

Human Perceptions on Aspects of Park Trees in Oak Ridge, TN

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Logos for University of Tennessee, URF, and City of Oak Ridge are present.

Outline

- ▶ Introduction
 - ▶ Urbanization and Urban Forestry
 - ▶ Urban Park Management
 - ▶ Utilizing Public Opinion
- ▶ Justification and Study Site
- ▶ Methods
- ▶ Future Directions

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The Process of Urbanization

Movement of a population to a central location (Clark, 1998)

- ▶ "Urban Area" = at least 1,000 people per square mile (U.S. Census Bureau, 2010)
- ▶ Urbanization Trends:
 - 1800 < 3% of population urban
 - 1996 = 50% of population urban (Clark, 1998)
 - Approx. 80% current population urban (Picket et al., 2011)

Urban What.....?




What is Urban Forestry?

- ▶ Rapid urban growth causes:
 - ▶ Loss of naturally forested areas (Heimlich and Anderson, 2001)
 - ▶ Compartmentalization and fragmentation of remaining green spaces
 - ▶ Adverse growing conditions (Craul, 1983)



And that's where we come in.....



Urban Park Management

Urban Parks provide numerous benefits to a city



- ▶ Increase property value (Harrick and Welle, 2009)
- ▶ Public saving due to direct usage (Nowak et al., 2002)
- ▶ Reduction of storm water runoff (Neville, 1996)
- ▶ Improve human well-being (Jackson, 2003)
- ▶ Reduce urban noise (Aylor, 1972)
- ▶ Provides wildlife habitat (McKinney, 2008)
- ▶ Increase biodiversity (Nowak, 1993)

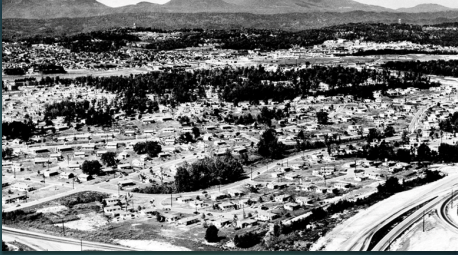
www.travelchannel.com

Utilizing Public Opinion

More than just tree care

- ▶ We must make management decisions based off of those using the parks (Wardell and Moore, 2005)
 - ▶ Vegetation management
 - ▶ Care of park facilities
 - ▶ Public Programs
- ▶ Heavily used in National parks
 - ▶ Yellowstone (Repansek, 2010)
 - ▶ Grand Tetons (Kuser, 2007)
- ▶ Gaining popularity in urban parks

History of Oak Ridge



Kessen, 2010; Taylor, 2012

Justification

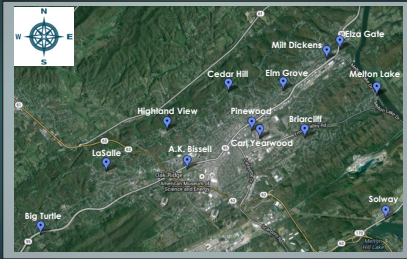
- > Rapid Land – Use Change
- > No City Forester
- > No Foundation
 - > Inventory
 - > Public Opinion



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Study Site

- ▶ Phase 2 of a 3 phase inventory
 - ▶ I – Street Trees: Five Main Thoroughfares (Turnbull, 2014)
 - ▶ II – Park Trees: Thirteen Parks
 - ▶ III – Trees Surrounding Municipal Complexes



Objectives

- ▶ Objective 1: Track park trees through geocoding and develop a workable park inventory for the city of Oak Ridge, TN.
- ▶ Objective 2: Investigate whether park visitor satisfaction can be attributed to various aspects of urban park trees through the use of a survey.



Methods

Park Inventory Park Survey



Methods: Park Inventory


- ▶ Thirteen City Parks
- ▶ GPS coordinates marked with Garmin etrex 200®
- ▶ Tree Species
- ▶ DBH (in.)
- ▶ General Condition Assessed: Good, Fair, Poor, or Dead



Methods: Park Inventory

Analysis

- ▶ Microsoft Excel Utilized to Calculate:
 - ▶ Shannon's Diversity Index [$H' = -\sum p_i \ln(p_i)$]
 - ▶ Relative Species Abundance
 - ▶ Percentage of trees in each condition class
 - ▶ Percentage of native vs. non-native species
- ▶ Calculations made for total inventory as well as each individual park





Methods: Park Survey

- ▶ Pre-survey interview questions were administered
 - ▶ Common theme: visitors enjoyed a lot of tree diversity
- ▶ Recreation and Parks Department
 - ▶ Number of trees
 - ▶ Types of trees
 - ▶ Planted arrangement of trees
 - ▶ Tree condition



Methods: Park Survey

- ▶ On-Site Survey
 - ▶ Five of the City Parks
 1. A.K. Bissell
 2. Big Turtle
 3. Elza Gate
 4. Melton Lake
 5. Carl Yearwood
- ▶ Will be utilizing Apple iPads® with accompanying iSurvey® app (Version: 2.11.13).
- ▶ Seven basic sections to the survey



Methods: Park Survey

Sections 1 and 2
Investigate specific reasons for visiting the park

Analysis

- ▶ Basic Descriptives
 - ▶ Why are people coming to the park?

Methods: Park Survey

Section 3
Obtain public opinion of the current management practices of the Oak Ridge Recreation and Parks Department

Analysis

- ▶ Exploratory Factor Analysis
 - ▶ Satisfaction Index

Methods: Park Survey

Section 4
Investigate how important certain aspects of the park (i.e. diversity of trees, number of trees, etc.) are to the visitor

Analysis

- ▶ Basic Descriptives
- ▶ Contingency Tables

Methods: Park Survey

Section 5
Investigate the attitudes held by the visitor towards trees that could affect satisfaction responses

Analysis

- ▶ Exploratory Factor Analysis

Methods: Park Survey

Section 6
Investigate park user satisfaction towards aspects such as tree diversity, number, species, and condition, that were measured in the initial inventory

Analysis

- ▶ Exploratory Factor Analysis
 - ▶ Develop a "Satisfaction Construct"
- ▶ Linear Regression
 - ▶ Construct as dependent variable
 - ▶ Attitudes as independent variables

Methods: Park Survey

Section 7
Gather basic demographic information

Analysis

- ▶ Basic Descriptives
- ▶ Chi-Square
- ▶ Contingency Tables
 - ▶ Do groups emerge?

Future Directions

Developing a tree management plan for the City of Oak Ridge

- ▶ **Ten year management plan**
 - ▶ Park Trees – Inventory and Survey Data
 - ▶ Street Trees – Inventory and Soils Data (Turnbull et al., 2014)
 - ▶ Trees Surrounding Municipal Complexes – Inventory Data
- ▶ **Management plan will include:**
 - ▶ Guidelines for proper care of existing trees
 - ▶ Protocols for future plantings
 - ▶ Pests or disease outbreak strategies
 - ▶ Development of public outreach programs

