF REGULATIONS

$379,629 / farm
$14,105 / acre
Estimated annual regulatory cost to the Wisconsin industry:

$2.6 million per year

Adjusted by volume of production.
14 regulations
10 State
1 Federal
WISCONSIN NUMBER OF RENEWALS PER YEAR

17 / year
Max 36
WISCONSIN COST OF REGULATIONS

Lost Sales: 73%

Changes Due to Regulation: 17%

Manpower: 8%

Fish Health Testing: 2%

Permits and Licenses: <1%
Mathematical relationship between inputs and outputs (Dey et. al. 2005)

\[ Y = \beta X + \varepsilon \]

- \( Y \) = Dependent variable (output)
- \( X \) = Explanatory variable (input)
- \( \beta \) = Parameter estimate of \( X \)
- \( \varepsilon \) = Random error term

(Umesh et. al. 2013)
• Frontier Production Function assumes 0 inefficiency.
## Technical Efficiency Estimates

<table>
<thead>
<tr>
<th>State / Grouping</th>
<th>Average Efficiency Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>0.822</td>
</tr>
<tr>
<td>Alabama</td>
<td>0.929</td>
</tr>
<tr>
<td>New York</td>
<td>0.795</td>
</tr>
<tr>
<td>North Carolina</td>
<td>0.927</td>
</tr>
<tr>
<td>Ohio</td>
<td>0.553</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>0.462</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>0.925</td>
</tr>
<tr>
<td>Other States</td>
<td>0.865</td>
</tr>
<tr>
<td>All Observations</td>
<td>0.766</td>
</tr>
</tbody>
</table>
76.6% Mean Efficiency
92.5% Mean Efficiency in Wisconsin
### Technical Efficiency Estimates

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Coefficient Estimate</th>
<th>Standard Error</th>
<th>T-Ratio</th>
<th>Significant (p 0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Size</td>
<td>0.002</td>
<td>0.001</td>
<td>1.918</td>
<td></td>
</tr>
<tr>
<td>Lost/foregone sales</td>
<td>-0.099</td>
<td>0.046</td>
<td>-2.178</td>
<td>*</td>
</tr>
<tr>
<td>Changes due to regulation</td>
<td>-0.187</td>
<td>0.057</td>
<td>-3.289</td>
<td>*</td>
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<tr>
<td>Fish health</td>
<td>-0.093</td>
<td>0.066</td>
<td>-1.414</td>
<td></td>
</tr>
<tr>
<td>Manpower to comply with regulation</td>
<td>0.220</td>
<td>0.082</td>
<td>2.669</td>
<td>*</td>
</tr>
<tr>
<td>Insurance</td>
<td>0.640</td>
<td>0.176</td>
<td>3.635</td>
<td>*</td>
</tr>
<tr>
<td>Baitfish only (dummy)</td>
<td>-0.109</td>
<td>0.557</td>
<td>-0.196</td>
<td></td>
</tr>
<tr>
<td>Sportfish only (dummy)</td>
<td>-0.753</td>
<td>0.382</td>
<td>-1.969</td>
<td>*</td>
</tr>
<tr>
<td>Number of states shipped to</td>
<td>-0.005</td>
<td>0.017</td>
<td>-0.281</td>
<td></td>
</tr>
<tr>
<td>Permit/license renewals</td>
<td>0.007</td>
<td>0.003</td>
<td>2.339</td>
<td>*</td>
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<tr>
<td>Number of state regulations</td>
<td>-0.043</td>
<td>0.032</td>
<td>-1.334</td>
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<tr>
<td>Number of federal regulations</td>
<td>-0.061</td>
<td>0.095</td>
<td>-0.643</td>
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<tr>
<td>Greatlakes region</td>
<td>-0.121</td>
<td>0.515</td>
<td>-0.235</td>
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<tr>
<td>Southeast region</td>
<td>-1.658</td>
<td>0.924</td>
<td>-1.795</td>
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<tr>
<td>sigma-squared</td>
<td>0.255</td>
<td>0.070</td>
<td>3.647</td>
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<tr>
<td>gamma</td>
<td>0.365</td>
<td>0.189</td>
<td>1.930</td>
<td></td>
</tr>
</tbody>
</table>
Technical Efficiency Estimates

Regulatory variables were statistically significant:
- Lost or Foregone Sales
- Changes due to Regulation
- Manpower to comply
- Permit/License Renewals
A Level Playing Field? A Uniform Code for Aquatic Animal Health?
55% Supportive of a Federal Model
35% Not Supportive of a Federal Model
10% No Response
Supportive of a Federal Model: 67%
Not Supportive of a Federal Model: 33%
WISCONSIN COST OF FISH HEALTH TESTING

$9,133 / farm
$182 / acre
A UNIFORM MODEL FOR FISH HEALTH SCENARIOS

• 7 scenarios
  • Recovery of lost sales
  • Reduction in the number of Permits and Licenses
  • Reduction in the number of Fish Health inspections
  • Farm level testing instead of lot level testing
  • Fish Health testing for all farms
  • Combination of scenarios 1-5 & 1-7

• Regional Comparisons
## A Uniform Model for Fish Health Scenarios

### Great Lakes
- Illinois
- New York
- Ohio
- Pennsylvania
- Wisconsin

### Southeast
- Alabama
- Florida
- North Carolina
- Virginia

### South Central
- Arkansas
- Kansas
- Louisiana
- Texas
**SCENARIO: NET BENEFIT**

Average Regulatory Cost per Farm

- **Great Lakes**: $100,000
- **Southeast**: $60,000
- **South Central**: $100,000

Legend:
- **Green**: Baseline
- **Yellow**: Scenario 8, 10% reduction in permits, 2 tests per year
- **Red**: Scenario 8, 50% reduction in permits, 2 tests per year
SCENARIO: NET BENEFIT

Average Regulatory Cost per Acre

Great Lakes | Southeast | South Central

- **Baseline**
- **Scenario 8, 10% reduction in permits, 2 tests per year**
- **Scenario 8, 50% reduction in permits, 2 tests per year**
**WISCONSIN CONCLUSIONS**

- **Estimated Cost to the Industry is $2.6 million / Year**
- **Average National Cost of $379,629 / Farm**
- **Average National Cost of $14,105 / Acre**
- **88% of Regulations are State Regulations**
- **Permits / Licenses = <1% of Regulatory Costs**
- **Indirect Costs = >99% of Regulatory Costs**
- **Legal and Labor Standards & Interstate Transport are the most expensive regulatory categories**
There is little room for doubt that the regulatory environment is resulting:

- In additional costs
- Restricted access to markets
- Affecting farm efficiency
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