

## REGIONAL AQUACULTURE EXTENSION SPECIALIST (RAES)

**Chairperson:** Christopher T. Weeks, Michigan State University

**Industry Advisory Council Liaison:** William E. Lynch, Jr., Marysville, Ohio

**Extension Liaison:** Kwamena Quagrainie, Purdue University

**Funding Request:** \$124,993

**Duration:** 2 Year (September 1, 2016 - August 31, 2018)

**Objectives:**

1. Continue RAES support to the NCRAC Aquaculture Community through ongoing activities in areas of liaison services, leadership, assessing and addressing industry needs and information transfer.
2. Develop and strengthen partnerships from within the NCR and outside the region among regulatory agencies, industry, academia, and other relevant entities to foster open, meaningful dialog on critical issues and build support for the NCR aquaculture industry.
3. Coordinate efforts for seeking non-NCRAC support for NCR aquaculture development.

**Deliverables:**

1. Open door liaison services to the NCR aquaculture community
2. Serve on 3 or more committees and panels as an industry representative
3. Support for, and interaction with, all NCR state aquaculture associations; attendance at 3 or more state association meetings, regional and/or national conferences per year
4. Direct information exchange to over 500 individuals per year through personal communications and site visits
5. Continue information outlet and topical news on the NCR fish culture list-serve and eXtension Ask-an-Expert
6. Annual updates to the NCRAC regulation website
7. Dialogue and information exchange on policy issues (e.g. Federal Register posts, legislation and regulation)
8. Regional aquaculture needs survey (once every 3 years)
9. Establish partnerships for NCR aquaculture industry development, submitting at least one grant proposal per year as a team member for NCR industry support.
10. Assist the Directors office in strategic planning and project selection protocol effectiveness

**Proposed Budget:**

Institution	Principal Investigator	Objectives	Year 1	Year 2	Total
Michigan State University	Christopher T. Weeks	1 - 3	\$ 61,866	\$ 63,127	\$124,993

**Non-funded Collaborators:**

Institution	Collaborator
Michigan Sea Grant	Ronald E. Kinnunen
Iowa State University	D. Allen Pattillo
University of Minnesota	Nicholas B. D. Phelps

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## **PROJECT SUMMARY**

The Regional Aquaculture Extension Specialist (RAES) project was initiated in 2008 under an overarching goal of advancing commercial aquaculture in the region. RAES initial objectives were to provide leadership and enhance information transfer to the aquaculture industry in the North Central Region (NCR). This work plan builds upon outcomes and achievements of RAES activities to date under expanded objectives. Specifically, the RAES will continue to strive to identify industry needs, work with others to develop and implement strategies to address those needs, provide liaison services to industry sectors, disseminate information to industry, public trust agencies and the general public, and develop and strengthen partnerships for sustainable aquaculture development in the NCR. At present this is a half time appointment for project PI (Weeks), sharing a 50% appointment with Michigan State University Extension.

## **JUSTIFICATION**

World food fish aquaculture production expanded at an average annual rate of 6.2 percent from 2000 to 2012, while US production levels actually dropped over this same time frame (FAO 2015). Value of US aquaculture products, however, rose from \$978 million in 1998 to \$1.1 billion in 2005, and \$1.37 billion in 2013 (USDA 2014). Meanwhile the US seafood deficit has risen from \$7.7 billion in 2005 to \$14.2 billion in 2014, and in 2014 we witnessed a \$2.0 billion increase alone (US Census Bureau 2015), making it possibly the largest increase to the deficit in US history. These data clearly indicate that the US is having difficulty in filling the growing demand for aquaculture production, both domestically and globally.

Aquaculture in the NCR could be characterized as an industry trying to sustain itself over a period of difficult economic and regulatory uncertainties. According to the 2013 Aquaculture Census (USDA 2014), the number of farms in the region has dropped from 417 in 2005, to 336 in 2013, while production value increased from \$35.4 to \$36.7 million. Unfortunately, the number of aquaculture extension personnel in the region has dropped over this time frame, and less than 5 FTE's remain in aquaculture extension across 12 NCR states.

Through a 2014 Aquaculture Needs Survey conducted under the RAES project, respondents identified regulations, feed costs, lack of government support, and finance issues as top impediments hindering industry expansion (Weeks et al. 2014). In another study lead by the RAES, the following action items were deemed necessary for improving aquaculture development in the NCR: 1) gaining social acceptance and political will, 2) streamlined regulations, 3) expanding aquaculture enterprises along supply chain based on proven species, technologies, and markets, 4) sector leadership and strong associations, 5) investment in research, education and outreach, 6) RAS cost reduction and 7) attracting investment to the region (Colyn et al. 2014). Collaboration among current producers, academicians, regulatory authorities, and other relevant entities at local, regional and national levels is a critical aspect of addressing these needs, and a coordinated effort across the region is vitally important. The RAES project has demonstrated the ability to meet these challenges and has been rated as a top priority for additional funding by NCRAC members on each occasion it has been brought forward for consideration.

## **RELATED CURRENT AND PREVIOUS WORK**

The project PI has been active in the role of RAES since 2009. Original objectives were 1) to provide leadership for the aquaculture industry in the NCR, and 2) Enhance information transfer.

Objectives have expanded as the project has carried forward and in 2014-2015 were as follow:

1. Continue RAES support to the NCRAC Aquaculture Community through ongoing activities in areas of liaison services, leadership, assessing and addressing industry needs and information transfer.
2. Develop and implement strategies to address AIS in aquaculture and baitfish in the NCR.

3. Develop and strengthen partnerships from within the NCR and outside the region among regulatory agencies, industry, academia, and other relevant entities to foster open, meaningful dialog on critical issues and build support for the NCR aquaculture industry.
4. Coordinate efforts for seeking non-NCRAC support for NCR aquaculture development.

Outcomes and impacts from the 2014-2015 RAES project are described as follow:

One of the initial projects undertaken by the RAES was the development of the NCRAC Interstate Transport Regulation Website. In that website, Weeks summarizes aquaculture contacts, importation requirements, fish health certification requirements, baitfish regulations and aquaculture facility licensing for the 12 NCR states and 9 adjacent states. The RAES maintains annual updates to the website, and in 2014 it received 4,689 page views.

In 2014-2015 the RAES attended 9 state aquaculture association meetings across the region, gave 10 presentations, 2 keynote addresses (Iowa and Ohio), played a key role in development and facilitation of the 2014 North Central Aquaculture Conference (Toledo, OH), as well as the Great Lakes Netpen Aquaculture Stakeholder Dialogue Meeting (St. Ignace, MI).

Current and/or important information was disseminated by the RAES through the NCR fish culture list serve (140 subscribers) and eXtension Ask-an-Expert. Direct and personal communications are estimated over 500 individuals per year.

The RAES represented industry interests at various private and public forums and has standing appointments to the Committee for the Right to Farm Generally Accepted Agriculture and Management Practices, Michigan Commission of Agriculture; Great Lakes Panel on Aquatic Nuisance Species; Aquaculture in Michigan (AIM), NSF International Global Food Division Advisory Council. In 2014 the RAES was voted into the NCRAC Board as an ex-officio member, working closely with NCRAC Director and others to improve NCRAC's project selection protocols and updating the Strategic Plan.

The RAES also helped to build and strengthen partnerships with a number of other organizations including, Indiana and Michigan Soybean Associations, Soy Aquaculture Alliance, Coalition for U.S. Seafood Production, National Institute for Sustainable Aquaculture, initiative for Ohio Seafood co-op, and private agricultural business startup groups such as Originz. In addition the RAES continues working with nonprofit groups including Aquaculture Research Corporation on Great Lakes open water aquaculture issues, and the Nature Conservancy on aquatic invasive species issues.

The PI has been awarded an additional \$347,000 in grants from non-NCRAC sources over the full term of the RAES project. These include a Michigan Sea Grant Integrated Assessment that produced a strategic plan for Michigan Aquaculture (Colyn et al. 2014), and a current project assessing the feasibility of moving AIS HACCP toward a recognized 3<sup>rd</sup> party verification program. The AIS HACCP project concept originated from a NCRAC meeting and has 3 NCRAC members working together on the project. In the Michigan Aquaculture Strategic plan, open water aquaculture was identified as having high potential for seafood production in the Great Lakes Region. Since release of the plan, there has been a flurry of activity in the state of Michigan and various stakeholder groups over issues pertaining to netpen aquaculture. Moreover, two proposals for commercial production facilities were subsequently submitted to the state for approval. In response the state has been spending major effort at assessing ecological, economic and legal implications of open water aquaculture in the Great Lakes. Reports of the findings from these assessments are expected to be released by the state within 1-2 months.

### **ANTICIPATED BENEFITS**

Since its inception, the RAES project has provided liaison and leadership, program facilitation, worked to identify and address industry needs, streamlined information and technology to industry, voiced industry concerns to regulators and informed aquaculture community members on current issues such as Federal

Register Postings of great importance to the NCR aquaculture Industry. This work plan includes continuing all current responsibilities and building upon previous accomplishments.

Anticipated benefits include:

- Information transfer to the aquaculture community via list serve, websites, state association events and other direct contact methods
- Continued updates on the NCRAC regulation website
- Coordinated regional effort towards industry development
- An industry voice on state, regional and national regulatory issues such as AIS
- Strengthened partnerships for NCR aquaculture development
- Non-NCRAC support (funding and partnerships) for NCR aquaculture sector

Through these achievements progress towards an overarching goal to increase production and improve the business environment for the NCR aquaculture sector should be realized.

## OBJECTIVES

1. Continue RAES support to the NCRAC Aquaculture Community through ongoing activities in areas of liaison services, leadership, assessing and addressing industry needs and information transfer.
2. Develop and strengthen partnerships from within the NCR and outside the region among regulatory agencies, industry, academia, and other relevant entities to foster open, meaningful dialog on critical issues and build support for the NCR aquaculture industry.
3. Coordinate efforts for seeking non-NCRAC support for NCR aquaculture development.

## PROCEDURES

### RAES Program Design Plan

The RAES project team consists of the Principal Investigator (PI), three non-funded project collaborators, a NCRAC Industry Advisory Council Liaison, and a NCRAC Extension Liaison. While NCRAC funded projects typically involve active participation by extension and research groups residing within two or more states in the NCR, the project team feels the RAES program is well suited for committee oversight of a single full time extension specialist to achieve RAES plan objectives. The PI, then, will fill a 50% RAES role, with oversight aided by other team members and the NCRAC Director. The RAES will provide status updates and facilitate teleconferences as needed. Decisions necessary for project planning will be by team consensus or by vote if the need arises.

### **Continue RAES Support to the NCR Aquaculture Community through Ongoing Activities in Areas of Liaison Services, Leadership, Assessing and Addressing Industry Needs and Information Transfer (Objective 1)**

The following RAES extension activities will continue under this 2016 - 2018 work plan:

- a) Project PI will continue to actively provide leadership and liaison services to the NCR aquaculture community as necessary to carry forward industry interests. The RAES shall maintain an open-door communication policy and be available via e-mail and telephone (land and cell lines) on a daily basis.
- b) Project PI will continue to support the NCR aquaculture industry through meetings, speaking opportunities and committee representation (examples: National Institute for Animal Agriculture, Great Lakes Panel for Aquatic Nuisance Species Task Force, NSF Food Division Advisory Council, Regulatory/Seafood sector).

- c) Project PI will continue to maintain and update the NCRAC Transportation Regulations, and Approved Aquatic Species website (<http://www.ncrac.org/Info/StateImportRegs/stateregsmain.htm>).
- d) The RAES will continue to help facilitate workshops across the region to the NCR aquaculture community (example: coordination role in partnership conference with NCRAC and Wisconsin aquaculture association scheduled for March 12-13, 2016, Milwaukee, WI).
- e) PI will continue to work with Director /appointees for facilitation of planning sessions to identify strengths and weaknesses in regional coordination and collaboration, and develop a strategies for improvement.
- f) PI will support the Director in assessment of the NCRAC Strategic Plan (NCRAC 1999) for topical relevance and potential update
- g) PI will attend state association meeting for each state within the NCR with active aquaculture associations and/or site visits with industry members across all NCR states to the greatest possible extent.

**Develop and strengthen partnerships from within the NCR and outside the region among regulatory agencies, industry, academia, and other relevant entities to foster open, meaningful dialog on critical issues and build support for the NCR aquaculture industry. (Objective 2)**

Over the span of the RAES project, the PI has developed working relationships across the NCR aquaculture community. This work plan is intended to strengthen existing ties and strives to build new partnerships for the purpose of achieving common goals that benefit from increased fish production.

- a) PI will obtain voting memberships within World Aquaculture and US Aquaculture Societies, the National Aquaculture Association, Michigan Farm Bureau, and Farm Bureau Aquaculture Advisory Committee providing special approval is granted by Michigan State University (MSU) for a portion of the dues of these programs (MSU policy does not allow for payment of membership dues unless special permission is obtained; PI is asking for \$300 maximum to pay a portion of these dues).
- b) PI will continue to serve on committees and panels of importance to regional/national industry development such as the Great Lakes Panel for Aquatic Nuisance Species, Farm Bureau, NSFI Food Division Advisory Council, and various funding review panels.
- c) PI will seek to develop partnerships among other agricultural commodity organizations (e.g., national and state soybean councils), aquatic animal health groups, and state, federal and tribal agencies, both inside and outside the NCR.
- d) PI will attempt to engage and interact with environmental groups to the extent possible.

**Coordinate efforts for seeking non-NCRAC support for NCR aquaculture development. (Objective 3)**

Objective 3 focuses on utilizing opportunities (e.g., funding) and partnerships (Objective 2) from non-NCRAC sources for regional industry development.

- a) In 2016 through project continuation, the PI will seek non-NCRAC support including, but not limited to, grant solicitations, requests for proposals, and commercial agriculture developmental and marketing programs.
- b) PI will work to form coalitions with common objectives to pursue and obtain non-NCRAC support for NCR aquaculture development.
- c) PI will provide support necessary in order to form teams and submit one or more grant application over the 2016-2018 project period for NCR industry development from a non-NCRAC source.

## PROJECT DELIVERABLES

1. Open door liaison services to the NCR aquaculture community
2. Serve on 3 or more committees and panels as an industry representative
3. Support for, and interaction with, all NCR state aquaculture associations; attendance at 3 or more state association meetings, regional and/or national conferences per year
4. Direct information exchange to over 500 individuals per year through personal communications and site visits
5. Continue information outlet and topical news on the NCR fish culture list-serve and eXtension Ask-an-Expert
6. Annual updates to the NCRAC regulation website
7. Dialogue and information exchange on policy issues (e.g. Federal Register posts, legislation and regulation)
8. Regional aquaculture needs survey (once every 3 years)
9. Establish partnerships for NCR aquaculture industry development, submitting at least one grant proposal per year as a team member for NCR industry support.
10. Assist the Directors office in strategic planning and project selection protocol effectiveness

## FACILITIES

MSU – Land Grant College; Agriculture Experiment Station; Director office of MSU Extension; close proximity to Ohio, Indiana, Illinois.

MSU Sea Grant Upper Peninsula of Michigan; close proximity to Wisconsin and Minnesota.

ISU – ISU extension; aquaculture research facilities for walleye, golden shiner, bluegill, yellow perch and largemouth bass; close proximity to South Dakota, Nebraska, Kansas, Illinois, Wisconsin.

University of Minnesota, College of Veterinary Medicine, St. Paul, MN 55108

## REFERENCES

Colyn, J., G. Boersen, B. Knudsen and C.T.Weeks (ed). 2014. A strategic plan for a thriving and sustainable Michigan aquaculture; Michigan Sea Grant Integrated Assessment Final Report. Michigan Sea Grant, Ann Arbor, MI. Available at: [http://www.miseagrant.umich.edu/wp-content/blogs.dir/1/files/2012/09/2014-MAA-Strategic-Plan\\_Final\\_141215.pdf](http://www.miseagrant.umich.edu/wp-content/blogs.dir/1/files/2012/09/2014-MAA-Strategic-Plan_Final_141215.pdf)

FAO. 2015. The state of world fisheries and agriculture 2014. Food and Agricultural Organization of the United Nations. Rome, Italy. Available at: <http://www.fao.org/fishery/sofia/en>

USDA (U.S. Department of Agriculture). 2014. Census of Aquaculture (2013). Volume 3, Special Studies, Part 2, AC-12-SS-2. USDA, Washington, D.C. Available at: [http://www.agcensus.usda.gov/Publications/Census\\_of\\_Aquaculture/](http://www.agcensus.usda.gov/Publications/Census_of_Aquaculture/)

US Census Bureau. 2015. Foreign Trade. Available at: <http://www.census.gov/foreign-trade/statistics/country/>

Weeks, C.T., J. Morris and W. Lynch. 2014. An on-line survey to identify impediments and priorities across stakeholders of the aquaculture industry in the North Central Region of the U.S. (unpublished).

## PROJECT LEADERS

<u>State</u>	<u>Name/Institution</u>	<u>Area of Specialization</u>
Iowa	D. Allen Pattillo Iowa State University	Fish culture, water quality, fisheries, regional extension
Michigan	Christopher T. Weeks – Lead PI Michigan State University	Aquaculture facility design, fish culture, aquaculture extension, fish health, baitfish, regulations
	Ronald E. Kinnunen Michigan State University Michigan Sea Grant	Fish culture, Hazardous Analysis and Critical Control Point (HACCP), aquaculture and baitfish extension
Minnesota	Nicholas B. D. Phelps College of Veterinary Medicine University of Minnesota	Fisheries research and extension AFS-FHS Fish Health Inspector, aquaculture, baitfish, aquatic Invasive species

DRAFT



UNITED STATES DEPARTMENT OF AGRICULTURE  
COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

OMB Approved 0524-0039  
Expires 03/31/2004

**BUDGET**

ORGANIZATION AND ADDRESS Michigan State University Dept. of Fisheries & Wildlife, 13 Natural Resources, East Lansing, MI 48824				<b>USDA AWARD NO.</b> Year 1: Objectives 1-4			
PROJECT DIRECTOR(S) Christopher T. Weeks				Duration Proposed Months: <u>12</u>	Duration Proposed Months: _____	Non-Federal Proposed Cost-Sharing/Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)
<b>A. Salaries and Wages</b>				<b>CSREES FUNDED WORK MONTHS</b>			
1. No. of Senior Personnel				Calendar	Academic	Summer	
a. ___ (Co)-PD(s) .....							
b. ___ Senior Associates .....							
2. No. of Other Personnel (Non-Faculty)							
a. ___ Research Associates-Postdoctorates . . .							
b. <u>1</u> Other Professionals .....				6			\$39,196
c. ___ Paraprofessionals .....							
d. ___ Graduate Students .....							
e. ___ Prebaccalaureate Students.....							
f. ___ Secretarial-Clerical .....							
g. ___ Technical, Shop and Other .....							
<b>Total Salaries and Wages</b> ..... <input type="checkbox"/>							\$39,196
<b>B. Fringe Benefits</b> (If charged as Direct Costs)							\$14,020
<b>C. Total Salaries, Wages, and Fringe Benefits (A plus B)</b> ..... <input type="checkbox"/>							\$53,216
<b>D. Nonexpendable Equipment</b> (Attach supporting data. List items and dollar amounts for each item.)							
<b>E. Materials and Supplies</b>							\$250
<b>F. Travel</b>							\$4,800
<b>G. Publication Costs/Page Charges</b>							
<b>H. Computer (ADPE) Costs</b>							
<b>I. Student Assistance/Support</b> (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)							
<b>J. All Other Direct Costs</b> (In budget narrative, list items and dollar amounts and provide supporting data for each item.)							\$3,600
<b>K. Total Direct Costs (C through I)</b> ..... <input type="checkbox"/>							\$61,866
<b>L. F&amp;A/Indirect Costs.</b> (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.)							
<b>M. Total Direct and F&amp;A/Indirect Costs (J plus K)</b> ..... <input type="checkbox"/>							
<b>N. Other</b> ..... <input type="checkbox"/>							
<b>O. Total Amount of This Request</b> ..... <input type="checkbox"/>							\$61,866
<b>P. Carryover -- (If Applicable)</b> .....				Federal Funds: \$	Non-Federal funds: \$	Total \$	
<b>Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)</b>							
Cash (both Applicant and Third Party) ..... <input type="checkbox"/>							
Non-Cash Contributions (both Applicant and Third Party) ..... <input type="checkbox"/>							
<b>NAME AND TITLE</b> (Type or print)				<b>SIGNATURE</b> (required for revised budget only)			<b>DATE</b>
<b>Project Director</b>							
<b>Authorized Organizational Representative</b>							
<b>Signature (for optional use)</b>							

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.

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COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

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**BUDGET**

ORGANIZATION AND ADDRESS Michigan State University Dept. of Fisheries & Wildlife, 13 Natural Resources, East Lansing, MI 48824				<b>USDA AWARD NO.</b> Year 2: Objectives 1-3			
PROJECT DIRECTOR(S) Christopher T. Weeks				Duration Proposed Months: <u>12</u>	Duration Proposed Months: ____	Non-Federal Proposed Cost-Sharing/Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)
<b>A. Salaries and Wages</b>				<b>CSREES FUNDED WORK MONTHS</b>			
1. No. of Senior Personnel				Calendar	Academic	Summer	
a. ____ (Co)-PD(s) .....							
b. ____ Senior Associates .....							
2. No. of Other Personnel (Non-Faculty)							
a. ____ Research Associates-Postdoctorates . . .							
b. <u>1</u> Other Professionals .....				6			\$39,980
c. ____ Paraprofessionals .....							
d. ____ Graduate Students .....							
e. ____ Prebaccalaureate Students.....							
f. ____ Secretarial-Clerical .....							
g. ____ Technical, Shop and Other .....							
<b>Total Salaries and Wages</b> ..... <input type="checkbox"/>							\$39,980
<b>B. Fringe Benefits</b> (If charged as Direct Costs)							\$14,497
<b>C. Total Salaries, Wages, and Fringe Benefits (A plus B)</b> ..... <input type="checkbox"/>							\$54,477
<b>D. Nonexpendable Equipment</b> (Attach supporting data. List items and dollar amounts for each item.)							
<b>E. Materials and Supplies</b>							\$250
<b>F. Travel</b>							\$4,800
<b>G. Publication Costs/Page Charges</b>							
<b>H. Computer (ADPE) Costs</b>							
<b>I. Student Assistance/Support</b> (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)							
<b>J. All Other Direct Costs</b> (In budget narrative, list items and dollar amounts and provide supporting data for each item.)							\$3,600
<b>K. Total Direct Costs (C through I)</b> ..... <input type="checkbox"/>							\$63,127
<b>L. F&amp;A/Indirect Costs.</b> (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.)							
<b>M. Total Direct and F&amp;A/Indirect Costs (J plus K)</b> ..... <input type="checkbox"/>							
<b>N. Other</b> ..... <input type="checkbox"/>							
<b>O. Total Amount of This Request</b> ..... <input type="checkbox"/>							\$63,127
<b>P. Carryover -- (If Applicable)</b> .....				Federal Funds: \$	Non-Federal funds: \$	Total \$	
<b>Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)</b>							
Cash (both Applicant and Third Party) ..... <input type="checkbox"/>							
Non-Cash Contributions (both Applicant and Third Party) ..... <input type="checkbox"/>							
<b>NAME AND TITLE</b> (Type or print)				<b>SIGNATURE</b> (required for revised budget only)			<b>DATE</b>
<b>Project Director</b>							
<b>Authorized Organizational Representative</b>							
<b>Signature (for optional use)</b>							

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.

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**BUDGET**

ORGANIZATION AND ADDRESS Michigan State University Dept. of Fisheries & Wildlife, 13 Natural Resources, East Lansing, MI 48824				<b>USDA AWARD NO.</b> Year 1 and 2: Objectives 1-3				
PROJECT DIRECTOR(S) Christopher T. Weeks				Duration Proposed Months: <u>24</u>	Duration Proposed Months: _____	Non-Federal Proposed Cost-Sharing/Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)	
<b>A. Salaries and Wages</b>				<b>CSREES FUNDED WORK MONTHS</b>				
1. No. of Senior Personnel				Calendar	Academic	Summer		
a. ___ (Co)-PD(s) .....								
b. ___ Senior Associates .....								
2. No. of Other Personnel (Non-Faculty)								
a. ___ Research Associates-Postdoctorates . . .								
b. <u>1</u> Other Professionals .....				12			\$79,176	
c. ___ Paraprofessionals .....								
d. ___ Graduate Students .....								
e. ___ Prebaccalaureate Students.....								
f. ___ Secretarial-Clerical .....								
g. ___ Technical, Shop and Other .....								
<b>Total Salaries and Wages</b> ..... <input type="checkbox"/>							\$79,176	
<b>B. Fringe Benefits</b> (If charged as Direct Costs)							\$28,517	
<b>C. Total Salaries, Wages, and Fringe Benefits (A plus B)</b> ..... <input type="checkbox"/>							\$107,693	
<b>D. Nonexpendable Equipment</b> (Attach supporting data. List items and dollar amounts for each item.)								
<b>E. Materials and Supplies</b>							\$500	
<b>F. Travel</b>							\$9,600	
<b>G. Publication Costs/Page Charges</b>								
<b>H. Computer (ADPE) Costs</b>								
<b>I. Student Assistance/Support</b> (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)								
<b>J. All Other Direct Costs</b> (In budget narrative, list items and dollar amounts and provide supporting data for each item.)							\$7,200	
<b>K. Total Direct Costs (C through I)</b> ..... <input type="checkbox"/>							\$124,993	
<b>L. F&amp;A/Indirect Costs.</b> (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.)								
<b>M. Total Direct and F&amp;A/Indirect Costs (J plus K)</b> ..... <input type="checkbox"/>								
<b>N. Other</b> ..... <input type="checkbox"/>								
<b>O. Total Amount of This Request</b> ..... <input type="checkbox"/>							\$124,993	
<b>P. Carryover -- (If Applicable)</b> .....				<b>Federal Funds: \$</b>	<b>Non-Federal funds: \$</b>	<b>Total \$</b>		
<b>Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)</b>								
Cash (both Applicant and Third Party) ..... <input type="checkbox"/>								
Non-Cash Contributions (both Applicant and Third Party) ..... <input type="checkbox"/>								
<b>NAME AND TITLE</b> (Type or print)				<b>SIGNATURE</b> (required for revised budget only)				<b>DATE</b>
<b>Project Director</b>								
<b>Authorized Organizational Representative</b>								
<b>Signature (for optional use)</b>								

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.

**Michigan State University  
Budget Explanation  
(Weeks)**

Funds requested: \$124,993

Grant Period: 9/1/16 - 8/31/18

**Grant Title: Regional Aquaculture Extension Specialist**

**Objectives 1-3**

**Salaries and Wages (\$79,176).**

Salary is requested for 0.5 FTE (6 calendar months) for PI Weeks in Year 1 (\$39,196), and Year 2 (\$39,980), for capacity as Regional Aquaculture Extension Specialist.

**Fringe Benefits (\$28,517).** Year 1 at 35.77% (\$14,020), Year 2 at 36.26% (\$14,497).

**Materials and Supplies (\$500).** General office and workshop supplies and materials (\$250/yr).

**Travel (\$9,600).** Years 1 and 2 (per year basis): travel, lodging, and meals for PI to attend up to 3 state aquaculture association/development meetings (\$900\*3), NCRAC Annual Program Planning Meeting (\$900), 1-3 regional meetings in representation of NCR industry members (\$500), and partial (50%) to attend National Aquaculture conferences and meetings (\$700).

**All Other Direct Costs (\$7,200).** Cell phone and office phone service (\$1,100/yr); membership fees for RAES to maintain memberships with organizations important for aquaculture development (\$300/yr), workshops and/or meeting facilitation (\$700/yr), and travel, lodging, and meals for outside speakers and/or attendees to attend meetings or conferences (\$1,500/yr).

## **SCHEDULE FOR COMPLETION OF OBJECTIVES**

All objectives (1-4) will be initiated sometime during the current RAES project period (2016-2018), and the deliverables will be made available to the NCR aquaculture community by the project completion date of 8/31/2018.

### **PARTICIPATING INSTITUTIONS AND PRINCIPAL INVESTIGATORS**

**Iowa State University**

D. Allen Pattillo

**Michigan State University**

Ronald E. Kinnunen

Christopher T. Weeks – Lead PI

**University of Minnesota**

Nicholas B. D. Phelps

DRAFT

## VITA

Christopher T. Weeks  
Department of Fisheries and Wildlife  
Michigan State University  
13 Natural Resources Building  
East Lansing, Michigan 48824

Phone: (517) 745-8840  
Fax: (517) 745-1562  
E-mail: weekschr@msu.edu

### EDUCATION

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

### POSITIONS

Regional Aquaculture Extension Specialist, NCRAC and Ohio State University (March 2008 – Present)  
Consultant, Aquaculture Bioengineering Corp., Rives Junction, Michigan (October 2001–2009, June 1996–May 1998)  
Research Associate, Michigan State University Department of Fisheries and Wildlife (January 2007 – March 2008)  
Lab Manager, Michigan State University Aquatic Animal Health Lab (October 2003 – January 2007)  
Aquaculture Facility Manager, Stoney Creek Fisheries, Harrietta, Michigan (August 2000 – October 2001)  
Hatchery Manager, Great Black Creek Fish Co., Black Creek, Wisconsin (May 1998 – August 2000)  
Cade Industries, Engineer, San Diego, California; Lansing, Michigan (January 1989 – February 1993)

### SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

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

### SELECTED PUBLICATIONS

- Colyn, J., G. Boersen, B. Knudsen and C.T.Weeks (ed). 2014. A strategic plan for a thriving and sustainable Michigan aquaculture; Michigan Sea Grant Integrated Assessment Final Report. Michigan Sea Grant, Ann Arbor, MI. Available at: [http://www.miseagrant.umich.edu/wp-content/blogs.dir/1/files/2012/09/2014-MAA-Strategic-Plan\\_Final\\_141215.pdf](http://www.miseagrant.umich.edu/wp-content/blogs.dir/1/files/2012/09/2014-MAA-Strategic-Plan_Final_141215.pdf)
- Weeks C.T. 2013. Sustainable aquaculture in the North Central Region US - A review of perceptions and recommendations from the aquaculture community. Journal of Extension v51 no.2 - 2COM1.
- Weeks C.T., R. Kim, M. Wolgamod, G. Whelan and M. Faisal. 2011. Experimental infection studies demonstrate the high susceptibility of the salmonid, lake herring (*Coregonus artedii*), to the Great Lakes strain of viral hemorrhagic septicemia virus (Genotype IVb). Journal of Fish Disease.
- Weeks, C.T., D. Garling, F.T. Barrows, and M. Faisal. 2010. The effect of feeding varying levels of soybean meal in high-nutrient-density diets on growth performance and body composition of juvenile Atlantic salmon. North American Journal of Aquaculture 72(4):279-289.
- Westers, H., and C.T. Weeks. 2003. Determining annual production capabilities for sequential rearing programs through use of routine fish culture data. North American Journal of Aquaculture 65:269-277.

## 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  
M.S. Michigan State University, 1979  
Ph.D. Michigan Technological University, 1997

### POSITIONS

Michigan Sea Grant Extension Agent (1982-present), Upper Peninsula, Michigan State University  
Fisheries Pathologist (1981), Rangen Research Laboratory, Hagerman, Idaho  
Fisheries Biologist (1979-1980), U.S. Fish and Wildlife Service, Leetown, West Virginia

### SCIENTIFIC and PROFESSIONAL ORGANIZATIONS

American Fisheries Society, Salmonid Section  
International Association for Great Lakes Research  
Alliance for Marine Remote Sensing

### SELECTED PUBLICATIONS

Kinnunen, R.E., M.C. Gould, and P. Cambier. 2005. Composting commercial fish processing waste from fish caught in the Michigan waters of the Great Lakes. Michigan State University Technical Bulletin. East Lansing, Michigan.

Pangle, K.L., T.M. Sutton, R.E. Kinnunen, and M.H. Hoff. 2005. Effects of body size, condition, and lipid content on the survival of juvenile lake herring during rapid cooling events. Journal of Great Lakes Research 31:360-366.

Pangle, K.L., T.M. Sutton, R.E. Kinnunen, and M.H. Hoff. 2004. Overwinter survival of juvenile lake herring in relation to body size, physiological condition, energy stores, and food ration. Transactions of the American Fisheries Society 133(5):1235-1246.

Hinshaw, J.M., G. Fornshell, and R.E. Kinnunen. 2004. A profile of the aquaculture of trout in the United States. Report for USDA Risk Management Agency, Federal Crop Insurance Corporation, through Mississippi State University, Starkville, Mississippi.

Kinnunen, R.E., editor. 2002. Environmental Strategies for Aquaculture Symposium Proceedings (December 2000). 62<sup>nd</sup> Midwest Fish and Wildlife Conference, Minneapolis, Minnesota. NCRAC CD Series #101, NCRAC Publications Office, Iowa State University, Ames, Iowa.

Gunderson, J.L., and R.E. Kinnunen. 2001. Aquatic nuisance species-Hazard analysis and critical control point training curriculum. Michigan Sea Grant Publication No. MSG-00-400.

Kinnunen, R.E. 2000. A white paper on the status and needs of salmonid aquaculture in the North Central Region. North Central Regional Aquaculture Center. Michigan State University, East Lansing, Michigan.

## VITA

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

Phone: (515) 294-8616  
Fax: (515) 294-2995  
E-mail: pattillo@iastate.edu

### EDUCATION

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

### POSITIONS

Aquaculture Extension Specialist III, Natural Resource Ecology and Management, Iowa State University, 2011-present  
Graduate Research Assistant, Department of Fisheries and Allied Aquacultures, Auburn University, 2008-2010  
Aquarium Technician, Department of Marine Sciences, University of Georgia, 2007-2008  
Fisheries Technician, Warnell School of Forestry and Natural Resources, University of Georgia, 2007-2008

### SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Fisheries Society  
World Aquaculture Society  
United States Aquaculture Society  
International Association of Astacology  
Xi Sigma Pi

### SELECTED PUBLICATIONS

- Pattillo, D. A. , C. E. Hicks, J. E. Wetzel, P. B. Brown, R. A. Rode, J. E. Morris. *In Prep.* Evaluation of the Newly-Developed, Least-Cost Experimental Diet for Bluegill at Commercial Densities.
- Pattillo, D. A. and J. A. Stoeckel. *In Review.* The effectiveness of AQUI-S™ and temperature manipulation for anesthetizing juvenile redclaw crayfish (*C. quadricarinatus*). *Aquaculture*.
- Pattillo, D. A. and J. A. Stoeckel. *In Prep.* The effectiveness of androgenic gland ablation for the sex reversal of juvenile male redclaw crayfish (*C. quadricarinatus*).
- Pattillo, D. A. and J. A. Stoeckel. *In Prep.* Potential escapement effects of the Australian redclaw crayfish (*Cherax quadricarinatus*), on a common crayfish species, (*Procambarus acutissimus*) in the Southeastern United States.



## VITA

Nicholas B. D. Phelps

University of Minnesota, Department of Veterinary Population Medicine

1333 Gortner Ave, St. Paul, MN 55108

Ph:612-624-7450

Fx: 612-624-8707

Email:phelp083@umn.edu

### Education:

Bemidji State University Aquatic Biology

BS 2005

University of Arkansas at Pine Bluff Aquaculture/Fisheries

MS 2007

University of Minnesota Veterinary Medicine

PhD 2012

### Professional experience:

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

### Selected funded grants:

- 2013-2018. An aquatic invasive species research center. MN Environment and Natural Resources Trust Fund. Role: Co-PI. \$8,724,628
- 2013-2016. Developing eradication tools for invasive carp species. MN Environment and Natural Resources Trust Fund. Role: PI. \$335,225.
- 2011-2013. Characterization of microbial community in fish for the development of probiotics. US Dept of Agriculture, North Central Regional Aquaculture Center. Role: Co-PI. \$240,000.
- 2009-2011. Preparing Minnesota for the viral hemorrhagic septicemia virus in fish. Minnesota Rapid Agricultural Response Fund. Role: PI. \$100,000.

### Selected publications:

- Phelps, N.B., Pelican, K., Goyal, S., Craft, M., and D. Travis. In press. Risk-based management of viral hemorrhagic septicemia virus (VHSV-IVb) in Minnesota. *North American Journal of Fisheries Management*.
- Phelps, N., S. Mor, A. Armien, W. Batts, A. Goodwin, L. Hopper, R. McCann, T. Ng, C. Puzach, T. Waltzek, E. Delart, J. Winton, S. Goyal. In press. Characterization of the novel fathead minnow picornavirus. *PlosOne*.
- Phelps, N., A. Goodwin, E. Marecaux, S. Goyal. 2013. Comparison of treatments to inactivate viral hemorrhagic septicemia virus in frozen baitfish. *Diseases of Aquatic Organisms* 102:211-216.
- Phelps, N., A. Armien, S. Mor, S. Goyal, J. Warg, R. Bhagyam, T. Monahan. 2012. Spring viremia of carp virus in the Minnehaha Creek, Minnesota. *Journal of Aquatic Animal Health* 24:232-237.

## Logic Model - RAES (2016-2018)

Activities	Outputs	Outcomes	Impacts
<p><i>In order to address needs of the NCR aquaculture industry, we will accomplish the following activities (e.g., data synthesis or committee formation):</i></p>	<p><i>The planned activities will produce the following specific deliverables (e.g., results, reports, maps, training, workshops):</i></p>	<p><i>We expect that the planned activities will lead to the following short-term changes (measurable or observable, within the grant period):</i></p>	<p><i>We expect that this project will lead to the following longer term changes (measurable or observable, 1-5 years after project ends):</i></p>
<p><b>Objective 1</b> Provide leadership and liaison services to the aquaculture community;</p> <p>Support the NCR aquaculture industry through presentations, attending state aquaculture association meetings, site visits and standing committees;</p> <p>Disseminate pertinent information on the NCR Fish Culture list serve and Ask-an-Expert (eXtension);</p> <p>Maintain and update the NCRAC Regulation and Approved Aquatic Species website;</p> <p>Help facilitate workshops and conferences for the NCR aquaculture community;</p> <p>Facilitate strategic planning sessions for regional coordination and collaboration;</p>	<p>Serve on 3 or more committees and panels as an industry representative; Continual effort towards establishing fair and effective policy; Problem resolution on case by case basis; Provide a voice for NCR industry interests and concerns for sustainable aquaculture development in the NCR;</p> <p>Attend at 3 or more state association meetings, regional and/or national conferences per year; Provide presentations and form dialogue opportunities on important issues; Direct information exchange to over 500 individuals per year through personal communications and site visits;</p> <p>Dialogue and information exchange on policy issues (e.g. Federal Register posts, legislation and regulation);</p> <p>Annual updates to the NCRAC regulation website;</p> <p>Regional aquaculture needs survey (once every 3 years);</p>	<p>Increasing awareness by regulators and environmental groups of industry concerns regarding commerce, legal and environmental issues; Increase industry sector involvement in policy making;</p> <p>Improved communication between industry and regulators; Postings by the NCR aquaculture community to the Federal Register, letters to legislators, etc.</p> <p>Improved public awareness of sustainable aquaculture across stakeholders;</p> <p>Signs of improvement in the working environment for current producers;</p> <p>Improved awareness of interstate transfer regulations and legal issues regarding live aquatic animals (measurable by website access count).</p> <p>Improvements to the project selection process and strategic plan for NCRAC.</p>	<p>Improved working environment for current producers;</p> <p>Better understanding of how to lower the risks associated with aquaculture business ventures; Increases in aquaculture production and value in the NCR.</p>

<p>Work with Director in assessment of NCRAC Strategic Plan (NCRAC 1999);</p>	<p>Steering committee role for the 2018 North central Aquaculture Conference; Assist in at one least additional workshop, meeting or conference per year;</p> <p>Updates to NCRAC Strategic Plan as determined through Director's office.</p>		
<p><b>Activities</b></p>	<p><b>Outputs</b></p>	<p><b>Outcomes</b></p>	<p><b>Impacts</b></p>
<p><u>Objective 2</u>  RAES will obtain/continue voting memberships and seek partnership opportunities with groups such as World and US Aquaculture Societies, the National Aquaculture Association, Michigan Farm Bureau, and Farm Bureau Aquaculture Advisory Committee;</p> <p>RAES will serve as an industry representative on panels such as Great Lakes Panel for Aquatic Nuisance Species, aquaculture related certification committees, and various funding review panels;</p> <p>Actively seek partnerships and project collaboration among other agricultural commodity organizations;</p> <p>PI will engage and interact with environmental groups and other stakeholders on important issues regarding sustainable aquaculture development;</p>	<p>Represent NCR aquaculture industry sector interests within other organizations, at meetings, and in dialogue opportunities;</p> <p>Represent NCR aquaculture industry sector and interests within policy decision groups, at meetings, and in dialogue opportunities;</p> <p>2 or more new or strengthened partnerships with common interests towards NCR aquaculture development per year;</p>	<p>Better understanding by state regional and national organizations of NCR aquaculture interests and needs.</p> <p>An increased number of coalitions and partnerships for NCR aquaculture industry development.</p>	<p>A much broader and improved support network for NCR aquaculture development.</p>

Activities	Outputs	Outcomes	Impacts
<u>Objective 3</u> Seek NCR industry support from non-NCRCAC entities;	Submission of at least 2 grant proposals for NCR industry support in 2016-2018 by a team of researchers, extension personnel and project collaborators;	NCR aquaculture industry development project(s) from non-NCRCAC sources;  Conduct extension work or research with high probability for positive impact on NCR aquaculture;	Commercial application of R&D and/or outreach information arising from non-NCRCAC support.  Increases in aquaculture production and value in the NCR.

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