

## **Restoration of urban riparian area : case study**

Restauration de secteur riverain urbain : étude de cas

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### **RESUME**

Le plaisir qu'on retire de la fréquentation des zones riveraines urbaines contribue à créer parmi la population des conditions favorables à leur préservation. Les promeneurs retirent des bienfaits psychologiques de la fréquentation de tels sites pour autant que ceux-ci intègrent des aménagements qui correspondent à des éléments visuels agréables. La présente étude de cas a été menée en s'appuyant sur la recherche de tels éléments visuels dans la littérature. Le projet s'est ensuite attaché à restaurer et à réintégrer ces zones riveraines dans le tissu urbain. Le parc d'Owens Bell est traversé par un cours d'eau qui a été réaménagé, à partir d'une zone de décharge, en une zone humide.

### **ABSTRACT**

Encouraging enjoyment and subsequent environmental stewardship of riparian areas can be accomplished through design that integrates visual preference data. Participants with favourable impressions of riparian zones may actively seek these areas for psychological restoration if the spaces are designed to meet their visual preference expectations. The following case study was designed and implemented based on visual preferences data revealed in the literature. This case study melds environmental restoration of riparian areas into the urban fabric. Owens Bell Park is bisected by a stream which was restored from a dumping area into a stream/wetland system.

### **KEYWORDS/MOTS CLES**

Citizen Involvement, Treatment, Urban Stream Restoration, Water Quality

## **1 INTRODUCTION**

Encouraging enjoyment and subsequent environmental stewardship of riparian areas can be accomplished through design that integrates visual preference data. Participants with favourable impressions of riparian zones may actively seek these areas for psychological restoration if the spaces are designed to meet their visual preference expectations. The following case study was designed and implemented based on visual preferences data revealed in the literature.

Owens Bell Park is surrounded by the Prospect Terrace infill and redevelopment project near downtown Asheville, North Carolina, USA, and drains to the French Broad River. The French Broad River headwaters' is in Western North Carolina and drains eventually to the Gulf of Mexico. This case study melds environmental restoration of riparian areas into the urban fabric. Owens Bell Park is bisected by a stream which was restored from a dumping area into a stream/wetland system. Aspirations of the restoration include maximizing opportunities for improving water quality, increasing habitat potential and providing a restorative amenity.

The Prospect Terrace project is the first housing development to be certified under the North Carolina Healthy Built Homes Housing Development program which certifies green building practices and techniques to reduce energy consumption. Citizens informed the park's program through charrettes. Project designers gathered input from stakeholders and conceptualised a site plan for the park that incorporates a pedestrian trails, bridge, bus shelter, tree preservation, and surface water amelioration on less than half a hectare. Park goals included creating a pocket park for the residents that offers accessible open space and educational opportunities in a visually secure setting.

## **2 CASE STUDY**

Environmental restoration is one of the objectives of the Owens Bell Park project. Materials were assembled to mimic naturally occurring environments. Large boulders were placed to form step pools found in higher gradient streams; the ensuing constructed pools help dissipate stormwater velocity and reduce stream bank erosion allowing these areas to be renaturalized. The banks of the stream were designed and planted with sweeps of indigenous shrubs, occasional canopy trees underseeded with a meadow mix, and wetland plant communities that will gradually give way to the maturing shrubs. The plantings will offer erosion control, habitat, and visual interest. The planned, emergent aquatic wetlands assist in filtering, sequestering, and transforming pollutants found in stormwater flowing through the site.



Existing Condition (Photo Credit: Benjamin Porter)



Under Construction (Photo Credit: Jon Calabria)



Citizen Involvement: Mayor cutting ribbon at dedication (Photo Credit: Jon Calabria)

### 3 DISCUSSION

Design objectives include integrating information suggested in visual preference studies to engage the viewer and provide an opportunity for relaxing and appreciating the ecology of the riparian system that melds with the urban fabric. Visual preference literature suggests that open water, crisp edges, and clear ground planes under canopy trees are preferred. Though these scenes are characteristic of the English Landscape School, several psychologists have also created visual preference models indicating people enjoy landscapes composed of canopy trees and a visible ground plane (Appleton 1975). Both pockets of open water and a visible ground plane with sparse canopy vegetation were integrated into other planted areas. When a landscape is legible and coherent, people can be further engaged in the landscape through a sense of mystery (Kaplan 1989). The conundrum for the designer is to create a “sense of mystery without fear” by allowing visual and locomotor access (Herzog 2002). The Owens Bell Park has a network of paved and soft surface trails to encourage access through the area; a bridge spans the wetland complex and affords visual access over the planned emergent aquatic vegetation. Adjacent meadow, shrub and tree plantings were arranged in the Park to provide a series of openings and enclosures that conform to the aforementioned “sense of mystery without fear.” Design elements target all of the human senses; park users can hear water tumbling over small cascades into pools, feel the texture of different plants, smell fragrances from flowers and leaves, and even taste fruit and nuts. Design elements such as overlooks and boardwalks elevate the park user and serve as the frame at Owens Bell Park.

Restoration of anthropogenic modifications to riparian systems can benefit humans if it relates environmental restoration design to people without sacrificing restoration goals. One successful way to restore physical environments, as well as satisfy human

perception, is to literally frame restored areas with a familiar element, as suggested by Joan Nassauer. She advocates meeting basic human perception needs by creating design elements and cues that provide an “orderly frame” to view the “messy ecosystem” (Nassauer 1995, 161). Her framework provides the suggestion of human intervention through management and control and avoiding the sense of an unkempt landscape. An environmental education series may be able to engage and move observers along a continuum resulting in an environmental aesthetic embracing ecologically beneficial restoration. An example is cited by Thomas Herzog in a visual preference study comparing American and Australians’ perceptions. He reports a group of natural resource managers who disliked exotic willows in Australia, while other landowners in Australia prized them because “willow trees are a clear sign of human influence” (Herzog 2000, 335). The managers had been actively eradicating the willows and were forced to stop because of political pressure from opponents who thought otherwise. This study supports people forming aesthetic preference based on ecological knowledge.

#### **4 CONCLUSION**

Riparian restorations that incorporate human perception preferences will likely result in greater cultural satisfaction of restored riparian areas. This may result in a value shift to create a complex environmental aesthetic (Eaton 2001; Mozingo 1997) that does not discard existing values but builds upon them (Mozingo 1997). Revealing ecological process would support a closer connection between ecological designs and currently accepted aesthetical preferences (Mozingo 1997). Perhaps additional restoration opportunities in urban areas can afford human and environmental restoration.

#### **LIST OF REFERENCES**

- Appleton, J. 1975. *The Experience of Landscape*. New York: John Wiley and Sons.  
Eaton, Marcia Muelder. 2001. *Merit, Aesthetic and Ethical*. New York: Oxford University Press.  
Herzog, Thomas R. and Kutzli, Glenn E., 2002, Preference and Perceived Danger in Filled/Forest Settings. *Environment and Behavior* 34:819-835.  
Kaplan, Rachel and Kaplan, Stephen, 1989. *The Experience of Nature*. New York: Cambridge University of Michigan.  
Mozingo, Louise A., 1997. The Aesthetics of Ecological Design: Seeing Science as Culture. *Landscape Journal* 16:46-59.  
Nassauer, Joan I., 1995. Messy Ecosystems, Orderly Frames. *Landscape Journal* 14:161-170.

