Strategic Regreening and Open Space Planning Using ModelBuilder:

A Case Study in the Anacostia Watershed, Washington, DC

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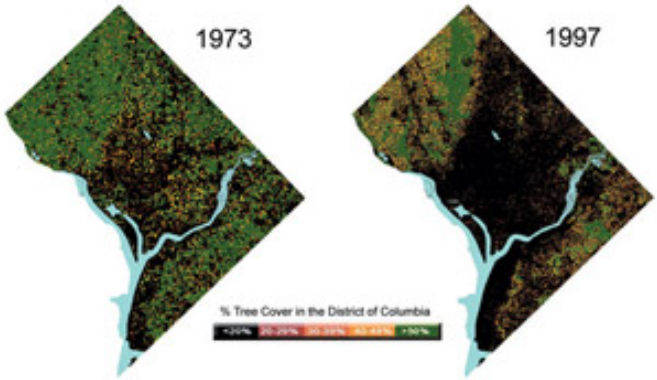
Abstract

Economic growth and new development are creating both opportunities and challenges to maintain, restore and create parks, trails, and urban forest lands. Casey Trees' research of the benefits of trees in urban areas as well as the mission to restore, enhance, and protect the tree canopy in Washington, D.C., is driving the concept of creating "functional open space." Using the findings of this research showing the values of trees and green space in an urban environment and applying the suitability modeling capabilities of ArcGIS Spatial Analyst extension's ModelBuilder, Casey Trees is evaluating the opportunities for maintaining, restoring, and creating green space in Washington, D.C. The purpose is to enhance the ecological, economic, and health and safety values of these urban areas. A case study will be presented to illustrate the use of this tool in guiding the future of green and open space in the Anacostia River Watershed.

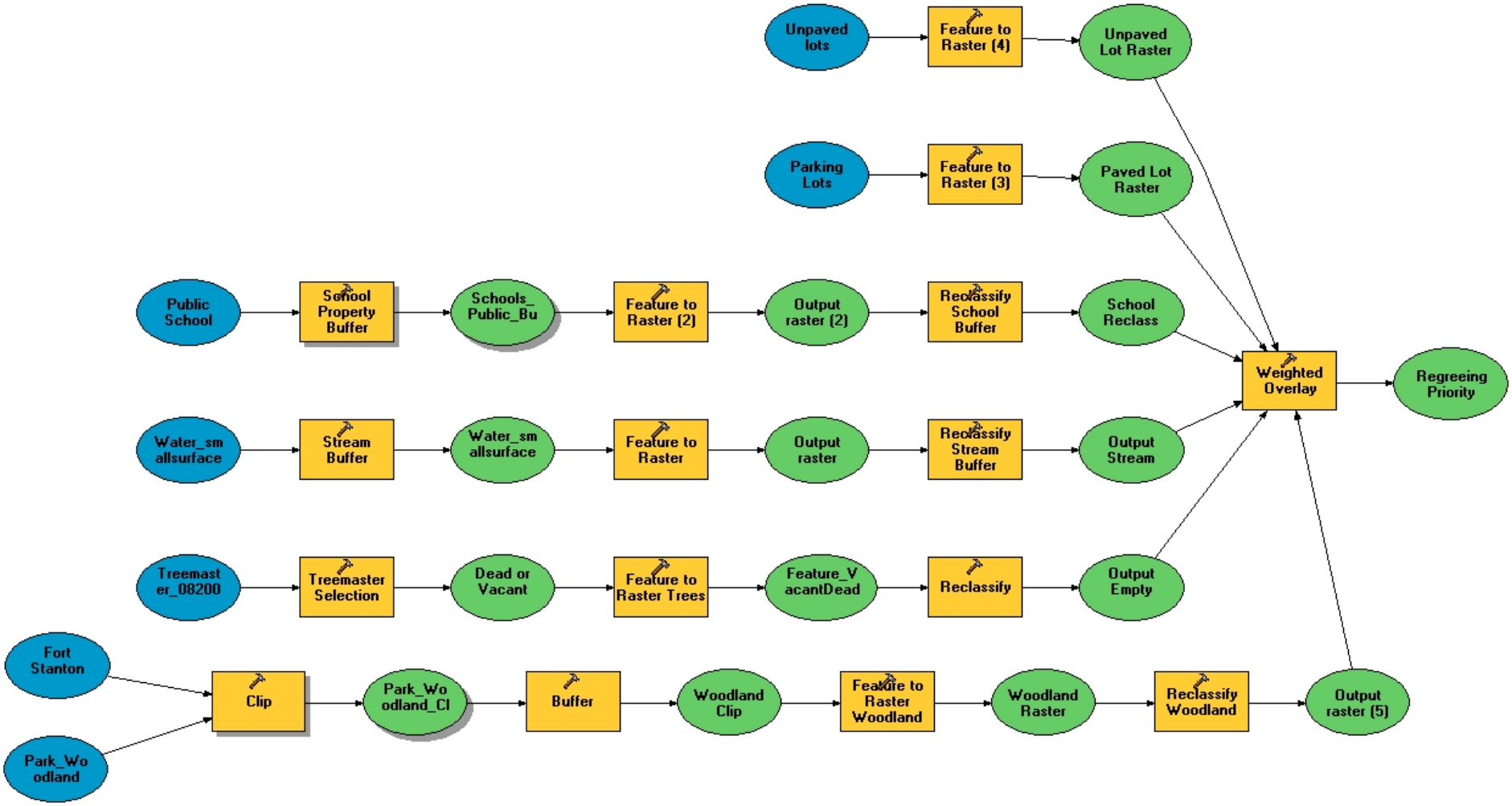
The mission of the Casey Trees Endowment Fund is to restore, enhance and protect the tree canopy of Washington, DC. These satellite images generated by American Forests show the massive decline in the tree canopy of Washington, DC since 1973.



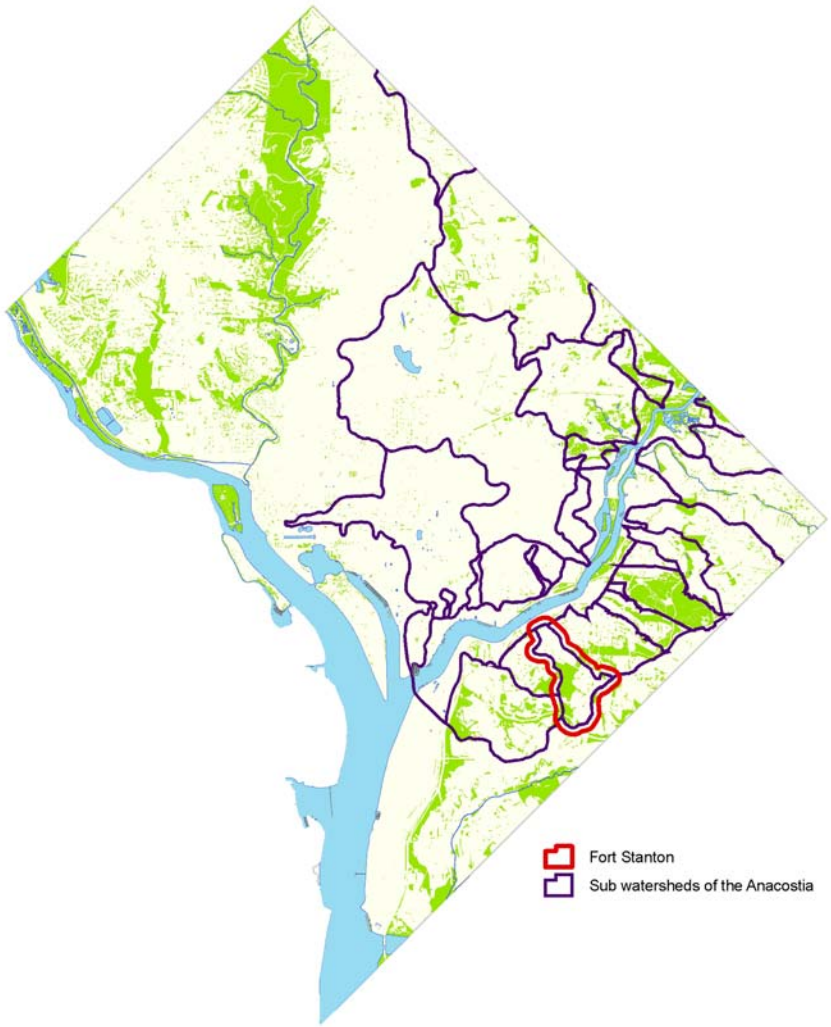
This case study uses ESRI's ArcGIS Spatial Analyst and ModelBuilder to demonstrate an example of Casey Trees strategic approach to watershed regreening. The summer of 2005, three teams comprised of college interns, Earth Conservation Corps and DC High School students will conduct an inventory assessment of Fort Stanton, a sub watershed of the Anacostia River. The objective is to identify opportunities to improve watershed health and is intended to assist the District wide efforts to clean up the Anacostia River. Fort Stanton is located in the southeast quadrant of DC. It is 366.9 acres or 0.57 square miles and 9.1% is covered by Urban Forest. Six DC public schools are in within the sub watershed.

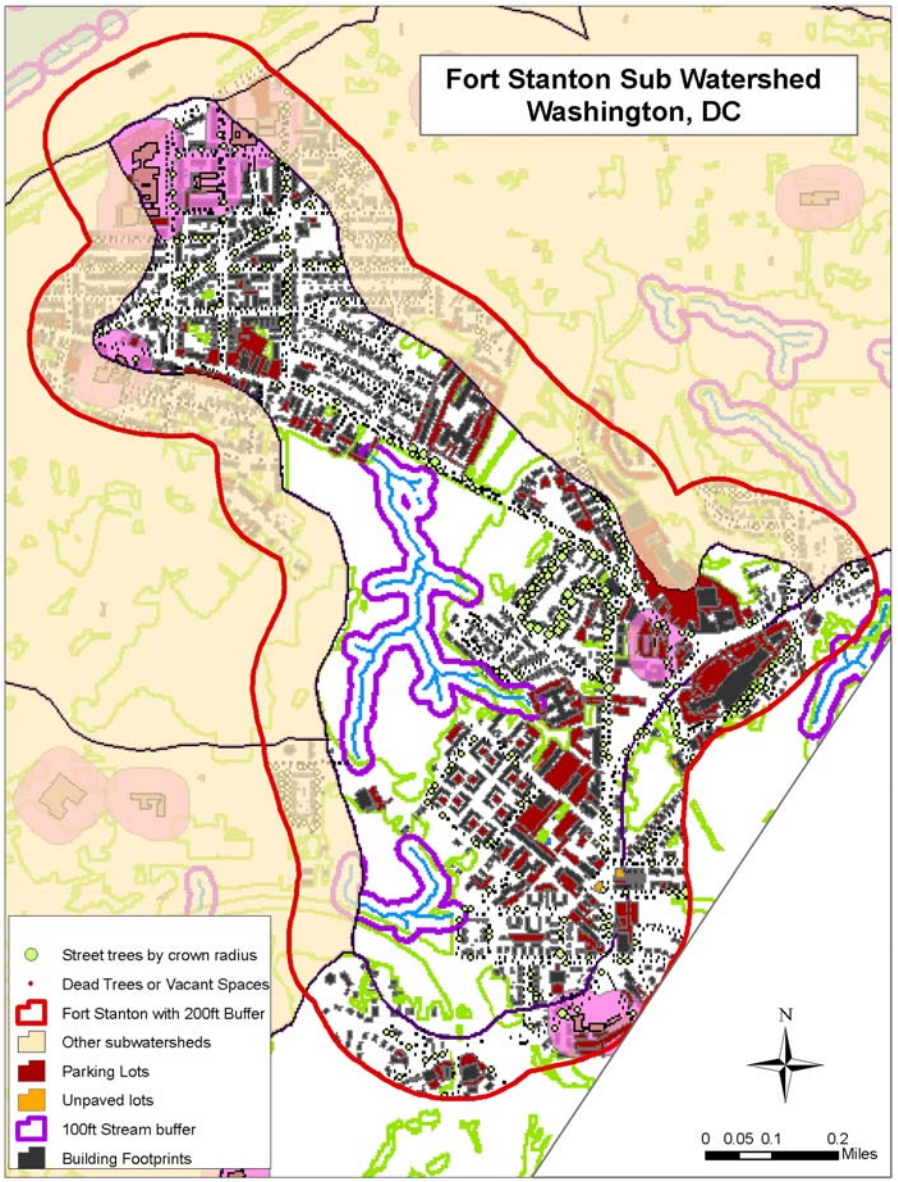
The teams will be working with ESRI's ArcPad 6.0.1 enabled Compaq iPaq handheld computers, adding defined attributes to ensure the most accurate data. The model begins with seven planimetric shapefiles provided by the Office of the Chief Technology Officer in the DC government and a street tree inventory shapefile generated by Casey Trees in 2002. These layers will be converted to raster and reclassified using a priority rating system and the weighted overlay tool in Spatial Analyst. A complete inventory assessment will be conducted looking for planting opportunities by prioritizing riparian buffer zones, empty street tree boxes, public school areas, vacant and unpaved lots.

In the future the model intends to consider air quality, high crime areas, a more thorough look at storm water diversion and other important benefits that trees can provide. The methodology should locate our prime areas for tree planting and set a standard for further ways to improve watershed health and 'regreen' Washington, DC.



Fort Stanton Regreening Priority Model


Fort Stanton
Sub watersheds of the Anacostia


Fort Stanton Sub Watershed
Washington, DC
Street trees by crown radius
Dead Trees or Vacant Spaces
Fort Stanton with 200ft Buffer
Other subwatersheds
Parking Lots
Unpaved lots
100ft Stream buffer
Building Footprints
N
0 0.05 0.1 0.2
Miles

This study will be conducted June – August 2005. Please contact The Casey Trees Endowment Fund for additional information at 202-833-4010 or www.caseytrees.org.

Casey Trees Reforestation Planting,
Fort Stanton subwatershed Washington, DC