NORTH CENTRAL REGIONAL AQUACULTURE CENTER EXTENSION PROJECT

Chairperson: D. Allen Pattillo, Iowa State University

Industry Advisory Council Liaison: Dan Vogler, Harrietta Hills Trout Farm, LLC.

Funding Request: $50,000

Duration: 2 Years (September 1, 2016 – August 31, 2018)

Objectives:

1. Strengthen linkages between North Central Regional Aquaculture Center (NCRAC) Research and Extension Work Groups.
2. Enhance the NCRAC extension network for aquaculture information transfer.
3. Develop and implement aquaculture educational programs and materials for the North Central Region (NCR).

Deliverables:

1. Revised NCRAC publication library
2. Development of new NCRAC resource(s)

Proposed Budget:

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<th>Principle Investigator</th>
<th>Objectives</th>
<th>Year 1</th>
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Non-Funded Collaborators:

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<tr>
<td>University of Nebraska-Lincoln</td>
<td>Dennis E. Bauer</td>
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<td>North Dakota State University</td>
<td>Mark E. Clark</td>
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<td>Southern Illinois University – Carbondale</td>
<td>Paul Hitchens</td>
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<td>Ronald E. Kinnunen</td>
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<td>Kwamena K. Quagrainie</td>
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<td>Michigan State University</td>
<td>Christopher Weeks</td>
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<td>University of Missouri</td>
<td>Bob Pierce</td>
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SUMMARY OVERVIEW

The NCRAC extension base project continues to be highly desired by the private industry stakeholders; however, lack of funding and aquaculture extension full time employees (FTEs) in the NCR creates challenges for dissemination of applied research findings. In a 2014 NCR Aquaculture Needs Survey (Weeks et al. 2014, unpublished), several priorities were identified for species information, extension activities, and needed outreach tools. One way to supplement learning opportunities is to provide high-quality, timely, and relevant publications and other online resources that are open access and readily available to NCRAC clientele. It has been indicated that many of the NCRAC fact sheets have become dated, with an average age of 18 years, and require revision to achieve maximum relevancy for today's aquaculture industry. The current project will complement previous extension information transfer efforts, and enhance learning outcomes for participants by providing a revised and updated NCRAC resource library.

JUSTIFICATION

Aquaculture in the NCR is an emerging industry that has continued into the 21st century, with an estimated farm gate value of $36.7 million. Although the NCR contains approximately 25% of the U.S. population, the regional aquaculture production accounts for less than 3% of all U.S. aquaculture according to the USDA. The North Central Regional Aquaculture Center (NCRAC) Extension Work Group represents one of the longest established organized programs providing aquaculture resource information and technical assistance to the NCR’s commercial aquaculture industry through applied and basic research, education, and outreach. The goal for the Extension Work Group is to focus on delivering more specialized services to the aquaculture industry and broaden the scope of the program in the NCR. Members of the NCRAC Extension Work Group will continue to expand on these efforts by providing information for state, regional, and national applications.

With the growth of the aquaculture industry in the NCR, a new demand and broader market for technical aquaculture services has evolved. Providing technical assistance in all aspects of aquaculture is critical to enhance the positive momentum that the region’s aquaculture industry is exhibiting. As novices enter the industry, they seek guidance from knowledgeable and experienced persons, commonly from state and federal agencies but also from private culturists. Experienced culturists need updated information on new research findings on alternative rearing techniques that can maximize production and profits. With this growth of the regional aquaculture industry, the demand for developing more effective strategies to advance the industry must occur. This requires timely responses to critical issues but also the timely transfer of research findings to the aquaculture industry for implementation. The need for more public outreach by NCRAC researchers is increasingly apparent given the limited number of cooperative and Sea Grant extension personnel. Extension work group members can lead these efforts, but a cooperative education strategy is needed for NCR aquaculture to be successful.

Project Relevance - University Extension programs provide an essential linkage between research and stakeholders. The NCRAC extension base project continues to be highly desired by the private industry stakeholders; however, lack of funding and aquaculture extension FTE’s in the NCR creates challenges for dissemination of applied research findings. The NCR online learning community is currently supported by both the NCRAC website, where one can download a variety of educational materials, and the NCRAC list serve, an email tool that allows timely sharing of information pertinent to the industry. It has been indicated that many of the NCRAC fact sheets have become dated, with an average age of 18 years, and require revision to achieve maximum relevancy for today’s aquaculture industry. According to Pat Howard of the Brenton Center at ISU the target cycle for extension materials is 5 years. Although many of the NCRAC resources are still very relevant and valuable, the public perception is that aged information is no longer relevant and valuable. Updates of critical NCRAC fact sheets will be the major focus of this project.

Who will benefit? Where will it be applied? - The NCRAC resource library is used by thousands of people annually in the NCR and even globally. The NCRAC website (www.ncrac.org) has continued to be a source of many of these requests. The NCRAC website receives an average of 20,000 unique hits per
month. Total hits are in excess of 40,000 with a peak in spring of up to 75,000. Requests come from a range of individuals: from the mildly curious with a limited background in aquaculture, to others with limited knowledge but real physical properties or financial resources, and to experienced aquaculturists with considerable expertise and knowledge who want to apply alternative innovative techniques. The experienced aquaculturists include individuals attempting to improve or change their operations themselves and those who have reached the point where they need outside professional help. Often clients may wish to evaluate the appropriateness of equipment, species, or techniques for use in the region. These interested parties need sound advice concerning the development and operation of aquaculture ventures. The NCRAC Extension Work Group plays a vital role in providing this information. Updated publications will benefit users from private industry, academia, natural resource agencies, and others. The current project will serve to continue and complement previous extension efforts to enhance learning outcomes for participants by providing up-to-date aquaculture information in a digital text format available at NCRAC.org.

Potential collaborations - This project will be a collaboration of aquaculture experts from the 12-state region, private industry, and professional writer(s). Members of the NCRAC Extension Work Group will continue to expand on these efforts by providing information for regional and national applications. Also, the Regional Aquaculture Extension Specialist (RAES) project overlaps with and cooperatively enhances NCRAC extension efforts. Land Grant Universities, private industry producers and natural resource agencies will all contribute in the revision and development of NCRAC resources.

Relevance to NCRAC mission – The North Central Regional Aquaculture Center (NCRAC) Extension Work Group represents one of the longest established organized programs providing aquaculture resource information and technical assistance to the NCR's commercial aquaculture industry through applied and basic research, education, and outreach. The goal for the NCRAC Extension Work Group is to focus on delivering more specialized services to the aquaculture industry and broaden the scope of the program for the NCR. This project is aimed at identifying and organizing aquaculture resource information to meet regional aquaculture industry needs by improving communication and interaction among the state aquaculture industry associations within the 12 NCR states. With the continued shortages in regional aquaculture extension personnel, this network has been critical to the ability of individual extension contacts to respond to information requests from their clients. In fact, many of these contacts often respond on a regular basis to client inquiries outside of their specific state.

With the growth of the aquaculture industry in the NCR, a new demand and broader market for technical information and aquaculture services has evolved. Providing quality technical assistance in all aspects of aquaculture is critical to enhance the positive momentum that the region's aquaculture industry is exhibiting. As novices enter the aquaculture industry, they seek guidance from knowledgeable and experienced persons, commonly from state and federal agencies. Experienced aquaculturists need updated information on new research findings on alternative rearing techniques. The need for more public outreach by NCRAC researchers is increasingly apparent given the limited number of cooperative and sea grant extension personnel. This is one of the primary goals of the NCRAC Extension Work Group.

Since 1989, this program has been a principal source of information, guidance, and technical assistance to the development of the regional aquaculture industry. The NCRAC Extension Work Group works closely with regional vocational agriculture instructors. In addition, several thousand people have attended local and regional aquaculture conferences, workshops, and lectures sponsored/co-sponsored and organized by NCRAC Extension Work Group members. This Work Group has established a network of industry and government aquaculture contacts at the local, state, regional, and national levels. The needs and requirements of novice and practicing aquaculturists are so multifaceted that the response depends on the stage of development in the client's proposed activity. Initial inquiries can usually be suitably answered with prepared pamphlets, bibliographies, guide to available resources (Aquaculture Resource Guide), Web pages posting answers to Frequently Asked Questions (FAQs), and Web-based links to appropriate resource information. These provide general answers and a broader view of the enterprise's possibilities. Follow-up requests and more specialized questions require greater time and advanced materials related to these specialized topics and problems. Critical to fulfilling this type of
request from clients will be the traditional one-on-one approach, with expert assistance to answer specific questions, solve problems through person-to-person or conference telephone calls, or on-site technical assistance when possible.

There is an ongoing need to develop up-to-date and relevant publications for the region’s aquaculture industry. For instance, the new aquaculture practice, aquaponics, is growing in popularity, yet there is little known about the sustainability and economic feasibility for aquaponics in the NCR. Most of the research for aquaponic food production is derived from the University of the Virgin Islands and Hawaii, which have tropical climates and do not represent our region. Aquaponics facilities in urban areas tend to depend on the tourism and social programming aspects of urban farming projects to be profitable. Thus far, niche marketing and integrated farming techniques have allowed aquaponics to be feasible in more rural areas, yet it is unknown if rural aquaponics food production facilities will be profitable long-term. An NCR-specific aquaponics fact sheet was commissioned in 2013 to provide potential producers the knowledge they need to be successful in the NCR.

Extension provides the linkage between federally funded aquaculture research at universities and the general public. The extension base project of the North Central Regional Aquaculture Center (NCRAC) continues to be critical and highly desired by the private industry stakeholders in the North Central Region (NCR) of the United States. As extension specialists, the project investigators are constantly in search of better ways to enhance information transfer to the public. Online technology transfer is one way to address the limited number of Extension FTEs in the NCR.

RELATED CURRENT AND PREVIOUS WORK

The extension service was initiated out of the Smith-Lever Act of 1914 “In order to aid in diffusing among the people of the United States useful and practical information on the subjects relating to agriculture, home economics, and rural energy…to be carried on in cooperation with the United States Department of Agriculture (NAF).” Extension programming seeks to foster positive change in American society by creating a network of educational resources that improve our quality of life. In the early days this was accomplished through demonstration activities like farm field days during which the learner obtained hands-on experience with new and proven technology. More recently, the traditional extension format has evolved because of 1) decreases in funding, 2) increasing diversity of clientele, 3) increased demand for variety in information delivery methods, and 4) changes in clientele perception of once generally accepted practices (Hildreth and Armbruster 1981). This shift in extension has led to an increased adoption of technology to aid in information transfer to a diverse audience in an easily and permanently accessible format for self-paced learning. Additionally, this has created a shift from many generalized county extension agents to fewer, specialized extension professionals. Fewer extension professionals can create fewer learning opportunities for US citizens, therefore extension has adopted a train-the-trainer format of program delivery such that local volunteer subject educators can be developed. Although dwindling in numbers and funds, extension has proven its worth through effectively fostering a 50% increase of agricultural productivity in the private sector due to Land-Grant University Research and Extension activities (Hildreth and Armbruster 1981). Within NCRAC, Weeks (2014) documented that access to extension specialists and the programs they develop are highly valued by private industry producers. An increased emphasis on extension program evaluation and broader dissemination of extension information through electronic outlets like websites and social media has helped in reaching a younger and more diverse audience and provide the most relevant, timely, and useful information. Extension remains a complex process of education that combines the art of anticipating the client’s needs, the best delivery method, and the best available science to provide the best learning opportunities and generate the greatest possible socioeconomic impact.

Colyn and Boersen (2015) identified aquaculture production of food fish as the fastest growing field of agriculture and the greatest potential area for growth in the NCR. It is estimated that a 160-300% increase in seafood production from aquaculture will be required to satisfy global demand by the year 2030. Seafood is currently the 2nd largest imported product into the United States and the current annual trade deficit is nearly $12 billion. Additionally, aquaculture has a far-reaching economic benefits because it
supports associated industries like transportation, processing, retail stores, etc. This means that there is substantial opportunity of aquaculture industry growth and a great need for extension support of this chronically fledgling industry.

The NCRAC Extension Work Group is designed to assess and meet the information needs of the various clientele groups through cooperative and coordinated regional educational programming. A network of Sea Grant and Cooperative Extension Service-designated contacts has been established to help maximize efficiency of education programs in the 12-state NCR. However, many of these contacts have part-time assignments on aquaculture and need additional resources to meet the growing demands of the aquaculture industry. Based on the 2014 NCRAC Needs Assessment Survey (Weeks et al. 2014) it is clear that the industry finds value in NCRAC extension efforts. The survey revealed that the most helpful services that NCRAC provides to gain the information needed to optimize private industry aquaculture operations are 1) opportunities to speak with their fellow industry counterparts (i.e. workshops, conferences, aquaculture associations, list serves, social media, etc.), 2) aquaculture informational websites (i.e. Regional Aquaculture Center, state aquaculture extension, USDA, eXtension.org, etc.) and 3) state/regional aquaculture extension contacts. In fact, the recent Originz NCRAC Needs Assessment Report (Colyn and Boersen 2015) suggests that a renewed focus on extension will be required to advance the aquaculture industry forward in the NCR.

In 2009-2010 Kinnunen was involved in conducting eight aquaculture biosecurity workshops and two AIS-HACCP workshops at private aquaculture and baitfish operations and state, federal, and tribal facilities in the NCR. He has also been involved with developing AIS-HACCP and biosecurity plans for these operations. Kinnunen is a co-author of the Aquatic Invasive Species-HACCP Training Curriculum, and has been actively involved in aquaculture outreach activities for over two decades. The presence that the NCRAC has had in the AIS regulatory issues is one of the main reasons that production and transport of aquaculture products is still allowed in many states in the NCR.

In light of the ever-increasing influence of the internet as a source of knowledge, the investigators found it prudent to develop an online webinar series that will cover topics of interest in aquaculture and make them available to the public. The use of webinars was identified by Weeks (2014) as being an important extension activity by the NCRAC community. This webinar series was modeled after the successful Aquaculture Boot Camp (ABC) model (http://southcenters.osu.edu/aquaculture/aquaculture-extension/boot-camp) developed by Dr. Laura Tiu at The Ohio State University. The ABC model uses researchers, extension specialists and industry mentors to teach such topics as aquaculture production training, business planning, and marketing. The ABC is offered at three levels of interest and commitment – introductory, intermediate, and intensive, with intensive having a hands-on component and intermediate and introductory conducted primarily online.

Effective packaging of information on all aspects of aquaculture appropriate to the NCR will bridge the gap between user groups and the extension informational network. The eXtension.org website is a virtual clearinghouse for extension information and an interface in which any person can find extension publication on any topic area, and also use the “Ask an Expert” function to directly pose a question that will be routed to an area expert by registered members of eXtension. Webinars and voiceover power point presentations are given by extension experts online, and are available for no charge to the general public. The training session (lead by Dr. Vanessa Weldon) on using eXtension.org was intended to give the NCRAC extension work group critical information on using eXtension.org for disseminating aquaculture information. This training session also gave extension personnel different electronic methods for evaluating the outcomes and impacts of extension programs.

The NCRAC extension base project continues to be highly desired by the private industry stakeholders; however, lack of funding and aquaculture extension FTE’s in the NCR creates challenges for dissemination of applied research findings. In spite of the limited number of aquaculture full-time equivalent positions in this region, substantial progress on the previously described objectives has been made. Extension liaisons are actively involved in several research projects and they have helped to improve the information transfer from research work groups to the public. Five North Central Regional Aquaculture Conferences have been held. The first was held in March 1991 in Kalamazoo, Michigan, the
second was held in February 1995 in Minneapolis, Minnesota, the third conference was held in Indianapolis, Indiana in February 1997, and the fourth was held in Kansas City, Missouri in February 1999, and the fifth was held in Toledo, OH in 2014. These regional meetings were attended by hundreds of individuals including persons from Canada. The sixth conference is planned for 2016 to be held in Milwaukee, WI.

Many NCRAC extension contacts are involved with their respective state aquaculture associations, and have worked with industry and governmental representatives to produce state aquaculture plans and improve governmental regulations. It is this interaction by extension contacts that the NCRAC Board of Directors wanted to support when they voted to increase funding support for NCRAC extension contacts in 1999, which continues through this proposal. The end result is an increased interaction between NCRAC extension contacts and their respective state aquaculture associations.

Extension liaisons have also assisted with the planning, promotion, and implementation of past baitfish, hybrid striped bass, walleye, and yellow perch workshops held throughout the region. These workshops have included "hands-on" experiences, formal presentations, in addition to forum sessions whereby producers share their experience with other producers as well as extension specialists. Several fact sheets and bulletins have been completed and are available to the public both in hard copy and on the Web. In part, these publications have the following topics: (1) walleye fingerling culture, (2) salt usage, (3) starting an aquaculture operation, (4) overview of aquaculture, (5) aquaculture as a business enterprise, (6) survey of salmonid producers, (7) channel catfish culture, (8) niche marketing, and (9) plankton management for fish culture ponds. The use of these publications has helped to supplement individual states' publications in this region. In 1994 a survey was undertaken to determine the use of NCRAC extension publications in the region. It was estimated that approximately 15,000 client questions are addressed annually by these publications; publications related to basic aquaculture topics were most often used. All of these Culture Manuals are now available in pdf format on the NCRAC Web site.

However, it has been indicated that many of the NCRAC fact sheets have become dated, with an average age of 18 years, and require revision to achieve maximum relevancy for today's aquaculture industry. The current project will complement previous extension information transfer efforts, and enhance learning outcomes for participants by providing a revised and updated NCRAC resource library.

**ANTICIPATED BENEFITS**

Existing aquaculture industry members need relevant and current information on new techniques and technologies in aquaculture, as well as updated information related to changing state and federal regulations. Increasingly, individuals are interested in aquaculture and aquaponics as a means of agriculture diversification or urban development. A healthy aquaculture industry in the NCR will reduce the need to import fish products and help improve the U.S. trade imbalance, a fact increasingly recognized in Washington. The NCRAC Extension Work Group meets these diverse client needs through on-site advice, publications, and specialized workshops. Entrepreneurs and prospective aquaculturists often require an enormous amount of time to educate and can benefit from the availability of the electronic media. Additionally, middle and high school teachers often use extension materials in their classrooms. The project components directed toward pre-service and in-service vocational agriculture teachers will make an investment in the future, and sustain the development of regional aquaculture. Continual updating of outreach information will assist NCRAC advisory service specialists in answering the needs of local communities, small businesses, industry, educational groups, and the general public.

Effective packaging of information on all aspects of aquaculture appropriate to the NCR will bridge the gap between user groups and the extension informational network. The eXtension.org website is a virtual clearinghouse for extension information and an interface in which any person can find extension publication on any topic area, and also use the "Ask an Expert" function to directly pose a question that will be routed to an area expert by registered members of eXtension. Webinars and voiceover power point presentations are given by extension experts online, and are available for no charge to the general public. However, as eXtension.org has evolved, many Land-grant institutions have un-invested their resources. The valuable service that eXtension.org served as a virtual clearing house for aquaculture
A demand has increased for information on the improvement of aquaculture rearing and management strategies to reduce and, if possible, eliminate environmental impacts. Fact sheets, technical bulletins, and videos have served to inform a variety of clients about numerous aquaculture practices in the NCR and to present possible solutions to relevant problems. For instance, the 2004 NCRAC publication “Aquaculture Effluents and Waste By-Products” was downloaded more than 300 times per month when it was first posted online in 2006. Species-specific publications on walleye, trout, and catfish, as well as publications on aquaculture businesses and transportation of fish in bags have been used in numerous regional meetings and have been requested by clients throughout the United States. Since new information on aquaculture production in the NCR is generated constantly, and new culture methods are being developed, it is critical, for success in the industry, that the NCRAC extension work group create and update extension publications to reflect current knowledge. The drafted aquaponics fact sheet will give timely, technical information on production potential, economics, and sustainability of aquaponics in the NCR, which will help potential producers be more profitable.

The presence that the NCRAC has had in the AIS regulatory issues is one of the main reasons that production and transport of aquaculture products is still allowed in many states in the NCR. The proposed work will include stakeholder meetings to develop 3rd party certification for AIS-HACCP plans, which will be a huge step forward for the industry. Also, the final stages of the AIS-HACCP DVD are currently underway. This program gives a complete rundown of the AIS-HACCP process, what threats exist in aquaculture facilities, and how AIS issues can be mitigated. Although this DVD will not be able to fully replace the workshop, it is a great resource for aquaculturists and regulatory bodies to understand the process of creating and implementing a HACCP plan. When coupled with the workshop, the industry members will be able to create their own HACCP plan that is tailored to their individual operation.

Project outputs, outcomes, and later impact assessment are now used for extension activities; these metrics are noted per individual Work Group member. However, there continues to be a need for extension professionals to be able to address public inquiries when there may not be an economic impact. For instance, potential aquaculturists are sometimes advised not to pursue specific activities as they may suffer economic losses if not well thought out or proposed efforts simply will not work in their specific circumstances. Such impacts may be hard to document but are nevertheless important to both the individual as well as for development of the aquaculture industry.

Current and potential producers learn through online resources, particularly in the absence of aquaculture extension personnel. These publication updates will provide a knowledge base and resources for beginning and experienced aquaculturists that will help them become more efficient and profitable. Table 1 expresses the anticipated benefits and impacts of this project.

Table 1. Anticipated benefits of the comprehensive training program in the short, medium, and long term.

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<th>Short Term</th>
<th>Goals</th>
<th>Update and improve the NCRAC resource library.</th>
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<td>Outcomes</td>
<td>Improve the quality and relevance of NCRAC-generated knowledge available to NCR aquaculturists.</td>
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<td>Mid Term</td>
<td>Goals</td>
<td>Generate an aquaculture information hub containing NCR-specific resources.</td>
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<tr>
<td>Outcomes</td>
<td>Improve aquaculture information transfer in the NCR.</td>
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<tr>
<td>Long Term</td>
<td>Goals</td>
<td>Foster NCR aquaculture industry development and profitability through the provision of high-quality, timely, &amp; relevant informational resources.</td>
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<td>Impacts</td>
<td>Expand the development of the NCR Aquaculture industry in terms of biomass production and profitability.</td>
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NCRAC Extension Project
OBJECTIVES
This project will focus on objectives 1-3 of the ongoing Extension project.

Objectives:
1. Strengthen linkages between North Central Regional Aquaculture Center (NCRAC) Research and Extension Work Groups.
2. Enhance the NCRAC extension network for aquaculture information transfer.
3. Develop and implement aquaculture educational programs and materials for the North Central Region (NCR).

DELIVERABLES
1. Revised NCRAC publication library
2. Updates to critical NCRAC resource(s)

PROCEDURES

Strengthen Linkages (Objective 1).

At least Extension Work Group member has been assigned to each Research Work Group with the goal of increasing the amount of information coming out of research projects. Extension Liaisons are responsible for interacting with researchers in developing possible extension products based on outcomes of these projects as well as assisting in writing research projects’ annual and termination reports.

Enhance Extension Network (Objective 2)

At least one extension contact has been designated by CES for each NCR state. These contacts will attend the annual in-state aquaculture meeting to assist state associations; provide aquaculture extension-related materials produced in their state to NCRAC, provide a link between NCRAC and aquaculturists in their state; identify and update lists of key state contacts to receive NCRAC announcements, newsletters, and other pertinent materials, identify key industry needs in their state and relay to NCRAC for setting priorities and determining projects to be undertaken, and generate an annual report for incorporation into the NCRAC Extension report.

Develop and Implement Aquaculture Education Programs and Materials for the NCR (Objective 3)

NCRAC Extension participants will help support the aquaculture industry. These activities include workshops and education materials that will be distributed within and outside of their states. Any workshop or materials developed and/or hosted by state aquaculture extension contacts will be advertised in surrounding states to take advantage of the NCRAC Extension network and the individual expertise of the Extension Work Group participants.

Iowa State University (ISU) staff will coordinate the NCRAC resource library review and work closely with the content editing specialist (CES) to complete the updating process. The CES will be hired from outside the NCR to alleviate the workload strains caused by the low number of NCR extension FTEs. However, the CES will work with the assigned subject area expert from within the NCR to ensure the quality and relevance of the work produced. ISU will also be responsible for final editing and layout as well as uploading the final product to the NCRAC website.

Project workflow - In year one of the project, a project committee of extension and private industry personnel will be selected as well as a content review specialist to review the NCRAC Resource Library that includes fact sheets, technical bulletins and videos. Figure 1 outlines the work process model for the

NCRAC Extension Project
project. The review process will occur early in the grant cycle (i.e., October 2016) at a meeting location, likely in Ames, IA. This 2–day meeting will convene the committee, where they will evaluate each publication using a ranking rubric to select which publications to keep as is, update, or delete. The review process decision tree is outlined in Figure 2. Following the decision to update, the projects will be ranked in order of priority based on their score derived from the ranking rubric (Table 2). The ranking rubric will provide a numerical score based on 1) Relevance to the current NCRAC priority areas, 2) Age of the publication, 3) Impact Potential of the updated information in the NCRAC community, 4) Uniqueness of the information in the publication, and 5) Likelihood of Completion during the grant cycle due to publication length and complexity. Each NCRAC resource will be assigned a subject expert (table 3) to assist in the provision of up-to-date information to the CES for the publication update. The highest scoring publications will be updated first, and updates will continue until the budget is exhausted or the grant ends, whichever is first. All revised NCRAC resources will Manuscripts will be provided to the project PI to oversee peer-review, editing and layout. Following the approval of resource updates, formatting and layout, the finalized publications will be uploaded to the NCRAC website (www.ncrac.org) to replace the previous version.
Figure 1. Work process model for NCRAC resource library revision process.
Figure 2. Review process decision tree for NCRAC resource library.
### Table 2. Potential NCRAC Resource Library Ranking Rubric.

<table>
<thead>
<tr>
<th>Category</th>
<th>Potential Score</th>
<th>0</th>
<th>1 (2)</th>
<th>2 (4)</th>
<th>3 (6)</th>
<th>4 (8)</th>
<th>5 (10)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relevance to NCRAC Priority Areas</strong></td>
<td>0-5</td>
<td>None</td>
<td>Very Poor</td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td><strong>Age (yrs) of Publication</strong></td>
<td>0-5</td>
<td>0-5</td>
<td>6-10</td>
<td>11-15</td>
<td>16-20</td>
<td>21-25</td>
<td>&gt; 25</td>
</tr>
<tr>
<td><strong>Impact Potential of Publication Info</strong></td>
<td>0-10</td>
<td>None</td>
<td>Very Poor</td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td><strong>Uniqueness of Information</strong></td>
<td>0-5</td>
<td>Contains only basic, common knowledge</td>
<td>Basic, but contains some useful info for NCR states</td>
<td>Contains NCR-specific info</td>
<td>Contains all NCR-specific info</td>
<td>Contains rare info and is NCR-specific</td>
<td>Sole source of info</td>
</tr>
<tr>
<td><strong>Likelihood of Completion during project period due to complexity and length</strong></td>
<td>0-5</td>
<td>Cannot be completed</td>
<td>Very unlikely</td>
<td>Unlikely</td>
<td>Moderate</td>
<td>Likely</td>
<td>Very Likely</td>
</tr>
</tbody>
</table>

### Table 3. Potential subject area experts to be assigned to NCRAC resource library publications for update.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Extension Contact</th>
<th>Subject Area of Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Nebraska-Lincoln</td>
<td>Dennis E. Bauer</td>
<td>Pond management</td>
</tr>
<tr>
<td>North Dakota State University</td>
<td>Mark E. Clark</td>
<td>Centrarchids</td>
</tr>
<tr>
<td>University of Wisconsin-Extension</td>
<td>Yet to be named</td>
<td></td>
</tr>
<tr>
<td>Southern Illinois University – Carbondale</td>
<td>Paul Hitchens</td>
<td>Production, Hauling &amp; Marketing</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>Ronald E. Kinnunen</td>
<td>AIS &amp; Seafood HACCP</td>
</tr>
<tr>
<td>Kansas State University</td>
<td>Charles D. Lee</td>
<td>Pond management</td>
</tr>
<tr>
<td>South Dakota State University</td>
<td>Yet to be named</td>
<td>N/A</td>
</tr>
<tr>
<td>Iowa State University</td>
<td>D. Allen Pattillo</td>
<td>Aquaponics and RAS</td>
</tr>
<tr>
<td>University of Minnesota</td>
<td>Nicholas B. D. Phelps</td>
<td>Fish Health and Regulations</td>
</tr>
<tr>
<td>Purdue University</td>
<td>Kwamena K. Quagrainie</td>
<td>Aquaculture Business and Marketing</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>Christopher Weeks</td>
<td>Regulations and Salmonid Culture</td>
</tr>
<tr>
<td>University of Missouri</td>
<td>Robert Pierce</td>
<td>Pond management</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>Yet to be named</td>
<td>N/A</td>
</tr>
<tr>
<td>Louisiana State University</td>
<td>Greg Lutz</td>
<td>Aquaculture Content Editing</td>
</tr>
</tbody>
</table>

NCRAC Extension Project
Project: North Central Regional Aquaculture Center Extension Project
Goal: Develop an efficient information transfer method of current aquaculture information
Objective: Increase the awareness, knowledge and skills of producers, professionals, students, and general citizenry regarding aquaculture in the North Central Region.

Assumptions:
- Producers are interested in diversifying their revenue streams by learning about aquaculture.
- Infrastructure and markets will develop for regionally produced aquaculture products.

External Factors:
- Limited number of aquaculture extension specialists
- A diverse(species and culture practices) aquaculture industry in the region
- Gaps in information and technical support for the industry
## FACILITIES

<table>
<thead>
<tr>
<th>Institution</th>
<th>Facilities</th>
<th>Procedures</th>
</tr>
</thead>
</table>
| ISU         | ISU has a multitude of meeting spaces and lodging accommodations, as well as extension support staff such as the Brenton Center to develop publications and perform editing and layout functions. **Subject Area Expert** | 1) Coordinating review committee meeting  
2) Contracting with updating entities  
3) Posting publications to NCRAC website  
4) Reporting |
| KSU         | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| LSU         | **Content Editing Specialist**                                              | 1) Connect with Subject Area Experts  
2) Review, edit, and update NCRAC resources                                                        |
| MSU         | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| NDSU        | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| OSU         | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| PU          | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| SDSU        | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| SIU-C       | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| UMO         | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| UMN         | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| UNE-L       | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
| UWI         | **Subject Area Expert**                                                     | Provide resources and expertise to CES                                                          |
REFERENCES


### PROJECT LEADERS

<table>
<thead>
<tr>
<th>State</th>
<th>Name</th>
<th>Institution</th>
<th>Area of Specialization</th>
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<tr>
<td>Iowa</td>
<td>D. Allen Pattillo</td>
<td>Iowa State University</td>
<td>Extension/Fish Culture</td>
</tr>
<tr>
<td>Indiana</td>
<td>Kwamena Quagrainie</td>
<td>Purdue University</td>
<td>Extension/Business &amp; Marketing</td>
</tr>
<tr>
<td>Louisiana</td>
<td>Greg Lutz</td>
<td>Louisiana State University</td>
<td>Extension/Content Editing</td>
</tr>
<tr>
<td>Michigan</td>
<td>Chris Weeks</td>
<td>Michigan State University</td>
<td>Extension/Regulations &amp; Salmonids</td>
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<td>Michigan</td>
<td>Ron Kinnunen</td>
<td>Michigan State University</td>
<td>Extension/Seafood &amp; AIS HACCP</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Nick Phelps</td>
<td>University of Minnesota</td>
<td>Extension/Fish Health</td>
</tr>
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</table>
PARTICIPATING INSTITUTIONS AND PRINCIPAL INVESTIGATORS

University of Nebraska-Lincoln
Dennis E. Bauer

North Dakota State University
Mark E. Clark

Purdue University
Kwamena K. Quagrainie

University of Minnesota-Duluth
Todd Phelps

University of Wisconsin-Extension
Unnamed

University of Missouri
Robert Pierce

Michigan State University
Ronald E. Kinnunen

Kansas State University
Charles D. Lee

Iowa State University
D. Allen Pattillo

South Dakota State University
Unnamed

Purdue University
Kwamena K. Quagrainie

Ohio State University
Unnamed
### PROJECT DIRECTOR(S)
D. Allen Pattillo

### Organization and Address
Iowa State University
339 Science Hall 2
Ames, IA 50014

### USDA Award No.

<table>
<thead>
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<th>Duration Proposed</th>
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<th>Summer</th>
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<td>1. No. of Senior Personnel</td>
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<tr>
<td>a. ___ (Co)-PD(s)</td>
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<td></td>
<td></td>
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<tr>
<td>b. ___ Senior Associates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. No. of Other Personnel (Non-Faculty)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. ___ Research Associates-Postdoctorates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. ___ Other Professionals</td>
<td>15000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. ___ Paraprofessionals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. ___ Graduate Students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. ___ Prebaccalaureate Students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. ___ Secretarial-Clerical</td>
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<tr>
<td>g. ___ Technical, Shop and Other</td>
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<tr>
<td>Total Salaries and Wages</td>
<td>15000</td>
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</table>

### B. Fringe Benefits (If charged as Direct Costs)
0

### C. Total Salaries, Wages, and Fringe Benefits (A plus B)
15000

### D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)

### E. Materials and Supplies

### F. Travel
12000

### G. Publication Costs/Page Charges

### H. Computer (ADPE) Costs

### I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)

### J. All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.)
3000

### K. Total Direct Costs (C through I)
30000

### L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)

### M. Total Direct and F&A/Indirect Costs (J plus K)

### N. Total Amount of This Request
30000

### P. Carryover -- (If Applicable) . . . . . . Federal Funds: $ Non-Federal funds: $ Total $

### Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)
- Cash (both Applicant and Third Party) __________
- Non-Cash Contributions (both Applicant and Third Party) __

### Signature (required for revised budget only)

NAME AND TITLE (Type or print)

SIGNATURE

DATE

Authorized Organizational Representative

Signature (for optional use)

---

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0524-0039. The time required to complete this information collection is estimated to average 1.00 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing the reviewing the collection of information.

Form CSREES-2004 (12/2000)
### USDA Award No. Years 2: Objectives 1-2

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### Organization and Address
- **Iowa State University**
  - 339 Science Hall 2
  - Ames, IA 50014

### Project Director(s)
- D. Allen Pattillo

### A. Salaries and Wages

<table>
<thead>
<tr>
<th>CSREES FUNDED WORK MONTHS</th>
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<tbody>
<tr>
<td>Calendar</td>
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</tbody>
</table>

1. **No. of Senior Personnel**
   - a. (Co)-PD(s)  
   - b. Senior Associates

2. **No. of Other Personnel (Non-Faculty)**
   - a. Research Associates-Postdoctorates
   - b. Other Professionals  
   - c. Paraprofessionals
   - d. Graduate Students
   - e. Prebaccalaureate Students
   - f. Secretarial-Clerical
   - g. Technical, Shop and Other

   **Total Salaries and Wages**  

### B. Fringe Benefits (If charged as Direct Costs)
- 0

### C. Total Salaries, Wages, and Fringe Benefits (A + B)
- 15000

### D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)
- 15000

### E. Materials and Supplies

### F. Travel
- 5000

### G. Publication Costs/Page Charges

### H. Computer (ADPE) Costs

| Education/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.) |
| All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.) |

### K. Total Direct Costs (C through I)
- 20000

### L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)

### M. Total Direct and F&A/Indirect Costs (J + K)
- 20000

### N. Other

### O. Total Amount of This Request
- 20000

### P. Carryover -- (If Applicable)
- Federal Funds: $
- Non-Federal funds: $
- Total $

### Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)
- Cash (both Applicant and Third Party)
- Non-Cash Contributions (both Applicant and Third Party)

### NAME AND TITLE
- **Project Director**
- **Authorized Organizational Representative**

### SIGNATURE
- (required for revised budget only)

### DATE

---

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0524-0039. The time required to complete this information collection is estimated to average 1.00 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting the collection of information. Form CSREES-2004 (12/2000)
### Organization and Address

**Iowa State University**  
339 Science Hall 2  
Ames, IA 50014

### Project Director(s)

D. Allen Pattillo

### USDA Award No.

<table>
<thead>
<tr>
<th>Duration Proposed</th>
<th>Total Funds Requested by Proposer</th>
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### Costs

**A. Salaries and Wages**

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of Personnel</th>
<th>CSREES Funded Work Months</th>
<th>Funds Approved by CSREES (If different)</th>
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<tbody>
<tr>
<td>1. Senior Personnel</td>
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<td>Calendar</td>
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<td>Summer</td>
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<tr>
<td>a. (Co)-PD(s)</td>
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<tr>
<td>b. Senior Associates</td>
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<td></td>
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<tr>
<td>2. Other Personnel (Non-Faculty)</td>
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<td>Academic</td>
<td>Summer</td>
</tr>
<tr>
<td>a. Research Associates-Postdoctorates</td>
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<td>b. Other Professionals</td>
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<td>c. Paraprofessionals</td>
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<tr>
<td>g. Technical, Shop and Other</td>
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<td>Total Salaries and Wages</td>
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#### 30000

**B. Fringe Benefits (If charged as Direct Costs)**

- 0

**C. Total Salaries, Wages, and Fringe Benefits (A plus B)**

- 30000

**D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)**

- 0

**E. Materials and Supplies**

- 0

**F. Travel**

- 17000

**G. Publication Costs/Page Charges**

- 0

**H. Computer (ADPE) Costs**

<table>
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<tr>
<th>Subcategory</th>
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<th>Funds Approved by CSREES (If different)</th>
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<tr>
<td>I. Student Assistance/Support</td>
<td>Scholarships/fellowships, stipends/tuition, cost of education, etc. (Attach list of items and dollar amounts for each item.)</td>
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<td></td>
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<tr>
<td>J. All Other Direct Costs</td>
<td>In budget narrative, list items and dollar amounts and provide supporting data for each item.</td>
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#### 3000

**K. Total Direct Costs (C through I)**

- 50000

**L. F&A/Indirect Costs** (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)

- 0

**M. Total Direct and F&A/Indirect Costs (J plus K)**

- 30000

**N. Other**

- 0

**O. Total Amount of This Request**

- 50000

**P. Carryover -- (If Applicable)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Federal Funds</th>
<th>Non-Federal Funds</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)**

| Cash (both Applicant and Third Party) |  |
| Non-Cash Contributions (both Applicant and Third Party) |  |

### Signature

**NAME AND TITLE** (Type or print)

**SIGNATURE** (required for revised budget only)

**DATE**

- Project Director
- Authorized Organizational Representative

- Signature (for optional use)

---

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Budget Explanation for Iowa State University

(Pattillo)

Objective 1-4 & Deliverables

A. Salaries and Wages: Year 1: Salaries are requested for hiring a content editing specialist (Greg Lutz, LSU) for an approximate value of $1,500 per publication. Year 1: $15,000 Year 2: $15,000

B. Fringe Benefits: None

C. Nonexpendable Equipment: None.

D. Materials and Supplies: None

E. Travel: Travel and lodging will be provided for the participants of the NCRAC resource library review committee (approximately 8 persons). Year 1: $12,000. Travel to different aquaculture facilities for collection of media resources (pictures, video, information, etc.) Year 2: $5,000.

F. Publication Costs/Page Charges: None

I. All Other Direct Costs: Meeting room and AV rental fees ($500), catering ($2,000) and supply ($500) costs for the NCRAC resource library review committee 2-day meeting. Year 1: $3,000.

J. Total Direct Costs: $50,000

K. Other: None.
# BUDGET SUMMARY FOR EACH YEAR FOR EACH PARTICIPATING INSTITUTION

## Year 1

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<th>NDSU</th>
<th>UMN</th>
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<th>KSU</th>
<th>ISU</th>
<th>SDSU</th>
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# SCHEDULE FOR COMPLETION OF OBJECTIVES

Start Date: September 1, 2016  
End Date: August 31, 2018

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<tr>
<td>Identify NCRAC resource library review committee</td>
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<td>Convene a meeting of the review committee</td>
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<td>Prioritize and assign content specialists to NCRAC resources</td>
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<td>Identify entities to update NCRAC resources</td>
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<td>Edit and update NCRAC resources</td>
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<td>University of Nebraska-Lincoln</td>
<td>Dennis E. Bauer</td>
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<tr>
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<td>Mark E. Clark</td>
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<td>Iowa State University</td>
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<tr>
<td>Purdue University</td>
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<td>Robert Pierce</td>
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<td>Ohio State University</td>
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</tbody>
</table>
VITA

Dennis Bauer                                                                                                               Phone: (402) 387-2213
BKR Extension Office                                                                                                        FAX: (402) 397-2065
148 West 4th Street                                                                                                   Email: dbauer1@unl.edu
Ainsworth, NE 69210

EDUCATION

B.S. University of Nebraska-Lincoln  1975    Wildlife and Natural Resources
M.S. University of Nebraska-Lincoln  1978    Range Science

POSITIONS

1978-Present University of Nebraska – Extension Extension Educator

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

Society for Range Management
Nebraska Cooperative Extension Association
VITA

Mark E. Clark
Department of Biological Sciences
North Dakota State University
NDSU Dept. 2715, P.O. Box 6050
Fargo, ND 58105-6050

Phone: (701) 231-8246
Fax: (701) 231-7149
E-mail: m.e.clark@ndsu.edu

EDUCATION

B.A. Mathematics 1987 University of Tennessee
M.S. Mathematics 1989 University of Tennessee
Ph.D. Ecology 1996 University of Tennessee

POSITIONS

2010-Present North Dakota State University Assistant Professor
2002-2009 North Dakota State University Assistant Professor
2000-2002 University of Montana Postdoctoral Fellow
1997-2000 Iowa State University Postdoctoral Fellow
1996-1997 Oak Ridge National Laboratory Postdoctoral Fellow

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Fisheries Society
Ecological Society of America
Society of Integrative & Comparative Biology

SELECTED PUBLICATIONS


VITA

Paul Hitchens  
Southern Illinois University  
Center for Fisheries, Aquaculture, and Aquatic Sciences  
173 Life Sciences II, Carbondale, IL 62901  
Phone: 618-536-7761  
E-mail: hitchens@siu.edu

EDUCATION

Bachelor of Science-Environmental Biology, Eastern Illinois University, 1981

RESEARCH AND PROFESSIONAL EXPERIENCE

2005-Present  Aquaculture Specialist/Researcher II, Illinois Aquaculture TechSERV; Fisheries and Illinois Aquaculture Center-Southern Illinois University; Carbondale, IL  
2003-2005  Technical Service Agent, Illinois Fish Farmers Co-op; Pinckneyville, IL  
2003  Independent Private Consultant, Inter Sea Farms De Venezuela C.A.; Maracaibo, Venezuela  
1990-2003  Technical Manager, Larfico S.A., Penaeid Shrimp Laboratory, Ayangue, Ecuador  
1984-1990  Technical Manager, Langomorro Cia., Ltd.; affiliate of Larfico S.A., Guayaquil, Ecuador  
1982  Technical Assistant II, Texas A&M University / National Marine Fisheries, Galveston, TX  
1982  Independent Private Consultant, Market Facts, Inc., Chicago, IL  
1981  Staff Biologist, King James Shrimp, Inc., Park Forest South, IL

PUBLICATIONS

VITA

Ronald E. Kinnunen
Michigan State University - Upper Peninsula
710 Chippewa Square, Ste. 202
Marquette, MI 49855-4823

Phone: (906) 226-3687
Fax: (906) 226-3687
E-mail: kinnune1@msu.edu

EDUCATION

B.S.  Michigan State University  1976  Fisheries Biology and Management
M.S.  Michigan State University  1979  Fisheries Biology and Management
Ph.D.  Michigan Technological University  1997  Biological Sciences

POSITIONS

1982-Present  Michigan State University  Michigan Sea Grant Extension Agent
1981  Rangen Research Laboratory  Fisheries Pathologist
1979-1980  U.S. Fish and Wildlife Service  Fisheries Biologist

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Fisheries Society, Fish Health Section, Salmonid Section
International Association for Great Lakes Research

SELECTED PUBLICATIONS


VITA

Charles D. Lee
Department of Animal Science and Industry
Rm. 131, Call Hall
Kansas State University
Manhattan, KS 66506-1600

Phone: (785) 532-5734
Fax: (785) 532-5681
E-mail: clee@ksu.edu

EDUCATION

B.S.  Kansas State University  1975  Fisheries and Wildlife Biology
M.S.  Kansas State University  1988  Animal Sciences and Industry

POSITIONS

1995-Present  Kansas State University  Extension Specialist-Wildlife
1989-1995  Kansas Dept. of Wildlife and Parks  Agricultural Liaison Biologist
1986-1989  Kansas State University  Extension Assistant

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

Kansas Chapter of the Society for Range Management
Kansas Chapter of the Wildlife Society
Society for Range Management
The Wildlife Society

SELECTED PUBLICATIONS

EDUCATION

B.A. Earlham College 1979 Biology & Spanish
M.S. Louisiana State University 1983 Fisheries (Aquaculture specialization)
Ph.D. Louisiana State University 1987 Wildlife and Fisheries Science (Aquaculture specialization)

POSITIONS

2013 – Present  Editor in Chief, Aquaculture Magazine.
1991 – Present  Specialist and Professor (Aquaculture) Louisiana State University Agricultural Center.
1991 Fisher–Biologist Programs Manager – Biometrician, Louisiana Department of Wildlife and Fisheries, Research Division.

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

World Aquaculture Society
United States Aquaculture Society
Latin American and Caribbean Aquaculture Society
National Aquaculture Association

SELECTED PUBLICATIONS

D. Allen Pattillo
Department of Natural Resource Ecology and Management
Iowa State University
339 Science Hall II
Ames, IA 50011-3221

EDUCATION

B.S.  The University of Georgia   2008  Fisheries and Aquaculture
M.S.  Auburn University   2010  Aquaculture

POSITIONS

2011-present    Aquaculture Extension Specialist III, Department of Natural Resource Ecology and Management, Iowa State University.
2008-2010       Graduate Research Assistant, Department of Fisheries and Allied Aquacultures, Auburn University.

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Fisheries Society
World Aquaculture Society
United States Aquaculture Society

SELECTED PUBLICATIONS


VITA

Nicholas B. D. Phelps                             Phone: (612) 624-7450
College of Veterinary Medicine, Veterinary Population Medicine Dept Fax: (612) 624-8707
University of Minnesota E-mail: phelp083@umn.edu
1333 Gortner Ave
St. Paul, MN 55108

EDUCATION

B.S. Bemidji State University 2005 Aquatic Biology
M.S. University of Arkansas at Pine Bluff 2007 Aquaculture/Fisheries
Ph.D. University of Minnesota 2012 Veterinary Medicine

POSITIONS

2013-present Assistant Professor, Dept Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota
2009-2013 Instructor, Dept Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota
2009-present Aquaculture Specialist, Extension, U of Minnesota
2009-present Head, Fisheries Diagnostic Service, Veterinary Diagnostic Laboratory, College of Veterinary Medicine, University of Minnesota
2008-2009 Scientist, Veterinary Diagnostic Laboratory, College of Veterinary Medicine, University of Minnesota
2007-2008 Scientist, Veterinary Diagnostic Laboratory, College of Veterinary Medicine, University of Minnesota
2005-2007 Research Assistant, Fish Disease Laboratory, University of Arkansas at Pine Bluff

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Fisheries Society, Sections: Fish Health, Fish Culture
United States Animal Health Association
American Association of Veterinary Laboratory Diagnosticians

SELECTED PUBLICATIONS

VITA

Robert A. Pierce II       phone: 573/882-4337
Extension Fish and Wildlife Specialist  fax: 573/884-5070
302 ABNR Bldg E-mail: piercer@missouri.edu
University of Missouri
Columbia, Missouri 65203

EDUCATION

B.S. Southern Arkansas University, Magnolia, AR 71753  1977 Biology-Agriculture
M.S. Mississippi State University, Starkville, MS 1981 Wildlife Ecology
Ph.D. University of Missouri, Columbia, MO 65203  Forestry

POSITIONS

2013 to present: State Extension Fisheries and Wildlife Specialist and Extension Associate Professor, University of Missouri
2001-2013 Extension Assistant Professor and State Extension Fish and Wildlife Specialist, University of Missouri
1989-2001 Extension Instructor and State Extension Fish and Wildlife Specialist University of Missouri
1982-89 County Extension Agent – Agriculture (Lincoln County) and Staff Chairman (Dallas County), University of Arkansas Cooperative Extension Service

SELECTED PUBLICATIONS

VITA

Kwamena K. Quagrainie
Department of Agricultural Economics
Purdue University
403 W. State St., Krannert Building
West Lafayette, IN 47907-2056

Phone: (765) 494-4200
Fax: (765) 494-9176
E-mail: kquagrai@purdue.edu

EDUCATION

B.S.   Agriculture   University of Science and Technology, Ghana
M.S.   Agricultural Economics   University of Alberta, Edmonton, Canada
Ph.D.   Agricultural Economics   2000 University of Alberta, Edmonton, Canada

POSITIONS

2005-Present   Purdue University   Aquaculture Marketing Specialist
2001-2005   University of Arkansas at Pine Bluff   Assistant Professor-Aquaculture Marketing

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Agricultural Economics Association
International Association of Aquaculture Economics and Management
World Aquaculture Society

SELECTED PUBLICATIONS

Christopher Weeks
Michigan State University
Department of Fisheries and Wildlife
East Lansing, Michigan 48824

VITA

Phone: (517) 353-2298
Fax: (517) 353-7198
E-mail: weekschr@msu.edu

EDUCATION

B.S.  Aerospace Engineering  1986  San Diego State University
M.S.  Fisheries and Wildlife: Fish Population Dynamics  1997  Michigan State University
Ph.D.  Fisheries and Wildlife: Aquaculture/Fish Nutrition  2007  Michigan State University

POSITIONS

2014-Present  Michigan State University  Extension Specialist
2008-Present  North Central Regional Aquaculture Center Regional Aquaculture Extension Specialist
2012  University of Alaska  Adjunct Professor
2007-2008  Michigan State University  Research Associate / Specialist
1996-2009  Aquaculture Bioengineering Corp.  Consultant
2003-2007  Michigan State University  Aquatic Animal Health Lab Manager
2002-2007  Michigan State University  Graduate Assistant
2000 – 2001  Stoney Creek Fisheries  Aquaculture Facility Manager
1998 – 2000  Great Black Creek Fish Co.  Hatchery Manager
1989 – 1993  Cade Industries  Engineer
1986 – 1989  McDonnell Douglas  Engineer

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

World Aquaculture Society
National Aquaculture Association
Aquaculture Engineering Society
Michigan Aquaculture Association, President 2003 - 2008

SELECTED PUBLICATIONS