

# BORDERLANDS

THE WINDSONG PEACE & LEADERSHIP CENTER

A COLLABORATIVE DESIGN PROJECT PORTFOLIO  
PERMACULTURE FOR SYSTEMIC CHANGE  
PRESCOTT COLLEGE 2017





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### **Permaculture For Systemic Change: Course Description**

Permaculture is a design methodology for creating sustainable human environments from the home garden to the large acre farm, from landscape planning to sustainable human settlements, organizations, and society. Permaculture uses an ethically-based whole-systems design approach, incorporating concepts, principles, and methods derived from natural ecosystems as well as from cultural and indigenous systems. Although rooted in horticulture and agriculture, Permaculture design is interdisciplinary, touching on a wide range of subjects including regional planning, ecology, animal husbandry, appropriate technology, architecture, and international development. Through classroom lectures, field trips, hands-on activities, experiential learning exercises, group discussions, readings, and student design projects and presentations, this course will cover topics including: Permaculture theory and practice, leadership capacity building for collective impact, and strategic sustainability toward systemic change. (Learn more at: [www.p4sc.weebly.com](http://www.p4sc.weebly.com))

# CONTENTS

**Introduction**

**Our Learning Journey, Our Co-Design Project**

**Site Assessment Summary**

Our process, How to & Design Purpose

**Windsong Co-Design Groups x 4**

Vision Statement

Ethics & Variables Venn Diagram

Systems Map

Overview Design

Windsong Design

**Resource List**

Tools, Methods & Approaches

**Gratitude**

# Introduction & History of The Borderlands



**Overview:** We are Prescott College students working on a design project for our Permaculture class. This design is for an organization called Me to We's peace and leadership institute in the hills outside of Patagonia Arizona as well as the surrounding Borderlands. Our work is focused on the institute and the region surrounding it. Windsong Peace and Leadership Institute is fifteen or so miles from the border between America and Mexico. We are working on a design that will help Windsong reach its goals to provide space for campers and to produce food. Additionally, our design works to create community and restore natural landscapes for the greater borderlands area.



**Cultural and Historical Context:** Originally part of Mexico until it annexed in 1853, Patagonia Arizona consists of a rich cultural history as well as an evolving present day community. The mountains and surrounding area of Patagonia have been inhabited by native peoples, such as the Tohono O'odham tribe, for over 10,000 years. In 1891 R.R. Richardson, a Civil War veteran and rancher, began developing mines in Patagonia. What started as Richardson's ranch, eventually became the town of Patagonia that exists today. By the 1900's Patagonia had running water, was a developed railroad depot, and destination for job seekers. Hardship hit during the 1920's and 30's however, when the stock market crashed. Summer rains washed out many infrastructures in Patagonia including part of the railroad and the trains stopped running as well as the town's main source of income and revenue. The town rapidly declined in productivity and the people were struck by poverty.

Gradually, recovery efforts are making positive effects. A community park now covers the land where the railroad used to run, Sonoita Creek was dammed to create Patagonia Lake (recognized as a state park in 1974), and the Nature Conservancy bought 312 acres of land, which has since grown and is a designated National Landmark. After years of tribal raids, Civil War, U.S invasion, mining, cattle ranching, development of the railroad through Sonoita Creek, border issues, and economic collapse, it is easy to say that Patagonia and the Sky Island area have undergone many transformations, hardships and times of struggle. However today, the natural beauty and diversity of the land is being recognized and drawing people in to participate in preserving and protecting it. This area holds huge potential, and with enough support and effort might be able to implement a restoration economy where the ecological restoration efforts actually bring in revenue and support the needs of the community.

**Ecological Context:** The sky islands are an incredibly ecologically diverse area. The reason for this diversity is that it is where the sonoran desert, rocky mountains, great plains, chihuahuan desert, sierra madre, and neotropics converge. It is a home to 112 endangered species, hundreds of species of pollinators, including butterflies, bees, hummingbirds, and bats, and over 300 species of birds. Many cats live there too including Jaguars, Ocelots, Mountain Lions, and Bobcats. This very special economic context is currently being threatened by mining, habitat fragmentation, development, global warming, ranching, border social issues, and invasive grasses (PARA).

**Economic Context:** It was said to us by several of the Borderlands Restoration partners that Santa Cruz County has one of the highest poverty rates in the state. Ron Pulliam asks “With all this richness in the natural world, why is there so much economic poverty?” Ron Pulliam and many others believe that a Restoration Economy is the answer to towns like Patagonia’s problems. Currently, the Borderlands region is in a state of transition from being an extractive economy to one that is restorative.

Patagonia’s history has proved that extractive economies are not reliable. According to the Patagonia Area Resource Alliance, there was a significant amount of mining activity in the Patagonia mountains that left behind hundreds of old mining sites that caused ecological disaster. The mining companies left the taxpayers of Patagonia to pay for the mess they created. The “boom and bust” that comes along with mining proves it is not economically reliable. Not realizing how this system was unsustainable to the community before, several mining companies currently want to re-introduce large scale mining in the area.

Recovering from the bust of the mining economy, Patagonia’s economy grew 421% and their population grew 69% after the mining ceased (PARA). Organizations like the Borderlands Restoration provide jobs and internships for students in the area that would have otherwise been unemployed. Eco-tourism is a large contributing factor to the growth of Patagonia’s economy. The town is sitting in one of the most biologically diverse areas in the country.

**Vision Statement:** As a community of students from Prescott College, our goal is to collaborate with other local organizations and individuals to further develop the land of the Windsong Peace and Leadership Center to create a successful example of restoration economy and apply principles of permaculture. After meeting with members of the surrounding community, we have gathered input and outlined their priorities and specific needs, which we will incorporate into our final design. By creating this site design, we hope to contribute to the efforts already in place, to restore and protect this unique and highly diverse area of land, implement sustainable permaculture principles, create a productive learning space, encourage leadership and action, and show that a restoration economy is a practical solution to the social/political and ecological issues that we face in today's world.

A sunset scene with silhouetted trees and a structure, with the text "Our Learning Journey, Our Co-Design Project" overlaid in white. The sun is low on the horizon, creating a bright glow and lens flare. The sky is filled with dark, dramatic clouds. The trees are bare, suggesting a late autumn or winter setting. A structure with a roof is visible in the background, partially obscured by the trees.

# Our Learning Journey, Our Co-Design Project

# J O U R N E Y S I T E S

**Arcosanti** - While visiting with one of Arcosanti's Co-Presidents Jeff Stein, we learned about the concept of Arcology which Paolo Soleri the founder of Arcosanti, based his work on: "The arcology concept proposes a highly integrated and compact three-dimensional urban form that is the opposite of urban sprawl with its inherently wasteful consumption of land, energy resources and time, and tendency to isolate people from each other and the community. Miniaturization creates the Urban Effect, the complex interaction between diverse entities and individuals, which mark healthy systems both in the natural world and in every successful and culturally significant city in history."

**Deep Dirt Farm** - This is a 34 acre salvage yard and educational farm site. Much of the focus at deep dirt is on restoring the watershed, improving soil quality, and providing a site for community empowerment. We were all very inspired by the head farmer, Kate. From her we learned a lot about how to observe and understand the land, and how to use the resources you have.

**Canelo Project** - This is a natural building site where Athena and Bill Stein have perfected, developed, and began teaching their very own technique. The technique involves using straw-bales with a mud and clay exterior. Their land is a home for their family, an example of a straw-bale village, and an educational space where they hold natural building workshops. At this site, we learned about building into landscapes in a subtle and sustainable way.

**Native Seed Search/Gary Nabhan** - The Native Seed Search project, started by Gary Nabhan, is an organization focused on saving and spreading native seeds. The organization includes a seed bank, an experimental farm to test out those seeds, and a system of sharing the seeds with the surrounding community. They also work closely with a native seed nursery. We learned from the native seed search project about the importance of genetic diversity.

On a different day, we got to see founder Gary Nabhan's personal homestead where he does restoration work and grows plants from all over the world.

**Wildlife Corridor with Ron Pulliam** - On the third day of our field trip we visited the wildlife corridor in Patagonia, AZ. Ron Pulliam, Caleb Weaver, and David Seibert--of the Borderlands Restoration Institute--told us how they have worked to protect the land and the current challenges it faces. A few years ago, they raised enough money to buy a critical 1000 acre parcel in Patagonia area. They have plans to sell a small amount of this land to developers and leave the rest in conservation. This allows them to fund future projects while protecting an important piece of land that connects two mountain ranges and allows animals to pass between.

They also told us of the projects they have conducted to restore the land. The Borderlands Restoration Institute has been placing rocks in areas with high amounts of erosion. These rocks decrease the amount of sediment carried away by runoff and saves the land from “unzipping” itself and causing irreparable damage to the hills and grasslands.

The institute plans to remove invasive species and repopulate natives in the corridor, but this proves to be very difficult. Some invasive grasses pose a real risk to the habitat for important species of bird and insect in the area.

The Borderlands is working hard for its community and we could really see that as we talked with them. We were all heartened to hear about their inspirational projects.

**Mexicayotl** - Everyone from our class agrees that we had a very special experience with Mexicayotl. Our hosts invited a group of dancers from the local academy to come and do a ceremony. We watched as they performed an empowering ceremony, and then we jumped up to join them when they invited us to dance with them. There were laughs all around as we stumbled through the moves and tried to keep up with the Mexicayotl students.

Part of why that night was so special is because we had so much fun, and we learned at the same time. Pastal called us out as Prescott College students that talk a lot and don't always act in a way that reflects our conversations. He had us set intentions for actions we could take to live our values. Everyone in the class thought it was a beautiful night, especially because the students we danced with were so passionate about their cause. They believed in standing up for their beliefs, keeping their culture alive, and hard work. We all learned something from those students and left the dance floor feeling inspired and stoked.

**Downtown Patagonia** - The Borderlands Restoration Institute is working on a project to rejuvenate the downtown Patagonia Park. They have a design plan that incorporates permaculture ideals into a tourist attraction. Their work on the downtown area is part of their idea of a “restoration economy”. They believe that our current economy values extraction and that we can shift to value restoring our wildlands. Their design for the downtown park involves planting native plants, reworking how water moves through the area, and creating a beautiful space that will make Patagonia more appealing to visitors. By restoring the area they can turn it into an asset that will bring in money for the town. This is a practical application of their idea for a restoration economy.

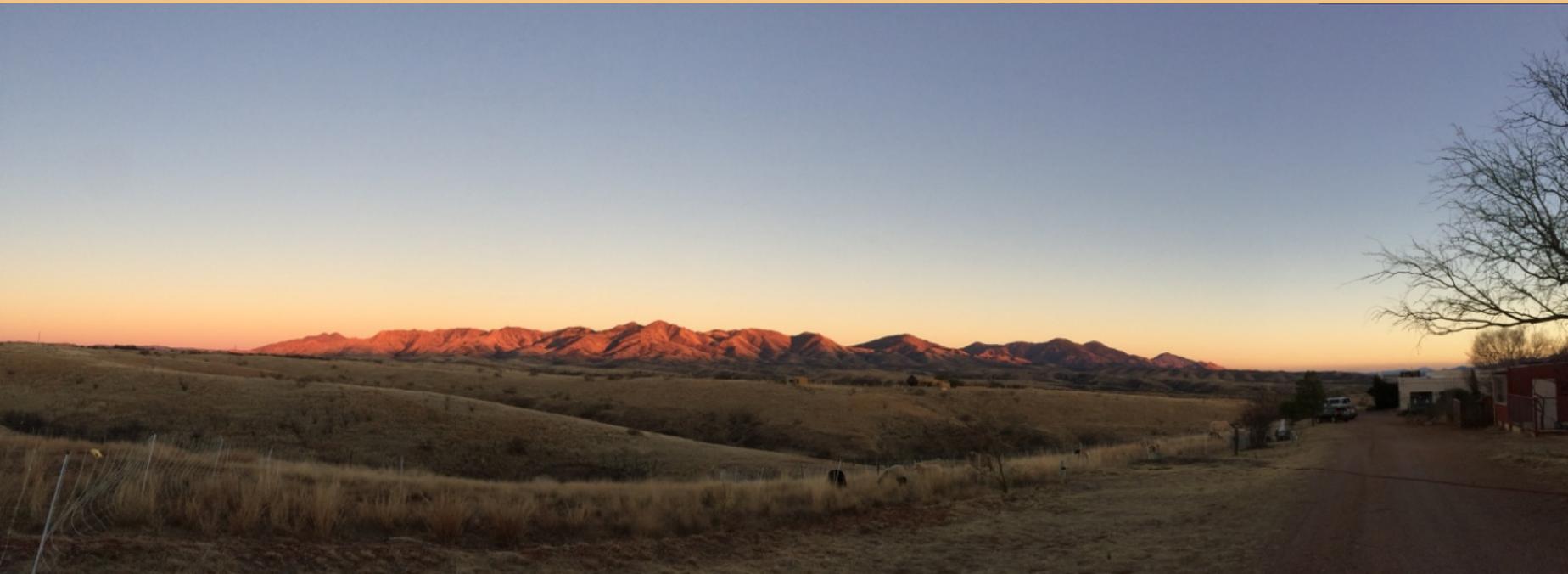
Patagonia already has some features of a restoration economy. The local bed and breakfasts are referred to as “bird and breakfasts” because the nearby sky islands are a big destination for birders. This sort of business creates jobs and brings in money based on natural areas that need to be preserved.

Everyone in the class was intrigued by the idea of a restoration economy. We figure that if we can restructure our values so that the economy is a driver for ecological restoration then the rest is simple. Businesses that work for the environment rather than against it will pop up everywhere if they can make money at it.

**The Border** - After visiting the border in Nogales, Arizona, we learned how the U.S. has established many large companies in Mexico to get the cheapest labor possible which contributes to Mexico’s poor economy (Windsong Peace and Leadership Center). We learned from the Mexicayotl who have lived on the border and observed it for a great part of their lives, that the border wall has caused more conflict than it has prevented it (Mexicayotl Charter School). The owners from the Nogales Mercado Farmers Market shared their beliefs that building another border wall will not make any difference. The owners have established this local market on the border to rebel against the large companies that have taken control over them for cheap labor in order give small business owners a fighting chance. The locally grown produce that is sold at the Farmer’s Market is also a resource for the town of Nogales to buy organic products free from pesticides and insecticides (Nogales Mercado Farmers Market).

# Windsong Peace & Leadership Center Permaculture Design & Goals

Windsong Peace and Leadership center serves as an education facility and retreat that hosts the Organization Me to We. This organization addresses social justice issues and current events, teaches practical tools to help reduce harmful impact on the environment, and cultivates leadership and community action, through hands-on workshops and learning programs for youth. By providing examples of social and ecological regeneration, Windsong serves as a safe, fun, engaging, and inspiring space to spark the interest, passion and the desire in people of all ages and backgrounds to improve their lives as well as the health of our planet. With these goals guiding us, we hope to create an interactive, practical, and sustainable plan for the property in order to increase productivity, restore natural habitat, facilitate learning, cultivate community, and provide a thriving example of a permaculture inspired lifestyle.



A landscape photograph of a grassy field with mountains in the background under a blue sky with clouds. The text is overlaid in white, bold, sans-serif font.

# Site Assessment Summary: Our Process, How To & Design Purpose

## Tour The Site & Observe Natural Cycles

“Permaculture designers use careful observation and thoughtful interaction to make more effective use of human capabilities, and reduce dependence on non-renewable and high technology” -David Holmgren, *Essence of Permaculture*

The First Principle of permaculture is “Observe and Interact.” It suggests that the permaculturist spend a full 12 seasons to watch how the ecosystem functions and and its different characteristics. This includes: Rain/water movement on site, Wind, Temperature, Growing conditions, Potential Hazards (fire, damaging erosion, extremes), Thriving areas vs. eroding areas, Soil quality Etc.

After the suggested twelve months of observation, permaculture principles suggest that only small changes are made at a time. This is so that when changes are made, the impact they have is more easily viewed and understood. For example, rather than planting 40 fruit trees across a property all at once, permaculture might suggest starting with a just few trees in a few different areas to locate the best place for growing the trees.

In a similar sense, building a house without researching the property to find the perfect place with the least hazards or risk management wouldn't be very sensible from a permaculture view. Being observant and making calculated and intentional decisions ultimately saves the designer, and the client, a lot of money, time, effort, and resources, all of which are imperative.



# Permaculture Principles & Ethics

guba



Creatively use and respond to change



Observe and interact



Catch and store energy



Obtain a yield



Use edges and value the marginal

Earth Care



Fair Share



People Care



Apply self-regulation and accept feedback



Use and value diversity



Use small and slow solutions



Integrate rather than segregate



Design from patterns to details



Produce no waste



Use and value renewable resources and services

# Recording Information

Use the PASER and PEMS systems of information gathering by thinking about what is already existing and what is wanted in the future. What exists; what is wanted?

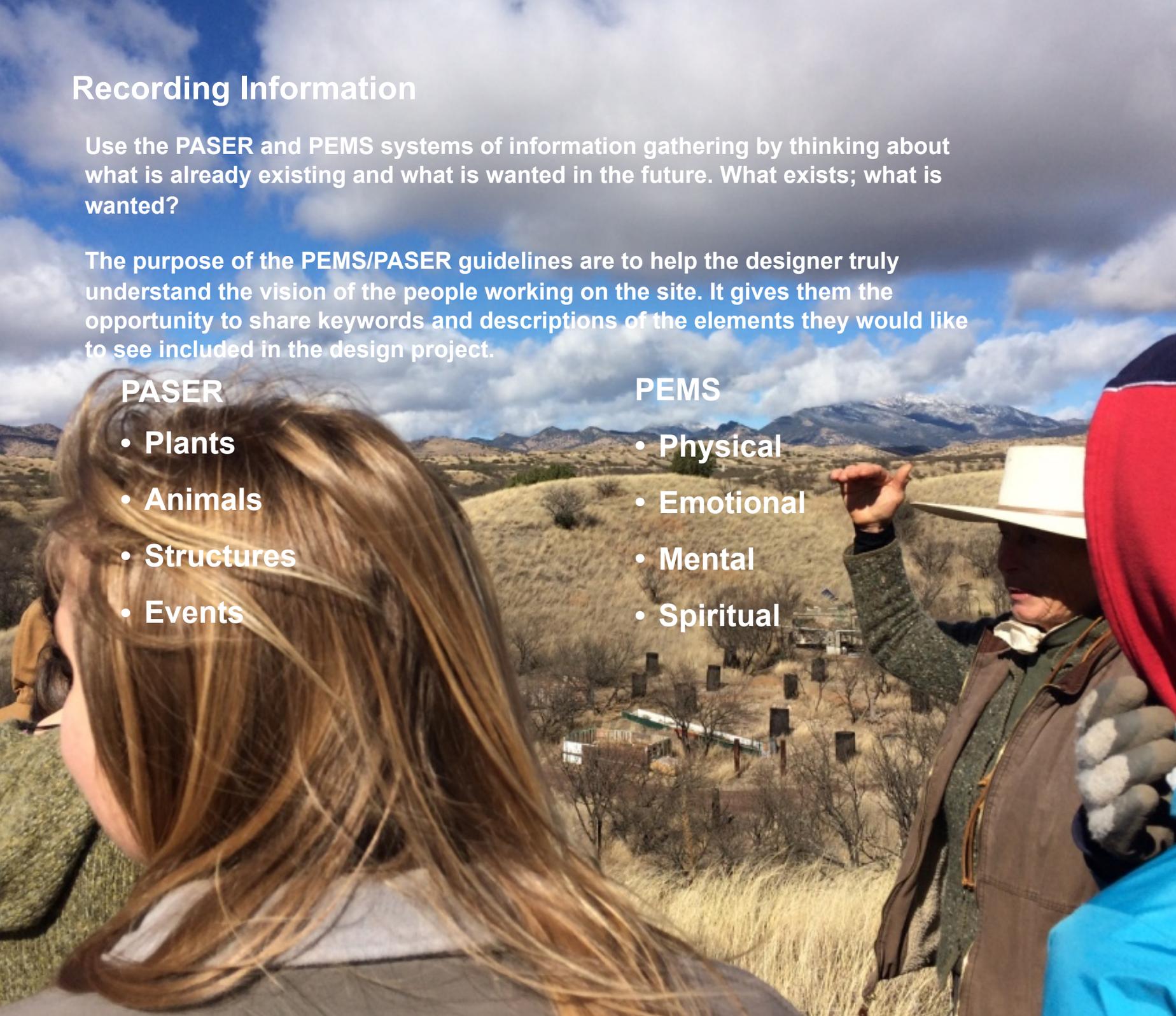
The purpose of the PEMS/PASER guidelines are to help the designer truly understand the vision of the people working on the site. It gives them the opportunity to share keywords and descriptions of the elements they would like to see included in the design project.

## PASER

- Plants
- Animals
- Structures
- Events

## PEMS

- Physical
- Emotional
- Mental
- Spiritual



**P.  
A.  
S.  
E.  
R.**

**Plants**

**(before)**

- Vines on walls
- willows/  
mesquite
- shrubs
- Grasses
- Variety of Cacti
- Rosemary
- Pomegranate

**(after)**

- Carob
- Tomatoes
- Cilantro
- Peppers
- Onions
- Olives
- Mushrooms
- Figs
- Desert  
honeysuckle
- Desert Willow
- Lemon Sage
- Canyon Grape
- Native Cherry
- Yerba mansa

**Animals**

**(before)**

- Dogs
- Wolf
- Horse
- Sheep
- Fences
- Chickens
- Goats
- Insects
- Birds
- Wild cats:  
Mountain Lions,  
ocelot, Bobcat,  
Jaguar

**(after)**

- Rabbits
- More horses

**Structures**

**(before)**

- Compost toilets
- Raised garden  
beds
- Swales/berms
- Outdoor shower
- Driplines
- Paths
- Patio
- Sunroom
- Stairs
- Labarynth
- Ceramic tile  
roofing
- Labarynth
- Sheep pen
- Courtyard
- Buildings X3
- Stargazing  
Platform

**(after)**

- Outdoor Circles
- Gazeebo
- Outdoor  
Classroom
- Yurt
- Soccer Field

**Events**

**(before)**

- Large group  
facilitation
- Circular group  
interaction
- Meals
- Free time
- Sleeping
- Music
- Reflection times
- Star gazing
- Games

**(after)**

- Community  
Gatherings
- Arts/Craft
- Cooking,  
student included
- More animal  
time

**P.  
E.  
M.  
S.**

Desired  
Aspects

**Physical**

- Accessible for all
- Designated areas: *Speaking, journaling, group*
- Intimate spaces
- Open grassy field
- Less Fences
- More Ramps
- Greenhouse
- Zen garden
- Agroforestry
- Salsa, tea, and herb gardens
- Insulation
- Solar power
- Outdoor Classrooms
- Yurts
- Gazeebo
- Water Catchment
- Fixing roof issues
- Erosion prevention
- Terraced animal area with feed crops

**Emotional**

- Check in circles
- Safe, inclusive
- Mirrors
- Moveable play spaces; interactive nature
- More animal interaction
- Incorporating rituals
- Low ropes activities; team building
- Circular clearings
- Intimate spaces

**Mental**

- Organized/uncluttered
- Freeing/inspirational
- Reflection
- Different learning styles
- Brain games
- Signage the includes ecology and site history
- Blackboards, whiteboards, community writing spaces (in classrooms too)
- Vision boards, mural spaces, tyles
- Permaculture education

**Spiritual**

- Spaces for worship (how inclusive? privacy?)
- Alter space (all inclusive: additive)
- Language peace totem
- Meditation oga
- Music
- Adding Sounds & smells ex: trickling waterfall

	<b><u>Animals</u></b>	<b><u>Plants</u></b>	<b><u>Events</u></b>	<b><u>Structures</u></b>
<b><u>Physical</u></b>	Chickens Sheep	Herb Garden Existing Trees Pomegranate Windbreaks (oak, cypress, mesquite, native grasses) Food Garden	Camps Field Trips Permaculture WWOOFing Play Activities	Justin's House Bunk House ADA approved Animal enclosures Sun room green house Birms and Swails Solar Power Water Catchment Trails around property
<b><u>Emotional</u></b>	Hoirse Goats Wolf Dogs	Garden Beds Agriculture Aesthetics Succulent Garden	Support/Inclusion Community Empowerment Performing Arts Mural Painting Canning	Courtyard/ Stargazer Music Living Roof Storage Cellar Pollinator Habitats
<b><u>Mental</u></b>	Logistics Food Education Snake Management	People's Garden Education -Seasonal Growing -Seed saving -Cuttings -Natural dyes/paints	Astronomy Workshops Natural Building Border Studies Harvesting/Processing	Pizza Oven Gate Classroom Tiny Home Snake Boundary Workshop
<b><u>Spiritual</u></b>	Birthing Caretaking Heritage livestock Pollinators	Milkweed Pollinator garden People's Garden (Vines, fruit trees, herbs, pollinator)	Ceremonies Me to We More community involvement Creative re-use	Main House Compost Toilets Eco-Shower People's Garden Labyrinth Fire Pit Amphitheater

## The Interview Process

After we toured the property we sat down with two of the people that represent Windsong and asked them a series of questions about the site itself and about what Windsong really does as an organization. Not only did we ask those questions separately, but we asked how Windsong's vision and the vision for the physical site itself intersected.

Interviewing clients to obtain their perspective on the site, their vision, and their perspective on the site and its uses, is a necessary piece of the Permaculture design process. If we don't know what we are doing and why we are doing it, it is then more difficult to produce a comprehensive site design.

The process of interviewing the client helps the designer to integrate permaculture designs based around the client's desires and needs rather than how they feel the site should be designed. Interviewing has the immense power to surface conversations that might otherwise go unspoken. The process sets the designer up for a more successful design that meets the needs of the site and client.

Some of the many questions we asked were: Why do you want a permaculture design? What do you value the most? What are your needs here? What is the site's function? Do you have goals to meet or improvements to make? What is the history of the site? Where do you spend the most time on the site? Etc.



## Examples of Questions and Answers From Interviews

### **How does your community dynamic function?**

-Concentrated facilitation times (includes intimate spaces, different learning styles, play spaces)

-Training sites for the facilitators and students

-Places to sit (for inspiration, journal reflections, etc.)

### **How would you like to combat issues with the roof?**

-Water storage and immediate useage

-Solar panels (a larger financial investment, only worth it if it pays back in the long run)

### **Growing food on the property?**

-Huge priority for Windsong

-Kid friendly food is a must (foods kids will actually want to eat)

-Include kids in cooking their meals

### **Would you want to turn the sunroom into a greenhouse?**

-Yes! Doesn't need to be all native, grow more edible food there

### **Because there is a limited amount of water, are there any other ideas to add to being able to store rainwater instead of just using a well?**

-Being able to have potable rainwater catchment systems that are entirely off well.

### **How can we better cater to people with disabilities?**

-It would be good to have accessible trails on the property for people with disabilities.

### **How about the use of wind turbines to produce energy?**

-Solar panels would be preferable since there is unlimited sun and wind turbines are more costly to put in and the wind is extremely strong.

## Reflect On Permaculture Principles & Ethics

Take into account the ethical categories of People Care, Earth Care, Fair Share when assessing property.

Do current aspects of the site reflect permaculture's ethical categories?

Do the changes we want to implement reflect the ethical categories?

Think about the 12 permaculture principles and their implications on the site.

Observe and Interact

Catch & Store Energy

Obtain a Yield

Self-Regulate; Accept Feedback

Use a Value-Renewables

Produce No Waste

Design from Pattern to Details

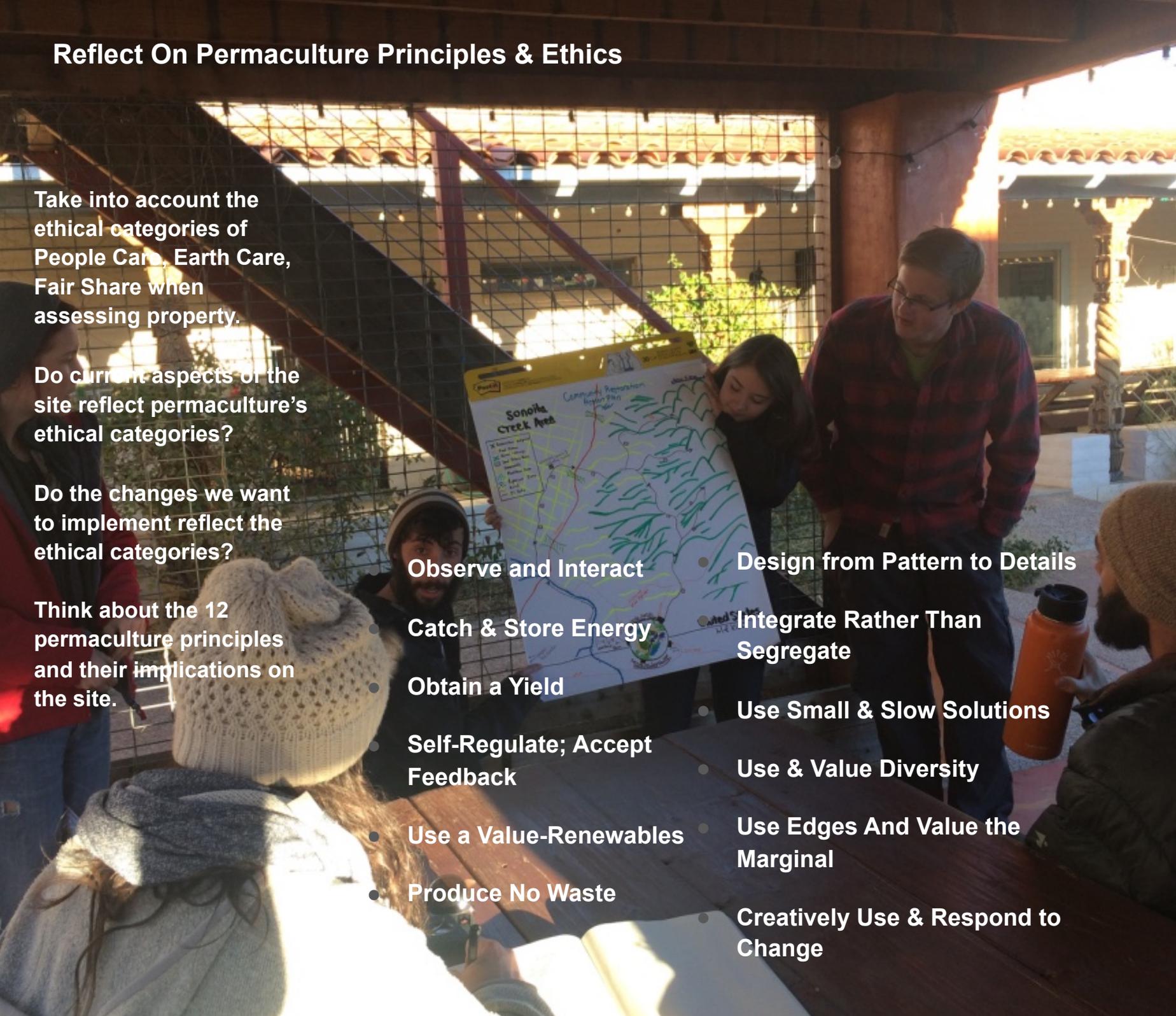
Integrate Rather Than Segregate

Use Small & Slow Solutions

Use & Value Diversity

Use Edges And Value the Marginal

Creatively Use & Respond to Change



## Acquire Topographical Maps

A topographic map shows elevation changes on a landscape through the use of contour lines. These lines on a map joining points of equal height above or below sea level. This is especially useful for site assessment because it details physical features of the property. It is important to understand the property's topography because of the patterns and specificities it can indicate as you gather information.

## Determine Zones

“Zoning in permaculture design refers to a method of ensuring that elements are correctly placed. Zoning is about correct placement- positioning things in ways that are the most appropriate; Zones are numbered from 0 to 5, and can be thought of as a series of concentric rings moving out from a centre point, where human activity and need for attention is most concentrated, to where there is no need for intervention at all...”

[http://permaculture.wikia.com/wiki/Zones\\_\(Permaculture\)](http://permaculture.wikia.com/wiki/Zones_(Permaculture))

It is important to place your zones over the topographic map to get a whole view of the property's use and areas of interaction so you may plan more effectively

## Transferring Data Into Detailed Designs:

The word “design” carries multiple connotations.

It is used as a noun, as well as a verb, covering a range of different emphasis and meaning:

- Preliminary sketch, or plan for making something
- The art of producing these
- A plan, purpose, intention
- A decorative scheme or pattern
- General arrangement or layout of a product
- An established version of a product

Taken from: Design Science Design Science A Framework Framework for Change Michael Ben-Eli The Sustainability Laboratory <https://www.bfi.org/sites/default/files/attachments/pages/DesignScience-FrameworkforChange-BenEli.pdf>

# Synthesizing Data - Transitioning to design jams and site map designs

- Creating causal loop diagrams
  - how everything connects directly; specific connections, easy to understand
- Venn diagrams
  - intersecting values and site observations (we used People care, earth care, fair share for our three sections and refined the vision statement at the center)
    - client values
    - client intentions
    - physical properties
    - desired permaculture implementations
    - philosophy



The background is a complex, abstract painting. It features a palette dominated by warm, earthy tones: various shades of orange, from light peach to deep, rich reds, and some muted greens and blues. The brushstrokes are thick and expressive, creating a sense of movement and depth. There are several distinct patterns and motifs: a vertical line of small, dark blue dots on the left; a central vertical column of larger, stylized, light-colored shapes; and a more intricate, geometric pattern on the right side that resembles a stylized architectural or mechanical structure. The overall effect is one of dynamic energy and artistic complexity.

# Windsong Co-Design Groups x 4

# Windsong Permaculture Site Design

Conner's & Jackson's Version



## Vision Statement

**Windsong Vision Statement:** Windsong Peace and Leadership Center provides a safe and inclusive environment that empowers youth to become visionary leaders focused on solution based, regenerative actions by engaging with local social and environmental justice educators, activists, and professionals who demonstrate the actions that children can take to systemically change what they passionately believe in.

**Overview Vision Statement:** Our vision for the Borderlands is that the unique individuals that comprise the region work in collaboration to improve social, cultural, and economic relations through a lens that focuses on social and environmental justice by fostering a restoration economy and openly communicating the region's collective learned experience with the greater global community.

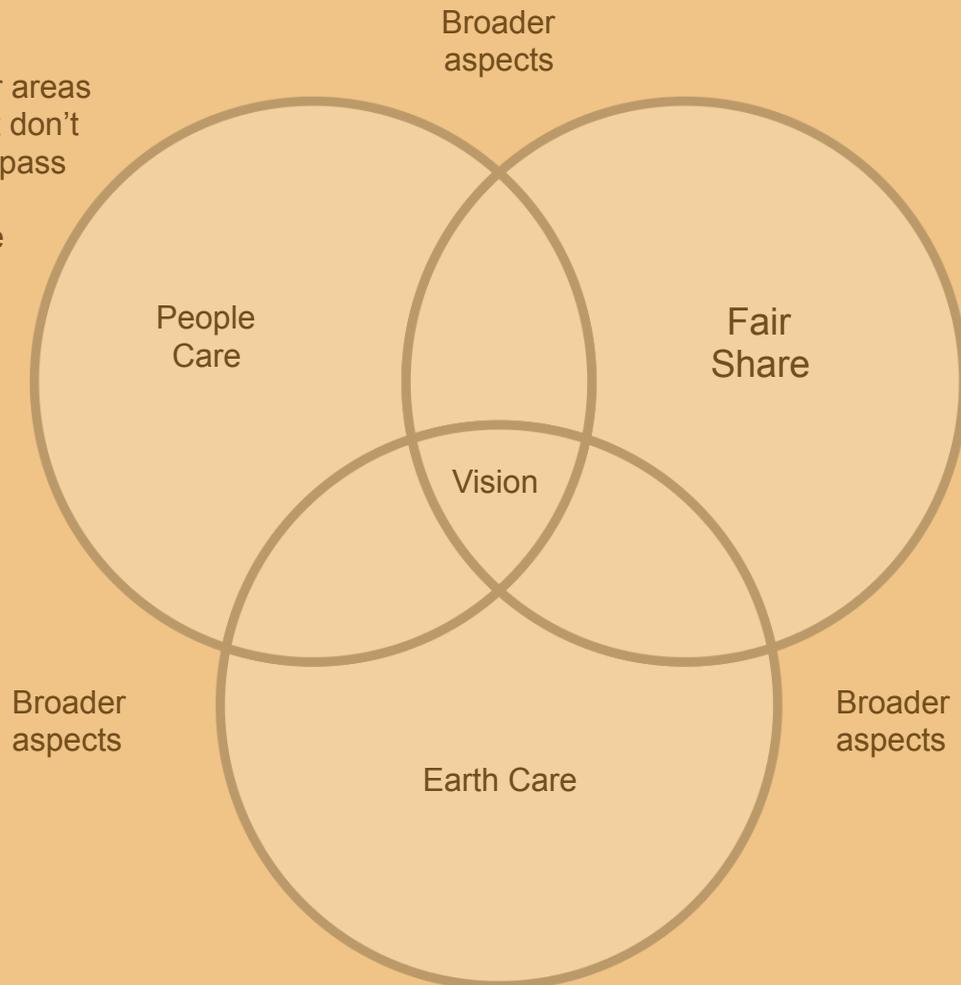
**Broader Global Context:** Our vision for Windsong Peace & Leadership Center describes a small but far reaching community that draws knowledge and experience from the Borderlands region and its important cultural, economic, and ecological history. We believe that the design we create for Windsong will deepen their communities' involvement in the Borderlands diverse systems and in turn become a leading model for other centers and programs within the global foundation Me To We. Not only will Windsong serve as an example for Me To We, already an organization with immense capability to enact change and empower youth, it is an integral part of our larger design for the Borderlands region. The Borderlands will become an archetype that shows that local communities from a wide variety of cultures and backgrounds can work collaboratively to preserve, restore, and protect ecological systems, while simultaneously enriching the economic prosperity of the region and developing strong relationships between its inhabitants.



## Ethics and Variables Venn Diagram

A Venn Diagram displays the relationships between many different aspects of something. Each of the three circles falls into its own category. The spaces where the circles intersect show how some aspects fall into multiple categories. In our diagram, the circles represent the three permaculture ethics People Care, Earth Care, and Fair Share as they relate to Windsong Peace and Leadership Center.

In our Venn Diagram, the extra circular areas outside of the circles denote ideas that don't directly relate to Windsong, but encompass parts of the broader context of the Borderlands Region and the rest of the planet.



# Windsong Venn Diagram

-Support/inclusion  
-Bilingual studies

-Engage with community  
-Social justice

-Regenerative Action  
-Demilitarization

-Community development

-Cross cultural connection

-Economic equity

## People Care

## Fair Share

-Rainwater catchment

-Kitchen Garden

-Aesthetics

-Intimate spaces

-Play spaces

-Art/Music

-Meditation/Yoga

-Greenhouse

-Field trips

-Accessibility for all  
-Worship space  
-Accommodating outdoor classrooms  
-Community engagement  
-Buying local  
-Trails

-Surplus Food Production

-Social Justice Studies

-Wool Donation/Production contracting

## Vision of Windsong Peace and Leadership Center

-Worm bin  
-Solar power  
-Wind breaks  
-Natural buildings  
-Agroforestry  
-Domestic farm animals

-Seed saving

-Plant & animal education (on site)

-Ecological diversity

-Wildlife habitat

-Local, organic food

-Renewable energy

-Ground water Restoration

-Native plant & animal restoration

-Open/accessible border

-Seed search/saving

-Restoration economy (jobs, wildlife watching, adventure education, environmental education, valuing the ecosystem, etc.)

-Creative re-use

-Ecological justice

-Keyline

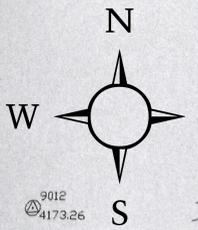
-Compost

-Greywater

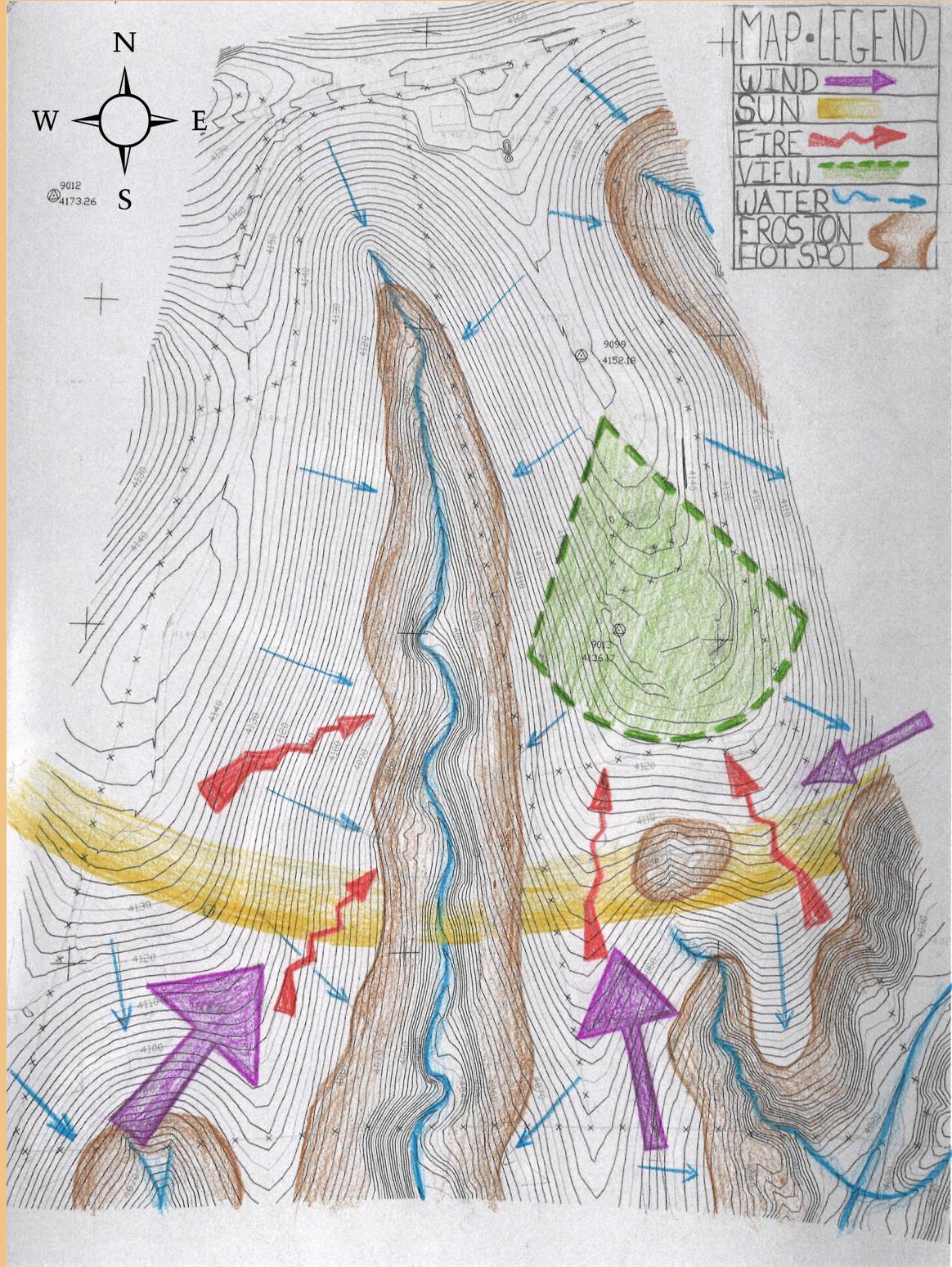
-Biodegradable materials

-Rainwater percolation pits

## Earth Care



MAP LEGEND	
WIND	
SUN	
FIRE	
VIEW	
WATER	
EROSION	
HOT SPOT	



### Sector Map

**Sun:** The sun's aspect on the property is shown from darker to lighter along the yellow arc.

**Wind:** The size of the purple arrows demonstrates the strength of the winds and shows the direction that the wind blows.

**Water:** The small blue arrows indicate how water moves down a slope and the blue lines show how it flows in the gullies.

**Fire:** The red zig zag arrows denote which direction fire would move (we believe it would move with the winds).

**View:** The green cone symbolizes the best view from the property.

**Erosion:** The brown areas show where we believe there will be high rates of erosion.

Seeing as we could only spend a short amount of time on the property, we have a rather limited understanding of the sectors. We offer our best interpretation of the land in this map, but would invite the proprietors to defer to their own judgement.

## Zone Map



**Zone Zero:** We chose zone zero to be all the buildings where people live. Although the Hacienda and the staff housing buildings are not continuously inhabited we thought that they still function as zone 0 for a good portion of the year and decided to reflect that in our design.

**Zone One:** We drew zone one in the areas that receive lots of traffic, this translates to immediately surrounding zone zero and all along the road. Inside zone one we have a small kitchen garden near the failing citrus tree, a trellis and vines to shade underneath the stargazing deck, the composting toilet, Justin's garden, the previous class' design, and the people's garden.

**Zone Two:** We drew zone two to encompass easily accessible grazing areas, the field for the kiddos, berms and swales along contour lines with pollinator gardens and native grasses, and beehives.

**Zone Three:** Zone Three incorporates grazing areas that are a little farther away from home than those in zone two. Also, zone three is hugely planted with food forest. The food forest is near the play field and on the east facing slope on the western side of the property.

**Zone Four:** Zone Four is comprised of ecological restoration areas, it is not planted with food, and it is not really for human uses besides aesthetics. In this context, ecological restoration means planting desert willows in the ravines, spreading native grass seed, building rock structures and berms and swales, and subtle rehabilitation efforts. Additionally, zone four might have some grazing.

**Zone Five:** This area is our control group. We have left it untouched so that we can see how the land reacts to little to no human intervention (may have to make some exceptions for grazing).

# Windsong Site Design

1. Main Road
2. Gate
3. Pollinator Gardens
4. Berm and Swale
5. Loop Driveway
6. Staff Housing
7. Solar Panels (also helping with water catchment)
8. People's Garden Tool Shed
9. Raised Beds For Kitchen Food
10. People's Garden (Chickens, small path)
11. Small Outdoor Classroom
12. Outdoor Shower
13. Composting Toilets
14. Water Catchment Tank
15. Kitchen Garden (replaces fruit tree)
16. Greenhouse (converted Sunroom)
17. Walking Labyrinth
18. Patio
19. Sloped Rock Wall
20. Existing Animal Pen
21. Mulched Field
22. Large, Apse-like Outdoor Classroom
23. Food Forest Surrounding Field
24. Seasonal Water Flow
25. Food Forest (Zone 3)
26. Native Grass Field (intended for restoration of native species and grazing areas)
27. Experimental Control Area: Zone 5
28. ADA Accessible Path Around Site
29. Fence Line
30. Topographical Map Lines
31. Justin's Families Residence



## Windsong Site Description

1. Main Road
2. Gate
3. Pollinator Gardens
4. Berm and Swale

The berms and swales are implemented all over the site along contour lines. They all will be used as “keylines” to slow, spread, and sink water to recharge the groundwater and help the native plants flourish.

5. Loop Driveway
6. Staff Housing
7. Solar Panels

The site design depicts the solar panels as only small parts of building rooftops. However, we believe that the solar panels should be fitted to cover the entire rooftop and be sloped downhill towards a water catchment tank. They will double to provide solar energy and direct water into tanks.

8. People’s Garden Tool Shed
9. Raised Beds For Kitchen Food

These beds are currently not being used. We believe that when water catchment systems on the site are developed and we can water the beds, they will be able to regularly produce food for cooking.

10. People’s Garden (Chickens, small path)
11. Small Outdoor Classroom
12. Outdoor Shower
13. Composting Toilets
14. Water Catchment Tank
15. Kitchen Garden (replaces fruit tree)

At this location there is currently a fruit tree that people don’t eat and a slanted roof that funnels rain water runoff into this spot. We suggest implementing a gravel pit to help sink and spread water and then implementing a garden for smaller food crops used in everyday cooking.

16. Greenhouse (Converted Sunroom)

The south facing sunroom is the sunniest places in the hacienda. We suggest converting it into a greenhouse for year round food production, passive solar heating in the winter, and as an educational aspect of Windsong

17. Walking Labyrinth

We suggest moving the labyrinth so that the play field can be created south of the hacienda.

18. Patio

19. Sloped Rock Wall

(for explanation see field diagram)

20. Existing Animal Pen

21. Mulched Field

(for explanation see field diagram)

22. Large, Apse-like Outdoor Classroom

Instead of creating a structure in a separate space, we suggest building a large, accommodating outdoor classroom in the Southwest corner of the open field. It will be protected by strong winds and the roof will help direct water into the food forest around the perimeter

23. Food Forest Surrounding Field

24. Seasonal Water Flow

25. Food Forest (Zone 3)

26. Native Grass Field (intended for restoration of native species and grazing areas)

27. Experimental Control Area: Zone 5

We suggest this area is left alone as wild so that we can see the differences between the areas of the site where the designs were implemented, where they were not implemented, and how the spaces interact with each other

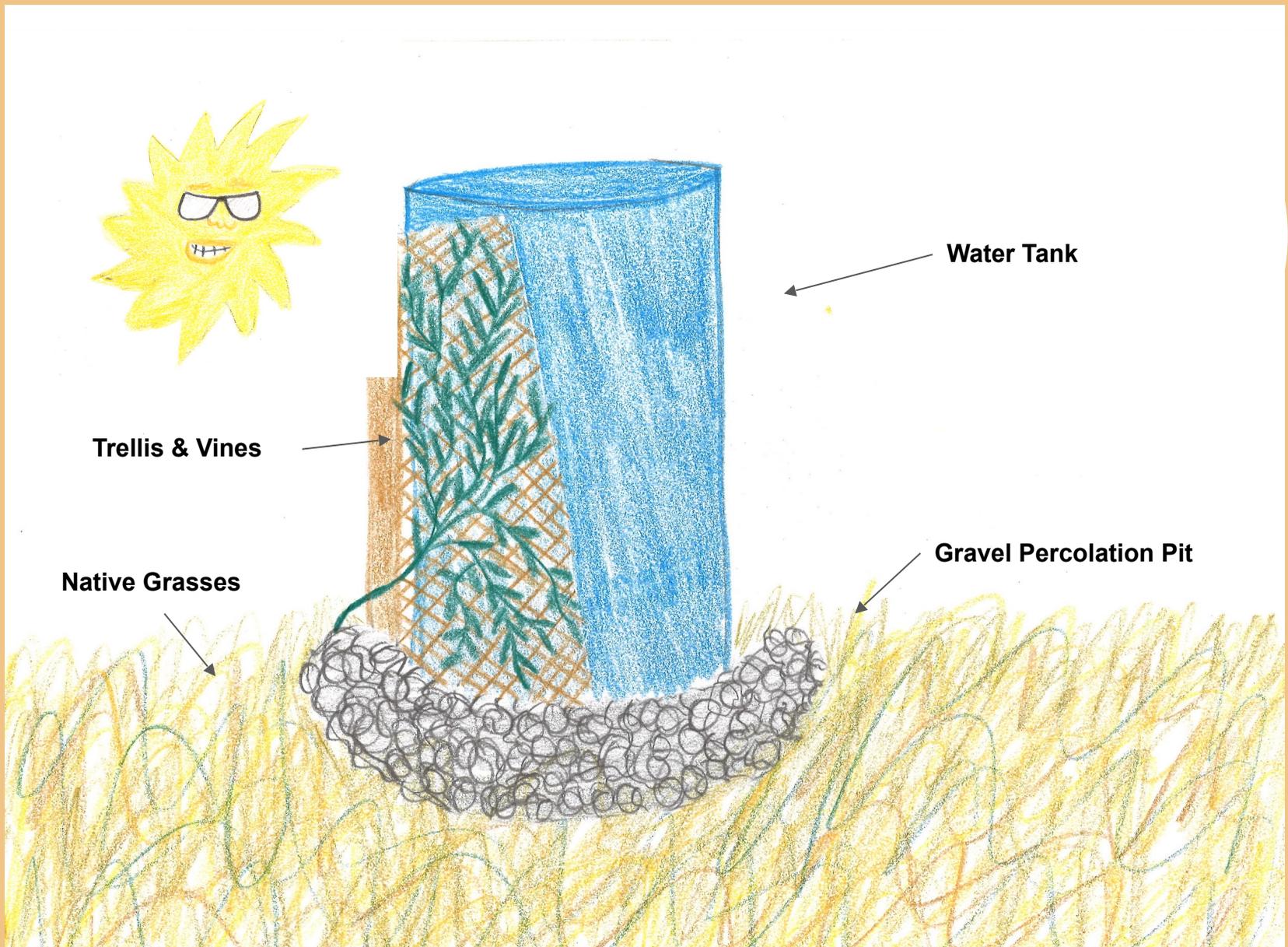
28. ADA Accessible Path Around Site

The path runs mostly around a contour line and should be dug out from the slope. A small retaining wall, similar to the open field, can be used to protect from soil erosion on the upward slope.

29. Fence Line

30. Topographical Map Lines

31. Justin’s Family Residence



### **Rainwater Catchment and Percolation Pit**

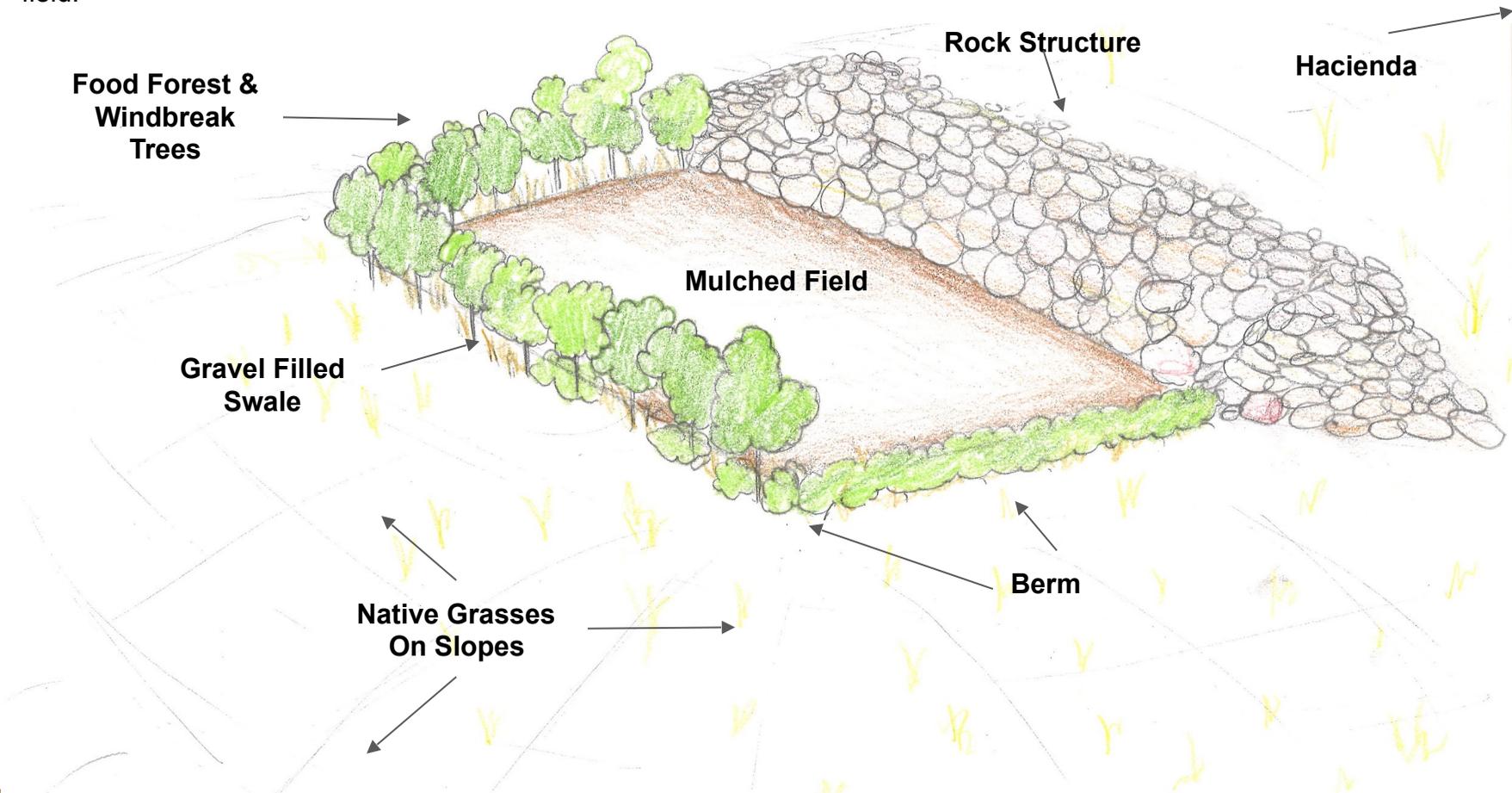
Our idea for rainwater catchment tanks also has a fail-safe for flood years. Our design has a pit lined with gravel forming a kidney bean shape on the downslope from the tank. This is to catch all the water that begins to overflow from the tanks during a heavy rain which prevents erosion and allows the excess water to sink into the ground and recharge the aquifer. Additionally, we have placed a trellis next to the tank so that vines can grow around it and protect it from aging too quickly in the sun. The uncovered portion of the tank could serve as an excellent canvas for students who visit Windsong to express themselves artistically.

## Sports Field

The need for a sports field/open play space for youth was strongly impressed upon us during our site assessment at Windsong. Not only does it give the kids an outlet for energy and fun, it provides a safer space for that environment. We are proud to present our extremely thought out idea for a drought tolerant field.

The field would be situated south of the hacienda, one of the flattest and widest spaces on the property. However, because there is an elevation drop of around 14" between the North side of the field and the South, we propose that machinery is used to dig the field out of the gradual slope on the property. The mulch can be acquired very cost effectively from local landscapers or the landfill. In order to mitigate erosion, a retaining wall of rocks and natural grasses will hold the soil and act to slow down, spread, and sink water runoff into the ground.

The West, South, and some of the East edges of the field would be lined with a swale filled with decomposed granite or pea gravel to stop erosion that water runoff from the field would cause. Beyond the swale, a series of trees would be planted between berms and swales. The inner rings would consist of native food trees while the outer rings of the forested area would be made up of more resilient native species that would act as a windbreak for the food crops and the field.



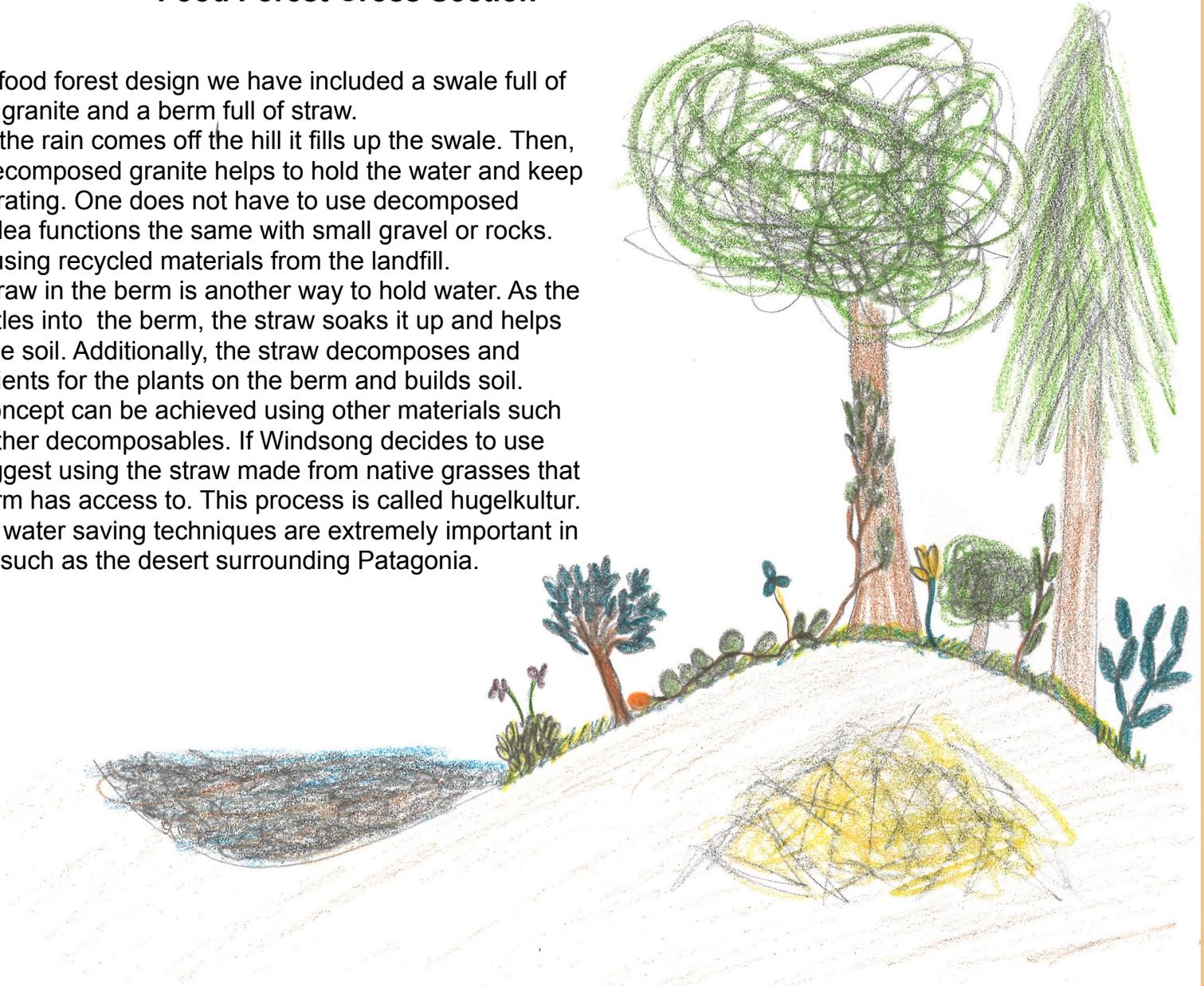
## Food Forest Cross Section

In our food forest design we have included a swale full of decomposed granite and a berm full of straw.

When the rain comes off the hill it fills up the swale. Then, the porous decomposed granite helps to hold the water and keep it from evaporating. One does not have to use decomposed granite, the idea functions the same with small gravel or rocks. We suggest using recycled materials from the landfill.

The straw in the berm is another way to hold water. As the rainwater settles into the berm, the straw soaks it up and helps to hold it in the soil. Additionally, the straw decomposes and provides nutrients for the plants on the berm and builds soil. Again, this concept can be achieved using other materials such as wood or other decomposables. If Windsong decides to use straw, we suggest using the straw made from native grasses that Deep Dirt Farm has access to. This process is called hugelkultur.

These water saving techniques are extremely important in a dry climate such as the desert surrounding Patagonia.



## Plant List

**Windbreak:** Pecan (good to be planted with arizona cypress and juniper for windbreak and for food)

Arizona Juniper (very hardy tree that is good for a windbreak and nursery tree, juniper berries as a spice)

Arizona Cypress (very hardy tree that can be planted as a windbreak and nursery tree)

Carob (chocolate substitute, can be planted in with the windbreak, smells bad so good to plant away from homes)

**Trees:** Wild Black Cherry (food production and planted in sun)

Emory Oak (food for people and animals)

Arizona Black Walnut (food and can be used as a dye)

Mesquite (can be planted as a food crop and nursery tree)

Pinyon Pine (nuts can be eaten and needles have medicinal uses)

Fig (refer to Gary Nabhan for specific variety)

Apples (refer to Gary Nabhan for specific variety)

**Vines:** Canyon Grape (planted to grow up trees, food)

Raspberry (planted to grow up the trees, food)

**Perrenials:** Pomegranate (food production)

Chiltepin (native chile plant)

Mormon Tea (can be chewed for alternative to caffeine)

Cliffrose (for aesthetically pleasing flowers)

White Sage (for tea, good for using in conjunction with peppermint)

Peppermint (for tea and flavor)

**Cacti:** Indian Fig Opuntia (for the fruit)

Agave (agave is plentiful on the property and can be planted as a food crop)

**Annuals:** Prescott Heirloom Tomatoes (food production)

Desert Chia (seeds can be eaten)

Anasazi Beans (for food production)

Hopi Vatnga (for eating and shells can be made into musical instruments)

Magdalena Big Cheese (for food production)

Nayarit Wild Cushaw (squash for food)

Dent Corn (many varieties of dent corn available from Native Seeds/SEARCH)

Tepary (wild bean plant available from Native Seeds/SEARCH)

Armenian Yard Long Cucumber (could experiment with cucumber growing, not a native)

Native Grasses (good hillside stabilizers, seed can be acquired from Native Seeds/SEARCH)

**For Pollinators:** Desert Honeysuckle (pretty flowers and attracts hummingbirds)

Desert Willow (important habitat for native hummingbirds)

Yerba Mansa (medicinal herb to be planted near decomposed granite aquifer)

Penstemon (Firecracker, Canyon, and Coral

Penstemon are all native to Arizona and could be an excellent addition. This plant attracts birds and hummingbirds and can be used as a dye)

Milkweed (good for butterflies)

We also suggest buying a wildflower seed mix from the Native Seeds/SEARCH website and broadcasting the seeds with students all around the property.

## Materials List

This is a working list of needed materials

- Backhoe
- Bulldozer
- Volunteers
- Workers (preferably hired from the community)
- Finances
- Seeds
- Plants
- Rock
- Mulch
- Decomposed Granite
- Water Tanks
- Piping
- Solar Panels
- Greenhouse siding panels
- Greenhouse Shade Covers
- Strawbale Building Materials For Outdoor Classrooms
- Professional Designers
- Urbanite (recycled concrete)
- Pipes for Water Catchment
- Gutter Systems
- Gardening Tools
- Basic Manual Labor Construction Tools
- Traill Materials (decomposed granite, rammed earth, cement)
- Native Straw for Berms
- Worms for Worm Bin Decomposition



# Systems Map

Our systems map, or causal loop diagram, depicts the relationships between areas of conflict, positive action, and leverage points in the Borderlands region. We found that many of the issues that were prevalent in the area were far-reaching, multifarious subjects that had no easy solution. However, we did find that some parts of this diagram helped us see connections between our systems map and our experience engaging with different individuals and communities in the Borderlands region. Leverage points “are places within a complex system (a corporation, an economy, a living body, a city, an ecosystem) where a small shift in one thing can produce big changes in everything.” -Donella Meadows

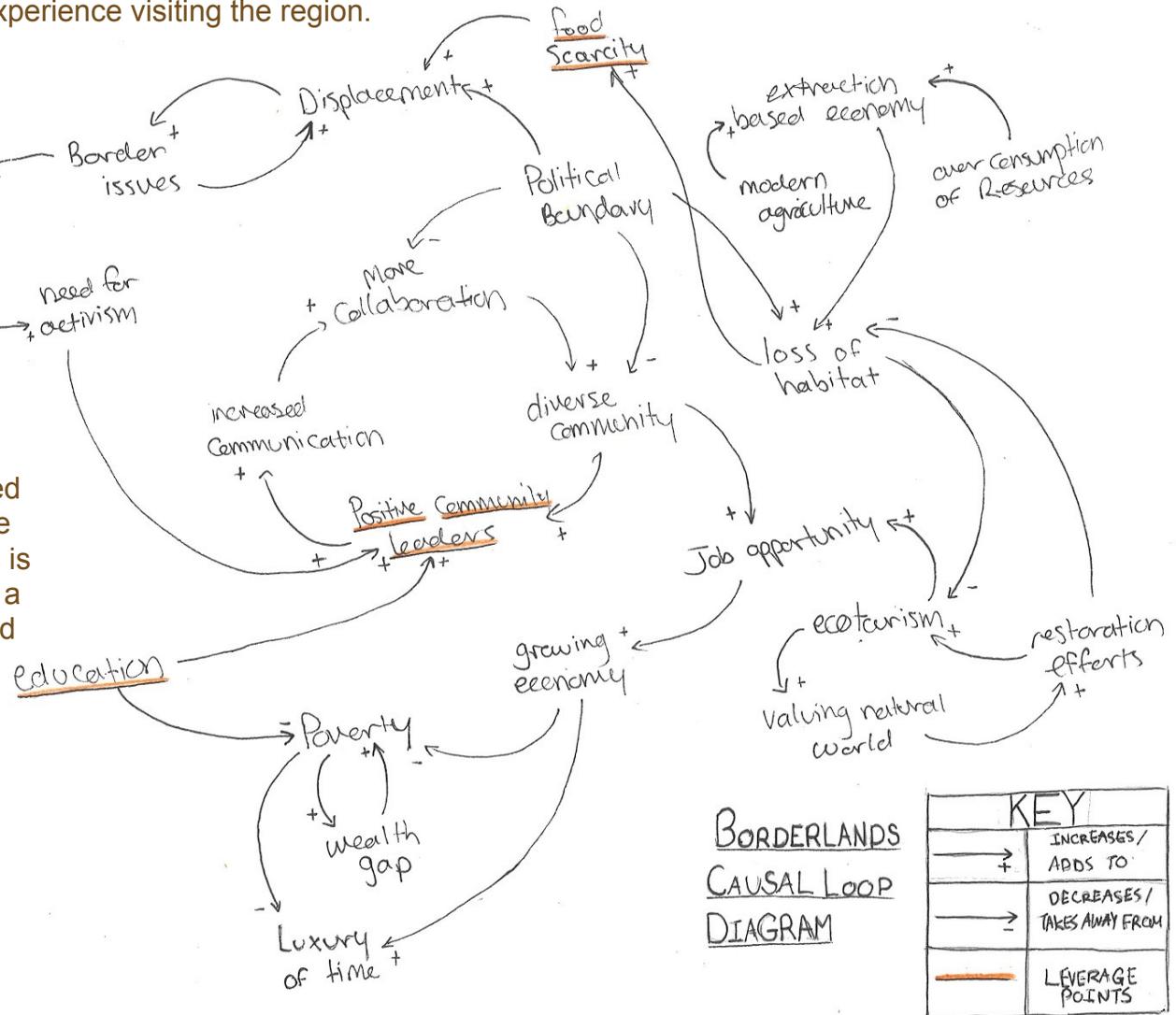
For example, when we were looking at this map and deciding which concepts are the best leverage points, we connected three with our experience visiting the region.

## 1. Positive Community Leaders:

Many of the people we met with were highly engaged, forward thinking members of the community who were effecting real change in the area.

2. Food Scarcity: As the need for a more sustainable future dawns upon us, this regions is coming together to cultivate a restoration economy and find ways to benefit the whole.

3. Education: Particularly with the Mexicayotl Academy, we were able to see that young, dedicated students were growing up with tools to become passionate leaders and make a real difference in the future.



## Overview Maps and Design

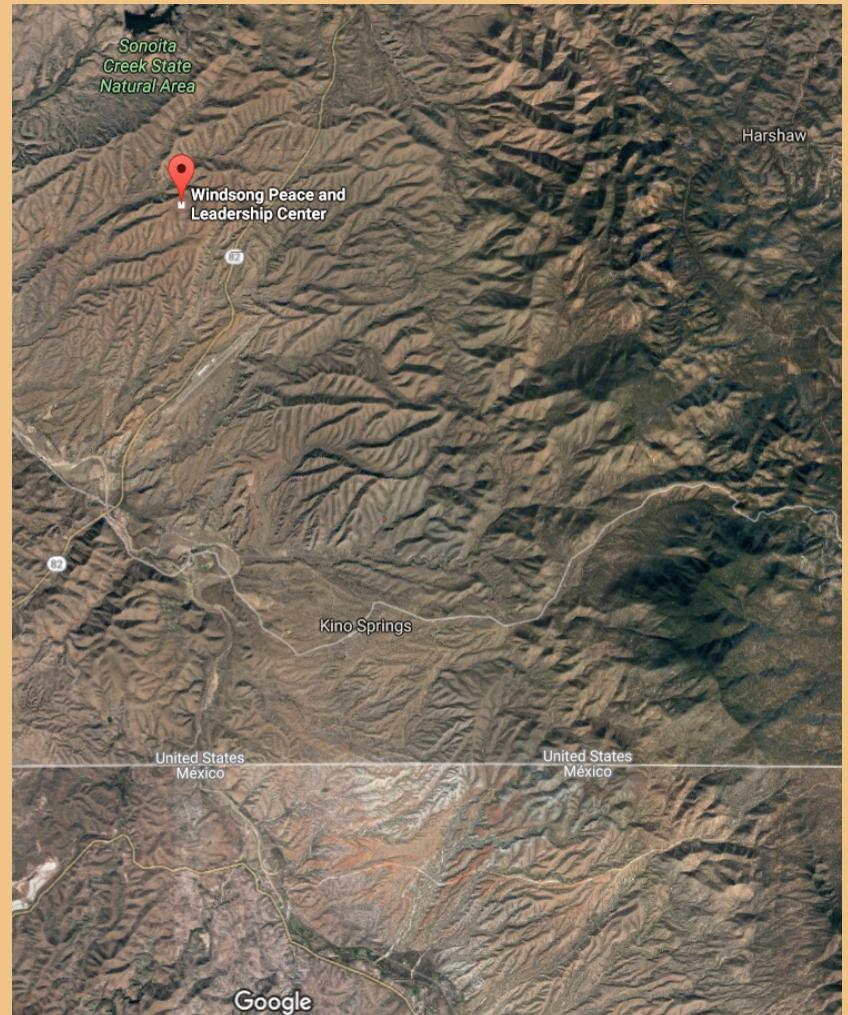
During our design process as a class, we focused on a slightly smaller aerial view of the Borderlands region. When we were reviewing the process, we found that the class' design for the broader Borderlands region did not line up with the feedback we received on our original design. The feedback was that our design for the region was very U.S.-centric and one sided.

In order to develop a more comprehensive design, we felt that expanding the map West and South would help us see the area from a more holistic viewpoint and allow us to make more informed, intentional design decisions.

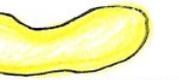
Original View

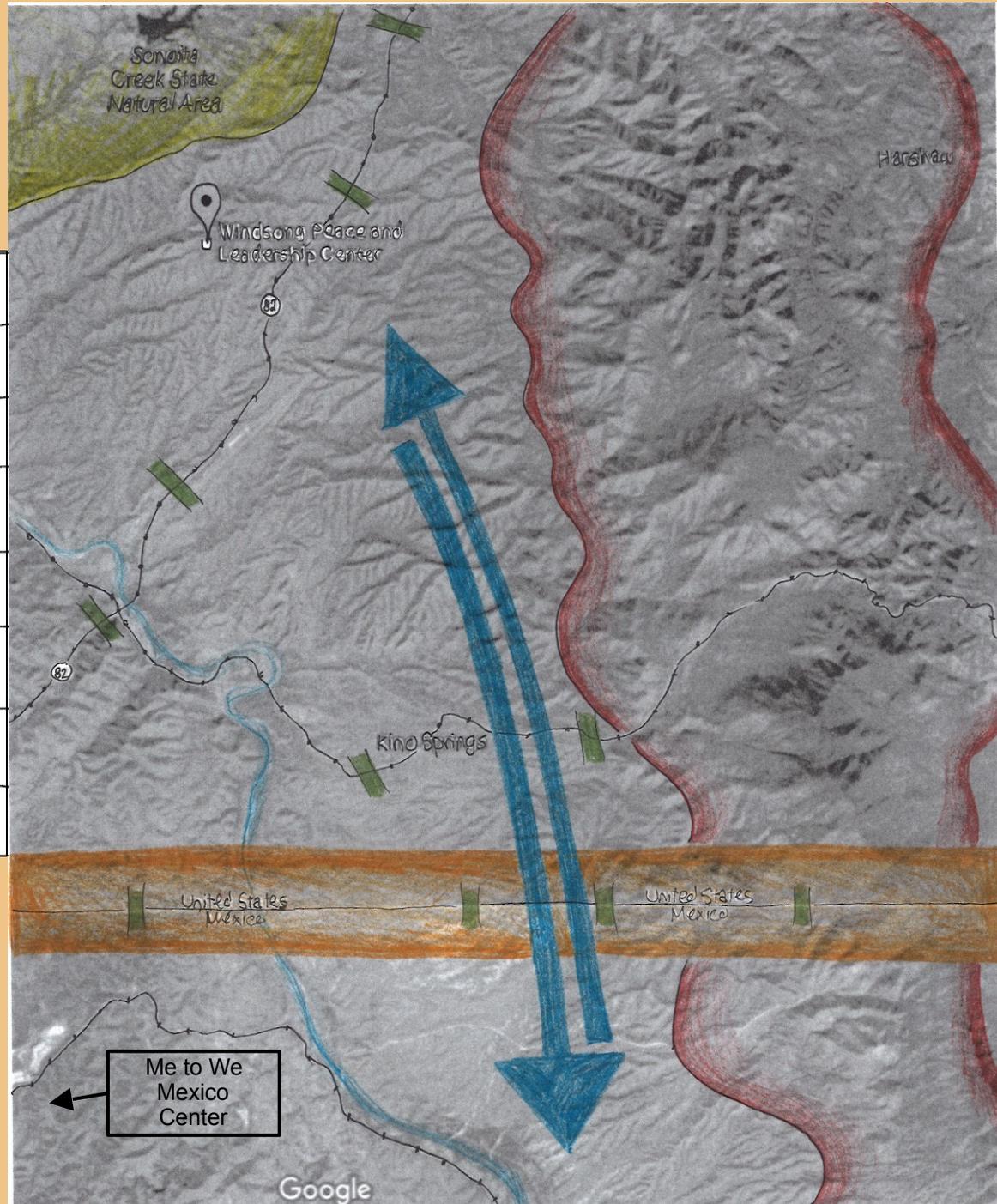


Widened View



# Borderlands Overview Map

Map Key	
	Conservancy Area
	Outward Bound Trip Region
	Colonias Region
	Direction of Animal Migration
	Animal Crossings
	Sonoita Creek
	Paved Highway



## Borderlands Overview Map Explained

- ❖ A large part of our overview design is derived from the Borderlands Leadership Restoration Institute expanding into an international organization with a large footprint in the region.
- ❖ Windsong does a free retreat for locals from both sides of the border. They educate about the ecological importance of the area and do the same thing they always do. This allows for a meetup between Mexican kids and American kids to share what life is like on both sides.
- ❖ Outward Bound opens up a chapter in the Borderlands that takes kids into the mountains and crosses from one side of the border to the other on animal crossings. Similarly to Windsong, they provide a free program for local Borderlands youth to bond and learn about their area. This is represented on the map as the red zone.
- ❖ In our reading from the Scientific American we realized that there are communities called Colonias along the border that lack access to clean water, food, and energy. We colored a band along the border to show outreach efforts by the Borderlands Restoration Institute to provide for these basic needs. The funds will come from a 1% income tax on people in Santa Cruz County who make more than \$150,000 a year. Since there is a large amount of food that is thrown away in Nogales, we figure that the Borderlands Leadership Restoration Institute can pay a discounted price for this food and deliver it to the colonias. Additionally, programs will work in the colonias to install rainwater catchment systems and singular solar lights. While these are not huge changes, we have confidence that they can make a big impact on these small communities.
- ❖ The Windsong and Outward Bound free programs will be funded by this income tax as well.
- ❖ We have opened up a new Me to We center in Mexico. This center will be mostly for Mexican youth, but we believe that there should definitely be interaction between Windsong and the new center's programs. We think that introducing youth from both sides of the border to share their stories is very important to increase understanding of border issues and raise the next generation of positive community leaders.
- ❖ We have placed animal crossings on the border to decrease the fragmentation effect that the border wall has on local wildlife habitat. To satisfy current political conditions, we think that the crossings should be under surveillance, but not in a way that interferes with animals trying to cross the border. The border agents that watch the crossings will have special ecological training to help increase their understanding of the crossings' importance.
- ❖ The yellow zone on the map represents a continued conservation effort by the BLRI to preserve the Sonoita Creek area and decrease human impact as much as possible.

## Sites Visited

Description of Permaculture Zones: <https://deepgreenpermaculture.com/permaculture/permaculture-design-principles/4-zones-and-sectors-efficient-energy-planning/>

Causal Loop Diagram Example:

[http://www.thwink.org/sustain/articles/020\\_NoSolutionsToProblemsLikeThese/LimitsToGrowth\\_ModelFigure1-3\\_Large.png](http://www.thwink.org/sustain/articles/020_NoSolutionsToProblemsLikeThese/LimitsToGrowth_ModelFigure1-3_Large.png)

Permaculture Sector Example:

<https://s-media-cache-ak0.pinimg.com/736x/99/07/70/990770c9c2f0e801ffe46e4c2a39354d.jpg>

Leverage Points

<http://donellameadows.org/archives/leverage-points-places-to-intervene-in-a-system/>

# Final Design for Windsong Peace and Leadership Center and the Borderlands Region



People Care  
-Intimate spaces  
-Aesthetics  
-Play Space  
-Food Production  
-Support/inclusion  
-Arts + music  
-space for spirituality  
(worship/meditation/yoga)  
-Holistic Wellness  
-trails

People/Earth Care  
-farm animal interaction  
-agroforestry  
-Local/ Organic Food  
-Compost  
-compost toilets  
-outdoor classrooms  
-Outdoor showers  
-Natural Building  
-Living roof  
-Water Catchment  
-Renewable Energy

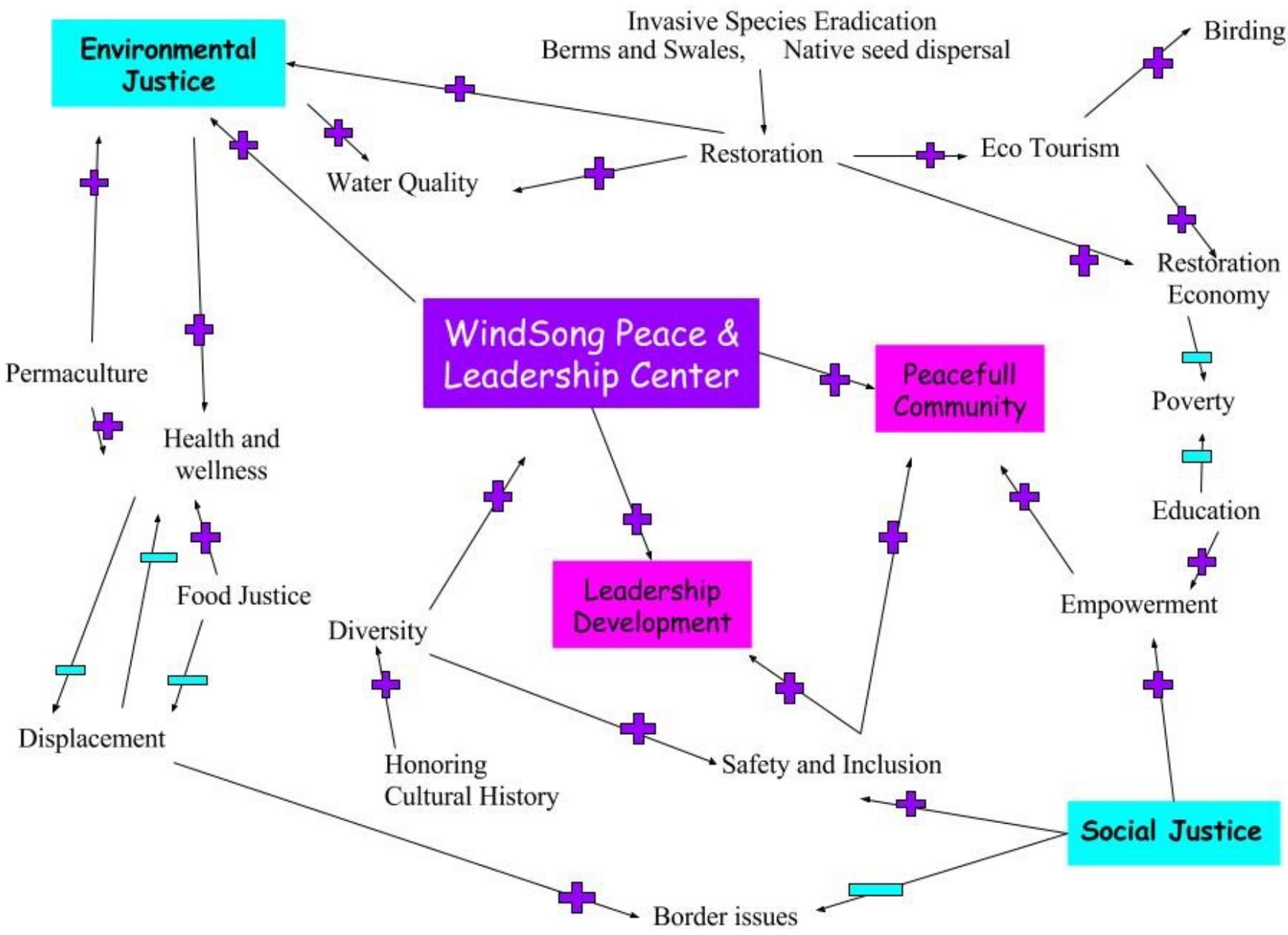
Earth Care  
-Renewable Energy  
(Passive Solar, Wind Energy)  
-Plant Diversity  
(Native Grasses/Plants)  
-Pollinator Gardens  
-Wildlife Habitat  
-Berms and Swales  
(restore groundwater, enrich soil)

Mission Statement  
Windsong  
Peace and Leadership  
Center provides a safe and inclusive environment that empowers youth through community, experiential outdoor learning, and social justice education to become visionary leaders in their broader communities .

Earth and Fair share  
-sharing abundance  
-Creative re-use  
-Seed Storing  
-clean H2O and air  
-Native Plant Use  
-Sharing space With animals

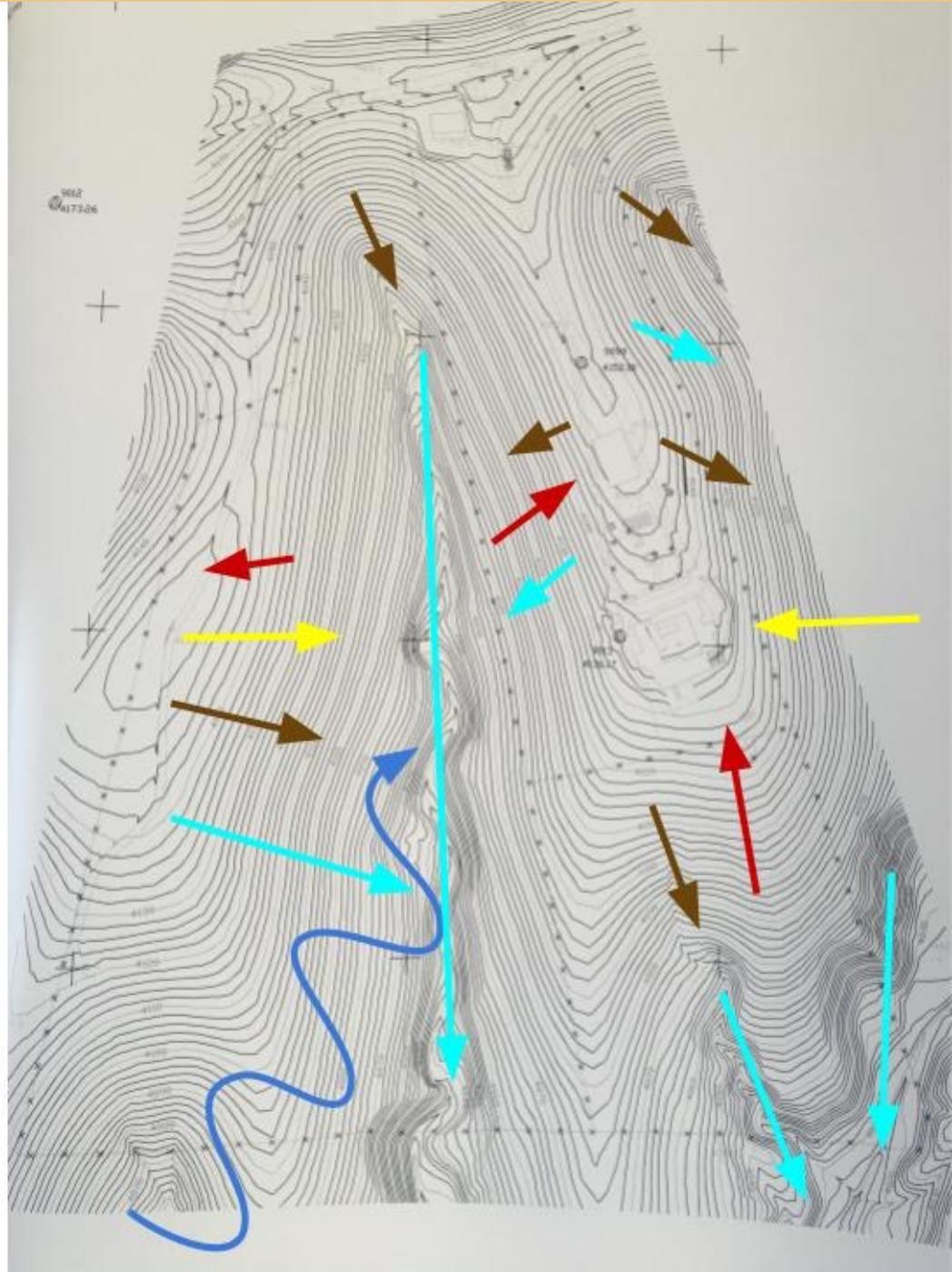
People and Fairshare  
-social justice  
-leadership development  
-honoring history  
-border studies  
-inclusivity  
-diversity  
-ADA standards  
-greenhouse  
-food 4 all

Fair Share  
-surplus  
-Bilingual studies  
-demilitarization  
-Scholarships  
-community building  
-cross-cultural connection

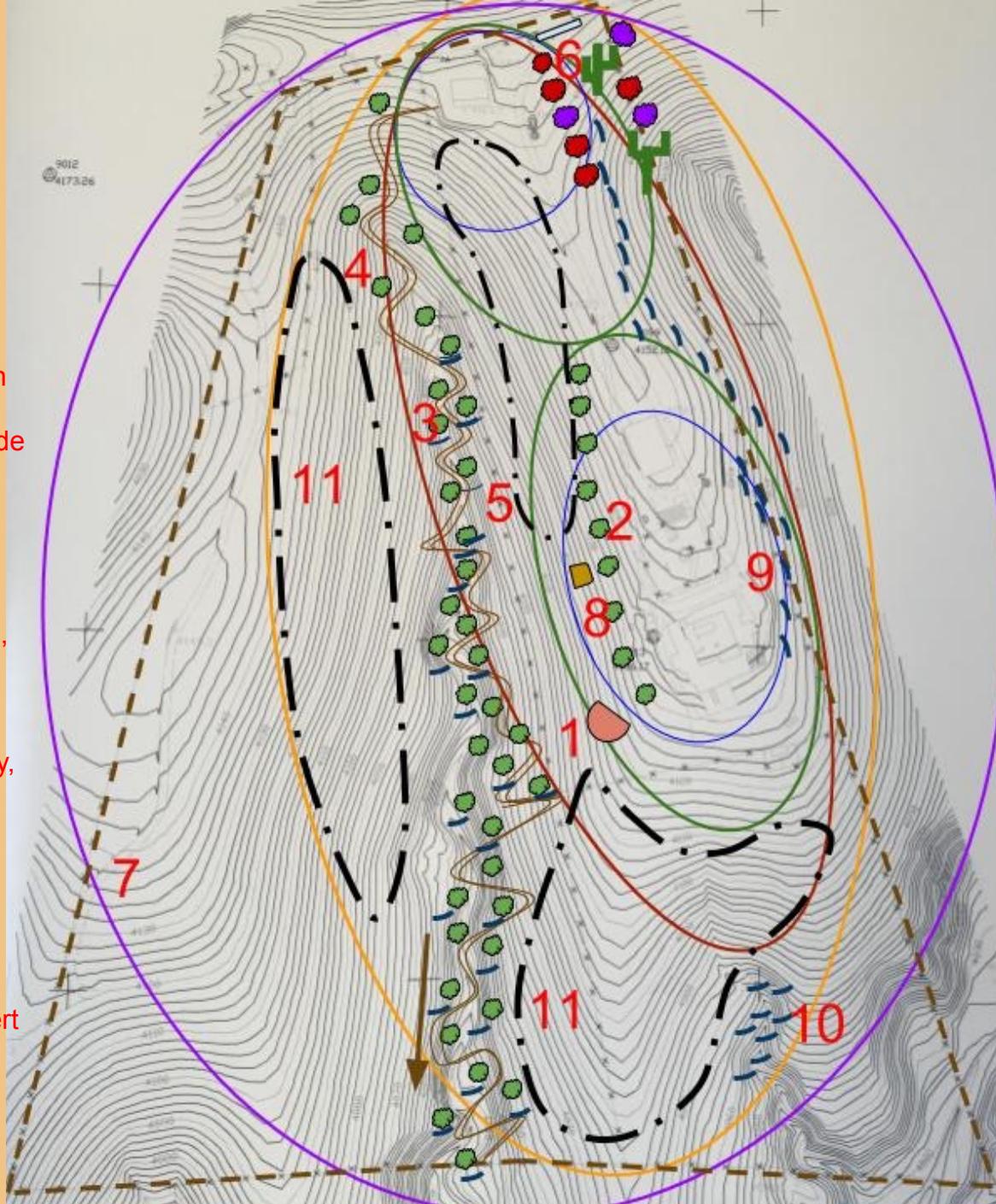


# Sectors Map:

-  Fire
-  Erosion
-  Sun
-  Water
-  Wind



1. Straw-Bale Amphitheater with glass windows  
 2. Windbreak made of juniper, carob, and cypress  
 3. Food Forest: Canopy - Pecan, Walnut, Carob. Sub Canopy - Fig, olives, apricot, apple, Native Cherry, Citrus Shrub - Rosemary, Herbs - Onions, Garlic, Mint, Chamomile Ground Cover - Chickpeas and Fava Beans Vines - Canyon Grapes and Desert Honeysuckle Funghi Layer



- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5

4. Trail made with recycled materials  
 5. Berms and Swales  
 6. Aesthetic Entry lined with lush grape trellis, cacti (prickly pear, aloe vera, agave), and fruit trees  
 7. Snake fence  
 8. Underground storage  
 9. & 10. Berms and Swales for Restoration  
 11. Animal grazing Area with feed crops

# Windsong Design

## Zone 1

- 1) Grassy Field (Native Grass, Non-water intensive species)
    - 1.1) Tents for shade/ yoga/speakers
  - 2) Culinary garden
- Garden + Citrus Trees: carrots, Onions, Garlic, greens, potatoes, pumpkins, squash, corn, beans, Lemon, Orange, Grapefruit, Lime, Cumquat.
- 3) Add more chickens
  - 4) Pollinator and Herb Garden: Yarrow, milkweed, bee balm, Sunflower, Poppies, Marigolds, Mint, lemon balm, lavender, Basil, mugwort, Oregano, sage, rosemary,
  - 5) Solar Panels
  - 6) Water Catchment for Pollinator Garden and Grass Field
  - 7) Outdoor Shower
  - 8) Compost Toilet
  - 9) Large Dining Hall
  - 10) Straw-Bale Outdoor- Classrooms with blackboards
  - 11) Art patio with tent cover
  - 12) Greenhouse: Kale, Cilantro, Mustard Greens, Spinach, Tomatoes, Peppers.
  - 13) Bicycle Blender
  - 14) Leaf-shaped Trellis providing shade for Star Gazing Deck
  - 15) Dye Garden
  - 16) Recycled Materials: Tires, Ropes, Nets, Wood, Baseball Diamonds. Playground based on Berkeley's Adventure Playground
  - 17) Labyrinth
  - 18) Bunnies





[Berkley's Adventure](#) an example of a recycled playground



**Amber Dusick: Adventure Playgr...**

[www.amberdusick.com](http://www.amberdusick.com)

More





## Ocotillo International Institute for Ecological, Economic, and Cultural Restoration

The Ocotillo Institute's mission is to restore the ecology, the economy, and the culture, surrounding the border in order to overcome the division caused by the wall. They sit where they do on the border as a model of what it could be like for the two countries to live in harmony.

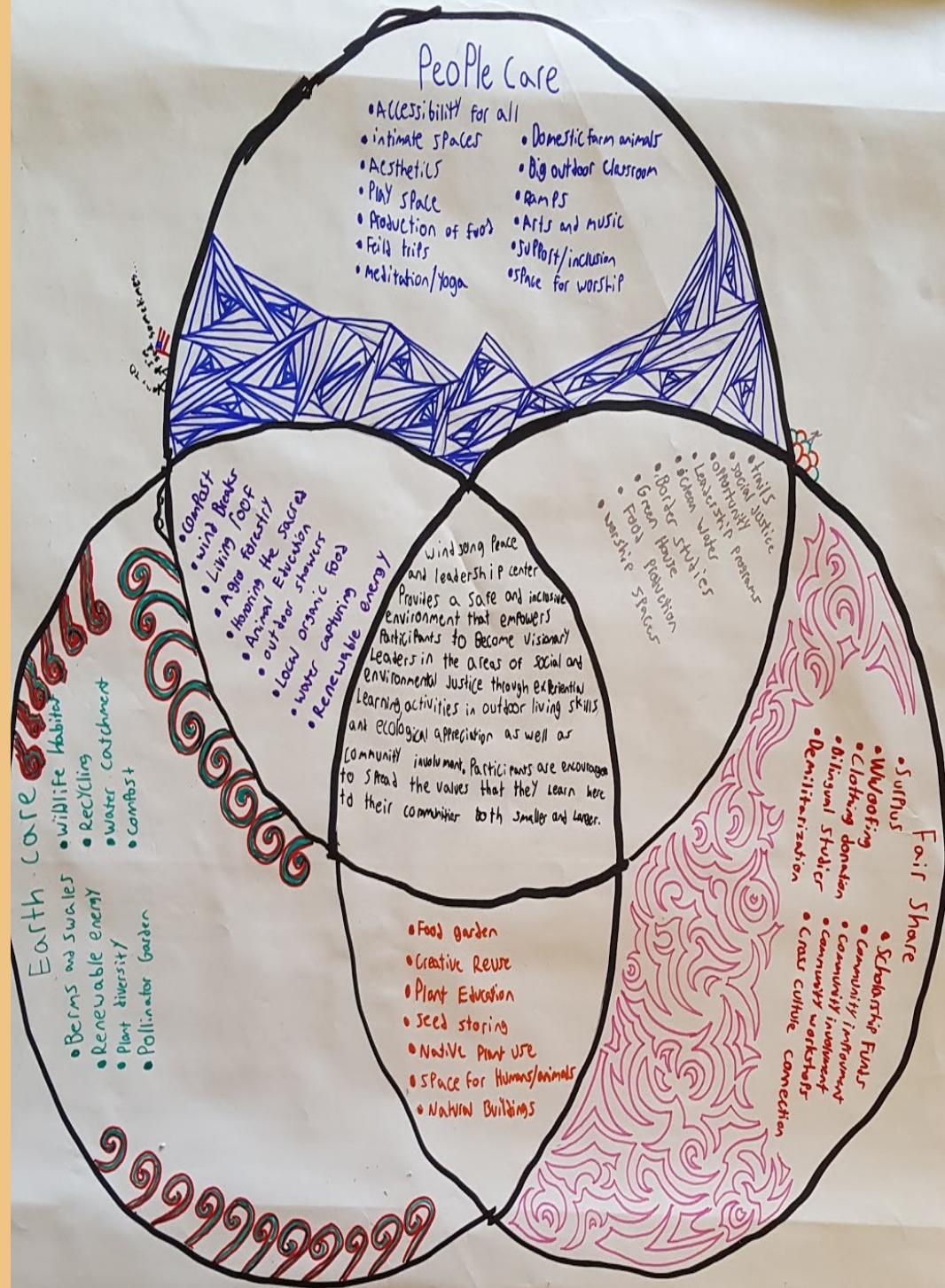
**Ecological restoration** - Is practiced through a city-scale educational model of a permaculture and agroforestry system. Efforts also take place through outposts on the El Jefe trail. On the trail seed boxes encourage hikers to spread native seed and restoration outposts attract volunteers to do larger restoration projects and serve as monitoring sites for restoration efforts.

**Economic Restoration** - The trail and the institute attract eco-tourism. The institute also includes a daily marketplace where vendors from either side of the border can bring any locally grown or crafted goods to sell.

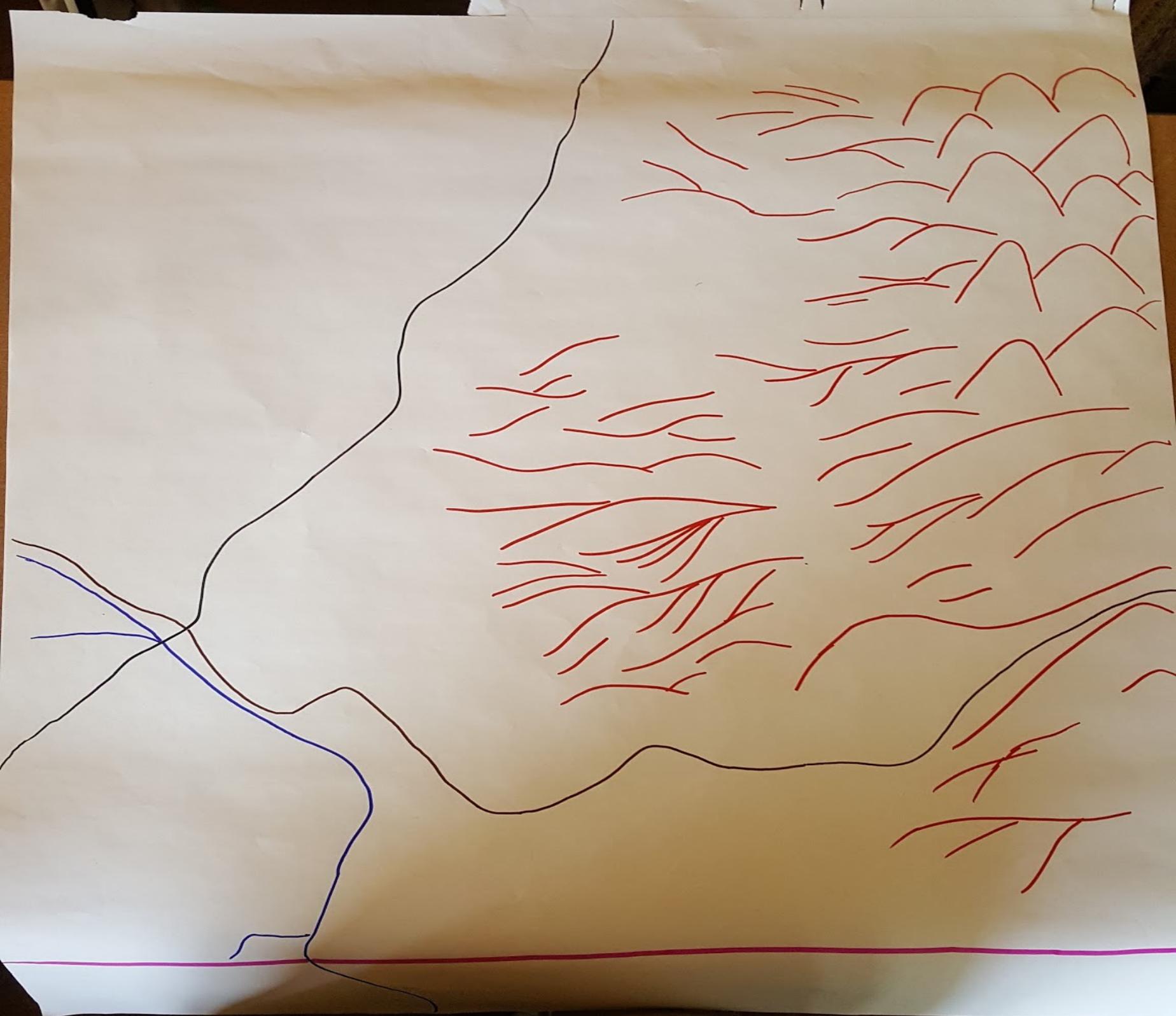
**Cultural Restoration** - These efforts will take place by bringing together people from both sides of the border to teach and learn new cultural skills. There will also be social events and signage to increase cultural sharing.



**Mission statement:**  
 Windsong peace and leadership center provides a safe and inclusive environment that empowers participants to become visionary leaders in the areas of social and environmental justice through experiential learning, activities in outdoor living skills, and ecological appreciation as well as community involvement development. They are encouraged to spread the values that they learn here to their communities both smaller and larger.







This map is based on the 20 miles of Borderlands surrounding Windsong peace and leadership center. The map shows the key features surrounding Windsong which include Rivers (In blue), Roads (In black), Mountains (In red), and The Border (In pink).

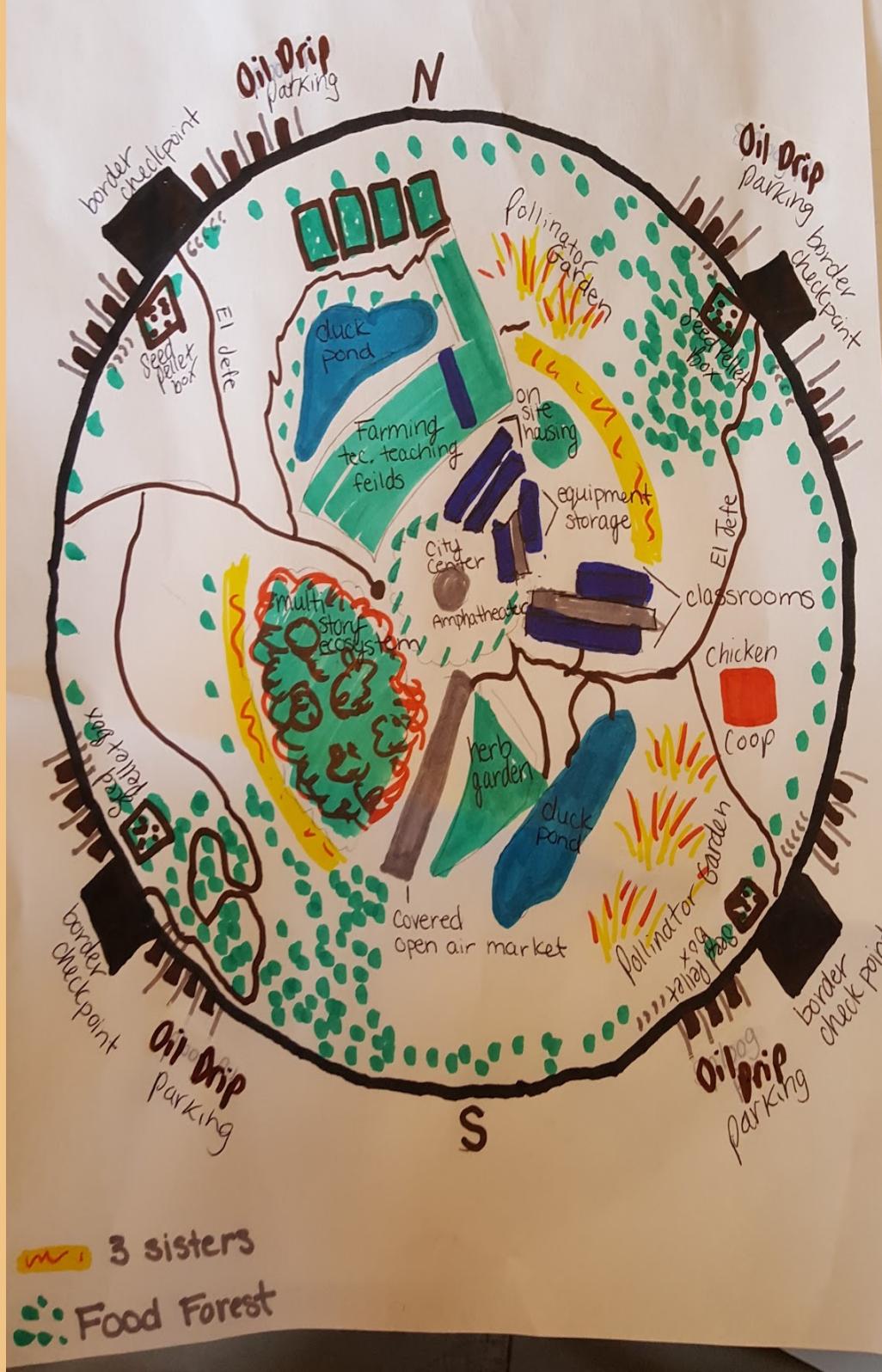
Added to the greater borderlands area:

North of the border we have envisioned a backpacking trail for multi day use that starts and ends at the ocotillo center. This trail will make its way through the riparian, grassland, and mountainous areas of the borderlands. The trail will serve several purposes such as providing an area for backpackers, ecologists, birders, campers, mountaineers, and educators a space to come to engage in their respective crafts. This has great possibility for benefit in the borderlands area. Not only will it promote a restoration economy by bringing people to the borderlands but it will give the people in the surrounding communities a stronger sense of place. Along the trail are seed pellet dispersal boxes that hikers can take handfuls of seed pellets and spread along the trail. These pellets will support the local grass lands and help restore areas that have been over grazed. Also along the trail will be several restoration outpost which will house people from the Ocotillo center who are currently doing restoration work as well as users of the trail in exchange for some restoration work. The restoration outposts are all strategically placed to provide the Ocotillo center with field points to spearhead borderlands restoration. There are three envisioned parking lots along the trail to provide parking for school groups and trail users alike. Lastly along highway 82 several animal crossings have been implemented in order to preserve the integrity of the wilderness corridor



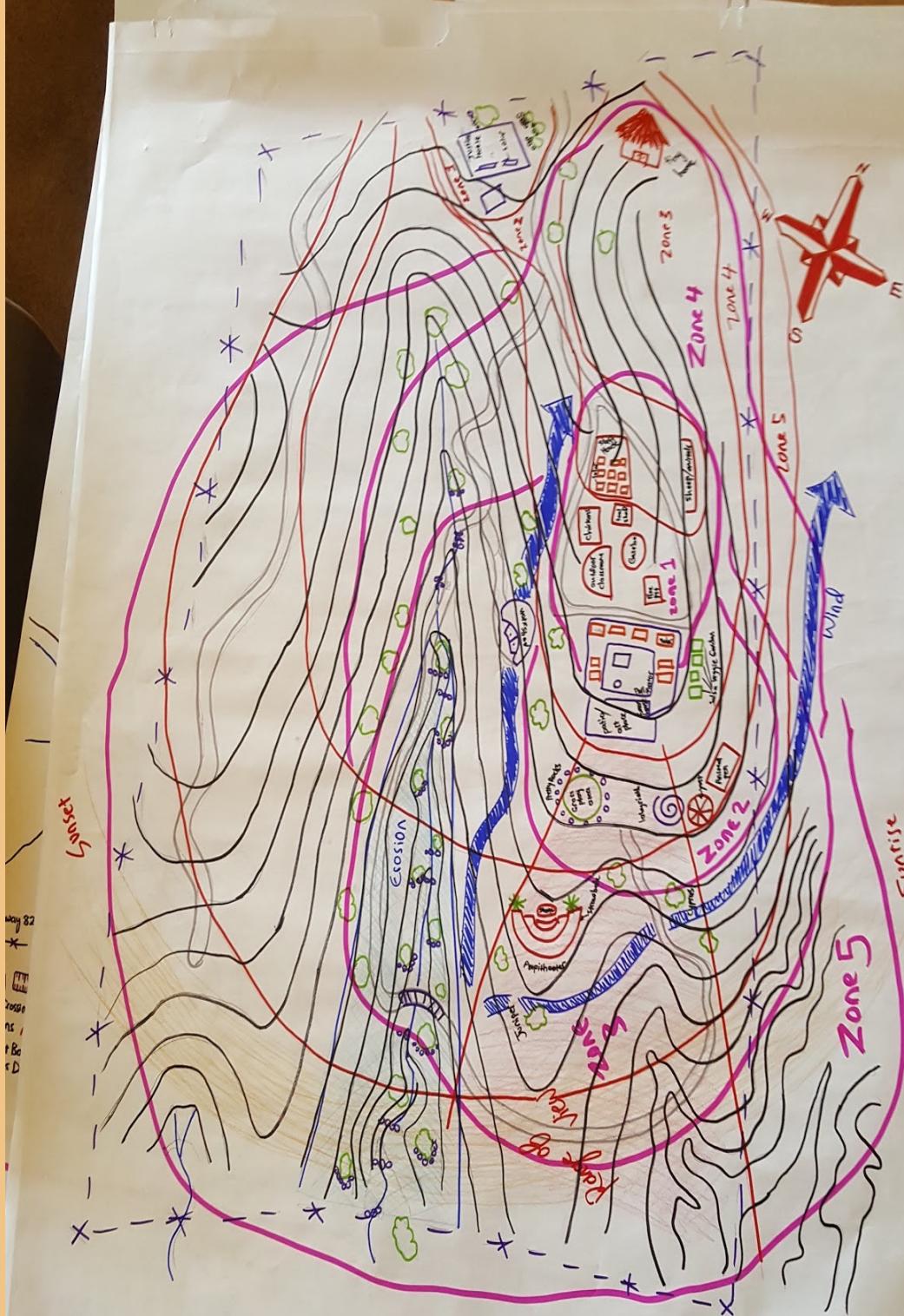
For our design of an overview of the greater borderlands community we have envisioned a place of education, recreation, regeneration, and restoration. We have decided to name this place The Borderlands Ocotillo International Center. The center is a Multinational Ecological and Community Restoration facility that aims to educate people on both sides of the border on topics and issues the borderlands is currently experiencing such as Environmental Issues, Border Issues, and Social Justice Issues. In addition to educate the center aims to be a showcase and research facility for Sustainable Living Techniques, Farming, and Teaching. This space will include a fully functional market to provide jobs and support the local economy, classrooms for education purposes, and on site maintenance and housing facilities. This Facility will play host to a large permaculture farm to serve as an experiential education classroom for those interested in Permaculture and farming. Along with providing jobs for locals, this farm will also provide all produce for the in town market allowing it to directly support the economy.

The Borderlands Ocotillo International Center is a Multicultural (Ecological and community restoration center) (Create restoration economy and educate people on both sides of the border on border issues, environmental issues, and social justice issues. Has classrooms and aside from the classrooms on facility it will play host to a large permaculture farm to serve as an experiential education center as well as a source of income for locals. There is opportunity for work within the local communities in farming teaching maintenance and working in the market. The market will only sell on site grown produce in short this facility offers great opportunity as a bridge between communities, a home to facilitate restoration economy and a place of education.





After an onsite assessment and a week of prototyping we have synthesized a design for the Windsong property. We have taken the 36 acres of the property and envisioned the highest fulfillable purpose it could obtain. First we observed how the natural world moves in conjunction with Windsong. We found strong winds from the south, a consistent illumination from the sun, and only 18 inch of rainfall on average a year. After our initial assessment we created an action plan that details our intended additions to the farm. Since we noticed a great need to save and catch water we added 2000 gallon water catchment system to each of the buildings. In an effort to conserve water within the property itself we altered the shape of the road to slow the flow of water on it. Along the lines of water we added many check dams around the property to combat erosion. Along the drainage on the west side of the property we added a small food forest to prevent erosion. We added an earth building just inside of the gate for modeling of natural building as well as a possible place for woofers to stay. We expanded the size of the chicken coop, added a large garden, and a rabbit den. In the center of the people's garden area we added an outdoor classroom. On the hill on the west side of the property we added a seed storage area. Along the northern gate we added Arizona sycamores to prevent the wind from damaging the gate. On the roof of the staff housing we added several solar panels. We also added a toolshed/ canning kitchen attached to the housing. Outside of the guest housing we decided on a small salsa veggie garden. The sun room was changed to a greenhouse, and the back patio made a space to create 2-d art. We kept the labyrinth and added a yoga circle. We left much of the hillsides clear to support animal grazing. Behind the hacienda we also added a grass play field. South west from the hacienda on the hill we added a north facing apse amphitheater to serve as a performing area as well as a windbreak for the hacienda. We added a trail that runs around the property to encourage walking and observance of the land. Lastly we created two sets of zones one stemming from justin's house and one from the hacienda.



# Sophia, Shelly, and Lily- Final Permaculture Design

February, 8th 2017

# Windsong Close Up Map



#### Food Forest:

pomegranates  
pecans  
walnuts  
figs  
olives  
raspberries  
canyon grape

#### Pollinator Garden:

milkweed  
desert honeysuckle  
hummingbird trumpet  
lemon balm  
monkey flower  
lupine

#### Herb Garden:

oregano  
rosemary  
thyme  
lemon balm  
lavender  
mint  
basil

#### Orchard:

cherries  
plum  
apricot  
apple

#### Windbreaks:

oak  
yucca  
mesquite  
juniper

#### Greenhouse Plants:

spinach  
kale  
lettuce  
komainos  
peas  
cucumber  
cucumbers  
water plants/seedlings

#### Vegetable Garden:

corn  
beans  
pods  
squash  
potatoes  
strawberries  
beets  
carrots

#### Grazing Animals:

sheep  
goats  
horses

#### New Structures/Areas:

amphitheater  
underground cellar  
straw bale tiny home  
fire-pit  
trail system  
play field  
berms/swales  
compost area  
sunroom into greenhouse

# Windsong Peace and Leadership Center

## EARTH CARE

Conservation  
Native Seed Saving

Creative Reuse  
Accessibility  
Animal Rights

Seed Storing  
Food Gardens

Holistic Wellness  
Restoration  
Education

Water Catchment  
Renewable Energy  
Natural Building

Native Plants  
Bulb Composting  
Pollinator Habitats

Living Wages  
Equal Opportunities

Multicultural Studies  
Scholarships

Play Space  
Art/Music  
Domestic Animals

ADA Approved  
Trails  
Community Engagement

Social Justice  
Network of Relationships

Farmer's Market  
Honoring Cultural History  
Demilitarization

PROVIDES A SAFE AND INCLUSIVE ENVIRONMENT FOR EMPOWERING YOUTH TO BECOME LEADERS IN THE AREAS OF SOCIAL AND ENVIRONMENTAL JUSTICE THROUGH COMMUNITY AND EXPERIENTIAL LEARNING

## PEOPLE CARE

## FAIR SHARE

# Venn Diagram

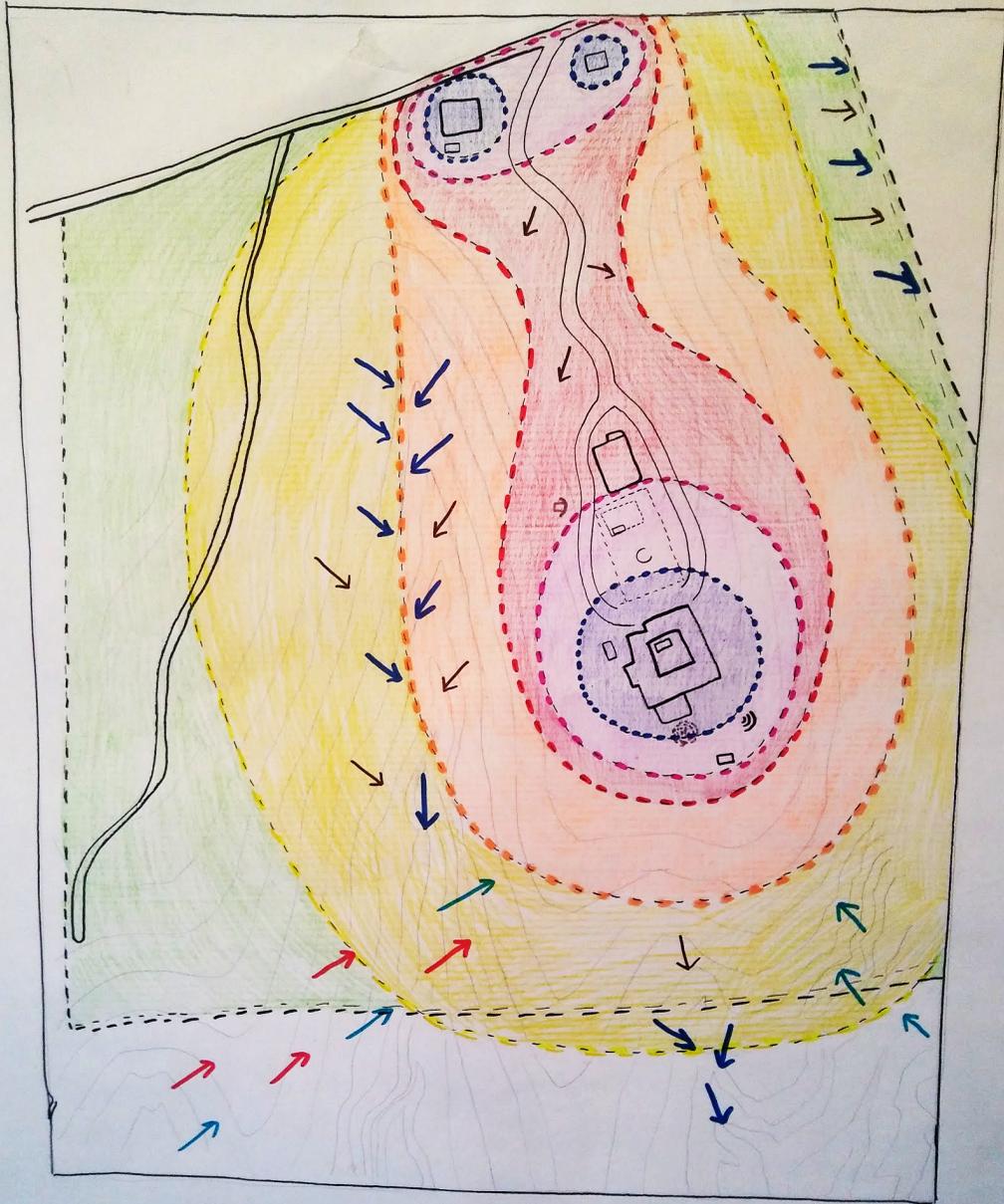
The venn diagram includes the mission statement of Windsong and the overlapping topics that relate Earth care, people care and fair share to both Windsong Peace and Leadership Center and the greater Borderlands region. We chose to use a flower of life to represent the connection between these elements because it is the pattern that embodies both the simplicity and complexity of the patterns of the natural world.



# Causal Loop Diagram

This Causal Loop Diagram visualizes the connections and loops present within the Borderlands Community as well as aspects we hope to see grow in community life there. The organization of our diagrams exemplifies how events, actions, attitudes and values positively or negatively relate to one another using plus and minus symbols. We hope that the visual organization of this is straightforward and direct. The bolded phrases are the key leverage points within the web that are connected to the most amount of specifics that form loops. Identifying these leverage points is important when understanding community dynamics and how far reaching these critical concepts can be in many areas. When one wished to change something within the web, they can pour energy and focus into leverage point areas for the most amount of impact. Lastly, we included areas that seemed logical, practical and sensible for this community as we designed this map with the intention of Borderlands Restoration and alignment.

# Windsong Zone and Sector Map



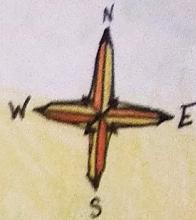
- |           |                     |
|-----------|---------------------|
| → Wind    | ----- Zone 1        |
| → Water   | ----- Zone 2        |
| → fire    | ----- Zone 3        |
| → erosion | ----- Zone 4        |
|           | ----- Zone 5        |
|           | ----- Property line |

# Zone and Sector Map

This map shows all the zones and sectors on the Windsong Peace and leadership Center land. Zones and Sectors are created to aid in efficient energy planning, and the placement of elements such as trees and plants, animals, structures and buildings. Zone One, the closest to the main dwellings, is composed of high maintenance areas, or areas that are accessed most frequently. Some examples of elements in zone one are vegetable and herb gardens that need regular watering, or are harvested from on a daily basis. Zone two contains features that are slightly less accessible and controlled than those in Zone one. Zone two is made up of larger, more independent systems, such as larger trees, compost area, and animals. Zone three is much more sprawling, shows less human influence and requires very little regular maintenance. Pastures and grazing areas are most often found in this zone. Zone 4 is primarily wild lands with some minimal restoration efforts such as berms and swales. Zone five has very low accessibility if any, and is left to its natural ways.

This technique of organizational planning, minimizes effort and maximizes productivity. Marking Zones in combination with identifying sector movement patterns (wind, water, erosion, fire) allows us to make every building, system, or plant we implement intentional and creates stacking functions. Stacking functions are created when one element, such as a tree, serves multiple purposes. For example, if this tree was a cherry, it would provide food, shade/a windblock, firewood, beauty, habitat for other plants, and pollen for bees and other pollinators. By planning around land features and patterns that already exist, designs will also seem more natural and require less maintenance. The intention for this map is to help us reach our goals of efficiency and productivity for this land, and create an intentional space that meets our needs while benefiting the surrounding environment.

# Borderlands Overview Map



Other **Borderlands Resilience and Leadership Center** locations include:  
Patagonia, Arizona → Borderlands Restoration Institute, + Deep Dirt Farm;  
Nogales, Arizona; Nogales, Sonora, Mexico; Naco, Sonora, Mexico

5 miles

# Windsong and Borderlands Overview Map

Our design plan for the Greater Borderlands Community is to build and implement a systemic network of centers throughout the region that work together in restoring and regenerating through permaculture and intentional practices. The first of these centers is Windsong Peace and Leadership Center, which focuses primarily on the voice of youth empowerment within the greater community. Our plan for what we are calling the Borderlands Resilience and Leadership Network is that it will serve as an intergenerational and international system of centers that can connect physically when able and through skype to educate, develop and help support projects of restoration in the Borderlands. These projects will include the rich infrastructure and resources already existing within the community. The locations will be the Youth leadership center at Windsong, a community center in Patagonia at the Institute, an Elders Center at Deep Dirt Farm, and Community center in Nogales, AZ and two Community centers in Nogales, Sonora, Mexico and in Naco, Sonora, Mexico. As these centers connect through technology such as skype, this opens up possibilities for a larger global system for restoration and resilience.

We were inspired to use a slow and small solution, as a permaculture principle, to create a system of local community members that could education and decide for themselves what their local community wants and needs, instead of us creating large changes within the physical landscape that is not home to us. Our intergenerational collaboration focus derived from our visit with Kate Tirion at Deep Dirt Farm because we felt that the hope we gave her was equal to the hope she gifted us.

# Tools & Resources



## 1. Permaculture

- a. Principals 1-12- <https://www.permaculture.co.uk/what-is-permaculture>
- b. Leaders: Mollison, Hollgrum -<https://www.permaculture.co.uk/what-is-permaculture>
- c. Permaculture ethics -<https://www.permaculture.co.uk/what-is-permaculture>
- d. P.E.M.S & P.A.S.E.R: [https://www.findhorn.org/programmes/applied-ecovillage-living/?id=53&price1=2280&price2=1880&price3=1720&date=080214&days=27&intro&price\\_date=0](https://www.findhorn.org/programmes/applied-ecovillage-living/?id=53&price1=2280&price2=1880&price3=1720&date=080214&days=27&intro&price_date=0)
- e. Constructible structures
  - i. Berms n swales- <http://www.harvesth2o.com/swales.shtml>
  - ii. Rain barrel- <http://www.rainbarrelguide.com/>
  - iii. Solar roof- [https://en.wikipedia.org/wiki/Solar\\_energy](https://en.wikipedia.org/wiki/Solar_energy)
  - iv. Passive solar- [https://en.wikipedia.org/wiki/Solar\\_energy](https://en.wikipedia.org/wiki/Solar_energy)
  - v. Check dam- [https://en.wikipedia.org/wiki/Check\\_dam](https://en.wikipedia.org/wiki/Check_dam)
  - vi. Straw Bale building- [https://en.wikipedia.org/wiki/Straw-bale\\_construction](https://en.wikipedia.org/wiki/Straw-bale_construction)
  - vii. Tiny Homes- [https://en.wikipedia.org/wiki/Tiny\\_house\\_movement](https://en.wikipedia.org/wiki/Tiny_house_movement)
  - viii. Apse- see section on structures <https://en.wikipedia.org/wiki/Arcosanti>

## 2. Agroforestry

- a. Founder [http://www.worldagroforestry.org/Units/Library/Books/Book%2007/agroforestry%20a%20decade%20of%20development/html/1\\_introduction.htm?n=6](http://www.worldagroforestry.org/Units/Library/Books/Book%2007/agroforestry%20a%20decade%20of%20development/html/1_introduction.htm?n=6)
- b. Principles- <https://en.wikipedia.org/wiki/Agroforestry>
- c. Examples- <https://www.youtube.com/watch?v=gSPNRu4ZPvE>

## 3. Restoration economy

- a. Principles <https://curs.unc.edu/files/2014/01/RestorationEconomy.pdf>
- b. Purpose <https://curs.unc.edu/files/2014/01/RestorationEconomy.pdf>
- c. First Hand Knowledge and Experience from Market Owners: <http://www.nogalesmercado.com>

## 4. Restoration economy

- a. Principles <https://curs.unc.edu/files/2014/01/RestorationEconomy.pdf>
- b. Purpose <https://curs.unc.edu/files/2014/01/RestorationEconomy.pdf>
- c. First Hand Knowledge and Experience from Market Owners: <http://www.nogalesmercado.com>
- d. Economic Context of Patagonia: <http://www.patagoniaalliance.org>
- e. Ron Pulliam's Perspective on a Restoration Economy: <https://www.scientificamerican.com/article/ldquo-restoration-economy-rdquo-strives-to-protect-pollinators-create-jobs/>

## 5. Social Justice

- a. The Border: Undocumented workers, Bilingual School- <https://www.hrw.org/news/2011/10/07/us-immigrant-injustice>
- b. Food Justice: <https://www.jacobinmag.com/2016/09/agriculture-ecology-food-justice-farmworkers-local-climate/>
- c. Gardens <http://deepeningcommunity.ca/content/urban-gardening-and-social-justice>
- d. Hero to Host- <http://www.margaretwheatley.com/articles/Leadership-in-Age-of-Complexity.pdf>
- e. First hand Witness of the kinds of Injustice that Occur on the Border Wall: <http://www.mexicayotlacademy.com>

## 6. Info aid

1. Borderlands restoration- <http://borderlandsrestoration.org/>
2. Native seed search- <http://www.nativeseeds.org/>
3. Deep dirt- <http://borderlandsrestoration.org/watershed-restoration/deep-dirt-field-institute/>
4. Windsong peace and leadership center- <http://www.windsongretreatcenter.com/Home/About.html>
5. Patagonia area resource alliance- [www.PatagoniaAlliance.org](http://www.PatagoniaAlliance.org) , <http://patagonia-az.gov/about/history/> , <http://www.patagoniaalliance.org/> , <http://www.patagoniaaz.com/about-the-area/>
6. Border Background Knowledge from Erin: <https://www.metowe.com/leadership-programs/arizona-leadership-center/>
7. The Definition of Arcology <https://arcosanti.org/Arcology>
8. permaculture principle wheel <http://www.gubaswaziland.org/>
9. permaculture zones image <http://lovelygreens.com/2012/08/learning-about-permaculture-zones.html>
10. topographic map images- [https://en.wikibooks.org/wiki/High\\_School\\_Earth\\_Science/Topographic\\_Maps](https://en.wikibooks.org/wiki/High_School_Earth_Science/Topographic_Maps)
11. [https://upload.wikimedia.org/wikipedia/commons/e/e9/Bryce\\_Canyon\\_Swamp\\_Canyon\\_Trail\\_topography.jpg](https://upload.wikimedia.org/wikipedia/commons/e/e9/Bryce_Canyon_Swamp_Canyon_Trail_topography.jpg)
12. Photo-
  - a. [https://c1.staticflickr.com/3/2808/11036067046\\_dcc7ebb69a\\_b.jpg](https://c1.staticflickr.com/3/2808/11036067046_dcc7ebb69a_b.jpg)
  - b. <http://i.huffpost.com/gen/1395712/thumbs/o-TALK-TO-A-PLANT-facebook.jpg>
  - c. <http://www.pestuk.com/blog/wp-content/uploads/2013/03/Bee.jpg>
  - d. <http://ohtoptens.com/wp-content/uploads/2015/06/Flower-Images-and-Wallpapers.gif>
  - e. <http://www.optimizeguide.com/wp-content/uploads/2016/05/interview.png>
  - f. <https://cdn.searchenginejournal.com/wp-content/uploads/2013/12/interview-progress.jpg>
  - g. <http://www.aliem.com/wp-content/uploads/interview.jpg>
  - h. <http://images.wisegeek.com/greenhouse-inside.jpg>
  - i. [http://www.solarkinguk.com/wp-content/uploads/2012/03/5052486185\\_f4e5d3e48a\\_b.jpg](http://www.solarkinguk.com/wp-content/uploads/2012/03/5052486185_f4e5d3e48a_b.jpg)
  - j. [https://sustainabilityworkshop.autodesk.com/sites/default/files/styles/400px/public/core-page-inserted-images/rainwater\\_harvesting\\_icon\\_-\\_revised.jpg](https://sustainabilityworkshop.autodesk.com/sites/default/files/styles/400px/public/core-page-inserted-images/rainwater_harvesting_icon_-_revised.jpg)
  - k. <http://www.pixelstalk.net/wp-content/uploads/2016/08/Flowery-digital-design-HD-wallpaper.jpg>
  - l. <http://clemensvdlinden.com/wp-content/uploads/2015/06/web-design.png>

## 7. Social Justice

1. The Border: Undocumented workers, Bilingual School- <https://www.hrw.org/news/2011/10/07/us-immigrant-injustice>
2. Food Justice: <https://www.jacobinmag.com/2016/09/agriculture-ecology-food-justice-farmworkers-local-climate/>
3. Gardens <http://deepeningcommunity.ca/content/urban-gardening-and-social-justice>
4. Hero to Host- <http://www.margaretwheatley.com/articles/Leadership-in-Age-of-Complexity.pdf>
5. First hand Witness of the kinds of Injustice that Occur on the Border Wall: <http://www.mexicayotlacademy.com>

## 8 Obstacles

1. Monocrops- <https://en.wikipedia.org/wiki/Monocropping>
2. Erosion: [https://en.wikipedia.org/wiki/Soil\\_erosion](https://en.wikipedia.org/wiki/Soil_erosion)
3. Pollinator Decline- <http://www.sciencealert.com/seven-species-of-bees-have-been-added-to-the-endangered-species-list>
4. The Border: Economy, Migration- <http://www.as-coa.org/articles/get-facts-five-reasons-why-us-mexico-border-critical-economy>

## 9 . Restoration

1. Biodiversity- <http://www.greenfacts.org/en/biodiversity/l-3/1-define-biodiversity.htm>
  - a. Seed dispersal- <http://www.nativeseeds.org/>
2. Soil replenishment- <http://www.fao.org/docrep/t0389e/t0389e02.htm>
  - a. Additions of organic matter-<http://www.dummies.com/home-garden/gardening/how-to-improve-garden-soil-with-organic-matter/>
  - b. Vermiculture- <http://www.wormpoop.com/composting/composting.htm>
  - c. Nitrogen Fixing plants- <https://www.gardeningknowhow.com/garden-how-to/soil-fertilizers/nitrogen-nodules-and-nitrogen-fixing-plants.htm>
  - d. Symbiotic plants-<http://yardsurfer.com/companion-planting/>



You're crazy  
Kool!  
Cammie

From the bottom  
of my heart, thank you  
for inspiring my kind, genuine  
my heart, and fighting a fire  
is action - Jackson

Jacob Pasley

John Calista

THANKS FOR  
the warm welcome  
you all ♡  
inspire  
me deeply  
Thank you!!!  
- Anya ☺

Thanks for  
Everything



John Pasley

Thank you  
for showing us  
around such an  
amazing community!  
I hope you see how  
all in the future!  
Vicky

It has been so  
awesome getting  
to meet all of you and  
all the amazing work  
you do! Thank you,  
Karin D.

Thank You  
for sharing all your  
wisdom and kindness with  
us! I learned so much  
and I am very grateful!  
Dorria

Thank you for being part of the process,  
teaching us, and allowing us to have such  
unique experiences!

This was possible because of you:

Adventures in Permaculture

[https://www.youtube.com/watch?  
v=3CM8U0mSfeM&t=438s](https://www.youtube.com/watch?v=3CM8U0mSfeM&t=438s)

Permaculture in Motion

[https://www.youtube.com/watch?  
v=tz24d8Qeank&t=30s](https://www.youtube.com/watch?v=tz24d8Qeank&t=30s)

