

NURSERY STOCK, HOMEOWNER PREFERENCES DRIVE TREE DIVERSITY IN SALT LAKE VALLEY

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Utah's early residents would be surprised to see the canopy of trees that covers the Salt Lake Valley today. Few trees are native to the valley, which means that most of the trees present there today are imported. It's a much different situation from a natural forest, which is shaped by climate, water availability and biodiversity. So, what factors shape the formation of a new urban forest?

University of Utah professor Diane Pataki and former U postdoctoral scholar Meghan Avolio (now a professor at Johns Hopkins University) took this question on, along with colleagues from Utah State University and the University of Delaware. Their survey of tree species diversity in the Salt Lake Valley is published in *Ecological Monographs* (<http://onlinelibrary.wiley.com/doi/10.1002/ecm.1290/abstract>) as "Biodiverse cities: the nursery industry, homeowners, and neighborhood differences drive urban tree composition."

They found that tree species diversity can be shaped by the species available in nurseries, the preferences of the homeowners, and even the tree selections of their neighbors.

"Ecology started out as a descriptive discipline," Pataki says. "You want to understand why you see the distribution of species that you do. This paper states what is out there in Salt Lake, and makes the best attempt we can to figure out why."

Counting trees

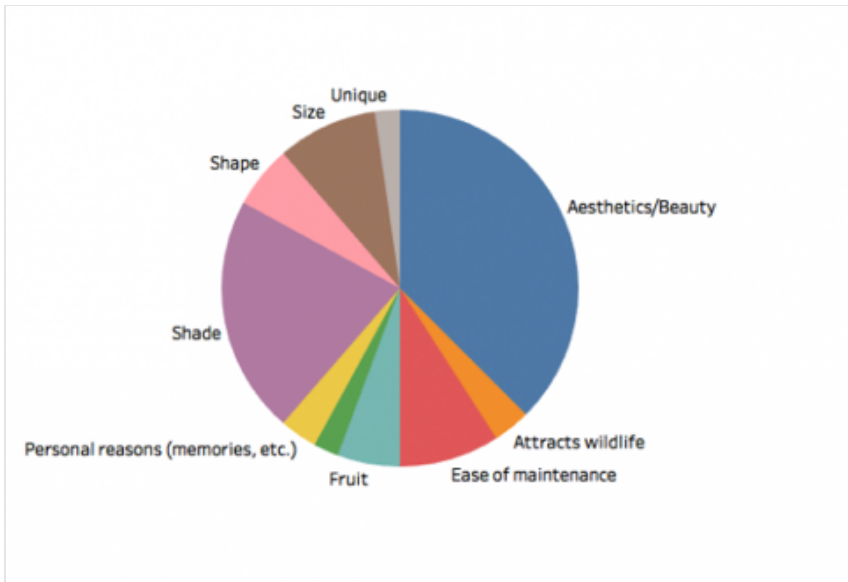
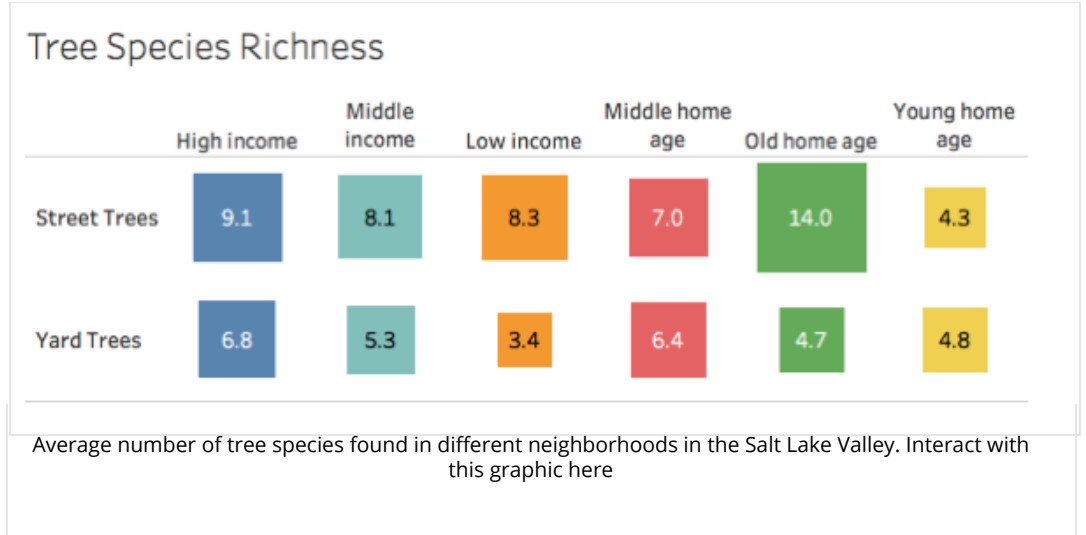
Urban ecology incorporates social science into ecology and is a relatively unexplored field. So, Pataki and Avolio didn't have much precedent to go on when designing their study. They began by looking at comparable neighborhoods in the Salt Lake Valley and chose nine neighborhoods representing combinations of median home age (pre-1939, 1951-1970 and 1985-2005) and median household income (less than \$45K, \$45-85K and more than \$85K). From those neighborhoods, they chose five or six blocks to survey, and sent postcard surveys to homeowners, followed up with in-person visits in 2014. The researchers were looking at the tree species present both in homeowner's yards and in streets. In the homeowner surveys, researchers asked what people liked about the trees in their yard, and what factors led them to remove trees.

Then in 2015, the researchers visited the six most popular nurseries in the Salt Lake Valley – three big-box retailers and three smaller, locally owned nurseries, recording all tree species offered for sale. Their aim was to examine the role of nurseries in shaping urban tree diversity. "Trees in Salt Lake come from nurseries," Avolio says. "This shouldn't be a surprise to anybody who lives in the Salt Lake Valley, but the role of nurseries is largely absent from the ecological literature."

What they found

After counting and classifying more than 15,000 trees, the team made the following observations:

- There were 148 distinct species present in neighborhoods and 262 species were offered for sale in nurseries.
- Locally owned nurseries offered nearly three times as many species, a total of 219, as big-box nurseries (80 species), but prices at those nurseries were, on average, around \$100 more per tree than the big-box retailers.
- Older neighborhoods had more diversity among street trees than younger, while higher-income neighborhoods had more diversity and more trees overall than lower-income areas.
- Younger neighborhoods had high numbers of flowering trees, dominated by the flowering pear, which accounted for two-thirds of all street trees in those areas.
- Survey respondents' favorite tree matched the most popular tree in both nurseries and yards: the maple (from the *Acer* genus).



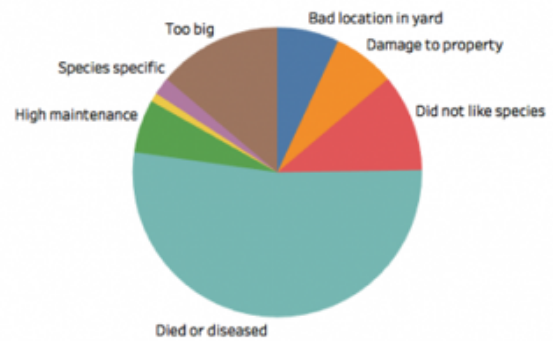
Top favorite tree traits. Interact with this pie chart here
 (https://public.tableau.com/views/Pataki_Avolio_Tree2/Dashboard1?:embed=y&:display_scouecnit=fjyc estr&peesu blaisnhd= ywesi)

“We find strong relationships between the sources of plants – nurseries – and why the plants are there – human preferences,” Avolio says. “Someone bought the tree and put it there because they liked something about it.”

They also noted that yards and neighborhoods close to each other had more similar species patterns, suggesting that neighborhoods have distinctive landscape identities. “These landscape identities likely contribute to the role that trees have in creating a sense of place,” the team writes, “whereby people form a bond with th. the attributes of a place that trees help create.”

Pataki adds: “When you walk through a forest, you see different environments. That’s probably driven by soil characteristics or slope. Maybe in neighborhoods, people influence each other’s plant preferences.”

Pataki and Avolio hope that their studies of tree diversity and preferences could positively impact nursery tree offerings and homeowner preferences in the future. “We’ll have a better understanding of what people want,” Avolio says, “and once we have that, we can make suggestions for trees that will be more sustainable – use less water, give off less pollen – as long as they have attributes that people like.”



Respondents' reasons for removing trees. Interact with this pie chart here

Pataki says that the imported tree diversity is a benefit to the Salt Lake Valley. “I’m skeptical of the idea that the best way to achieve sustainability goals in urban landscaping is by planting native species,” she says. “That’s way too narrow of an approach. The urban forest is quite diverse and more diverse than the trees that were here before. In fact, the native landscape was almost treeless and that’s not what most people want for the city.”

Find the full study here

(<http://onlinelibrary.wiley.com/doi/10.1002/ecm.1290/abstract>).

Tara L.E. Trammell, from the University of Delaware, and Joanna Endter-Wada from Utah State University were additional co-authors of this study.

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