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BOOK REVIEW

Old Growth Urban Forests, Springer Briefs in Ecology. 2011. By Robert E. Loeb. 78 pp. Springer: New York, U.S. ISBN 978-1461405825

In total, this ecological brief is thought-provoking and informative, whether or not one agrees with the premise of the definition as presented. A fine scholarly contribution within limits, the book develops underpinnings for interpreting forest dynamics and ecological approaches for urban canopy systems and associated urban vegetation management.

The author develops a concept of the old growth urban forest in three major sections. After introducing the topic and developing a workable definition for the old growth urban forest in the first section, the second section employs a series of studies to compare New York City, New York, and Philadelphia, Pennsylvania, U.S., as nodes of a megalopolis that fall within a common forest region. The comparison is used to explore historical ecology methods to develop and discuss aspects of forest dynamics within an urban context. The third section presents the argument for the conservation and restoration of old growth urban forest areas of merit through adaptive management and community partnerships.

There is no formal definition posited for the urban forest or for the old growth urban forest. Rather, there are short background sections that discuss aspects of each word or phrase. There are major assumptions made about, and limitations imposed upon, the subject, which must be accepted, or at least allowed, for the purpose of getting the value from the text. According to the text, if the current tree community has fidelity with the pre-development (or previous to a post-development major disturbance) canopy species with a percentage of large trees, the litmus test for designation as "old growth" has been passed. There also has to be some definition of urbanity for that the author chooses a metropolis. With the choice of a metropolis as the defining unit, the author can move into suburban and adjacent lands within his treatment of forest typologies at a regional scale, but it limits what community canopies fall into the term "urban forest." The author assigns typologies of street, landscape, and remnant within the larger urban forest definition. Defining the forest in this text relies on the arboreal community to the exclusion of other vegetation types within the defined system, which hampers extension into a larger forest ecological context.

The use of a resetting event for the vegetation community, chosen as a consequence of a development process, also begs some indulgence when dealing with some metropolis systems. For example, the use of the Miami, Florida, U.S., metropolis in remnant old growth urban forest research can identify a major development or re-setting event in the city expansion of the late 1890s or in a major hurricane several years later. In either case, old growth status could be conferred within a single tree lifespan or community generation. This juxtaposition between the concept of old growth, its definition for an urban context, and the marked rapid expansion of urban systems might suggest that there is room for revision and improvement in the definition of old growth in terms of the urban forest. The definition demands a canopy species distribution and some aspects of size distribution that reflect the pre-development plant community or a level of existing stock maturity. Simple repetition of species occurrence does not mark old growth as much as consumer behaviors in many cases. Maturity by trunk size, as used in the text, is difficult to gauge when trees (particularly among inner city areas) do not necessarily reach maturity or natural cohort senescence prior to redevelopment or decline. Interpretation of size in relation to designed site types is also largely undefined to anchor the concept of maturity by size. Forty years of a species lifespan capable of centuries of growth might be considered successful, but not old in the context of the discussion. If an observed forty-year specimen is of the same species as had been used in three previous plantings, chosen out of market access or tradition, it would trace back to the start of the industrial revolution and rapid urban design changes. Such occurrences can define continuity, but not what might be ascribed to an old growth forest trajectory in a larger discussion of ecological value or function.

The second section of the book deals with analysis methods for concept development. The author introduces a sequence of inquiry that relies heavily on paleopalynology (the analysis of the pollen record), compared with records of the historic flora and witness tree records (specific trees or groups identified by species in historic documentation). The author points out the challenges in their integration and verification through a discussion of "methodological actualism versus methodological uniformitarianism." The point made by the author: Data over decades and centuries as part of a public record are rarely set for formal analysis. The data are not always reliable. Our taxonomy is a dynamic classification process (assuming the use of the correct identifications). Finally, methods of measure and collection are far from standardized over multiple decades/centuries. These confounding factors force conclusions to be rather broad, but can inform discussions of urban forest canopy dynamics.

While the text presents a sound approach with pollen and historic records, the use of a burgeoning resource of data through geo-spatial analysis and interpretation is largely ignored. Digital inventories are becoming commonplace and can be effectively used in the comparison of historic documentation and published flora compilations against the disturbance and recruitment filter that is the urban landscape design and redevelopment process. These tools are shown in the application of conservation efforts detailed in the book's third section, and will certainly augment the approaches and perspectives laid out for the reader.

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With the author's argument presented for preservation and restoration of old growth urban forests, there is the *a priori* assumption that change or replacement in the species community is a negative event. The assumption may be questionable since a rapidly changing climate will undoubtedly shift certain niche environments faster than varied plant species can migrate or exist in balance with the new environmental stress gradients. Old growth forest can describe a very stable state, but it is a system dynamically coupled with its environment. As niches develop and disintegrate, there must be invasion or replacement linked with such disturbance. Pollen records indicate such transitions in natural systems, so they ought to be evaluated objectively in urban systems to better inform decisions based on science rather than rhetoric or policy. Practical questions arise in consideration of this approach. If an introduced species was used in early urban design and development (pre-industrial revolution) and is still in use under a very changed environment; when is it native or naturalized in the urban system? Additionally, from what distance is introduction acceptable to facilitate species migration over urban bottlenecks in a period of rapid environmental change?

This ecological brief certainly lays groundwork for future discussion and study. The text represents a needed step in developing an urban context for evaluating forest community dynamics. Of course, as with most steps, there are alternatives and challenges that may also inform and advance the conversation. Key for this text is the role of the benchmark set of species in both defining an old growth urban forest and conferring value for conservation and ecological consideration. In addition to environmental aspects to community development, urban tree management actions for engineering, ecological, public safety, or aesthetic purposes exert very particular species recruitment filters biased to management desires in designed spaces. Since urban forests are derived as part of a built environment, the drive to look backward to predevelopment plant communities in our planning and management could be counter-productive. However, discussions of defining and choosing between native species in the urban system versus choosing for species aptness for the fitness landscape of changed environment over the expected lifespan of the design can in some ways be grounded and informed by considering the author's forest dynamics approach.

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