



Environment and Natural Resources Trust Fund

2027 Request for Proposal

General Information

Proposal ID: 2027-124

Proposal Title: Indigenous Practice, Modern Threat: Brain-Tanning and CWD

Project Manager Information

Name: Tiffany Wolf

Organization: U of MN - College of Veterinary Medicine

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Project Basic Information

Project Summary: We will explore and mitigate human-mediated dispersal and exposure to CWD prions by examining the potential for leather products to be contaminated with CWD prions through traditional brain-tanning practices.

ENRTF Funds Requested: \$416,000

Proposed Project Completion: June 30, 2030

LCCMR Funding Category: Education and Outdoor Recreation (C)

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

CWD threatens treaty-reserved rights and the practice of long-standing cultural traditions related to deer harvest by Indigenous people. Tribal hunters, their families, and their communities use deer for a variety of purposes. Deer hides can be turned into rawhide (i.e., untanned, dehaired hides) to be used for drums, shakers, and sinew. Others turn their deer hide into leather using a traditional technique known as brain-tanning. Tanned hides are used for clothing, moccasins, mitts, medallions, leggings, and other uses. Hide preservation, whether it is rawhide or tanned leather, has its roots in the deep history of Indigenous people. The processes of dehairing, scraping, drying, tanning, and smoking hides have been passed down through the generations through stories and songs. There is a rich history behind these activities. Yet, this history has not been well documented. If brain-tanned hides can be contaminated with CWD prions, they could pose a significant risk for human exposure and spread as items made from tanned hides are long lasting and often transported to other tribal communities. People or other environments could be exposed without recognizing the existence of such a risk.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

The Minnesota Center for Prion Research and Outreach (MNPRO) has been a dedicated partner with Tribal and intertribal natural resource agencies in the surveillance and management of CWD in ways that integrate cultural perspectives and needs. The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) is an intertribal organization operating under delegated authority from 11 midwestern Ojibwe tribes charged with assisting its member tribes with the implementation of their treaty-reserved rights in a manner that is biologically sound and culturally appropriate. One of the missions of GLIFWC is to infuse Ojibwe culture into its work, including science. MNPRO and GLIFWC are partnering to leverage social science methods to explore the long-standing cultural practice of brain-tanning in collaboration with cultural knowledge-holders among its 11 member Tribes (Phase 1). For this proposal, we propose to expand the social science study to more Ojibwe and Dakota Tribes, particularly those in Minnesota, as well as to utilize RT-QuIC to experimentally assess the risks of prion contamination of hides and associated wastewater through the practice of brain-tanning (Phase 2). We will use results from each phase of study to develop guidelines for safe practices in the maintenance of this important native practice.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

Specific project outcomes include: 1) a descriptive summary of brain-tanning practices and perspectives on CWD, 2) experimental determination of how prion contamination of leather may occur and potential for further spread via leather products, 3) best practice guidelines for brain-tanning leather that integrate cultural knowledge and perspectives with recommendations for mitigation of prion contamination, as well as 4) culturally-appropriate video and other outreach materials that can be directly shared with Tribal communities about the project and its findings.

Activities and Milestones

Activity 1: Document the process and traditional ecological knowledge (TEK) of brain-tanning with the perceived risks and responses to CWD

Activity Budget: \$116,757

Activity Description:

This project was conceived through ongoing dialogue between MNPRO, GLIFWC and other Tribal community members, and is focused on tribal concerns related to the practice of brain-tanning in the preservation of deer hides for cultural use. The overall project will be conducted among Ojibwe and Dakota tribes across the midwest within which hide preservation and brain-tanning is still practiced today. We will partner with 2-3 cultural knowledge holders that continue the art of brain-tanning, working with them as guides for connecting with other brain-tanning practitioners. We will do this through in-person interviews led by project partners to focus deeply on traditional ecological knowledge of the process and changes to the hide that occur, as well as to gather perspectives on how those that continue the cultural practice might respond to the emergence of CWD. Our goal is to conduct approximately 15-20 semi-structured and in-depth unstructured interviews that will last 1-4 hours each. Where there is opportunity, we will collect additional data through participant observation as brain-tanning is conducted by study participants. This proposal Activity will primarily support efforts to gather data from brain-tanning practitioners from Ojibwe and Dakota Tribes within Minnesota.

Activity Milestones:

Description	Approximate Completion Date
Interviews conducted with brain-tanning practitioners to delve into brain-tanning processes, TEK, CWD risks and responses.	June 30, 2028
Qualitative analysis of interview data.	September 30, 2028
Draft summary report to tribal partners for further distribution.	December 31, 2028

Activity 2: Investigate the risks of CWD prion contamination through hide preservation by brain-tanning

Activity Budget: \$117,585

Activity Description:

We have recently assembled biological materials from CWD-positive (CWD+) deer and are collecting CWD-negative (CWD-) biological materials for this project. We will work with a cultural knowledge-holder to process (i.e., brain-tan) an initial set of CWD- tissues in the MNPRO lab to ensure the procedures, scaled for experimental study, are appropriate. We will repeat the brain-tanning process in the lab with three replicate tissue sets of CWD+ and CWD- brain and skin tissues using a factorial design. Specifically, we will pair brain and skin tissues used for brain-tanning based on CWD infection status: CWD- brain/CWD- skin; CWD+ brain/CWD- skin; CWD- brain/CWD+ skin; CWD+ brain/CWD +skin. At various stages of tanning, hide will be sampled and subjected to RT-QuIC for prion detection using laboratory equipment obtained through previous LCCMR support. We will also screen wastewater generated from the tanning process. Further, we will swab hide surfaces and test by RT-QuIC to determine if prion contamination can be lifted from the surface material. This series of experiments will allow us to determine at which stages of the process prion contamination might occur and the potential for further spread via the final leather or waste products.

Activity Milestones:

Description	Approximate Completion Date
RT-QuIC analyses of assembled CWD+ and CWD- biological materials (skin and brain).	December 31, 2027
Brian-tanning and initial RT-QuIC testing of an initial set of CWD- tissues.	April 30, 2028
All experimental processing and RT-QuIC testing completed	August 31, 2028

Activity 3: Development of safe practices guidelines for brain-tanning in areas of CWD

Activity Budget: \$100,158

Activity Description:

We will leverage data and insights from Activities 1 and 2 for the development of safe practices for brain-tanning practitioners and other tribal community members. To do this, we will conceptually map the steps of the brain-tanning process, integrating the experimental data to identify stages of the leather-making process where CWD prions might be introduced or leather treatment steps that might inactivate or remove prion contamination (i.e., critical control points). We will leverage findings from our qualitative data to determine how the process can be adapted at each of these critical control points to mitigate prion risk without disrupting spiritual or cultural benefits or the ongoing passage and preservation of traditional ecological knowledge. For example, preliminary data suggest that substitution of porcine brains for the tanning process may be an acceptable alternative to the use of cervid brains. If this is more widely acceptable across practitioners from different cultural groups, it may be integrated as a recommendation for best practices in brain-tanning. In partnership with GLIFWC, we will generate print media (e.g., fact sheets, coloring books) that can be shared with Ojibwe and other tribal communities to disseminate project findings and safe practice guidelines.

Activity Milestones:

Description	Approximate Completion Date
Conceptual mapping of the brain-tanning process with critical control points and culturally-appropriate mitigation options	December 31, 2028
Co-production of printed outreach materials on brain-tanning, CWD risks and best practice guidelines.	April 30, 2029
Draft manuscript and reporting	August 31, 2029

Activity 4: Production of documentary video essays for outreach and cultural preservation

Activity Budget: \$81,500

Activity Description:

Our experience engaging a variety of Tribal nations demonstrates the effectiveness of multifaceted project communication, ensuring that it reaches and resonates with those who are most impacted. Video presents an opportunity to document Indigenous knowledge and laboratory science of the brain-tanning process, portraying its cultural grounding. In collaboration with practitioners and artists, we propose to produce a series of short videos (3) demonstrating the technique, Indigenous knowledge of the physical and chemical changes it has on the hide, and the risks of CWD and how they may be avoided (e.g., participation in CWD surveillance, tissue selection, etc). These videos will gain relevance by showcasing the role of prepared hide in art and fashion. To enhance their visual appeal and significance, the videos will animate original illustrations by Indigenous artists. Through high-quality video production we aim to illuminate a living practice with a deep history and a sustainable future. Videos will be edited to 3-5 minutes each and shared with tribal natural resource agencies and GLIFWC for tribal community access.

Activity Milestones:

Description	Approximate Completion Date
Video design and agreements in place.	August 31, 2029
Principle shooting, sound, and illustrations obtained for final editing.	December 31, 2029
Post-production Tribal reviews, final editing and dissemination.	June 30, 2030

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Marissa Milstein	University of Minnesota	Co-investigator	Yes
Travis Bartnick	Great Lakes Indian Fish and Wildlife Commission	Key Collaborator	No
Alexandra Bohman	Great Lakes Indian Fish and Wildlife Commission	Collaborator	No
James Uran, Jr.	White Earth Department of Natural Resources	Collaborator	No

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.

Communication of project findings and best practice recommendations is critical to ensuring that project outcomes reach key stakeholders to have the greatest impact. Outreach and community engagement are integral to project communication and our experience in working with a variety of tribal nations is that multiple modalities of communication and engagement are most effective. A key product of the project will be safe practice guidelines for ensuring the perpetuation of brain-tanning for tribal communities as they confront the emergence of CWD. Through these guidelines we will be able to address specific concerns raised by Native communities related to this important cultural practice. This project will empower Tribal communities in their ability to safely continue the cultural practice of brain-tanning for the use of harvested deer in CWD areas. The awareness of CWD this project raises related to this important cultural practice may also serve as another mechanism for tribal natural resource agencies to engage tribal hunters in CWD surveillance and management. Thus, we will document the stages of the project as well as knowledge learned for the development of outreach and education materials. These will include print media (i.e., fact sheets, coloring sheets for youth), short videos, as well as a 3-D model representation of the project - all of which can be used at community events or cultural exhibits. Further, this project will serve as thesis research for a Native student recently recruited and expected to matriculate in the UMN Conservation Sciences program in September 2026, thus, providing a training opportunity that bridges the student's cultural heritage and professional development goals. Other ways in which we will disseminate findings:

- Reporting to the Voigt Intertribal Task Force
- Reporting to the Minnesota Indian Affairs Commission
- Conference posters and presentations, including the Native American Fish and Wildlife Society Annual Meeting, Wildlife Disease Association annual meeting, Minnesota Chapter of The Wildlife Society meetings
- Publication in scientific and professional journals (e.g., Society and Natural Resources, Prion, The Wildlife Professional)
- Communications through the CWD Research Consortium and UMN's Center for Infectious Disease Research and Policy (CIDRAP)

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?

Dissemination of project findings will be directly communicated to Tribal communities as part of this project. This will be done primarily through direct engagement at community events and sharing of videos with Tribal natural resource agencies and cultural preservation groups, as well as promotion to public media, particularly those media agencies with Tribal audiences. This will be in addition to dissemination through the scientific and natural resource management communities via annual meetings, conferences, and publication.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Emerging Issues	M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 10c	\$233,000
Establishing a Center for Prion Research and Outreach	M.L. 2022, , Chp. 94, Art. , Sec. 2, Subd. 03k	\$3,877,000
Chronic Wasting Disease Prion Soil Research	M.L. 2022, , Chp. 94, Art. , Sec. 2, Subd. 03n	\$732,000
Emerging Issue: CWD Prions in Minnesota Waters	M.L. 2022, , Chp. 64, Art. , Sec. 2, Subd. 20b-1	\$164,000
Emerging Issues: Highly Pathogenic Avian Influenza Virus in Wildlife (23)	M.L. 2023, , Chp. 60, Art. 2, Sec. 2, Subd. 10b-2	\$382,000
White-Tailed Deer Movement and Disease in Suburban Areas	M.L. 2024, , Chp. 83, Art. , Sec. 2, Subd. 03u	\$699,000
Emerging Issues: Highly Pathogenic Avian Influenza Virus in Wildlife (24)	M.L. 2024, , Chp. 83, Art. , Sec. 2, Subd. 10b-1	\$885,000
Chronic Wasting Disease Prions in Minnesota Waters	M.L. 2025, First Special Session, Chp. 1, Art. 2, Sec. 2, Subd. 03jj	\$322,000

Project Manager and Organization Qualifications

Project Manager Name: Tiffany Wolf

Job Title: Associate professor

Provide description of the project manager's qualifications to manage the proposed project.

Tiffany Wolf is an associate professor of Ecosystem Health in the College of Veterinary Medicine and co-director of the Minnesota Center for Prion Research and Outreach (MNPRO) at the University of Minnesota (UMN). Prior to becoming faculty, she was an associate veterinarian of the Minnesota Zoo for 10 years. Dr Wolf is a wildlife epidemiologist and veterinarian who works closely with natural resource managers and community partners to understand wildlife disease patterns with the goal of developing science-based strategies that mitigate their impacts on both wildlife populations and the people that depend on them. Dr Wolf has partnered with Tribal Nations and other Indigenous communities for over a decade to address their research priorities on issues such as zoonotic disease emergence, dog health, and chronic wasting disease (CWD). Dr Wolf is the recipient of the UMN Community Engaged Scholar Award (2021), Academy of Excellence in Team Science Award (2022), and McKnight Land Grant Professorship (2023). Notably, the Team Science award was based on the accomplishments of the MNPRO team in research and education on CWD and other prion diseases. Dr Wolf received her Doctor of Veterinary Medicine from Louisiana State University in 2002 and her PhD from UMN in 2015.

Organization: U of MN - College of Veterinary Medicine

Organization Description:

The University of Minnesota College of Veterinary Medicine affects the lives of animals and people every day through

educational, research, service, and outreach programs. We are dedicated to the education of future and current veterinarians and biomedical scientists and the discovery of new knowledge and skills.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Associate professor		Primary investigator of the project, managing all project activities as well as co-advising the graduate student.			36.6%	0.3		\$64,739
Assistant professor		This person will co-manage the project, with particular focus on Activities 1 and 3, while contributing expertise to Activities 2 and 4. The person will also co-advise the graduate student on the project.			36.6%	0.24		\$47,912
Researcher		Four researchers, including 2 laboratory and 2 communications specialists, will contribute to project Activities 2 and 4, respectively. Communications specialists will facilitate the development of outreach materials throughout all aspects of the project.			32.3%	0.54		\$56,119
Graduate student		The graduate student will contribute to all activities of the project, being primarily responsible for the collection of qualitative data, laboratory data, and analysis of each. Percent benefits include a fringe rate of 24.2% and tuition remission (\$19,562).			51.4%	1.5		\$197,848
							Sub Total	\$366,618
Contracts and Services								
Minnesota Biomanufacturing Services	Internal services or fees (uncommon)	Obtain RT-QuIC substrate from this laboratory protein production facilities.				0		\$800
Rebekah Anderson Creative	Service Contract	Graphic recording services to document meeting discussions related to Activity 3 for use in outreach.				-		\$2,200
							Sub Total	\$3,000
Equipment, Tools, and Supplies								

	Tools and Supplies	Lab consumables	Laboratory supplies needed for brain-tanning procedures and RT-QuIC testing.					\$3,000
	Tools and Supplies	Data management and video production supplies, including external hard drives, camera cleaning supplies, lighting, etc.	to support the collection and management of interview data and the collection and storage of video					\$300
							Sub Total	\$3,300
Capital Equipment								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Ground transportation (3700 mi at 0.75/mi + UMN Fleet rental @ \$1900 for ~5 weeks), lodging (\$100/night for 21-28 nights), and per diem at \$68/day for 2-3 people over the course of the project (~15-20 trips in total).	Travel to communities to conduct interviews with brain-tanning practitioners, record video content for outreach, as well as to conduct outreach and meet with collaborators.					\$15,000
							Sub Total	\$15,000
Travel Outside Minnesota								
	Conference Registration Miles/ Meals/ Lodging	travel (air fare, lodging for 4-5 nights, and per diem) and registration for 2 conferences in the last 2 years of study.	Dissemination of project findings at national/international conferences such as the Native American Fish and Wildlife Society.	X				\$2,982
	Miles/ Meals/ Lodging	4-5 trips to GLIFWC tribes outside of MN for an estimated 1850 miles at 0.75 mileage, for 15 nights lodging (~\$100/night) and per diem at \$68/day for 1-2 people	to conduct a limited number of interviews of Ojibwe brain-tanning practitioners in areas of Michigan and Wisconsin where CWD occurs	X				\$5,600
							Sub Total	\$8,582
Printing and Publication								
	Publication	Publication fees: charges for open access publication of 2-3 manuscripts	We anticipate the submission of 2-3 manuscripts in the dissemination of results. Publication fees range from					\$6,000

			\$1800 to \$4000, depending on the journal and level of accessibility (e.g., open access). Because we want to reach underrepresented audiences, such as Tribal natural resource agencies and other Indigenous scientists, we will strive for open access publication.					
	Printing	Outreach Materials: factsheets (~200/year), coloring sheets (~200/year), and posters (1-2 per year)	outreach materials that can be used at Tribal community events or scientific meetings					\$1,800
							Sub Total	\$7,800
Other Expenses								
		Stipends for Expert Consultation at \$35/hr for a total of 120 hours of interviews and team meetings.	Support for 2-3 brain-tanning practitioners who can support the university team in interviewing other brain-tanning practitioners					\$4,200
		Honoraria for interviewees	Honoraria (\$100 each) provided to interviewees in exchange for traditional knowledge and time contributed to the interview process.					\$1,500
		Outreach materials	Commission of Native American artwork for video media production.					\$5,200
		Video production - video equipment rental	rental of miscellaneous video recording equipment					\$800
							Sub Total	\$11,700
							Grand Total	\$416,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Travel Outside Minnesota	Conference Registration Miles/Meals/Lodging	travel (air fare, lodging for 4-5 nights, and per diem) and registration for 2 conferences in the last 2 years of study.	Funds are requested to support travel to 1 conference per year of study to broadly disseminate new findings in a timely manner to relevant audiences, such as the Native American Fish and Wildlife Society.
Travel Outside Minnesota	Miles/Meals/Lodging	4-5 trips to GLIFWC tribes outside of MN for an estimated 1850 miles at 0.75 mileage, for 15 nights lodging (~\$100/night) and per diem at \$68/day for 1-2 people	To collect interview data from brain-tanning practitioners from areas where CWD occurs, we will support some travel by the graduate student researcher and regional community members serving as project consultants to Tribal nations in Wisconsin and Michigan.

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	-
Non-State				
Cash	Great Lakes Indian Fish and Wildlife Commission (GLIFWC)	Funds contributed to support the qualitative data collection (interviews) from brain-tanning practitioners among the GLIFWC member Tribes.	Potential	\$100,000
In-Kind	MNPRO staff-owned videography equipment	Video camera, recording and production equipment to be used by MNPRO communication specialists for outreach video production.	Secured	\$5,212
In-Kind	University of Minnesota Indirect Costs	54% Modified Total Direct Costs (MTDC) - unsecured	Potential	\$192,950
In-Kind	University of Minnesota	Use of laboratory equipment for experimental activities, including an RT-QuIC plate reader (\$1,031), biosafety cabinet (\$500), -80C freezer (~\$563) and refrigerated centrifuge (~\$406).	Secured	\$2,500
			Non State Sub Total	\$300,662
			Funds Total	\$300,662

Total Project Cost: \$716,662

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [0c636589-e6d.pdf](#)

Alternate Text for Visual Component

The visual summary features a graphic of two pieces of deer-hide leather sewn together with silhouettes of people engaging in craft production, knowledge-sharing and knowledge-recording, and laboratory testing....

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

Title	File
Regents of University of Minnesota Endorsement of Proposal	bf16935e-234.pdf
Great Lakes Indian Fish and Wildlife Commission Letter of Collaboration	22c529c6-430.pdf
Shakopee Mdewakanton Sioux Community Natural Resources Department Letter of Support	d69e4f69-ead.pdf
Secretary of State Good Standing	4e74b5b7-e2c.pdf
Audit Report	d2c7c47a-ebd.pdf
990 Exemption Form	dec4486e-d4e.pdf
IRS Determination Letter	5e6a365c-efa.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I understand the UMN Policy on travel applies.

Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

Yes

Does the organization have a fiscal agent for this project?

No

Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing \$10,000 or more or large-scale stream or wetland restoration?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care, treatment, education, training, instruction, or recreation to children")?

No

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:

Tibor Downing - U of Minnesota

Brett Carlson - U of Minnesota

Marissa Milstein - U of Minnesota

Travis Bartnick - Great Lakes Indian Fish and Wildlife Commission

Jonathan Gilbert - Great Lakes Indian Fish and Wildlife Commission

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

Yes, I understand