

Discovery: **Biocultural Restoration**
ESF at the nexus for building relationships between people and nature

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(1) The discovery opportunity

In a time of unprecedented loss of biodiversity and ecological integrity, ecological restoration is a compelling priority. Decades of restoration experience demonstrates that "it is not only the land which is broken, but our relationship to the land that is in need of healing." G.P. Nabhan suggests that we must invest in restoration as well as "re-storyation", the co-creation of a new narrative to heal the broken relationship with land. For that we need a pluralistic science which engages multiple ways of knowing—engages human values as well as p-values. The conventional philosophy and practice of restoration is often limited to a narrow focus on the mechanics of ecosystem rehabilitation and fails to consider culture. *Our discovery opportunity is to explore, innovate, educate and apply a new model of **biocultural restoration** which engages multiple goals and knowledges, linking culture and nature for reciprocal flourishing.*

ESF is uniquely positioned to be a world leader in restoration of relationships between people and nature, through its place in Haudenosaunee territory, in a post-industrial city, its close relationships with indigenous and local communities, its expansive forest properties with a history of traditional use, and its growing research and teaching at the interface of human and natural systems. To advance the theory and practice of *biocultural restoration*, we need new ways of *knowledge exchange* among multiple stakeholders and decision-makers, a transformative shift from *knowledge as a thing* to *knowledge as a process*. Knowledge co-generation, a central part of our project, is a promising way to transform knowledge exchange via the integration of other ways of knowing with scientific ecological knowledge (SEK), most notably traditional ecological knowledge (TEK) and local ecological knowledge (LEK).

With Discovery Challenge support, we will establish ESF as a leader in integration of TEK and SEK for restoration, position ourselves to be a nexus for inclusive STEM training for indigenous/First Nations students, and improve the cross-cultural competency of mainstream STEM students in a variety of natural resources programs. We will train the next generation of scientists and practitioners to address global environmental justice and resource stewardship challenges. Core components of this project are pilot infrastructure case studies both on ESF properties and within the surrounding communities.

Onondaga Lake provides an excellent case study for the development and practice of biocultural restoration. This lake's watershed has a long history of indigenous land use followed by recent use as a waste sink for industry and municipalities. Restoration efforts to date under CERCLA, though highly laudable, fall short of a biocultural vision that aims to heal the land, the people, and the cultural connections that maintain long-term sustainable relationships. Historical records reveal an *ecological cornucopia* around Onondaga Lake under indigenous management, one based on seasonal pulses of abundance. The Lake is also a case study of the shift from indigenous *culture of land*, with premium placed on ecosystem services and landscape features to a *culture of the market*, where wealth is vested in commodity items. Biocultural restoration aims to shift us in the direction of a culture of land, through participatory restoration of ecosystems. The significance of biocultural restoration is magnified in urban areas such as Syracuse which has one of the highest poverty rates in the nation. Our collaborative is connected to other

biocultural restoration research opportunities around the country ranging from restoration of fire regimes in national parks, to design of restorations to support urban and rural food systems, restoration of traditional fisheries, agriculture, sacred sites and culturally significant plants.

(2) Undergraduate and graduate programs that will be impacted

The ESF USDA-funded Sowing Synergy program in biocultural restoration, initiated by the Center for Native Peoples and the Environment (CNPE), is poised to become a leader in the development and practice of biocultural restoration. CNPE developed first-in-the-country graduate courses on biocultural restoration and integration of knowledges. The course work and research engages ESF's extraordinary capacity for environmental research with social sciences and environmental humanities. While graduate education in STEM fields for Native American students has been declining nationally, enrollment of Native students at ESF has increased; we can become a magnet for indigenous and mainstream students seeking to integrate these approaches. With this "seed" grant, we can grow not only a robust "tree" of innovative research, education and outreach but an entire "forest", a new intellectual and ecological landscape based on synergy between nature and culture, which addresses the most pressing issues of our time. We will expand biocultural restoration education at first through the introduction of a new area in GPES, a major in Environmental Science, and public outreach workshops. These biocultural restoration case studies will be living laboratories for discovery for undergraduate and graduate students, faculty, and staff.

(3) Agencies, partners, and funding entities either currently or anticipated to be interested

Knowledge exchange and co-generation is most challenging (and likely most needed) when participating groups have strongly divergent cultures, knowledge systems, and asymmetric power relations. Clearing such hurdles will require boundary organizations that have well-established relationships with all parties, who can legitimately operate as trusted facilitators, experts, and intermediaries. Few institutions in North America are better situated to do this than ESF, via both CNPE's engagement with indigenous communities and our long-standing agency partnerships. The proposed project straddles numerous federal and regional funding streams, as suggested below:

- a) ESF's CNPE recently received funding via NYS EPF to improve NYS DEC's capacity to engage indigenous communities and incorporate cultural resource protection and restoration in land planning and decision-making. We expect that this DEC funding will expand with ESF biocultural restoration models that demonstrate traditional forest management.
- b) A biocultural restoration model for impacted lakes, like Onondaga Lake, will synergize well with efforts by the SUNY Water Research and Education Center and the Skanonh Great Law of Peace Center, to attract funding from the EPA and the Great Lakes Restoration Initiative.
- c) The project will attract interest from government agencies engaged in NRDAR processes at Superfund sites across the US.
- d) We have a strong record of funding with the USDA Higher Education Challenge Grants which could sustainably support the graduate education components.
- e) We are in various stages of relationship building with philanthropic foundations who have expressed interest in supporting these efforts. This Discovery Challenge project could strengthen the likelihood of those contributions.

(4) Expanding current or creating new partnerships

ESF coursework, graduate research, and outreach programs have all benefited from CNPE's partnership with successful biocultural restoration at Onondaga and Akwesasne, including the Akwesasne Cultural Restoration Program, recipient of the largest NRDAR cultural settlement in the country. ESF's role in the ecological restoration of Onondaga Lake when combined with CNPE's service-based experience with regional cultural restoration efforts will attract NRDAR Trustees and practitioners seeking new restoration paths at degraded sites. Our emerging program has attracted the attention of the Society for Ecological Restoration, state (NYS Museum and NY State Parks) and federal agencies, through an array of partnerships. We will expand our already-strong relationship with indigenous tribes, agencies and organizations.

(5) Increasing the use of ESF assets especially properties beyond the Syracuse main campus

ESF is positioned to assume a leadership role in biocultural restoration through both main campus and Forest Properties. At first steps, we will invigorate the relationship between ESF's educational programs and Forest Properties to develop Biocultural Model Forests in the Heiberg Memorial Forest, Huntington Forest/AEC, and Cranberry Lake Biological Station. The Biocultural Model Forests will be a living example that combines the knowledges of ESF's faculty, staff and students with those of indigenous nation partners and local communities. ESF's forest lands will serve as a hub where we invite together indigenous and non-indigenous students, faculty, staff and community members—a type of partnership and community approach to land management that is called for world-wide. These powerful wellsprings of knowledge will be applied through mutual learning and experimentation to address the challenges forests are facing throughout the world: changing historical land use, loss of biodiversity, climate change, and many others. As we know, place matters—informing knowledge, its generation, and its utility. Each forest property, while sharing similar characteristics, is also unique, with local communities facing their own discrete challenges (disconnection from the land, injustice in access to proximate lands, resource degradation, economic and social sustainability, community health). Part of our larger effort will involve a co-generation of knowledge and experience around place, land, and community that allows us to address environmental, social, and economic challenges in these regions with a new knowledge system comprised of elements from traditional, local, and scientific ecological knowledges.

(6) Informing policy decisions, enhancing ESF's reputation, and having a global impact

Indigenous communities around the world are using traditional and scientific knowledges together to create biocultural restoration practices which benefit land and culture for sustainability. We have been approached to take the lead in writing the first volume dedicated to biocultural restoration, in partnership with indigenous collaborators. Our vision is to build upon our successes and become a global nexus for integration of scientific and indigenous to local knowledge in service to restoration.

(7) New investments required to move the initiative forward

Primary investments from this project will be in Forest Properties and main campus, to create biocultural forest models for education and scholarship. To engage this scholarship in the long-term, we recommend that ESF use cultural landscape knowledge as a part of education and hiring for Forest Properties and recruit a faculty member focused on human-nature relationships and restoration.

Discovery Challenge: Biocultural Restoration

Project Feasibility Statement

1) *Initial Startup of the Project:* Relationship strengthening is the first stage of the project work. Through a series of workshops we will explore introduction of biocultural restoration to ESF curriculum, properties and the wider community. We will collaborate with the Onondaga Nation, ESF Forest Properties, the Akwesasne Cultural Restoration Program, and the City of Syracuse, to name a few, to identify ESF properties and community lands that can be serve as place-based biocultural restoration (BIOCURE) Places for research, education and community engagement. Using traditional, local and scientific knowledge coupled to community goals, we will create BIOCURE demonstration sites for education and research. We will design a graduate area in GPES and undergraduate major in Biocultural Restoration with the guidance from our community partners. These new majors will include significant field experiences in BIOCURE Places. We will work with ESF Outreach to introduce BIOCURE Places as part of an annual ESF workshop and conference on biocultural restoration. These events will bring together leading scholars and practitioners of biocultural restoration from throughout the world to catalyze the development of a new discipline based on synergism between land and culture,

2) *How the Project Will Grow to Be Self-sustaining:* This unique project will position ESF extremely well for philanthropic, NGO and community funding partnerships. BIOCURE Places will allow better exploration of multiple knowledge systems for restoration of landscapes and human well-being; it will show how ESF can become the right place for investment in this innovative scholarship. This project will further strengthen ESF's role in federal and state policy, planning and decision-making. For example, the Center for Native Peoples and the Environment is currently partnering with NYS DEC on natural resource management that recognizes and actively restores indigenous relationships with place. With BIOCURE Places for capacity-building and to improve links between agencies and local communities, this funding stream to ESF will likely greatly expand.

Transformative

1) *In General:* Biocultural Restoration will fundamentally transform environmental stewardship through restoring ecosystems as well as our cultural connections to place. BIOCURE Places will be among the first examples to embrace equally traditional, local, and scientific ecological knowledge. Our BIOCURE program will be the first of its kind in the nation. Learning from BIOCURE Places, integrated education, community partnerships, and international conferences, we believe will be a simple but critical step toward devising means of mutual flourishing for people and planet. By embracing multiple knowledges, we will research and teach new "old" paths toward connecting to where we live, and in so doing, connect with each other.

2) *With Respect to Research and Education at ESF:* Biocultural Restoration will provide our students with skills and experiences needed to address increasing socio-ecological complexities due to climate change and associated environmental degradation. Our BIOCURE Places, workshops, and conference will be a vital part of scholarship at ESF. We will weave these Places and our workshops throughout the curricula to become a systemic part of what it means to be a member of the ESF community, embracing the mission of Improve Your World. By connecting public engagement to ESF's research and educational strengths, BIOCURE will promote stronger collaborations and partnerships between ESF and diverse communities *for a sustainable future*.