POLLINATOR PATHWAY TOOLKIT

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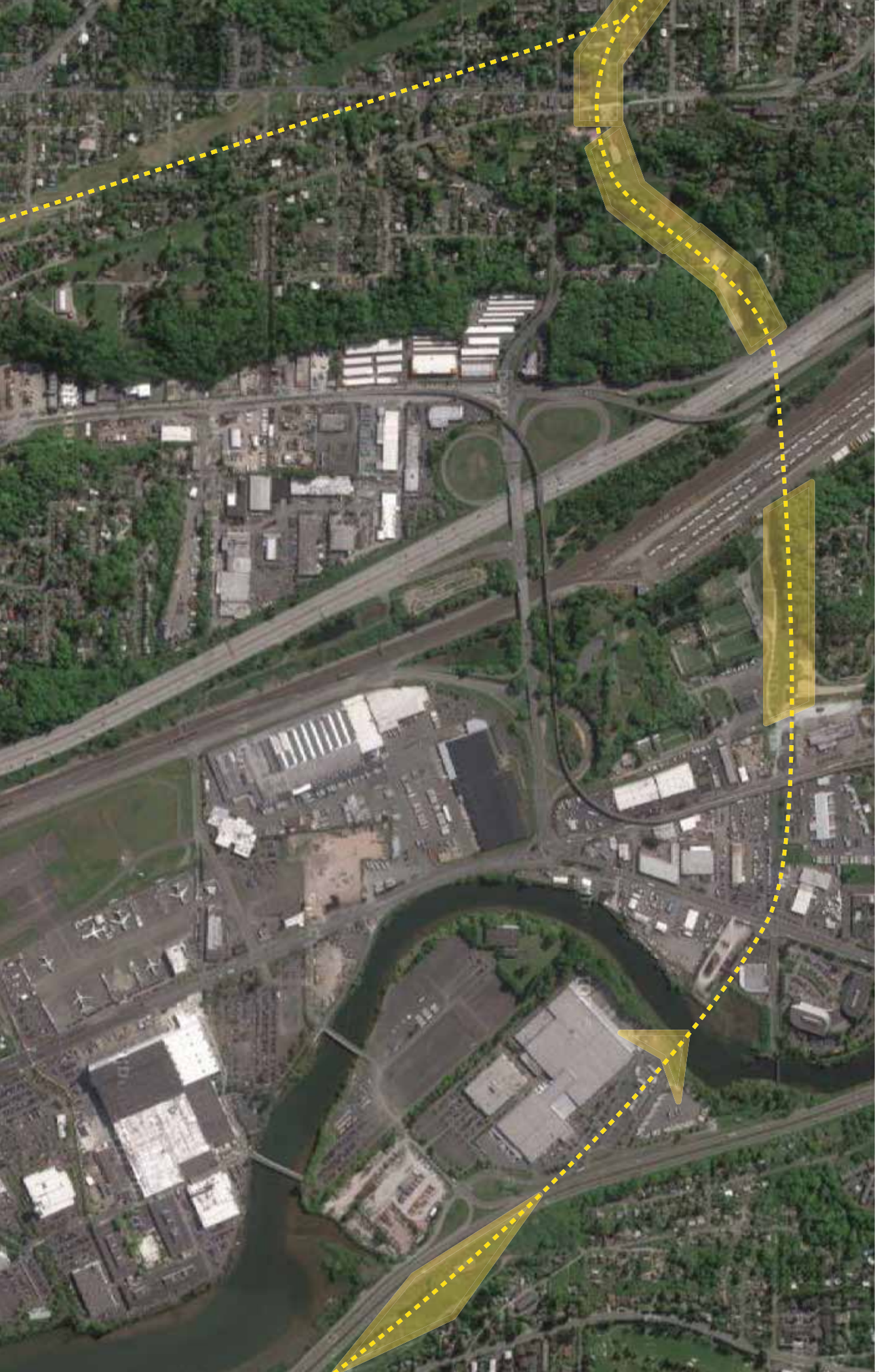


WHY A TOOLKIT?

Hello! Starting a Pollinator Pathway is no small feat, and we created this guide to help you get started. Founded by Sarah Bergmann in 2007, the Pollinator Pathway has kickstarted a global movement. It prompts us to reframe our relationship with nature from one where nature is "over there", to one where we recognize ourselves as an organism that is part of the long evolution of the planet. It is about humanity turning around a narrative—from "saving nature" to that of becoming an ecological, or symbiotic civilization. More broadly, it is a project about the Anthropocene—and about humanity becoming a different *kind* of civilization—something we've done many times over.

To solve the complex issues of our time, we believe that we need to ask big questions and work across silos—and that to address something like a lasting civilization and sustained planetary biodiversity, we need to become more nimble in our thinking—in order to pivot into new modes of thought, collaboration, and organization. It is about cultivating a certain kind of openness to big questions, and to working across different fields in pursuit of those questions, in order to address complicated problems. This project is about understanding that the problems we face in the Anthropocene are not limited to the purview of one field (for example, that how we design a city is not separate from ecology and climate, any more than environmental problems are only environmental) and that this requires us to broaden our response past siloed disciplines.

Two arenas that have potential to support this expansive type of approach are systems thinking and design. Design (or "design thinking", the thinking process of design) has come to mean many things, but we think its strong suit has to do with a willingness to turn questions around and potentially generate entirely new ways of seeing problems. This includes asking if what we assume to be a problem is, in fact, the problem.

This toolkit is a starter guide for those interested in participating in an ecological design with a Pollinator Pathway. It is by no means comprehensive; it is intended to introduce you to a big picture, and to help organize your thinking as you plan your project. The contents describe how to participate in a global landscape plan that:

1. CONNECTS FRAGMENTED LANDSCAPES
2. SUPPORTS MAXIMUM BIODIVERSITY
3. ENGAGES SYSTEMS THINKING; DESIGNS WITH THE BIG PICTURE IN MIND
4. SUPPORTS DENSITY IN CITIES
5. OFFSETS (THE LACK OF BIODIVERSITY IN) FARMS
6. COLLABORATES ACROSS DISCIPLINES

We hope you'll find these pages informative and useful.

Elizabeth Stinson summed up a similar line of thought—in this case, about the antidisciplinary approach of MIT's Media Lab—in a 2016 WIRED piece: "science, design, art, and engineering, long considered their own areas of focus, are no longer domains to be explored in isolation, but together, in the hopes of expediting progress and discovery."

Design thinking has been popularized and codified by design firms in recent years, but it stems from multiple threads, notably the liberal arts—where it was a response to the siloization within these disciplines. To learn more about the origins of design thinking, we recommend Buchanan's "Wicked Problems in Design Thinking"

web.mit.edu/jrankin/www/engin_as_lib_art/Design_thinking.pdf

LIVING IN THE ANTHROPOCENE

We now live in an age many scientists are calling the Anthropocene, in which humanity has come to influence every natural system on the planet, on a geologic scale.

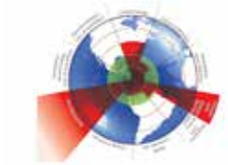
The Pollinator Pathway project was built on the idea that, to ensure a relationship with the planet that sustains us, we need to a) design on long time, b) design widely across systems, and c) design comprehensively.

It also urges participants to see our engagement with the planet as one that embraces the relationship between systems—from the ecology designed by other species to the ecology designed by us—stimulating ethical, social, and cultural conversations.

SO YOU WANT TO START A POLLINATOR PATHWAY

Joining this project means contributing to a community of participants invested in creating a better symbiotic relationship between human civilization and the planet. Highly successful projects connect fragmented landscapes, help plan for thousands of years from now, and design for their place in a system.

Here's a quick overview of the big picture driving, and defining, The Pollinator Pathway:



A helpful tool for thinking about the big picture is the earth system framework called Planetary Boundaries, which was put forward by a group of earth scientists in 2009. It outlines nine boundaries that we cannot cross for a "safe operating space for humanity". We consider it an excellent design brief. For more info: nature.com/news/specials/planetaryboundaries

How Can Our Civilization Design Itself into a Thriving Planet?

We live in the age of the Anthropocene, or Age of Humans: humanity is a major presence in every ecosystem on earth and a major influence shaping the planet. How might we organize ourselves in a way that supports the planet—and the inherent ability of the species in it to create the world? What does good design look like? The Pollinator Pathway is built on the recognition that we live in an age of complexity—and that to design well, we need to design on long-time, and think widely and comprehensively across systems. It also means understanding and designing for the hidden (human) dynamics and drivers of landscape.

Fragmented Landscapes, and the Current Design of the World

Humans have made a swift reorganization of the planet since our hunter-gatherer days. As we expanded as a species, and developed a globalized society with large-scale cities and agriculture to match, we cordoned the deep, once seamlessly connected biodiversity of the planet to fragmented landscapes. These landscapes, now disconnected, enable the function and health of the planet. Their primary producers are plants, and pollinators are how most plants reproduce: 80% of Earth's plants are pollinated by species such as bats, moths, butterflies, beetles, and over 20 thousand species of bees native to their regions (not the domesticated honeybees we're used to hearing about in the news).

Homogeneous Agriculture (and the Problem with Honeybees)

Agriculture is (intentionally) a landscape where biodiversity has been designed out in order to provide food for humanity. Since plants and pollinators are symbiotic partners, where there is no plant biodiversity, there are also fewer pollinators.

← Image: Benjamin Grant/Daily Overview

Honeybees are super-generalist species that "disrupt the structure and functionality of plant-pollinator networks":

https://www.nature.com/articles/s41598-019-41271-5.epdf

Here's a helpful piece that explains how fragmentation affects species: www.theatlantic.com/science/archive/2017/11/living-on-the-edge/544658/

Since pollination is necessary for (some) crops to complete a functional lifecycle, people began addressing this problem by bringing in outside pollinators (usually honeybees) to provide pollination in these systems. As agriculture expanded, so did this practice, and a result is that honeybees are trucked in a circuit around the United States, and world, at bloom time to pollinate select crops. Recent troubles with honeybees and colony collapse have shown us that a system dependent on one species is a fragile one—but even more poignantly, they give us a pretty good glimpse of how vulnerable the planet might be if we were to continue to design out biodiversity.

Large-scale agriculture is a vast, utilitarian design (and, in terms of time, what we might also call a “short” design). These landscapes both *are* vulnerable, and they also *generate* vulnerability. (Another way of saying this is that they change the structure, or dynamics, of the landscapes themselves.) As landscapes driven by economics, and designed with the express purpose of food, they will also produce only so much ecological complexity as is necessary for food production.

We know that globally, we are trending generalist, domesticated and homogeneous—in other words, we are designing more of the types of landscapes that generate a similar kind of vulnerability as agriculture. Therefore, among the last things we need to do *outside* these systems of big scale agriculture, is increase vulnerability by expanding honeybees, as some well-meaning “save the honeybee” campaigns do (doing so would be a little like adding cows to a grass problem). But it also means that it is not supportive to expand domesticated *landscape*s.

A Better Design—Connected, Resilient Landscapes for our Changing World

A better solution outside of these existing systems, is to design a *counter-system* of connected ecological design. This means connecting fragmented landscapes—and therefore, native plants, and with them, their partners in native pollinators. By connecting these landscapes—created on deeper time by the interactions of millions of species—we are supporting and enabling the complexity of the planet. This is a counterweight to the designed lack of biodiversity in large-scale agriculture.

The aim of creating Pollinator Pathways is to connect and expand fragmented landscapes around the globe, from our national parks and refuges down in scale. Connecting these landscapes strengthens their resilience.

CONNECT THE PARKS!

← Image: Ian Webster for the Pollinator Pathway

Designing for Long-Time

All species design the planet, on different time and spatial scales. Here, we mean "design" in the broadest sense of the word: For example, by eating and distributing seeds, birds create the future locations of forests; beavers organize the shape and the behavior of ponds (scaling way up, another example is the Amazon, which generates its own rain). The existence of different species creates the basic functioning (the behavior as well as the physicality) of the world.

For more about how the Amazon generates rain: e360.yale.edu/digest/trees-in-the-amazon-generate-their-own-clouds-and-rain-study-finds

Species that lived in earlier epochs—say, the Pleistocene—helped create the Holocene, and species in the Holocene helped design the Anthropocene. How might we organize our civilization in the Anthropocene so that we support the next epoch of life? What ecologies do we create in contemporary times? Can we design a future of nature that sustains life in the next epoch by calling on the design of the past? In the case of the Pollinator Pathway, what that means is designing in support of landscapes and plants that have been around a long time—and their pollinator relationships.

The field of paleoecology is one arena asking interesting questions about how we might draw from the past to support the present.

For example, the Pleistocene Park project replicates the behaviors of long-ago species in hopes of creating particular ecological conditions. www.theatlantic.com/magazine/archive/2017/04/pleistocene-park/517779/

For a visceral understanding of these relationships, take a look at the moth and orchid, below. The orchid (right) has a foot-long nectar spur, and the moth (left) has a foot-long proboscis. The moth's proboscis fits inside the nectar spur like a hand in a glove. These are highly specialized relationships that are adapted to each other over a very long time.

(Xanthopan morganii praedicta and Angraecum sesquipedale)

Each species enables the reality of the other (and makes the physical characteristics of those places). Now, imagine you're in a forest filled with trees. One of those tree species is pollinated by a particular species of pollinator. If the pollinator is not present to pollinate the tree, and there are no other pollinators suited to this tree, the tree will struggle to reproduce, and over time, may disappear from the forest. Poof. You get the idea. By supporting the design of species that have already helped evolve the planet, we support a lasting civilization. Species *generate* life.

To learn more about pollination and forests, here's a great piece by David Biello: www.scientificamerican.com/article/missing-pollinating-birds-hurt-flower-plant/

Climate Change, and the Making of the World

Here is why it is so important: with climate change, the phenological timing (the timing of biological events like first flowering of spring) of the world is changing. As temperatures shift, species—including plants—are moving in response. What this can mean is potential mismatches of the timing between species—and therefore, an unraveling of ecosystems as we know them. For example: a bird species might historically migrate at a particular time of year, and is used to being able to anticipate food on arrival at a particular location. With climate shifts, the bird arrives, but its food has hatched early, late, or not at all. Plants—including trees—are also moving in response to climatic change, and they are moving in unpredictable directions. If a species needs to move in order to respond to the changing life conditions of the planet, and it is located inside of a fragmented landscape, it will run out of room (and then, you know—poof).

Most ecological literature points to how climate change *impacts* species, but the same is true of the inverse: the interactions of species across time and space *influence* the behavior of the planet, including climate.

Since species design the planet and generate the function of the world—complexity (or biodiversity) is a kind of insurance plan against what we've just witnessed with honeybees, where an entire system was made vulnerable to collapse because it was winnowed down to one species. Creating a comprehensive plan for connectivity supports the long design of the planet—and us.

Cities Are Ecosystems, Too

Over 50% of humanity now lives in urban areas. How do cities fit within a big picture goal of planetary biodiversity? Can cities form a better symbiosis with the planet?

For a beautiful entry into exploring this thinking we recommend Jenny Price's wonderful, perspective-shifting piece called "Thirteen Ways to See Nature in Los Angeles": https://believermag.com/thirteen-ways-of-seeing-nature-in-la/

When we think of nature, cities are probably not the first thing that come to mind. Yet a city is a kind of ecosystem in more ways than one. An obvious way to see a city as an ecosystem is via the plants and animals inside the city (and another way to say that, is that cities *generate* certain species).

Yet another way to see the city as an ecosystem, is via its presence itself—and the behaviors, structures, and flows (such as transportation, buildings, recycling, or movement of goods) forming its ecology and influencing the planet.

Can we seek more ways for cities to help generate different ecological outcomes, or support the ecology on which they depend? Can they behave better? We support the creation of

a better symbiotic relationship between cities and the ecologies outside them—via cities that *behave* more like ecosystems, rather than just look like them.

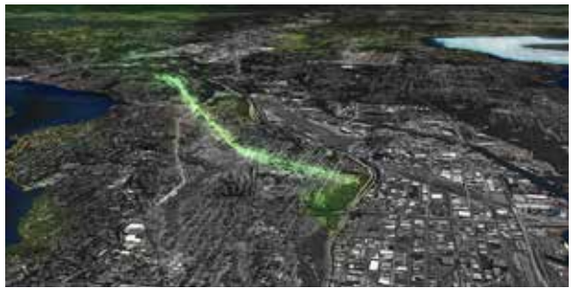
What do we mean by that? Cities contribute profoundly to both climate change *and* biodiversity loss via expansion, or sprawl. An important thing we can do to address both climate change and sprawl is to design in support of density in our cities. In other words, density means less urban sprawl, and less need to drive, which means less climate change, and more land not developed outside cities. Therefore, we recommend two approaches when it comes to cities:

For useful context on what greening vs. greenwashing cities adds up to, we recommend this piece by Wade Graham in the LA Times: latimes.com/opinion/op-ed/la-oe-graham-folly-of-green-buildings-20160306-story.html

1) Design ways to connect landscapes inside cities that simultaneously support biodiversity and density.

This approach is about creating Pollinator Pathways inside the city via a kind of ecological judo: connecting two or more fragmented landscapes while supporting density. Designing in collaboration with smart urban planning practices that support density, means selecting two or more fragmented green spaces and connecting them, while using underused space or areas where buildings would not go.

A couple of examples of sites using underused space to connect landscape are connecting two parks while going up and over buildings, or using rail or transmission lines. Here are some visual examples:



A POLLINATOR PATHWAY
(This project is a great fit: a transmission line that a) connects landscape, and b) when repeated, will not add to sprawl).

NOT A POLLINATOR PATHWAY
(This project is a multiblock development with some plants surrounding it. It a) has no plan to connect landscape, and b) when repeated, will add to sprawl).

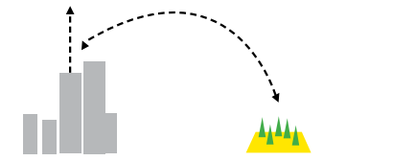
2) Design ways for cities to contribute to biodiversity and landscape connectivity outside of cities.

How can cities build a more supportive relationship with the areas outside of them? For example, could cities help catapult and fund the creation of landscape connectivity outside urban areas? Put another way, can cities help pay for the future of nature? While we don't have all the answers to these questions, we think they are important ones to ask, and we share them knowing that they can be a useful catalyst for others to develop them further.

If you are a designer or planner who wants to contribute to expansion of these directions, we're all ears.

Here are some approaches that can support this direction within the Pollinator Pathway project: LEED (new.usgbc.org/leed) and SITES (sustainablesites.org) rating systems can each be modified to include an offset-type payment that supports connectivity. For example, a developer, in order to achieve a set of points within the LEED or SITES framework on a building or site, could agree to specific financial support to groups working to make Pollinator Pathway connectivity projects. They could do so by either supporting a park (aka, a Pollinator Pathway endpoint) or the connection of parks (such as supporting a segment of a Pollinator Pathway).

Another approach that supports symbiosis between cities and areas outside them is the (brilliant if unromantic-sounding) real estate mechanism called Transfer of Development Rights (TDR). What TDR means is that development inside cities can help pay for land outside cities; a land owner outside a city agrees to leave their land undeveloped, in exchange for selling the right to develop higher inside cities. This way, land outside cities is protected, and the city grows denser. Taking it one more step, it can feasibly be used to connect landscape.



TRANSFER OF DEVELOPMENT

What the Pollinator Pathway Is Not

The aim of the Pollinator Pathway is to design a better symbiosis between civilization and the planet. It means addressing the design of relationships themselves. So, we want to be clear about what a Pollinator Pathway is not. It is not about a singular focus on a species (or cause) that loses sight of a larger system. For example, it is not only about

adding plants to cities (though a project inside a city might certainly include plants). In short, doing so does not address the underlying issue of sprawl (what it will effectively do in time is create a sprawl-with-plants design).

Cities are also often drivers of certain kinds of species: typically generalist, cosmopolitan species that can function in human-dominated environments. It is important to recognize that expanding these kinds of species is not as valuable as designing in support of the deep ecology of the planet. In other words, what we want to avoid doing is a) inadvertently designing a system that adds some biodiversity, but, by failing to embed planning for density or systems thinking into its purpose, does nothing to address the expansion of our cities, or b) inadvertently designing a new global ecosystem of cosmopolitan, generalist species (the honeybee is such a species). From our vantage point, many arrangements of overlapping ecological backup plans—or, the design of complexity—is a far better approach than generating only a small handful of (even the toughest) species.

Designing Across Systems

How we define a problem deeply informs a resulting design. Overall, to create a healthier relationship between humanity and the planet, we need comprehensive thinking that moves us beyond silos, and an approach that takes into account the natural behavior and momentum of systems. This is integral to the Pollinator Pathway project.

Lets talk about the idea of drivers, and designing against momentum and bureaucracy.

In the case of cities, there is a natural momentum toward sprawl, and, as we've outlined in these pages, simply adding plants to cities will not address this system-problem. A way around that is to broaden the scope to design both in support of ecology and density. In the case of agriculture, while supporting our food supply is vital, it is important to recognize that designing a system with food at the center will lead to only as much biodiversity as is necessary to produce food; centering the system beyond agriculture will result in a more biodiverse design. The same is true of roads; a department of transportation exists to build roads. Adding biodiversity alongside roads, results in a system of roads with biodiversity added to them—and creates a driver for the expansion of roads-with-plants. In effect, it makes the road (or farm) the "client". A broader goal of connecting landscape expands the conversation in such a way that can include roads, but does not make them a driver of the design.

To design well, we need to create a comprehensive design that uses existing systems, but does not fall sway to their limits and drivers. What this project is attempting to lay out is some of the basic parameters of these systems, to help you push for a more supportive design.

For more on farms as "client" read: "Delivery of crop pollination services is an insufficient argument for wild pollinator conservation"

www.nature.com/articles/ncomms8414

↑ *A Storm in the Mountains* by Bierstadt, an example of Western romantic narratives of Nature in early America.

↓ Cave paintings reflecting a hunting civilization.

For more on how the Amazon may have been human-generated, read Charles Mann's "1491"

www.theatlantic.com/magazine/archive/2002/03/1491/302445/

A Story About Humanity as an Ecosystem

Finally, the Pollinator Pathway is about us. It is about civilizations and how they relate to, design, and alter the dynamics of the planet. (One of the questions that drives this project is, "what do we emit as an ecosystem?" Another is, "what did we design while we were designing something else?") It is about us as an ecosystem, and our symbiosis.

It is also about culture. How we think profoundly influences what we design, especially in the Anthropocene. We come from a long lineage of cultural transformation that has brought us from hunter-gatherer, to farmer, to a globalized society. Each of these permutations of humanity has also redesigned the dynamics of the planet—such as the fire adapted landscapes of midwest North America generated by Native Americans prior to European arrival, or the existence of the Amazon (which, though disputed, has been speculated to have been made by humans). This project was started to explore how we—as an organism—can move toward a new kind of organization of our design, and create an expansive ecological civilization.

“LIFE DID NOT TAKE OVER THE WORLD BY COMBAT, BUT BY NETWORKING.”

—LYNN MARGULIS

A BRIEF HISTORY

Imagine creating a civilization at the beginning. How would you design? What does symbiosis look like at a grand scale?

For a beautiful look at what it might look like to think about ourselves symbiotically in the context of deep time, look at Olivia Judson's wonderful theory of life on the planet through time, or Lynn Margulis' revolutionary work on symbiosis and evolution.

Judson: www.theatlantic.com/science/archive/2017/05/a-grand-unified-theory-for-life-on-earth/525648/

Margulis: (book)
Symbiotic Planet
In it, Margulis discusses symbiosis and James Lovelock's *Gaia* theory.

"Gaia is just symbiosis as seen from space"
—Greg Hinkle, in *Symbiotic Planet*

THE POLLINATOR PATHWAY began as a system-park. My aim in building it was to meet two seemingly-incongruous goals simultaneously: to connect two land fragments, and to support density. In other words—as has been outlined in the preceding pages—by uniting land fragments, it supported the connection of biological life (based on the basic science behind ecological corridors), and by designing for density inside cities, it contributed to the creation of cities that produce less sprawl, which supports design against climate change and increases planetary ecology. By making the Pollinator Pathway, what I was doing, was making a beautiful public design project that brought these elements together.

More broadly, I built this project as a way to contribute to a global cultural imagination about nature in the Anthropocene. I created it as a place that I could return to again and again, for years, to try to understand and articulate a bigger picture. It was a way to integrate physical work and reflection, and to use all of me—head, heart, and hands. The project was designed to span disciplines; it straddles literature, culture, design, urbanism, history, and ecology—and includes a reading list that I've shared with the approximately 2000 university students who have engaged with and learned from this project (some of these writings are linked throughout these pages).

It is, in short, a long research project. It has some similarity to projects such as Paul Salopek's *Out of Eden* project, or Eric Sanderson's *Mannahatta* project. Eric Sanderson, after discovering an early map of Manhattan, spent ten years reconstructing what Manhattan might have looked like at Hudson's arrival when it was occupied by the Lenape tribe; the result is a book, published in 2009. Salopek's project, begun in 2013, has particular resonance to me: it is an immersive journalism project that involves a ten year walk across four continents and follows the route of humanity's migration; the Pollinator Pathway is something along these lines, but, of course, in reverse: it has meant building a future of nature while seeking to understand the implications of civilization-scale design. I wanted to understand how we got to where we are today, in the midst of the 6th extinction, while also designing a way forward. I made it to understand and give context to a story—one that takes us from the rise of plants, to the rise of humanity, to whatever lies beyond. (It will eventually include a large-scale illustrated book.)

This project is about seeing civilization through the lens of evolutionary time. It represents a shift in narrative away from humans as dominant (and its subsequent response, to save nature), to humans as symbiotic. It especially takes a long look at the Western narratives of nature as perpetually "over there" that have contributed to the Anthropocene. (By believing nature was separate from humanity, we managed to design the globe.) At the end of the day, it is a story about the planet—about energy moving through different designs through time. It was created as a way to build toward what our relationship with nature might become, at this global "organization of design" in our history.

I invite you to join this project—to build on it, and contribute to the principles that guide it.

-SARAH BERGMANN

Universities and Professors

Seattle University, College of Arts and Sciences
Kenneth Alan, Art History
Kate Koppelman, Literature

Seattle University, Department of Biology
Lindsay Whitlow, Ecology

University of Washington, College of Art + Art History + Design
Kristine Matthews, Design

University of Washington, Department of Biology
Jeff Riffell, Entomology
Amy Lambert, Interdisciplinary Art and Science

University of Washington, College of Built Environments
Nancy Rottle, Green Futures Lab
Robert Hutchison, Future Lab

Cornish College of the Arts
Preston Wadley, Foundations
Kim Mackay, Integrated Studies

Further Reading

The Trouble With Wilderness, William Cronon
Extinction, Ashley Dawson
6th Extinction, Elizabeth Kolbert
Massive Change, Jennifer Leonard and Bruce Mau
Symbiosis, Lynn Margulis
Wilderness and the American Mind, Roderick Frazier Nash
13 Ways to See Nature in LA, Jenny Price
Learning How To Die in the Anthropocene, Roy Scranton
The Death of Environmentalism, Ted Nordhaus and Michael Shellenberger

Enormous thanks to

Gabby Arens
Aaron Hirsh
Erin Kendig
Cassie Klingler
Kristine Matthews

POLLINATOR PATHWAY IDEALS

The Pollinator Pathway is a vision for designing our relationship with the planet with these ideals:

1) Connects landscape
Pollinator Pathways connect fragmented landscapes to create healthy networks. Two primary examples:

A. A physical pathway that connects two green spaces, making a “railroad” of access for organisms between them. This is easier if you’re a utility corridor and harder if you’re a homeowner gathering a network.

B. A policy or program that supports a healthier, more sustainable exchange between cities and less-developed, natural areas. For example, a transfer of development policy granting developers the ability to build higher buildings in the city in exchange for also maintaining undeveloped land outside the urban core promotes healthy growth for both landscapes.

2) Plans for the the Long-term
A Pollinator Pathway project is built for other species—it is a design plan for the planet that should last beyond your lifetime. Your project should include a long-term, multigenerational vision and maintenance plan.

3) Meets ecological standards
All Pollinator Pathway projects use a high minimum-percentage of native plants, are hardy/drought tolerant, meet pollinator requirements, and are pesticide free. The emphasis on native plants requires extra planning to ensure lasting design.

4) Supports a Healthy Relationship Between Urban and "Wild"
In cities, Pollinator Pathway projects support density and achieve connection without producing sprawl. By limiting human building and domestication in wild areas, we enable these landscapes to mature into rich, resilient ecosystems. Ideas to achieve this balance:

A. A transfer of development program in which developers can build higher buildings in exchange for setting aside land *outside* cities (taking it one more step, this can be used to fund Pollinator Pathway connection projects outside of cities).

B. An offset-type method that links the creation of buildings with financial support of landscape connection projects.

C. Connect landscapes within cities using only underused space to mitigate sprawl. Find two parks, connect them—but seek underused space to do so.

5) Meets design standards
Inside of the city, beauty matters; maintain high standards of civic design.

As your team asks questions and works through your project, we recommend supporting a "growth mindset" as explained by psychologist Carol Dweck. Learn more: www.brainpickings.org/2014/01/29/carol-dweck-mindset/

6) Gathers an interdisciplinary team
To design the future of the planet, you need to bring together a good team-—one that includes ecologists, designers, and planners and more.

7) Always asks: is this the right question or right problem to solve?
All models are flawed. Please help build and improve on this one. Solving design problems requires collaboration and creativity. We live in an age of siloization, a boon for efficiency and focus—but also a recipe for similar-minded thinking, which is limiting. Spend time exploring the problem from different angles, including actively exploring perspectives from different fields to determine how and if to move forward.

ASK YOURSELF:

When designing your project, ask yourself the following questions to understand how well you meet the Pollinator Pathway ideals and brainstorm ways to improve:

1) Is my project connecting landscapes? Is this a physical connection (a physical pathway connecting two green spaces), a policy connection linking urban and wild areas, or both? If not, how can I change it so it does create connection?

2) How likely is it that my project will persist into the future? How many years do I see it lasting? What will the effect of my project be 20, 50, 100, 1000 years into the future? How can I ensure my project outlives me?

3) Does my project meet basic ecological standards for healthy plant and animal life? If not, what can I do to fix this?

4) Does my project help maintain a healthy relationship between urban and “wild” areas, either through policy or physical design (or both)? Does my project mitigate sprawl or contribute to it? Have I taken advantage of opportunities to incorporate underused space or leverage policies or programs to design my project in a way that moves away from sprawl, now and in the future?

5) In a city, how can I create a design that will be low maintenance, drought tolerant, beautiful, and lasting? Outside a city, what can I do to create the best design scenario for a given site—for pollinators and for low maintenance?

6) Will I be involving all the necessary partners and professionals to realize my project? How will I connect with the agencies, organizations or other groups that can help me form strong, lasting networks in the landscape?

7) Ask, is this the problem? Where does it take me if I switch the "client" of the problem? Do I come to the same solution? Is creating a Pollinator Pathway the best outcome available to me, or is there another way I can contribute?

PROJECT TIMELINE

WHAT'S INCLUDED IN THIS DOCUMENT AND HOW LONG WILL EACH STEP TAKE?

TODAY

Step 1:
Gather Your Resources
A checklist of recommended resources in addition to this toolkit.

Step 2:
Picking the Right Sites
Guiding questions on selecting the "right" land to connect.

+1 MONTH

Step 3:
Assess a Reference Site
Work with an ecologist to conduct your initial guided assessment.

Step 4:
Initial evaluation of Your Endpoints
Assess your endpoints prior to connection.

+2 MONTHS

Step 5:
Create your Design + Draft your Project Plan
Considerations and resources when making your initial plan.

Step 6:
Develop a Maintenance Plan
Determine the right maintenance plans for your project.

+3 MONTHS

Step 8:
Reach out to Neighbors
Resources and tips on how and when to reach out to the community.

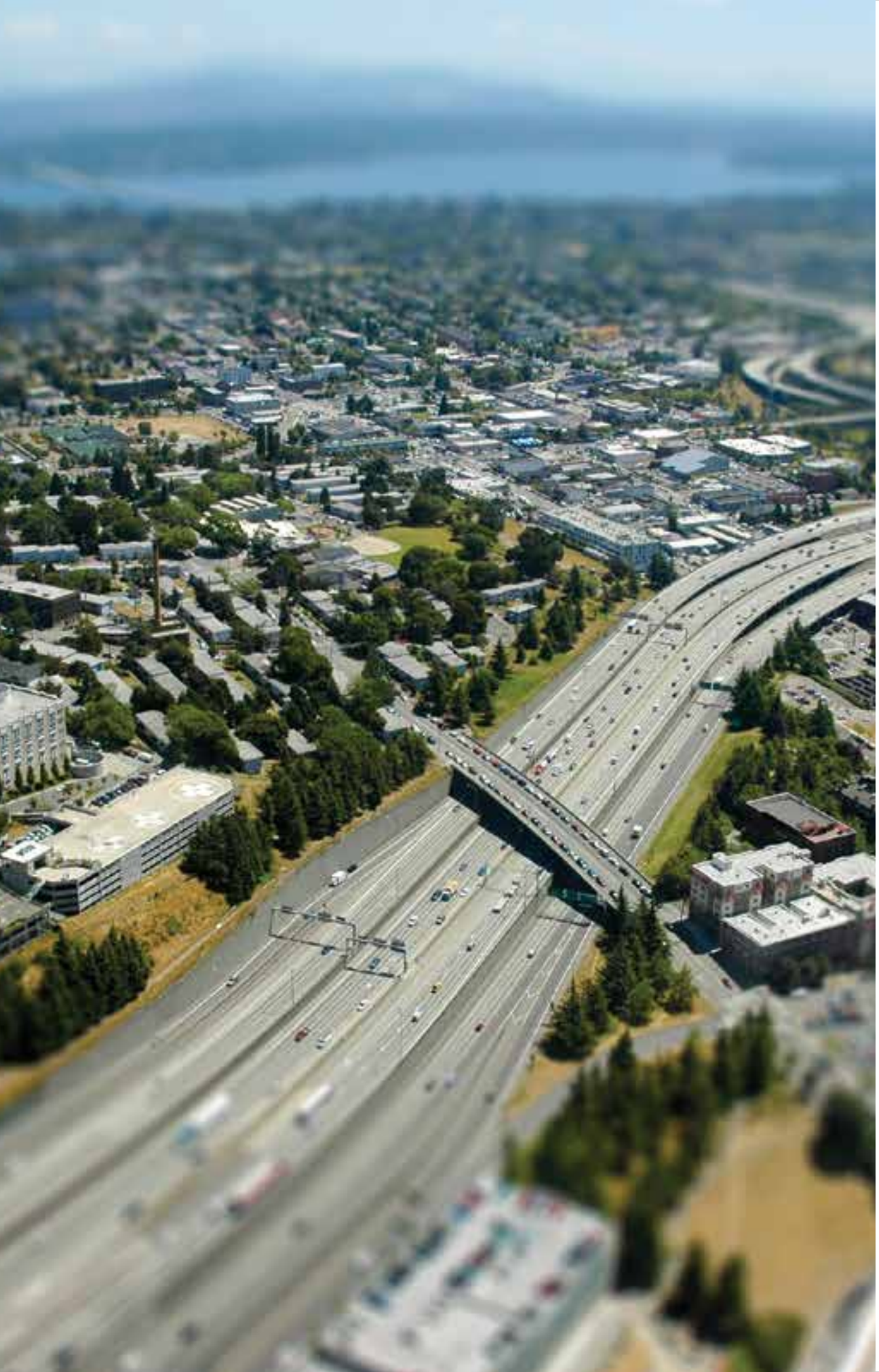
Step 9:
Secure Funding
Tips and resources on how to secure the right funders for the long haul.

+6 MONTHS

Step 10:
Build your Project
When to plant, and other resources for developing your project.

+12 MONTHS

Step 11:
Monitoring and Telling the Story



1

GETTING STARTED: GATHERING YOUR RESOURCES

A: PICK YOUR TEAM

To successfully start planning your Pollinator Pathway, you need:

- [ ] Ecologists (for guidance and monitoring assistance)
- [ ] Urban planners (if you are in a city)
- [ ] Landscape Designers, with strong knowledge of regional plants
- [ ] Project Managers
- [ ] Installers and Garden Managers

TIP: Having trouble finding an ecologist? We recommend looking at universities. If there's no local university near you, consider enlisting a high-school biology teacher.

Some notes: making a Pollinator Pathway requires lasting commitment and team effort, in order to make civic design projects that support life for the long haul. It isn't *impossible* to do it without government and institutional level support, but it will be hard. We encourage you to engage a wide spectrum of support—including institutional and government involvement.

B. GATHER YOUR MATERIALS

To make a Pollinator Pathway, you will need:

- [ ] Funding
- [ ] Buy-in, at city, community, and neighbor levels
- [ ] A design plan
- [ ] A project-building plan
- [ ] A monitoring plan
- [ ] A long-term maintenance plan

C. FIND YOURSELF IN THE SYSTEM/CHOOSE YOUR PROJECT TYPE

- [ ] DEVELOPMENT-DRIVEN POLLINATOR PATHWAY:
  For using Transfer of Development to support a Pollinator Pathway, please contact us directly at: info@pollinatorpathway.com

- [ ] POLLINATOR PATHWAY:
  For making a Pollinator Pathway (that connects two or more parks), proceed to the next page.

CONSIDERATIONS BEFORE YOU GET STARTED:

A good question to ask is, should you make a Pollinator Pathway? Consider: is your location a good fit for such a project? Will you be able to commit to long term care, or have you identified an institution that can? Would it be best to build one, or join in with another project? Pooling resources, and making *one* lasting project, is a better plan than making many that may not last.

2

PICKING THE RIGHT SITES

LOCATING YOUR ENDPOINTS

Your next step is to locate two green spaces you can feasibly connect given the guidelines within this toolkit.

Here are some guiding questions to help you begin:

-What do you own and/or have control over?
-Ecology: what kind of land is in your plan and how large is it?
-Is it considered a park?
-What is located between these two green spaces?
-Are you in the process of building a park?
-Is it a building? If so, can you design on it?
-Is it public space? If so, who manages it?
-Are you in a city? If so, who is using these spaces?
-What is the nearest green space you can create a pathway to?
-Where are the nearest parks around or near that area?
-Who has ownership of the land separating the two areas?
-If you don't own the land, how will you persuade those who do to create a Pollinator Pathway?
-Do you have a good relationship with those who you will be working with?
-Do you have the appropriate funding and/or resources to connect these two land pieces?

Answering these questions while keeping in mind the ecology and connectivity requirements outlined in the criteria will inform decisions about whether this Pollinator Pathway is feasible.

3 ASSESSING A REFERENCE SITE

After confirming which two spaces you plan to connect, work with an ecologist to conduct an initial guided ecosystem assessment of each endpoint.

By this point in your project Steps 1 and 2 should be fully executed. It is critical to have a strong team and defined project locations before jumping into choosing the right ecological assessment, creating a project plan and finding funding.

Choosing a "reference site" and the appropriate ecosystem assessment for your endpoints is essential to your project evaluation. In this section we offer tips on how to locate a reference site and how to select an ecosystem assessment.

LOCATING A REFERENCE SITE

Working from an existing example of an intact natural community within a similar ecosystem as your project site(s) is an integral part of project success. A site like this is known in ecology circles as a “reference site.” Selecting a reference site can be challenging. Degradation or landscape changes may also have altered current conditions from their historic conditions—infusing ambiguity in what is considered “natural” or "pristine" and what is not. The goal is to choose references sites that reflect conditions least altered by humanity available (Whittier et al. 2007).

TIP: If you need support in selecting your reference landscape, we encourage you to seek the advice of ecologists; a nearby university or college biology department may also be able to assist you.

BENEFITS OF SELECTING A REFERENCE SITE

There are multiple benefits to selecting a reference site.

– By learning what is historically there, you help establish a baseline of knowledge that you can use to assess success over time.

– Once you know more about the particular plant and animal species within these spaces, you can learn more about how to design for their preferences. This information:

– Helps inform which species to include in planting palettes
– Provides insight into plant community dynamics and networks
– Helps provide a physical baseline against which project success can be measured
– Can contribute to tracking the influence of climate cycles and other variability patterns over time

TIPS FOR HOW TO CHOOSE A REFERENCE SITE

Choosing a reference site is a practice of narrowing down and matching the most relevant biophysical aspects, ecological complexity, and potential stresses of the reference site to your chosen endpoints.

Below is a list of relevant characteristics to get you started in selecting the right site. In some cases conducting an ecosystem assessment of your chosen endpoints may be necessary in order to select an analogous ecosystem.

Some considerations:
– Local diversity and abundance of native plants and pollinators
– Topography
– Soils, especially soils associated with native vegetation
– Existing native vegetation
– Biological legacies such as snags, stumps, or peat deposits
– Proximity to urban environment
– Structural complexity
– Presence and ratios of aggressive non-native species which may be indicative of particular site conditions
– Climate cycles
– Proximity to watersheds

If rapid climate change is your primary concern, be sure to select an additional reference site within the predicted climate envelope for the project area. Incorporating plants species from both reference systems will allow the system to respond to climatic variables and reorganize in response to shifting baseline conditions.

TIP: Once you’ve selected a site, make sure to use the same ecosystem assessment to ensure a cohesive and comparative data set.

Record additional information about your site such as:

– Ecological descriptions, species lists and maps of the project
– Historical and recent aerial and ground-level photographs
– Herbarium and museum specimens;
– Historical accounts and oral histories by those familiar with the project site
– Paleoecological evidence, e.g. fossil pollen, charcoal, tree ring history, middens

4 INITIAL EVALUATION OF YOUR ENDPOINTS

NEXT, SELECT THE RIGHT ECOSYSTEM ASSESSMENT FOR YOU

What is an ecosystem assessment? It is a biophysical snapshot of an ecosystem at a particular point in time. When many assessments are added together over the course of years they collectively track the ecosystem's "pulse" as the surrounding environment changes.

For this project, your ecosystem assessment should seek to include elements that meet the minimum requirements below.

MINIMUM REQUIREMENTS

These are the bare minimum of indicators or qualities your ecosystem assessment should include for this project.

1. Incorporates the Pollinator Pathway objectives into goals that measure:

   a. Biodiversity
   b. Connectivity
   c. Civic Design
   d. Density (for cities)
   e. Long-term Maintenance

2. Has a holistic rather than compartmental view of an ecosystem

3. Uses both quantitative and qualitative measurements

4. Has a method that identifies and tracks indicator species over time

At the end of the baseline ecosystem assessment, the project team should be able to use the assessment to state:

- What resources exist within a project site
- What resources are not being supported in the ecosystem
- What a management plan and planting palette would look like to address the lack of support

WHEN WILL YOU USE THIS?

You will need this ecological assessment to conduct 3 initial baseline assessments and many post-assessments thereafter for monitoring. One for each of your two green spaces you plan to connect and the land between those spaces (the pathway).

TIP: Hosting a survey is one way to engage others in your project, as well as teach you more about the species within your endpoints early on. You can survey the site, identify the species within it, and then expand your research on species you find (which you can do through libraries, online plant sources, herbariums and botanists, entomologists and ecologists).

A robust ecosystem assessment will use multiple indicators like vegetation, soil, water, size, and interaction (or connectivity) with surrounding landscape, for example.

Although a one-size-fits-all ecosystem assessment doesn't exist yet, many state agencies, nonprofit organizations and private environmental agencies have been analyzing and evaluating ecosystems for years—some with hundreds of years of scientific research grounding them. The best part: they have published the assessments to the public.

The most important thing when picking an assessment is that you keep it as simple and consistent as possible to maintain the integrity of the information collected.

COMMON ASSESSMENT TACTICS

–Creating a phenology chart for plants and other organisms to discover gaps and develop a planting palette.

Identifying what species represents:
–A good receptor or indicator of change to environmental stresses
–The dominant community or communities
–Native and non-native species
–Desirable and non-desirable species, including invasive/noxious species
–A limiting factor for the ecosystem

Identifying the soil type(s):
–Creating an ecosystem network that shows the relationships between life forms within the ecosystem.

EXAMPLES

Here are two assessments that fit the bill. You are always free to create or use your own assessment provided it meets the above criteria, is simple, and is consistent throughout your evaluation program.

–University of Michigan: EMI Sourcebook
–NatureServe: Ecological Integrity Assessment (EIA)

Here are some handy ecosystem mapping tools to quickly identify and reference ecosystems around the world:

–USGS Ecosystem Mapper Tool: www.usgs.gov/products/maps/overview

–ESRI Maps: www.esri.com/en-us/home

DRAFT YOUR PROJECT PLAN

5

Developing a project plan early will allow you to find the necessary resources for the project at the right time, define an appropriate timeline, and communicate the story and expected results to relevant parties—like neighbors or funders.

Monitoring to determine whether sites meet criteria outlined in this document is critical to evaluating whether a project is successful. We recommend using an Adaptive Management approach through the management (post-planting) process.

What is Adaptive Management? It is a robust, iterative process of decision-making that aims to reduce uncertainty over time. This cyclical approach can help you monitor ecosystem indicators, funding, project leader goals, new practices or policies and enable you to call for adjustments in Pollinator Pathway maintenance plans as needed. It also uses scientific method decision-making and typically involves experimental management elements in weed control, planting palettes, etc.

Below is a generalized project plan timeline. You can expect to have something similar on a high level.

TIP: It is almost always better to plant in the fall. Doing so allows roots to develop and plants to establish themselves over rainy seasons.

	STEPS	
YEAR 1	1. EARLY SPRING	Evaluate existing site conditions
	2. SPRING/SUMMER	Develop your planting palette
	3. SPRING	Prepare site for planting (including irrigation)
	4. FALL/WINTER	Planting and irrigation installation
	5. FALL/WINTER	Followup weed management/watering
YEAR 2	6. SPRING/WINTER	Ongoing management: annual weeding, replanting, mowing
	7. ONGOING	Monitoring

DEVELOPING YOUR PLANTING PALETTE AND DESIGN

6

Successful Pollinator Pathways are dependent on a strong scientific foundation, thoughtful spatial planning and a realistic maintenance regime.

Set yourself up for Success
Developing a planting palette that meets the needs and limitations of your project is critical for success. The general rule of thumb is that the more effort put into developing a planting palette and design, the less effort will be needed in maintaining your project. Research into plants and their pollinator partners is an ongoing process. As you gather information and design your project, give consideration to local height guidelines, native pollinator preferences, ease of care, and drought tolerance.

Some useful (US-based) resource sites:

Plant lists by state:
www.wildflower.org/collections/

A bit hard to navigate, but has lots of information useful to developing location-based plant lists:
www.plants.usda.gov/java/

Zipcode-based species information-gathering:
www.butterfliesandmoths.org/

GENERAL TIPS

• Enlist a garden designer, and collaborate with an ecologist or someone trained in the natural sciences, to help you in your design.

• Seek out information about pollinators in your area, and design for them. Consider them your client. (We strongly suggest you bring in an ecologist for this point.)

• A simple way to work (and how the first Pollinator Pathway was built) is to develop a list of pollinators endemic to your project's region, and from there, create a (very large) plant list (of plants these pollinators utilize). Once this list is established, it can be vetted for other considerations and characteristics. For example: you might establish that butterfly 'X' is local to your region. Then, you research that butterfly's known food sources, preferences, life cycle, and other particularities (for example, butterflies frequently use more than one plant species for nectar and for their young; identify and include these plants in your design). If you are creating a design where aesthetics matter, you can then vet that list again—for things like local height restrictions, ease of care, growth habits, etc. At the end of this process, you should have a solid, narrowed-down list.

• Use very high levels of native plants. We define success as 100% outside cities—and 80-100% spatially inside cities. (The reason for this choice in-cities is based on aesthetics. Many cities have height ordinances that tend to limit native plants choices, and some native plants are not well-suited to public design projects.)

• Use pollinator friendly plants, with exception of native ferns and cone-bearing trees.

• Plant your plants in groupings (two feet minimum groupings of the same plant species; it makes it easier for pollinators to locate and benefit from plants).

• Pledge to not use pesticides or herbicides.

• Source local, pesticide free plants and seeds. This is harder than it may seem—but where the industry has not caught up, your project can help push the envelope. Many, many professional plant nurseries use pesticides. For the first Pollinator Pathway, we found that it was easier to create custom orders well in advance with plant growers who could grow our specifc plants for us en masse without pesticides.

• Plan for climate change: emphasize versatile, robust species that can adapt to changing conditions and shifting climate zones. Follow science-based recommendations on plant choices for shifting climates, and join the lineage of citizen trackers contributing to tracking bloom times.

• Emphasize low maintenance and drought tolerant plants. You'll need to create a maintenance plan that is realistic to your locale; it will be beneficial if you choose plants that require less care. (A note: if your project interfaces with a public that is responsible for your project's maintenance, take care to emphasize that low maintenance still requires maintenance).

• Design for bloom overlap. Designing for overlapping bloom times gives consistent annual food sources to pollinators, especially with changing climates. Native plants also sometimes face hurdles to community acceptance due to factors such as seasonal die-off and the more muted size and color of plants and their flowers, so (where aesethetics matter) creating overlap also serves another purpose of providing year-round interest.

• Provide physical structure with woody species. Woody shrubs or trees, along with supporting pollinators, can provide more consistent structure, in contrast to the ever-changing nature of herbaceous plants in a Pollinator Pathway.

DESIGN FOR MAINTENANCE + ASETHETICS

Social perception can play an important role in the long-term success of a Pollinator Pathway. Since aesthetic quality is not necessarily coequal with the biotic and physical quality, it is essential to balance aesthetic management for the community with communication about what this landscape should look like.

You can make choices in your design that will make your road easier when it comes to maintenance. Following simple design criteria will ensure that Pollinator Pathways have wide community acceptance (increasing likelihood of care and becoming self-sustaining) while also meeting ecological criteria.

Where aesthetics matter, prioritize edge treatments such as:

• **Paths**
Bordering a designed landscape with a defined path (dirt, rock, mulch, etc) can be perceived as more intentional and can also prevent "social trails" through sensitive landscapes.

• **Designed edges**
Where community interest is high, a more designed and maintained planting edge can enhance the aesthetic quality of the project.

We already recommend planting in groupings because it is beneficial to pollinators; it serves double duty as it also makes maintenance easier. Similarly, selecting plant species that are utilized by pollinators *and* which have robust ground-cover, will help you prevent or delay aggressive invasive plants from taking root.

Making an irrigation plan at the design-stage will also set you up for success early on in your project. If your project is in an urban setting, building a professional irrigation system into your budget is especially essential.

7

DEVELOP A MAINTENANCE PLAN

All Pollinator Pathways require maintenance effort to perform their best. Their overall health and appearance is in direct relationship to how well you maintain them, and the first three years are especially important. All projects are different—you may be approaching yours as a school group, organization, group of citizens, or government agency—which means that your particular project will mirror your very specific resources and needs. We are sharing some of what we've learned along the way as a loose guide to get you started—to help you create a plan tailored to your specific project.

Maintenance of your project will likely include hand-weeding and hoeing, replanting, trimming, updates to signage, irrigation installation and troubleshooting, monitoring of ecosystem indicators, and (post-bloom, spot) mowing. We recommend giving careful consideration to the question of maintenance well before you begin your project, and building a robust maintenance plan. (We can promise you that a project without a healthy maintenance plan, will certainly fail.)

Questions to ask yourself:

Who will be taking care of this project in ten years? Twenty? One hundred? One thousand? Is there a local organization or agency that can own ongoing watering and maintenance? (For example, a Parks or Transportation department, or a local environmental nonprofit.) If you are part of a school, how will you ensure that this project is watered through the summer months? You'll want to build these kinds of considerations into your plan—and begin building these partnerships and agreements early.

GENERAL

Map out areas that are most visible to people to identity which spaces will need high or low level appearance of care. By mapping and overlaying these high-visibility areas, ecologists and landscapers can be more strategic with management plans, resources and community outreach efforts.

MONITORING

Work with an ecologist to develop a long-term monitoring plan that will track the success of your project. If monitoring for pollinators is considered part of your maintenance strategy (as opposed to being described in a separate plan), include it in your maintenance plan. For reference, the original Pollinator Pathway was assessed for pollinators at start (before any planting), then, once planted, was monitored by an entomologist (once per week for five years between early Spring and Winter along a pre-determined series of transects).

This helped expand understanding of which species were visiting the project, as well as to adjust the design according to what pollinators were found inhabiting the project.

Information you'll want to include in a monitoring program:

- What species of pollinator are visiting your project?
- How many, how often, and when?
- What plant species, or other aspects of the landscape, are they utilizing?
- Are they moving from point A to B, or staying put?

It may be useful to build a monitoring plan that can be contributed to by citizen scientists. (Note that events like these can also be less-than-precise; if adopted it is most useful when accompanied by, or supported by, entomologists).

Here's a rough outline of a few years of maintenance:

Year 1—Spring/Summer

• You can expect to need to weed once every 1-2 weeks. As your project grows and the plants mature they will require less weeding. Plan to trim and tidy edges—this goes a long way in creating an appearance of care.

• Watering is critical during the garden's first year. Your plan should include professional irrigation installation, monitoring, and maintenance. If your project does not include professional irrigation, a plan for hand watering should be made.

• Create a watering schedule specific to your garden. Watering frequency will depend on how quickly your project dries out, but a rough rule of thumb for new plantings is that they should be watered deeply and regularly every 4-5 days. Watering should be done especially deeply (probably longer than may seem normal) and regularly in the first year. The reason for this is to establish roots; the deeper roots go, the more hardy the plants become; underwatering creates shallow roots, which then need extra watering support over time. It is also important to let the ground dry a bit in between watering. If you overwater, fungus can develop and kill plants as easily as under-watering. Monitor and water again when the soil feels barely moist at 1″ deep.

• A word about trimming: many living species use the spent blooms, leaves and stalks of plants. Where you can avoid trimming, raking, or otherwise disturbing these processes, the better. Where aesthetics are of high importance, trim back damaged leaves across the plot as necessary, training practitioners to do so minimally.

Year 1—Fall

• By fall, your project should continue to be watered regularly, but can be decreased in frequency as rains increase. (Short heavy thunderstorms will not properly soak your garden, but longer rains will.) Projects should be regularly monitored, by checking soil moisture level. Similarly, weeding can be tapered off for winter, depending on your project. Our own approach was to create a "put the project to bed" fall effort—we fully weeded, tidied, and then let the gardens rest until spring.

Year 2—Spring/Summer

At this stage, your project is still new and vulnerable, but gaining robustness. You'll still need to treat it with great care—especially when it comes to watering, which should still be done with regularity and diligence. You can expect to be watering once per week at minimum (more if your summers are especially hot). Monitor to determine if this is often enough.

• Weed gardens once every one-two weeks

• Trim back to remove damaged/old growth where necessary

• Spread organic material around the garden (compost, organic fertilizer). This will help to improve the soil quality over time if done each spring. Improving the soil quality also improves its ability to hold water.

• Mulch: mulch is useful—but word on the streets is that it can also smother pollinators nesting beneath soil. (We've heard conflicting reports on this, but to be safe, we recommend not going overboard, and researching whether or not there are better times to mulch for your area in order to avoid nesting pollinators.) After spreading fertilizer and organic matter, we recommend top dressing your project with no more than 2" of mulch. Monitor your site to see how nesting species respond.

Year 2—Fall

• Cut back only as necessary.

• Weed as necessary

Year 3—Spring/Summer

• Water weekly

• Weed gardens once every two-three weeks

• Trim back dead flowers and damaged leaves as necessary

• Apply organic fertilizer

• After spreading the fertilizer, top dress with 2" of finely shredded natural bark mulch before the first dandelions go to seed

Year 3—Fall

• Cut back only as necessary.

• Weed as necessary

ALL TOGETHER NOW:

Hosting a visioning charrette is a great way to share in the excitement of your project with a community. Invite designers, planners, ecologists and the public to bring their ideas to the project (you provide the materials, and show maps, design progress, and current site constraints). The results can help inform the future design of the project, and help build a case for its sustained support.

(Pictured: architecture firm Olson Kundig working through Pollinator Pathway ideas.)

COMMUNICATING WITH THE PUBLIC

8

By now you should know which landscapes you plan to connect—and a bit more about the properties between these two landscapes. We encourage and recommend reaching out early and often to the community along your Pollinator Pathway—and the broader public.

Why Community Buy-in?

Involving the public in design and implementation of a Pollinator Pathway can build trust and buy-in between neighbors, planners and land managers. Neighbors and frequent users of these landscapes can also contribute ideas that result in a richer and more sustainable design. Effective upfront communication may build a stronger base of committed stewards, and local knowledge can provide a useful supplement to professional expertise.

Minimum Requirements

• Educational/public presentation about the Pollinator Pathway, and early identification of community needs and concerns

• Involve the community in site analysis and/or data collection before planning begins

• Present plan options to the community and solicit ideas and feedback before design is complete

• Present final plans to the community before implementation

Suggested Activities

• Engage the community in a visioning charrette; invite design firms, ecologists and planners to work together to contribute ideas to the project

• If appropriate for your project, host a design contest to engage big visions for your design

• Invite the community to join a volunteer activity, such as a site monitoring event or a site preparation party

• Host a walking tour of the proposed site, to share your vision with community members

• If feasible, create signage on-site to convey your proposal early on in the planning stages

• Engage a conversational gathering such as a community dinner. Can you set up tables on the proposed site, and invite

community chefs to help host a dinner? Excellent. Consider inviting your favorite thinkers, writers, artists, astrophysicists, ecologists, and planners to the party. Host a dinner about the future of nature, or about civilization itself. Ask chefs to design a phenology-based menu and spend your evening talking about long time and the Anthropocene. Have fun.

Communication Methods

In-person communication is a time-tested means of inviting users or neighbors to participate in a design process and should be considered a minimum requirement. However, there are numerous other methods of flexible engagement to be considered.

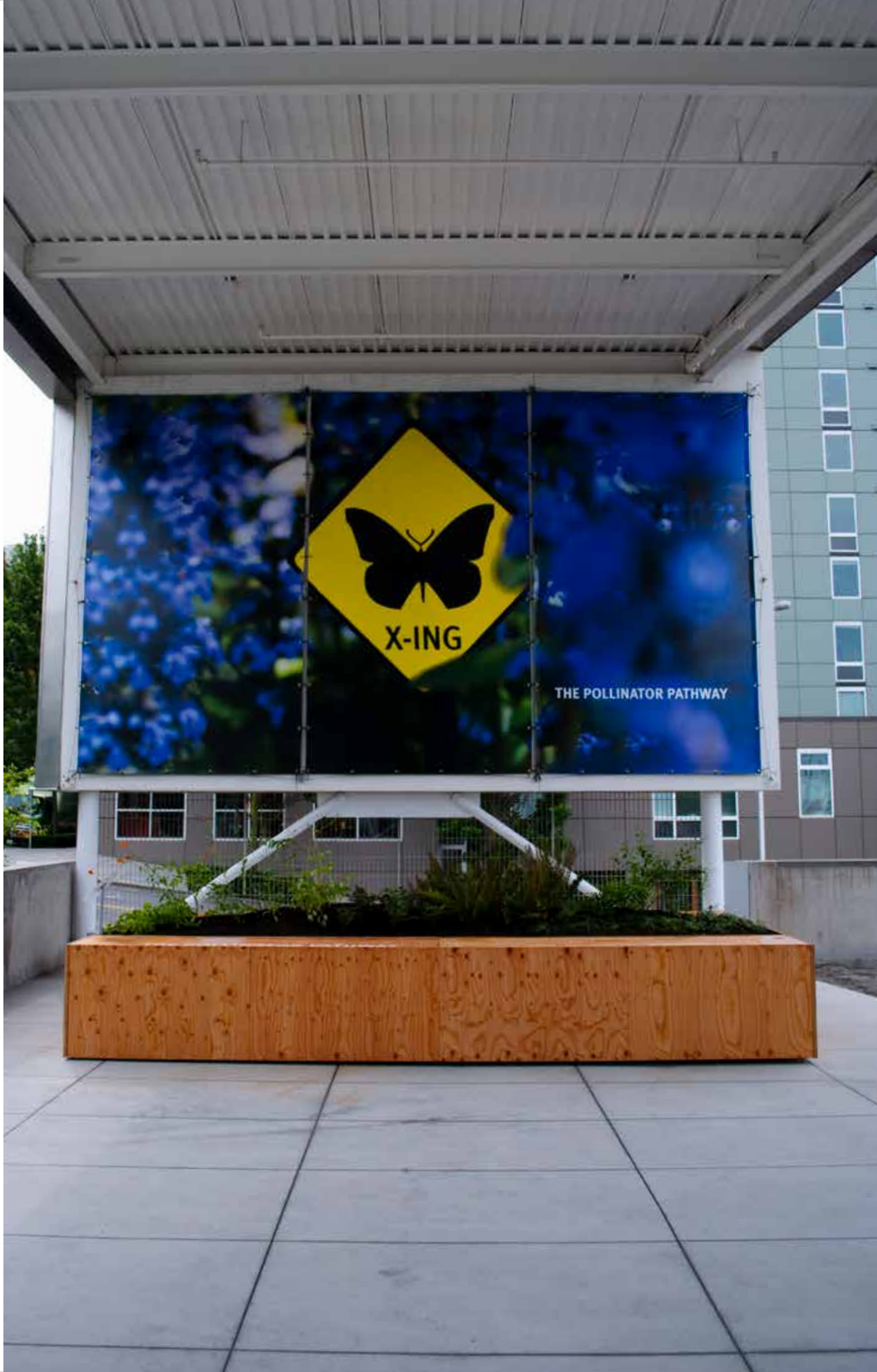
For community outreach, consider the neighborhood demographics when planning community events. Food, childcare, transportation, interpreters, and written translations can help facilitate participation of groups and individuals. Being able to attend community events can be a product of privilege, as it takes time, personal resources, and energy to attend (this has a way of "curating" who shows up, and therefore, whose voices are heard). Help lower hurdles to attendance.

Graphic Design Materials

Beautifully designed tools and materials are an effective way to tell a story of the project and engage long term interest. We recommend telling a short, clear, and positive story.

• **Signage** Signs can alert the neighborhood resident that the Pollinator Pathway is an intentional project and presents a host of opportunities for participation. Maps provide an interesting way of telling the story of the project and well as connecting it to the larger landscape system, a key message of the Pollinator Pathway concept.

• **Brochures** It is useful to produce two brochures; one for the general public, and one (if applicable) for property owners along your proposed site.



→ Installation at Seattle Art Museum's Olympic Sculpture Park about the project.

9

SECURE YOUR FUNDING

Finding the right long-term funders for a Pollinator Pathway is critical to the success of the project. Here are some facts about the project and some approaches to finding the right funder fit we find useful.

Benefits to the Funder

• Positive media coverage for your community
• Supporting scientifically tested and monitored technology
• Leave a legacy by building a project that will last for generations
• Public acknowledgement
• Will join a network of other projects across the globe
• Chance to build model relationships with individuals, public and private institutions
• Opportunity to participate in smart systems and design thinking strategies

Testimonials

“The Pollinator Pathway essentially performs ecological judo.”

LINDSAY WHITLOW, PH.D.
ASSISTANT PROFESSOR, BIOLOGY DEPARTMENT
SEATTLE UNIVERSITY

"The Pollinator Pathway provides important lessons not only in ecology, but in history and biogeography, as well.”

AARON E. HIRSH, PH.D.
AUTHOR, TELLING OUR WAY TO THE SEA
CHAIR, VERMILION SEA INSTITUTE

“An astronaut's view on landscape and the globe.”

MARLA SPIVAK
MACARTHUR GENIUS
ENTOMOLOGIST

Examples of Funders

Environmental foundations
Government agencies
Horticulture organizations
Independent grant organizations
Individual donors and supporters
Crowdfunding
Social impact design funders

"OF THE MANY things that appeal to me about the Pollinator Pathway, the thing that impresses me most is the cross-disciplinary nature of the work. It seized the attention of museums, curators, artists, urban planners, journalists, designers, environmentalists, educators, activists, and gardeners.

The work has reached an enormous and diverse audience through direct participation and visitorship—with the potential of reaching thousands more. It introduced most of us to the concept of the Anthropocene—the human centric epoch that began when human activities started to impact the earth's ecosystems."

ALAN MASKIN
PRINCIPAL, OLSON KUNDIG

FINAL STEPS

10

Thank you for joining.

Please share and celebrate the success of your project with your community and your industry peers, and encourage them to learn more.

Continue to monitor your project—and modify your design as you gain knowledge over time.

A brief note: Please credit Sarah Bergmann in your materials when you share your project. (Doing so is simply a way to help people understand that the Pollinator Pathway project is connected to a bigger body of work.)

Thank you again for your massive contribution to the biosphere.

DESIGN RESOURCES

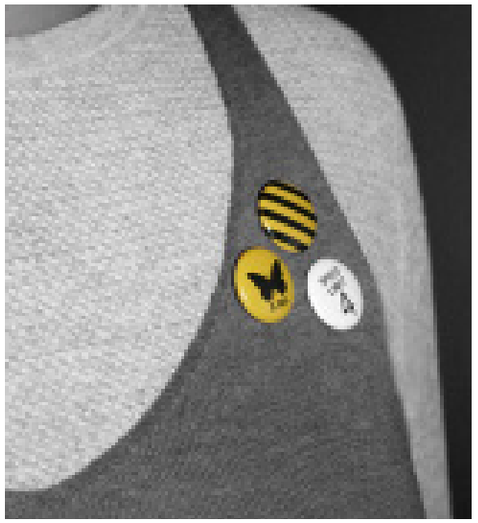
We are making some of the resources we produced available to help you communicate your project. To utilize some of these resources, you may need to enlist the help of a graphic designer with Indesign (a very common design program) so that you can modify the text of the templates.

BUTTONS
Design files for our butterfly buttons. You can send these file straight to a button-printer, order however many you want, and share with friends of your project or at your next event.

SIGNAGE
We made you some simple signs for use on-site with your project, as well as some extra ones just for fun (we use them at events and when we show off newly planted gardens).

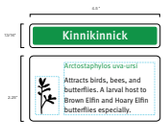
BAG/TSHIRT TEMPLATES
Easy tshirt or bag design templates to print. We use these to give to supporters—and we're sharing the files with you. You can send these right to a printer (it is always nice to have a graphic designer help you, but not necessary).

BROCHURE TEMPLATES
Fill in the blanks on this brochure template (you'll need to work with a designer who has Indesign to modify the text).



Hello.
We're designing a Pollinator Pathway!

This project is part of a movement to make a global system of connected ecological design. For more information, or to get involved, please reach out to us here:



Some helpful recent articles and interviews about the Pollinator Pathway project:

In Defense of Plants, *Pollinator Pathway: A Design Challenge For The Planet* (interview with Matt Candeias)
www.indefenseofplants.com/podcast/2017/11/5/ep-133- pollinator-pathway-a-design-challenge-for-the-planet

NPR, *Why Honeybees Are The Wrong Problem To Solve,* by Adam Frank
www.npr.org/sections/13.7/2017/06/13/532729268/why- honeybees-are-the-wrong-problem-to-solve

The Stranger, *Why Sarah Bergmann Clashes with Bee People*, by Charles Mudede
www.thestranger.com/slog/2017/09/22/25429639/forest- bathing-note-4-why-sarah-bergmann-clashes-with-bee- people

THANK YOU!