



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

**NOTICE OF CONTRACT NO. 751B6600025**

**Between  
 STATE OF MICHIGAN  
 and**

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

Name and Address of Contractor <b>Michigan State University          Office of Sponsored Programs          426 Auditorium Rd., Rm 2          301 Administration Building          East Lansing, MI 48824-2601</b>	Primary Contact Diane Cox	
	Email Coxd@osp.msu.edu	
	Telephone (517) 884-4243	Contractor #, Mail Code *****5984/283

State Contact	Division	Name	Telephone	Email
Contract Compliance Inspector	Fisheries	Marisa Lay	(517) 284-5837	laym@michigan.gov
Contract Administrator	Finance and Operations	Lisa VanOstran	(517) 284-5975	vanostranl@michigan.gov

Contract Summary			
Description (Provide a basic but comprehensive description of services) An integrated approach for aquatic invasive species early detection and monitoring.			
<b>Initial Term</b> 1 year, 6 months	<b>Effective Date</b> 04/05/2016	<b>Initial Expiration Date</b> 9/30/2017	<b>Available Options</b> none
<b>Payment Terms</b> Net 30	<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</b> <input type="checkbox"/> P-Card <input type="checkbox"/> Direct Voucher (DV)	<b>Available to MiDeal Participants</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>ESTIMATED CONTRACT VALUE AT TIME OF EXECUTION: \$264,600.00</b>			



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

**CONTRACT NO. 751B6600025**

**Between  
 STATE OF MICHIGAN  
 and**

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

Name and Address of Contractor Michigan State University Office of Sponsored Programs 426 Auditorium Rd., Rm 2 301 Administration Building East Lansing, MI 48824-2601	Primary Contact Diane Cox	
	Email Coxd@osp.msu.edu	
	Telephone (517) 884-4243	Contractor #, Mail Code *****5984/283

State Contact	Division	Name	Telephone	Email
Contract Compliance Inspector	Fisheries	Marisa Lay	(517)284-5837	laym@michigan.gov
Contract Administrator	Finance and Operations	Lisa VanOstran	(517)284-5975	vanostranl@michigan.gov

Contract Summary			
Description (Provide a basic but comprehensive description of services) An integrated approach for aquatic invasive species early detection and monitoring.			
Initial Term 1 year, 6 months	Effective Date 04/05/2016	Initial Expiration Date 9/30/2017	Available Options none
Payment Terms Net 30	F.O.B. N/A	Shipped N/A	Shipped From N/A
Minimum Delivery Requirements N/A	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
ESTIMATED CONTRACT VALUE AT TIME OF EXECUTION: \$264,600.00			

THIS IS NOT AN ORDER: This contract is dependent on grant money through the Department of Environmental Quality (GLRI). Orders for delivery will be issued directly by the Michigan Department of Natural Resources through the issuance of a Purchase Order Form.

**FOR THE CONTRACTOR:**

Michigan State University  
 Firm Name  
*Diane Cox*  
 Authorized Agent Signature  
 Diane Cox, Senior Contract and Grant Administrator  
 Authorized Agent (Print or Type)  
*14 Apr 16*  
 Date

*JAZ*

**FOR THE STATE:**

*Laura Gyorkos*  
 Signature  
 Laura Gyorkos, Manager  
 Name/Title  
 DNR Finance and Operations/Procurement  
 Division/Section  
*4/13/16*  
 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. 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: **Aquatic invasive species early detection and monitoring** in collaboration with Fisheries Division of the Michigan Department of Natural Resources (DNR). Project completion date is **September 30, 2017.**

### I-B ISSUING OFFICE/CONTRACT ADMINISTRATOR

This contract is issued by the State of Michigan, Department of Natural Resources, Finance and Operations Division (FOD) for Fisheries Division (FD).

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

Lisa VanOstran, DNR, FOD  
3rd Floor, Constitution Hall  
P.O. Box 30028  
Lansing, MI 48909  
(517) 284-5975

### I-C CONTRACT STAFFING

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 oversee the contract on a day-to-day basis during the term of the contract. However, oversight 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 Project Manager is: Seth Herbst, Ph.D.  
Department of Natural Resources  
Fisheries Division  
P.O. Box 30446  
Lansing, MI 48909  
Telephone: (517) 284-5841  
Fax: (517) 373-0381  
Email: [herbsts1@michigan.gov](mailto:herbsts1@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. Kim Scribner  
Department of Fisheries and Wildlife and Zoology  
Michigan State University  
480 Wilson Rd Rom 2E  
East Lansing, MI 48824  
Telephone: (517) 353-3288  
Email: [scribne3@msu.edu](mailto:scribne3@msu.edu)

I-D CONTRACT COMPLIANCE INSPECTOR

Marisa Lay  
Financial Analyst, DNR, Fisheries Division  
P. O. Box 30446  
Lansing, MI 48909  
Telephone: (517) 284-5837  
Email: [Laym@michigan.gov](mailto:Laym@michigan.gov)

I-E PROGRAM OF WORK

**Problem/Need:**

The establishment of and increases in abundance and persistence of numerous Aquatic Invasive Species (AIS) in the Great Lakes is a source of great concern within the region that also increases the risk of secondary spread into inland waterbodies. The threat to Michigan is substantial because the State has a large amount of Great Lakes shoreline (>3,000 miles) and contains over 11,000 inland lakes, all in relatively close proximity to source populations and high risk vectors of AIS in the Great Lakes.

The State of Michigan has addressed the threats of AIS by developing and implementing management plans, including the *Aquatic Invasive Species State Management Plan* and the *Proposed 2010 Plan for the Prevention, Detection, Assessment, and Management of Asian Carps in Michigan Waters*. The invasive species management plans developed by Michigan are in line with national AIS management plans and federal invasive species priorities within the GLRI Action Plan in that prevention and early detection are key components addressed to combat AIS. Although early detection is widely recognized as a critical component of AIS management, it continues to be difficult to implement and evaluate early detection techniques in the field. To date, agencies have typically used genetic tools (i.e., eDNA) or traditional fisheries sampling gears to detect the presence of AIS. However, few approaches have evaluated a more comprehensive early detection monitoring that includes a simultaneous combination of genetic and traditional sampling approaches. Neither have both approaches been systematically compared simultaneously under different field scenarios and for different ecological guilds of species. The need for combining genetic and traditional gear sampling is to account for uncertainties and biases associated with each individual technique. For example, using multiple traditional gears for sampling is effective for sampling fish communities and detecting presence of live individuals (i.e., EPA-Duluth and USFWS traditional gear work with developing species accumulation curves). The use of multiple traditional gear types for early detection, however, is labor intensive and requires a large number of sample events. In addition, traditional gear types have selectivity issues making some species or size classes not vulnerable to capture. Genetic sampling techniques are effective at detecting species that are rare or at low density. However, some of the drawbacks of genetic sampling are the long (i.e., weeks to months) turn-around times from sample collection to finalized lab results and also the interpretation of eDNA results is limited because of unknown false negative detection rates in natural environments. In addition, genetic markers are lacking for multiple aquatic invasive species of interest and therefore limit our ability to widely use the technique for early detection.

**Purpose and Objectives:** The goal of this project is to develop and evaluate rapid and sensitive methods of early detection and monitoring for emerging and current AIS to inform proactive management actions in Michigan's inland, coastal, and Great Lakes waters. This will be achieved by:

- 1) Comparing the effectiveness of genetic and traditional gear sampling for early detection monitoring of AIS in inland lake and river habitats under controlled experimental conditions,
- 2) Determining the rate of false negative detections for a range of established species of different ecological guilds that occur in different habitats using eDNA in natural lake and river environments,
- 3) Developing rapid and sensitive molecular and computational methods of surveillance and monitoring for emerging and current AIS including eDNA species-specific markers and polymorphic markers that are capable of identifying locations of introduction, rates, direction and environmental features associated with dispersal, estimate recruitment, and evidence of selection,
- 4) Determining experimentally, whether multi-locus genotypes can be obtained from eDNA to facilitate estimation of numerical abundance as well as presence/absence of AIS,
- 5) Estimating demographic trends of geographically and numerically expanding populations of AIS.

**Expected Results and Benefits:** This research will provide validated monitoring protocols involving traditional gear and eDNA methods for an expanded number of AIS to build greater capacity for early detection for multiple invasive species of concern for Michigan and others within the Great Lakes Basin. It will also give us a better understanding of locations of introduction, rates, direction and environmental features associated with dispersal, estimate recruitment and evidence of selection.

#### **Procedure:**

The MSU laboratory will complete the following tasks under this contract:

- Task 1. Develop molecular genetic environmental (eDNA) laboratory techniques to enable rapid non-invasive surveillance methods for species where such methods have not been developed (e.g., Northern Snakehead Fish (*Channa argus*), Stone moroko (*Pseudorasbora parva*), Zander (*Sander lucioperca*), Wels catfish (*Silurus glanis*), Killer shrimp (*Dikerogammarus villosus*), Yabby (*Cherax destructor*), Red swamp crayfish (*Procambarus clarkia*), Golden mussel (*Limnoperna fortune*) (yr 1).
- Task 2. Evaluate the effectiveness of the PCR primers by testing for non-specific amplification (species specificity).
- Task 3. Use existing eDNA markers for Grass carp (*Ctenopharyngodon idella*), Rusty crayfish (*Orconectes rusticus*), Round goby (*Neogobius melanostomus*) and newly developed markers for the other AIS in experimental field trials in conjunction with field gear (see below).
- Task 4. In year two, apply the eDNA methods for samples to be collected from inland and Great Lakes locations for the aforementioned AIS and we will genotype specimens and conduct directed sampling for established AIS (Grass carp, Rusty crayfish, and Round gobies) to estimate, rates, direction and environmental features associated with dispersal, and estimates of recruitment.

The MSU field staff will complete the following tasks under this contract:

- Task 1. Conduct AIS sample collections using traditional field methods to develop eDNA markers in the laboratory for desired AIS (yr 1).
- Task 2. Compare AIS detection between traditional gear (conducted through existing Michigan DNR monitoring programs) and eDNA sampling in river and lake habitats.
- Task 3. Conduct directed sampling in habitats that are known to be associated with areas of high and low abundance and areas of long and short-term occupancy by Grass carp, Rusty crayfish and Round goby to verify the statistical methods and markers developed in the laboratory. Analyses of genetic data will provide important information concerning processes of colonization and dispersal by AIS.

#### **Methods:**

##### *Sample and environmental data collection:*

- eDNA water sampling will be conducted by MSU using protocols previously established.
- eDNA and markers developed for each AIS will be evaluated for added value to existing Michigan DNR surveying programs.
- Use specimen collections for species identification (DNA barcoding and RADseq genomics) based on established Michigan DNR electro-shocking to be conducted in the context of established inland, coastal and Great Lakes surveys.

Sampling will be conducted over a range of aquatic habitats and areas at high risk of introduction. Sampling for genomic sequencing and SNP genotyping will likewise be based on current species distributions, timing occupancy of habitats and the locations of habitats that are believed to either represent a barrier to dispersal and based on best estimates of population abundance. eDNA sampling conducted by MDNR and Michigan Department of Environmental Quality (MDEQ) and sampling using traditional gear will be conducted as part of the existing MDNR-Fisheries Division Status and Trends monitoring program and the MDEQ Qualitative Biological and Habitat Survey for Wadable Streams and Rivers program with additional boat electrofishing sampling as deemed necessary.

- Samples of species from non-Michigan locales will be collected from cooperators.

## eDNA

- For unstudied species, MSU will develop species-specific PCR-based genetic markers using publically available sequence information (GenBank, [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)). To ensure species specificity of amplification products and sensitivity (amount of DNA in water samples to ensure amplification and correct assignment of species presence), MSU will target short fragments of the mitochondrial DNA d-loop or the COI gene (Ivanova et al. 2007). MSU will align sequences from all available sequence data including sequences of related species and non-target Michigan native species.
- *Evaluation of PCR sensitivity and species specificity* –MSU will visualize and quantify amount of PCR products using highly sensitive quantitative (q)PCR. Positive reactions for each sample, replicate, and location and species will be identified based on species specific PCR amplification product size (in base pairs). MSU will conduct serial dilutions using DNA samples of voucher specimens to provide an estimate of the sensitivity of the PCR to detect species DNAs when present.
- *Quality Control and Assurance* – MSU will follow established U.S. Environmental Protection Agency (EPA) and U.S. Fish and Wildlife Service (USFWS) quality control and assurance

### *Development of new single nucleotide polymorphism (SNP) markers*

- MSU will use Restriction-site Associated DNA sequencing (RADseq) to identify and map >10,000 genome-wide Single Nucleotide Polymorphisms (SNPs). To carry out a genome-wide screening study, MSU will genotype groups of individuals of each of three AIS mentioned above that represent a range of taxonomic diversity, ecology and habitat requirements, and residence time in Michigan.

### *Data Analysis*

Analyses of data collected to compare eDNA vs traditional gear and sampling intensity will be based on general and/or generalized linear methods to determine the potential difference in the number of species detected by group (traditional gear sampling only, genetic (i.e., eDNA) sampling only, combination of traditional and genetic sampling). MSU will evaluate discrepancies of species composition between the two sampling techniques. MSU will determine the probability of false negative detection for aquatic invasive species of concern (round goby, grass carp, rusty crayfish). MSU will determine detection probabilities and eDNA false negative rates under different experimental conditions. Estimates of gene flow rates and direction and relatedness will be conducted using existing population genetics software.

DNR will provide the following:

- DNR PI as well as other Fisheries Division DNR staff will provide assistance with field sampling efforts for sample collection
- DNR PI will assist with manuscript/report development (30%).

## I-F DELIVERABLES

This contract will allow for increased capacity through the Partnership for Ecosystem Research and Management (PERM) with Michigan State University Fisheries and Wildlife Departments to analyze genetic samples for the early detection and population demographics of high risk AIS.

MSU PI will provide a draft report which is due 9/30/2016 and a final report which is due September 30, 2017 that will:

- Identify the effectiveness of combining genetic and traditional sampling techniques for an early detection monitoring program for the state of Michigan and that can inform the Interstate AIS monitoring and surveillance plan funded with the 2014 GLRI grant.
- Provide a new eDNA PCR method for unstudied AIS.
- Estimate rates and direction of inter-location gene flow for each AIS as well as measures of population recruitment that will inform us of potential source-sink dynamics of established AIS that will help inform control efforts.

## I-G PROJECT CONTROL AND REPORTS

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

The DNR Project Manager will meet as needed with the PI for the purpose of reviewing progress and providing necessary guidance in solving problems that arise.

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

## I-H 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 in 2013.

## I-I MODIFICATIONS OF CONTRACT

This contract may be modified if 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-J 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-K SEVERABILITY

Each provision of this contract shall be deemed 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-L 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-M 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 an employee, agent, or servant of the State for any reason.

## I-N 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-O 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-P 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. MSU may publish information concerning the award of this in the MSU Board of Trustees report only, without prior written consent.

### Publication

The Contractor will not use, release, publish or present 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. The Contractor will provide the State, for its review, copies of all presentations or articles being submitted for publication at least forty-five (45) days in advance. The State will review the proposed publication and provide comments. A response shall be provided to the Contractor within forty-five (45) days; otherwise, the Contractor may assume that the State has no comments. The Contractor agrees to address any concerns or issues identified by the State with respect to the State-supplied information prior to submission for publication or presentation.

### 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 that was compensated under the contract.

### Ownership of Samples\Equipment

Any samples provided by the DNR for use under this contract will remain the sole property of the DNR and must be returned upon the request of the DNR Project Manager

At the end of the project period, the DNR will retain ownership of any supplies/equipment purchased with funding under this contract and for the purposes of the project which are not consumed while completing the project. The supplies/equipment must be returned to the State upon the request of the DNR Project Manager.

## I-Q 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-R 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-S 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-T 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-U 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-V 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-W INSURANCE REQUIREMENTS

The Contractor shall purchase and maintain such insurance as will protect them 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 themselves 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 the minimum levels of insurance coverage as indicated below. 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 any subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

The Contractor waives all rights against the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents for recovery of damages to the extent these damages are covered by the insurance policies the Contractor is required to maintain pursuant to this contract, unless such damages are the result of the negligence or omission of the State of Michigan.

The insurance shall be written for not less than any minimum coverage herein specified or required by law, whichever is greater.

BEFORE THE CONTRACT IS SIGNED BY BOTH PARTIES OR BEFORE THE PURCHASE ORDER IS ISSUED BY THE STATE, THE CONTRACTOR MUST FURNISH TO THE DNR, FS, CERTIFICATE(S) OF INSURANCE VERIFYING INSURANCE COVERAGE. THE CERTIFICATE MUST BE ON THE STANDARD "ACCORD" FORM. THE CONTRACT OR PURCHASE ORDER NUMBER MUST BE SHOWN ON THE CERTIFICATE OF INSURANCE TO ASSURE CORRECT FILING. All such Certificate(s) shall contain a provision indicating that coverage afforded under the policies WILL NOT BE CANCELLED OR MATERIALLY CHANGED without prior written notice having been given to the DNR, FS. Such NOTICE must include the CONTRACT NUMBER affected.

The Contractor is required to provide the type and amount of insurance checked () below:

- 1. Commercial General Liability with the following minimum coverage:
  - \$2,000,000 General Aggregate Limit other than Products/Completed Operations
  - \$2,000,000 Products/Completed Operations Aggregate Limit
  - \$1,000,000 Personal & Advertising Injury Limit
  - \$1,000,000 Each Occurrence Limit
  - \$500,000 Fire Damage Limit (any one fire)
  
- 2. If a motor vehicle is used to provide services or products under this Contract, the Contractor must have vehicle liability insurance for bodily injury and property damage as required by law.

- 3. Worker's disability compensation, disability benefit or other similar employee benefit act with minimum statutory limits. NOTE: (1) If coverage is provided by a State fund or if Contractor has qualified as a self-insurer, separate certification must be furnished that coverage is in the state fund or that Contractor has approval to be a self-insurer; (2) Any citing of a policy of insurance must include a listing of the States where that policy's coverage is applicable; and (3) Any policy of insurance must contain a provision or endorsement providing that the insurers' rights of subrogation are waived. This provision shall not be applicable where prohibited or limited by the laws of the jurisdiction in which the work is to be performed.
- 4. Employers liability insurance with the following minimum limits:
  - \$100,000 each accident
  - \$100,000 each employee by disease
  - \$500,000 aggregate disease

#### I-X 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-Y 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-Z 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-AA 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-BB 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-CC 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-DD 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-EE 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-FF 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-GG RENEWALS - Reserved

#### I-HH 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-II 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

### Proposed Budget

Project Title: "Aquatic invasive species and pathogen testing"

4/5/2016 – 9/30/2016

<b>Salaries and Wages</b>		<b>\$69,047.00</b>
Post Doctorate Student (TBD)	6 mo	\$42,000.00
Lab Tech (Jeannette Kanefsky)	4 mo	\$17,447.00
Undergraduate		\$9,600.00
<b>Benefits</b>		<b>\$18,887.00</b>
Post Doctorate Student (TBD)		\$10,436.00
Lab Tech (Jeannette Kanefsky)		\$7,716.00
Undergraduate		\$735.00
<b>Field and Lab Supplies</b>		<b>\$29,000.00</b>
PCR DNA sequencing primers		\$2,231.00
PCR reagents		\$11,505.00
PCR Taqman SNP primers		\$5,532.00
Containers and filters for field sample collection		\$2,231.00
DNA Extraction Kits		\$4,372.00
DNA Sequencing Kits		\$3,129.00
<b>Contractual Services</b>		<b>\$50,400.00</b>
MSU RTSF RAD library sequencing		\$38,400.00
MSU RTSF Bioinformatics		\$7,000.00
MSU HPCC computational services		\$5,000.00
<b>Travel/Per diem</b>		<b>\$5,000.00</b>
Mileage for sampling		\$5,000.00
<b>Total Direct</b>		<b>\$172,334.00</b>

## Proposed Budget

Project Title: "Aquatic invasive species and pathogen testing"

10/1/2016 – 9/30/2017

<b>Salaries and Wages</b>		<b>\$44,447.00</b>
Post Doctorate Student (TBD)	12 mo	\$21,421.00
Lab Tech (Jeannette Kanefsky)	4 mo	\$17,796.00
Undergraduate		\$5,230.00
<b>Benefits</b>		<b>\$13,819.00</b>
Post Doctorate Student (TBD)		\$5,418.00
Lab Tech (Jeannette Kanefsky)		\$8,001.00
Undergraduate		\$400.00
<b>Field and Lab Supplies</b>		<b>\$23,000.00</b>
PCR DNA sequencing primers		\$1,769.00
PCR reagents		\$9,125.00
PCR Taqman SNP primers		\$4,388.00
Containers and filters for field sample collection		\$1,769.00
DNA Extraction Kits		\$3,468.00
DNA Sequencing Kits		\$2,481.00
<b>Contractual Services</b>		<b>\$8,000.00</b>
MSU RTSF RAD library sequencing		\$4,000.00
MSU RTSF Bioinformatics		\$2,000.00
MSU HPCC computational services		\$2,000.00
<b>Travel/Per diem</b>		<b>\$3,000.00</b>
Mileage for sampling		\$1,570.00
Airfare for conference		\$1,430.00
<b>Total Direct</b>		<b>\$92,266.00</b>