Revealing the Beauty of Biesbosch

----Experiencing the Ecological Aesthetics of Dynamic Landscapes through Recreation

Dan Liu | 4448723
CHN - thousand islands
NL - Biesbosch
After construction of power station

Before 1959
The story behind the fish-like islands...?
Site Visit - spatial

views from the dike, changing with the route, different on both sides.
What is Biesbosch like in professionals’ eyes?
What is Biesbosch like in ordinary visitors’ eyes?
Combination of sky, water and green

- The images are nothing special by contrast of the ordinary.
- Biesbosch needs a design that helps to perceive the beauty in a more exciting way.
Analysis - general

A complex of natural processes and human interventions...

Timeline of natural events and human interventions

What people do for a living...

- fishing
- reeds - handicraft
- willow fields - handicraft
- agriculture and grazier
- recreation
Analysis - general
The main biotopes through evolution are the mudflats, bies marshes, reeds field, willow forests.

Biodiversity decreased, especially the reeds, marshes and mudflats.

With the Room for River project, Biesbosch is going through a depoldering stage of returning back.
Analysis – recreation status

Landmarks and landscape elements

- A lot of interesting things going on in the lands
- Local culture: willow woods, huta
- Several land arts scattered in the area.
- Water reservoir quite dead

Recreational area

Recreational activities

Recreational conclusion map

- Museum-centered walking, bicycle, canoe connecting smaller dots
- Mainly sightseeing on water
- A lot of things can be activated: reservoir, hut, mounds
- Experience can be vivid
Fascination

Get to know Biesbosch

Problem statement

Relation between human and nature

Research questions

Methodology

Design

Reflection
Problem statement

Main problem
**Today’s recreation lay-out in the Biesbosch doesn’t use or reveal the identity of the place.**

The Biesbosch area is presenting its identity in the Biesbosch museum. Why not experiencing the real dynamic landscape outside? So far recreational accessibility is mainly developed along the edges on the dikes. It’s hard to be ‘in’ the landscape itself.

Causes:

**Broken landscape structure:**
Due to long-term human intervention the dynamic natural landscape is transformed into a ‘fixed’ cultural landscape. Recently parts of the Biesbosch were transformed for the ‘room for the river’ project. Again a very functional landscape was created. These transformations are lacking ecological aesthetic concerns.

**Biodiversity decrease:**
The reduction of the water dynamics, consequences of the Delta works and large-scale poldering resulted in a decrease of the biodiversity. In the recent ‘room for the river’ project there are some additional ecological benefits, but more of an ecological expression without establishing the ecosystem out of a biodiversity concern.

**Accessibility to landscape:**
The accessibility of Biesbosch by walking and biking is difficult. Routes are mainly situated on dikes and along roads. No particular paths is leading into the landscape.
Historical view

Mono - aesthetical
1. In the old times, nature is perceived from an aesthetic point of view. However, the interventions have no effects on the natural function.

Dialogic relation
3. In the future, it is best that both aesthetic and ecological aspects of nature are addressed in landscape design. So that human and nature can establish a dialogic relation.

Mono - ecological
2. In modern landscape design, it is the ecological function that is addressed in nature. The experience and aesthetics are given little concern.

Dialogic relation
4. Ecological aesthetics can be as medium to establish the dialogic relation between human and nature.
Eco**l**ological aesthetics

**Ecological aesthetic** refers to aesthetic that’s contained in living life existence and operations, relying on the species equality and ecological balance. (Jiayuan Qin, 2006)

Ecological integrity is the base ground for aesthetic appeal.

**The role of landscape design:**
Landscape modifies the physical context for ecological integrity, and deals with social context to facilities aesthetic appeal.
Relation between human and nature from Dordrecht to Werkendam

Urban – Green (for passing through, not for experiencing) - Wildness
- The relation between human and nature in Biesbosch is ‘mono-ecological’.
- There’s little aesthetical concern in the current situation.
- With depoldering, there’s more room for water, but the biodiversity increase is only additional.
Fascination

Get to know Biesbosch

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Research questions and objective

The main research question:

**How to experience the ecological aesthetics of Biesbosch through recreation?**

**Sub questions:**
- How to define ecological aesthetics?
- Which ecological aesthetics are to be experienced in the Biesbosch?
- How can the ecological aesthetics be strengthened through landscape design?
- How to balance nature protection and recreation development?

**Objective:**
Through experiencing the ecological aesthetics of dynamic landscapes, the aim is to sensitize people to forces and processes of dynamics, to establish a dialogic relation between human and nature.
Design site – Kleine Noordwaard

- Where has the most dynamics
- Where connects with urban
- Where has a recreation basis
Dynamics – tide & flood – current & foreseen

Current situation
Haringvliet block closed

Foreseen situation
Haringvliet half-open
(based on Getemd Getij scenario)
History of Kleine Noordwaard

The intensified dynamics will change the ecological integrity and therefore the aesthetic appeal?
Ecological stability - Succession - history

**naural process**
bare sand flats - rough herbage vegetation

**natural process + human intervention**
osier fields, willow beds

**natural succession + polders**
tidal forests

**arable lands**

**nature take over again**
Ecological stability – the steady status

Abstraction - the most steady status in natural condition

The most steady status in natural condition

The most steady status in natural condition abstraction
Ecological stability – current situation

The lay-out of the four biotopes

The river banks are steep slopes
Design principle 1 - sculpture

Current situation

Natural succession in years

Human interventions to modify the landscape to **reveal the characteristics**
Landscape characteristics – what existed before

There used to be streams, ponds, puddles and so on...

Lay-out history of the 4 biotopes.
In the willow forest, there are still streams and clearing exist. In mudflats, streams too. However, the characteristics lost in reeds and bies.
Aesthetic appeal – what exists at present

1. Formal Beauty in Ensembles of Elements.

- mudflats
- bies
- reeds
- willows
Aesthetic appeal – what exists at present

2. Sequential Beauty in Figuration of Different Ensembles

will be replaced in the future...
Aesthetic appeal – what can be experienced in the future

Apart from the formal beauty of the species...

Sequential Beauty in Figuration of Different Ensembles
Aesthetic appeal – what can be experienced in the future

Adaptive Beauty in Coordinating with Dynamic Changes
How to experience the aesthetics through landscape design?

1. Signs
How to experience the aesthetics through landscape design?

2. Contrast
Design principle 2 - framing

before
mudflats

after
mudflats

reeds

willows
Design principle 3 – orientation of paths
Application of design principles in design process

- Terrain sculpture
  - Landscape restoration
  - Reestablish ecological integrity

- Orientation of paths
  - Routing system design
  - Aesthetic appeal

- Framing
  - Nodes along the routings

- Ecological Aesthetics
Concept

original landscape

landscape restoration
Reconstruct the ecology integrity.

Enhance the aesthetic characteristics.
Concept Development

Original landscape

Present landscape

Human intervention - fill & dig, plantation
Natural process - succession

PROGRAM
NATURE

Zoning - recreation, reserve

How to turn the broken landscape to original structure?

Routing experience
Composition development...

Before

After

water detension area

landscape structure
Design steps

Roads to enter site.
The terrace structure.
Facilities of visitor senter, etc.

dig & fill strategy
to form the terrace

Visitor center

Paths connections in site.
Visual connections with other parts.

visual connection

visual connection
with reservoir

Nodes for programs
along the path experience.

nodes for programs
along the connection
Dig & Fill Balance Model Experiment

The earth work can be balanced in site.
Master plan – dry season – steady status
Master plan – flood season – steady status
Section – dry season
Willow Fascine with Double Row of Poles

What is fascine?
A biotechnical riverbank stabilization design approach. A fascine is a rough bundle of brushwood or other material used for strengthening an earthen structure, or making a path across uneven or wet terrain. Typical uses are protecting the banks of streams from erosion, covering marshy ground and so on.

Willow fascine with double row of poles
- Set foot embankment and protect it both from erosion, but also cast clay materials
- Allow for height difference from both sides.
- Allow for people walking through.
- Resistant for the water passing through on a daily basis.

Main material
Branches of pollard willow, Ø 2-4cm, long 70-200cm.
Twigs of pollard willow, Ø 0.5-1.5cm, long 70cm.

1. Section of river channel indicating the location of a fascine.
2. Site image of a willow fascine with two rows of poles.
3. Pollard willow.
4. Main branch material.
Transformation - fast - tides, floods

Phase 0 | original

Phase 1 | 0.5y
terrain setting,
dig & fill strategy

Phase 2 | 0.5-1y
facility construction
Phase 3 | 1-2y
platation, seeding by man
natural succession to take over

Phase 4 | 2y, ready for total open to public
steady status
Slow dynamics - Sea Level Rise Study

Historical and Projected Sea Level Rise

Possible situation is nothing is done... now 50 years 100 years

Elevation evolves with sedimentation.
Sedimentation Study

Local sediments:
- 47% from the river,
- 53% from the Noordward

Natural situation

Sediments cut in the upper stream

Area under water for over 100 days/year

River polder
Transformation - slow - sea level rise

Phase 5 | 50y, reaction to sea level rise
open dike for more sediments,
man creates pile buffer,
old terrace submerging

Phase 6 | 60y
old terrace submerging,
new terrace forming

Phase 7 | 100y
old terrace submerged,
new terrace formed
## Paths design framework

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Path in willow forests
Path in reeds field
Node installation in reeds field
Summer – dry season – viewpoint in reeds field.
Winter – flood season – view point in reeds field.
Relationship between human and nature – Dordrecht to Werkendam
In Dordrecht city center
Through rural area
From Werkendam to site
The Biesbosch atmosphere!
Reflection

In this specific graduation project this concept of Flowscapes is adopted since the landscape (terraces) as part of infrastructure (water management).

With the flows at the core, the opened polder facilitates aesthetic and ecological relations between human and nature.

The design can be seen as a refinement based on the Room for River project, refining the ecological function as to be more suitable for dynamic changes in the foreseen and adding an aesthetical layer to enlarge its existence to a park.

The design is this tamed dynamic that the whole project is based upon. It is in the not total nature environment that an eco-park is built on. Therefore, an eco-park here in the Netherlands may not fit every estuary dynamic landscape.
Thank you 🌻