MARINE ORNAMENTAL AQUACULTURE IN THE NORTHEAST U.S.: The State of the Industry

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INTRODUCTION

The state of the marine aquarium industry in the U.S.

Fig. 1. 1.3 M U.S. households have marine aquaria.

- 1.3 M U.S. households have marine aquaria (Fig. 1).[1]
- 105 U.S. public aquaria showcase marine ornamental fishes & inverts.[2]
- In 1998, sales (excluding corals) totaled today's equivalent of $479 M.[3]
- The U.S. imports 11 M marine aquarium fishes among 1,802 spp. annually,[4] representing 50% of global demand.[5]
- The U.S. imports 510 K coral fragments annually,[6] representing 64% of global demand.[7]
- The U.S. imports up to 164 K non-coral inverts from up to 516 spp. annually.[8]

The state of marine ornamental aquaculture (MOA) in the U.S.

- 142 fish (66 commercially),[9] 75 corals & a handful of non-coral inverts[10] are currently aquacultured.
- Aquaculture can relieve fishing pressure on wild populations, while contributing to the regional economy.

Study goal & objectives

- *Goal:* To characterize the state of the MOA industry in the Northeast U.S.
- *Objectives:*
  - Determine how many businesses are breeding and/or selling MOA spp.
  - Determine which spp. are being aquacultured
  - Determine the value of aquacultured spp. to these businesses

METHODS

Business ID

- Northeast U.S.: 12 states (ME, NH, VT, NY, MA, RI, CT, PA, NJ, DE, MD, WV)
- Google Map Search: "Aquarium"
- Listings screened (still in business? In the marine aquarium industry?)

Survey

- Constant Contact[11] online survey platform
- Anonymous participation
- Skip logic directed participants to questions pertinent to their business
- Data exported to MS Excel for descriptive statistical analysis & graphical visualization of results

RESULTS

Business ID

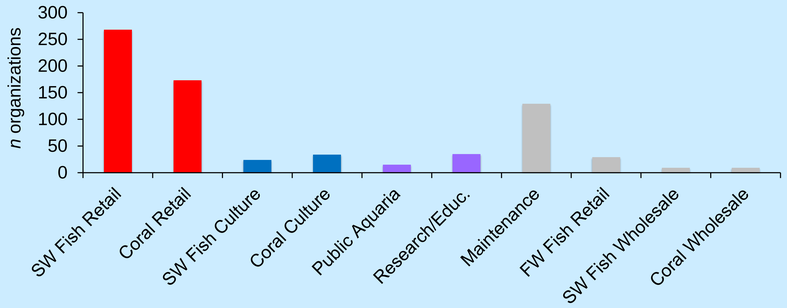

Fig. 2. 529 active businesses operating in the Northeast U.S. FW = Freshwater, SW = Saltwater

RESULTS (cont'd)

Respondent Characterization

- 75 respondents (19% of contacts)
- 65% aquaculture or fragment a marine ornamental sp.
- 74% would join a professional association
- 73% would attend an MOA conference

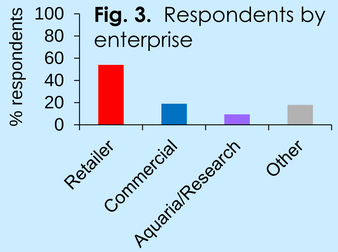

Fig. 3. Respondents by enterprise

Species Aquacultured

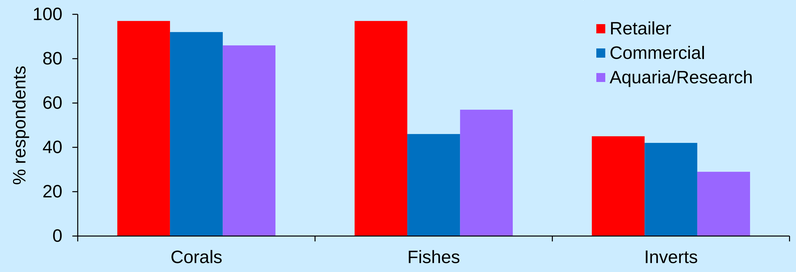

Fig. 4. % respondents aquaculturing or conducting sales of MOA spp., by commodity & enterprise

- Aquaculturists frag from 8 to 50+ spp. of corals (Fig. 5a).
- Clownfish are the most popular fish spp. aquacultured (Table 1, Fig. 5b).
- Respondents may have interpreted "aquaculture" broadly. Some reported spp. have not previously been documented as being aquacultured. Did some respondents consider grow-out a form of aquaculture?
- Aquacultured stock accounts for a median of 35% of corals, 18% of fishes, & 0% of non-coral inverts sold by retailers.
- Some respondents noted efforts to source MOA stock, but challenges in finding enough to meet demand.

Table 1. Fish & non-coral invert spp. aquacultured in the Northeast U.S.

Fishes	Non-Coral Inverts
Banggai cardinalfish	Anemones:
	Assorted
Clownfish:	Bubble tip
Clark's	
Common	Nudibranchs (*Berghia* spp.)
Orange	
Maroon	Scallops
Pink skunk	
Orange skunk	Sea urchins
Tomato	
	Shrimp:
Coral cat shark	Coral banded
	Peppermint
Gobies	
	Snails:
Hawaiian yellow tangs	Assorted
	Mexican turbo grazer
Orchid dottybacks	*Nassarius* spp.
	Turbo grazer
Seahorses:	
Sydney (White's)	Starfish
Other	
	Upside-Down Jellyfish

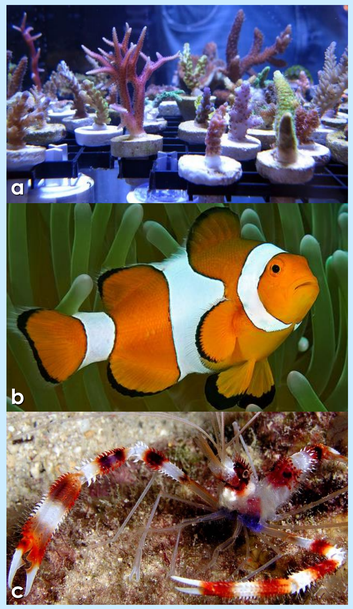

Fig. 5. Representative MOA spp.:
a. Fragmented Acroporid corals
b. Common clownfish
c. Coral banded shrimp

RESULTS (cont'd)

Reported Annual Revenue

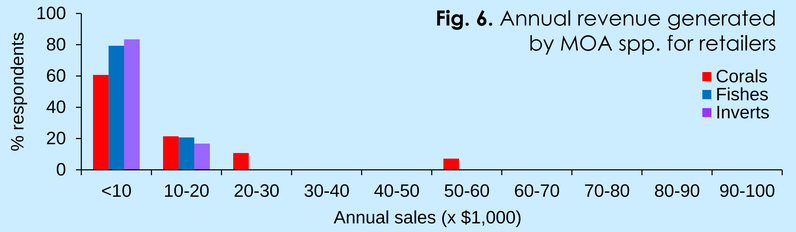

Fig. 6. Annual revenue generated by MOA spp. for retailers

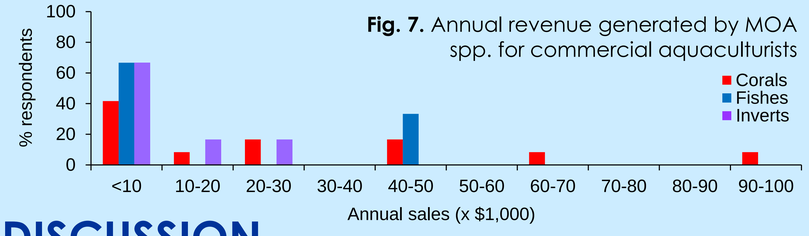

Fig. 7. Annual revenue generated by MOA spp. for commercial aquaculturists

DISCUSSION

- Sizeable marine aquarium industry operating throughout the Northeast U.S.
- MOA spp. comprise a median of 0 to 35% of marine livestock sold by retailers (depending on commodity), the rest is wild-caught.
- Available MOA stock does not meet demand.
- Opportunity for growth of commercial MOA
- Regional resources available to support growth:
  - Economic demand (Fig. 8a)
  - Public aquaria & research institutions dedicated to industry R&D (Fig. 8b)

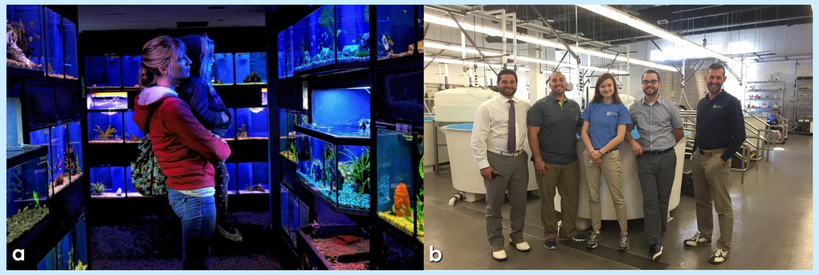

Fig. 8. Regional resources available to support growth **a.** Customers shop for additions to their home aquarium. **b.** Mystic Aquarium (Mystic, CT) and the Marine Science Magnet High School (Groton, CT) partner to conduct MOA R&D.

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PHOTO CREDITS

Fig. 1. www.updis.com Fig. 5a. www.marineaquariumsa.com Fig. 5b. www.oceanreefs.com.au Fig. 5c. coreyfischer.com/diving_portal.html Fig. 8a. www.wherethechildrenplay.com

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