

Sustainable Ecodesign Institute

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May 3, 1991

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ABSTRACT

As a landscape architecture student, I have discovered that learning about sustainable ecodesign is not an easy task. For my thesis project, I have created a sustainable ecodesign institute as a working model that demonstrates methods so students, designers, and lay people can learn, apply, and teach these sustainable "little-discovered" methods. Many valuable sustainable ecodesign lessons that were once commonly practiced now need to be reintroduced into mainstream society and combined with current appropriate technologies so design efforts that threaten the entire ecological cycle are halted.

The various investigative design methods used to complete the project includes gathering resource material in the form of people, texts, journals, and magazines; choosing a site; reviewing existing working models for sustainable ecodesign; creating diagrams and lists to determine important factors that must be present in the final plan; analyzing the site; writing a project program; brainstorming conceptual thought; recording preliminary studies; designing the final product; preparing the thesis critique; and organizing the final thesis book.

INTRODUCTION

My thesis project involves designing a East Central Indiana research institute, as a working model, that demonstrates sustainable ecodesign methods. The whole communal complex has an overriding philosophy with regards to:

1. Following the laws of life (discovering that nature reflects harmonious and chaotic change in balance).

2. Reflecting bioregionality (the idea of a group of ecosystems exemplifying a certain region).
3. The use of renewable energy sources.
4. Being self-sufficient through the integration of living systems.

Demonstrations are held on the site to teach sustainable ecodesign, such as; site contained design (no importing or exporting of materials), bioengineering, permaculture, erosion control, plant diversification, crop rotation, terraced farming, wetlands and native plant associations, and natural materials on site used as structural elements. Workshops and seminars educate designers and lay people with do-it-yourself techniques and encourage grass roots movements.

BACKGROUND

Main Problem:

Sustainable ecodesign is not widely practiced in the environmental design fields of today. Reverence for nature has evolved into an ignorance or oversimplification towards nature. Instead of demonstrating human ecosystems that function in sustainable way with the grand, natural ecosystem, humans are simply satisfied to partake in life as observers, full of praise for illusionary aesthetics and aghast when a crisis surfaces. Societal changes must occur so that we can eliminate the idea of promoting industrial growth and financial gains no matter what the cost to the natural systems. Once the importance of the lessons to be learned from nature is realized, ecologically sensitive design practices will be in demand. As a designer, I feel that it is my obligation to be able to inform colleagues and the public about sustainable ecodesign practices.

Literature and Other Sources:

Many thoughts held by environmentalists today, directly relate to what I want the bioregional learning center essentially to uphold. Ernest Callenbach's comments from bicycles to solar energy reinforce the mindset of what I see bioregional ecological centers radiating.

"Ecotopians are devoted to stable state systems and technologies which disrupt the natural order as little as possible. They do not believe in the old kind of Progress or expansion, but wish to live - personally and in the realm of technology and economics - in modest, reliable, nondestructive ways" (Callenbach 274). Even though Ecotopia is fictional, I am presenting the ecotopian philosophy as the central theme of my thesis project.

In the book, Design For Human Ecosystems, John Lyle addresses sustainable living from the design perspective. "This book describes principles, methods, and techniques for shaping landscape, land use, and natural resources in ways that can make human ecosystems function in the sustainable ways of natural ecosystems" (Lyle 5). Lyle provides suitability models that are especially helpful when needing information on biological sewage treatment, water flow systems, stratified agriculture, forest production, vegetative habitats, or wetlands restoration.

Two other environmentalists with advice to offer are Lester Brown and James Lovelock. Brown gets people involved in sustainable living by saying, "We have not inherited the earth from our fathers, we are borrowing it from our children" (Brown 349). Lovelock's philosophy is based on a way of seeing the Earth different by referring to the planet, Gaia, as being alive. He believes that we can either see the world as a living organism that we are part of, or become extinct (Lovelock 38).

Sustainable ecodesign involves all aspects of life. One communal

resident explains, "We are always doing most of the following: auto maintenance, child care, construction, utilities maintenance, purchasing, cooking and baking, darkroom work, administration, forestry work, business management, gardening, publishing, home births, computer work, furniture and cabinet making, driving, warehousing, health care, building maintenance, dairy work, indexing, choral singing, folk dancing, tai chi, dramatic productions - you name it, we do it" (Kinkade 80).

I do not see ecologically-sensitive design as the sole solution for a safer world; whole attitudes will have to be examined and altered, also. The book, Healing The Wounds, The Promise of Ecofeminism, has challenged me to bring together body, mind, and spirit; the personal, political, and the spiritual; and theory, practice, and reflection. "This book is about global ecological sisterhood. We need such books and such anthologies more than ever because we must illuminate now the vision of a world free of mass destructive weapons, free of sexism and racism, free of violence and repression" (Plant 262). As I live each day, I develop an even stronger background for sustainable ecodesign.

Upon viewing several video tapes that feature issues on sustainable life styles, I have noted a few catch words and phrases mentioned that pertain to my thesis project: bioengineering, permaculture, solar aquatic systems, bioshelters, energy cycles, ridge till, cover crops, organic fertilizers, diversity, manure pits, mainstream farmers searching for alternatives, use nature's subsidies - not the government's, beneficial insects, basic approach to living, organic farming, greenhouses, livestock, orchards, compost, cover crops, meditation area, and group weeding parties (See Bibliography). These terms refer to approaches to land design that may be represented within the research/educational components of

my project.

Definitions:

Bioregionalism - a cluster of ecosystems arranged topographically and climatically so as to delineate a distinct region. As a cultural movement it celebrates the particular: the unique and often indescribable features of a place. It celebrates this through visual arts, music, drama and symbols which conveys the feeling of place.

Diversity - the increase from a few organisms to complex interactions increases the number and relationships, promotes stability, protects from external change which all result in a greater order.

Organic Farming - being able to know, grow, and regulate food without artificial fertilizers, insecticides, preservatives, or coloring for healthier living.

Greenhouses - offer year-round food supply and research.

Sustainable Ecodesign - practice of creating sustainable and regenerative landscapes, and understanding that the landscape is a self-supporting ecosystem which revitalizes our land, body and spirit.

Erosion Control via Bioengineering - to protect the soil and eliminate topsoil loss.

Watershed Management - using water wisely by minimizing inputs and outputs.

Commune - people coming together for a particular purpose and are committed to living together. All members share chores and responsibility for maintenance.

Climatic Conditions - wind, precipitation, temperature and solar influences.

Self-reliant Site - creates renewable energy and produces some sort of food.

A Transformed Society - requires a total restructuring of mental and spiritual selves, the spirit and feeling of a community, a place which reflects spirituality and diversity, yet emphasizes unity.

Four Characteristics of Healthier Lives - sense of humor, altruistic (helping other people), anticipation (foresaw problems and delayed gratification), and being able to forget about anger and hurt.

PROGRAM REQUIREMENTS

Goals:

By designing a sustainable ecodesign institute, I present sustainable living information otherwise unspoken of except by a select few. I want sustainable ecodesign to become a common practice among lay people, landscape architecture, architecture and conventional engineering firms. I see the institute as a place for people from all backgrounds to gather, and collect and trade environmental information on a site with sustainable ecodesign demonstrations at work. The communal living and workshop participants can then branch out to other communities, all levels of the educational system, and grass roots movements to create other sustainable ecodesign institutes.

Client:

The main focus of the institute will be to educate about the practice and basic research of sustainable ecodesign. Any ecologically-conscious person is a potential participant in the communal living, workshops and seminars which would take place at the institute. Twenty students from

Ball State University will live on the site for one semester maintaining the area and conducting research. The first students to live at the institute may be majoring in landscape architecture, but future participants may come from any of the colleges at the university. Dave Ferguson and family will continue living on the site offering valuable input and direction. Various educational programs will bring up to twenty people onto the site temporarily to live and learn up to a week. Other programs will involve the students explaining the living systems in a site tour to school groups and other interested people.

Activities:

This working model will provide housing (permanent and temporary), food production, waste utilization, and happiness. To be self-sufficient in food and energy: organic gardens, orchards, windmills, solar power, aquaculture, greenhouses, herb gardens, composts, a public farmer's market, and alternative agriculture are all considerable actions to be incorporated into the design. Issues pertaining to happiness include meditation areas, a library, and a gathering place for meetings, dancing, singing, theatre and musical productions.

Assumptions:

* People (from designers to your own neighbor) want to protect the land and its' resources for future generations, and they are willing to alter their current styles of living and attitudes.

* A group of highly motivated, nature oriented people have donated the money for the sustainable ecodesign institute whose programs will concentrate on East Central Indiana and its' environmental attributes.

* Ball State University landscape architecture professors and students have acquired the site, and they have volunteered to set the design layout in motion. All construction and installation will be done by professors, students, and volunteers as a part of the learning process.

* The students will live on the site to maintain the sustainable ecodesign demonstrations, workshops, seminars, and outreach programs.

SITE DESCRIPTION

The site is located on 750 West in Yorktown, Indiana. Approximately 30 acres of the site is owned by Professor Dave Ferguson. 20 more acres border the White River. Buildings (house, barn and several outbuildings) and pasture are on 8.75 acres, and the tilled fields are on 22 acres (the upper north field is 7 acres, and the lower south field is 15 acres). This rural area offers diversity in topography, vegetation and microclimates, which can support a variety of examples of sustainable ecodesign. This retreat away from industrialization gives access to Ball State University faculty and students, and a hands-on opportunity to learn from ecological systems.

The homestead area contains the Ferguson house, barns, outbuildings and black locust trees. Besides the tilled fields, there is an observation point on the central hill that provides a panorama of the entire site. On the west side of the hill is a clearing which is enclosed by the surrounding slope, and has a sacred, calming feeling. On the east side of the hill is an open, clear area.

The site is open to Indiana's winds and smells of growing and decaying plants. The traffic from Route 32 is distracting to the point of not belonging. The long views over the fields to the trees bordering the

White River have an horizontal feel with lots of sky. When on the site, one is aware of the surrounding rural properties, but not to the extent of feeling imposed upon. Northwest of the site is a woodlot. Vegetation borders the river's edge. The real history of the site is told by the 10 trees near the house standing 80'+ and are over one hundred years old. The topography is gently sloping to flat fields.

Fox silt loam is found on the upper level and on the northeast corner of the lower level. The 0 to 2% slopes occupy terraces and outwash areas. Native vegetation was hardwoods. Fox loam is found on the 12 to 18% slope near the built area. This slope is subject to further erosion. Sloan silt loam is found on the bottom of the slope, and collects water from the higher areas. Ross soil occupies the level flood plain on the lower half of the site. Native vegetation was mixed hardwoods and prairie grasses. Genesee silt loam borders the White River.

The White River is seen, smelled, heard, and felt from the site, and it defines the character of the area. The sound of the flowing water is heard throughout the entire site (a calm, easy flow around the bend - speeding up when there are not any obstacles past the steel bridge). Vegetation flourishes on the borders of the river which is full of wildlife. The river is the source of uniqueness, and the giver of life to the entire area. The site seems to be restrained, yet eagerly wanting to breathe in full force - the calm living on the edge of entropy.

CONCEPTS

Spatial Concept:

The outlook acts as the central, gathering point where visitors choose which part of the site to visit. Each area radiates from the outlook

hub which provides a view of the whole site and a trailhead to various paths. The different areas are the sacred clearing, demonstration area, food production, wildlife preserve, White River and dwelling area.

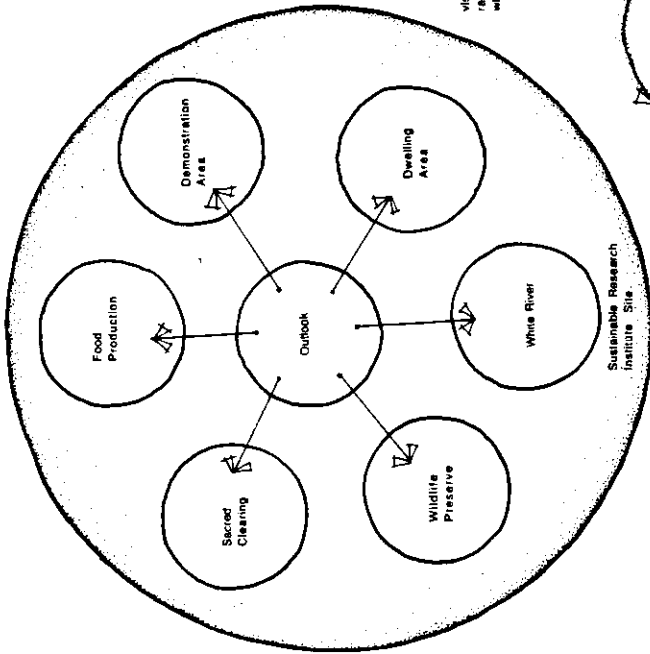
Spiritual Concept:

The spiritual concept reflects the importance of the White River. The site design allows for the participant to choose which path to take in life. Some areas provide a sense of security, stability and comfort while other areas encourage self-discovery, to ask questions and take chances. The ultimate answers lie in the river - the source of birth and death.

Grand Concept:

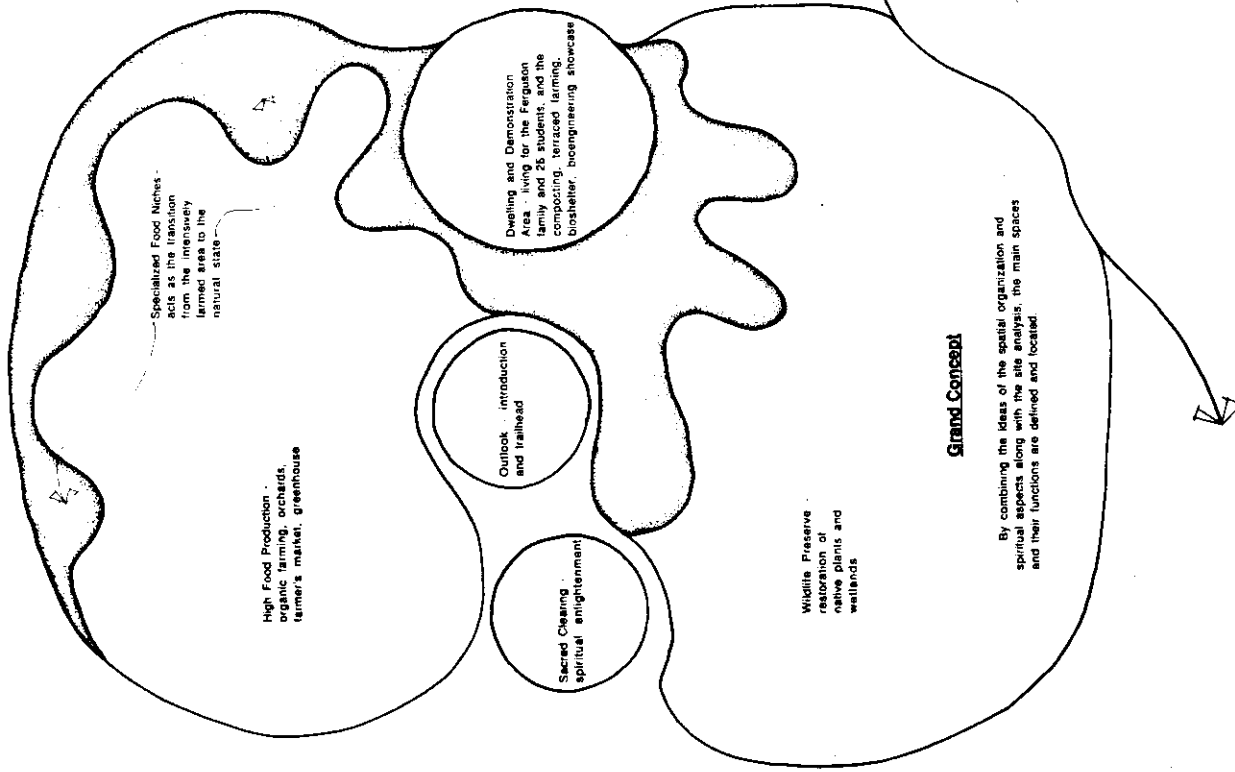
By combining the spatial organization and spiritual aspects with the site analysis, the main spaces and their functions were defined.

1. High food production with organic farming, orchards, a farmer's market and greenhouse is located on the upper level of the site.
2. A dwelling and demonstration area is where the Ferguson family and students live, and where the bioshelter is located. This is the existing homestead.
3. The outlook is an introductory point and trailhead.
4. The sacred clearing is for spiritual enlightenment.
5. The wildlife preserve to be revegetated and restored to wetlands is on the lower level.
6. Specialized food niches act as the transition from the intensively farmed area to the natural state on the lower level.



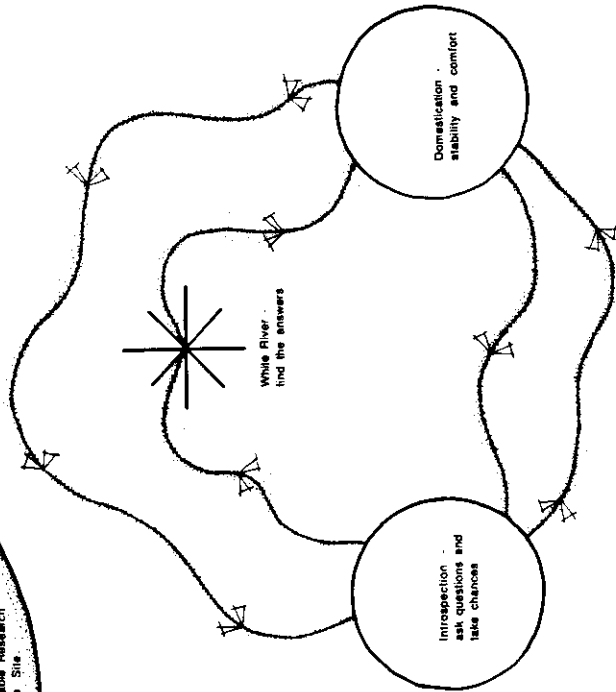
Spatial Concept

The outlook acts as the central, gathering point where visitors choose which part of the site to visit. Each area radiates from the outlook hub which provides a view of the whole site and a trailhead to various paths



Grand Concept

By combining the ideas of the spatial organization and spiritual aspects along with the site analysis, the main spaces and their functions are defined and located.



Spiritual Concept

The site design allows for the participant to choose which path to take in life. Some areas provide a sense of security while other areas encourage self-discovery. The ultimate answers lie in the river - the source of birth and death

COMPREHENSIVE PLAN

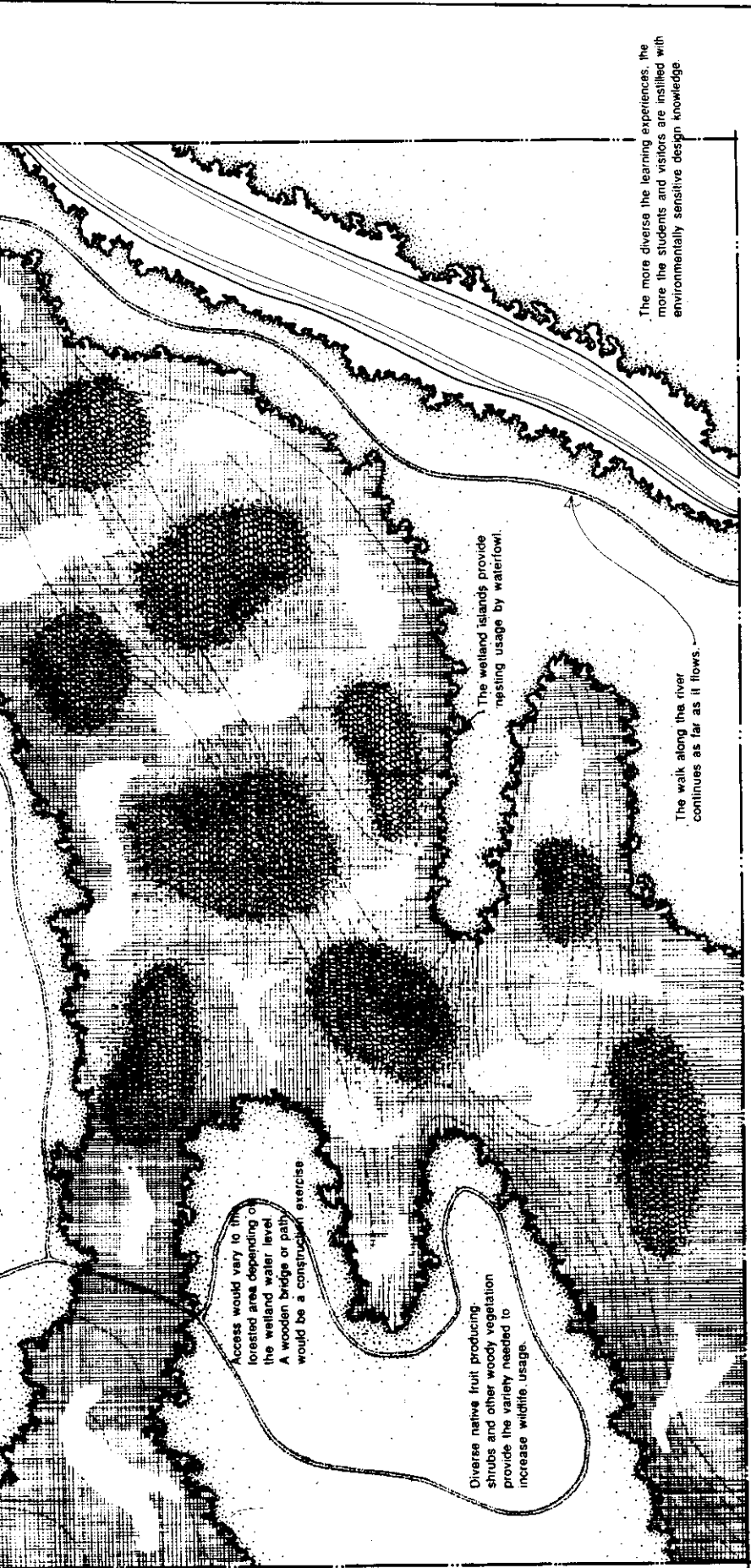
Two entrances to the site are provided seven parking spaces using a paving that is a water permeable surface to retain runoff are provided at the public entrance, any extra automobiles may park on the roadside. The private entrance allows the Ferguson family and students a separate access to the site.

The private residence is surrounded by pre-existing black locust trees and a native understory to promote a strong wildlife environment. Strawberries grow as the ground cover. The students live in the two-story renovated barn surrounded by wildflowers. The Ferguson house is secluded yet easily accessible to the institute to allow privacy for the family.

The windmill on the public welcoming corner brings up water from a well to demonstrate alternative energy. A diagonal promenade lined with cherry trees brings visitors to the institute with a grand flourish. The orchard full of 150 apple, plum, peach and cherry trees is rotated so that the visitors are brought straight to the trailhead from the public entrance in a formal procession. Temporary foods stands for the weekend farmer's market is an open grassy area bordered by fruit trees.

Food production on the upper level consists of raised beds that grow healthy soil and a variety of crops, organic mound farming of mixed vegetables, bee hives for a supply of honey, nut trees that extend from the existing woodlot, 5' x 5' composting of plant waste and refuse where the access paths cross, greenhouses which extend the growing season and allow propagation of native species, and a grape arbor which a trellis leading to the overlook.

The demonstration area is south of the student housing. Groups and



Access would vary to the forested area depending on the wetland water level. A wooden bridge or path would be a construction exercise.

Diverse native fruit producing shrubs and other woody vegetation provide the variety needed to increase wildlife usage.

The wetland islands provide nesting usage by waterfowl.

The walk along the river continues as far as it flows.

The more diverse the learning experiences, the more the students and visitors are instilled with environmentally sensitive design knowledge.



Comprehensive Site Plan

7 parking spaces are provided at the public entrance, extra autos may park on the roadside.

The farmer's market is an open grassy area bordered by fruit trees.

150 apple, plum, peach, and cherry trees.

Raised beds to grow healthy soil.

Organic mound farming of mixed vegetables.

The diagonal promenade lined with cherry trees brings visitors to the institute with a grand flourish.

The private residence is surrounded by pre-existing black locust trees and a native understory to promote a strong bird environment.

Strawberries grow as the ground cover.

The storage shed also acts as a garage for the Fergusons.

Students live in the restored barn.

Groups and students meet at the amphitheater for lectures, concerts, and plays.

The aquaculture pond supports productive aquatic plants such as water chestnuts and watercress.

The bioshelter maximizes solar use. The students use the lower level for indoor recreational purposes. The public have access to the upper level library and gathering hall.

Experimental crops to record hardiness and productive qualities of native species.

Composting of plant waste and refuse where the paths cross

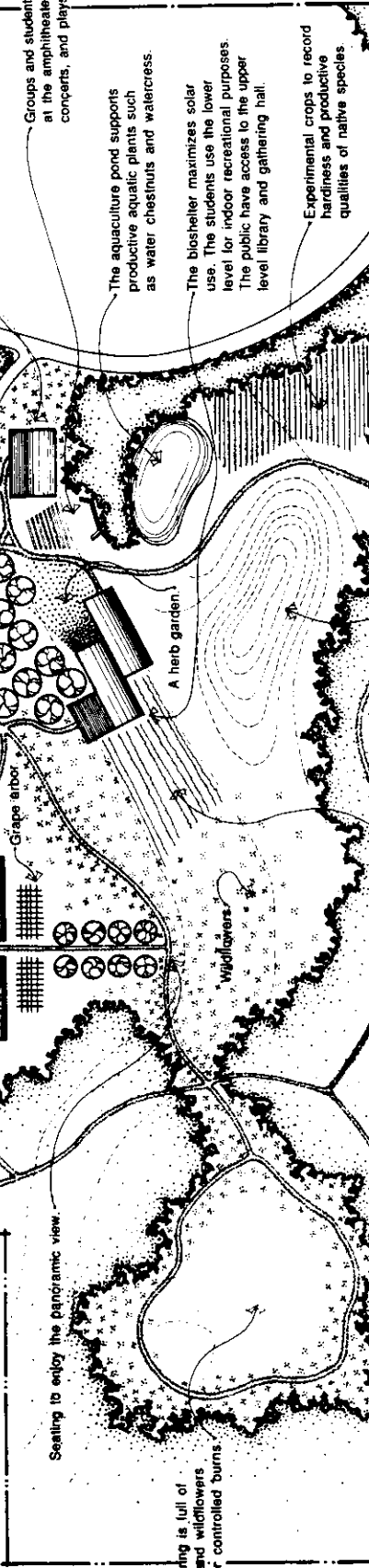
Beehives for honey production.

Nut trees extend from the woodlot.

The greenhouses extend the growing season, and allow propagation of native species

Seating to enjoy the panoramic view

The sacred clearing is full of native grasses and wildflowers - opportunity for controlled burns.



students are able to meet at the amphitheater for lectures, concerts, and plays. An herb garden is next to the amphitheater. The aquaculture pond supports productive aquatic plants such as water chestnuts and watercress. Experimental crops are grown to record hardiness and productive qualities of native species. Earth mound exercises promote bioengineering techniques. Intermixed terraced crops control plant disease and insect pests. The bioshelter maximizes solar use. The students use the lower level for indoor recreational purposes. The public have access to the upper level library and gathering hall.

The sacred clearing is enclosed by the slope and surrounding vegetation while a trail circles the clearing. It is full of native grasses and wildflowers, allowing the opportunity for controlled burns.

The wetlands cover the entire lower level by breaking the existing levee. The diverse native fruit producing shrubs and other woody vegetation provide the variety needed to increase wildlife usage. The wetland islands increase nesting usage by water fowl. The walk along the river continues as far as it flows.

The purpose of the trail system is to give participants many choices for a variety of experiences. More linear, formal paths are found in the intensively farmed area, while the naturalistic wetlands paths are flowing.

The more diverse the learning experiences, the more the students and visitors are instilled with environmentally sensitive design knowledge.

DISCUSSION OF FINAL SOLUTION

Upon final presentation, many thoughtful insights were suggested

pertaining to the comprehensive plan. Professor Malcom Cairns questioned the emphasis on functional design which lacked in aesthetics. Many aspects of the midwest landscape could be taken advantage of and incorporated into the final design. My concern to make the institute work left room to improve upon how the places actually look. The surrounding context also needs to be explained about breaking the levee concerning wetlands expanding to the other properties.

Professor Ron Spangler asked for more information on the installation of the plan in a phase sequence. Even more thought and planning would be needed to create a installation and maintenance plan ranging in difficulty and time spans.

Greg Mohr mentioned my personal commitment to sustainable ecodesign, and wanted to know how this thesis project has changed my lifestyle. Not only has my eating habits altered, my living habits now include recycling, discussing self-sufficiency with friends and strangers, reading any sustainable information possible, and thinking for tomorrow.

SUMMARY

A sustainable ecodesign institute educates all people about a way to live with the earth. While recognizing that ecological sensitive design is important, whole attitudes need to be examined and changed also. I hope my thesis project demonstrated a philosophy in landscape architecture design that is aware of its role in the overall grand scheme.

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