



Michigan Department of Natural Resources – Procurement Services  
 P.O. Box 30028, Lansing, MI 48909  
 OR  
 530 W. Allegan, Lansing, MI 48933

**NOTICE OF CONTRACT NO. 751B3200019**  
**Between**  
**STATE OF MICHIGAN**  
**and**

*Required by authority of 1984 PA 431, as amended.*

Name and Address of Contractor  <b>Michigan State University</b> <b>Office of Sponsored Programs</b> <b>426 Auditorium Rd</b> <b>301 Administration Building</b> <b>Lansing, MI 48824-2612</b>	Primary Contact <b>Lisa Somers</b>	
	Email <b>Somers@osp.msu.edu</b>	
	Telephone <b>(517) 884-4239</b>	Contractor #, Mail Code <b>*****5984/283</b>

State Contact	Agency	Name	Telephone	Email
Contract Compliance Inspector	DNR	Marlene Sublet-Bennett	(248) 359-9062	Sublet-Bennettm@michigan.gov
Buyer	DNR	Jana Harding-Bishop	(517) 373-1190	Hardingj3@michigan.gov

**Contract Summary**

Description (Provide a basic but comprehensive description of services)  
 Refinement of the Aquatic Portion of Michigan's Wildlife Action Plan and Development of Tools to Support the Plan

Initial Term <b>22 months</b>	Effective Date <b>December 7, 2012</b>	Initial Expiration Date <b>September 30, 2014</b>	Available Options <b>1 - 1 year</b>
Payment Terms <b>Net 45</b>	F.O.B. <b>N/A</b>	Shipped <b>N/A</b>	Shipped From <b>N/A</b>
Minimum Delivery Requirements <b>N/A</b>		Alternate Payment Options <input type="checkbox"/> P-Card <input type="checkbox"/> Direct Voucher (DV)	Available to MiDeal Participants <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Miscellaneous Information  
**The terms and conditions of this Contract are those of RFP – Call for Project with the due date of May 11, 2012, this Contract Agreement and the Contractor's proposal as negotiated. In the event of any conflicts between the specifications, and terms and conditions, indicated by the State and those indicated by the Contractor, those of the State take precedence.**

**ESTIMATED CONTRACT VALUE AT TIME OF EXECUTION: \$109,279.00**



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Payment Terms <b>Net 45</b>	F.O.B. <b>N/A</b>	Shipped <b>N/A</b>	Shipped From <b>N/A</b>
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**THIS IS NOT AN ORDER:** This Contract Agreement is awarded on the basis of our Call for Project RFP with a due date of May 11, 2012. Orders for delivery will be issued directly by the Michigan Department of Natural Resources through the issuance of a Purchase Order Form.

All terms and conditions of the invitation to bid are made a part hereof.

**FOR THE CONTRACTOR:**

Michigan State University  
 \_\_\_\_\_  
 Firm Name  
 Craig O'Neill for Lisa Somers – On file in DNR Procurement  
 \_\_\_\_\_  
 Authorized Agent Signature  
 Lisa Somers, Manager  
 \_\_\_\_\_  
 Authorized Agent (Print or Type)  
 1/2/13  
 \_\_\_\_\_  
 Date

**FOR THE STATE:**

On-file in DNR Procurement  
 \_\_\_\_\_  
 Signature  
 Sharon Walenga-Maynard/Procurement Services Manager  
 \_\_\_\_\_  
 Name/Title  
 Financial Services/Procurement  
 \_\_\_\_\_  
 Division/Section  
 1/9/13  
 \_\_\_\_\_  
 Date

## STATE OF MICHIGAN TERMS AND CONDITIONS

### I-A PURPOSE

This contract consists of the State of Michigan's (State) terms and conditions and the work statement (Appendix A). This contract constitutes the complete and exclusive agreement and understanding of the parties as it relates to this transaction. This contract supersedes all proposals, or other prior agreements, and all other communications between the parties relating to this transaction. If there is a conflict between the State's terms and conditions and the Contractor's Proposal, the State's terms and conditions shall take precedence.

The purpose of this contract is to obtain the services of the Department of Fisheries and Wildlife at Michigan State University to conduct research titled: **Refinement of the Aquatic Portion of Michigan's Wildlife Action Plan and Development of Tools to Support the Plan (MSU #125068)** in collaboration with Fisheries Division the Michigan Department of Natural Resources (DNR). Project completion date is September 30, 2014.

### I-B ISSUING OFFICE

This contract is issued by the State of Michigan, Department of Natural Resources, Financial Services (FS) for Fisheries Division (FD).

FS is the only office authorized to change, modify, amend, alter, clarify, etc., the prices, specifications, terms, and conditions of this contract. All requests for changes, modifications, amendments, etc. must be addressed to:

Jana Harding-Bishop  
DNR, FS  
6th Floor, Mason Building  
P.O. Box 30028  
Lansing, MI 48909  
(517) 373-1190

### I-C CONTRACT ADMINISTRATOR

Upon receipt of the properly executed contract agreement, it is anticipated that the person named below or any other person so designated be authorized to administer the contract on a day-to-day basis during the term of the contract. However, administration of this contract implies no authority to change, modify, clarify, amend, or otherwise alter the prices, terms, conditions, and specifications of this contract.

The DNR contract administrator is:

Tammy J. Newcomb, Ph.D.  
Research Program Manager  
Department of Natural Resources  
Fisheries Division  
P.O. Box 30446  
Lansing, MI 48909-7946  
Telephone: (517) 373-3960  
Email: [newcombt@michigan.gov](mailto:newcombt@michigan.gov)

The MSU Principal Investigator (MSU-PI) for this project is listed below. This person is responsible for the administration and research of the project. The MSU-PI does not have the authority to change, modify, clarify, amend or otherwise alter the prices, terms, conditions and specifications of the contract as that authority is retained by MSU - Office of Sponsored Programs.

Dr. Dana Infante  
Department of Fisheries and Wildlife Services  
Michigan State University  
480 Wilson Road  
East Lansing, MI 48824

Telephone: (517) 432-7232

Email: [infanted@msu.edu](mailto:infanted@msu.edu)

Partner: Dr. Kevin Wehrly

Michigan Department of Natural Resources

Institute for Fisheries Research

212 Museums Annex Building

1109 N. University

Ann Arbor, MI 48109-1084

Telephone: (734) 663-3554, ext. 12055

Email: [wehrlyk@michigan.gov](mailto:wehrlyk@michigan.gov)

Contract Compliance Inspector (CI) named below serves as the DNR day-to-day manager of the awarded contract. Requests to change, modify, amend, alter, or clarify the prices, specifications, terms, or changes, must be addressed to the CI. However, monitoring of the contract implies no authority to change, modify, clarify, amend or otherwise alter the prices, terms, conditions and specifications of the contract as that authority is retained by DNR-Financial Services.

Marlene D. Sublet-Bennett

Financial Analyst, Program Support, Fisheries Division

Southfield Operations Services Center

26000 W. Eight Mile Road

Southfield, MI 48034

Telephone (248) 359-9062

Email: [sublet-bennettm@michigan.gov](mailto:sublet-bennettm@michigan.gov)

#### I-D PROGRAM OF WORK

Specific program objectives and deliverables are detailed in the attached research proposal (**ATTACHMENT A**).

#### I-E DELIVERABLES

The MSU PI is responsible for providing an annual progress report, manuscript or journal publication, and a final report to the DNR contract administrator in written and electronic format by the specified date. A template for these reports will be provided by the DNRE contract administrator and submitted reports must use the template or contain all information requested on the template. The reports shall be mailed and transmitted electronically to the DNR contract administrator listed in I-C. Deliverables:

- (1) A refined river database, framework, and associated application tools;
- (2) A coordinated, parallel lake database, framework, and associated application tools;
- (3) A state-wide EDU layer;
- (4) A state-wide AES layer;
- (5) A list of high priority conservation areas;
- (6) Statewide assessment results for both lakes and rivers;
- (7) A conservation strategy refinement plan/report that will summarize progress made during the first 10 years of implementation of the MWAP.

Performance Report

September 30, 2013

Final Report  
2014

September 30,

Final payment will be withheld until final report is submitted. Electronic data files and mapping products will be shared in electronic format with the DNR contract administrator.

#### I-F PROJECT CONTROL AND REPORTS

The Contractor will carry out this project under the direction and control of the DNR, Fisheries Division.

The DNR contract administrator will meet as needed with the PI for the purpose of reviewing progress and providing necessary guidance in solving problems which arise.

The PI will submit deliverables as listed in Section I-E above, and identify any problems, real or anticipated, which should be brought to the attention of the DNR contract administrator to insure that the contract remains on schedule and will be completed as scheduled.

#### I-G PRICE PROPOSAL

This is a **fixed price contract**, and Contractor may invoice at the end of each fiscal quarter (December 31, March 31, June 30, and September 30) for 25% of the annual DNR contribution to the study (the contract cost). Contractor's fiscal contribution to this study (20%) is the waiver of normal overhead charges per the Agreement between MSU and DNR, executed 1984, as amended.

#### I-H MODIFICATIONS OF CONTRACT

This contract may be modified provided that any changes proposed by either party are requested in writing and mutually agreed to by the official representative of the Contractor shown in this contract and the DNR contract administrator. This request is not valid until it is signed by all parties, a Contract Change Notice is issued by the Issuing Office, and a Purchase Order is issued by the DNR.

#### I-I NO WAIVER OF DEFAULT

The failure of a party to insist upon strict adherence to any term of this contract shall not be considered a waiver or deprive the party of the right thereafter to insist upon strict adherence to that term, or any other term, of this contract.

#### I-J SEVERABILITY

Each provision of this contract shall be deemed to be severable from all other provisions, and if one or more of the provisions shall be declared invalid, the remaining provisions of this contract shall remain in full force and effect.

#### I-K HEADINGS

Captions and headings used in this contract are for information and organization purposes. Captions and headings, including inaccurate references, do not, in any way, define or limit the requirements or terms and conditions of this contract.

#### I-L RELATIONSHIP OF THE PARTIES

The relationship between the State and the Contractor is that of client and independent contractor. No agent, employee, or servant of the Contractor or any of its subcontractors shall be or shall be deemed to be an employee, agent, or servant of the State for any reason.

#### I-M COST LIABILITY

The State of Michigan assumes no responsibility or liability for costs incurred by the Contractor prior to the signing this contract. Total liability of the State is limited to the terms and conditions of this contract.

## I-N CONTRACTOR RESPONSIBILITIES

The Contractor is responsible for the performance of all of its obligations under this contract, whether the obligations are performed by the Contractor or a subcontractor. The State reserves the right to approve any subcontractor hired to perform the Contractor's obligations under this contract, and the right to require the Contractor to replace any subcontractor deemed unacceptable by the State. The Contractor is exclusively responsible for adherence by subcontractors to all provisions of this contract. Further, the State will consider the Contractor to be the sole point of contact with regard to contractual matters, including but not limited to payment of any and all costs resulting from the contract.

## I-O INFORMATION RELEASE / OWNERSHIP

### News Releases

News releases pertaining to this Contract or the services, study, data, or project to which it relates will not be made without prior written State approval, which will not be unduly withheld.

### Publication

The Contractor will not use, release, or publish any analyses, findings, results or techniques developed under this agreement, or any information derived therefrom until such analyses, findings or techniques have been reported to the State in the manner prescribed by this agreement and have become public domain. These analyses, findings or techniques will be considered in the public domain when: 1) they are submitted to the State and receive positive action, 2) they are formally accepted by the State, or 3) forty-five (45) days elapse after submission to the State, whichever of the three may occur first. No material may be published which is exempt from disclosure under Public Act No. 442 of 1976 known as the "Freedom of Information Act" without express permission from the State. The Contractor will provide the State, for its review, copies of all presentations or articles being submitted for publication at least thirty (30) days in advance. Review of materials will be handled expeditiously and approval will not be unduly withheld.

### Acknowledgement of State Participation/Support

All publications or oral presentations concerning the analyses, findings, results or techniques developed under this contract will contain an acknowledgement, of the State's participation and support unless the State requests in writing that their participation and support not be acknowledged. Furthermore, Contractor may not receive fees for any article in excess of the cost of preparation of published article and excluding the cost of the research and compilation which was compensated under the contract.

## I-P DISCLOSURE

All information in this contract is subject to the provisions of the Freedom of Information Act, 1976 Public Act No. 442, as amended, MCL 15.231, et seq.

## I-Q ACCOUNTING RECORDS

The Contractor will be required to maintain project records pertaining to Appendix A 'Work Statement' for three (3) years from the expiration date of this contract, which access shall be made available to the State upon reasonable notice to Contractor.

## I-R AUDIT OF CONTRACT COMPLIANCE

The Contractor agrees that the State may, upon 24-hour notice, perform an audit at Contractor's location(s) to determine if the Contractor is complying with the requirements of this contract. The Contractor agrees to cooperate with the State during the audit and produce all records and documentation that verifies compliance with the requirements of this contract.

## I-S SAFETY AND ACCIDENT PREVENTION

In performing work under this contract on State premises, the Contractor shall conform to any specific safety requirements contained in this contract or as required by law or regulation. The Contractor shall take any additional precautions as the State may reasonably require for safety and accident prevention purposes. Any violation of such safety requirements, rules, laws or regulations shall be a material breach of this contract and shall be grounds for cancellation of this contract in accordance with the Cancellation provisions contained herein.

## I-T TAXES

### Employment Taxes

Contractors are expected to collect and pay all applicable federal, state, and local employment taxes.

**Sales and Use Taxes** Contractors are required to be registered to remit sales and use taxes on taxable sales of tangible personal property or services delivered into the State.

## I-U GENERAL INDEMNIFICATION

Each party to this contract must seek its own legal representative and bear its own costs; including judgments, in any litigation that may arise from performance specific to each party's responsibilities. It is specifically understood and agreed that neither party will indemnify the other party in such litigation.

## I-V INSURANCE REQUIREMENTS

The Contractor shall purchase and maintain such insurance as will protect him/her from claims set forth below which may arise out of or result from the Contractor's operations under the contract (Purchase Order), whether such operations be by himself/herself or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

**NOTE: CONTRACTOR MAY SUBMIT EVIDENCE OF SELF-INSURANCE AND/OR AMENDMENT OF EXISTING LIABILITY COVERAGE IN FULFILLMENT OF ABOVE PROVISIONS, IF THE STATE ACCEPTS THE EVIDENCE OR AMENDED LIABILITY COVERAGE AS PROVIDING COMPARABLE PROTECTION OF THE STATE'S INTEREST.**

The Contractor is required to provide proof of insurance or self-insurance. The purpose of this coverage shall be to protect the State from claims which may arise out of or result from the Contractor's performance of services under the terms of this contract, whether such services are performed by the contractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

## I-W NOTICE AND RIGHT TO CURE

In the event of a curable breach by the Contractor, the State shall provide the Contractor written notice of the breach and a time period to cure said breach described in the notice. This section requiring notice and an opportunity to cure shall not be applicable in the event of successive or repeated breaches of the same nature or if the State determines in its sole discretion that the breach poses a serious and imminent threat to the health or safety of any person or the imminent loss, damage or destruction of any real or tangible personal property.

## I-X CANCELLATION

The State may cancel this contract without further liability or penalty to the State, its departments, divisions, agencies, offices, commissions, officers, agents, and employees for any of the following reasons:

1. **Material Breach by the Contractor.** In the event that the Contractor breaches any of its material duties or obligations under this contract, which are either not capable of or subject to being cured, or are not cured within the time period specified in the written notice of breach provided by the State, or pose a serious and imminent threat to the health and safety of any person, or the imminent loss, damage or destruction of any real or tangible personal property, the State may, having provided written notice of cancellation to the Contractor, cancel this contract in whole or in part, for cause, as of the date specified in the notice of cancellation.

In the event the State chooses to partially cancel this contract for cause charges payable under this contract will be equitably adjusted to reflect those services that are cancelled. In the event this contract is cancelled for cause pursuant to this section, and it is therefore determined, for any reason, that the Contractor was not in breach of contract pursuant to the provisions of this section, that cancellation for cause shall be deemed to have been a cancellation for convenience, effective as of the same date, and the rights and obligations of the parties shall be limited to that otherwise provided in this contract for a cancellation for convenience.

2. **Cancellation for Convenience by the State.** The State may cancel this contract for its convenience, in whole or part, if the State determines that such a cancellation is in the State's best interest. Reasons for such cancellation shall be left to the sole discretion of the State and may include, but not necessarily be limited to (a) the State no longer needs the services or products specified in this contract, (b) relocation of office, program changes, changes in laws, rules, or regulations make performance of the services under this contract no longer practical or feasible, and (c) unacceptable prices for additional services requested by the State. The State may cancel this contract for its convenience, in whole or in part, by giving the Contractor written notice 30 days prior to the date of cancellation. If the State chooses to cancel this contract in part, the charges payable under this contract shall be equitably adjusted to reflect those services that are cancelled.
3. **Non-Appropriation.** The State may cancel this contract in the event that funds to enable the State to effect continued payment under this contract are not appropriated or otherwise made available. The Contractor acknowledges that, if this contract extends for several fiscal years, continuation of this contract is subject to annual appropriation or availability of funds for this contract. If funds are not appropriated or otherwise made available, the State shall have the right to cancel this contract at the end of the last period for which funds have been appropriated or otherwise made available by giving written notice of cancellation to the Contractor. The State shall give the Contractor written notice of such non-appropriation or unavailability within 30 days after it receives notice of such non-appropriation or unavailability.
4. **Criminal Conviction.** In the event the Contractor, an officer of the Contractor, or an owner of a 25% or greater share of the Contractor, is convicted of a criminal offense incident to the application for or performance of a State, public or private contract or subcontract; or convicted of a criminal offense including but not limited to any of the following: embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, attempting to influence a public employee to breach the ethical conduct standards for State of Michigan employees; convicted under State or federal antitrust statutes; or convicted of any other criminal offense which in the sole discretion of the State, reflects upon the contractor's business integrity, the State may cancel this contract.
5. **Approvals Rescinded.** In the event any final administrative or judicial decision or adjudication disapproves a previously approved request for purchase of personal services pursuant to Article 11, Section 5 of the Michigan Constitution of 1963, and Chapter 7 of the Civil Service Rules, the State may cancel this contract. Notwithstanding any other provision of this contract to the contrary, the State Personnel Director is authorized to disapprove contractual disbursements for personal services if the Director determines that disbursements under this contract violate Article 11, Section 5 of the Michigan Constitution or violate applicable Civil Service rules or regulations. Cancellation may be in whole or in part and may be immediate as of the date of the written notice to the Contractor or may be effective as of the date stated in such written notice.

## I-Y ASSIGNMENT

The Contractor shall not have the right to assign this contract or to assign or delegate any of its duties or obligations under this contract to any other party (whether by operation of law or otherwise), without the prior written consent of the State. Any purported assignment in violation of this section shall be null and void. Further, the Contractor may not assign the right to receive money due under this contract without the prior written consent of DNR Financial Services.

## I-Z DELEGATION

The Contractor shall not delegate any duties or obligations under this contract to a subcontractor other than a subcontractor named in the bid unless DNR Financial Services has given written consent to the delegation.

## I-AA NON-DISCRIMINATION CLAUSE

In the performance of any contract or purchase order resulting herefrom, the Contractor agrees not to discriminate against any employee or applicant for employment, with respect to their hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of race, color, religion, national origin, ancestry, age, sex, height, weight, marital status, physical or mental disability unrelated to the individual's ability to perform the duties of the particular job or position. The Contractor further agrees that every subcontract entered into for the performance of any contract or purchase order resulting herefrom will contain a provision requiring non-discrimination in employment, as herein specified, binding upon each subcontractor. This covenant is required pursuant to the Elliot Larsen Civil Rights Act, 1976 Public Act 453, as amended, MCL 37.2101, et seq, and the Persons with Disabilities Civil Rights Act, 1976 Public Act 220, as amended, MCL 37.1101, et seq, and any breach thereof may be regarded as a material breach of the contract or purchase order.

## I-BB UNFAIR LABOR PRACTICES

Pursuant to 1980 Public Act 278, as amended, MCL 423.231, et seq, the State shall not award a contract or subcontract to an employer whose name appears in the current register of employers failing to correct an unfair labor practice compiled pursuant to Section 2 of the Act. This information is compiled by the United States National Labor Relations Board.

A Contractor of the State, in relation to the contract, shall not enter into a contract with a subcontractor, manufacturer, or supplier whose name appears in this register. Pursuant to Section 4 of 1980 Public Act 278, MCL 423.324, the State may void any contract if, subsequent to award of the contract, the name of the Contractor as an employer, or the name of the subcontractor, manufacturer or supplier of the Contractor appears in the register.

## I-CC SURVIVOR

Any provisions of this contract that impose continuing obligations on the parties shall survive the expiration or cancellation of this contract for any reason.

## I-DD PERFORMANCE REVIEWS

DNR may review with the contractor their performance under the contract. Performance reviews shall be conducted quarterly, semi-annually or annually depending on contractor's past performance with the State. Performance reviews shall include, but are not limited to, quality of service being delivered and provided, timeliness, percentage of completion, accuracy of billings, customer service, completion and submission of required paperwork, and other requirements of the contract.

Upon a finding of poor performance, which has been documented by DNR Financial Services, the Contractor shall be given an opportunity to respond and take corrective action. If corrective action is not taken in a reasonable amount of time as determined by DNR Financial Services, the contract may be canceled for default.

## I-EE ELECTRONIC PAYMENT AVAILABILITY

Electronic transfer of funds is available to State contractors. Contractor is required to register with the State electronically at <http://www.cpexpress.state.mi.us>. Public Act 533 of 2004 requires all payments made by the State of Michigan be transitioned to Electronic Funds Transfers (EFT).

## I-FF RENEWALS

This contract may be renewed by a written and mutually executed agreement of the parties, in accordance with Section I-I above, not less than 30 days before its expiration. The contract may be renewed for up to one (1) one (1) year period.

#### I-GG COMPLIANCE WITH LAWS

The Contractor represents to the best of its knowledge and belief that, in performing the services called for by this Contract, it will not violate any applicable law, rule, or regulation, or any intellectual rights of any third party; including but not limited to, any United States patent, trademark, copyright, or trade secret.

#### I-HH Legal Effect

Contractor must show acceptance of the Contract by signing the Contract and returning it to the Contract Administrator. The Contractor must not proceed with the performance of the work to be done under the Contract, including the purchase of necessary materials, until both parties have signed the Contract to show acceptance of its terms, and the Contractor receives a Contract release/purchase order that authorizes and defines specific performance requirements.

# ATTACHMENT A

## Work Statement

Michigan Department of Natural Resources  
Study 237016

Proposed for Fiscal Years: 2013-2014

**Name of Study:** Refinement of the Aquatic Portion of Michigan's Wildlife Action Plan and Development of Tools to Support the Plan

**A. Problem:** This proposal will address two on-going issues. The first is related to implementation of and updates to the aquatic portion of Michigan's Wildlife Action Plan (MWAP). This plan was submitted and accepted by USFWS in 2005 to meet the State Wildlife Grant funding requirements. During the past 7 years, Fisheries Division has made considerable effort in resource monitoring, habitat improvement, and habitat permit evaluation. There have been initial efforts to identify high priority conservation areas, assess ecosystem health, and identify key human disturbance factors, all of which are components required by USFWS and MWAP. However, more work is needed to provide resource managers with the appropriate framework, databases, and tools essential for carrying out such tasks. Also, during these past few years, new GIS data sets along with new approaches for generating and managing large-scale databases required for such efforts have been developed and have been made available. Updating initial efforts is critical to ensure that results delivered to management are highly relevant and based on best available information.

Second, the Department is also responsible for completing a required 10-year conservation strategy refinement report by 2015. Presently, Fisheries Division does not have a strategy to fulfill the aquatic portion of these responsibilities. Without adequately synthesizing the Division's management activities and producing the required reports, we will jeopardize efforts to protect, enhance, and rehabilitate aquatic resources and risk losing federal funds.

**B. Objectives:** The goal of this proposed project is to help refine Michigan's comprehensive aquatic conservation strategy, synthesize progress made during the first phase of implementation of the plan, and develop and apply improved databases, frameworks, and tools for the implementation of Michigan Wildlife Action Plan. The objectives are to: (1) update and maintain Michigan's river classification framework and databases and coordinate the development of Michigan inland lake GIS databases and classification framework; (2) refine Michigan's ecological drainage units (EDUs) that were developed by The Nature Conservancy; (3) define aquatic ecological systems (AESs); (4) identify high priority conservation areas for both inland lakes and rivers; (5) assess environmental conditions of Michigan's rivers and inland lakes; (6) identify key environmental threats to each water body; (7) develop GIS application tools to meet the other implementation needs of the MWAP programs of Fisheries Division; (8) synthesize progress made in aquatics during the first 5-year wildlife action plan into a progress report; and (9) develop and write the aquatic portion of the 10-year conservation strategy refinement report.

**C. Expected Results and Benefits:** Addressing the proposed objectives will enable Fisheries Division to more strategically plan and manage Michigan's aquatic resources; to more effectively allocate resources; to more efficiently protect, enhance, and restore high priority conservation areas; and to fulfill the obligations related to State Wildlife Grant funding. Without implementing the proposed objectives, the ability to make management decisions will be less objective, and this could put the Division at risk of losing federal funding. The advancement of GIS technology and the increased availability of statewide databases of increasingly better resolution and meaning have substantially improved the efficiency of obtaining essential information for implementing biological conservation. It has become clear that more fisheries and other aquatic resource programs are relying on statewide databases and advanced GIS tools to effectively carry out daily management activities. However, management staffs in fisheries programs are typically users, not developers, of conservation frameworks, databases, and GIS application tools. It is the vision of the Fisheries Division that researchers develop frameworks, databases, and application tools to meet current, emerging, and future management needs of managers and policy makers.

This project will generate (1) a refined river database, framework, and associated application tools; (2) a coordinated parallel lake database, framework, and associated application tools; (3) a conservation strategy refinement plan/report that will summarize progress made during the first 10 years of implementation of the MWAP and will develop an enhanced comprehensive aquatic conservation strategy and management supporting tools for Version 2 due to USFWS in spring of 2015.

The river work will use the current statewide database as a backbone and incorporate many newly-developed elements that are essential for the implementation of the MWAP. Those new elements include EDUs, AESs, high priority conservation areas, river valley segment (VSEG) environmental status, key human disturbances associated with each VSEG, projected fish assemblages for each VSEG, and VSEGs that predict where to find species of greatest conservation need including rare, endangered, threatened, and special concern species and their associated key habitats. The river work will also include incorporation of new, state-wide stream water temperature and flow models generated as part of a project funded by the Great Lakes LCC that PIs are involved with, “A Regional Decision Support Tool for Identifying Vulnerabilities of Riverine Habitat and Fishes to Climate Change.” Through this effort, vulnerability of reaches to changes in climate have been determined, and that data will also be incorporated.

The lake work will use the statewide inland lake classification framework database that is currently under development as the backbone and incorporate many newly developed elements that are essential for MWAP implementation. Those key new elements include EDUs, AESs, high priority conservation lakes and their associated local and network watersheds, lake health status, key human disturbances associated with each lake, projected fish assemblage type for each lake, and lakes that predict where to find species of greatest conservation need including rare, endangered, threatened, and special concern species and their associated key habitats.

The conservation strategy refinement report will synthesize and analyze the monitoring and other conservation efforts made during the first 10-year implementation of the aquatic portions of the MWAP and to report progresses and identify gaps. The conservation strategy refinement report will also develop enhanced strategies to fill remaining gaps and implement new management plans. This document will be integrated with a similar terrestrial portion compiled by Wildlife Division to become the Version 2 of MWAP, which is mandated by Congress to be rewritten every 10 years.

In addition to fulfilling Michigan’s obligations for State Wildlife Grant funding, results will deliver specific GIS tools for specific management programs. The project will provide GIS technical support to Fisheries Division and other DNR programs using the database and GIS tools that meet the needs for implementation of MWAP. This proposed project will enhance the knowledge of management personnel in understanding the function and process of the resources they manage; increase the efficiency in decision making; and improve effectiveness of management actions. This project will provide fisheries and other aquatic resource managers with information and tools that are otherwise not available, but are essential, for science-based biological conservation decision making.

A final set of benefits related to this proposed work stems from the fact that PIs are involved in other larger-scale related projects. Dr. Infante has been a lead on a national assessment of fish habitat in river systems in support of the National Fish Habitat Action Plan ([www.fishhabitat.org](http://www.fishhabitat.org), Esselman et al. In Review), and both Dr. Wehrly and Dr. Infante will begin collaboration on a national-scale lake assessment, also in support of the National Fish Habitat Action Plan. Further, both PIs are involved in two large-scale climate change assessment projects. Lessons learned through these efforts will help ensure the success of achieving project objectives in Michigan. Also, the spatial framework developed for these national efforts (see Wang et al. 2011) will be cross-walked with the Michigan framework. This will ensure that all data assembled for the national efforts can also be readily available for Michigan (e.g., various anthropogenic landscape disturbance layers, habitat assessment scores, results of stream temperature and flow models, downscaled climate data, etc.). These larger-scale efforts will also benefit from being informed by more refined activities that can be accomplished in this proposed state-wide effort. The exchanges across this project and larger-scale efforts will lead to more robust generation of products and greater visibility and utility of results

#### **D. Procedure:**

Job 1. Update and maintain Michigan’s river classification framework and databases and coordinate the development of Michigan inland lake GIS databases and classification framework. These databases will be updated as new and better resolution databases become available, along with data necessary to calculate key ecosystem properties. These databases will also be updated as advanced computer hardware and GIS software become available.

Job 2. Refine Michigan’s ecological drainage units (EDU) that were developed by The Nature Conservancy.

- Job 3. Define aquatic ecological systems (AESs) (i.e., subwatersheds with distinct characteristics in physicochemical and biological properties of their aquatic systems).
- Job 4. Identify high priority conservation areas for both inland lakes and rivers.
- Job 5. Assess environmental conditions of Michigan rivers and inland lakes.
- Job 6. Identify key environmental threats to each water body.
- Job 7. Develop GIS application tools to meet the other implementation needs of the MWAP programs of Fisheries Division. To address this job, we will work with field biologists and other management and conservation entities to develop critical information packages based on their needs.
- Job 8. Synthesize progress made in aquatics during the first 5-year wildlife action plan into a progress report.
- Job 9. Develop and write the aquatic portion of the 10-year conservation strategy refinement report.
- Job 10. Write annual performance report.
- Job 11. Write final report. A final report citing the publication produced under job # will be prepared.

**G. Schedule:**

<b>Proposed Work</b>	<b>2012-13</b>	<b>2013-14</b>
Job 1. Update and maintain river/lake frameworks and databases.	X	X
Job 2. Refine EDUs.	X	X
Job 3. Define AESs.	X	X
Job 4. Identify high priority conservation areas.	X	X
Job 5. Assess environmental conditions.	X	X
Job 6. Identify key environmental threats.	X	X
Job 7. Develop GIS application tools.	X	X
Job 8. Synthesize progress.	X	X
Job 9. Develop and write the 10-year conservation strategy refinement report.	X	X
Job 10. Prepare annual performance reports.	X	X
Job 11. Write final report.	NA	X

<sup>1</sup> NA = not scheduled

**H. Geographical locations:** Databases, GIS tools, and technical support will be for watersheds located throughout the State of Michigan. Personnel conducting the work will be based at Michigan State University, Department of Fisheries and Wildlife, East Lansing, Michigan and at the Institute for Fisheries Research, Ann Arbor, Michigan.

**I. Personnel:** List all personnel (e.g. research biologists, technicians, field biologists) required for this project. Please list the primary investigator first who will be responsible for the job activities and reporting.

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**GIS Research Technician, Arthur Cooper**  
 Michigan State University and Institute for Fisheries Research

**J. Products and deliverables:**

- (1) A refined river database, framework, and associated application tools;
- (2) A coordinated, parallel lake database, framework, and associated application tools;
- (3) A state-wide EDU layer;
- (4) A state-wide AES layer;
- (5) A list of high priority conservation areas;
- (6) Statewide assessment results for both lakes and rivers;
- (7) A conservation strategy refinement plan/report that will summarize progress made during the first 10 years of implementation of the MWAP.

**K. Detailed Budget: See attached for requested amount.**

An additional advantage to the proposed work is that benefits would be added to this project in the form of collaborative match. A portion of Dana Infante’s salary can be used as match, for example, as indicated below. Also, Arthur Cooper will be provided with a laptop computer through Michigan State along with software updates for the first two years of the project. He will also be encouraged to travel to at least two professional, national meetings in the first two years of the project so that his efforts may be informed by other similar projects. Finally, in partnering with Michigan State University on this proposed work, the negotiated overhead amount of 20% would be waived. Together, this represents a collaborative match of 78% of the total requested amount.

Total Requested Amount	\$109,279
Total Collaborative Match	\$85,238
Percent Collaborative Match of Total Requested Amount	78%

Collaborative Match Categories

Dana Infante Salary Match (16.7% in first year, 25% in last two years)	\$61,932
Laptop computer and software for Arthur Cooper	
Software licenses (estimate of \$150 per year, first year)	\$150
Travel for Arthur Cooper (1 trip per year, first year @ \$1,300 per trip)	\$1,300

**Literature Cited:**

- Esselman, P. C., D. M. Infante, L. Wang, W. W. Taylor, R. Tingley, J. Fenner, A. Cooper, D. Wieferich, D. Thornbrugh, J. Ross. *In Review*. A landscape assessment of fish habitat conditions in United States rivers and their watersheds. Report by the Assessment Team to the Science and Data Committee and Board of the National Fish Habitat Action Plan.
- Wang, L., D. M. Infante, A. Cooper, J. Lyons, and J. Stewart. 2011. Effects of dams in river networks on fish assemblages in non-impoundment sections of rivers in Michigan and Wisconsin, USA. *River Research and Applications* 27:473-487.

82650-77548- 237016/41

PO No.: \_\_\_\_\_

University Reference No.: \_\_\_\_\_

## ATTACHMENT B

### Proposed Budget

*Funding for this project is 50% funded through Federal funds and 50% through State Game & Fish funds.  
CFDA 15.634*

#### Year One Budget

Dates: 12/7/2012 to 9/30/2013

	Requested Funds	Matching Funds*	Total Cost
<b>SALARY/WAGES (See note below)</b>			
GIS research assistant	24,412	0	24,412
<b>Total Salary/Wages</b>	<b>24,412</b>	<b>0</b>	<b>24,412</b>
<b>FRINGE BENEFITS</b>			
GIS research assistant	11,220	0	11,220
<b>Total Fringe Benefits</b>	<b>11,220</b>	<b>0</b>	<b>11,220</b>
<b>Total Personnel Costs</b>	<b>35,631</b>	<b>0</b>	<b>35,631</b>
<b>OPERATING COSTS</b>			
Research Supplies & lab fees	0	0	0
General Supplies( include computer & Parts)	0	0	0
Phone	0	0	0
Postage	0	0	0
Printing/Copy Charges	0	0	0
Publication/Page Reprint Charges	0	0	0
Conference, Workshops	0	0	0
Others	0	0	0
<b>Total Operating Costs</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TRAVEL</b>			
Domestic Travel	0	0	0
<b>Total Travel</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL DIRECT COSTS</b>	<b>35,631</b>	<b>0</b>	<b>35,631</b>
Indirect cost base	0	0	0
<b>INDIRECT COSTS</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL COSTS by source</b>	<b>35,631</b>	<b>0</b>	<b>35,631</b>

**Year Two Budget**

**Dates: 10/1/2013 to 9/30/2014**

	<b>Requested Funds</b>	<b>Matching Funds*</b>	<b>Total Cost</b>
<b>SALARY/WAGES (See note below)</b>			
GIS research assistant	50,288	0	50,288
<b>Total Salary/Wages</b>	<b>50,288</b>	<b>0</b>	<b>50,288</b>
<b>FRINGE BENEFITS</b>			
GIS research assistant	23,360	0	23,360
<b>Total Fringe Benefits</b>	<b>23,360</b>	<b>0</b>	<b>23,360</b>
<b>Total Personnel Costs</b>	<b>73,648</b>	<b>0</b>	<b>73,648</b>
<b>OPERATING COSTS</b>			
Research Supplies & lab fees	0	0	0
General Supplies( include computer & Parts)	0	0	0
Phone	0	0	0
Postage	0	0	0
Printing/Copy Charges	0	0	0
Publication/Page Reprint Charges	0	0	0
Conference, Workshops	0	0	0
Others	0	0	0
<b>Total Operating Costs</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TRAVEL</b>			
Domestic Travel	0	0	0
<b>Total Travel</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL DIRECT COSTS</b>	<b>73,648</b>	<b>0</b>	<b>73,648</b>
Indirect cost base	0	0	0
<b>INDIRECT COSTS</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL COSTS by source</b>	<b>73,648</b>	<b>0</b>	<b>73,648</b>