Convergence in Urban Park Forests of the Coastal Northeastern United States

(Powerpoint Slides withAbstract, Literature Cited and Acknowledgements)

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Abstract

The vascular floras of ten large (> 1000 acres) urban park located in or bordering Boston, New York, Philadelphia, Baltimore, and Washington D.C. are compared for similarities and analyzed for the existence of communities. The combined flora for the ten park forests contains 147 families, 599 genera and 1397 species with 490 being non-native species. Less than 1% of the total number of species were present in all ten parks and less than 5% were present in eight or more of the ten parks. However, the species present in eight or more of the ten parks share common characteristics. The non-native species are invasives and nearly all of the native species thrive in disturbed environments.

Alternatives for urban park forest management are proposed which incorporate non-native invasives and native disturbance species.

Keywords

Comparative flora, urban parks, human impact, invasive species, management alternatives.

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Slide 2

Urban Park Forest Conditions

The diversity of native plant species found in an urban park forest is influenced by human activities including uncontrolled vehicle and pedestrian traffic, arson, dumping, modification of soil structure, air pollution and soil pollution (Loeb 1987).

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Continuum of Plantings in Urban Park Forests

Landscaped forests such as Central Park, New York City (Loeb 1993)

Episodic plantings of varying extent including Pelham Bay Park, New York City (Loeb 1998)

Virtually unplanted forests, for example Middlesex Fells, Boston (Drayton 1993)

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Change Through Time in the Flora of Urban Park Forests

Central Park, NYC – Arboreal (Loeb 1993)

Year	Total Species	Non-native	1982
1857	78	23	49
1858	149	62	80
1863	244	155	105
1873	212	138	96
1903	220	136	113
1970	139	88	94
1982	162	95	162

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Change Through Time in the Flora of Urban Park Forests

Pelham Bay Park, NYC – Entire Flora (DeCandido 2001)

Year	Native	Non-Native	Planted
1946-1947	481	187	3
1994-1998	441	301	50
Common	328	160	0

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Change Through Time in the Flora of Urban Park Forests

Middlesex Fells, Boston – Entire Flora (Drayton and Primack 1996)

Year	Native	Non-Native
1889	350	72
1993	244	87
Common	216	51

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Research Questions

Are the floras of large (>400 ha) urban park forests in the coastal northeastern United States converging to a common flora?

How should the urban park forests be managed in light of commonalities in floras?

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Parks, Cities, References

Park Name	City	Literature Reference
Middlesex Fells	Boston	Drayton 1993
Pelham Bay	New York	DeCandido 2001
Van Cortlandt	New York	Natural Resources Group 1990
Breezy Point	New York	Venezia and Cook 1991
Jamaica Bay	New York	Venezia and Cook 1991
Wildlife Refuge	New York	Venezia and Cook 1991
Pennypack	Philadelphia	Horowitz et al. 2004
Wissahickon Creek	Philadelphia	Horowitz et al. 2004
Oregon Ridge	Baltimore	Redman 1999
Rock Creek	Washington	Fleming and Kanal 1995

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Totals for Families, Genera, Species and Non-native Species

Families	147
Genera	599
Species	1391
Non-native Species	490

Nomenclature follows Gleason and Cronquist (1991), Bailey et al. (1976), Kartesz (1999), and Bailey and Staff of the Bailey Hortorium (1954).

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Number of Parks Present, Native Species, Non-native Species, and Invasive Species

Number	Native	Non-native	Invasive
1	282	162	32
2	182	92	34
3	124	70	31
4	93	42	22
5	64	37	18
6	63	43	24
7	48	22	13
8	25	15	12
9	13	8	8
10	7	6	6

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Why Are Species Lost?

Disturbance

Theft

Drought

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Alternative for Management

Philosophy:

“we must maintain an open mind and analyze the issue of exotic species introduction and management as an intrinsic and continuous process in a world where our own species is a main agent of change.” (Lugo 1997)

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Alternative for Management

Guide for Actions:

“learning to manage and control environmental change, recognizing when conditions are obviously beyond our control, avoiding condemning species” (Lugo 1997)

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Key Elements for Management: Build Linkages to Interest Groups

Friends groups – species monitoring

Law enforcement – safety for people and plants

Forest companies – forest sponsorship

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Key Elements for Management: Non-Planting Activities

Friends monitor species changes and open habitats

Capital projects to recapture runoff

Lease forest tracts for timber growth and harvest

Slide Sixteen

Key Elements for Management: Plantings for Species Diversity

Disperse native species plantings

Select native species that thrive among non-native invasives

No shrubs except to create exclusion boundaries

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Conclusions: Science

Urban park forests remain diverse

Convergence in non-native invasive species

Need for standard methods including habitat assessment

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Conclusions: Management

Value existing species including non-native and invasive species

Focus on existing environment

Capture runoff

Attract forest industry sponsors

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