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Abstract

Thresholds: Gradients of Activity in a Changing Landscape

By:

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There is no such thing as a natural landscape. All environments are imagined, shaped and controlled by humans. This thesis aims to expose the life of a landscape, to study the activities and interests that inform landscape.

It is possible to organize interests in a way that provides for flexible and dynamic change and growth of those interests supported by the landscape. This study is played out on one particular landscape, Lake Murray, South Carolina.

Lake Murray is a hydroelectric reservoir located just west of the capital city of Columbia. The dam provides power and drinking water for the area. However, fluctuations in water levels that result from power generation are unpopular with lake residents and users. They would prefer lake levels be kept high at all times regardless of power needs. Development around the lake is growing at a rapid pace and if left unchecked could seriously affect wildlife, drinking water, and recreation. It is possible to see the fluctuating lake levels as an opportunity to enhance use and enjoyment of the lake while preserving it and providing maximum hydro-electric power.
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Thresholds:
Gradients of activity in a changing landscape

There is no such thing as a natural landscape. All environments are imagined, shaped and controlled by humans. This thesis aims to expose the life of a landscape, to study the activities and interests that inform landscape.

It is possible to organize interests in a way that provides for flexible and dynamic change and growth of those interests supported by the landscape. This study is played out on one particular landscape, Lake Murray, South Carolina.
Lake Murray is a hydro-electric reservoir located just west of the capital city of Columbia, South Carolina. It encompasses 50,000 acres and has 520 miles of shoreline. When the Lake Murray dam was finished in 1930, towns and cemeteries were flooded and 5,000 homes were relocated. Today the Lake Murray area is home to over 125,000 people. The area has become extremely popular for recreation. It is also growing as a suburb of Columbia.
Competing Interests, Multiple Uses: Population

Competing Interests: Lake Murray, SC/ROADS AND TRAFFIC

Competing Interests: Lake Murray, SC/ACCESS
There are multiple interests present in this particular landscape, and these interests often come into conflict. There are three major conflicts surrounding Lake Murray: Access to the resource, development of the resource, and preservation of the resource. These conflicts are mainly between South Carolina Electric & Gas (SCE&G), and the residents and recreational users of the lake. SCE&G owns the right to run and operate the dam and reservoir and would prefer to generate as much power as possible from the reservoir. This results in fluctuation of lake levels, depending on rainfall and time of year. Recreational lake users and home owners would prefer the lake to be at a consistently high level year round to ensure maximum benefits of access to the lake and enjoyment of its resources.

Currently, 60% of the lake is developed. Developers and SCE&G would like to see 75% of the lake developed, while lake watch groups would like to see development capped at 67%.

Lake Murray also provides drinking water to half of the Columbia metropolitan area. The lake is home to species of fish, birds and other animals that are extremely popular with lake residents and important attractors of recreational lake users.

It is possible to see this situational problem as an opportunity to take advantage of fluctuation and difference.
An example of organizing competing interests and working within a flexible system is the Appalachian Trail. The trail is a linear footpath that runs from Georgia to Maine. This is an entire system that addresses development, recreation and preservation of the resource of the Appalachian mountains. Within this system there is no fixed terminus. The trail can be entered into and exited from multiple areas along the system. The system of main and arterial trails is flexible and can shift and accommodate additional amenities or avoid encroaching development. The only requirement is that it maintain a continuous route.

Similarly, Lake Murray can be seen as a continuous system around a circular path. The shifts of lake levels can be seen as an opportunity to incorporate additional amenities or activities that continue to provide enjoyment while lake levels fluctuate. This is enhancing the resource of the lake while protecting it. Seeing the lake edge as a flexible system is an opportunity to address the competing interests of providing power while allowing for maximum enjoyment and preservation of the Lake.
Competing Interests, Multiple Uses: The Appalachian Trail Natural Resource as Organizational Structure

Competing Interests, Multiple Uses: The Appalachian Trail / Prioritizing Interests

Competing Interests, Multiple Uses: Flexible Systems
Within the lake system are multiple levels of fluctuation. There is the level of lake floor, lake surface, and sky, as well as the variation of the water edge. These levels of fluctuation can coordinate with popular activities in the lake area such as camping, bird watching, diving, hiking, fishing, and swimming. Bridging activities or elements can provide access to the lake at certain times of year as well as introduce new activities. Coordinated activities and access can be linked through a series of trails that connect users to the body of water as well as to themselves, creating a fluctuating band of inhabitation around the lake that provides access, curbs traditional development and adds amenities.
Competing Interests: Lake Murray, SC / Multiple Uses: BRIDGING

ACCESS

WATER LEVEL: FULL

WATER LEVEL: LOW

WATER LEVEL: VERY LOW

SKY

LAND/WATER

LAKE FLOOR

ISSUES

OWNERSHIP

UNDEVELOPED LAND

COLUMBIA AREA WATER

SKY

LAND/WATER

LAKE FLOOR

Competing Interests: Lake Murray, SC / Multiple Uses: LAKE SHORE SECTIONS

Competing Interests: Lake Murray, SC/ ACCESS
Focusing on a small portion of the lake, a trail area and system points are laid out. These system trails and points cover varying lake levels and areas bordering the lake. Different activities and areas are visible and accessible depending on lake levels and time of year.

These diagrams show basic sections of the lake as well as the system stretched out sectionally along the lake.
Scenario Possibilities

Scenario possibilities consist of 5 categories: Material, Activity, Strategy, Season, and water level. These categories are further broken down into subcategories to create a range of different scenario options.
Scenarios
Even smaller portions of the lake and shoreline are examined to investigate the types of activities and enhancements that could be added to the lake at varying water levels and times of year. In this scenario, small inlets are dredged out to create ponds for stocking popular Lake Murray fish. These areas are primarily used for education of young anglers and environmentalists. The ponds are a year round attraction that also stock the lake with varieties of fish.
STOCKED PONDS

Portion of lake area with trail and system areas

Types of fish stocked in the ponds
- striped bass
- bluegill
- largemouth bass
- black crappie
- trout

Plan of activity area

Water levels

Larger pond
Individual stock ponds
Metal Mesh gates
Osprey Stands

Section through activity area

Water level low

Water level medium

Water level high
In the protected water scenario, the earth under the lake is built up to create two areas of water with a separation barrier between them. The smaller area of water next to the shoreline provides protection for small boats, swimmers, and anglers from the wake of large boats, jetskiers and waterskiers. A concrete mesh embedded into the earth provides a boat ramp for small boats, kayaks and canoes.
Section of activity area

Grasscrete Boat ramp

Water level high

Water level medium

Water level low

Protected Swimming, Fishing, Boating Area

Boating - pool

Boating - ramp

Boating - separated

Plan of activity area

Water levels

Swimming

Portion of lake area with trail and system areas

PROTECTED WATER
Gabion walls provide shelter as well as erosion protection in this area. Set far out into the lake area, the gabion walls provide erosion protection and act as fish attractors. Closer to shore, the walls are arranged in groups to form fishing shelters right on the shoreline during the summer months. Further away from the 360' water mark, the gabion walls can act as hunting blinds in winter.
Areas along the lake edge can be used for habitat enhancement as well as educate the public about lake flora. Habitat enhancement includes the planting of shrubs and trees that thrive in this setting, such as wild celery, bald cypress, river birch, black willow, and button bush. These types of shrubs and trees attract wildlife such as Mallards, Wood duck, Canada Geese, and Whitetailed Deer.
Portion of lake area with trail and system areas

Plan of activity area

Water levels

wild celery
bald cypress
river birch
black willow
buttonbush

bald cypress
river birch
buttonbush
wild celery
black willow

winter pond

Section of activity area

Water level low

Water level medium

Water level high
In certain areas where the water recedes during winter or high power production and little rainfall, areas of the lake near the 360' mark can be dredged out to form retention ponds when lake levels are low. In addition, campers who prefer to be close the water’s edge are provided with concrete and stone camping pads located at various water levels.
Portion of lake area with trail and system areas

Camping

Boating

Plan of activity area

Water levels

Concrete camping pads

Winter fishing/boating pond

Concrete camping pads

Water level low

Water level medium

Water level high

Section of activity area
The Winter spa is an amenity that is only available when lake levels are low, which is primarily during the winter months. Areas of the lake will be contoured and filled in with stone and concrete to provide various sizes of pools for the winter spa. The first level of pools are individual baths. The second level of pools are group jacuzzi style pools. The third level provides a large group swimming area. These heated pools are provided for rest, relaxation and enjoyment of the serene lake environment when the water recedes.
Portion of lake area with trail and system areas

Plan of activity area

Materials for Walkway and Pools

Group swimming pool
Jacuzzi style pools
Stone paths
Personal pools

Personal pools
Jacuzzi style pools

Water level low: Spa fully functional
Water level medium: Spa partially functional
Water level high: Spa not functional

Section cut through activity area
Revised Maps
The revised maps illustrate the system at full capacity and use, and gives examples of some of the many possibilities for lake amenities and access year round according to lake levels. The symbols correspond with the phylogram map detailing season, activity, site materials and strategies for a particular area on the map.
Portion of lake area with trail and system areas

Trail, system points and areas of focus (scenarios)

Trail and areas visible at highest water level
Trail and areas visible at low water level
Trail and areas visible at lowest water level
The revised maps show the system area and points stretched out sectionally compared to the earlier site map study. The sectional map also shows what type of site condition change occurs at what point.
The area of Lake Murray, South Carolina is a dynamic landscape, made by a dam built to provide hydro-electric power for the growing areas surrounding the city of Columbia. The lake is operated by South Carolina Electric & Gas, and power produced by the dam serves the entire community. The lake is home to many species of plants, fish, birds and other wildlife that are a popular attraction for many outdoors enthusiasts. It is also home to thousands of people who have homes on the shoreline. There are conflicting interests involving optimal enjoyment of the lake while protecting it and preserving it from over development. By seeing the lake shoreline and varying water levels as an opportunity to enhance enjoyment and preservation of Lake Murray rather than seeing it as an obstacle, creative and innovative uses can be realized while providing maximum power generation for the area and protection of the lake for many years to come.
Bibliography


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