

REGIONAL AQUACULTURE EXTENSION SPECIALIST (RAES)

Principal Investigator: Christopher T. Weeks, Michigan State University

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

Extension Liaison: Kwamena Quagrainie, Purdue University

Funding Request: \$196,612

Duration: 2 Years (September 1, 2011 - August 31, 2013)

Objectives:

1. 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.
2. Develop and implement strategies to address and promote aquaculture sustainability 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.
5. Examine regional aquaculture development and assess NCRAC research and extension activities in terms of impacts on the NCR aquaculture industry. Make recommendations for improving NCRAC projects in terms of incorporating measures of program success.

Proposed Budget:

Institution	Principal Investigator	Objectives	Year 1	Year 2	Total
Michigan State University	Christopher T. Weeks	1 - 5	\$96,770	\$99,842	\$196,612
Totals			\$96,770	\$99,842	\$196,612

Non-funded Collaborators:

Institution	Collaborator
Michigan Sea Grant	Ronald E. Kinnunen
Iowa State University	Joseph E. Morris

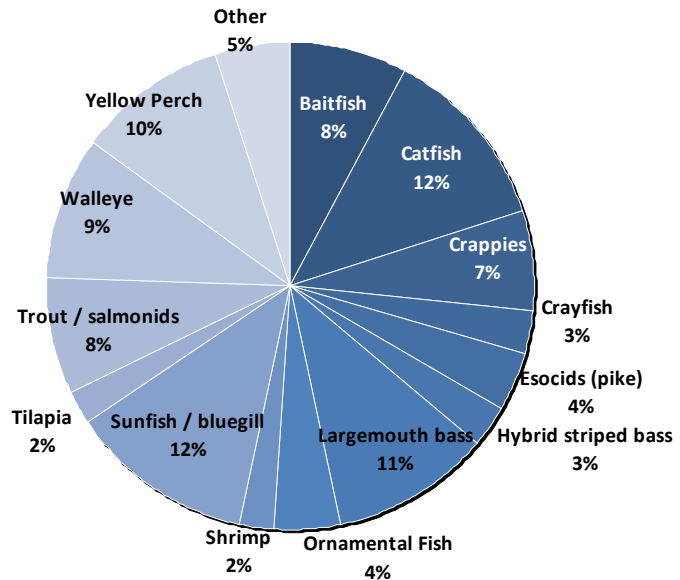
TABLE OF CONTENTS

SUMMARY OVERVIEW (PARTICIPANTS, OBJECTIVES, AND PROPOSED BUDGET).....	1
JUSTIFICATION	3
RELATED CURRENT AND PREVIOUS WORK	5
ANTICIPATED BENEFITS.....	6
OBJECTIVES.....	7
PROCEDURES.....	7
FACILITIES	10
REFERENCES.....	10
BUDGET	
BUDGET AND BUDGET EXPLANATION.....	12
Michigan State University (Weeks – Objectives 1-5).....	12
SCHEDULE FOR COMPLETION OF OBJECTIVES	15
CURRICULUM VITA FOR PRINCIPAL INVESTIGATOR	16

JUSTIFICATION

The North Central Region (NCR) is comprised of 12 Midwest states and covers a large geographic area with varying climates. Aquaculture in the region is quite diverse. Over 50 different cold, cool, and warm water aquatic animal species are raised in the NCR using a variety of production systems including pond, flow-through, and recirculation. General species and groups of aquaculture products raised in the region are provided in Figure 1 (Weeks and Lynch 2009).

Figure 1. Percent of general aquaculture products raised in the North Central Region.
Source: 2009 NCR Aquaculture Industry Survey (Weeks and Lvnch 2009).



Currently, U.S. Department of Agriculture census data is one of the few economic indicators available to help evaluate aquaculture development program success. In 2005, 416 facilities in the NCR reported sales of \$35 million, which is a 26% increase over 1998 production values (USDA 2007). In 2007, 1,075 aquaculture farms in the region produced a value of \$57.6 million; however, this data included state and federal hatchery production value equivalences of fish stocked into the wild (USDA 2009).

The NCR aquaculture industry may be at a critical point in terms of progress and development. In 2005, food fish production made up 37% of NCR total aquaculture sales, baitfish 28%, and sport fish 12% (USDA 2007). Missouri led NCR food fish production with 35% of total value in 2005 (USDA 2009). From 1998 – 2005, Minnesota, Ohio, and Wisconsin appeared to be gaining substantial ground in terms of increased farm registrations and production. When 2007 data is included, Minnesota production (in value), comprised predominately of baitfish and sport fish, looks to have peaked, while fish production in Missouri and Illinois are now in decline. It appears that the NCR aquaculture community, which has been historically tied to baitfish and sport fish production, is making strides to increase food fish production but facing many challenges along the way.

On a national scale, production of traditional aquaculture species (e.g., catfish and trout) has been repressed over the past several years. According to U.S. trade data, the national seafood deficit in 2009 was \$9.2 billion (USDA Global Agricultural Trade System 2010). This could be viewed as mixed news for U.S. aquaculture. While the deficit has increased substantially over the past few decades, increasing demand for imports indicates that the U.S. seafood industry has a potentially large market share opportunity. Identifying specific constraints facing the industry is an important initial step for expanding U.S. production. The following constraints appear to be hindering NCR aquaculture industry development:

- Uncertainty and confusion in the NCR aquaculture regulatory environment
- Need for expansion of training and education opportunities
 - K-12 and higher education

- Outreach and extension
 - Industry
 - Public awareness
- A shortage or underutilization of existing/future political support
- Few if any financial opportunities
 - Assistance in lending opportunities
- Shortage or underutilization of effective partnerships

Imposed regulations arising from the discovery of Viral Hemorrhagic Septicemia (VHS) in the Great Lakes region has had a major impact on fish production across the NCR. Regulatory control of the U.S. aquaculture industry is often divided between state agricultural and environmental protection agencies. Complicating matters further is the point that nearly all states have independently established sets of non-uniform regulations for controlling live aquatic animal movement and stocking. Moreover, the U.S. Department of Agriculture's Plant and Animal Inspection Service (APHIS) has imposed a series of Federal Orders restricting commerce of live aquatic animals particularly in areas of the NCR because of VHS. In 2010 APHIS published its National Aquatic Animal Health Plan (USDA 2010). The ability of U.S. producers to accept and conform to the plan, and its overall impacts on the industry has yet to be determined. Due to the existing highly uncertain regulatory environment, NCR producers often require clarification from state regulators prior to conducting daily business activities such as interstate transport. For this reason, the Regional Aquaculture Extension Specialist (RAES) project, established through the North Central Regional Aquaculture Center (NCRAC), has devoted much effort to clarifying interstate transport requirements and reducing burdens on producers caused by regulatory controls.

Access to training and education opportunities appear to correlate with positive attributes towards industry development. Wisconsin, for example, leads all NCR states in terms of registered aquaculture facilities and production (USDA 2009). Wisconsin also has the greatest number of aquaculture extension personnel in the region, plus added support of three or more demonstration facilities providing opportunities for hands on training through the University of Wisconsin. Both Ohio and Wisconsin have developed higher education majors or sub majors in aquaculture. These successes are likely due to a combination of strong political support, good leadership, and access to educational opportunities. Aquaculture extension activities in the region can certainly look to these states as models for future development. In addition, regional outreach activities can do more to address growing environmental and social sustainability concerns. Examples include aquaculture impacts on the environment and human health benefits from seafood.

According to a 2009 poll of the NCR aquaculture community, one of the main factors hindering industry growth is lack of financial opportunity (Weeks and Lynch 2009). This response indicates that lending institutions may view aquaculture as a risky undertaking. Major industry expansion likely requires substantial capital infusion. Thus, being labeled as a poor economic investment is indeed a major problem for U.S. aquaculture. The RAES will coordinate extension activities focusing on economic viability which, if successful, would help facilitate financial resources for aquaculture expansion. In turn this would create new jobs and stimulate social and political support for the aquaculture industry. Activities conducted on behalf of economic sustainability, then, could help build momentum in areas of social acceptance and development (social sustainability).

NCRAC's mission is to enhance aquaculture through education, research, and technology transfer to support a sustainable profitable industry throughout the NCR (NCRAC 1999). Research projects funded by the Center have focused primarily on native species with good potential as food fish or baitfish, although additional research has been undertaken on fish nutrition, aquaculture effluents, aquaculture drugs, and tilapia. NCRAC also supports regional extension and outreach programs for transfer of research and technologies to the industry. During the NCRAC 2010 Annual Planning Meeting, the Industry Advisory Council (IAC) and the NCRAC Board of Directors lifted up this RAES project for an additional 2-year term spanning September 1, 2011 - August 31, 2013. It is the goal of the RAES project to support the NCR aquaculture industry by providing the means necessary to meet the objectives described herein.

RELATED CURRENT AND PREVIOUS WORK

NCRAC is one of five Regional Aquaculture Centers (RACs) administered by the U.S. Department of Agriculture's National Institute of Food and Agriculture. Extension and outreach has been an important component to NCRAC since its inception in 1988 (Swann and Morris 2001). Twelve "Base," or stand-alone, extension projects have been funded through the Center with the following principle objectives (NCRAC 2010):

- 1) Strengthen linkages between NCRAC Research and Extension Groups
- 2) Enhance the NCRAC extension network for aquaculture information transfer
- 3) Develop and implement aquaculture educational programs for the NCR.

In addition to NCR extension activities, there are a number of active local (state), national, and academic aquaculture extension programs for which partnership opportunities exist. Examples include the National Sea Grant College Program, state university aquaculture programs, state commerce and agricultural development programs, and the Indiana Soybean Board. Maintaining effective partnerships and communications is extremely important for industry development and one of the primary objectives of this work plan.

Originally awarded to Ohio State University (OSU) for the period 2005 – 2007, the RAES project was extended through August 31, 2009. The Principal Investigator, Chris Weeks, took on the RAES position on a contractual basis through OSU in March 2008. The project was lifted up for open proposal submission by NCRAC for a 2-year continuation, and funded by NCRAC through August 2011.

Objectives for the original project were:

1. Provide leadership for the aquaculture industry in the NCR
2. Enhance information transfer

For the 2009 – 2011 RAES continuation, objectives were expanded to:

1. In conjunction with the NCRAC Industry Advisory Council and state aquaculture extension contacts, assess and prioritize North Central Region (NCR) industry needs, focusing on issues with regional significance.
2. Develop and implement strategies to address pertinent needs - interact with pertinent NCRAC and non-NCRAC aquaculture initiatives to accomplish identified strategies.
3. Develop and facilitate "linkages" among agencies, industry, academia, and other relevant entities to foster open, meaningful dialog on critical NCR issues.
4. Coordinate efforts for seeking non-NCRAC support to facilitate information and technology transfer to the industry.

In the position of RAES, Weeks has attended association meetings in each state across the NCR where such meetings have been held. He has facilitated, or helped facilitate a VHS Summit (U.S. Trout Farmers' Association Annual Conference, Milwaukee, Wisconsin, 2008), Largemouth Bass Nutrition Workshop (Purdue University, 2008), and an on-line aquatic animal veterinarian training with tuition waivers provided for 44 certified veterinarians across the nation (Fish Health Course, University of Wisconsin School of Veterinary Medicine, 2009). He also facilitated the NCRAC Baitfish Production Workshop held September 21, 2010 (La Crosse Fish Health Center, Wisconsin).

Past and current activities undertaken by the RAES also include:

- 2009 NCRAC Aquaculture Industry Survey;

- Developed and administrating two Web sites:
 - 1) NCRAC Roadmap information transfer Web site – provides easy information access to all RAC and Aquaculture Network Information Center (AquaNIC) publications, industry related contacts, NCR state associations, events, etc.;
 - 2) North Central Region Aquaculture Contacts, Transport Regulations, and Approved Aquatic Species – summaries and access to all aquaculture and baitfish regulations for 12 NCR states and 9 adjacent states, fish health contacts and laboratories, and approved aquatic species;
- Facilitate NCR aquaculture List Serve (115 subscribers as of 6/2010);
- The RAES was instrumental in developing a plan with the Michigan Department of Agriculture for the USDA 2008 Cooperative Agreements for VHS, alleviating VHS testing costs for over 20 Michigan producers and providing USDA APHIS important VHS surveillance information;
- Several presentations regarding status of aquaculture in the region, effect of VHS regulations on NCR aquaculture, interstate transport regulations, and NCRAC protocols.

ANTICIPATED BENEFITS

Over the past 2½ years, the RAES project has made a number of strides towards improving the NCR aquaculture industry, including: providing liaison services, offering a leadership role when needed, working to provide a unified voice for addressing industry interests, identifying industry critical needs, assessing industry progress, and streamlining information and technology to the industry. This work plan includes continuing all current responsibilities and building upon these accomplishments.

In previous assessments, internal and external factors having potentially significant influence on industry development have been identified. Information access, management practices, partnerships, organization, support from within the industry, willingness to participate, ingenuity, and environmental sustainability are examples of industry internal factors. External factors include regulations, funding opportunities, support from outside the industry, epizootics, exotic species, etc. This work plan takes a slightly different approach than previous NCRAC projects by focusing on aquaculture sustainability, which is a common denominator of many, if not all, of the current topical issues facing the industry.

Sustainability is a key term used to describe long term viability of industrial development. Opponents often use environmental degradation as a means to discredit industrial activities across the general population. Within the NCR, aquaculture producers have identified environmental regulations as a serious concern. Perhaps, for this reason, the term “aquaculture sustainability” does not appear to be a major discussion point across the region. Anti-aquaculture groups, however, have been increasing their attacks against production practices and consumption of aquatic animals raised in captivity. In order for aquaculture development to expand significantly, industry supporters must strive to ensure that aquaculture practices are sustainable and socially acceptable. Through discussion opportunities, presentations, workshops, list serves, and other outreach activities the RAES will demonstrate that further industry development necessitates environmental, social, and economic sustainability. An anticipated benefit, then, is for increased awareness of sustainable aquaculture across the industry, regulatory agencies, and the general public.

Partnerships, alliances, and endorsements are extremely important at this phase of NCR aquaculture development. Through direct interactions, the RAES plans to form and strengthen alliances with groups such as the National Aquaculture Association, Farm Bureau, and other potentially supportive organizations. Ideally, the RAES will attain voting membership within a number of organizations to help promote NCR industry interests on a broader scale. The RAES will encourage, through discussion and outreach, other members of the NCR aquaculture community to also take a more proactive approach to partnership building. In addition, the RAES will actively seek outside funding through collaborative efforts

with the goal of securing 1-2 funded projects through pursuit of non-NCRAC grant opportunities. Increased support for NCR aquaculture is anticipated on local, state, and national levels with the potential for 1-2 funded research projects from outside the NCR through these activities.

One conclusion from the current RAES project is that measuring outreach program success is difficult, specifically measuring success in terms of impact on the NCR aquaculture industry. The final objective of this work plan is designed to help gain a better understanding of the effectiveness of NCRAC extension, outreach, and research activities in terms industry impact. The structure and objectives of recent and current NCRAC projects (RAES project included) will be reviewed and assessed as to whether anticipated benefits or measured outcomes are identified and/or being realized. A database will be constructed of the number of state registered aquaculture facilities in each state over time. Other potential indicators (e.g., economics, federal funding, extension full time equivalents) will also be identified and examined for their feasibility for use as measurements of program development. In Year 2 of this project the RAES will report assessment results and make recommendations for future NCRAC activities. Anticipated benefits from this activity will be a written review describing the status of NCR aquaculture based on acquired data and how aquaculture research and NCRAC extension activities might be improved in the region through a better understanding of industry impacts.

OBJECTIVES

1. 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.
2. Develop and implement strategies to address and promote aquaculture sustainability 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.
5. Examine regional aquaculture development and assess NCRAC research and extension activities in terms of impacts on the NCR aquaculture industry. Make recommendations for improving NCRAC projects in terms of incorporating measures of program success.

PROCEDURES

RAES Program Design Plan

The RAES project team consists of the Principal Investigator (Weeks), two non-funded collaborators (Kinnunen and Morris), the Industry Advisory Council Liaison (Lynch), and the Extension Liaison (Quagraine). 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 full time RAES position, and the remaining team members will serve as the project oversight committee. The RAES will provide team members a status update twice per year and facilitate a minimum of two teleconferences annually. 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 (Objective 1)

The following RAES extension activities will continue under this 2011 - 2013 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. Contact information can be found on the RAES Web site:
<https://www.msu.edu/~weeksch/>.

- b) Project PI will continue to maintain and update two information transfer Web sites developed for the NCR aquaculture industry. The NCRAC Transportation Regulations, and Approved Aquatic Species site (<http://www.ncrac.org/Info/StateImportRegs/stateregsmain.htm>) provides summaries of all aquaculture and baitfish regulations including health certification and interstate transport requirements for the 12 NCR states and 9 adjacent states. This Web site receives 500+ views per month and has been given a main link from APHIS aquaculture (http://www.aphis.usda.gov/animal_health/animal_dis_spec/aquaculture/aquastates.shtml). In addition, the RAES has posted a unique quick reference guide condensing NCR state regulations down into tabular format: <http://www.ncrac.org/Info/StateImportRegs/stateregsmain.htm>.
- c) RAES will maintain the NCRAC Roadmap Web site (<http://www.ncrac.org/roadmap/index.htm>) designed to provide easy access to all NCRAC and AquaNIC publications, regional extension contacts and academic programs, regulations, events, and production statistics. In addition the RAES will continue to facilitate breaking news and important information via the NCR Aquaculture List Serve presently housed at Iowa State University (ISU). These activities will be accomplished through cooperative efforts with the Associate Director's office located at ISU.
- d) The RAES, will offer services to the NCR aquaculture community to help facilitate workshops intended to provide pertinent and useful information to the industry.

This activity is expected to keep the RAES updated on industry needs, help maintain a good working relationship between the RAES and the NCR aquaculture community, and to improve upon existing outreach tools designed to transfer pertinent, useful, and important information to the aquaculture industry.

Develop and Implement Strategies to Address Pertinent Needs (Objective 2)

The term "sustainable aquaculture" is often used inconsistently. The Food and Agriculture Organization of the United Nations (FAO) defined the term sustainable aquaculture as:

the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment of continued satisfaction of human needs for present and future generations. Such sustainable development conserves (land,) water, plants and (animal) genetic resources, is environmentally non-degrading, technologically appropriate, economically viable and socially acceptable (FAO 2010).

Aquaculture sustainability, then, encompasses most if not all aspects of fish culture.

- a) In 2011, the project PI will review all available materials from previous regional sustainability oriented projects. Material from outside the region will also be reviewed to the extent possible. This activity is intended to establish a baseline for program development and prevent duplication of previous work. Examples include NCRAC's Environmental Strategies for Aquaculture Symposium (Kinnunen 2000), and Best Management Practices for Aquaculture in Wisconsin and the Great Lakes Region (Malison and Hartleb 2005).
- b) In 2011 to early 2012, the RAES will facilitate a NCR Aquaculture Sustainability Program Development Workshop (perhaps coinciding with the NCRAC annual program planning meeting). The goal of the workshop will be to develop a regional aquaculture sustainability promotional strategy. A working group, selected from among industry, environmental agency, and academic experts, will start by reviewing a summary of material reviewed in Objective 2a), and the FAO definition of sustainable aquaculture (above). The working group will then be tasked to outline a strategic plan for promoting sustainable aquaculture in the NCR.

- c) In 2012 – 2013, the project PI will solicit help from potential project collaborators and oversee implementation of the work plan strategy developed within the Aquaculture Sustainability Workshop. Anticipated outreach activities will be in the form of workshops, newsletters, Web sites, and various other outreach and education tools identified by the working group.

Results from this objective are expected to increase awareness for sustainable aquaculture across the industry, regulatory agencies and the general public.

Develop “Linkages” to Foster Dialog on Critical NCR Issues (Objective 3)

Over the span of the RAES project, the PI has worked to develop 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. The RAES team has identified the following groups for which partnership building opportunities could be advantageous: political alliances; regulatory agencies; the general public; the National Aquaculture Association (NAA), Farm Bureau; National Association of State Aquaculture Coordinators (NASAC); and food, restaurant, and other agricultural commodity organizations. The NAA for instance, promotes itself as “One industry, One voice.” Unfortunately, very few members of NCRAC, presumably, are actual voting members of NAA.

- a) Starting in 2011 through project continuation, the PI will obtain voting memberships in NAA and NASAC, and will actively pursue means to advance NCR interests on a national platform. The PI will also join the Michigan Farm Bureau and pursue networking opportunities through this organization on a national level as well as the Farm Bureau Aquaculture Advisory Committee. Additionally, the PI will seek to develop partnerships among other agricultural commodity organizations (e.g., national and state soybean councils) both inside and outside the NCR.
- b) In 2011 through project continuation, the PI will attend a minimum of 3 regional state aquaculture association meetings per year in order to communicate directly with local industry representatives. With the association’s approval, the PI will hold a 10-20 minute discussion during the meeting centering on prime objectives of this work plan, specifically, industry needs, aquaculture sustainability, building partnerships, and improving political and public support.

This activity is expected to help the NCR aquaculture industry gain important allies across the U.S., and establish and/or strengthen partnerships among groups such as the NAA, Farm Bureau, NASAC, and other agricultural development organizations.

Coordinate Efforts for Seeking Non-NCRAC Support (Objective 4)

Objective 4 focuses on utilizing opportunities (e.g., funding) and partnerships (Objective 3) typically available from non-NCRAC sources for regional industry development.

- a) In 2011 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.

This activity is expected to result in a minimum of one grant application submittal per year for NCR industry development from a non-NCRAC source. The actual target for this activity would be two or more project awards annually; however, this number depends greatly on various factors including availability of non-NCRAC opportunities and the team effort utilized, or realized, within the NCR aquaculture community. One example of a non-funded opportunity under consideration is a grant proposal writing workshop.

Examine Regional Aquaculture Development and Assess NCRAC Research and Extension Activities (Objective 5)

Objective 5 is designed to help gain understanding of the current status of the region's aquaculture industry and how measurable impacts can be better incorporated into NCRAC aquaculture research and extension projects.

- a) Starting in 2011, RAES team members will devise a list of potential indicators related to aquaculture development. Experts in aquaculture, economics, and statistics will also be asked to participate. Examples (of indicators) include: numbers of state registered facilities, types of systems employed, production levels, species, aquaculture support funds allocated and received by states, extension full time equivalents, etc. The PI will then construct a dataset from obtainable data for use in subsequent analyses.
- b) Continuing in 2012 through the term of the project, the data will be utilized in qualitative and quantitative assessments to the extent possible, including economic and statistical analysis. The RAES project will then be used as a model to see if possible correlations exist between the RAES project and changes in aquaculture developmental indicators over time. Any potential modifications to either RAES project protocols or indicator data acquisition that could improve the ability to measure impacts the RAES project is having on the industry will be assessed.
- c) In 2013, the RAES will provide a report on results achieved through this objective and make recommendations that might help provide a means for measuring future NCRAC project success in terms of impacts on the industry.

This activity is expected to provide accurate information on the current status of the NCR aquaculture industry, the beginning of a centralized dataset for NCR aquaculture, and a written review on how aquaculture NCRAC research and extension projects might be improved.

FACILITIES

Michigan State University's North Central Regional Aquaculture Center, 950 Kalamazoo Street, East Lansing, Michigan.

REFERENCES

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BUDGET

ORGANIZATION AND ADDRESS Michigan State University Dept. of Fisheries & Wildlife, 13 Natural Resources, East Lansing, MI 48824 PROJECT DIRECTOR(S) Christopher T. Weeks				USDA AWARD NO. Year 1: Objectives 1-5 Duration Proposed Months: <u>12</u> Duration Proposed Months: _____ Funds Requested by Proposer Funds Approved by CSREES (If different) Non-Federal Proposed Cost-Sharing/ Matching Funds (If required) Non-federal Cost-Sharing/ Matching Funds Approved by CSREES (If Different)						
A. Salaries and Wages 1. No. of Senior Personnel				CSREES FUNDED WORK MONTHS						
				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				12.0			\$64,000			
c. ___ Paraprofessionals.....										
d. ___ Graduate Students.....										
e. ___ Prebaccalaureate Students.....										
f. ___ Secretarial-Clerical.....										
g. ___ Technical, Shop and Other										
Total Salaries and Wages →							\$64,000			
B. Fringe Benefits (If charged as Direct Costs)							\$26,240			
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →							\$90,240			
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)										
E. Materials and Supplies							\$500			
F. Travel							\$4,600			
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.)							\$1,430			
K. Total Direct Costs (C through I) →							\$96,770			
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. Other..... →										
O. Total Amount of This Request →							\$96,770			
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 (Type or print)				SIGNATURE (required for revised budget only)				DATE		
Project Director										
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.

BUDGET

ORGANIZATION AND ADDRESS Michigan State University Dept. of Fisheries & Wildlife, 13 Natural Resources, East Lansing, MI 48824 PROJECT DIRECTOR(S) Christopher T. Weeks				USDA AWARD NO. Year 2: Objectives 1-5				
				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)	
				Funds Requested by Proposer	Funds Approved by CSREES (If different)			
A. Salaries and Wages				CSREES FUNDED WORK MONTHS				
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				12.0			\$64,640	
c. ___ Paraprofessionals.....								
d. ___ Graduate Students.....								
e. ___ Prebaccalaureate Students.....								
f. ___ Secretarial-Clerical.....								
g. ___ Technical, Shop and Other								
Total Salaries and Wages →							\$64,640	
B. Fringe Benefits (If charged as Direct Costs)							\$27,472	
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →							\$92,112	
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)								
E. Materials and Supplies							\$500	
F. Travel							\$5,800	
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.)							\$1,430	
K. Total Direct Costs (C through I) →							\$99,842	
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. Other..... →								
O. Total Amount of This Request →							\$99,842	
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 (Type or print)				SIGNATURE (required for revised budget only)				DATE
Project Director								
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.

BUDGET EXPLANATION FOR MICHIGAN STATE UNIVERSITY

(Weeks)

Objectives 1-5

- A. Salaries and Wages.** Year 1: Salary is requested for one 100% FTE extension specialist to act in capacity of Regional Aquaculture Extension Specialist (\$64,000) Year 2: Salary is requested for one 100% FTE extension specialist (\$64,640).
- B. Fringe Benefits.** Year 1: Fringe benefit rate is 41%. Year 2: Fringe benefit rate is 42.5%.
- E. Materials and Supplies.** Years 1 and 2: General office and workshop supplies and materials (\$500).
- F. Travel.** Year 1: Travel, lodging, and meals for PI to attend three-four state aquaculture association/development meetings at locations to be determined (\$2,100); travel, lodging, and meals for speakers and attendees to facilitate a regional aquaculture workshop at a location to be determined (\$2,500). Year 2: Travel, lodging, and meals for three-four state aquaculture meetings (\$2,100); travel, lodging, and meals for one national Aquaculture America Conference at a location to be determined (\$1,200); travel, lodging, and meals for speakers and attendees to facilitate a regional aquaculture workshop at a location to be determined (\$2,500).
- J. All Other Direct Costs.** Years 1 and 2: Cell phone and office phone service (\$1,080 per year); membership fees for RAES to join NAA, NASAC and Farm Bureau (\$350 per year).

SCHEDULE FOR COMPLETION OF OBJECTIVES

Table 1. RAES work plan timeline (* - represents planned workshop, meeting, or written report)

Task	9/11	3/12	8/12	9/12	3/13	8/13
(1a) Liaison services and leadership roles	→					
(1b) Maintain state regulations website	→					
(1c) Maintain NCRAC Roadmap and NCR Fish Culture List Serve	→					
(2a) Aquaculture sustainability strategy workshop	→	*				
(2b) Implement NCR sustainability work plan		→				
(3a) Active participation in 3 or more partnerships / organizations	→					
(3b) NCR State Aquaculture association meetings	* *		*	**		*
(4a) Seek non-NCRAC support	→					
(4b) Form working coalitions	→					
(5a) Aquaculture program impact development	→					
(5b) Impact data analysis		→				
(5c) Impact assessment report					→	

VITA

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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)
McDonnell Douglas, Engineer, Long Beach, California (September 1986 – January 1989)

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

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

SELECTED PUBLICATIONS

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.

Weeks, C.T., and H. Westers. 2004. Trout production facility – 125,000 pounds annual production, conceptual design, Aquaculture Bioengineering Corporation report for Aquatic Consultants Inc., Albuquerque, New Mexico, September 2004.

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.

SELECTED PRESENTATIONS

Weeks C.T. 2010. Aquaculture in Michigan - overview of status, regulatory structure and impacting factors. Michigan Department of Agriculture. Lansing, Michigan.

Weeks C.T. 2010. Interstate movement of live fish regulations in the North Central U.S., Workshop for Veterinarians on Fish Regulatory Medicine, University of Wisconsin-Madison.

Weeks C.T. 2009. North Central Region Aquaculture Center Seeks Input from Missouri Aquaculture Industry. Lincoln University, Missouri.

Weeks C.T. 2008. VHS: a Regional Industry Perspective. Illinois VHS Conference and Workshop. Southern Illinois University-Carbondale.