

Board of Trustees of Southern Illinois University
900 South Normal Avenue
Carbondale, IL 62901-4302
FEIN 37-6005961
DUNS # 93900755
SAM 3NDX8

Nebraska Community Foundation
PO Box 83107
Lincoln, NE 68501-3107
FEIN 47-0769903

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM

Contract between Nebraska Community Foundation, Platte River Recovery Implementation Program, and the Board of Trustees of Southern Illinois University

PALLID STURGEON GENETICS RESEARCH 2021 - 2026

1. Parties. This Contract is made and entered into by and between Nebraska Community Foundation (“**Foundation**”) of Lincoln, Nebraska, representing all signatories to the Platte River Recovery Implementation Program (“**Program**”) and the **Board of Trustees of Southern Illinois University** (“**Contractor**”). The following persons are authorized to act on behalf of their respective parties with regard to this Contract: Diane Wilson of the Foundation; Jason Farnsworth of the **Program**; and Patrick Amihere of the **Contractor**.

2. Purpose of Contract. The purpose of this Contract is to allow the **Foundation**, acting as the fiscal agent for the Governance Committee (GC) of the **Program**, to retain the services of the **Contractor** to render certain technical or professional services hereinafter described in connection with an undertaking to be financed by the **Program**, and to delegate the Executive Director’s Office (“**ED Office**”) through its Executive Director or his designee the authority to administer this Contract.

3. Term of Contract and Required Approvals. This Contract is effective when all parties have executed it. The term of the services to be completed by Contractor under this Contract is from **July 31, 2021** through **December 31, 2026**. All services shall be completed during this term. Furthermore, the services to be performed under this Contract will commence upon receipt by **Contractor** of authorization to proceed from **Program**.

If the **Contractor** has been delayed and as a result will be unable, in the opinion of the **Program**, to complete performance fully and satisfactorily within this Contract period, the **Contractor** may be granted an extension of time, upon submission of evidence of the causes of delay satisfactory to the **Program**. An extension of the contract term must be in writing, signed by both Parties in order to be valid.

4. Payment.

A. Firm Fixed Price. The **Program** agrees to pay the **Contractor** a firm fixed price based on the budget depicted in Exhibit C, attached to and incorporated by reference as part of this Contract, for the research described in Exhibit A and associated Scope of Work included as Exhibit B, all attached to and incorporated by reference as part of this Contract. Total Year 1 Payment under this contract shall be **\$186,890**. Year 2 – 5 Payments shall be based on the number of Platte genetic samples that are sequenced at a firm fixed price of \$45 per sample. Total Year 1 – 5 Payments under this contract shall not exceed **\$366,890**.

B. Payment. Payment shall be made directly to the **Contractor**. The **Contractor** shall maintain records to support audits the **Program** may require. Year 1 Payment shall be billed in one lump sum following Contract execution. Year 2 – 5 billing reports shall be submitted no more often than monthly and no less than annually for work since the last billing report. The billing report shall be in substantially similar form to the invoice set forth in Exhibit E. All payments under this Contract will be made in United States dollars payable by check to the "Board of Trustees, Southern Illinois University" and sent to the **Contractor's** Billing Point of Contact as follows:

Name: Shelley Perez
Department: Office of Sponsored Projects-Accounting
Mailing Address: Woody Hall 311, MC 4709
Southern Illinois University Carbondale
Carbondale, Illinois 62901
Phone: 618-536-4536
Fax: 618-536-2630
Email: gaca@siu.edu

C. Billing Procedures. The **Contractor** shall send billing reports for budget items outlined in Exhibit C to the **ED Office** (address included below). The Program's Executive Director, upon receiving the billing report, will review the bill and advance the invoice to the Bureau of Reclamation who will advise the **Foundation** of approval. The **Foundation** will make payment of these funds directly to the **Contractor** within 30 days of receiving notice of approval provided payments are due within 60 days after the billing date set forth on the billing report.

Billing Point of Contact (Program):

Mr. Jason Farnsworth, Executive Director
Platte River Recovery Implementation Program
Headwaters Corporation
4111 4th Avenue, Suite 6
Kearney, Nebraska 68845
Phone: (308) 237-5728
Fax: (308) 237-4651

Email: farnsworthj@headwaterscorp.com

D. Withholding of Payment.

(i) When the **Program** has reasonable grounds for believing that the **Contractor** will be unable to perform this Contract fully and satisfactorily within the time fixed for performance, then the **Program** may withhold payment of such portion of any amount otherwise due and payable to the **Contractor** reasonably deemed appropriate to protect the **Program** against such loss. These amounts may be withheld until the cause for the withholding is cured to the **Program's** satisfaction or this Contract is terminated pursuant to Section 8.U. Any amount so withheld may be retained by the **Program** for such period as it may deem advisable to protect the **Program** against any loss. This provision is intended solely for the benefit of the **Program** and no person shall have any right against the **Program** or **Foundation** by reason of the **Program's** failure or refusal to withhold monies. No interest shall be payable by the **Program** or **Foundation** on any amounts withheld under this provision. This provision is not intended to limit or in any way prejudice any other right of the **Program** or **Foundation**.

5. Responsibilities of Contractor.

A. Scope of Services. The **Contractor** shall perform the specific services required under this Contract in a satisfactory and proper manner in accordance with standards appropriate to an institution of higher education as outlined in the research proposal in Exhibit A and associated Scope of Services in Exhibit B. If there is any conflict between this Contract and the provisions of the specific requirements of Exhibit B, the specific requirements shall prevail.

B. Personnel. All of the services required hereunder will be performed by the **Contractor** or under its supervision, and all personnel engaged in the work shall be fully qualified and shall be authorized, licensed, or permitted under state and/or federal law to perform such services, if state and/or federal law requires such authorization, license, or permit.

C. Subcontracts.

(i) **Approval Required for Subcontracts.** Any subcontractors and outside associates or consultants required by the **Contractor** in connection with the services, work performed or rendered under this Contract will be limited to such individuals or firms as were specifically identified in the proposal and agreed to during negotiations or are specifically authorized by the **Program** during the performance of this Contract. The **Contractor** shall submit a list of the proposed subcontractors, outside associates, or consultants; the scope and extent of each subcontract; and the dollar amount of each subcontract prior to Contract execution to the **Program** for approval. During the performance of the Contract, substitutions in or additions to such subcontracts, outside associates, or consultants will be subject to the prior approval of the **Program**. The **Program** approval of subcontractors will not relieve the **Contractor** from any

responsibilities outlined in this Contract. The **Contractor** shall be responsible for the actions of the subcontractors, outside associates, and subconsultants.

(ii) **Billings for Subcontractors.** Billings for subcontractor, associates or subconsultants services will not include any mark up. The subcontract costs will be billed to the **Program** at the actual costs as billed to the **Contractor**. Subcontract costs will be documented by attaching subcontractor billings to the **Contractor's** billing submittals.

(iii) **Copies of Subcontracts.** The **Contractor** shall provide to the **Program** copies of each subcontractor contract immediately following execution with the subcontractor. All subcontracts between the **Contractor** and a subcontractor shall refer to and conform to the terms of this Contract. However, nothing in this Contract shall be construed as making the **Program** a party to any subcontract entered between the **Contractor** and a subcontractor.

(iv) **Contracts for Subcontractors.** All subcontracts that Contractor enters into shall include any applicable provisions and certifications required by 2 CFR Part 200, including Appendix II thereto, and any other federal, state or local laws or regulations.

(v) **Debarment and Suspension.** Contractor shall not enter into subcontracts with any entity or individual that is suspended, debarred or otherwise excluded from participation in the transaction covered by this Contract.

D. Requests from the Program. The **Contractor** shall be responsible and responsive to the **Program** and the **ED Office** in their requests and requirements related to this Contract.

E. Reports. The **Contractor** shall provide annual written progress reports to the Program and a final report describing research methods, results, accomplishments, and interpretations. Annual reports shall be submitted by December 1 of each year. The final report shall be submitted prior to the termination date of this Contract. All reports shall be sent electronically to the Program's Technical Point of Contact.

H. Inspection and Acceptance. All deliverables furnished by the **Contractor** shall be subject to rigorous review by the ED Office prior to acceptance, provided such acceptance shall not be unreasonably withheld.

6. Responsibilities of the Program.

A. Designated Representative. The Executive Director of the **Program** shall act as the **Program's** administrative representative with respect to the **Contractor's** service to be performed under this Contract and shall have complete authority to transmit instructions, receive information, and interpret and define the **Program's** policies and decisions with respect to services covered by this Contract.

B. Data to be Furnished to the Contractor. All information, data, reports, and maps as are available to the **Program** and necessary for the carrying out of the Scope of Services set forth herein shall be furnished to the **Contractor** without charge and the **ED Office** shall cooperate with the **Contractor** in every way possible in the carrying out of the project.

C. Review Reports. The **ED Office** shall examine all data, reports and other work products presented by the **Contractor** to the **Program** and shall promptly render in writing the **Program's** decisions pertaining thereto within the time periods specified in Exhibit B.

D. Provide Criteria. The **ED Office** shall provide all criteria and full information regarding its requirements for the project provided such criteria and information shall not conflict with the terms of this Contract.

7. Special Provisions.

A. No Finder's Fees. No finder's fee, employment agency fee, or other such fee related to the procurement of this Contract shall be paid by either party.

B. Publication. It is understood that the results of this work shall be available to the **Contractor** for publication including academic theses and dissertations and use in connection with related work. Use of this work for publication and related work by the **Contractor** must be conducted with full disclosure to and coordination with the **Program's** Technical Point of Contact.

The results of the **Contractor's** work may be published jointly by the **Contractor** and the **Program** or by the **Contractor** separately if the **Program** is given the opportunity to review and provide comments. Manuscripts prepared for publication by the **Contractor** shall be in writing and shall be reviewed by the **Program** within 30 days of receipt of the manuscript. It is further agreed that proper acknowledgement of funding support will be noted in all publications. In the event of disagreement, the **Contractor** may publish results on its own responsibility, giving proper acknowledgement of cooperation and disclaim that the other party agrees with the contents of the publication. Publications by the **Contractor** shall not discuss implications of the research to the **Program**.

C. Publicity. Any publicity or media contact associated with the **Contractor's** services and the result of those services provided under this Contract shall be coordinated with the **Program**. Media requests should be directed to the Director of Outreach and Operations in the **ED Office**.

D. Monitor Activities. The **Program** shall have the right to reasonably monitor all Contract-related activities of the **Contractor** and all subcontractors. This shall include, but not be limited to, the right to make site inspections at any reasonable time, to bring experts and consultants on site to examine or evaluate completed work or work in progress, and to observe all **Contractor** personnel in every phase of performance of Contract-related work.

E. Kickbacks. The **Contractor** certifies and warrants that no gratuities, kickbacks, or contingency fees were paid in connection with this Contract, nor were any fees, commissions, gifts, or other considerations made contingent upon the award of this Contract. If the **Contractor** breaches or violates this warranty, the **Program** may, at its discretion, terminate this Contract without liability to the **Program**, or deduct from the Contract price or consideration, or otherwise recover, the full amount of any commission, percentage, brokerage, or contingency fee.

F. Debarment and Suspension. **Contractor** certifies by signing this Contract that neither **Contractor** nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded by any federal department or agency from participation in the transaction covered by this Contract.

G. Anti-Lobbying. **Contractor** makes the representations set forth on the Certification Regarding Lobbying, which is attached as Exhibit D and incorporated by reference as part of this Contract. **Contractor** shall execute such Certification at the time of executing this Contract.

H. Office Space, Equipment, and Supplies. The **Contractor** will supply its own office space and supplies. Illumina MiSeq DNA sequencer purchased for this work (Exhibit C) will become the property of the **Contractor** upon termination of this Contract. Commodities for genotyping are disposable, non-permanent supplies that are covered under year 1 costs and years 2-5 costs on a per sample basis as specified in Exhibit C.

8. General Provisions.

A. Amendments. Any changes, modifications, revisions or amendments to this Contract which are mutually agreed upon by the parties to this Contract shall be incorporated by written instrument, executed and signed by all Parties to this Contract.

B. This paragraph has been intentionally left blank.

C. Assignment/Contract Not Used as Collateral. Neither party shall assign or otherwise transfer any of the rights or delegate any of the duties set forth in this Contract without the prior written consent of the other party. The **Contractor** shall not use this Contract, or any portion thereof, as collateral for any financial obligation, without the prior written permission of the **Program**.

D. Audit/Access to Records. The **Program**, the **Foundation** and any of their representatives shall have access to any books, documents, papers, and records of the **Contractor** which are pertinent to this Contract except as otherwise restricted under law or regulation. The **Contractor** shall, immediately upon receiving written instruction from the **Program** or the **Foundation**, provide to the Foundation or any governmental entity, independent auditor, accountant, or accounting firm, all books, documents, papers and records of the **Contractor** which

are pertinent to this Contract. The **Contractor** shall cooperate fully with the **Foundation** or any such governmental entity, independent auditor, accountant, or accounting firm, during the entire course of any audit authorized by or required of the **Program**.

E. Availability of Funds. Each payment obligation of the **Program** is conditioned upon the availability of funds and continuation of the Platte River Recovery Implementation Program. If funds are not allocated and available for the continuance of the services performed by the **Contractor**, the contract may be terminated by the **Program** at the end of the period for which the funds are available. The **Program** shall notify the **Contractor** at the earliest possible time of the services which will or may be affected by a shortage of funds. No penalty shall accrue to the **Program** in the event this provision is exercised, and the **Program** shall not be obligated or liable for any future payments due or for any damages as a result of termination under this section. This provision shall not be construed to permit the **Program** to terminate this Contract to acquire similar services from another party.

F. Award of Related Contracts. The **Program** may undertake or award supplemental or successor contracts for work related to this Contract. The **Contractor** shall cooperate fully with other contractors and the **Program** in all such cases.

G. This paragraph has been intentionally left blank.

H. Compliance with Law. The **Contractor** shall keep informed of and comply with all applicable federal, state, and local laws and regulations in the performance of this Contract.

I. Confidentiality of Information. All documents, data compilations, reports, computer programs, photographs, and any other work provided to or produced by the **Contractor** in the performance of this Contract shall be kept confidential by the **Contractor** for a period ending on **December 31, 2026**, provided that the **Contractor's** obligation shall not apply to information that:

- (i) is not disclosed in writing or reduced to writing and marked as confidential at the time of disclosure;
- (ii) is already in the **Contractor's** possession at the time of disclosure;
- (iii) is or later becomes part of the public domain through no fault of the **Contractor**;
- (iv) is received from a third party having no obligations of confidentiality to the **Contractor**;
- (v) is independently developed by the **Contractor**; or
- (vi) is required by law or regulation to be disclosed.

J. Conflicts of Interest

(i) **Contractor** shall not engage in providing consultation to or representation of clients, agencies or firms which may constitute a conflict of interest giving rise to a disadvantage to the **Program** or a disclosure which would adversely affect the interests of the **Program**. **Contractor** shall notify the **Program** of any potential or actual conflicts of interest arising

during the course of the **Contractor's** performance under this Contract. This Contract may be terminated in the event a conflict of interest arises. Termination of the Contract will be subject to a mutual settlement of accounts. In the event the contract is terminated under this provision, the **Contractor** shall take steps to ensure that the file, evidence, evaluation, and data are provided to the **Program** or its designee. This does not prohibit or affect the **Contractor's** ability to engage in consultations, evaluations, or representation under agreement with other agencies, firms, facilities, or attorneys so long as no conflict exists.

(ii) A conflict of interest warranting termination of the Contract includes, but is not necessarily limited to, representing a client in an adversarial proceeding against the **Program**, its signatories, boards, commissions, or the Foundation, or initiating suits in equity including injunctions, declaratory judgments, writs of prohibition or *quo warranto*.

K. Entirety of Contract. This Contract, consisting of *twelve (12)* pages, Exhibit A, consisting of *six (6)* pages, Exhibit B, consisting of *seven (7)* pages, Exhibit C, consisting of *one (1)* page, Exhibit D consisting of *one (1)* page, and Exhibit E consisting of *one (1)* page represents the entire and integrated Contract between the parties and supersedes all prior negotiations, representations, and agreements, whether written or oral.

L. Force Majeure. Neither party shall be liable for failure to perform under this Contract if such failure to perform arises out of causes beyond the control and without the fault or negligence of the nonperforming party. Such causes may include, but are not limited to, acts of God or the public enemy, fires, floods, epidemics, quarantine restrictions, freight embargoes, and unusually severe weather. This provision shall become effective only if the party failing to perform immediately notifies the other party of the extent and nature of the problem, limits delay in performance to that required by the event, and takes all reasonable steps to minimize delays. This provision shall not be effective unless the failure to perform is beyond the control and without the fault or negligence of the nonperforming party.

M. Indemnification. To the extent permitted by Illinois law and not inconsistent with the doctrine of sovereign immunity, the **Contractor** shall indemnify and hold harmless the **Foundation**, the **Program**, the **ED Office**, and their officers, agents, employees, successors and assignees from any and all claims, lawsuits, losses and liability arising out of **Contractor's** failure to perform any of **Contractor's** duties and obligations hereunder or in connection with the negligent performance of **Contractor's** duties or obligations, including but not limited to any claims, lawsuits, losses or liability arising out of **Contractor's** malpractice. The obligations of this paragraph shall survive termination of this Contract.

N. Independent Contractor. The **Contractor** shall function as an independent contractor for the purposes of this Contract and shall not be considered an employee of the **Program**, **Foundation**, or **ED Office** for any purpose. The **Contractor** shall assume sole responsibility for any debts or liabilities that may be incurred by the **Contractor** in fulfilling the terms of this Contract, and shall be solely responsible for the payment of all federal, state and local taxes which may accrue because of this Contract. Nothing in this Contract shall be interpreted as

authorizing the Contractor or its agents and/or employees to act as an agent or representative for or on behalf of the Foundation or the Program, or to incur any obligation of any kind on the behalf of the Foundation or the Program. The Contractor agrees that no health/hospitalization benefits, workers' compensation and/or similar benefits available to Foundation, Program, or ED Office employees will inure to the benefit of the Contractor or the Contractor's agents and/or employees as a result of this Contract.

O. Notices. All notices arising out of, or from, the provisions of this contract shall be in writing and given to the parties at the address provided under this Contract, either by regular mail, facsimile, e-mail, or delivery in person. Notice is effective upon delivery.

P. Notice and Approval of Proposed Sale or Transfer of the Contractor. The Contractor shall provide the Program with the earliest possible advance notice of any proposed sale or transfer or any proposed merger or consolidation of the assets of the Contractor. Such notice shall be provided in accordance with the notice provision of this Contract.

Q. Ownership of Documents/Work Product/Materials. Program and Contractor shall have joint ownership of all data collected or compiled by Contractor within the scope of this work.

R. Patent or Copyright Protection. The Contractor recognizes that certain proprietary matters or techniques may be subject to patent, trademark, copyright, license or other similar restrictions, and warrants that no work performed by the Contractor or its subcontractors will knowingly violate any such restriction.

Inventions conceived or first reduced to practice under this Contract by the Contractor shall be owned by the Contractor and the Contractor shall bear the costs of filing related patents. Each party shall be granted a free, irrevocable, nonexclusive, and non-assignable right to use, solely for its internal noncommercial purposes, patented or non-patented inventions resulting from the work under this Contract.

S. Insurance Coverage. The Contractor shall not commence work under this Contract until the Contractor has obtained the following insurance coverages and provided the corresponding certificates of insurance upon request by the Program:

(i) Comprehensive general liability insurance coverage provided through the Southern Illinois University Self-Insurance Program with limits of \$1,000,000 per occurrence and a \$3,000,000 general aggregate covering its employees acting within the scope of their appointments and its enrolled students while acting in the scope of an approved unpaid Internship for which academic credit or the equivalent may be awarded.

(ii) Workers' compensation and employer liability insurance coverage provided through the State of Illinois Self-Insured Workers' Compensation Plan, providing statutory limits of coverage for all State employees.

(iii) Automobile liability coverage furnished to the University by the State of Illinois through the State of Illinois Self-Insured Automobile Liability Plan and administered by the State of Illinois Department of Central Management Services, providing coverage of \$2,000,000 for all state-owned and leased vehicles while engaged in state business; and;

(iv) Professional liability insurance coverage provided through the Southern Illinois University Self-Insurance Program with limits of \$1,000,000 per occurrence and a \$3,000,000 general aggregate covering its employees acting within the scope of their appointments and its enrolled students while acting in the scope of an approved unpaid Internship for which academic credit or the equivalent may be awarded.

T. Taxes. The **Contractor** shall pay all taxes and other such amounts required by federal, state and local law, including but not limited to federal and state income taxes, social security taxes, workers' compensation, unemployment insurance and sales taxes.

U. Termination of Contract. This Contract may be terminated, without cause, by the **Program** or **Contractor** upon fifteen (15) days written notice. This Contract may be terminated immediately for cause if the **Contractor** fails to perform in accordance with the terms of this Contract. In the event of a termination, **Program** shall pay **Contractor** for all reasonable work performed up to the effective date of the termination including any actual direct costs, F&A (Facilities & Administrative or indirect) costs and any noncancellable commitments incurred by **Contractor** prior to the effective date of termination provided that in all instances, the total cost to Program in the event of termination shall not exceed **\$366,890**. In the event the contract is terminated under this provision, the **Contractor** shall take steps to ensure that the data collected, analyses performed, results and interpretations made prior to termination are provided to the **Program** or its designee. Notwithstanding the foregoing, **Contractor** may elect to unilaterally terminate its obligations under this Contract immediately upon written notice to the **Program** if **Program** fails to timely make any payment required under this Contract provided **Program** shall have a period of seven (7) days to cure such nonpayment after receipt of proper notice of nonpayment from **Contractor**.

V. Third Party Beneficiary Rights. The parties do not intend to create in any other individual or entity the status of third-party beneficiary, and this Contract shall not be construed so as to create such status. The rights, duties and obligations contained in this Contract shall operate only between the parties to this Contract and shall inure solely to the benefit of the parties to this Contract. The provisions of this Contract are intended only to assist the parties in determining and performing their obligations under this Contract.

W. Time is of the Essence. Time is of the essence in all provisions of the Contract.

X. Titles Not Controlling. Titles of paragraphs are for reference only and shall not be used to construe the language in this Contract.

Y. Waiver. The waiver of any breach of any term or condition in this Contract shall not be deemed a waiver of any prior or subsequent breach.

Z. Survival. The parties' obligations under sections 8.D. (Audit/Access to Records), 8.S. (Insurance Coverage), and 8.U. (Termination of Contract) will survive the termination of this Contract.

9. Contacts.

Administrative Point of Contact (Foundation):

Diane M. Wilson
Manager of Public/Private Partnerships
Nebraska Community Foundation
PO Box 83107
Lincoln, Nebraska 68501-3107
Phone: (402) 323-7330
Fax: (402) 323-7349
Email: dwilson@nebcommfound.org

Technical Point of Contact (Program):

Dr. Malinda Henry, Science Lead
Platte River Recovery Implementation Prog.
Headwaters Corporation
4111 4th Avenue, Suite 6
Kearney, Nebraska 68845
Phone: (308) 237-5728
Fax: (308) 237-4651
Email: henrym@headwaterscorp.com

Administrative Point of Contact (Contractor):

Patrick Amihere, Director
Office of Sponsored Projects Administration
Woody Hall 311 MC 4709
Southern Illinois University
Carbondale, Illinois 62901
Phone: (618) 453-4540
Fax: 618) 453-8038
Email: contracts@siu.edu

Admin. Point of Contact (Program):

Jason Farnsworth, Executive Director
Platte River Recovery Implementation Prog.
Headwaters Corporation
4111 4th Avenue, Suite 6
Kearney, Nebraska 68845
Phone: (308) 237-5728
Fax: (308) 237-4651
Email: farnsworthj@headwaterscorp.com

Media Point of Contact (Program):

Dr. Bridget Barron, Director of Outreach
Platte River Recovery Implementation Prog.
Headwaters Corporation
4111 4th Avenue, Suite 6
Kearney, Nebraska 68845
Phone: (308) 237-5728
Fax: (308) 237-4651
Email: barronb@headwaterscorp.com

Technical Point of Contact (Contractor):

Dr. Edward Heist, Associate Director
Fisheries & IL Aquaculture Center
Life Science III, MC: 6511
Southern Illinois University Carbondale
Carbondale, Illinois 62901
Phone: (618) 536-7761
Email: edheist@siu.edu

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10. Signatures. By signing this Contract, the undersigned certify that they have read and understood it, that they have the authority to sign it, and that their respective Party agrees to be bound by the terms of the Contract.

NEBRASKA COMMUNITY FOUNDATION

Diane M. Wilson
Manager of Public/Private Partnerships

Date

BOARD OF TRUSTEES OF SOUTHERN ILLINOIS UNIVERSITY

Patrick Amihere
Director, Office of Sponsored Projects Administration
for Austin Lane, Chancellor,
Southern Illinois University Carbondale

Date

**PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM
ACKNOWLEDGEMENT**

I hereby certify that the Governance Committee of the Platte Program has authorized the Nebraska Community Foundation, acting as contracting agent of the Governance Committee of the Platte Program, to enter into this agreement.

Jason Farnsworth
Executive Director

Date

**EXHIBIT “A”
RESEARCH PROPOSAL**

**Resolving Pallid Sturgeon Species Identification, Demographics and Hybridization using
GT-Seq**

**Edward J. Heist
Southern Illinois University Carbondale**

Introduction – Pallid sturgeon (*Scaphirhynchus albus*) is an endangered species endemic to the Missouri and Mississippi river basins where it is far less common than shovelnose sturgeon (*S. platorhynchus*). Pallid and shovelnose sturgeon are genetically very similar, more similar than are intraspecific populations of many other species (Allendorf et al. 2001; Campton et al. 2000). The species hybridize and produce fertile offspring (Schrey et al. 2011), meaning that an individual fish may have inherited a variable fraction of its genes from both species.

Hybridization is listed as one potential threat to the survival of pallid sturgeon (Dryer and Sandvol 1993), as hybridization between a rare and common species may result in the rare species going extinct as its genome is subsumed into that of the common species (Rhymer and Simberloff 1996). Use of genetically pure pallid sturgeon as broodstock for the conservation stocking program is critical because stocking of hybrid and backcross fish can further the deterioration of species boundaries and thus accelerate extinction of pallid sturgeon. Field-research programs including the Habitat Assessment Monitoring Program (HAMP, Jacobson et al. 2015) which monitors the response of several fish species to stream modifications and the Pallid Sturgeon Population Assessment Program (PSPAP, Colvin et al. 2018) which monitors trends in juvenile sturgeon population abundance, rely on accurate species ID to manage and conserve pallid sturgeon.

Currently pallid and shovelnose sturgeon are identified using a panel of 19 microsatellite loci but recently Jordan et al. (2019) demonstrated that these markers are insufficient for identifying the species and their hybrids. Preliminary results from our ongoing project to develop hundreds of Single Nucleotide Polymorphism (SNP) markers indicate that these new markers provide much greater resolution than the current microsatellites (Figure 1). The markers were developed using a technique called ddRAD (Peterson et al. 2012) in which I sequenced small portions of the genomes of 57 putatively pure pallid and 52 putatively pure shovelnose sturgeon. The ddRAD approach is too inefficient for scoring large numbers of individuals. However, a new approach called Genotyping in Thousands by Sequencing (GT-Seq, Campbell et al. 2015) will allow us to use our ddRAD sequences to design primers and probes for efficiently genotyping larger numbers of individuals for the most powerful markers. In year one we will focus on the development of these GT-seq markers for pallid genotyping.

Species ID and hybridization – Over the past 20 years my laboratory has collected several thousand sturgeon genetic samples. Initial identification was made based on a combination of genetic and morphological traits. In years two and three of this project we will determine GT-Seq genotypes from a minimum of 2000 adult and sub-adult individuals including putative pallid, shovelnose and hybrid sturgeon distributed across the entire range of pallid sturgeon. A variety of analytical approaches will be used to provide better resolution of the species status of each individual and identify more reliable criteria for identifying pure pallid sturgeon. Discriminant Analysis using Principal Components (DAPC, Jombart et al. 2010, Figure 1) will be used to sort genetic data into “natural” groups composed of pure species with hybrids spanning the space between the clusters. STRUCTURE (Pritchard et al. 2000) will assign the fraction of each fish’s genome comprised of pallid and shovelnose sturgeon genes. Results from both analyses will be used to construct NewHybrids (Anderson and Thompson 2002) baselines for identifying pure pallid and shovelnose sturgeon and the reliability of these baselines will be evaluated using modeling as was done in Jordan et al. (2019).

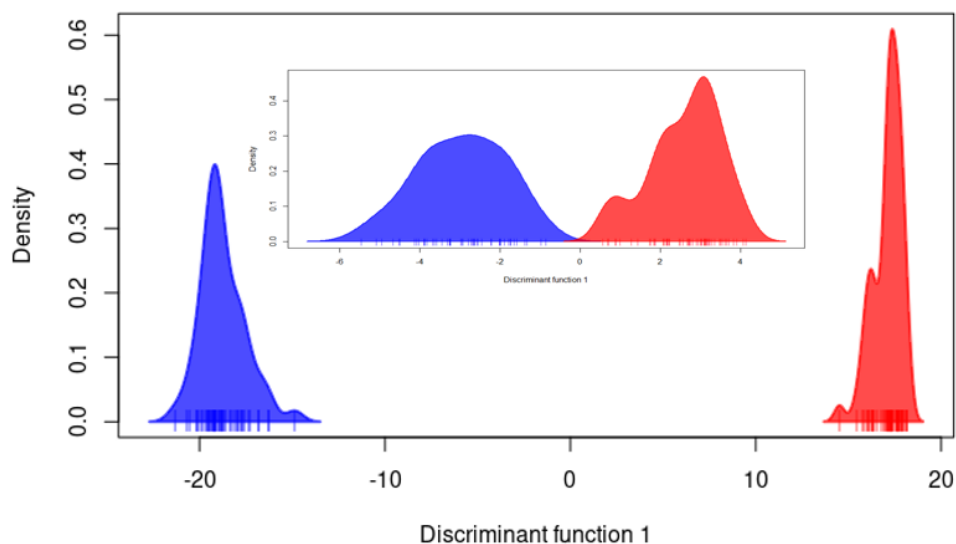


Figure 1. Discriminant analysis using principal components (DAPC, Jombart et al. 2010) resolution between putatively pure pallid (blue) and shovelnose (red) sturgeon. Main graph is for the new SNP markers, inset is for microsatellites. SNP resolution was 100% consistent with putative species identification; microsatellites falsely assigned one of the shovelnose sturgeon to the pallid sturgeon cluster.

Population Structure – Currently pallid sturgeon has four recognized management units. The GPMU is found in the upper Missouri River, the CLMU in the lower Missouri River to the mouth of the Grand River, 250 miles upstream of the confluence with the Mississippi River, the IHMU from the Grand River downstream to the confluence of the Mississippi and Ohio rivers,

and the CPMU in the Mississippi from the Ohio to the Gulf of Mexico. Analyses based on microsatellites indicate that hybridization is rare in the GPMU, uncommon in the upper reaches of the CLMU, and then increasingly common in the IHMU, and pervasive in the CPMU (Jordan et al. 2019). Microsatellite data indicate that the GPMU and CLMU are genetically distinct but the CLMU and IHMU are not. However, genetic structure within species may be compromised by the presence of undetected hybrids among the purported pure pallid sturgeon, and no conclusions can currently be drawn about stock structuring involving the CPMU because of the difficulty of identifying pure pallid sturgeon there. Once we have identified which sturgeon from each of the management units are pure pallid sturgeon we will re-analyze genetic stock structure as an aid to better define management units and perhaps the designation of distinct population segments under the US Endangered Species Act.

Demographics -- Effective population size (N_e) can be thought of as the number of successful breeders and is inversely proportional to the rate at which populations are losing genetic variation and becoming inbred. N_e is generally smaller than census population size (N_c) and studies from many species indicate that N_e is, on average, approximately 10% of N_c (Frankham 1995). Franklin (1980) recommended that healthy populations have and N_e of at least 500, which was the basis for the current Pallid Sturgeon Recovery Plan's (USFWS 2014) recommendation that recovery goals for each management unit will be met when "a self-sustaining genetically diverse population of 5,000 adult Pallid Sturgeon is realized and maintained within each management unit for 2 generations (20-30 years)" (USFWS 2014). Thus, reliable estimates of N_e are critical for evaluating current status and progress towards recovery goals. N_e can be estimated using genetic data, provided data can be obtained from large numbers of unlinked genetic markers (i.e., the SNP markers currently being developed).

We will determine N_e from GT-Seq data from genetically pure wild pallid sturgeon from the GPMU and CLMU management units using the NEEstimator program of Do et al. (2014). The wild GPMU pallid sturgeon represent the last remaining adults that were spawned prior to the recruitment collapse. Understanding N_e of this population will tell us N_e of a pre-collapse population, which may not have been as large as 500. The CLMU wild pallid sturgeon represent what are currently the only naturally-recruiting pallid sturgeon (Steffensen et al. 2019). We have tissue samples from more than 100 GPMU and several hundred wild CLMU pallid sturgeon that, when confirmed as pure pallid sturgeon, will make for robust estimates of N_e . Note that N_e estimates are based on comparisons between all pairs of sampled individuals and you do not need to sample 500 individuals to get an estimate greater than 500.

Population composition based on larval identification – Currently we know little about the actual composition of *Scaphirhynchus* sturgeons that are spawned throughout the lower Missouri River. Most sturgeon captured are morphological shovelnose sturgeon, while those that are submitted for genetic analyses exhibit some pallid-like morphologies. The least biased sampling

of *Scaphirhynchus* are the larval and free embryo collections done by HAMP and PSPAP. In a typical year, several thousand wild-caught sturgeon free embryos and larvae are screened for 2 SNPs following the protocols of Eichelberger et al. (2014). This technique efficiently identifies most free embryos and larvae as pallid sturgeon or “other” with the “other” category including shovelnose sturgeon and hybrids. In 2014 we identified 7 pallid sturgeon larvae including 4 that were caught near the mouth of the Platte River (Heist et al. 2015). In years 2 – 5 of this project we will use GT-Seq with the new species-ID protocols to identify 2000 larval/free embryo sturgeon from the waters of Nebraska and Missouri to characterize the species composition of sturgeon that are spawned in the wild. Sampling will include reanalysis of individuals collected in 2014, which may have been a relatively successful year for pallid sturgeon spawning in the lower Missouri. This study will provide the first examination of the numbers of pallid; shovelnose and hybrid sturgeon spawned and will provide benchmarks for determining the extent, and in future years the trajectory, of hybridization and successful pallid sturgeon reproduction.

Contributions to Platte River Learning – In addition to the contributions this project makes to our understanding of pallid sturgeon along their range as a whole, the project fills important gaps in our knowledge of the importance of the Platte River for pallid reproduction and recruitment. With SNP technology pallid free larvae that are collected at the Missouri River confluence with the Platte River can be traced back to known parents and telemetry fish. Previously this required genetic information from both parents, but with multiple SNP markers at multiple loci, genetic information from a single parent is enough for a match. Coupling this technology with the expansion of free larvae sampling into the Platte River and its tributaries will help us link parental origin to free larvae capture locations helping us understand how important the Platte is for pallid reproduction and recruitment.

The proposed research will allow us to determine the composition of Platte River pallid free larvae. GT-seq combined with SNP technology allows us to determine the fraction of free larvae at the confluence or in the Platte River itself that are pure pallid, hybrid, and shovelnose sturgeon. Without SNP technology, we currently are unable to distinguish between hybrids and shovelnose sturgeon.

Current stocking efforts have focused on the confluence of the Platte River with the Missouri River. The proposed research project contributes to pallid hatcheries and stocking by identifying pure pallids, making as much use of them as possible, while avoiding the use of hybrids and backcross fish as broodstock which further propagates their genes into future generations of pallid sturgeon.

The genetic research proposed here will be supplied genetic samples from captured putative pallid sturgeon and larva/free embryos collected during a 5-year study by UNL/NGPC that

focuses on the Platte River. Previous studies on the Platte River varied in effort, sampling period, and spatial distribution of sampling. We know little about what we may be able to catch there in terms of larva/free embryo/exogenous feeding young of the year, making it difficult to get a reliable estimate of the number of samples that may be collected from the Platte. We are estimating a total number of genetic samples (adults, juveniles, larva/free embryo) collected annually from the Platte to be 25 – 40 samples.

With the more rigorous sampling effort, accompanied by tracking of telemetered fish, focused strictly on the Platte as proposed by the UNL/NGPC study, we may obtain a greater number of samples. Genetic research combined with a focused effort to capture, take genetic samples, tag and track pure pallid sturgeon within the Platte River and its tributaries fills an information gap that will help us determine how the Platte River contributes to pallid reproduction and its potential role in species recovery.

Deliverables – We will provide annual reports for each year of the project and a final report describing results, accomplishments, and interpretations. Findings will be presented at national and regional meetings including Pallid Sturgeon Recovery Team meetings, the three regional pallid sturgeon meetings, the pallid sturgeon fall science meeting and the national meeting of the American Fisheries Society. We will also publish peer-reviewed journal articles describing the findings. All papers and presentations will acknowledge the support of the Platte River Recovery Implementation Program and the Army Corps of Engineers.

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EXHIBIT “B” SCOPE OF WORK

This project relies on Missouri River pallid sturgeon genetic samples that will be provided to SIU by the United States Army Corps of Engineers (USACE) and from lower Platte River pallid sturgeon genetic samples that will be collected and provided by the University of Nebraska, Lincoln in collaboration with Nebraska Game and Parks Commission (UNL/NGPC) under a separate agreement. The USACE and UNL/NGPC are not party to this agreement but their roles in collecting and providing genetic samples to SIU are described in the scope of work below.

TASK: COMMUNICATION AND COORDINATION

Objective: Develop a system of information exchange among Program Technical Point of Contact, SIU, UNL/NGPC, and USACE through which information, data, and samples are exchanged in a timely manner to facilitate successful achievement of collaborative research objectives and provide information for Program planning, management, and decision-making.

Key Understandings

- ED Office takes an active roll in research.
- Project requires communication and coordination between Program, SIU and UNL/NGPC who will be collecting genetic samples in the lower Platte.
- Project also requires communication and coordination between Program, SIU and USACE who will be collecting genetic samples in the Missouri River.

Key Activities

- Pre-season (Jan-Feb) planning and post-season (Sep - Oct) wrap up meetings involving Program Technical Point of Contact, SIU and UNL/NGPC principal investigators, graduate students, and technical staff.
- Collaborative development of prioritization guidelines for tagging, genetic sampling, genetic analyses, and close coordination between the two projects to provide timely feedback to guide efforts.
- Regular phone call/virtual platform/email updates among parties
- Attend and participate in Program-led meetings as necessary

SIU Responsibilities

- SIU will participate in pre-season (Jan-Feb) planning and post-season (Sep - Oct) wrap up meetings involving Program Technical Point of Contact and UNL/NGPC principal investigators, graduate students, and technical staff.
- SIU will engage in regular formal and informal communication and coordination with the Program’s Technical Point of Contact, ED Office, and Program committees to keep them informed of progress toward and potential impediments to achieving Program objectives. Examples include, but are not limited to, updates/discussions on sample collection, sample

processing, data analysis, and progress toward meeting objectives and presentation(s) of interim study progress and results at Program meetings.

- SIU will facilitate the process required for Dr. Malinda Henry to serve on graduate student committees.

Program Responsibilities

- The Program's Technical Point of Contact will schedule, organize, lead, and document formal and informal coordination meetings between SIU, UNL/NGPC, USACE, and the ED Office.
- ED Office Technical Point of Contact will schedule and engage in regular phone call/virtual platform/email updates
- ED Office Technical Point of Contact will schedule, organize, and lead Program meetings as necessary
- Program Technical Point of Contact will serve as a member of graduate student advisory committees to help tie student theses/dissertation research to Program objectives.

TASK: SUPERVISION AND TRAINING OF STUDENTS AND TECHNICAL STAFF

Objective: Ensure the proper training and supervision of students and technical staff is provided prior to and during the course of the proposed scope of work to facilitate accurate and efficient data collection that contributes toward the achievement of Program objectives.

Key Understandings

- Students and technical staff must be adequately trained to perform their duties in a manner that efficiently and effectively contributes to attainment of the research objectives.
- Training and supervising graduate students and technical staff is the responsibility of the Principal Investigator.
- Graduate students and technical staff will be exclusively dedicated to this research effort, engaged in a minimum of 20 hours a week of project related work.

Key Activities

- Training in the appropriate documentation, processing, and storage of genetic samples for sequencing.
- Training in the development and use of SNP markers with GT-seq for sequencing
- Training in the analysis (Discriminant Analysis Using Principal Components, STRUCTURE, NewHybrids, and any other alternatives chosen) of sequence data for genotyping of pallid, shovelnose, and hybrid sturgeon.
- Introduction of students to past and present accumulated learning about pallid/shovelnose sturgeon, methods for sequencing and analyzing sequence data for genotyping, and applications to recovery of the species.

SIU Responsibilities

- SIU will select graduate students for participation in the proposed research.
- SIU will provide the appropriate training, support, and supervision of graduate students and technical staff.
- SIU will notify the Program immediately if a change in supported graduate student or technical staff is necessary and justify the change in personnel.

Program Responsibilities

- ED Office will evaluate the training and credentials of SIU selected graduate students and technical staff.

TASK: DEVELOPMENT OF SNP MARKERS FOR USE WITH GT-SEQ

Objective: Refine the use of SNP markers to pick the most powerful and distinct SNP markers to widen the genetic gap between species and establish a new genetic basis for species identification of pallid vs. shovelnose sturgeon, with hybrids spanning the gap between.

Key Understandings

- Previous work by SIU toward development of SNP markers and species identification will be incorporated into this project as a jumping off point for use of GT-seq sequencing.
- The additional throughput provided by GT-seq process will allow for the testing of a large number of SNP markers, from which to choose the most unique for differentiating between pallids and shovelnose.
- The expectation is that Year 1 will be sufficient for the development and troubleshooting of this technology including the design of primers and probes and establishing PCR protocols for efficiently amplifying SNP loci prior to GT-Seek.
- Starting in year 1 we will begin the process of screening previously collected samples to define allele frequency baselines for more reliable identification of pallid, shovelnose and hybrid sturgeon. This process will be completed in time to begin analyzing the Platte River samples collected in spring of 2022.

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Key Activities

- Development of probes and primers for SNP detection utilizing GT-seq.
- Development and troubleshooting of SNP GT-seq protocols
- Identify SNP allele frequency baselines for more reliable identification of pallid, shovelnose and hybrid sturgeon.

SIU Responsibilities

- Development of probes and primers for SNP detection utilizing GT-seq.
- Development and troubleshooting of SNP GT-seq protocols
- Testing, comparison, and selection of SNP markers for optimal species differentiation
- Keep Program Technical Point of Contact informed of progress, setbacks, and/or

modifications in proposed methods or expected results.

TASK: GENETIC SAMPLE PROCESSING AND SEQUENCING USING GT-SEQ WITH SNP MARKERS

Objective: Process and sequence 1000 genetic samples per year for each of Years 2-5.

Key Understandings

- For genetic analyses of Platte River samples to be informative the project relies upon genetic analyses (both past and present) of Missouri River sampled pallids to provide enough samples for the establishment of genetic baselines for the species and to resolve parentage. Collaboration between SIU, UNL/NGPC, USACE and the ED Office is an integral part of achieving study objectives.
- Years 2-5 will be devoted to processing, sequencing, and genotyping of samples provided by UNL/NGPC to meet study objectives and inform UNL/NGPC research.
- Samples collected and transported/shipped by UNL/NGPC will be appropriately processed and stored by SIU.
- Samples to be processed and sequenced using GT-seq will be limited to samples in the genus *Scaphirhynchus*. Free embryo/larvae/endogenous feeding young of the year that are not sturgeon, are not part of the approved scope of work.
- Processing, sequencing and analysis of genetic samples will give priority to samples collected by the UNL/NGPC research project
- Sample processing, sequencing and analysis will occur as soon as possible to inform and reduce field efforts to genetically identified pallid sturgeon. Priorities for analysis should be as follows: 1) sub-adult and adult fish tagged to limit active tracking to pallids, 2) embryos/free larva captured below potential spawning locations (to confirm successful spawning), and 3) other age 0 sturgeon (to assess ratio of pallids to shovelnose/hybrids).
- When quick turn-around is necessary without appropriate sample size for a “full run”, USACE samples shall be used to fill these gaps improving cost effectiveness of each run.

Key Activities

- Sample storage and processing in preparation for sequencing.
- Use of SNP markers and GT-seq to sequence 1000 samples per year for each of Years 2-5.
- Maintaining accurate and up to date sample and results database.

UNL/NGPC Responsibilities

- UNL/NGPC will perform the appropriate sample collection, storage, and shipping/transport procedures required for genetic analysis of samples as per SIU established protocols.
- UNL/NGPC will engage in regular formal and informal communication and coordination with SIU principal investigator, students and technical staff to facilitate the process of sample shipping.

- UNL/NGPC is responsible for the timely shipping/transport of genetic samples under appropriate conditions to SIU for analysis
- UNL/NGPC will provide capture data associated with genetic samples to SIU at time of sample delivery.

SIU Responsibilities

- SIU will store genetic samples under appropriate conditions prior to and following project completion for a period no less than 5 years, making them available to the Program, UNL/NGPC or other parties as agreed upon by all joint owners.
- SIU is responsible for appropriate processing, sequencing, maintenance of database with sample collection data and sequencing results for 1,000 samples per year provided by the concurrent research conducted UNL/NGPC.
- SIU will give priority to samples collected in conjunction with this project from UNL/NGPC.
- At such time that there are no or not enough Platte River samples to fill a run, SIU may utilize the MiSeq equipment purchased under this contract, to sequence samples collected by the USACE, given that labor and commodities are paid on a per sample basis by the other entity, and not by the Program.
- Keep Program Technical Point of Contact informed of progress, setbacks, and/or modifications in proposed methods or expected results.

Program Responsibilities

- Program Technical Point of Contact, together with SIU and UNL/NGPC will establish protocols for the exchange of information, data, and samples among parties.

TASK: DATA ANALYSIS

Objective: Develop and utilize methods for data analysis that are appropriate for the sequence data collected and achieve research objectives, reflected in the current published literature, and mutually agreeable to all parties, including SIU and ED Office.

Key Understandings

- Years 2-5 will be devoted to analysis of sequence data of samples provided by UNL/NGPC and the UNL/NGPC proposed research.
- Data and genotyping results within the scope of work will be provided to UNL/NGPC in a timely manner to facilitate the field component of this research.
- Research proposal gave only a brief description of methods of analysis of sequence data.
- Program ED Office (together with Program Independent Scientific Advisory Committee (ISAC)) will take an active part, together with SIU principal investigator, graduate students and technical staff in evaluating data analysis methods and developing alternatives as appropriate.

Key Activities

- Maintaining accurate and up to date sample and results database
- Review of the literature to assess data analysis options for similar datasets and questions
- Exercises utilizing similar datasets to evaluate alternative methods of analysis
- Meetings to present, review, and discuss data analysis methods proposed and alternatives

SIU Responsibilities

- SIU will conduct a thorough literature review documenting the use of proposed data analysis methods and propose potential alternatives.
- SIU will remain up to date with current analytical methods relevant to the proposed scope of work.
- SIU will present proposed methods and alternatives in a pre-project meeting with the ED Office and ISAC statistical advisor.
- SIU will bring new methods to the attention of the ED Office as they become available.
- SIU will be responsive to ED Office and ISAC suggestions to reach a consensus on data analysis.
- SIU will provide the results of data analysis reviews to the ED Office Technical Point of Contact in the form of published articles, R code, exemplary datasets, etc. for review.

Program Responsibilities

- ED Office will seek the advice of ISAC statistical advisor on new methods and alternatives.
- ED Office with input from ISAC statistical advisor, will review suggested data analysis options presented by SIU in the form of published articles, R code, exemplary datasets, etc.
- ED Office will organize, participate in, and document the pre-project meeting and periodic update meetings to discuss data analysis methods.
- ED Office will be responsive to SIU suggestions to reach a consensus on data analysis.

TASK: DATA USE, REPORTING OF RESULTS AND WORK PRODUCTS

Objective: Establish joint ownership of all information, data, and samples generated from the proposed scope of work; establish guidelines for data sharing, publication, and use of data for other work; and define required work products under contractual obligation.

Key Understandings

- Genetic samples in their entirety and associated data are jointly owned by the Program, UNL/NGPC, and SIU. As such, the use of these samples or resulting data by the Program, UNL/NGPC, and SIU for publication and related work by the any party must be conducted with full disclosure and coordination.
- Authorship and order of authorship of published and presented works will be decided with consensus by all involved parties including SIU, UNL/NGPC and ED Office.

Key Activities

- Development and maintenance of a cumulative results database
- Development of annual and final reports to the Program
- Development of MS thesis and PhD dissertations

- Development of manuscripts to be published in peer-reviewed journals
- Participation in scientific/academic meetings including the Program's annual Adaptive Management Reporting Session

SIU Responsibilities

- SIU will provide written annual progress reports to the program and a final report describing methods, results, accomplishments and interpretations relative to Program objectives.
- Annual reports will be submitted by December 1 of each year.
- The final report will be submitted prior to the termination date of the contract.
- SIU will consult with the Program's Technical Point of Contact to review manuscripts developed using work products associated with this Contract.
- SIU will participate in the Program's annual Adaptive Management Reporting Session.

Program Responsibilities

- The ED Office will examine all data, reports and other work products presented by SIU within 30 days and render in writing whether the submitted work product is acceptable in terms of relevance to addressing Program objectives, amount of information and detail provided, progress made in attaining objectives, and use of appropriate analytical techniques given the data available.
- Manuscripts prepared for publication by SIU will be reviewed by the Program within 30 days of receipt of the manuscript.

EXHIBIT “C” PROJECT BUDGET

Year 1

Illumina MiSeq DNA sequencer (with 5-year service plan) \$143,810

Labor \$20,457

GT-Seq Primers \$5750

Consulting (GTseek) \$3000

Indirect (47.5% all but equipment) \$13,873

Total year 1 = \$186,890

Total Year 1 Costs paid by PRRIP for equipment purchase and GT-seq consulting.

Year 2 – 5 (July 1, 2022– June 30, 2026)

1,000 samples per year run w/ GTseq

\$45 per sample

1,000 samples X 4 years = \$180,000

Year 2-5 Costs are shared by Program and USACE based upon the number of samples analyzed from each source.

Total 5-year project budget is \$366,890. Maximum contract price is total 5-year project budget. It is anticipated year 2 – 5 Platte River samples will be substantially lower than 1,000 per year, reducing associated sequencing costs.

Explanation of Costs Per Sample:

In each of years 2-5 of the project, 1000 individuals will be analyzed using GT-Seq. Estimated costs for 1,000 samples in year 2 includes \$8090 in commodities, \$21,060 for the graduate student stipend, and \$13,846 indirect cost = \$42,996. Graduate student stipends are expected to rise 3% each year and commodity costs will likely rise as well. Estimated average cost per sample for 1,000 samples over each year of the project to be \$45 per sample

EXHIBIT “D”

Certification Regarding Lobbying

The undersigned certifies, on behalf of **Contractor**, that to the best of his or her knowledge and belief:

1. No federal appropriated funds have been paid or will be paid, by or on behalf of **Contractor**, to any person for influencing or attempting to influence an officer or employee of any federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, or the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.
2. No registrant under the Lobbying Disclosure Act of 1995 has made any lobbying contacts on behalf of the Contractor with respect to the federal grant or cooperative agreement under which the Contractor is receiving monies.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who makes an expenditure prohibited by Section 1 above or who fails to file or amend the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

BOARD OF TRUSTEES OF SOUTHERN ILLINOIS UNIVERSITY (“CONTRACTOR”)

By:

Director, Office of Sponsored Projects Administration
for Austin Lane, Chancellor,
Southern Illinois University Carbondale

Date

EXHIBIT "E"
INVOICE



ATTN:
AGENCY:
ADDRESS:

Invoice No.:
Invoice Date:
Final Invoice: ☐ Yes ☐ No

Please include invoice number on
remittance advice or return copy of
invoice with payment.

Remit to:
Southern Illinois University Carbondale
Office of Sponsored Projects Administration
Mail Code 4709
900 South Normal Avenue
Carbondale, IL 62901

Award Number:
Award Amount:
SIU Account Number:
Request Number:
Project Period: -
Project Title:

Current Billing Period:

Please direct any questions to: Shelley Perez
gaca@siu.edu
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Fax: (618) 453-8038

"By signing this invoice, I certify to the best of my knowledge and belief that the invoice is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and objective set forth in the term and conditions of this Agreement. I am aware that any false, fictitious, or fraudulent information, or the omission of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise."

Shelley Perez, Chief Accountant
Office of Sponsored Projects Administration for
Austin A. Lane, Chancellor
Southern Illinois University

Date

Fiscal Officer

Date