INTRODUCTION & OBJECTIVES

The invasive plant species **Japanese knotweed** (*Fallopia japonica*, Fig. 1 A), **Tree of Heaven** (*Ailanthus altissima*, Fig. 1 B), **common reed** (*Phragmites australis*, Fig. 1 C), and **purple loosestrife** (*Lythrum salicaria*, Fig. 1 D) are all currently present in Bushkill Township, PA.

The objectives of the Bushkill Township Invasive Species Management Project are to (1) identify and map these four species within Bushkill Township; (2) use this information to predict where these species are most likely to be found within the township; (3) develop an action plan for invasive species treatment and social media outreach.

Analysis

- ArcGIS 10.1 used to calculate properties of each stand.
- Elevation, slope, aspect, residential density, soil type, and distance from bodies of water, woodlands, wetlands, tower corridors, & bridges.
- Above features that best characterized each species’ affinities were used to create hot spot maps.
- Two maps were created for purple loosestrife, one before fieldwork based solely on literature and one after fieldwork.

RESULTS: MAPS

**Invasive Species in Bushkill Township**

**Predicted Hot Spots of Japanese Knotweed**

**Predicted Hot Spots of Tree of Heaven**

**Predicted Hot Spots of Purple Loosestrife, Before Fieldwork**

**Predicted Hot Spots of Purple Loosestrife, After Fieldwork**

**RESULTS: SPECIES AFFINITIES**

Table 1. Select features with the average or majority for each species (n = number of data points collected). Asterisks represent the features chosen for hot spot map calculation (asterisk in parenthesis for ‘before’ map only).

<table>
<thead>
<tr>
<th>Feature</th>
<th>Japanese Knotweed</th>
<th>Common Reed</th>
<th>Tree of Heaven</th>
<th>Purple Loosestrife</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from a body of water</td>
<td>224 ft *</td>
<td>304 ft</td>
<td>658 ft</td>
<td>187 ft *</td>
</tr>
<tr>
<td>Distance from forested area</td>
<td>39 ft *</td>
<td>640 ft</td>
<td>140 ft *</td>
<td></td>
</tr>
<tr>
<td>Distance from wetlands</td>
<td>450 ft</td>
<td>631 ft</td>
<td>1185 ft</td>
<td>535 ft *</td>
</tr>
<tr>
<td>Residential Density</td>
<td>Low *</td>
<td>Low *</td>
<td>Med-low *</td>
<td>Low *</td>
</tr>
<tr>
<td>Distance (Average)</td>
<td>483 ft</td>
<td>665 ft *</td>
<td>806 ft</td>
<td>573 ft</td>
</tr>
<tr>
<td>Slope (Average)</td>
<td>9.82°</td>
<td>6.33°</td>
<td>12.89°</td>
<td>8.62°</td>
</tr>
<tr>
<td>Soil type (majority)</td>
<td>70% all hydric</td>
<td>86% partially</td>
<td>89% partially</td>
<td>hydric *</td>
</tr>
</tbody>
</table>

To predict species affinity throughout Bushkill Township, the above selected features were used to assign quantitative high/medium/low affinities for each species. All features were weighted equally in the creation of hot spot maps, which are accurate to 30 sqft (Figure 4).

CONCLUSIONS

- Hot spot maps are a useful tool for predicting where a species is most likely to be found.
- Invasive species do not all have the same affinities.
- Hot spot maps are more specific and focused if more data is collected (Fig. 4 B, n=67 vs Fig. 4 D, n=14).
- Literature alone cannot accurately predict species affinity – fieldwork is essential (Fig. 4 E is 47% accurate, Fig. 4 F is 96% accurate).

FUTURE WORK

- Use hot spot maps to guide future fieldwork for these species in areas of interest within Bushkill Township.
- Expand data collection to include additional species.
- Develop action plan for invasive species treatment using knowledge of species locations.
- Expand current database by resident use of the Bushkill Township Invasive Species Data Collection Application.

MAP SOURCES


* Not all sources were included in final maps but all were used for data analysis.