Activating Design for Biodiversity

CAMOZZI Zach*; ST. PIERRE Louise and FALK Charlotte
Emily Carr University of Art and Design
* rcamozi@ecuad.ca

This paper documents a research project that has taken place over five years in the Emily Carr Industrial Design program. Our aim was to uncover methods to connect designers with nature, and to gain insight into how understanding our interdependence might change the way that designers work and prioritize. The act of practicing design with more-than-humans has effectively challenged human-centred design and activated deeper awareness of the implications of our design work. Over 160 Industrial design students, and 6 faculty members have been re-learning our place in the world as dependent among, and interdependent with, all other forms of life. Our research affirms that this shift in worldview is accomplished through direct, visceral engagement with nature and forms of wildness that are found when we slow down and wander outside of our human-made environments. External guests, including our more-than-human partners, prompt designers to care, to reconsider daily rituals, to re-language and to tell new stories. This engagement opens pathways to a plurality of views and approaches, and seeds a shift in priorities. Recalibrating practices in this way illuminates human interconnection with animate and inanimate beings, highlighting our deep relationality and reliance on the natural world in everything we do. Several questions guide our research. How can design include the presence and voices of more-than-human beings in our processes? How can we establish the importance of more-than-human stakeholders in decision-making? What forms of pedagogy engage new learners? How do students re-interpret these teachings and show us new ways of knowing? How might this activate different approaches to design?

Interdependence, Relationality, Multi-species, Post-Anthropocentric
A. Introduction

This paper documents a research project by the Design for All Beings Research Group that has taken place over five years in the Emily Carr DESIS (Design of Social Innovation for Sustainability) Lab, and the Industrial Design program. Our aim was to uncover methods to connect designers with nature, and to gain insight into how understandings of interdependence might change the way that designers work and prioritize. We speculated that practicing design with more-than-humans would challenge the profession’s humanistic and human-centric roots. Our Design for Biodiversity Project begins to redress ecological misunderstandings that permeate culture in the Modern West, inclusive of industrial design education (St. Pierre 2019).

Through a series of projects, we have been re-learning our place in the world as dependent among, and interdependent with, all other forms of life. Our findings affirm along with others (Jickling et al. 2018) that this shift in worldview is best accomplished through direct, visceral engagement with nature and forms of wildness that are found anywhere, and are not limited to spectacular nature settings. The challenge of bringing this form of engagement to industrial design studio classes is a nuanced one.

The imperative for Modern Western societies to lighten the impact of our human presence on earth is well understood (Harvey 2021; Lade et al. 2020). Biodiversity loss, climate change, and ecotoxicity contribute to a growing awareness that we are collectively committing severe damage to the environment, or ecocide (Siddique 2021). To counter this, we call for a profound re-imagining of industrial design’s roles and relationships with material extraction, manufacturing processes, and consumerism. This deep shift in priorities can be empowered by learning to appreciate and understand biological interconnectedness.

This paper focuses on how we enact new ways of thinking, learning and doing both inside and outside of the design studio. Students and faculty uncover new ways to notice, attend to, and value nature. We attempt to de-centre the human, opening pathways for designers to reconsider their relationships with nature and each other (Escobar 2020; Fletcher et al. 2019). We began with a number of questions. How can design include the presence and voices of more-than-human beings in our processes? How can we establish the importance of more-than-human stakeholders in decision-making? What forms of pedagogy engage new learners? How do students re-interpret these teachings and show us new ways of knowing? Ultimately, RockFish, Ants, Kelp, Berries, Rice, Urchins, Cedar, Snow and Polypores and a multitude of other beings helped us grapple with these questions.

This research sits within ECU’s Design for Social Innovation and Sustainability Lab (DESIS) and has been partially funded by ECU’s Ian Gillespie Design Research Grants.
B. Community

Over the course of the project the network has expanded to include 160 Industrial design students, six ECU faculty members, external guests and a multitude of more-than-human beings. At its core, this work values the need for de-centered, non-hierarchical, flexible and responsive approaches in order to meaningfully support eco-systems, organisms, and land. This work calls into question the way that contemporary design has been harnessed by corporate, political, and industrial interests (Boehnert 2018; Fletcher et al. 2019).
This work has taken place on the traditional, ancestral and unceded territory of the Coast Salish peoples – Squamish, Tsleil-Waututh and Musqueam Nations. For ‘time out of mind’, Indigenous communities have taken care of this land and all the beings are part of her; the trees, the rocks, the rivers and everything in between (Thomas, 2019).

Over the years, a variety of guests have returned to the studio to help us develop new relationships. These guests bring biology expertise, cultural questioning, and traditional Indigenous wisdom. This pedagogy highlights a plurality of views, countering Modern Western tendencies to interpret life through a singular lens (Escobar 2020).

Carleen Thomas, a leader from the Tsleil-Waututh First Nation (now Chancellor of ECU), told us there is an “interconnection between the health of a culture and the health of the environment” (Thomas, 2019). Thomas's family and nation reside on Burrard inlet, a heavily industrialized waterway that serves Vancouver, and one of its fjords, Say Nuth Khaw Yum. Thomas weaves stories of care, history, and biodiversity in relation to these lands (səlgilw̓ət). The contrast between these two landscapes supported our students in imagining biodiverse histories and futures.

Connie Watts (Nuu-chah-nulth, Gitxsan and Kwakwaka’wakw Ancestry), Associate Director of Aboriginal Programs at Emily Carr, reminded students that beings feel and perceive the world in ways we will never understand and that it is necessary to remember humility. “Everything is spirit,” she said (2020).

Reyhan Yazdani brought insights about ritual and family in the context of making and eating food. She helped our students question how we connect with each other, and opened wonderment about how moments of connection could be repeated to become daily rituals (2019). Yazdani opened conversations about how we form relationships, and how simple rituals are all around us.

Amanda Weltman, a field researcher with Ocean Wise Coastal Ocean Research Institute brought a Western Science lens, sharing her time spent below the surface of the ocean, and Citizen Science initiatives in the region (2018; 2019; 2020). These included her own Rockfish Abundance Surveys, Eagle Counts, and insights from her outreach work between residents and coastal bear populations.

Depending on where they were in the Industrial Design program, students were exposed to a selection of these guests. Each guest was aware they were an entry into, or pivot, within the project for some students. The Design for Biodiversity project evolved over time, building and deepening understandings that led to a wide range of outcomes that span disciplines, cultures and knowledge. Our studio classes have created stronger relationships for us, and for them.
C. Pedagogy and Practice

This project has taken place over an expanse of time that allowed for contemplation and reflection, and supported a shift in worldviews. There is a six-year span from when the Design for All Beings group (St. Pierre 2014) first asked why more-than-human beings were left out of conversations about social innovation, to this paper, which begins to describe applied methods for including all beings. There have been shifts in understanding and in pedagogy that could only have taken place over time. Faculty focus has moved from designing artifacts to support another species, to finding ways to learn about and deepen their relationships with other beings. Our network of collaborators has expanded to include the Otago DESIS lab in New Zealand, bringing Maori perspectives to complement that of our local indigenous advisors.

Students also have time between courses in second and third year, nearly a year, to digest information and experiences and then further develop their own practices. In the third year we see students internalizing our pedagogy and shared practices, and reflecting them back to us in new ways. By fourth year, students like the Roving Designers (Grauer 2021) were leading other students, independent of faculty. The following section elaborates on some of our pedagogy.

Some of our more specific pedagogy include:

- **teach slow, learn slow.** Slowing down gives students the opportunity to step out of the design process they know. A key component of slowing down in our classes were contemplative practices (St. Pierre 2019). In some situations, students were given written prompts (Simon, 2020), to start their exploration of a local intertidal zone. These asked students to breathe slowly and situate oneself in place. In other situations, Louise St Pierre often led daily meditations for her students, then made space for them to learn...
mindfulness. This changed the tempo, opened awareness, and helped us to teach slow, and learn slow.

- **Celebrating sensory ways of knowing.** The rhythm expressed through these daily meditations was mirrored in class expectations. We asked students to return to a place again and again, investigating senses but also to question how daily feelings and emotions changed what they sensed, and how they noticed (Falk 2012). This was an opportunity for students to integrate a new awareness of the natural world into their design process.

  “I explored creating a community with non-human lifeforms, such as birds and flora. By opening the space for a non-verbal communication by existing in the same space and allowing the environment to envelope my senses.” (Anonymous student reflection 2020)

- **‘explore-how-to-explore’ nature.** Many students needed to re-learn how to pay attention to nature (St. Pierre 2019). Together we designed devices and actions that took them upside down, into crevices, outside at night and into the water, all aimed at an immersive sensory engagement with nature that supports relationship finding and building. Once we gain a personal and felt understanding (Bai 2001), we can question current ways of doing and being, and articulate new futures. This can lead to post-humanist understandings of our human situatedness among other beings, within a community of others, instead of above all others (Harraway 2016, Plumwood 2009/2013).

  “I now see my local parks as whole ecosystems full of different coexisting life forms. I think the most essential part of gaining empathy for non-human creatures is through practicing awareness and observations” (Anonymous student reflection 2020).

- **re-imagine care and support.** In an early conception of this project, we focused on directly attending to species needs. This means we still saw ourselves above these species. As we worked through the processes, we began to gradually rethink the tendency for humans to see ourselves as the solver of problems or the saviour of others. In many cases, what other species need is for us to design tactics to get humans out of the way.

- **re-languaging.** Regularly referring to rocks, trees and eagles as beings rather than things (Kimmerer 2015) supports a widespread relationality that brings the creative frictions of diverse more-than-human stakeholders to our decision making processes. It takes a while to get comfortable with saying “her bark is quite thick”, instead of “it’s bark is quite thick”, but the results are powerful.

  Often I push them out the way, I shove rocks that make my garden path uneven, I cut branches that are at eye level. But whose habitat is under this rock? What if this branch enjoys getting me wet? Who am I to decide that these beings are less important because they don’t fit my interpretation of a garden. Can my garden be for more than just me? (Camozzi Personal Journal, 2016)

- **Integrate story-telling and time.** Within our classes we shared a constellation of methods for students to explore. Storyboarding, prototyping with the land (Camozzi 2019/2017), bodystorming (Schleicher et al. 2010), animated GIFs, low-fidelity video prototypes,
meditation practices, and shared prompts (Chisholm, Falk, Kozak 2020) are some of the methods offered to students. Centering storytelling in the design process creates opportunities to see interconnections, as the students must show their designs in action and in place. A sequence of events, frame-by-frame in a storyboard, asks us to reconsider, communicate, research, and design with respect to the timelines of nature. Stories, and telling stories, are also a way of bringing ourselves into other points of view. In second year and third year studios we specifically asked students to storytell about their own repeated actions, or daily rituals.

- **Frame the outcome as a daily ritual.** We used ritual as an entry and grounding activity within our courses. We defined ritual as deliberate and focused moments of attention to recurring phenomena. ‘Temporal’, ‘malleable’, ‘static’, ‘slow’, were some terms students used to describe day-to-day rituals. Students saw skipping stones across the ocean, sinking your feet into the surf, and drawing on sand as rituals to inspire their project directions. When students began to question what a ritual was in their lives they began to ground their work and its impact in daily practice.

- **Wander outside.** Wandering outside preempts design processes that are tied solely to drawing, prototyping, and sitting at a desk. Faculty strove to “[build] the natural world into every class meeting and... encourage care of the more-than-human neighbourhood as part of class expectations” (Ford & Blenkinsop 2021, p.6). Students would go to the beach, the local park, and the aquarium. They did this during class field trips, after class in small groups, or alone to address homework prompts. Students often returned again and again to a selected sit spot (Heimbuch 2018), their chosen place to slow down or to begin their wander (Simon, 2020). Whether travelling up the beach or into the water, wandering outside reframes our thoughts. “The waves washing over my toes tickle, I wonder if my toes tickle that wave back?” (Anonymous student reflection 2019). Some students internalized this practice, incorporating wandering outside in many of their later projects.

- **Experiment with ways to embody** - Knowledge that is held in relationship with nature is strongest when embodied, as many Indigenous communities know deeply (Akama & Yee, 2016). If we embed these learnings deep enough, away from surface level ‘thinking’, it can affect our decision making (Bai 2001). How we know changes what we know; challenging design’s existing ways of thinking and being. Again, we leaned on storytelling, sometimes through species cards that prompt dialogue (Lundebye 2019), as well as moving through bodystorming and experiential role play (Camozzi et al. 2020). Cards asked students to act as starfish, kelp and killer whale, in activities that demonstrate the interplay within an ecosystem. Students learn through their entire bodies rather than solely with their heads or hands, literally crawling, and jumping around a room. This was practiced over time in the classroom. It began to feel natural, and supported a shift in how all of us act, think and feel. This role play carried into the third year course where we asked students to design species cards for themselves. Species cards and the associated role play is embodied learning that declares that we, humans, are also a species. We shuffled ourselves into the deck like every other being.

- **Highlight a plurality of views.** A plurality of views counters Modern Western tendencies to interpret life through a singular lens (Bai 2004). As discussed above, cyclic and periodic dialogues with guests from Indigenous communities, from the sciences, from other students, and from the natural world, built relationships that span disciplines, cultures
and knowledge. Inspired by this pedagogy, students began to shift their perspective about who has agency. Third year industrial design student Danika asked “What does the tree see when the tree sees me?” (Oystrek, 2021).

- **Incorporate space for reflection, flexibility and play.** Interrupting the typical demanding pace of a studio course makes room for students to slow, revisit, and reconsider how they might carry out their work. The back and forth movement from indoor to outdoor, immersed in nature then enclosed in the studio, was central to our planning. Students need time to consider the meaning of what they have noticed. Reflection became collaborative, students talk and sketch together, sharing stories and interconnections. At times it also became analytical, like when third year students map the breadth of systems and networks, a practice that highlights multiple relationships among many beings.

  “I think exploring this freedom [] in a way, made me improve how I organize my brain and ideas and be more patient and resilient to come up with a more desirable outcome.” (Anonymous student reflection 2020)

- **sketch prototypes** - students created prototypes and took them outside for experimentation, whether to the shore, the alley, the wood or the backyard. Testing outdoors is very memorable. Imagine sitting in the intertidal zone letting the waves envelope you. Or creating games for crows on your windowsill that they turn their beaks up at. Prototypes spawn more prototypes directly on location. Students reflect and even meditate while the waves wash over a broken idea. Letting go or evolving ideas becomes much easier when you have a richer awareness of the relationships in your surroundings. Designing for Biodiversity requires this agility, and practicing outdoors builds it.
Figure 5 (Clockwise from top left): Third year student Lucia Ponce Laresgoiti wanders outside; propositional prototypes by Andres Somesco, third year; storyboards INDD 200 by Aisha Nasution and Claire Ko, INDD 310 student Ingrid (Dee) Van Zyl explores tree bark through making; documentation of a ritual at the water’s edge by Danika Oystrek and Aaron Lin for INDD 200; species cards by Oystrek created in third year; INDD 200 students test their prototypes in the ocean.
D. Conclusions

Robin Wall Kimmerer (2021) talks about “activating us to live differently in the world, [and how] that is medicine” for us and for all beings. Our forays into activating design with more-than-humans felt like medicine. Students and faculty began to enjoy slowing down and wandering outside of our human-made environments and stretching our points of view. Our students showed us, as they articulated their growing connections with animate and inanimate beings, that experiential immersion is a particularly effective pedagogy for learning about the natural world. It is also a powerful way of remembering. They showed a new understanding of deep relationality and reliance on the natural world in everything we do. It leaves us increasingly committed to reach out for more-than-human engagement throughout the entire design process. We have re-imagined how to belong with other species.

In the span of this project, books have been published (Fletcher et al. 2019), methods explored and pedagogies deepened. As a result, our awareness of human interdependence with the natural world has begun to permeate everything we do. Design research has been reinterpreted by students in their fourth year, new pedagogy has been developed by participating and adjacent faculty, and student collectives returned to feed new ways of knowing back into our research and classrooms. Our work only begins to indicate the plurality of practices that support new forms of world-making in support of biodiversity. This research project allowed for an expanded range of design outcomes that challenge conventional notions of what design should do and should be, like the design of daily rituals, new foods, social innovations, musical instruments, species cards, contemplative practices, and play.

In closing, we note that much of Zach and Charlotte’s pedagogy in INDD 200 was grounded in our local intertidal zone. Between high and low tide, this place usually contains a rich abundance of shellfish and seaweeds. But during the summer of 2021, the Pacific Northwest experienced an unprecedented heat dome, where an estimated over 1 billion sea animals died (Yurk, 2021). Sea stars, sea cucumbers, mussels, rockweed, butter clams and many others were cooked and washed ashore. Our beaches smelled of death. Bivalves filter and clean the water and provide food for many species, so scientists speculate that there may be long term ecosystem damage. All of us, students and faculty who have taken on this project are reminded why this work is so important. This impels us to continue to invest in learning how to design and live in a healing relationship with this beautiful Earth.

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About the Authors:

**Zach Camozzi** – I was born in Toronto, central Canada, to Italian-Canadian and French-Canadian parents. As a child, my family moved to the West Coast and its ocean, mountains and dense rainforests. On the lands of the Shíshálh (Sechelt) and Skwxwú7mesh (Squamish) Nations, my love of nature was nourished. The dominantly white, English speaking, cis, working class culture (of which I identify) influenced choices like studying Engineering and working in Outdoor Education. I straddle, struggle and continue to decolonize myself and my practice through my work as an interdisciplinary designer teaching in the Faculty of Design and Graduate Studies at Emily Carr University. I primarily research Nature’s connections and influence on design. This allows me to practice within recreation, education and health. In Emily Carr’s Design for Social Innovation Lab (DESIS) I develop pedagogy that de-centres humans. Within the Health Design Lab, I activate outdoor spaces to support children with learning differences. With the British Columbia Children’s Hospital Research Institute, I intervene in outdoor play, adding risk in early childcare for development.

**Charlotte Falk** – Raised in a middle class family in Treaty 6 territory by my mother (of English-Canadian descent) and my father (of German descent), I grew up in a family of scientists, with an early interest in making and art that ultimately led to design. This trajectory was in part through my maternal grandmother’s infectious interest in early Canadian antiques and design. I am a settler, an able-bodied, cis-gender, white woman — identities I continue to interrogate and carry with me into the spaces of my practice. I am an interdisciplinary designer, educator, artist, and (rookie) gardener with a practice spanning industrial design, communication design, public art and architecture. This interdisciplinary practice is reflected in my teaching: at Emily Carr University of Art and Design as a sessional lecturer, and at Langara College as a part-time instructor, both located in Vancouver on the unceded territory of the Coast Salish Peoples - Skwxwú7mesh (Squamish), Stó:lō and Sḵwx̱wú7mesh (Tsleil-Waututh) and xʷməθkʷəy̓əm (Musqueam) Nations. My research investigates design processes in relation to materiality and technique, with emphasis on pluralistic, participatory approaches to design.

**Dr. Louise St. Pierre** – My French-Canadian and British-Canadian ancestors were farmers and makers on the original lands of the Cold Lake First Nation people in remote Northern Alberta. I grew up as a cis-gender white woman with a connection to the land and to cycles of nature that has permeated my research and my life, from the development of early ecological design methods (Okala.net), to developing classes in ecological design, and to being arrested in climate protests. My recent efforts to heal the relationship between Western Modernity and Nature include founding the Design for All Beings Research Group, teaching Design with More-than-Humans, and publications such as Design and Nature: A partnership (Routledge 2019). My approaches to embodied, relational, and experiential pedagogies are informed by my deep engagement with wisdom traditions and contemplative practices.