WET POND STORMWATER MANAGEMENT PRACTICES and BEAUTY

Presentation

Final Proposal

Jane L. Didona

May 25, 2006

TOPICS

- Water
- Water becomes a Resource
- Stormwater Management
- Research Question
- Research Design
- Limitations and Biases
- Conclusions

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WATER

Water themes from pilot study “Water is the Answer”

- Water is an everyday resource
  - The everyday-ness of water
  - Water is abundant
  - Water nourishes the landscape
- Water is a source of power
- Water is a source of physical enjoyment
  - Water is fun
  - Water is relaxing
  - Water is appealing to the senses
- Water is a source of reflection
  - Water is a place find oneself
  - Water elicits memories

WATER

- Water in the landscape is important part of life
- People seem to prefer the water landscape they grew up in
- People seem to prefer water that is clean with a neat landscape surrounding it and abundant wildlife
- People seem to prefer water that moves
- People seem to need the opportunity to view and interact with the water
- People seem to prefer water to be in a more natural configuration

WATER BECOMES A RESOURCE

Only 1 percent of the water on the planet is available to us and is located in lakes, streams, ponds and aquifers.

Storm water runoff is a non point source pollution that was identified as a major contributor to the degradation of the recreational waterways. As little as 10 percent impervious area in the watershed adversely impacts the streams and rivers.

Clean Water Act 1972 charged the federal government with the task of protecting the waters of the United states. The first regulated impacts were point source pollution but after 20 years of regulation only 20 percent of the recreational waters had improved. In 1987 the act is amended to include non point source pollution.

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STORMWATER MANAGEMENT

New York State Stormwater Management Design Manual is meant to provide a unified approach for designing and sizing Stormwater Management Practices (SMPs) to meet the goals of pollutant removal, reduction in channel erosion, prevention of overbank flooding and extreme flood control.

There are six performance goals:

- **the site feasibility**
- **a safe conveyance**
- **a pretreatment component**
- **removes the maximum amount of pollutants**
- **landscaping that provides environmental enhancement**
- **ease of maintenance**

STORMWATER MANAGEMENT

A Stormwater pond has a permanent pool of water and can have extended detention above the permanent pool capable of treating the water quality volume through settling and biological uptakes.

Other general characteristics:

- an embankment with emergency spillway
- a bottom elevation 2 feet higher than the groundwater
- a stabilized inlet
- a forebay
- configured with a minimum 1.5:1.0 length to width ratio
- minimum 1:100 surface area to drainage area ratio
- long flow paths and irregular shapes
- 15' wide safety bench
- the outlet orifice size to provide the appropriate release of water as per the various volumes and to prevent erosion
- a trash rack

RESEARCH QUESTION

what visual elements of the natural pond landscape contribute to its scenic beauty and if those visual elements are incorporated into the design of the wet pond SMP will the result be a preferred water landscape?

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RESEARCH QUESTION

"When designed and sited correctly, artificial lakes and wetlands can help developers reduce negative environmental impacts caused by the development process and increase the value of the property." (USEPA, September 1995)

If people are to be a part of the sustainable equation, natural and cultural processes must have equal footing in the development of any ecological design. (Baird, 2003)

ecological designs must combine environmental technology and aesthetics into works of natural art that become visible and enjoyable design elements. (Dreiseitl, 1999)

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RESEARCH DESIGN

this study intends to discover practical applications for the specific landscape context of a wet pond SMP, the research design will be mixed methods utilizing a combination of expert and psychophysical paradigms.

The final phase will be a psychophysical paradigm using the wet pond photo simulations as the stimuli for a survey and questionnaire in order to assess the visual quality of the resulting images and to determine what visual elements contribute to the scenic beauty of the resulting SMP.

first phase will use an expert approach to determine the individual elements of a natural pond water landscape that contribute to its scenic beauty. The data collected from this phase will be used to inform the development of visual representations of wet pond SMP's.

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RESEARCH DESIGN

First Phase – Expert Paradigm

- Study the natural pond as depicted in art, in research, and in its physical state utilizing such techniques as observation, journaling and document review in order to determine a palette of visual elements that comprise a preferred natural pond landscape.
- Review these elements with committee to determine if the resulting elements are credible tools for photo simulation .
- Research and visit several installed wet pond SMPs to determine if they meet the criteria of the New York State Stormwater Management Manual.
- Photograph each SMP using similar guidelines for lighting, time of day, exposure, etc. Review with the committee to determine which are the best for photosimulation.
- Photosimulate the visual elements of the natural ponds into the view of the wet pond SMP.
- Review the images with committee for opinions on accurate representation, quality of image and quality of printing.

RESEARCH DESIGN

- Second Phase – psychophysical paradigm utilizing mixed methods
  - Purposive recruitment of at least 40 participants from a variety of professions, gender, and socioeconomic backgrounds.
  - Invite respondents to a water event to be held a pleasant, neutral colored space with a lot of light and high ceilings.
  - Participants will review each image and evaluate using a 5 point Lickert scale.
  - Participants will fill out a questionnaire that will attempt to ascertain the reasons for preferences of the photographs. Questions will include why they liked/disliked a photograph, what elements of the photograph they liked/disliked, what emotions did the photograph evoke, and would the respondent like to live near the water landscape depicted in the photo.

RESEARCH DESIGN

Analysis

- Assign each image a mean and standard deviation number
- Index questionaire data by themes, codes and connections between themes
- Identify what elements are important to the participants perception and why these elements are important
- Compare these elements to the visual elements utilized in the photo simulations

LIMITATIONS AND BIASES

- Do people really care that the structure that treats the stormwater should also be beautiful?
- Researcher has no background or understanding of statistical data analysis and therefore had to design a study with an elementary data analysis component
- Researcher will need to modify her presentation style and interview process so as to not unduly influence the participants
- Researcher needs to modify writing style from a business style to an academic style

CONCLUSIONS

effective ecological landscape planning is to balance ecological concerns with human use and preference (Ndubisi, 1999)

The premise is that a preferred water landscape will be an amenity for the community and therefore increase the quality of life of the community

This study intends to investigate the human use and preference of a wet pond SMP by first developing a palette of visual elements that contribute to a natural ponds scenic beauty and then determine if those elements when incorporated into a wet pond SMP will create a preferred water landscape.

CONCLUSIONS

- It is anticipated this study will be of great interest to ecological designers, landscape architects, ecological engineers, developers, political decision makers and government agencies
- Anticipated dissemination of this study will be further research, journal articles, presentations and articles in professional periodicals
- Anticipated result is a wider acceptance of the incorporation of the landscape architect as a member of the design team, to act as the mediator between the cultural and natural processes.