WORK LIKE NATURE

Sustainability lessons from ecosystems for your job or business

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To everyone who is working for a better world:

- *Thank you for your contribution.*
- *The work you do matters.*
- *Keep going!*

Contents

Preface

The year was 1992 and a group of us wandered along dirt roads breathing in the scent of a dry, sun-warmed forest. Fir, cedar, hemlock, maple and arbutus trees stood together, each reaching for the light. The forest was beautiful. Only the scattered decaying stumps revealed that these woods had been harvested before.

I was on a field trip with the university where I would later become a full-fledged scientist. We were touring Merv Wilkinson's seventy-seven-acre property, named Wildwood, on Vancouver Island's east coast, a piece of land Wilkinson had been logging since the 1940s.

"I have cut this forest nine times over," said Wilkinson. Yet, we were not in a clear cut. We stood in a healthy, thriving and diverse forest that had sustained Wilkinson for more than fifty years.

That day, Wilkinson introduced us to his style of forest management and the techniques he started using long before sustainable forestry was considered a progressive idea, such as keeping his forest productive by cutting less than the rate of growth. But Wilkinson's practices went deeper than simply a sustained rate of cut.

"I work with nature," Wilkinson explained. "When I realized how important woodpeckers are to keeping insect populations in balance, I decided I better leave some snags for them to nest in." Snags are dead standing trees that, until the 1990s, were routinely removed from managed B.C. forests. However,

Wilkinson recognized their value and started keeping them decades earlier.

Wilkinson also explained how he relied on nature for fertilization and the planting of new trees. The nutrients from decomposing leaves and wood naturally boosted the growth of Wildwood's trees. Wilkinson didn't plant young trees like most foresters do; instead, he strategically left healthy, locally adapted and seed-rich trees standing. Their seeds fell to the ground, where the soil and sun nourished the seedling into a tree for Wilkinson to later harvest. Nature did his work for him, while he acted as the conductor of a living orchestra.

Journey to win-win

The Wildwood field trip stayed tucked in my memory for twenty years as I built a career, first as a field biologist and then a civic employee, figuring out how to minimize the negative environmental impact of forestry, agriculture, manufacturing, and urban growth. This memory stayed with me as I was paid to fix pollution issues, protect natural resources and minimize habitat destruction.

As I strived to slow the loss of species and their habitat, my efforts never felt like enough. I imagine this is how a doctor feels when she can reduce a tumour but can't destroy it. A smaller tumour does not make for an inspirational success story.

My work often felt like a guilt-trip, as I prodded people to reduce energy use, protect fish habitats and decrease contaminant runoff. I came across as an adversary when I tried to convince people to save a bit of land here or lower pollution

there.

At Wildwood, Wilkinson didn't choose between the environment and his livelihood. Instead, he nourished the environment, and it provided his sustenance.

Along with Wildwood, the ecosystems—the forests, the grasslands and the rivers—that I worked in as a field biologist also inspired me. Nature doesn't need to think about reducing its impact. In nature, there's no pollution: one animal's waste is another's resource. Total habitat loss doesn't exist in nature, as life creates habitat as it goes about its business. In nature, there's no need to reduce energy use, as flora and fauna live within the limits of the sun.

In my work in municipal government, my colleagues and I used the concept of "nature's services," like flood management, pollination and temperature moderation, to justify the conservation of ecologically rich lands. We talked about the benefits that nature brings to our community, such as nurturing our crops, cleaning our air and beautifying our neighbourhoods. We began to design community plans to mimic an ecosystem. We encouraged planners and developers to weave nature through the urban landscape, to value nature for its natural capital, and to generate resources and manage waste on site.

I showed teachers how to grow their school gardens in concert with nature. We built habitats to attract beneficial animals, like chickadees, lady beetles and bees, to help us with pollination and insect control. By working with nature's decomposition services, we moved from paying for soil to building it ourselves. We grew a diversity of crops to make our gardens more resilient and more interesting. In the city, we used the same practices that I saw ecological farmers using

with great success.

Michael Pollan, in his book *The Omnivore's Dilemma*, introduced me to Polyface Farm and farmer Joel Salatin, whose family had inherited a degraded acreage. They began to heal the land by using nature as a guide. They planted and harvested trees, rotated livestock on open pastures to mimic how wild herbivores graze, and raised diverse livestock that complement each other. For example, chickens are put on fields after cows are moved off. The chickens further fertilize the land by distributing the cow's manure. And they keep flies in check by eating hatching fly larvae as free chicken feed. Today, the land and water are healthy, and Salatin raises more livestock than other farmers in his county. All while using principles from nature to nourish rich soil, raise healthy livestock, and build a successful business.

As I watched the growth of nature-inspired sustainability, I saw Wildwood's concepts being applied widely across many disciplines, not just natural resource sectors like forestry and farming, but also in manufacturing, construction, engineering and health care. However, I also saw a need to further distill the brilliance of nature to help people in these and other industries see how ecosystems can be a model and inspiration for sustainability. I wrote *Work Like Nature* to give you a blueprint to "work like nature" and be more sustainable in your own profession.

Introduction

The United Nations (UN) Millennium Ecosystem Assessment states that sixty percent of ecosystem services, including fresh water availability, pollination, and air purification, are being used unsustainably. Over the past fifty years, to satisfy our demands, we have degraded the world's landscapes to a point where we will "substantially diminish the benefits that future generations obtain from ecosystems." These future generations are our kids, and their kids, and their grandkids.

It's logical to feel overwhelmed, powerless and guilty when you hear about the state of the environment: the oceans are acidifying, the ice caps are melting, greenhouse gas levels are rising, species are disappearing, and storms are intensifying.

At a workshop, I witnessed the despair and helplessness that environmental degradation can cause. Twenty of us sat in a tight circle. A woman stood up, her voice shook and she was close to tears. She expressed her frustration with the impact humans are causing to the environment and the slow adoption of sustainable practices. Across the circle, another woman rose and said: "Just tell me what to do. I don't know what to do."

This image of a woman standing up to ask for help stuck with me. Being well aware of the vulnerability of the natural environment and wanting to contribute to a more sustainable world doesn't mean you know what action to take.

Even the word "sustainability" adds to the confusion. If you ask fifty people what sustainability means, you'll likely get

fifty different answers. In a LinkedIn group called Sustainability Professionals, a member posed the question "What is your definition of sustainability in less than four lines?" To date, there are 1388 comments. If the professionals aren't clear on this issue, where does that leave everyone else?

A common reference for sustainability is the 1987 UN Brundtland Report:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The UN Millennium Ecosystem Assessment I cited earlier showed that globally we're not meeting this goal. Where does an individual start to try and meet the intent expressed in the Brundtland Report? Indeed, we can each make environmental change in our personal lives, and a growing number of resources help us do this. But what if we each also made changes in our work, where our action could touch many more people than just our family members? Could we each redesign, or design at the outset, the products and services we offer—things like dinner, furniture, health care, coffee, cities, buildings, and education—to be more sustainable and to work like nature?

When I imagine what a business or a person's job would look like if it were more sustainable, I don't start with light bulbs and recycling. Don't get me wrong: efficiency, especially for energy and water use, is a key piece of the puzzle, but I start with ideas from thriving ecosystems.

An ecosystem is an interdependent system of organisms interacting with each other and their physical environment. An ecosystem can be small like a pond or large like the boreal forest, and robust ecosystems share inherent principles.

Let's consider a tree, which is itself an ecosystem. Each year that tree grows larger and produces many new mini-trees. As it grows and reproduces, the tree doesn't worry about lessening its ecological footprint or feel guilty about the environmental damage it's causing. Quite the opposite, actually: as a tree grows, it cleans the air, stores water, makes oxygen and provides food and refuge for other plants and animals. That tree doesn't plug into the electrical grid to get energy. It lives within the limits of the sun's energy. This tree and its ancestors evolved over generations to work with, not against, the natural environment, whether that physical environment is wet winters, clay soils, intermittent fires or prevailing southerly winds. And the tree's larger forest "neighbourhood" doesn't need garbage service. The leaves and wood in a forest are used and decomposed by the organisms living in the soil. The nutrients go on to re-nourish the same trees.

How can we, like a tree in a forest, simultaneously thrive in our livelihood, support our community and nurture the natural environment? If we can figure that out, then we can be successful in our work, support our families and contribute to the greater good just like a growing forest does—that's sustainability. By working like nature, we too can be sustainable.

In *Work Like Nature* we'll explore six lessons from nature to help move your job or business towards a more sustainable system. These strategies dovetail with other new green practices you may have heard of, including the circular economy, the sharing economy, green infrastructure, natural capital and systems thinking—each of these ideas has its basis in nature.

Here's a brief introduction to the six lessons we'll explore:

Work with nature's services

In nature, plants and animals get their goods and services, such as water, food, shelter, energy, and climate protection, from the ecosystems they inhabit, and they in turn often contribute to the health of these resources as well. In Chapter 1, we'll explore the importance of caring for the services of nature you rely on.

Use non-toxic materials and processes

In nature, organisms can't build their materials, like their body armour and baby nurseries, away from where they live. Therefore, they manufacture in a manner that doesn't foul their home or bodies. In Chapter 2, we'll explore the importance of using non-toxic materials and processes.

Seek and share optimal resources

In nature, species use resources that are plentiful. Dozens of animal species flock to spawning salmon streams to take advantage of this abundant food resource. In nature, species share resources over space and time. Swallows and bats both eat insects on the wing, but they use this resource at different times of day. In Chapter 3, we'll investigate how we can design our work to use resources more optimally.

Upcycle wastes into resources

In a forest, one organism's waste is upcycled into another's treasure. Each autumn deciduous trees drop their leaves. The leaves become food for soil dwelling insects, worms and fungi. These critters then turn the leaves into nutrients, which in turn become available for plants to use. In Chapter 4, we'll talk about upcycling wastes into valuable resources.

Be diverse

In nature, diversity gives ecosystems the ability to resist and bounce back from stressors, like drought or disease. In Chapter 5, we'll explore how you can use diversity to increase your resilience.

Pay attention to interconnection

The components of a forest are interdependent and thrive because of their relationships to each other. A hummingbird raises its young in the safety of a tall fir tree. It gathers lichen and old spider webs draped on the tree to construct its nest. To "return the favour," the hummingbird provides nutrients to nourish the tree and eats insects from its branches. In Chapter 6, we'll consider the benefits of nurturing your interconnections and the risk of ignoring them.

At the end of each chapter, I've included exercises to help you start integrating these nature-inspired ideas into your work. And to make these ideas a bit more concrete, I've given suggestions of how various professionals might integrate the chapter lesson into their jobs. After reading all six lessons and completing the exercises, you'll see how to work like nature and have a framework for weaving sustainability into your job or business.

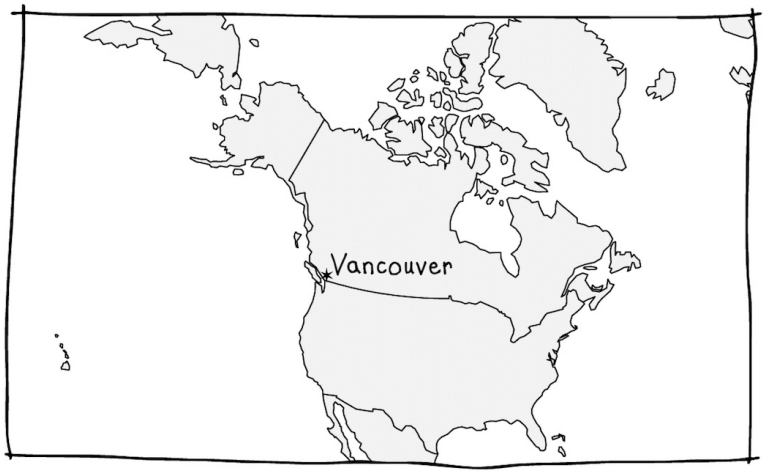
Observe any ecosystem, whether a forest, grassland or desert, and you'll see these six lessons everywhere you turn. These ideas from nature can shift anyone's work to a new model, especially people who work in areas that rely on natural resources, such as manufacturers, food processors, chemists, energy producers, farmers, engineers, building operators, builders, textile designers and health care professionals.

Implementing an ecosystem-based model in your work can help you achieve long-lasting and meaningful sustainable change and let you:

- Use resources more effectively by upcycling wastes into resources, using more optimal resources for your needs and using safer materials and processes.
- Promote nature by enhancing natural areas, reducing pressure on natural resources and making use of nature's services.
- Cultivate resilience for your community and business by increasing diversity and working with your local environment.

To illustrate the ideas, I tell the stories of green innovators who work like nature. Many of these innovators come from the Vancouver area, which includes the City of Vancouver, the Metro Vancouver region and the bordering Fraser Valley region. I use the name Vancouver liberally to mean all of these areas.

Vancouver, both the city and the region, are wrapped in a phenomenal natural setting that is beautiful and inspiring. The emerald-green Coast Mountains frame one side, the Pacific Ocean the other, and the naturally murky brown Fraser River courses down the middle. The Fraser River is the most productive salmon river in the world, and on either side the rich soil is an asset that nourishes Vancouver's food supply. *Work Like Nature* is set in Vancouver, but these are only examples, as similar innovation is happening in pockets around the world.



Wilkinson was my introduction to an innovator designing in concert with nature. Now I have a whole new set of innovators to draw from. These innovators have put forward ideas that are greener, but they are also simultaneously building new businesses, creating unique careers and growing healthier communities. They have developed opportunities in bioplastics, biogas, car sharing, coastal engineering, insect rearing and waste repurposing, and continue to develop more. And potential new job titles are popping up, such as pollinator habitat specialist, nature health therapist, green chemist, fertilizer chef, ecological designer and local renewable energy expert. These innovators are putting ideas from nature into action and demonstrating that nature isn't an obstacle—nature is an opportunity.

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Lea Elliott

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