The U.S. Forest Service's National Urban and Community Forestry Advisory Council (NUCFAC) funded the Bloomington Urban Forestry Research Group (BUFRG) to study tree planting projects supported by nonprofit organizations, including the Pennsylvania Horticultural Society (PHS).

This brochure presents the results of part of the project: a re-inventory of trees planted by PHS from 2009 to 2011 and benefit estimates from i-Tree Streets.

PHS planted more than 5,000 trees from 2009 to 2011. In June and July of 2014, teams of volunteers, supervised by PHS, re-inventoried 1,742 of those trees. In our analysis of the re-inventory data we found:

- Survival rate was 59%.
- 53% of trees were in good condition.
- Average DBH (diameter at breast height) was 2.5 inches.
- 57% of trees were between 2 and 4 inches DBH.
- The estimated total replacement value of the trees is $277,000.
- Estimated total annual benefits of the trees are $16,000.

If all trees planted from 2009 to 2011 had the same species composition, average DBH, and mortality rates as the re-inventoried trees, they would provide around $50,000 in total annual benefits.

For more information, visit:

phsonline.org
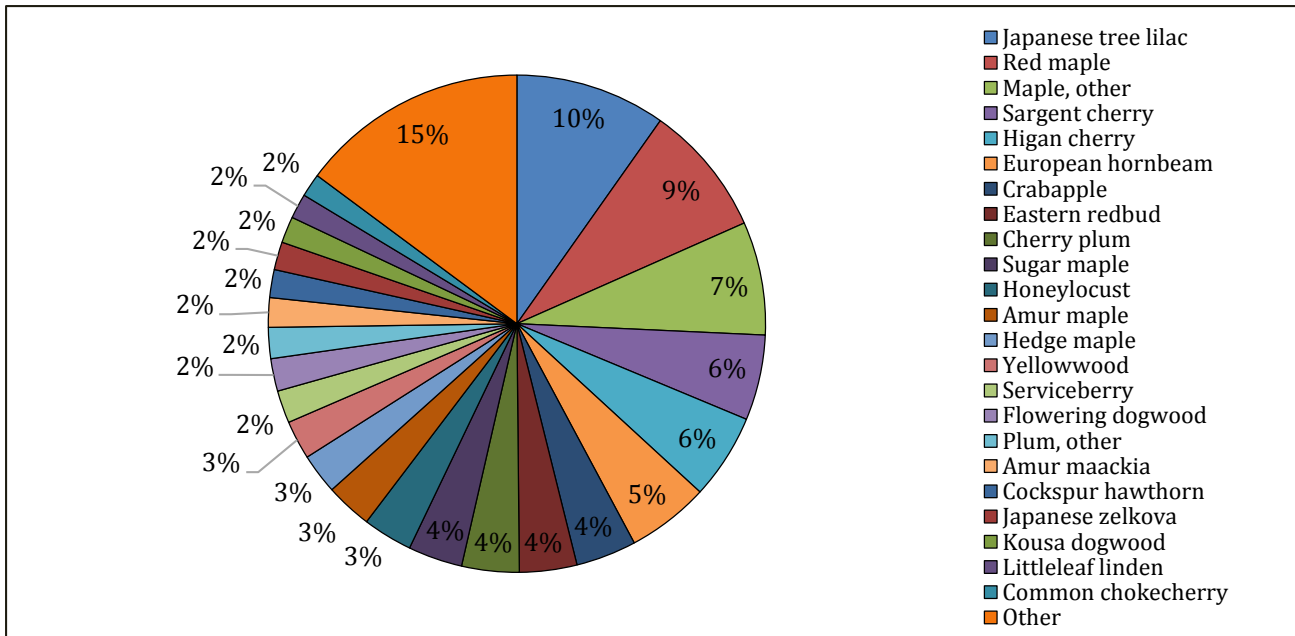http://www.indiana.edu/~cipec/research/bufrg_about.php
www.iTreetools.org
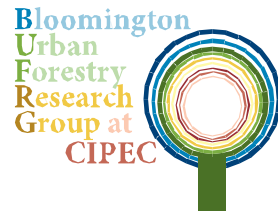
Pennsylvania Horticultural Society

Planted Tree Re-Inventory:
Survival and Benefits of Recently Planted Trees

Legend:
- Japanese tree lilac
- Red maple
- Maple, other
- Sargent cherry
- Higan cherry
- European hornbeam
- Crabapple
- Eastern redbud
- Cherry plum
- Sugar maple
- Honeylocust
- Amur maple
- Hedge maple
- Yellowwood
- Serviceberry
- Flowering dogwood
- Plum, other
- Amur maackia
- Cockspur hawthorn
- Japanese zelkova
- Kousa dogwood
- Littleleaf linden
- Common chokecherry
- Other

Above: Species distribution of surviving re-inventoried trees. Japanese tree lilacs made up 10% of surviving re-inventoried trees, while 25% of surviving re-inventoried trees were maples.

Tree Benefits

We used i-Tree Streets to estimate the energy, carbon, air quality, stormwater, and aesthetic benefits and canopy cover provided by the re-inventoried trees. i-Tree takes into account the species and size class of each tree in calculating canopy cover and incorporates energy costs and climate in calculating benefits.

Most (67%) of the current annual benefits are aesthetic; we expect aesthetic benefits to become relatively less important over time as the trees grow larger and contribute more stormwater benefits.

Below: Estimated annual benefits per tree, by type, provided by the ten most common surviving tree species.
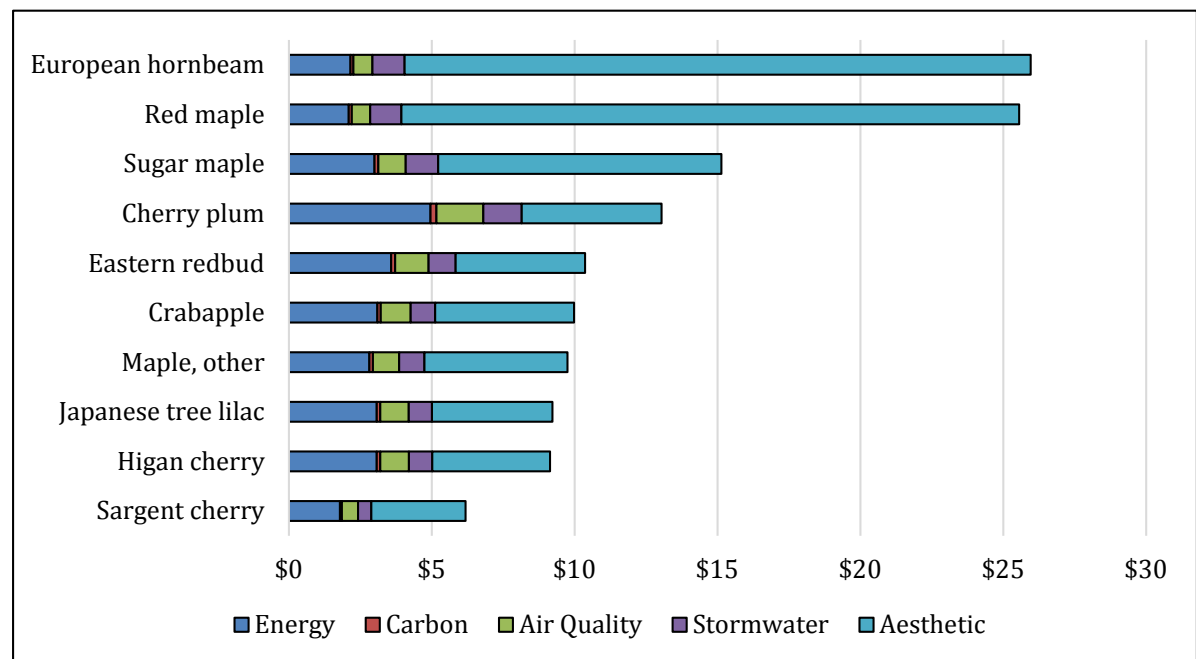
The re-inventoried trees . . .

- Provide $16,000 in total estimated annual benefits.
- Provide $3,000 in annual energy benefits, corresponding to 450 GJ of reduced energy usage.
- Sequester or avoid 18,000 kg of CO_2 each year.
- Take up or avoid 18 kg of ozone, 44 kg of nitrogen dioxide, 11 kg of particulate matter, and 19 kg of sulfur dioxide each year.
- Intercept more than 120,000 gallons of rainfall each year.
- Provide $10,000 in increased property value (aesthetic benefits).
- Provide 59,000 ft^2 of canopy cover.