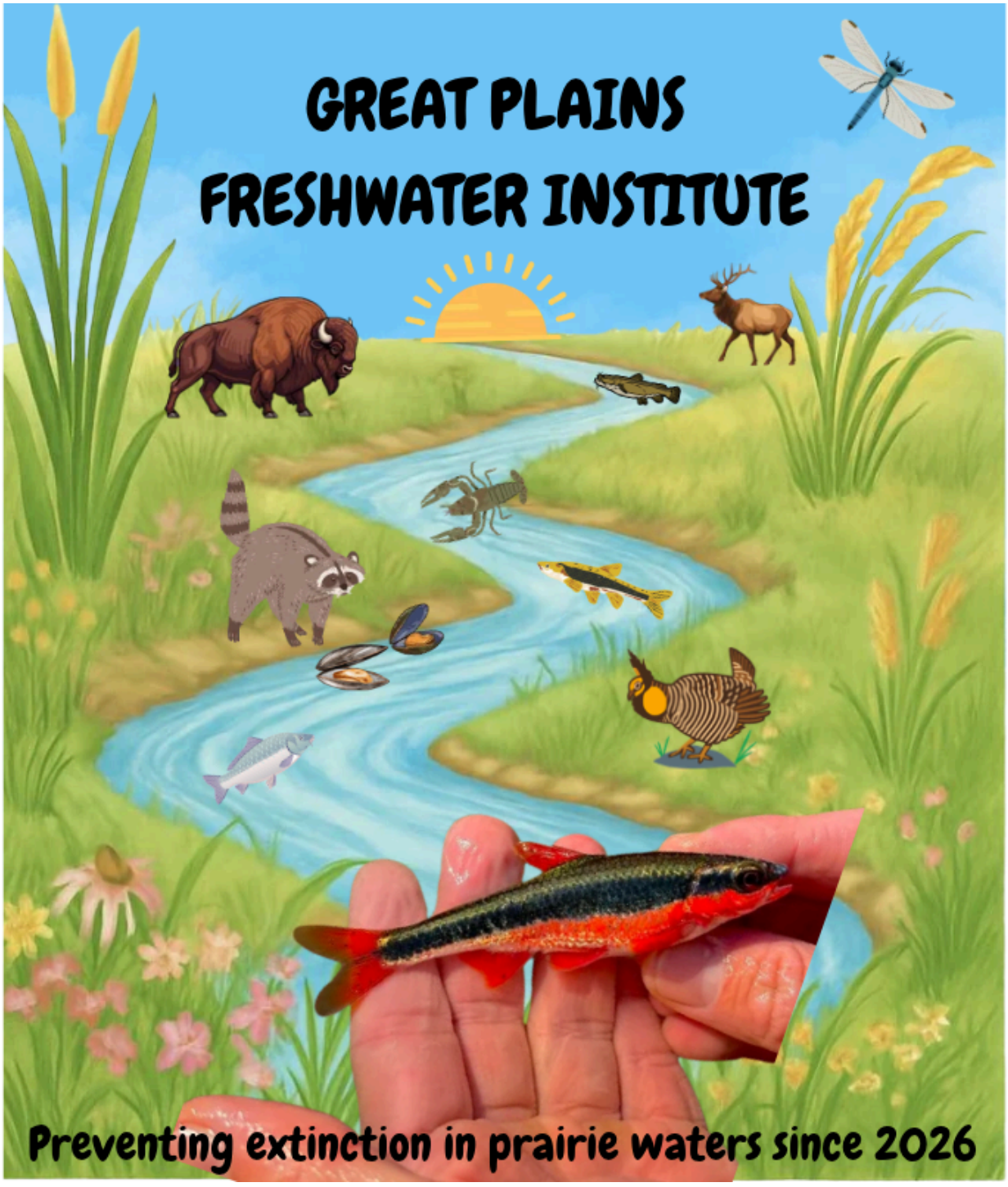

GREAT PLAINS
FRESHWATER INSTITUTE
Preventing extinction in prairie waters since 2026

# GPFI NONPROFIT PITCH

This document serves as a working scaffold to conceptualize and then pressure-test the structure of a new nonprofit organization before filing articles of incorporation to obtain tax-exempt status. Below is a developing nonprofit plan structured to help bring my burgeoning idea for a 501(c)(3) entity into reality.

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***Current Title & Affiliation:*** ***Postdoctoral Research Associate in Fish Ecology, University of Nebraska-Lincoln School of Natural Resources***

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# EXECUTIVE SUMMARY: THE CONCEPT

### *Overview*

Freshwater biodiversity across the Great Plains is collapsing at an accelerating rate due to myriad threats to aquatic ecosystems, such as habitat fragmentation, climate change, and the degradation of water quality (Covich et al. 1997; Dodds et al. 2004; Perkin et al. 2015). Many native freshwater organisms in prairie river and stream systems are imperiled, historically overlooked, and underrepresented in conservation investment. Existing state and federal hatchery infrastructure across the region is aging and largely designed to support recreational fisheries, with limited capacity for propagation, recovery, and research focused on nongame and imperiled species. In a time of growing uncertainty in the long-term efficacy, staffing, funding, and viability of ecosystem monitoring and species recovery plans, there is a mounting need for independent partners to work alongside traditional freshwater fisheries/ecosystem research & management institutions to help prevent further ecosystem degradation and extinction.

The **Great Plains Freshwater Conservation Research Institute (GPFCRI)** will be a nonprofit organization dedicated to advancing research; enacting on-the-ground freshwater conservation and fisheries management programs and initiatives grounded in science through partnerships; training and inspiring the next generation of freshwater stewards through education and public outreach, and recovering imperiled freshwater fishes, mussels, crayfish, snails, macroinvertebrates, and aquatic and riparian plants across the Great Plains.

GPFCRI is proposed as a regional, independent conservation research center dedicated to preventing extinction and restoring native freshwater biodiversity through applied science, conservation propagation, and collaborative river research. Situated at the heart of the Great Plains, GPFCRI will facilitate collaborative partnerships across jurisdictions and institutions to integrate captive propagation of imperiled freshwater organisms and applied ecological research on Great Plains freshwater habitats and their responses to climate change, water quality degradation, habitat fragmentation, and invasive species introductions to address urgent conservation science needs in Great Plains freshwater ecosystems.

GPRCRI is designed to *complement*—not replace—state and federal conservation programs by serving as a collaborative hub for applied freshwater science and synthesis as well as imperiled species recovery across the Great Plains. GPFCRI will function as a hybrid institution, combining elements of a conservation hatchery, applied research center, education, training, and outreach facility, and a regional conservation collaborative. The Institute will partner with Tribal Nations, state and federal agencies, universities, watershed organizations, and other nonprofits to conduct mission-driven science and conservation work independent of short-term policy cycles. Over its first five years, GPFCRI aims to establish itself as the flagship independent freshwater conservation institute for the Great Plains.

## *The Conservation Need - Confronting the Freshwater Biodiversity Crisis across the Great Plains*

Freshwater ecosystems are among the most imperiled globally, with extinction rates exceeding those of terrestrial systems (Ricciardi & Rasmussen 1999; Strayer & Dudgeon 2010). North American freshwater mussels are considered one of the most endangered faunal groups on the continent (Haag and Williams 2014), and Great Plains fishes have experienced disproportionate declines due to hydrologic modification, channelization, and habitat simplification (Perkin et al. 2015; Hoagstrom et al. 2011). As Great Plains aquatic ecosystems continue to experience profound ecological change, several interrelated pressures are driving the decline of native freshwater biodiversity:

- **Hydrologic alteration** from dams, diversions, and channelization has fundamentally altered natural flow regimes.
- **Hydrologic alteration** in the Missouri River basin and associated tributaries has fundamentally reshaped sediment transport, channel morphology, and habitat heterogeneity (Galat & Lipkin 2000; Jacobson & Galat 2008). Benthic specialists such as chubs (*Macrhybopsis* spp.) and pelagic broadcast spawners are particularly sensitive to these changes.

- **Habitat fragmentation** by a dense network of barriers and obstacles across the landscape is limiting fish movement and recruitment, isolating local populations across river networks.
- **Connectivity** is declining between rivers, tributaries, and floodplain habitats.
- Agriculturally-driven **nutrient loading and sedimentation** have degraded water quality to the extent that many rivers, streams, and lakes across the region no longer meet safety standards for immersion recreation. Current legal limitations of the Clean Water Act–including recent changes to Section 404, the waters of the US (WOTUS) rule–make it difficult to enforce and mitigate against non-point source pollution impacts to water quality at the landscape scale (Stets et al. 2020).
- **Climate-driven shifts in temperature, flow variability, and drought frequency** are placing increasing thermal and hydrologic stress on native fishes adapted to different hydrologic patterns.
- Climate projections indicate **increasing frequency of extreme precipitation events and drought cycles** across the northern Great Plains (USGCRP 2018), with implications for temperature, flow intermittency, and recruitment dynamics in prairie fishes (Whitney et al. 2016).
- **Establishment and range expansion of invasive and non-native species** threaten surviving populations of native species, particularly native small-bodied minnows in Great Plains streams and rivers.

These pressures disproportionately affect native-nongame species, which historically have received limited research and conservation investment compared to recreationally valuable fishes. Many Great Plains native fishes remain poorly studied, with incomplete life history information, limited captive propagation knowledge, and inadequate recovery infrastructure (Lackmann et al. 2024).

Freshwater mussels face even greater compounded conservation challenges, including high sensitivity to water quality degradation and dependence on host fish species for reproduction. Because their successful reproduction hinges on host-fish availability, suitable flow regimes, and stable substrate conditions (Haag and Williams 2014), declines in host fish populations can cascade into native mussel reproductive failure.

Moreover, across much of the northern Great Plains, few facilities exist with the expertise and infrastructure to support sustained mussel propagation and conservation research, and current conservation and research infrastructure in the northern Great Plains remains limited relative to the conservation need. At the time of this writing, there is still not one formally-trained federal malacologist dedicated to freshwater mussel monitoring and recovery for the entire USFWS Region 6 FAC (Fisheries and Aquatic Conservation Programs), and current monitoring surveys and

captive mussel rearing programs lack the capacity to scale up their efforts across species' ranges.

### *Limitations of Existing Native Fish and Mussel Propagation Infrastructure and Conservation Research on the Great Plains*

State and federal hatcheries across the Great Plains were primarily constructed in the late 19th and early 20th century damming era to support recreational fisheries production (Jones 1963). While these facilities remain essential, most face growing structural and programmatic limitations:

- Aging, crumbling infrastructure requiring major modernization to meet modern fish propagation needs
- Limited to no rearing space dedicated to native nongame species
- Staffing and funding constraints that prioritize sportfish production
- Restricted capacity for experimental propagation and research
- Insufficient infrastructure for native freshwater mussel, crayfish, or other freshwater invertebrate propagation or conservation research
- Dependence on fluctuating agency priorities, funding cycles, and changes in federal regulations–as well as recent sweeping cuts and de-staffing efforts–has consistently pushed work on behalf of native species conservation to the proverbial backburner

As a result, propagation and recovery efforts for imperiled native fishes are often episodic rather than sustained, and many species lack dedicated facilities capable of long-term conservation programs. Furthermore, the lack of basic life history information or sufficient contemporary occurrence data on some species has precluded the development of species recovery plans or captive propagation protocols.

Beyond public fish, wildlife, and water quality management agencies, university research programs at Great Plains public and private higher education institutions, including USGS partnerships like Cooperative Fish and Wildlife Research Units, are also often structurally ill-equipped and insufficient to meet these pressing conservation needs due to frequent student and faculty turnover, skyrocketing overhead costs, and inefficiencies due to institutional siloing as it relates to academic publishing or data sharing policies.

There is a clear need for an independent institution focused specifically on:

- Imperiled and historically-overlooked species
- Research-driven propagation and recovery
- Adaptive conservation informed by applied freshwater science

- Long-term, mission-centered investment into the recovery of Great Plains freshwater community assemblages and aquatic ecosystems stretching beyond the short timescales of ever-shifting public policy and funding priorities.

### *The Value of an Independent, Regional Freshwater Conservation Research Institute: Sustaining Capacity & Fostering Coordination Across States*

An independent nonprofit conservation institute provides several critical advantages:

- Continuity across changing political and policy environments
- Ability to pursue long-term species recovery goals
- Flexibility to address emerging ecological challenges
- Capacity to integrate research, propagation, and outreach
- Ability to leverage partnerships to obtain sufficient funding and staffing capacity across jurisdictions
- Enhanced eligibility for philanthropic and foundation funding
- Stable institutional identity focused solely on freshwater conservation science separate from traditional public institution bureaucracy and appropriation cycles

# MISSION STATEMENT

### *Mission*

- To advance the science- and place-based conservation of Great Plains freshwater ecosystems and imperiled species through data-driven programs
- To deliver peer-reviewed research that empowers people to make informed, regenerative decisions for the future of our freshwater resources. Our science is designed to guide the choices shaping the future of agriculture and water management on the Plains.
- To educate people of all ages about the ecology of Great Plains freshwater ecosystems and organisms and cultivate a “freshwater ethic”
- To foster opportunities for individuals of all backgrounds to connect with freshwater ecosystems

The Great Plains Freshwater Conservation Research Institute advances conservation of imperiled freshwater fishes and mussels through applied research, conservation propagation, habitat science, and collaborative partnerships addressing climate change, water quality degradation, and habitat fragmentation across prairie river systems.

# VISION STATEMENT

### *Vision*

- We envision a future in which our region's resilient prairie rivers support native fish and mussel biodiversity, a future in which our prairie rivers, lakes, and headwater streams are safe for direct contact recreation.
- We seek a future in which we live in concert with our freshwater kin such that there is still clean water to drink and healthy fish to catch and eat seven generations from now and beyond.
- We seek to ensure the existence of resilient prairie rivers, streams, lakes and reservoirs and thriving native freshwater biodiversity across the Great Plains for the next seven generations and beyond through science-driven conservation and collaborative stewardship.
- We seek to educate and empower stakeholders to see the value in the native freshwater species of the Great Plains and reduce the wanton waste of historically maligned "rough", "coarse", or "trash" species.
- We seek to increase the representation of historically marginalized groups in the aquatic sciences on the Great Plains, especially for Indigenous peoples.

# CORE VALUES + ETHICS

***Kinship – Wótakuye:*** All are welcome in freshwater science and the Great Outdoors Is For Everyone. The organization will include, uplift, educate, and create spaces for folks from all walks of life to engage with freshwater ecosystems and their conservation, and to participate in freshwater science and natural history as a way of knowing. We will welcome individuals of all walks of life, all abilities, all income and educational attainment levels, all ages, genders, cultures, creeds, family compositions, parental status, ethnicities, or other demographic backgrounds, etc. We will strive to be 2S+TBQIALG-affirming, culturally- and trauma-informed. We will root our conservation work in the communities in which we do our science by engaging our partners and stakeholders early and often in a reciprocal, kinship relationship rather than unidirectional, extractive Western paradigms of science and conservation. We seek to listen, amplify, connect, empower, and champion others more than we speak or do ourselves. We seek to foster a freshwater ethic for a brighter future for all persons by engaging with everyone regardless of background. We commit to upholding a culture of tolerance and inclusion.

***Wisdom – Wóksape:*** The current dominant paradigm of settler, Western, colonial science is extractive and rooted in capitalism. We acknowledge the harm inflicted by its practice and that Western science/academia is only *one* way of seeing and relating to the land. We aim to develop, foster, and deepen lasting, place-based relationships with our stakeholders. We will ground our decision-making in Two-Eyed Seeing (Reid et al. 2020), incorporating the latest peer-reviewed information/scientifically-sound data while also drawing from our ethical perspectives and Traditional Ecological Knowledge (TEK) to inform our structured decision making process. We will respect the sovereignty of our Tribal nation partners, and work to support and amplify Tribal data sovereignty efforts and existing Tribal natural resource monitoring, stewardship, and restoration programs. In all our work, we will strive to do ethical, responsible, community-rooted science across the Great Plains, and to be good neighbors and good kin while carrying it out.

***Prayer – Wóčekiya:*** Clean water and healthy, biodiverse aquatic ecosystems are a basic human right. We maintain that water on the Great Plains—our prairie rivers, streams, lakes, river-reservoir complexes, and other freshwater habitats and ecosystems—cannot be owned, only stewarded as it flows from one place to another throughout the hydrologic cycle. As such, we maintain that prairie waters are their own indivisible, living entities–our living ancestors and would-be parties to legal proceedings, and should be studied and managed with reverence and care.

***Compassion – Wówauŋšila:*** There is no such thing as a trash fish or an animal that lacks value in an ecosystem. We hold that respecting the sanctity of life on earth includes respecting the sanctity of small-bodied prairie stream minnows, often overlooked by anglers as “dinky” or lacking “charisma.” We reject the wanton waste or devaluation of species traditionally viewed as “trash,” “coarse,” “rough,” or “nongame” species.

***Respect – Waóhola:*** We will be accountable to one another and to the land and waters. We will strive for transparency. If harm is done, we will take responsibility for that harm and work together to rectify it. Any individual affiliated or associated with GPFCRI will be expected to adhere to our organization's Code of Conduct and uphold core values.

***Fortitude – Wowačíŋtaŋka:*** We will confront an uncertain future with courage and resilience. We will work together to overcome obstacles as a community. We will play the long game on behalf of our freshwater ecosystems.

***Generosity – Wačáŋtognaka***: We will share our time, talents, and resources with partner organizations and individuals who share in our mission in the spirit of kinship and reciprocity, knowing that all flourishing is mutual.

# GOVERNANCE STRUCTURE

## *Board of Directors & Youth Council*

GPFCRI will be governed by an independent Board of Directors composed of scientists, conservation professionals, and community leaders. The Institute will collaborate with:

- Tribal fisheries and natural resource programs
- State fish and wildlife, natural resource agencies
- Federal conservation agencies
- Universities and research institutions
- Watershed and wildlife conservation nonprofits
- Regional stakeholders and communities, including K-12 schools and private businesses
- 5–7 member founding executive board
- 5-7 member Youth Council to meet annually and ensure the organization is focusing on relevant long-term questions and initiatives for the next seven generations (ages 13-25)
- Founder as Executive Director who answers to Board of Directors

## *Key Governance & Compliance Safeguards*

To protect the nonprofit status of GPFCRI:

- The Board will approve all earned income programs
- All revenue-generating activities must have documented mission relevance
- We will work diligently to maintain transparent accounting
- We will avoid excessive unrelated business income not focused on the nonprofit's mission
- We will develop and abide by our written conflict-of-interest policy

***Suggested composition of the inaugural executive board:***

- Tribal representatives - elders, youth, stakeholders from across Očhéthi Šakówiŋ territories
- Tribal fisheries/wildlife professional(s)--bonus points if we can find partners representing several federally recognized Tribes and/or Indigenous elders with personal experience fishing or recreating in Great Plains aquatic ecosystem
- Fisheries scientist(s), preferably those with conservation aquaculture/native fish or mussel propagation experience and/or a background in native fish conservation surveys or freshwater survey & monitoring programs
- Freshwater fish ecologists, limnologists, and other aquatic ecology researchers, preferably those with experience working on the Great Plains
- State & Federal fisheries, wildlife, and water management agencies
- Local conservation nonprofit leaders or volunteers
- Individuals with private consulting experience in natural resource conservation
- Small Great Plains business owners & entrepreneurs committed to championing the freshwaters of the region
- Financial professionals
- Additional volunteer board members with expertise in/passion for conservation (ideally with some skills in fundraising, sci comm, public outreach, law, web design, etc.)
- Someone with conservation education, outreach/R3 engagement experience
- A lawyer with experience in natural resources/environmental law and policy, or some other water or environmental policy expert
- Recruit from broader network of NANFA (North American Native Fish Association) and Native Fish for Tomorrow membership with geographic ties to the Great Plains

# FOUNDING TEAM: STAFF, EXECUTIVE BOARD, AND KEY VOLUNTEERS

This nonprofit is the collective brainchild of a group of passionate individuals who care about the future of freshwater ecosystems on the Great Plains. Below are some brief biosketches for our organization's key team members that highlight their relevant qualifications and experiences and explain why they're ideal for helping this project set off upriver.

## *Founder, Chief Freshwater Scientist, and Executive Director*



**Elizabeth Renner**

**Dr. Liz Renner; Postdoctoral Research Associate in Fish Ecology, University of Nebraska-Lincoln School of Natural Resources (Lincoln, NE/ Lyons, SD)**

Enthusiastic, dedicated freshwater fisheries ecologist with a broad, diverse skillset from 11 years of experience working in Great Plains aquatic ecosystems, including past experience working for:

- South Dakota Dept. of Game, Fish and Parks - Fort Pierre Fisheries Center, Upper Missouri River Fisheries Management Area (Fort Pierre, SD)
- Gavins Point National Fish Hatchery and Aquarium, US Fish and Wildlife Service Region 6 (Mountain & Prairies)-Pallid Sturgeon Recovery Program, Missouri River Basin Recovery and Implementation
- Kansas State University Division of Biology in collaboration with Kansas Dept. of Wildlife and Parks
- South Dakota Dept. of Transportation - Survey & Environmental Division
- USDA Natural Resources Conservation Service
- Minnehaha Conservation District

Strengths, key skills and competencies to offer the organization:

- As a 6th generation South Dakota farm kid who grew up in the Sioux Falls area but who has now lived and worked in Kansas and Nebraska, my cultural connection to the region runs deep like the roots of big bluestem and other native prairie grasses. I grew up in community with Sičaŋǧu Oyáte (Lakȟóta) elders and children through volunteer work on the Rosebud Reservation, which

first ignited a lifetime of commitment to ongoing self-reflection, learning local histories, and working in partnership with Indigenous peoples.
- Well-connected with potential state, federal, university, & nonprofit partners and collaborators across the Great Plains region
- Firm foundation in Great Plains freshwater ecology - organismal identification skills (fishes, macroinvertebrates, phytoplankton, zooplankton, aquatic vegetation)
- Grantwriting
- Public speaking, teaching, science outreach and communication in-person and online via social media
- Multilingual (professional Spanish fluency, beginner Lakȟótiyapi fluency)

## *Founding Board Members*



dillnelson2o@gmail.com

**Dillon Nelson; PhD Candidate in Molecular Biology, South Dakota State University**
**Oglala Lakota (Pine Ridge, SD / Brookings, SD)**

- Skilled researcher skilled in biomolecular techniques with research experience studying the plant communities of grassland ecosystems and cyanobacteria
- Experience as a research mentor, teacher, and role model for Indigenous students in STEM



jokojokwu-idu2@huskers.unl.edu

**Jerome Okojokwu-Idu; PhD Candidate in Natural Resource Sciences, University of Nebraska-Lincoln School of Natural Resources (Lincoln, NE)**

- Climate scientist whose research examines ways to advocate for the rights of Indigenous people in fossil fuel-rich areas of Nigeria as the global economy phases into clean energy, as well as the ways these areas are threatened by climate change
- Born in Kaduna but grew up in Lagos, Nigeria. He holds a master's degree in Environmental Management from the University of Lagos and is presently studying Natural Resource Sciences with specialization in Climate Impact and Assessment for his PhD
- Passionate about climate advocacy and is well-versed in communications.



**rae.yorek@gmail.com**

**Rae Yorek; Assistant Director at Black Hills Clean Water Alliance**
**Rapid City, SD**

- With a diverse background in civil engineering and fluvial geomorphology as well as community organizing around environmental justice and water conservation, Rae brings us her technical background in riparian habitat restoration coupled with strong people skills. Her diverse connections will help us build towards long-term, large-scale projects that protect water and honor steward-led sovereignty.

## *Other Potential Founding Board Members & Core Volunteers (Folks Who've Already Helped Us)*

- Dr. David O'Hara, Chair of Sustainability, Professor of Philosophy
- Tom Frear, Owner and Producer, Cottonwood Recording Studio (Rapid City, SD)
- Jayden Halsey, SD Wildlife Federation
- Alex Massa, Flyfishing Enthusiast, Jazz Musician & Executive Director/Founder @ Improvise Arts, Artistic Director @ South Dakota Jazz Orchestra (Rapid City, SD)
- Dr. Traci Glyn DuBose
- Cole Hoffman
- Dr. James Smoot
- Dr. Walter Dodds

# CORE PROGRAM AREAS

The nonprofit will focus on several core mission areas:

### *Imperiled Freshwater Species Research and Conservation Propagation*

- Captive rearing and propagation of threatened and endangered fishes
    - Development of species-specific propagation protocols
    - Captive rearing experiments to develop captive rearing and propagation protocols
- Life history studies on threatened and endangered Great Plains fishes and mussels
- Hatchery-based applied research partnerships with state, federal, and university partners
- Environmental flow and climate change response modeling for imperiled species
- Reintroduction and augmentation support
- Genetic conservation and broodstock management
- Freshwater mussel propagation and host-fish research

### *Independent Freshwater Monitoring, Surveying, and Data Analysis*

- Captive rearing and propagation of threatened and endangered fishes
    - Development of species-specific propagation protocols
    - Captive rearing experiments to develop captive rearing and propagation protocols
- Supplement the SD DANR water sample collection and monitoring program alongside FBSR
- Aid South Dakota Game, Fish and Parks Aquatics Section/Natural Heritage Program staff with survey and monitoring fieldwork
- Potentially obtain funding from private walleye angling groups and/or public agency funding to deploy and manage a network of limnological monitoring buoys on mainstem Missouri River reservoirs

### *Applied Freshwater Ecology & Conservation Research*

- Population monitoring and life-history studies
- Habitat fragmentation and connectivity research with key partners (fish passage and upstream movement studies in conjunction with a barrier removal, pre- and post-assessment, etc.)
- Climate change impacts: phenological changes, hydrologic + thermal resilience of Great Plains freshwater ecosystems
    - Modeling historic and predicted impacts of climate change to imperiled species and whole assemblages

    - Collaborate with state climate offices, USGS, NOAA, NEON/NSF LTER, TNC to expand resolution and spatial coverage of in-situ freshwater monitoring stations across the Great Plains
    - Climate vulnerability experimentation and modeling for imperiled species
- Flow regime and hydrologic ecology, river restoration science
- Nutrient and sediment impacts on native species
- Basic and applied experiments with aquatic invasive species
- Watershed-scale conservation research–collaborate with riparian ecologists (hydrologists, dendrologists, fire ecologists, atmospheric scientists, etc.)
    - Development of applied monitoring and management tools
- Thermal and flow regime modeling
- Adaptive conservation strategies

### *Freshwater Consv. Education, Outreach, and Training/Continuing Ed*

- *Freshwater Conservation Science Outreach & Education*
    - Provide interpretive public tours for visitors of all ages, K-12 & college field trip tours, nature-based afterschool club programs
    - Host outreach events: Creek Critters for 3-12yo (including preschool and elementary field trips); Science on Tap/Science Cafe after-hours community events, tabling at community festivals and fairs (e.g. Sioux Empire Water Festival, Sioux Falls Mayor's Water Summit, Sioux Falls Riverfest, Yankton Riverboat Days, Pierre Oahe Days
        - Collaborate with SD Outdoor Campus, Great Plains Zoo & Aquarium
    - Online outreach via social media – Instagram, Facebook, Bluesky, Tiktok, etc.
- *Cultivating a Freshwater Ethic via Community Building*
    - Host local fishing meetups with NANFA and local angling/microfishing groups
    - Birding, herping, macroinvertebrate BioBlitz citizen science activities
    - Freshwater-inspired art classes & community art programs
        - First Fridays Freshwater Art (FART) nights
    - Hosting benefit concerts and live music nights
        - Monday Night Mussel Jams
    - Serving as a community hub for mutual aid & fundraising efforts in the event of natural disasters or community tragedies
- *Mentoring and Hands-On Training of Student & Early-Career Researchers & Fisheries Professionals*
    - Training and mentoring of student and early-career freshwater ecologists and natural resource professionals, with an emphasis on providing education and training opportunities to historically-excluded, underrepresented groups in STEM
    - Indigenous student mentorship programs via partnerships with local Tribal schools and Tribal fish & wildlife management agencies; Native American Fish and Wildlife Society; BIA schools
    - Mentoring students through the AFS Hutton Junior Fisheries Biology Program; 2S+TBLGIA+ students; women and non-binary students

    - Student internships and research experience/apprenticeship training (K-12 field trip tours and classes/afterschool programs; HS science fair/FFA agriscience fair experiments; graduate dissertation & thesis research
    - Society for Freshwater Science instars mentoring program, create our own equivalent of an NSF-REU program

### *Documenting, Indexing and Advancing the Citation of Traditional Ecological Knowledge in Aquatic Ecology*

- Support the development of a sovereign data repository/database outlet for Indigenous peoples of the Great Plains to catalog and contribute Traditional Ecological Knowledge, Indigenous names, basic life history information for native Great Plains aquatic & riparian flora & fauna, recipes, phenological information, species monitoring programs, gray literature database
- Long-term data archiving and facilitating the collaboration of Indigenous partners to centralize, write down, and allow for citation and legal reference to Indigenous names and lifeways for freshwater bodies and freshwater organisms

# UNIQUE POSITIONING ON THE PLAINS

## *Competitive Landscape*

Few Great Plains institutions and organizations focus specifically on:

- Native fishes & mussels of Great Plains prairie rivers, streams, and wetlands
- Integration of drought, hydrology, and biodiversity assessment data to better predict future impacts of climate change and anthropogenic impacts on Great Plains freshwater ecosystems

GPFCRI fills a widening geographic and taxonomic gap in a time when traditional freshwater and fisheries research and conservation institutions (state and federal fish and wildlife management agencies, fish hatchery facilities, and research institutes; USGS cooperative research units; and labs at public and private universities in the Great Plains and beyond) are increasingly being stretched beyond capacity with staffing cuts, budget shortfalls, hiring freezes, drastically reduced public funding and staffing for conservation science at the federal level.

GPFCRI would be uniquely positioned to bridge that gap and leverage partnerships with teams at those traditional freshwater conservation and management institutions in addition to partnerships with other nonprofits, private businesses and individuals to be able to carry on with conservation missions and prevent extirpation and extinction.

## *Strategic Positioning*

If structured correctly, GPFCRI could be:

- A research center
- A conservation hatchery
- A training institute
- A contract science provider / independent water quality+ freshwater fisheries laboratory for bulk sample processing
- A regional conservation hub

all without compromising nonprofit status. The use of diversified revenue streams and an adaptable funding model is one way that long-lived conservation research institutes survive.

# FACILITY CONCEPT: A RESEARCH HUB

The Institute will operate a hybrid research and conservation propagation facility designed to support both experimental and operational conservation work.

## *Location Considerations*

- Ideally located near a college and located within the immediate watershed of a prairie river or stream - the facility will provide proximity to priority conservation systems while remaining accessible to regional partners
- Somewhere along the Big Sioux River near Sioux Falls (intersection of I-90 and I-29 for out-of-state visitors and ease of bait distribution + reintroduction stocking, near a major population center lacking any facility of its kind, within an hour's drive of:
    - Great Plains Zoo & Aquarium (currently fundraising for a major capital expansion to build an on-site aquarium, though current zoo plans only mention/highlight marine species);
    - South Dakota State University, University of South Dakota, Augustana University, University of Sioux Falls, Morningside College, Dakota State University, Dakota Wesleyan
    - SD Game, Fish and Parks regional office and Outdoor Campus East
    - (less than 3 hr drive to Blue Dog State Fish Hatchery, Missouri River/Chamberlain SDGFP Office, Gavins Point NFH in Yankton)

## *Core Infrastructure: The Minimal Viable Product*

- Freshwater ecology wet and dry laboratory - microscopy and water chemistry setup, lab bench space for fish ID and genetic/eDNA work
- Aquarium & small circular mesocosm room, flumes, recirculating aquaculture system (RAS)
- Dedicated space for egg jars/hatching battery
- Controlled propagation and larval rearing systems
- Bait rearing units (MUST HAVE ADEQUATE BIOSECURITY CONTROL PROTOCOLS)
- Flow-through flumes/experimental stream mesocosm unit (similar to the one at Konza Prairie Biological Station)
- Freshwater mussel culture and host fish rearing infrastructure
- Gear storage/field operations and equipment facility for storing nets, vehicles, boats; workshop & tool storage area for maintenance and fabrication work
- Outreach/training classroom - interpretive signage/ floor tape for safety and traffic flow on public tours

## *Ancillary Future Needs to Enhance Mission*

- Cabin cruiser research vessel to perform contract hydroacoustic surveys and scientific diving work on the mainstem Missouri River and beyond (existing demand)

# BUSINESS PLAN: PROPOSED STARTUP FUNDING STRATEGIES & POTENTIAL REVENUE MODELS

## *GENERAL CONSIDERATIONS*

- An earned-revenue strategy is one of the most important pieces for long-term independence and stability. A conservation institute that blends grants + contracts + mission-aligned earned income would be far more resilient than one relying only on external grants and private donations alone.
- The nonprofit will generate revenue via private consulting, providing technical services in freshwater research (fisheries sampling, data analysis, water chemistry analysis, synthesis, report preparation, survey design and methodology, database design)
- The institute could also generate revenue by selling live bait (the private bait industry operators seem to be aging in Minnesota and the Dakotas, leading to live bait shortages during the summer fishing season) or contracting hatchery rearing with state hatchery systems and agencies on the Great Plains
- Could generate revenue via the sales of freshwater-inspired merchandise and art,
- Hosting training workshops and conferences
- Nonprofits can generate revenue (even significant revenue) as long as activities either:
    - Directly support the mission (best scenario)
    - Are limited and managed under Unrelated Business Income (UBI) rules

| *Expense description* | *Estimated cost* |
|---|---|
| Personnel wages & fringe benefits | $60,000 salary + $14,000k fringe |
| Facilities & infrastructure | Facility lease or purchase?<br>-Minimum $14,400 annually for commercial lease of shop space |
| Utilities | TBD |
| Insurance | $500-900 annually |
| Accounting, legal, administrative | $2,500 initial administrative costs for incorporation & launch |

### *Early Capital*

- Seed donors from professional network, 1-2 larger corporate sponsorships
- Conservation philanthropists
- Regional foundations (Great Plains-focused)
- USDA Rural Development grants/loans
- State conservation innovation grants
- In-kind donations of old hatchery rearing units, aquaria, and sampling gear

### *Long-Term Strategy*

- Multi-year federal research and conservation grants
- Contracting with universities, state, and federal agencies
- Endowment building
- Corporate or major nonprofit conservation partnerships
- Named research fellowships
- Development of and subscription revenue from the development and sale of freshwater monitoring/management software as a service (SaaS)

### *GPFC-RIVERS could operate under a diversified funding strategy:*

- Federal and state conservation grants
- Cooperative research agreements
- Private aquaculture and bait sales
- Sales of merch, art, books, & other materials inspired by native fishes of the Great Plains
- Philanthropic and foundation support; long-term endowment development
- Fee-for-service applied research or laboratory processing (otoliths, shells, macroinvertebrates, zooplankton & phytoplankton/chl-a, microcystin, water chemistry)
- Educational programming and outreach

### *Consulting & Technical Services*

- Services could include:
    - Fisheries surveys & monitoring
    - Data analysis & modeling
    - Age and growth analysis
    - Histological analysis
    - Habitat & connectivity assessments
    - Water chemistry & nutrient analysis
    - eDNA monitoring
    - Database design

    - Statistical consulting
    - Report preparation
    - Conservation planning
    - Grant science support
- Potential Clients:
    - State agencies
    - Tribal governments
    - Federal agencies
    - Watershed protection groups
    - NGOs
    - Environmental firms
    - Private landowners
    - Engineering firms
- This income is **mission-aligned scientific work**, not unrelated business. Many research nonprofits rely heavily on cooperative agreements and contract science. This could realistically become **30–60% of operating revenue.**

### *Live Bait Sales*

- The aging bait industry in the Dakotas and Minnesota is creating supply gaps. However, for a nonprofit, bait sales must be justified under mission alignment. Bait sales could be acceptable if we framed it as:
    - Supporting native fish conservation
    - Promoting sustainable bait practices
    - Preventing invasive species spread
    - Supporting education and outreach
    - Funding conservation propagation
- Then it can be considered mission-related earned revenue, not purely commercial. We can structure it safely by keeping bait sales small-to-moderate scale initially:
    - Tie directly to conservation education
    - Avoid competing aggressively with private industry
    - Document conservation relevance
    - Possibly operate as:
        - Conservation bait program
        - Certified disease-free bait
        - Native bait stewardship program
- Risks
    - If too commercial → IRS may classify as unrelated business
    - Requires state bait licensing (not a problem as I have strong connections with the biologist who oversees South Dakota's private bait dealer licensing)

    - Requires biosecurity controls
- Viable funding option — but should not be our primary revenue pillar. Think of it as supplemental stability income.

## *Freshwater-Inspired Merchandise*

- Mission-aligned merchandise is very safe for nonprofits. Examples:
    - Native fish art & prints
    - Field guides
    - Conservation apparel
    - Educational kits and toys
    - "Adopt a species" sponsorship packages
    - Hatchery-raised species supporter program
- This revenue is:
    - Low risk
    - Public engagement friendly
    - Brand building
    - Philanthropy-adjacent
    - Not huge income — but steady and valuable.

## *Workshops, Training, and Conferences*

- This is one of the **most stable and mission-aligned income sources** for conservation institutes. Possible programs include:
    - Fish sampling methods training
    - Freshwater mussel ID and propagation
    - R / fisheries data analysis workshops
    - Climate & hydrology modeling
    - Field techniques courses
    - Safety training:
        - Motorboat Operation Certification Course (MOCC)
        - Wilderness First Aid/First Responder
        - Scientific diving
    - Tribal consultation or federal permitting technical training
    - Conservation hatchery management
- Benefits:
    - Directly mission-aligned
    - Builds institutional reputation
    - Creates future collaborators
    - Generates steady revenue

- Often grant-supported or subsidized by professional societies
- Can scale
- Many institutes generate $50k–$150k/year from training alone. This should be one of our core revenue pillars.

## *Potential Revenue Mix (First 5 Years)*

| *REVENUE SOURCE* | *TARGET CONTRIBUTION* | *YEAR 1-5 POTENTIAL* |
|---|---|---|
| Grants & cooperative agreements (USFWS, USGS, NSF, BOR, NGPC, SDGFP, NDGF, etc) | 40-55% | $250k-$1M |
| Consulting and technical service contracts | 25-40% | $50 - $200k |
| Workshops & training, conferences | 10-20% | $25,000 |
| Philanthropy | 10-20% | Private foundations $50-250k<br>Corporate $25-$100k<br>Individual donors $10-50k |
| Merchandise and small retail/freshwater art | 2-5% | $20,000 - $50,000 |
| Bait sales | 0-10%, optional, small scale | TBD |

# MEASURABLE OUTCOMES (5-10 YRS)

- Development of captive propagation protocols for at least 2 flagship fish species
- Establishment of freshwater mussel propagation capacity for at least 2 species
- Publication of applied research informing regional management (5 peer-reviewed journal articles and/or contributions to agency technical publications)
- Securing of at least 3 multi-year cooperative agreements
- Training of 5+ undergraduate and graduate students or early-career fisheries & conservation ecology professionals
- Regional recognition as conservation partner across at least 2 states
- The institute will conduct:
    - Applied conservation research
    - Environmental flow modeling
    - Recovery implementation
    - Public outreach
    - Policy-relevant science synthesis
- Potential initial flagship/focal species:
    - FISHES
        - Topeka Shiner
        - Sturgeon Chub
        - Sicklefin Chub
        - Kendall Warm Springs Dace
        - Shoal Chub
        - Flathead Chub
        - Peppered Chub
    - MUSSELS
        - Higgins' Eye
        - Scaleshell
        - Winged Mapleleaf

# CONCLUSION

***IF WE BUILD IT...***

The Great Plains Rivers & Fishes Institute represents a strategic and urgently needed investment in the future of freshwater biodiversity across prairie river systems. By integrating conservation propagation, applied ecological research, and collaborative science, the Institute will provide the long-term infrastructure necessary to prevent extinction, restore native species, and build resilience in Great Plains freshwater ecosystems.

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