ETHNOBIOLOGY LETTERS

Perspectives

Biocultural Design: Harvesting *Manomin* with Wabaseemoong Independent Nations

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Abstract This essay describes how biocultural design (BD) was utilized to develop a *manomin* (wild rice, *Zizania palustris*) harvest camp and the prospect of this approach to implement the principles reflected in recent calls for an Ethnobiology 5. In this case, BD brought together knowledge, practices, and innovation within an intentional process of co-design to respond to the specific community aspirations of restoring relationships with *manomin*. The paper provides an overview of the benefits and challenges of using the practice of BD to re-establish wild rice harvesting. The information presented here is part of a larger initiative to restore *manomin* habitats, harvest practices, and consumption being undertaken by Wabaseemoong Independent Nations, Northwestern Ontario, Canada.

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Introduction

Ethnobiology 5—as described by Nabhan et al. (2011), Wolverton (2013), and Wyndham et al. (2011)—prioritizes applied science, multidisciplinarity, respect for different knowledge systems, support of Indigenous innovation, and cultural practices that increase the resilience of social-ecological systems. It also opens space for forward-looking approaches with a focus on problem-solving, guided by local values and different knowledge systems building upon earlier ideas promoted by Posey et al. (1984) and Beaucage and Taller de Tradición Oral del Cepec (1997). These approaches are biocultural, ecocultural, ecogastronomic, focal, and reciprocal because they recognize the linkages between landscape degradation, damage, and destruction of landscapes and the disappearance of values, knowledge, practices, and beliefs of landscape inhabitants (e.g., Gavin et al. 2015; Higgs 2003; Janzen 1988; Kimmerer 2011; Martinez 2003; Nabhan et al. 2010).

Notable for its absence within the proposal for an Ethnobiology 5, is design, despite having a presence within anthropological responses to the representational crisis (Rabinow et al. 2008). Biocultural design (BD) is rooted in a perspective that local biological materials have potential as resources for meeting aspirations of local communities through design projects that are inclusive of diverse knowledges about, and respectful of local values related to, the materials being utilized (Davidson-Hunt et al. 2012). It signals an intention to co-produce knowledge that addresses contemporary problems that are multidimensional and resists simple solutions using a process which moves from inspiring action to implementing ideas (Buchanan 1992; Davidson-Hunt et al. 2012). BD also reflects a recent engagement of anthropological texts with design as a movement toward interaction with materials and cultural processes of making other worlds possible (Escobar 2011; Ingold 2013).

Additionally, BD draws upon the idea of biocultural heritage, which includes biological materials, traditional ecological knowledge (TEK), and innovations (Apgar et al. 2011; Gavin et al. 2015; Swiderska 2006). The use of TEK—which is "a cumulative body of knowledge, practice and belief evolving by adaptive processes and handed down through generations by cultural transmission" (Berkes 2012:7)—is an empowering act that allows for the reclamation of biocultural heritage and increases the social acceptability, economic feasibility, and ecological viability of

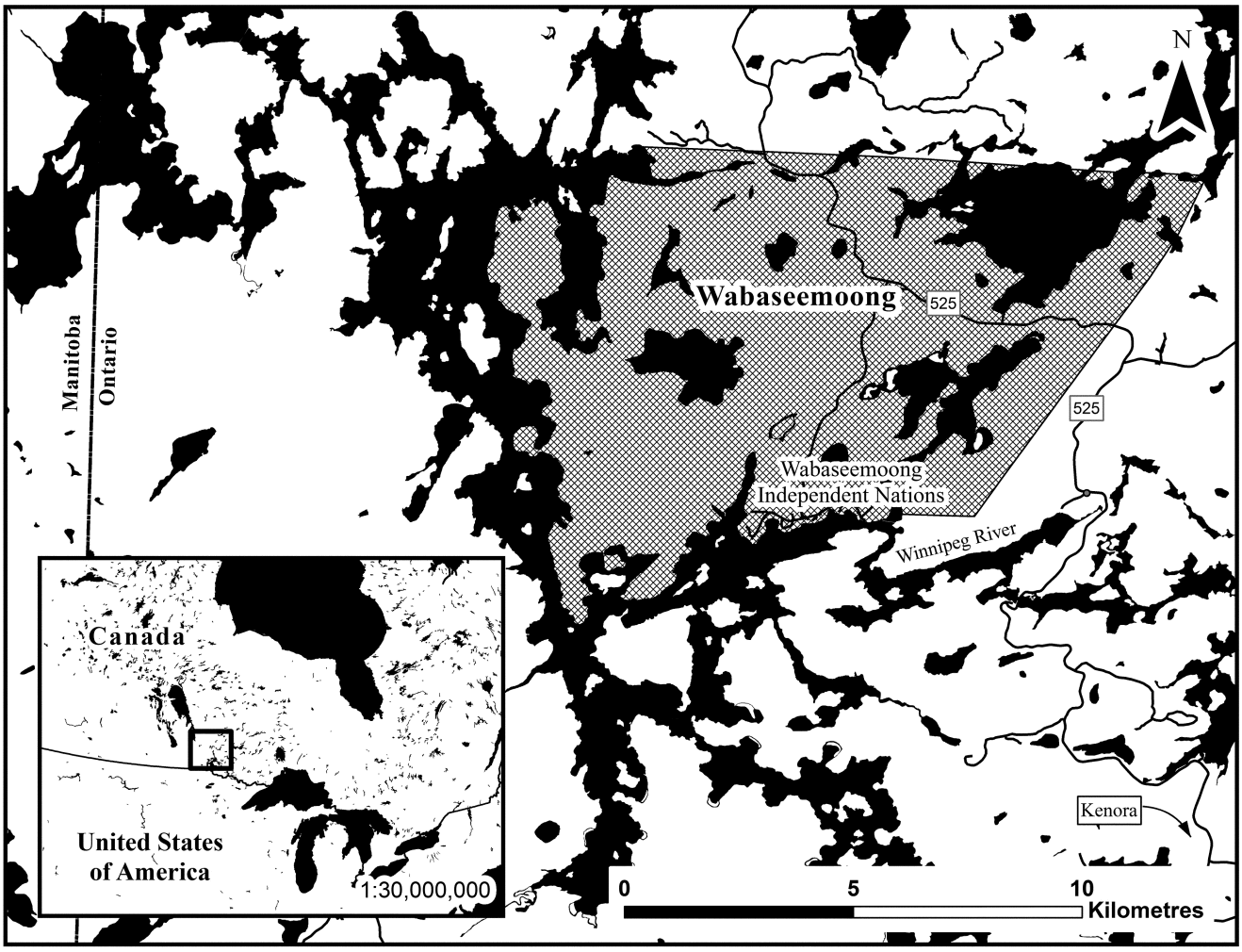

Figure 1 Geographic location of the Wabaseemoong Independent Nations community.

projects. TEK also contributes to "intensely respectful emotional engagement with nature," which is a prerequisite for long-term community involvement with biological materials (Hunn 2014:148). Moreover, TEK includes processes of creativity and innovation as individuals navigate the contemporary environments of their lives, drawing upon their histories and cultural memories linking the past with possible futures (Davidson-Hunt 2003).

BD is an incipient design practice. It will develop as it is applied in diverse contexts and through such application concepts, and methodologies will be refined as outcomes, benefits, and challenges are evaluated. In this case, BD provided an approach to support our community colleague who desired a reengagement with the practice of *manomin* (*Zizania palustris*) harvesting by the Anishinaabe (Ojibway, Ojibwa, Saulteaux, Chippewa) people of Wabaseemoong Independent Nations, located in Northwestern Ontario, Canada (Figure 1). This community, like other Anishinaabe communities of the boreal forest, has been harvesting wild rice as a dietary staple and a plant of spiritual, symbolic, and economic significance since before recorded time. In August or September, for several weeks, most community members moved to their wild rice camps for the harvest. Then, they either processed—or finished—manomin to prepare it for consumption, or sold it green (unprocessed) to buyers.

Until the 1900s, Anishinaabe harvesting and finishing had remained mostly subsistence-based and relatively stable. However, the twentieth century brought enormous ecological, socio-cultural, and economic changes that disrupted wild rice harvesting

and decreased community involvement (Kuzivanova 2016). Residential schools where children lived separately from their families, the industrialization of wild rice production, the loss of land resulting from the establishment of Whiteshell Provincial Park, and the introduction of welfare and other economic opportunities on reserve lands, disrupted the relationships Wabaseemoong Independent Nations members had with *manomin*. Wild rice habitats were negatively impacted by hydroelectric developments on the Winnipeg River and its principal tributary, the English River, and an increase in hydroelectric power consumption. The disappearance of wild rice harvesting and finishing practices resulted in diminishing knowledge and a shift of values, especially the knowledge and values of the younger generation. This loss is one of the main grievances of Wabaseemoong Independent Nations Elders.

Biocultural Design: An Approach to Biocultural Restoration

BD can be thought of as a problem-solving practice comprised of values that guide the selected methodologies. Davidson-Hunt et al. (2012) suggest that the design team should identify values that act as a set of guiding coordinates for the design process. They provide some general coordinates related to the composition of the design team and its operational principles, political support, and other key values. These guiding coordinates are not meant to be prescriptive, but rather provide the team with a way to ensure innovations are consistent with their values. They also allow opportunities for creativity to emerge from the participants, who work toward identifying activities to fulfill their aspirations.

The first step undertaken in Wabaseemoong Independent Nations was to form a design team made up of community members and co-led by V. Kuzivanova and M. McDonald, who was the initiator of the project in the community. Then, the team identified the guiding coordinates for the project as shown in Table 1. These coordinates drew upon the ideas from human-centered design (Brown 2009; IDEO 2009), capability sensitive design (Oosterlaken 2009), and wild design that focuses specifically on biocultural restoration projects (Higgs 2003; Higgs and Hobbs 2010). They also relied on local values, similarly to the values-focused approach described in Reid et al. (2014). While we used BD as an overarching practice of innovation and problem solving, the specific methods—participant observation, interviews, and biophysical methods—allowed for the collection of data at the early stages of information gathering. This data was then utilized as part of design workshops to generate ideas and prototypes that responded to the initial aspiration of the project.

Biocultural Restoration: Outcomes

Besides the process of co-design itself, the main project outcomes referred to TEK documentation, site selection, and the involvement of children and young people through the community school (see Kuzivanova 2016 for details). The documentation of TEK at the beginning of the project allowed for the description and comparison of the relationships between Wabaseemoong Independent Nations members and *manomin* in the past and in the present, as well as identification of cultural and ecological historical reference conditions for the restoration process. The choice and documentation of the sites for restoration efforts was based on historical and biophysical data, as well as site accessibility. The school, as the main partner for the involvement of young people and children, incorporated knowledge about *manomin* in its formal and informal curricula. The inclusion of this culturally appropriate knowledge contributed not only to the establishment of the missing relationships between community members and wild rice, but also to ongoing efforts of school staff to implement approaches that can transform and decolonize their system of education.

One of the end products of this project was a working prototype for a wild rice camp, which the project participants chose as the main platform for re-establishing relationships between community members and *manomin* due to its hands-on character and the direct involvement of participants. The wild rice camp took place in the Wabaseemoong Traditional Land Use Area on September 15–18, 2014. Its prototype extensively relied on community residents' TEK, included different traditional elements, took place at the selected site, and allowed for the participation of diverse community members: Elders, Social Services department clients, teachers, and high school students. It also provided opportunities for visiting cultural sites, crossing old portages, and offering tobacco, which is a sacred gift traditionally used in ceremonies. Overall, the camp contributed to re-storying of the landscape through resurfacing memories that were shared by Elders with the younger generations and re-encoding *manomin* values into the culture—an important process of biocultural restora-

Table 1 Guiding coordinates for the Wabaseemoong Independent Nations biocultural restoration project.

Guiding coordinates	Explanation in the context of this project	References
Design brief at the start of the project	A design brief — a two-page document provided by a community representative in November 2013 — established the context of the study, preliminary research objectives, restoration options, and potential future uses of *manomin.* This design brief followed six months of discussions between Wabaseemoong Independent Nations and the University of Manitoba about potential collaborative work.	Davidson-Hunt et al. 2012
The main team and subteams of participants with diverse skills and knowledge	The first design team was established at the preliminary workshop on February 2014. Then, throughout this project, participants worked in teams/subteams and played different roles: teachers focused on the involvement of students; wild rice camp participants tested and provided a feedback on the prototype for a wild rice camp; adults, Elders, and young people shared their knowledge and perspectives on the restoration process.	Brown 2009; Davidson-Hunt et al. 2012
Various forms of engagement to reconnect people with their landscapes	Community residents took part in diverse activities, such as interviews, workshops, educational activities, and wild rice camp — a four-day long wild rice harvesting event (Figure 2). M. McDonald and the research assistant were also community liaisons and helped transcribe interviews, trigger the snowball sampling process, prepare workshops, conduct biophysical surveys, and spread the word about events.	Higgs 2003; Higgs and Hobbs 2010
Spaces of inspiration, ideation, and implementation from gathering insights to creating action plans	The project went from a design brief to a prototype for a wild rice camp, the main functional outcome of the project. The design brief was the main inspiration tool. Within the space of ideation, the participants documented TEK, determined sites for restoration efforts, identified possibilities for the school involvement, and developed a prototype for a wild rice camp. Within the space of implementation, teaching materials were developed for the school and a prototype for a wild rice camp was tested.	Brown 2009; IDEO 2009
Moving from divergent thinking to convergent thinking	Diverse Wabaseemoong Independent Nations members were asked very general questions on the restoration options in the design brief at the beginning to create choices. Many of the initial restoration options, for instance, controlling water levels and upgrading roads to rice fields fell away as people realized that possibilities already existed to harvest rice without infrastructure upgrading.	Brown 2009; Davidson-Hunt et al. 2012
Integrating TEK and Western science-based knowledge	Both TEK and Western science-based knowledge were incorporated in all project phases and, thus, broadened the biocultural restoration process.	Higgs 2003; Higgs and Hobbs 2010
Prototyping of event(s)/activity (ies)/process(es)	The culmination of the ideation stage and the whole project was a prototype for a wild rice camp — a desirable, feasible, and viable model that fulfilled the purposes of the project.	Brown 2009; IDEO 2009
Ethical ecological intervention based on respect to ecosystems	The site chosen for further restoration efforts and for organizing wild rice camps in 2014 required minimal intervention efforts. The initial site suggested in the design brief was dismissed due to the necessity to repair the culvert structure to control water levels.	Higgs 2003; Higgs and Hobbs 2010
Focus on capabilities – opportunities that allow people to live their lives in a valuable manner	All community residents were given freedom to take part in the project in general and the wild rice camp in particular, as well as to sell the rice they harvested or keep it for personal consumption. The project expanded participants' capabilities and focused on learning: acquisition of knowledge, skills, norms, and values.	Oosterlaken 1992; Sen 1999

tion (Wabaseemoong Wild Rice Project 2016). One of the Elder male camp participants later explained the importance of this experience:

> We talked to each other… It's like we lived in the past. We were kids again. We pictured our parents. I could visualize all the relatives from the community. I could see them and feel the connection… How empowering it is. It is really something.

Reflections on the Approach: Why Biocultural Design?

A biocultural design approach links an established practice of design with the biological materials and capabilities available to communities to meet their aspirations. Design practice has moved toward multidimensional approaches that recognize that many challenges do not have single solutions but rather are indeterminate and comprise holistic complexes of related elements, which require systemic thinking—known by some as wicked problems (Buchanan 1992). BD incorporates such ideas from design but with a specific focus on how local biological materials can contribute to processes of innovation that systematically include ecological, economic, social, and cultural dimensions. We propose four benefits of using the BD approach for biocultural restoration projects: co-designing in a team, prototyping, the capability approach, and the action component, as well as one major challenge.

First, BD is a process of co-design in a team, which means that the product, service, or the whole system is designed in collaboration with subteams of people who will use it in the future (Burkett 2014). In the Wabaseemoong Independent Nations case, design brought multi-aged community residents and university researchers together. The diverse knowledge, skills, and experience of community members and university researchers increased the amount of available expertise and the possibility of unforeseen outcomes. Community Elders were the main project guides who shared their knowledge about traditional *manomin* harvesting, finishing, and storage practices, identified the reasons for the disruption of these practices, informed the site selection process, showed how to make traditional equipment for the camp, and retold stories that were included in the educational process. Community teachers shared ideas on how wild rice could be included in the curricula and organized high school students' outing to the ricing site. Young people, who were also viewed as knowledgeable individuals, reflected on the restoration process and the involvement of the students. The main challenge for the co-leads of the design team was to ensure that all points of view, opinions, ideas, and expertise were respected. Respect, as one of the guiding coordinates of the design process, required the co-designers to actively ensure that diverse perspectives were stated and considered at the early workshops during the design and implementation of the *manomin* harvest camp and as part of the final evaluation.

Figure 2 I. Fisher knocking manomin into the canoe, 2014. Photo credit: Valeria Kuzivanova.

One more positive characteristic of design lies in the recognition that every idea generated is a potential prototype, which diversifies restoration projects and helps to avoid a rigid technocratic process. After the testing and improvement of prototypes, new prototypes emerge because prototyping inspires new ideas (Brown 2009). As the first wild rice camp in 2014 was considered a prototype, it was adapted and improved in 2015 and 2016 based on the suggestions of the 2014 camp participants. In the future, this prototype may additionally be adapted and applied to other community initiatives targeted at self-determined development and cultural well-being through the awareness of the value of traditional foods, such as

wild game and blueberries. Besides the wild rice camp, numerous other related prototypes were generated and implemented for educational programs and activities. Some examples are educational posters for science and native language classes, Elder-youth workshops, and a nine-minute video showing the whole process of ricing—wild rice harvesting and finishing—which can be found on the project Facebook page (Wabaseemoong Wild Rice Project 2016).

Additionally, design is a re-affirming and capability-enhancing process. It identifies solutions that build upon existing capabilities (*sensu* Sen 1999) rather than gaps between what is needed and existing capabilities (Table 1). Design also shifts the focus to appreciative inquiry, which considers people as having gifts and skills, treats organizations as capable, and focuses on the development of worthwhile ideas (Burkett 2014). For example, the facilitation techniques used at the Wabaseemoong Independent Nations design workshops were primarily targeted at setting goals and identifying advantages. As opposed to approaches that highlight what is missing, design expands capabilities and allows building confidence to incrementally address more challenging problems.

Another positive characteristic of BD is that it changes the dominant discourse of Indigenous peoples as victims to one that can be constructed by participants themselves as doers. Overall, design brings the needed action component to biocultural restoration and translates knowledge into practice by using applied research as part of the design process (Higgs and Hobbs 2010; Wolverton 2013; Wyndham et al. 2011). BD recognizes that cultural processes are the means by which knowledge becomes dynamic and meets contemporary needs by building upon the ecological and cultural endowments of people living upon the lands of their ancestors (Davidson-Hunt et al. 2012). A male Elder and teacher from Wabaseemoong Independent Nations powerfully expressed the idea of the dynamism of knowledge, which contributes to land stewardship:

> Hopefully, in the future, students can go not just rice picking, but also participate in other activities and preserve wildlife because it involves everything: the water, the plants, the trees, all that is right there… That's why we need to keep moving and protect this area …

While BD can be used to recognize capabilities and catalyze action, it is an approach that requires time to realize the benefits, which is one of the main challenges. Participation allowing for community ownership of project outcomes requires iterative cycles of visioning, gathering information, assessing potential opportunities, deciding upon pathways of action, and evaluating outcomes before implementing a solution. A young male teacher from outside the community, who also participated in the wild rice camp, pointed out this challenge:

> Going back and ricing brought tears into the eyes of those who already have experience and memories… I feel that it hasn't necessarily translated to the next generation yet. They don't have this bank of memories and experiences to draw from … As this happens over years, you start to reclaim those experiences into the culture. That's good and that's momentum. The thing is just carrying forward this momentum to next year.

The leadership provided by diverse community members allowed for such momentum. The camp was undertaken again in 2015 and 2016.

Conclusion

Ethnobiology 5 has opened a new space for the practice of ethnobiology. We offer this perspective piece not as a critique of Ethnobiology 5 but as an addition of a practice that could provide a new approach for an ethnobiology of the contemporary. While still incipient as a practice, we suggest that design could infuse ethnobiology with a renewed vigor in supporting the co-production of knowledge about biological materials to respond to present challenges of Indigenous and local communities.

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Declarations

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