Investing in Aquaculture:

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Oregon and Pacific Northwest Aquaculture Development Conference

"Investing in the Future of Seafood"

What will it take for sustainable aquaculture to grow in Oregon?

OR 2018 sales = $23.7 M.
#16 nationally in sales.
Nearly double that of 2013/2005.

Majority of growth in sales from shellfish.

38 farms (2018).
#20 nationally.
Up 1 from 2013; down 10 from 2005.

- Physical resources are here
- Diverse ecosystems
- Experienced farmers raising variety of agriculture crops

What does it take to further grow the sustainable aquaculture sector in OR?

Investment

What kind of investment?

- Financial
- Research
- Extension
- Education
- Human resources
- Public policy/regulation
- Aquaculture literacy

Business capital:

- To build facilities
- To operate farm
- To process fish, shellfish, seaweed
- To distribute products

Financial investment

Panel: The Investment Experience

Panel: Investment and Finance

Panel: Aquaculture Business Planning

Business Planning

Tool to guide you through process of business planning & eases the pain of producing a polished business plan.

FREE!

agplan

https://agplan.umn.edu

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Cover Page

Executive Summary
- Business Description
- Mission Statement
- Goals
- Plan Summary
- Capital Request

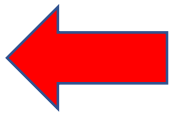
Business Description
- Business Overview
- Location/Area Fished
- Gear/Facilities
- Business History
- Ownership Structure

Operations
- Products
- Services
- Production System
- Customer Service
- Inventory Management
- Licenses, Permits & Regulations
- Patents and Trademarks
- Risk Management
- Environmental Issues
- Quality Control
- Implementation Timeline

Marketing Plan
- Market Trends
- Customers
- Marketing Strategy
- Marketing Contracts
- Strategic Partners
- Pricing
- Promotion
- Distribution
- Market Segments
- Target Market
- Competitive Advantage

Management & Organization
- Management Team
- Board of Directors
- Advisory Board
- Personnel Plan
- Professional Services

Financial Plan
- Financial Position
- Historical Performance
- Financial Projections
- Asset Management
- Benchmarks
- Capital Request



My Fishing Business > Cover Page

Font Name | Real f

Previous | Next

Tips | Resources | Samples | Comments

This is the cover page for your business plan. Enter the name of your business, contact information, including address, email, fax, phone, website, and the date the plan was prepared. You may also want to include a graphic image or photo representing your business. Make the business name the most prominent feature and otherwise, keep the page relatively clean - lots of white space. This is a good place for a logo.

The page may also include a "title". The title might say "Business Plan", or might briefly describe what the business plan is for. For example, it might say "Business Plan for Vessel Acquisition".

Planning for the startup phase

Aquaculture has fairly long startup.

- **To build facilities**
- **To get crop going**
- **To move up the learning curve**
- **To develop markets**

Common mistakes:

1. Overly optimistic estimates of sales revenue.
2. Under-estimation of costs.
3. Insufficient operating capital to sustain business through entire startup phase, often 2 to 3 years, more for RAS.
4. Under estimating water requirements.
5. Assuming existing facilities & equipment can be used as is.

Catfish is Life videos

www.uscatfish.com/catfish-is-life

Investment in Research

Why should we invest public funds in aquaculture research?

Shouldn't the companies make this investment?

Most aquaculture is done by family farms, many of which are now 3rd and 4th-generation aquaculture farming families.

85% of U.S. aquaculture farms are classified as small businesses.

Investment

Production
- Systems
- Management
- Water quality
- Nutrition
- Disease
- Genetics

Economics

Marketing

Researchers!

Technicians!

Farm crew!

Investment in Research

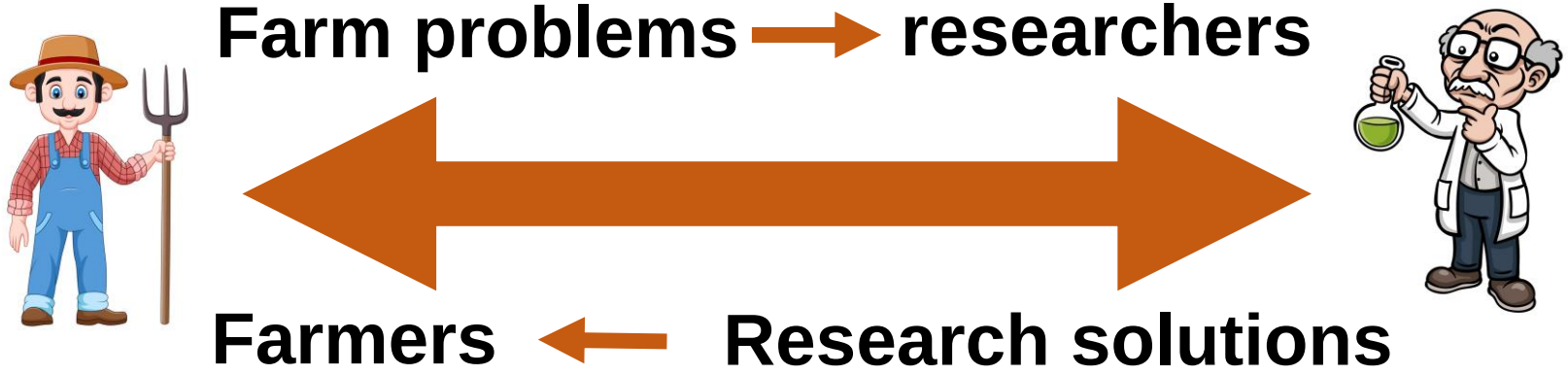
Investment in Extension

- Farm R & D
- Verification
- Diagnostics
- Marketing
- Business planning & development
- Associations

Science-based information

- To farmers
- To policy-makers
- Agency staff
- Public

Two-way communications channel:



Investment in:

- Future researchers
- Extension agents
- Technicians
- Diagnosticians

Education
Formal & informal

Oyster gardening, anyone?

Citizen science – restorative aquaculture?

Aquaculture's not for everyone –

Leo Ray, Idaho:

"If you go into it because you love doing it, you will be successful".

- **If you're going into aquaculture strictly to get rich, you won't be successful.**
- **Fish need care around the clock. Many fish farmers are at work at 4 a.m. and work into the evening, 7 days a week, like a dairy.**
- **Even shellfish, harvest happens when tides allow, regardless of weather conditions.**

We have to keep this in mind when talking about recruiting young people into educational programs on aquaculture.

Investment in: Managers Entrepreneurs

Human resources

Investment in: Workforce

Human resources

Check out the Lonoke Business Academy, Arkansas.

- **Labor scarcity is a major issue.**
- **Long-term solution is automation.**
- **Many farms rely heavily on family labor.**
- **Workforce development programs must be driven by farmers.**

Investment Policy & regulation

Farm-level Regulatory Compliance Costs

Baitfish/sportfish

Salmonids

Pacific Coast shellfish

Florida tropicals

Catfish

Hybrid striped bass

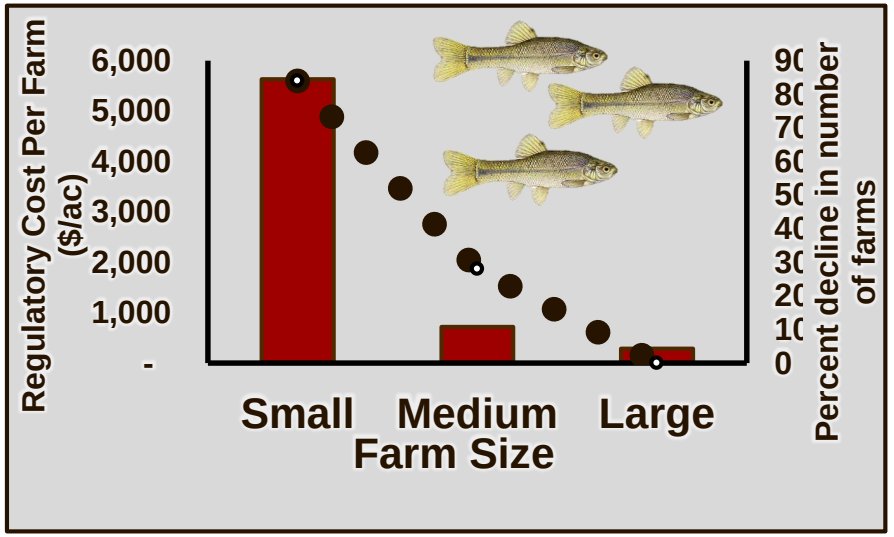
Red drum

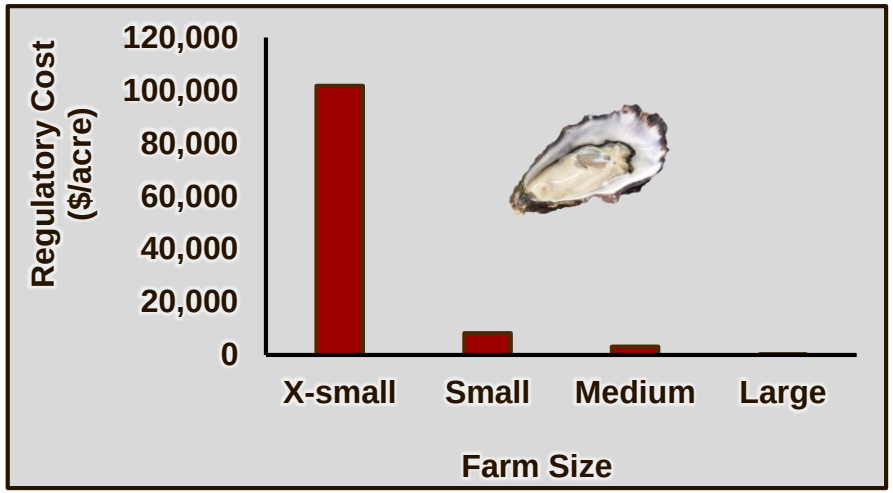
East Coast shellfish

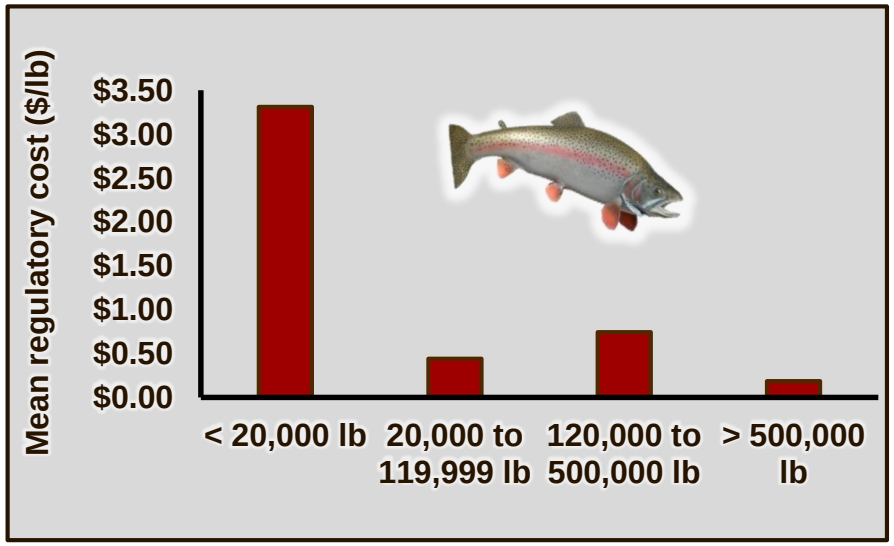
Tilapia

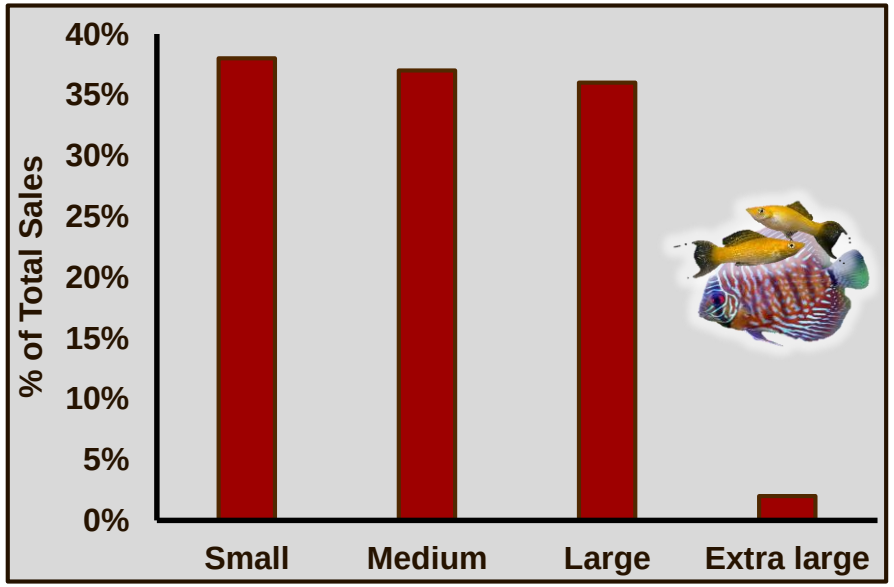
Regulations have become one of the greatest costs of production on U.S. aquaculture farms: 8.5% to 22% of total operating costs.

Disproportionately negative effects on smaller farms









Environmental Regulations:

Most costly regulations for most sectors.

Salmonid Farms → 62%

Baitfish/ Sportfish → 61%

Shellfish farms → 66%

Environmental Regulations:

Economic Losses to Birds on Catfish Farms

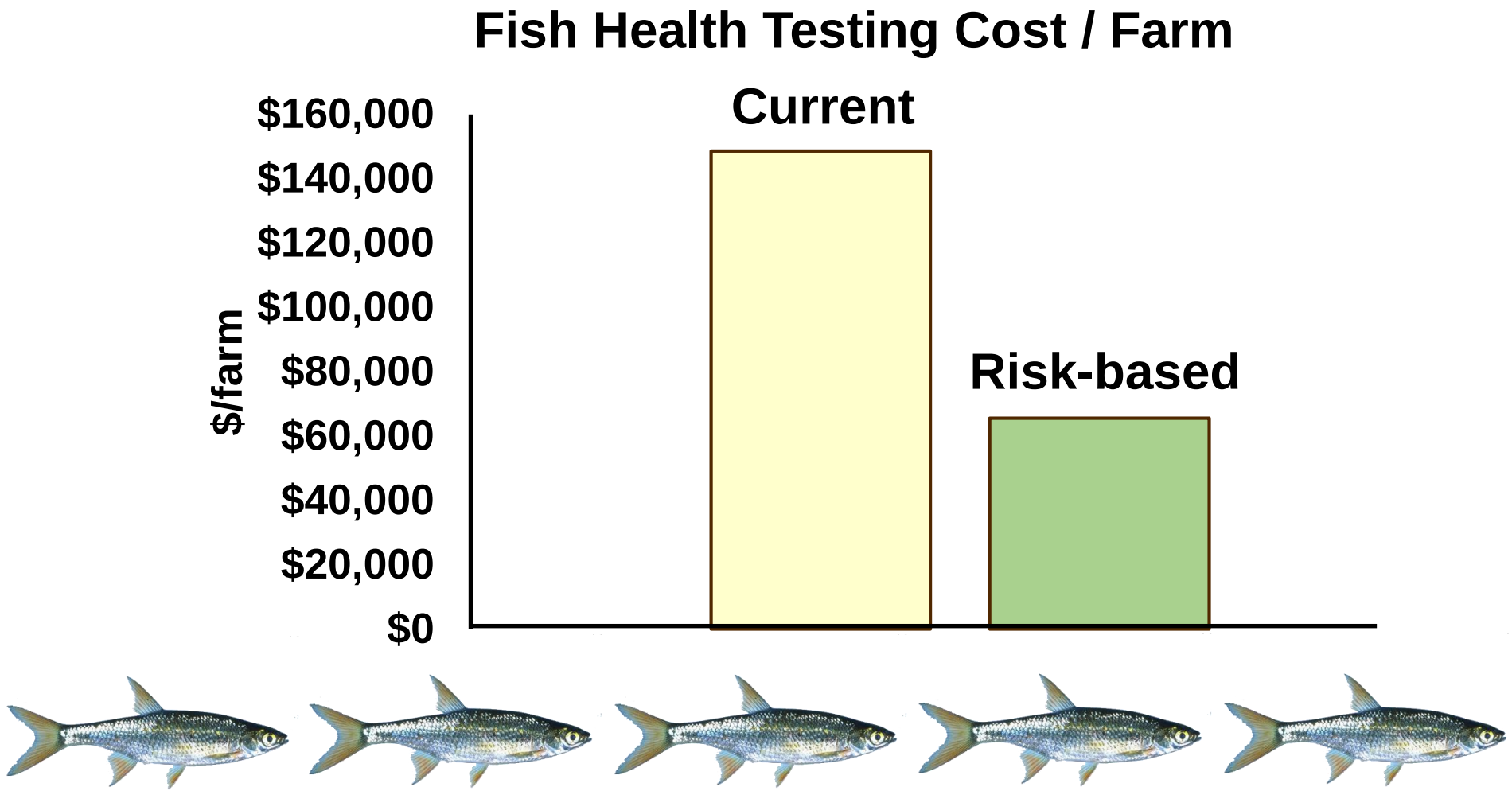
Range	Bird-scaring	Lost revenue	Total
Low	$7.7 M	$25.8 M	$33.5 M
Average	$17.5 M	$47.2 M	$64.7 M
High	$27.2 M	$65.4 M	$92.6 M

Environmental Regulations: Paths Forward

- Reduce frequency of testing effluents where farms have long-term data showing no non-compliance.

- Compensation for suffering reverse externality of avian predation:
  - Expenses to scare birds.
  - Value of fish lost to birds.

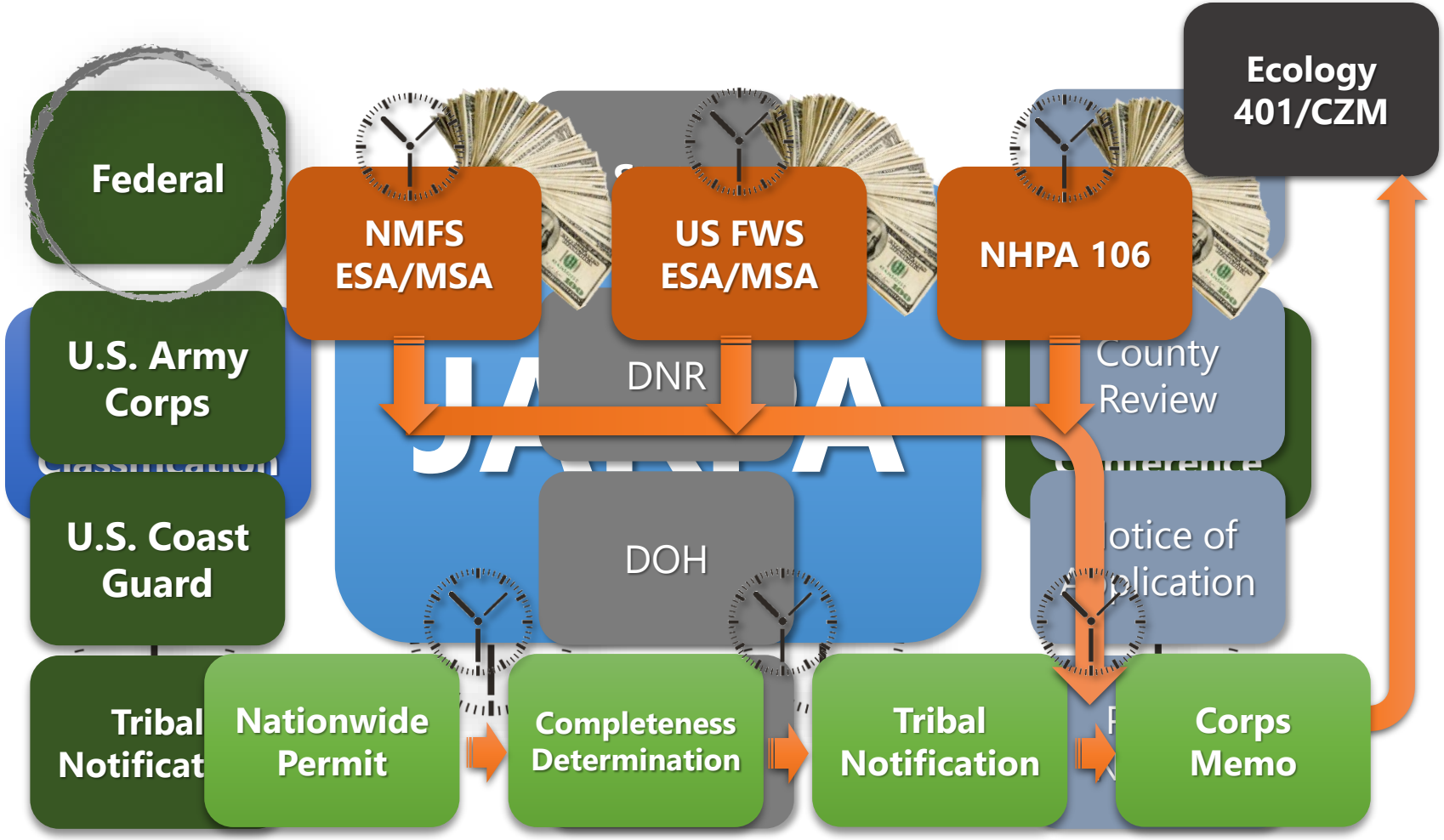
Interstate Shipping of Live Fish



Interstate Shipping of Live Fish: Paths Forward

- **Reduce the number of tests done.**
- **Pay attention to costs.**
- **Will a move to PCR increase costs?**
- **CAHPS: Potential to reduce costs if it replaces existing state regulations.**
- **Need for educational efforts to state agencies, natural resource agencies.**

Sequential permits & permitting delays



Permitting Delays: Paths Forward

- **Regulatory streamlining.**
- **One-stop shop for permitting.**
- **Change from a sequential to a concurrent review by all the relevant agencies.**

Drug & Chemical Approvals: Paths Forward

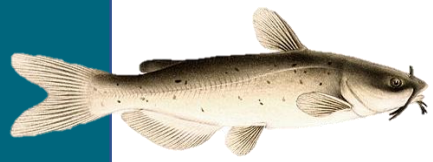
- **Greatest regulatory cost on FL tropical fish farms.**
- **Need approval mechanism for non-foodfish.**
- **Major issue for ornamental fish.**

Engagement of research & extension scientists with regulatory agencies

- **Regulatory process needs scientific input from research & Extension faculty.**
- **Researchers: we need thorough reviews of the science of emerging issues BEFORE regulations are crafted.**
- **Extension personnel: need to engage with regulatory agencies & make sure that they have access to the latest science.**

What problems do aquaculture producers face?

- **Regulatory constraints to growth: lost sales, thwarted expansion, lost opportunities**

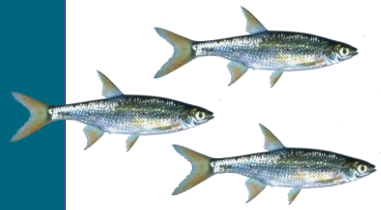


$35 million a year

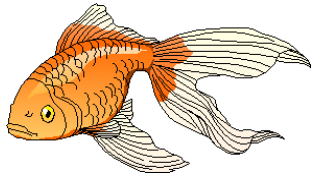
$52 million a year

$32 million a year

$13 million a year



$15 million a year



$23 million a year

$280 million/yr Pacific coast; $2 million/yr Atlantic coast

Total = $452 million/yr

30% of all U.S. aquaculture sales

Investment

General public in U.S. very poorly informed about aquaculture.

“Refuting Marine Aquaculture Myths, Unfounded Criticisms, and Assumptions” (Zajicek et al. 2021)

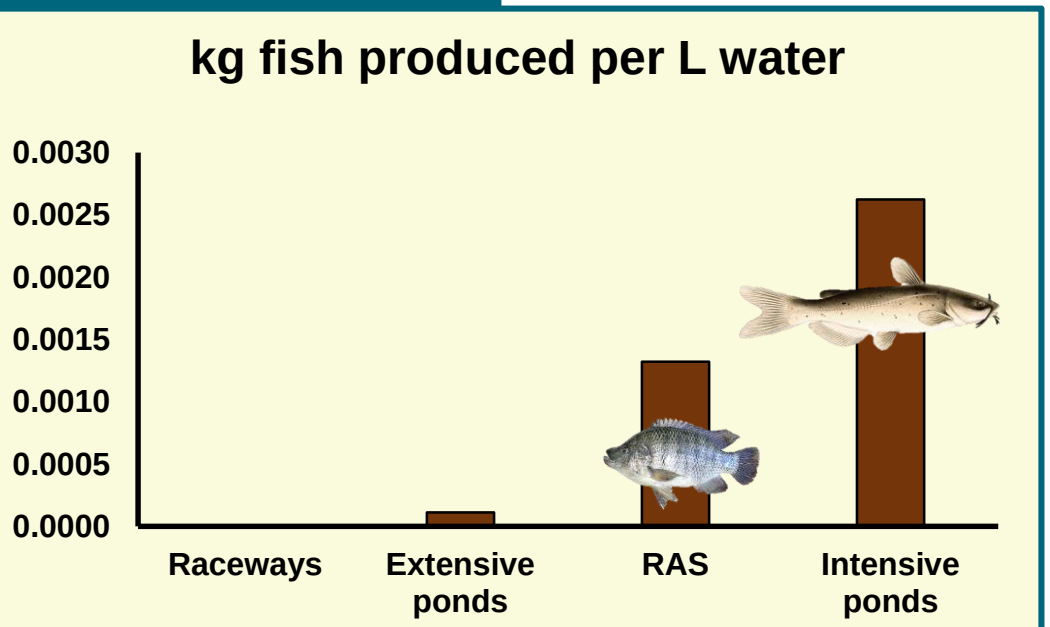
Leads to opposition, skepticism, court challenges, barriers.

Aquaculture literacy

Let's talk about some of the myths surrounding aquaculture.

Aquaculture water use facts.

1. **U.S. pond production (think catfish, the biggest sector of U.S. aquaculture) does NOT have water flowing through the ponds. Growout ponds not drained for 10-15 years; only drained when the silt eroded from levees needs to be pushed back up on levees.**



2. **Trout raceway production not considered to a 'consumptive' use of water. Water flows through raceways & returned to its original source (Boyd 2005).**

Another myth of aquaculture: that it is not done sustainably.

U.S. aquaculture is sustainable, whether ponds, raceways, RAS, or net pens.

BEST CHOICES

- Arctic Char (farmed)
- Barramundi (US farmed)
- Catfish (US farmed)
- Clams (farmed)
- Cobia (US farmed)
- Cod: Pacific (Alaska longline)+
- Crab: Dungeness, Stone
- Halibut: Pacific+
- Lobster: Spiny (US)
- Mussels (farmed)
- Oysters (farmed)
- Sablefish/Black Cod (Alaska+ or British Columbia)
- Salmon (Alaska wild)+
- Scallops: Bay (farmed)
- Shrimp, Pink (Oregon)+
- Striped Bass (farmed or wild*)
- Tilapia (US farmed)
- Trout: Rainbow (farmed)
- Tuna: Albacore (troll/pole, US+

GOOD ALTERNATIVES

- Caviar, Sturgeon (US farmed)
- Clams (wild)
- Cod: Pacific (US trawled)
- Crab: Blue*, King (US), Snow
- Flounders, Soles (Pacific)
- Herring: Atlantic
- Lobster: American/Maine
- Mahi Mahi/Dolphinfish (US)
- Oysters (wild)
- Pollock (Alaska wild)+
- Salmon (Washington wild)*
- Sablefish/Black Cod (California, Oregon or Washington)
- Scallops: Sea (wild)
- Shrimp (US, Canada)
- Squid
- Swai, Basa (farmed)
- Swordfish (US)*
- Tilapia (Central America, farmed)
- Tuna: Bigeye, Yellowfin (troll/pole)

AVOID

- Caviar, Sturgeon* (imported wild)
- Chilean Seabass/Toothfish*
- Cobia (imported farmed)
- Cod: Atlantic, imported Pacific
- Flounders, Halibut, Soles (Atlantic)
- Groupers*
- Lobster: Spiny (Caribbean)
- Mahi Mahi/Dolphinfish (imported)
- Marlin: Blue*, Striped*
- Monkfish
- Orange Roughy*
- Salmon (farmed, including Atlantic)*
- Sharks*, Skates
- Shrimp (imported)
- Snapper: Red
- Swordfish (imported)*
- Tilapia (Asia farmed)
- Tuna: Albacore, Bigeye, Yellowfin (longline)*
- Tuna: Bluefin*, Tongol, Canned

ack)

Stringent laws & enforcement structures in the U.S., with required monitoring data show this.

What is the effect on global pollution & water quality of U.S. consumers supporting aquaculture production overseas by consumption of imports?

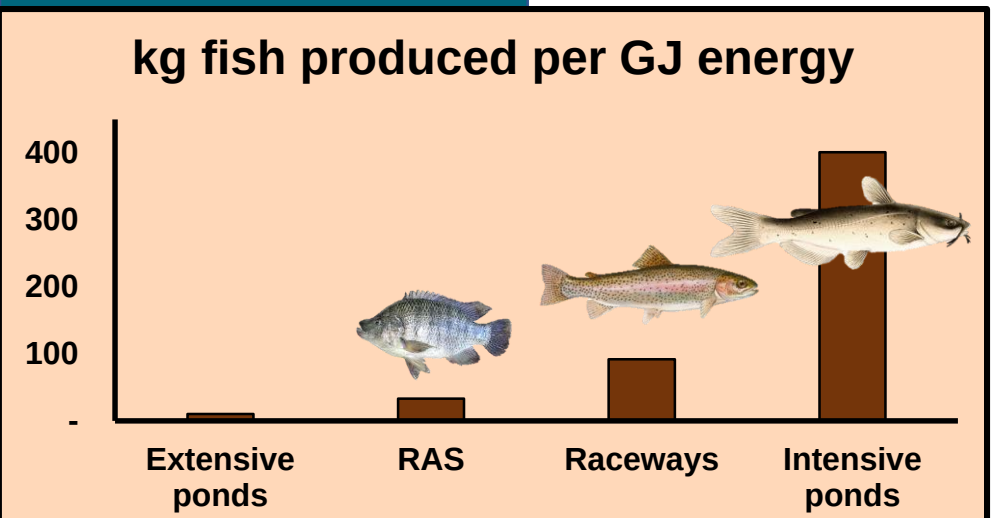
“By opposing the development of a domestic aquaculture sector, anti-aquaculture special interest groups bear some responsibility for these negative environmental and social impacts in countries with lower regulatory oversight” (Helvey et al. 2016).

We’re exporting pollution by not raising our seafood on U.S. farms that operate under the stringent laws of the U.S.

Resource use efficiency

Another myth of aquaculture: only RAS are “green”.

What if that $330 M were invested in static pond aquaculture, with very little discharge?



Water: 5 M gal/day withdrawal & discharge

“Profit” is evil.

Another myth of aquaculture: For-profit farms are not sustainable.

1. “Sustainability” includes “economic sustainability” which = “profitable”.
2. Profit on a family farm = income for the farm family. If farm is not profitable, they have no income. Farmers are not paid every other week to farm. They do not have employers who pay for health care insurance, etc.
3. When farmers attend meetings, they are not being paid to do so; their income comes from sale of what they raise, after paying the bills.

What will it take for sustainable aquaculture to grow in Oregon?

Maine

FOCUSMAINE

- Good business-level planning, of course.
- Statewide planning, too.

MAINE AQUACULTURE ASSOCIATION

- Aquaculture Development Plan
- Workforce Development Plan

Open for aquaculture businesses.

Wrapped environmental quality into its brand.

Sales doubled in 10 years.
Economic impact tripled.

OREGON AQUACULTURE ASSOCIATION

Confederated Tribes of Siletz Indians

Oregon State University

Chemeketa Community College

Thank you for your attention!

QUESTIONS/COMMENTS?