SOCIAL JUSTICE AND URBAN GREENING: THE CASE OF URBAN TREE PLANTING PROGRAMS IN MASSACHUSETTS*

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Theoretical Context and Background
- SES approach, justice, and place
- NSF-REU / HERO research program

Research Themes:
- ALB and Tree Planting in Worcester
  - Key Findings
- Tree Planting in Massachusetts
  - Preliminary Research and Findings

Conclusions
A systems approach to urban greening

Human and ecological factors that co-produce legacies for both urban tree cover pattern/process, and institutional orientation and stability (modified from Roman et al., in review; Mincey et al. 2013)
Why use “Place”?

• Power of “spatial” imaginaries

• Place offers grounded materiality of everyday life

• Problem of scale and “local trap”

• Places as systems, relations
Social justice for urban greening

• Robert Bullard (1993)
  • Environmental pollution, risks, disproportionately affect communities of colour

• Laura Pulido (2000; 2015; 2016)
  • Racialization processes as always already *inherent to urbanization processes* (with local variations)

• Nik Heynen (2003)
  • Scalar elements of “justice” in urban greening – multiple perspectives on what is “right”
• Clark supported program
• NSF-REU site (2012-2014): Research Experience for Undergraduates
• Participating undergraduates in residence at Clark for 8 weeks in the summer to conduct research.
• Tree disturbance and planting research (2014-2017):
  • >1000 trees in Worcester sampled
  • >500 trees in Gateway cities
  • > 100 Stakeholders interviewed/focus groups
Pulse disturbance: the Asian longhorned beetle (ALB) infestation

> ALB discovered in Worcester in August 2008 – targets hardwood species (esp. maples)
> Quarantine zone: six towns, 337 km$^2$
> Trees removed (eradication strategy) and counting: 35,030 (2015)
> Trees planted: 30,000 + (2014; goal met)

Granville Avenue, Worcester
Study area: Worcester quarantine zone
Total canopy change: Identifying loss 2008-2010

- Total Tree Cover Lost: 2%
  - Boylston: 0.8%
  - West Boylston: 1.7%
  - Holden: 1.9%
  - Shrewsbury: 1.9%
  - Worcester: 3.5%

- Tree Cover Lost in Burncoat, Greendale, & Indian Hill: 18%
Spectrum of Impacts:

**Environmental**

Loss

Gain

Personal

Communal

“The repercussions, ecologically, of the wind got so severe we lost power five times. The house over there had the shingles blown off.”

- Worcester Resident

“We had skunks and rabbits, and birds…and we really do miss that because most of them have left us.”

- Worcester Resident

“When the trees came down…it revealed a lot of things that were not so nice to look at.”

- Shrewsbury Resident

“The most beautiful thing was when the trees made a tunnel over all the streets and you could drive through the tunnel…and I miss that so much.”

- Worcester Resident

“It’s a great opportunity to do some really broad scale urban forestry work.”

- Worcester Resident

“We had an older stock of urban forest here to begin with, and I think, this, this, I think, gave us an impetus to really address what we have here in the entire city.”

- Government Official
Broader Implications

Environmental Awareness

“I got involved with these two people last year... we are establishing a group with issues not only in the trees but with other things in our neighborhood.”
- Worcester Resident

“I had...a much greater appreciation for the value of the environment, trees particularly, and how vulnerable all of our communities can be to these kinds of pests. As a country, as a commonwealth, we have to be really incredibly vigilant on how we keep our eyes open on protecting our communities.”
- Government Official

Sacrifice

“I think we're looking [at eradication] in a narrow way because it affected our neighborhood...But we want to see the beetle eradicated because it could do such critical damage. I think we're short-sighted if we overlooked that.”
- Shrewsbury Resident

“I think people appreciate the sacrifice that Greendale made for the rest of the state.”
- Worcester Resident
Tree planting benefits, programs

- Energy
- Wildlife
- Property Value
- Community
- Noise
- Air Quality

Casey Trees
Worcester Tree Initiative

Casey Trees - Washington DC

MillionTreesNYC
A PLANYC Initiative with NYC Parks and New York Restoration Project

MillionTreesLA

Rebuilding Worcester’s Urban Forest
Replanting Program

Initial Goal, 2009:
• Plant 30,000 trees to replace those cut in the Quarantine Zone

Organizations:
• The Massachusetts Department of Conservation and Recreation (DCR) assists communities and nonprofits to manage community trees and forest ecosystems
  • Plant on private property; owners steward
  • Plant on streets; WTI/City steward
• Worcester Tree Initiative (WTI) promotes urban forestry and stewardship in Worcester and surrounding communities
  • Teach people how to plant and steward; water new city trees
• City of Worcester: Coordinate with DCR, WTI for priority streets, trees
Survivorship Factors

“This one [in the front yard] we kinda chose cause we wanted a prettier tree in the front and the ones in back we wanted ones that would grow tall and provide shade”

“Well I wanted to add colors so most of the trees I got were either a reddish color or would eventually flower. We wanted to add some colors to the property”
Summary of Worcester planting analysis

• **Tree Planting**
  • Survivorship was 77.6% (79.6% without White Fir)
  • Higher survivorship hypothetically linked to greater care of ornamental/non-native/front yard trees
  • Opportunity to improve communication about shade/native/back yard trees and their ecosystem services

• **Resident Experience**
  • Most residents were appreciative of the tree planting programs and had a positive feeling regarding the WTI and DCR
  • The majority of residents watered their trees and didn’t feel burdened by their trees
Greening the Gateway Cities (GGC) Program: Massachusetts Department of Conservation and Recreation (DCR), 2014-present

Goal:
To reduce energy costs by expanding tree canopy 5%-10% in select neighborhoods.

Planting zone criteria:
- Low tree canopy
- Older housing stock
- High wind speeds
- Large renter population

Program Structure:
- DCR plants trees and waters street trees
- Community partners for communication/outreach
- Private stewardship

Planting commenced: Chelsea, Spring 14; Holyoke, Fall 14; Revere, Fall 15
Research Questions

1. Understand factors related to tree health and survivorship

   How does tree health compare across the three cities?
   ...by species?
   ...by land use?
   ...by site type?

2. Understand the contribution and experience of residents and stakeholders

   What attitudes contribute to successful tree stewardship?
   What are the experiences of residence in caring for trees?
   How have the new trees affected residents’ perception of their property/neighborhood/city?
Tree Survey and Interviews 2017

Tree Survey - 4 weeks
Assess tree characteristics that indicate tree health and canopy cover.
Record environmental factors that could affect tree health.

Interviews - 1 week
Interview residents and stakeholders.
Assess resident interaction with the Department of Conservation and Recreation.
Survivorship: All Trees

- Holyoke, Chelsea, & Revere: 81% Alive, 10% Removed, 12% Standing Dead, 1% Unknown
  - n = 1390

- Holyoke: 78% Alive, 10% Removed, 1% Standing Dead, 12% Unknown
  - n = 842

- Chelsea: 86% Alive, 6% Removed, 7% Standing Dead, 1% Unknown
  - n = 432

- Revere: 94% Alive, 5% Removed, 1% Standing Dead, 1% Unknown
  - n = 116
Key Trends: Greening the Gateway Cities

Housing type was not significant in survivorship of private trees.

Street trees performed better than private trees.

Private, non-residential trees had lower survivorship than private residential and street trees.

Front yard trees perform better than backyard trees.

Maintained parks and other maintained areas performed poorly compared to other land uses.

Street trees on institutional land use had high mortality though surviving trees had higher vigor than trees on other land uses.
Summary: Justice and Tree Planting

- Ecological-human factors interface (SES)
  - Current and future ecosystem services
  - Energy costs and savings
  - Health and well-being of residents
  - *Stewardship*, esp. watering in first three years
- Factors relating to tree health and survivorship
  - Growth patterns, species performance
  - Soil composition, shading, nearby impervious surfaces
- Factors relating to “institutional sustainability context”
  - Individual attitudes towards trees and tree-scapes (sense of place, environmental awareness)
  - Actor-networks and relationships (NGOs, gov, other groups)
Thank you

Questions?
References

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