Project Overview:

Black’s Nook Restoration Plan
Resource Inventory
Bioengineering Group, Inc.
By Jennifer Sumael
Goals of Restoration Plan

• Improve water quality within Black’s Nook
• Restore and develop strategies to maintain degraded and fragmented landscapes
• Improve circulation and provide for appropriate site amenities
Goal of my task

• Natural/Cultural resource inventory database for Black’s Nook Pond, showing cultural and ecological components
Project Location
Black’s Nook
Products/Output

1. Database of landscape/ecological components
   A. Feature datasets of landscape/ecological components.

2. Database of cultural components
   A. Feature datasets of cultural components

3. Documentation of the methodology for database development

4. Maps showing natural/cultural resources in the Black’s Nook area
   A. Natural resources
   B. Cultural resources
Tasks:

• List names, feature types and attributes of datasets to be created
• Database characteristics
• Review field data/Import CAD data to GIS
• Create feature datasets and associated feature classes
• Input remaining field data into feature classes
• Create Maps
List names, feature types and attributes of datasets to be created

A. Natural Resources
   1.A Vegetation feature dataset
      1.a Trees-Specimen
      1.b Trees-Stands
      1.c Shrub masses
      1.d Ground Cover
      1.e Canopy
      1.f Invasives
   1.B Soils
   1.C Slope
   1.D Litter
Continue...

B. Cultural Resources
   2.A Trails
   2.B Overlooks
   2.C Pond Access areas
   2.E Facilities
Database Characteristics

A. Coordinate system and datum
  • NAD_1983_Stateplane_Massachusetts_Mainland_FIPS_2001
  • Projection: Lambert_Conformal Conic

B. Base Information
  • Cambridge boundary, Fresh pond reservation, roads, water bodies

C. File structure/Directory structure
  • Relative path
Review Data field

How data were generated for this project?

A. Field survey for Natural Resources
   • Using aerial photo, and locate information manually, not using GPS
   • Import MRSid in CAD, draw whatever information from the field survey
   • Information stored in Excel File

B. Cultural Resources from City of Cambridge Water Department
Problems Encountered

CAD file when exported to GIS

- NO spatial Information (Coordinate system, projection)
- Georeferencing is possible but still the polygon and points are made in CAD, and it is a small scale project which is hard to match with roads and buildings for Georeferencing
- Manual inputs in aerial photo were not all match with excel information
Continue...

When CAD exported to GIS polygons and points fall on the right location

Why? I don’t know.
CAD to GIS
Solution:

- Create feature classes for all information, and trace the points and polygons from the CAD file
- Edit tables with the excel information, discrepancies were audited detail to detail approach
Create Data Dictionaries and Input Data

Tree Specimen

Problem:
Discrepancy on data (311 Big Trees, endangered species)

Solution:
Match one by one

Geometry: Points
### Tree Stands

**Trees (group of trees)**

**Geometry: Polygons**

<table>
<thead>
<tr>
<th>FID</th>
<th>Shape</th>
<th>ID</th>
<th>GENUS</th>
<th>SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Polygon</td>
<td>4</td>
<td></td>
<td>Large stand of white pine with Ailanthus in the gro</td>
</tr>
<tr>
<td>1</td>
<td>Polygon</td>
<td>5</td>
<td></td>
<td>Very open understory: Canopy 66% mostly cedars</td>
</tr>
<tr>
<td>2</td>
<td>Polygon</td>
<td>21</td>
<td></td>
<td>Vest stand of Robinia (about 9&quot;) on the outer edge</td>
</tr>
<tr>
<td>3</td>
<td>Polygon</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Shrub Masses

## Attributes of Shrub Masses

<table>
<thead>
<tr>
<th>FID</th>
<th>Shape°</th>
<th>ID</th>
<th>GENUS</th>
<th>SPECIES</th>
<th>DBH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Polygon</td>
<td>2</td>
<td>Cluster of buckthorn saplings</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>Polygon</td>
<td>3</td>
<td>Very dense Celastrus with a few buckthorn and ooth</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Polygon</td>
<td>4</td>
<td>Celastrus well established throughout row of trees</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Polygon</td>
<td>5</td>
<td>A stand of small dogwood shrubs</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Polygon</td>
<td>6</td>
<td>Japanese knotweed</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Polygon</td>
<td>7</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Polygon</td>
<td>8</td>
<td>Allaria, elm saplings, buckthorn</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Polygon</td>
<td>9</td>
<td>Allaria on ground, elm, norway maple, and oak sap</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Polygon</td>
<td>10</td>
<td>Open canopy area, staghorn sumac have established</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

## Geometry: Polygons