

Project Title: A NCRAC-Sea Grant Partnership for Regional Aquaculture Extension Focused on Marketing and Consumer Demand [Termination Report]

Total Funds Committed: \$150,000

Initial Project Schedule: November 1, 2018-October 30, 2020 [Extended to April 30, 2021]

Current Project Year: November 1, 2020-April 30, 2021

Participants: J. S. Carlton (Purdue University)

Extension Liaison: R. Kinnunen (Michigan State University), replaced by K. Quagraine (Purdue University)

Industry Liaison: M. Emerson, Crystal Lake Fisheries, Missouri

Project Objectives

1. Hire a regional aquaculture extension specialist housed at Purdue University and jointly appointed in the North Central Region Sea Grant Programs and serving all 12 states of the North-Central Region.
2. Conduct a regional needs assessment to better understand what consumer- and marketing-oriented aquaculture programming is being done and how to best use extension to address needs and impediments.
3. Work with existing personnel throughout the North Central Region to develop and deliver extension programming to address consumer needs and impediments aimed at all of the states in the North Central Region.
4. Coordinate development of regional aquaculture extension networks by serving as a liaison among the Sea Grant programs, partnering universities, NCRAC stakeholders, and other stakeholders throughout the North Central Region.
5. Use quantitative and qualitative evaluation to assess the effectiveness of the specialist's program and to help plan subsequent years of the program.
6. Partner with stakeholders to develop funding extending beyond the initial two-year period.

Project Summary

Aquaculture is an important source of healthy protein for ever-expanding domestic and global populations. However, the US edible seafood trade deficit was over \$14 billion in 2016. Aquaculture production in the North Central Region (NCR) could grow if producers have improved access to knowledge, skills, and technology and consumers demand this healthy, sustainable, locally produced food. This partnership between the North-Central Regional Aquaculture Center (NCRAC) and Sea Grant, co-funded by NCRAC and Sea Grant and housed at Purdue University, focused on aquaculture marketing and consumer education throughout the North Central Region. During the project we conducted a multiphase needs assessment to determine the programmatic approach that we should take and worked to fulfill project objectives by delivering multimodal extension to stakeholders, including a popular webinar series, a number of well-used extension publications, a series of videos on aquaculture in the region, and a website to house it all.

Anticipated Benefits

Short-term knowledge gains (timeframe: 1–2 years):

- Consumers will increase knowledge of the health, environmental, and economic benefits of locally produced seafood
- Consumer awareness of locally produced farmed seafood will increase

- Consumers will increase knowledge of how to clean and cook seafood
- Producers will have increased knowledge of consumer preferences and marketing techniques and understanding of relevant food supply chain regulations
- Program staff, NCRAC, USDA, and Sea Grant will increase their understanding of how to effectively partner on synergistic resource issues

Medium-term behavior changes (timeframe: 2–5 years)

- Consumers will increase their consumption of locally produced seafood
- Seafood producers, distributors, and sellers will adapt their practices based on consumer preferences
- The aquaculture industry will receive increased investment from existing and potential producers
- NCRAC, USDA, and Sea Grant will invest in continued partnerships on re- source issues.

Long-term condition changes (timeframe: 5+ years)

- Consumers will be aware of and demand locally produced aquaculture as a healthy, sustainable source of protein.
- The aquaculture industry in the NCR will be more resilient through in- creased sales, a better- understood market position, and increased consumer demand
- Enhanced quality of life for NCR residents thanks to increased production and consumption of locally grown seafood and a vibrant aquaculture industry
- A culture of collaboration and partnership between NCRAC, USDA, and Sea Grant

We will be creating aquaculture content for workshops to train educators and Extension personnel in STEM (Science, Technology, Engineering and Math) related fields and other industry-related concepts such as business operation, marketing, and financial management. Once development is completed, these workshop materials could be used in the NCR and throughout other RACs. With undergraduate enrollment declining at most universities, the addition of more applied courses/programs such as aquaculture could help reverse this trend. Few students are aware of the career opportunity available in aquaculture, so there is a need for identifying a clear career pathway that shows how education coupled with internship programs can lead to career opportunities in aquaculture. Ultimately, the aquaculture industry will benefit from an educated, skilled, young workforce that will help the U.S. aquaculture industry prosper and be ready to “carry the torch” for the industry as a generational change takes place. This can be best accomplished by the co-development of the aquaculture workforce.

Technical Summary and Analysis

Objective 1.— Ms. Amy Shambach was hired in summer 2019 to serve as our Regional Aquaculture Marketing Associate. She has been working across the states in the North-Central Region to achieve all of the objectives.

Objective 2. — A regional needs assessment was conducted to better understand what consumer- and marketing-oriented aquaculture programming needs. To gauge the interest of land grant extension specialist and their stakeholders we surveyed Agriculture and Natural Resources Extension personnel across the USDA North Central Region. The survey was designed to included questions related to three types of aquaculture: fish farming, shrimp farming, and aquaponics. For each of the aquaculture types, we asked respondents whether stakeholders had

contacted them about the types and the respondents' perceptions of commercial and educational interest in the types. We also asked respondents whether they provide aquaculture and aquaponics programming.

The survey was implemented via Qualtrics and administered in February of 2020, prior to the widespread shutdowns and quarantines related to SARS CoV-2 pandemic in the US. We contacted a total of 541 Extension personnel and received 160 responses, a 29.6% response rate. The response rate across states was roughly similar and we do not believe any non-response bias would substantially influence our conclusions.

Overall, 47%, 35%, and 15% of respondents indicated that stakeholders had contacted them about aquaponics, finfish aquaculture, and shrimp aquaculture. Approximately 8% of respondents indicated that they offered aquaculture or aquaponics programming; 45% and 55% indicated that they did not offer aquaculture and aquaponics programming, but were interested in offering it. These results indicate that there is interest in increasing Extension capacity in fish farming either by hiring new staff or through train-the-trainer models.

This survey has resulted in two manuscripts, one of which is currently in review at the Journal of Extension, and one of which will be submitted (target journal: *Agriculture and Human Values*) soon.

To learn more about producer's programming preferences, we interviewed a variety of farmers from across NCRAC. An interview guide was designed to include sections on general farm information, marketing, and programming. We contacted approximately 83 producers and conducted approximately 27 needs assessment interviews from a total of ten NCRAC states. As a result of this process, we identified several programming needs gaps. This needs assessment was also used as the basis for a peer-reviewed publication, currently in press at *Choices*, a publication of the Agricultural and Applied Economics Association.

In response to identified gaps, we used an integrated approach to develop outreach materials and programming. Due to COVID-19, our programming options were limited, but we developed brochures, factsheets, a website, promotional materials, and a cookbook in addition to a series of six webinars on aquaculture marketing. The EatMidwestFish.org website was launched in January, 2021, to serve as a resource hub for consumer-facing information, products, and resources. A [Fish Finder](#) map was incorporated into the website as a tool to help consumers find farm-raised fish near them. Seventy foodfish farmers in the NCRAC region have signed up to have their aquaculture business on the map.

There are three deliverables in the final stages of development; 1 farmed fish fact sheet (American paddlefish), 1 cookbook, and 1 coloring book. These products will be seen through completion, anticipated by early 2022.

Objective 3. — We have provided cross-project updates between NCRAC and the Sea Grant Great Lakes Aquaculture Collaborative (GLAC) to facilitate networking and collaboration. In addition, we have ensured that NCRAC logos and information is included in products where applicable, helping NCRAC to share credit for some of the GLAC work that the project team has contributed to. One example of collaborative programming is first webinar in the marketing webinar series, “Aquaculture Business Planning 101: Aquaculture Can Be Successful But...”, presented by Dr. Carole Engle.

Project staff played a key role in the development of a second web-based tool, the [Great Lakes Fresh Fish Finder](#) (GLFFF) map. Since the GLFFF and the Eat Midwest Fish, Fish Find map projects were in development at the same time, the two project teams were able to work together to collect producer data for the maps. By working together, we were able to amplify marketing potential for aquaculture producers in the NCRAC region who are interested in direct sales and provide an additional marketing tool to non-food fish producers in six of the 12 NCRAC states (MI, MN, IL, IN, OH, WI). The GLFFF team, composed of staff from all 7 of the Great Lakes Sea Grant Programs (IL/IN, MN, WI, MI, OH, PN, NY), will continue to work under Amy Shambach's leadership to expand and promote the resource.

Objective 4. — For the webinar series, topics included business, marketing, social media marketing, consumer preferences, processes verification, and buyer preferences. Attendance ranged from 15 to 66. All webinars were recorded, closed captioned, and published online at YouTube. YouTube views range for 22–268. Total number of programs viewed range from 41–334. Publishing webinars online increased total views 114.3–469.0 % in less than a year.

Program evaluations were emailed to registered individuals for webinar 2–6. Webinar one of the series was done in partnership with the GLAC. Twenty-three evaluations were completed for webinars 2–6. 91.3% of respondents learned something new from the program and planned to apply what they learned at work. 100% of respondents reported that they were satisfied with the webinars. 95.7% expressed that attending the program was a good use of their time. When asked what topics attendees would like to learn more about one attendee asked for webinars on shortening the supply chain, 1 asked for more social media engagement tips, and one asked for content on processing and packaging.

Dr. Valle de Souza presented NCRAC-funded consumer preference research in the fourth webinar in the marketing webinar series and describe how consumers do not cook seafood at home is because they do not know how to cook it. In response, we developed consumer-facing programming for educators, consumers, and producers, including the [eatmidwestfish.org](#) website, brochures (2), farmed fish fact sheets (6), farmer videos (2), and cooking demonstration videos (6). Brochures and fact sheets have been printed for future in-person distribution. Cooking demonstrations released in the first half of 2021 have collectively been viewed 230 times. Two Local Farmers, Local Fish videos were produced and published on the YouTube video platform in 2021, one on marine shrimp raised in a biofloc system and one on rainbow trout produced in an indoor recirculatory system. Total views for these two videos are 15000+ and 320 respectively. We are unsure why the numbers of views vary so drastically, but we are working to find out to inform future programming.

Social media will continue to be used for consumer-facing outreach and to drive users to the website. Illinois-Indiana Sea Grant (IISG) actively manages multiple accounts to achieve this goal, IISG has Facebook and Twitter accounts and Eat Midwest Fish operates on Twitter and Instagram. Since the @EatMidwestFish Twitter account was established in September of 2019 it has attracted 176 followers, has had almost 7,000 profile visits and nearly 120,000 tweets have been seen (Tweet Impressions). In 2021 an Instagram account was established in an attempt to expand reach.

Google Analytics was installed to collect data for the EatMidwestFish website. From January 1 to October 18, 2021, Google analytics reports 6,677 pageviews (5,785 unique). The average time spent on a single page was 1 minute 52 seconds. The top 5 visited pages are the home page, the fish finder map, dry brine smoked rainbow trout recipe, sautéed tilapia recipe, and the recipe page, 1,709, 822, 765, 456, 293 respectively. When we looked at content categories (Home, About, Local Fish, Recipes, Nutrition & Safety, Resources) we see that the most visited content categories are recipes (2654), followed by the home page (1709) and information on local fish (1341).

Objective 5. — Funded was provide by USDA/NIFA and National Sea Grant to continue working on marketing and consumer education for two additional years. Regional Sea Grant directors showed strong support for continued support of the project resulting in National Sea Grant committed an additional \$70,000 over the next 2 years to continue working on a phase 2. Regional stakeholders represented by NCRAC’s Industry Advisory Council support this work to continue, which was made evident by the Industry Advisory Council’s (IAC) recommendation to the NCRAC board to fund “Addressing Critical Aquaculture-Marketing-Oriented Applied Research and Outreach (Phase 2).”

Objective 6.— We continue to seek long-term funding for this work.

Principal Accomplishments:

Objective 1 — Objective 1, was accomplished by hired Amy Shambach in summer, 2019 to serve as our Regional Aquaculture Marketing Associate. She was responsible for working across the states in the North-Central Region to achieve all other objectives.

Objective 2. —Gaps in educational materials and programming exist for consumers and producers. Consumers rank not know how to cook seafood as one reason why they do not cook more seafood at home, as presented by Dr. Valle de Souza and producers identified consumer education regarding farm-raised seafood as a marketing need in addition to a list of marketing topics that they were interested in learning more about. 45% and 55% of extension staff respondents indicated that they did not offer aquaculture and aquaponics programming, respectively, but were interested in offering it.

Objective 3. — Project staff played a vital role in developing extension networks by being an active part of the GLAC. Project teams worked together to extend the reach of marketing tools for producers interested in direct sales and to provide programming. Working together has resulted in a more robust collaborative community to develop and deliver programming and support local economies by providing producers with online marketing opportunities and consumers with ways to find locally produced seafood.

Objective 4. —Producer-facing marketing programming was highly effective. 91.3% of evaluation respondents learned something new from the program and planned to apply the information presented in their work. 95.7% expressed that attending the program was a good use of their time. Publishing webinars online increased total views 114.3 – 469.0 % in less than a year.

Consumer-facing programming is being seen by consumers on social media platforms and websites. EatMidwestFish's twitter profile has been visited by 7,000 times, nearly 120,000 tweets have been seen, and the website has had 6,677 total pageviews. Consumer education topics include aquaculture, seafood nutrition, seafood safety, recipes and cooking demonstrations. The project team was able to deliver and deliver consumer-facing resources and materials that teach consumers about regional product fish and shell fish and how to prepare seafood to the general public. Qualitative and quantitative information from phase 1 will be used to drive Phase 2 work.

Objective 5. — National Sea Grant and USDA-NIFA committed to funding phase 2 of this project for an additional two years to extend this project beyond its initial startup. The producer stakeholder group has showed support for the project but are unable to committee financial resources to extended the project at this time. Producer support has been given in the form of time and participation.

Impacts

- Increased Consumer Awareness of Local Produced Fish and Shellfish
- Increase Consumer Awareness of Aquaculture, Aquaculture Products, Seafood Safety and Nutrition & How to Prepare Seafood
- Provide Producers with Marketing Programming & Tools

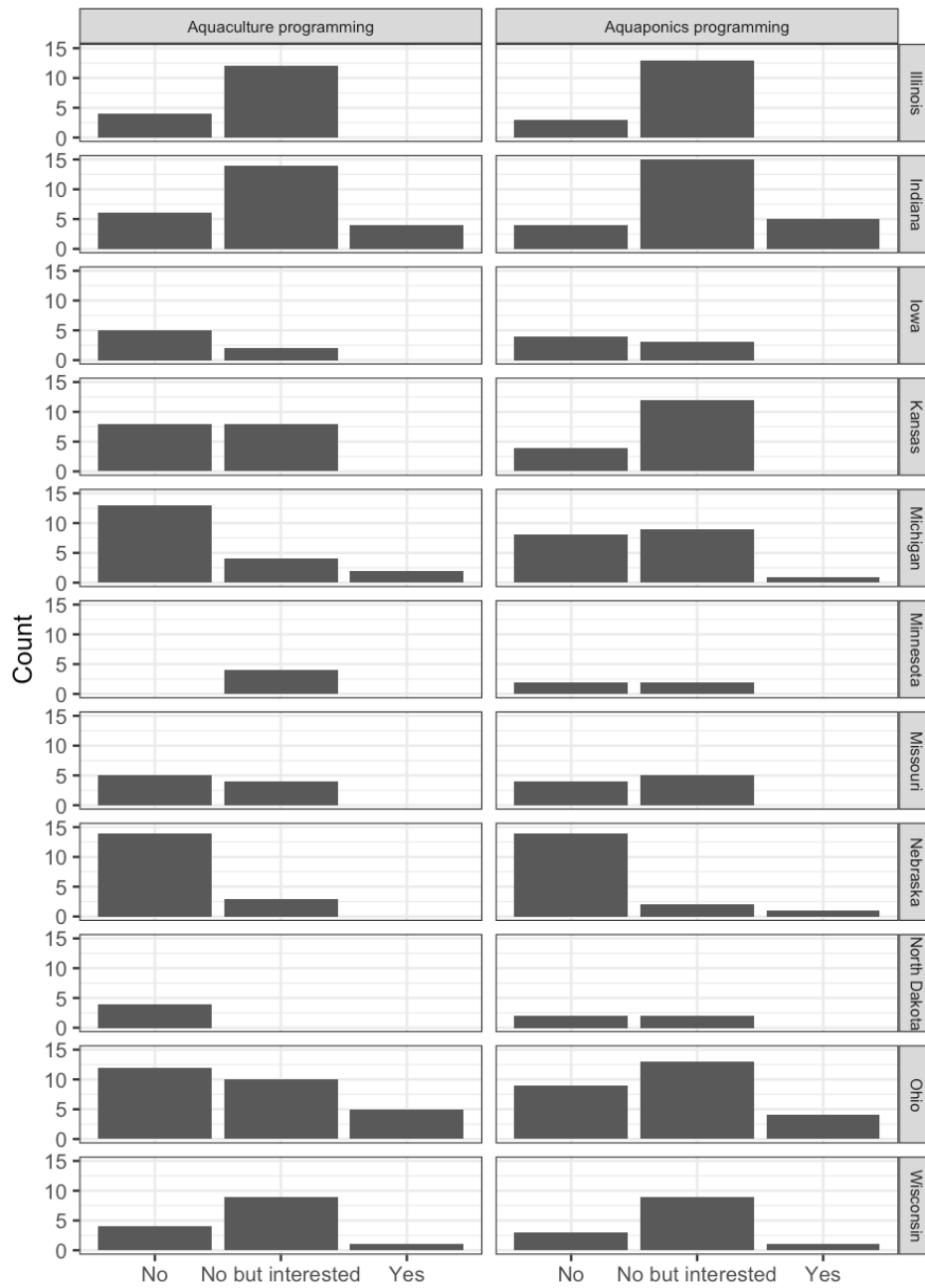
Recommended Follow-Up Activities

1. Continue to promote Midwest aquaculture as a source of locally produced, healthy protein
2. Continue to facilitate aquaculture outreach and education by leveraging extension personnel throughout the NCRAC region. Since aquaculture extension capacity is limited, consider working with other consumer-facing extension staff.
3. Work with aquaculture producers to promote a direct-to-consumer sales model where appropriate. This is not appropriate in all places, but has been successful for many producers.
4. Federal aquaculture funding is increasing in the region thanks to significant investments from NOAA/Sea Grant on top of USDA/NCRAC's substantial funding. There is a risk that these funds will operate in duplicative or cross-purpose manners. USDA and NOAA should ensure that lines of communication remain open and that someone is there to serve as an official or unofficial liaison between the agencies.

Publications, Manuscripts, Workshops, and Conferences

See the Appendix for a cumulative output for all NCRAC-funded Extension activities

Aquaculture Extension programming



Data: Survey of USDA North-Central Region ANR Extension staff

Figure 1. Aquaculture and aquaponics programming by state

Pricing strategies employed by Midwest aquaculture producers

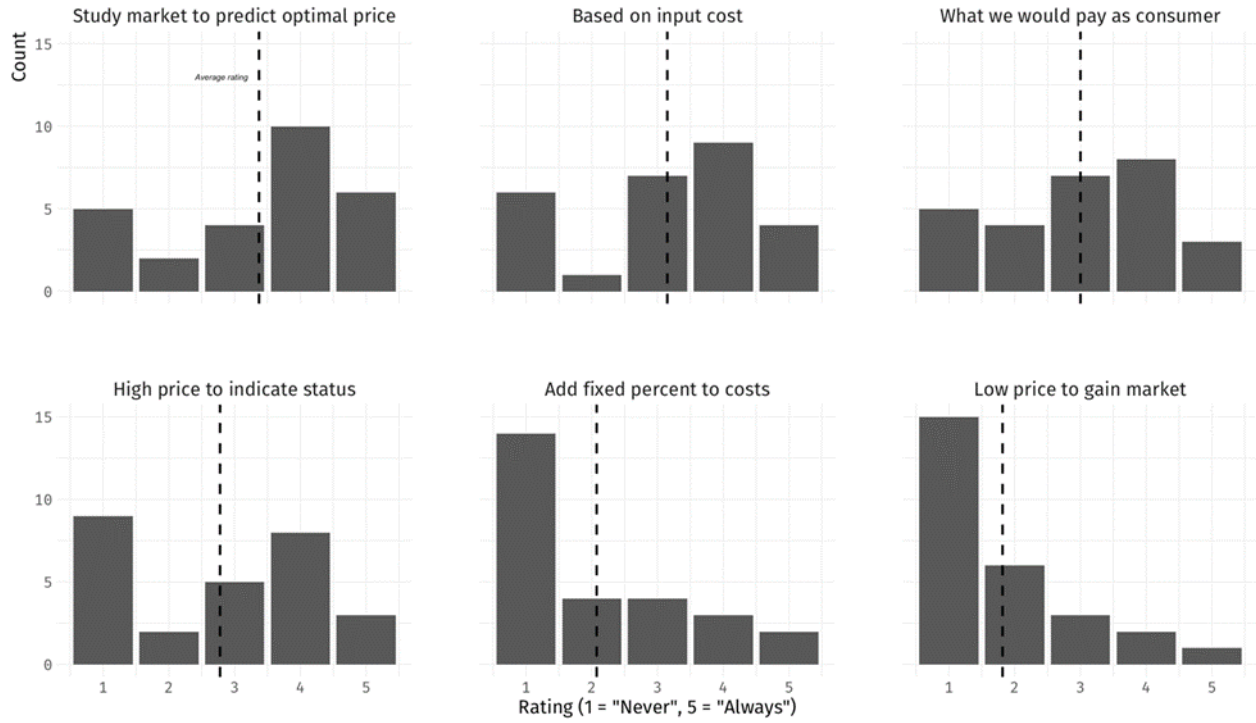


Figure 2. Pricing strategies employed by Midwest aquaculture producers in a qualitative interview.

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