Perspectives on Research and Development Needs in Urban and Community Forestry

Abstract

Research and the science-based knowledge it produces is a foundation for building partnerships that will broaden support for community forests in the West. This paper examines future trends in demography and technology that will shape the science of urban forestry and the delivery of technologies and information.

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Research and development in urban and community forestry has potential to enhance the visibility and management of urban forests in the West. We explore this potential by first presenting our perspective on the value of urban and community forestry as a platform from which people connect with the land and each other. We explain the need for urban forest science to substantiate the claims we make about the benefits of trees and as a basis for sound resource management. Looking to the future, we identify social and demographic trends that will influence how we conduct research and disseminate findings and technologies. Several specific issues that are likely to require research in the West are described. Finally, we assess the availability of resources for research and development to support the growth of urban and community forestry in the West.

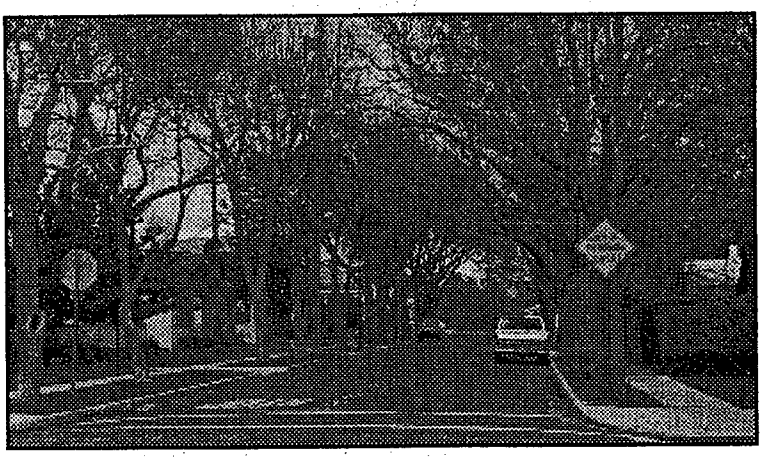
Philosophical Underpinnings of Urban and Community Forestry

Conservation leader Aldo Leopold has a sage perspective on people and land. He wrote in his journal, "There are two things that interest me; the relationships between people and land, and the relationships between people and other people." The key concept here is relationships, as in linkages between objects. Leopold later went on to propose a land ethic concerning the relationship between people and land; a relationship of respect, reverence, interdependence, and stewardship with the goal of maintaining healthy land and healthy people. This land ethic was offered to counter the natural tendencies of humans to exploit and dominate the land for their immediate benefit. It has counterparts in the cultural ethics of aboriginal people in North America and other continents as well.

Ethics concerning relationships between people and other people derive from a combination of natural biological drives, such as survival, competi-

tion, cooperation, reproduction, dominance, avoidance; and the spiritual motivations that tend to counter those biological drives, such as affection, friendship, love, respect, reverence, and care. The rules defining these people-to-people relationships are both cultural and religious in their source and they constitute a culture's ethics regarding interpersonal interactions.

Do you see a pattern of similarity in these two kinds of ethics: people-to-land and people-to-people? It is this: ethics evolve or are revealed to guide people in counteracting some of the undesired effects of natural biological drives. These biological drives cannot be eliminated or completely neutralized or we would cease to survive; other species would out-compete us for the space and resources we possess. But since we don't care for all the ramifications of these natural drives, we have ethics to temper them.



What does this have to do with urban and community forestry in the West? Well, it has everything to do with it. Consider these two questions. Where do most of the people now live in the U.S. and the West? More than 80% now live in cities and urban areas. Where do most of these people interact with other people outside their immediate families? They congregate in the same places: work, churches, neighborhoods, civic groups and the local polity. And where do all these people have any kind of daily connection with land or nature (or some semblance of nature)? The connection is made in those same cities and urban residential areas. So, if we are going to foster a land ethic in our people and at the same time strengthen our culture's ethics about how people relate to one another, what better place to focus than in our cities and communities?

Urban and community forestry can have a tremendous payoff. If people who live in cities gain a new or renewed respect, understanding, and sense of caring for the land that nourishes their bodies and spirits, and a similar respect for working together with one another, then perhaps they will extend this ethic to other places and other kinds human interactions. The environmental, economic and aesthetic benefits of such a transformation are not trivial. The magic of urban and community forestry is in how people connect with one another for land stewardship in their very own neighborhoods and communities. That is the message from the case stories we have heard at the Best of the West Summit.

Need for Research and Development in Urban and Community Forestry in the West

Resources for urban forest planning and management are precious few. One important way that research and development can contribute to

healthier community forests is by producing knowledge that will lead to more informed decision-making and cost effective management. Science is critical – necessary but not by itself sufficient – to more progressive policies and better management of community forests in the West. In collaboration with practicioners, policy-makers, and other stakeholders, researchers can help find innovative solutions to pressing problems in our communities.

One reason that resources for urban and community forestry are lacking is that potential investors are not aware of the benefits trees provide. Science-based information can increase public awareness and support for investments in urban and community forestry. For example, because trees can increase human well-being, improve air quality, and reduce atmospheric CO_2, health care foundations, air quality districts, and electric utilities stand to benefit from investments in urban and community forestry. Attracting new partners like these will rely in part on sound science that quantifies benefits and costs associated with tree planting and stewardship programs.

Future Trends That Will Influence Urban and Community Forestry Research and Development

A number of social and demographic trends are influencing communities in the West and these trends influence research and outreach. The most profound trend is rapid population growth. Communities in Nevada, Arizona, Utah, California and other Western states are among the fastest growing in the U.S. With rapid urbanization comes concern about preserving and enhancing quality of life. In metropolitan areas this concern is expressed in policies aimed at protecting water quality, insuring ample water supplies, and improving air quality. Urban-wildland issues such as fuels management and riparian habitat protection reflect the desire to maintain rural atmosphere and environmental quality while accommodating economic growth.

A second trend influencing urban and community forestry research and development is the increasingly diverse ethnic nature of communities. Trees mean different things to different people. Traditional attitudes and perceptions about urban and community forestry may not be shared by minority groups. To be successful, research products and outreach will need to be targeted to specific cultures within communities.

The West is notorious for its pioneer spirit and respect for individual freedoms. One reflection of this value is the increasing interest in local control over land use and economic decision-making. With few exceptions, state and regional planning take a backseat to local planning. This suggests that research and development will be most effectively applied at the local level. Only after examples of local success are widely recognized will opportunities for regional scale applications become possible. Researchers will need to work with local professionals to solve pressing problems in ways that can be applied to other communities.

To maximize the public's return on investment given limited research funding, we need to plan research and development so as to integrate all aspects of the research cycle. The research cycle has several stages: basic research, applied research, product development, training, and outreach. We can "close the loop" by linking each stage in the research cycle. For example, basic plant physiology research on environmental control of stomata should be linked with field measurements of transpiration and tree water use. This research should be used to develop information on irrigation requirements for trees in different settings.

Brochures/videos/workshops/computer software should be developed to transfer this knowledge to different user groups. We can make the most of limited dollars for research by developing the capability to not only conduct research but to develop and deliver products that make a difference to our customers.

In the future, research and development will become more collaborative. The problems and challenges posed in urban ecosystem science are becoming more complex and multi-dimensional. Solutions to these problems will require interdisciplinary approaches that blend an assortment of expertise. Universities, consultants, business, and non-profits will play increasingly important roles in defining the urban and community forestry research agenda and conducting this research. Interdisciplinary "steering committees" will facilitate and guide specific research projects and the development of products. Researchers must strive to address the needs of an increasingly diverse clientele.

To sustain support from customers and funding sources, research and development must remain issue relevant. Moreover, issues that are framed broadly are likely to engender the widest base of support. For example, the concept of "growing better communities through urban forestry" connects urban forestry with the broader issue of community sustainability. Some specific issues that are likely to be pertinent in the West are:

- **Urban forest health.** This can be understood as the capacity of urban ecosystems to restore equilibrium under stress, indicated by the presence of adjustment and feedback mechanisms. There is need to ❶ better understand the current health of our urban and community forests, ❷ identify indicators of their capacity to equilibrate, ❸ develop programs to monitor stress, and ❹ mobilize resources to enhance urban forest health.
- **Urbanization and the urban-wildland interface.** We must continue documenting the value of maintaining the resiliency of healthy landscapes to constant change. Forces of change are multi-dimensional. They include environmental and technological change, as well as the complete spectrum of human uses of forests. Also, we need to better understand how to manage urban forest landscapes as functional and structural keys to healthy urbanizing ecosystems.

- **Livable cities.** Polluted urban run-off threatens drinking supplies, lakes, and beaches. If projections hold true, Denver will run out of drinking water in 20 years. Some cities in the West have serious air quality problems and as health standards become more stringent an increasing number of communities will be addressing air quality issues. Unchecked sprawl transforms prime agricultural land into suburbs. As local communities strive to maintain vital economies while improving environmental quality, research is needed to quantify the extent to which urban forest landscapes can be managed to enhance the livability of our cities.

Future Directions in Technology Transfer and Applications

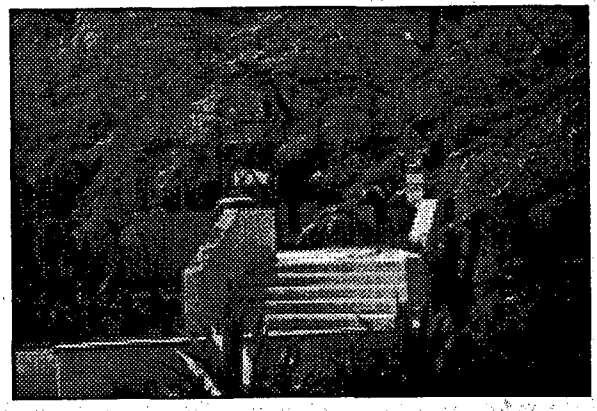
There is need to develop cutting-edge technologies and training programs from science-based information and to apply this knowledge to solve local problems and build community capacity. Traditional partners in technology transfer include State Foresters and their State Urban and Community Forest Councils, Forest Service State and Private Forestry, Cooperative Extension, and local non-profits. Stronger affiliations with state and local planning agencies, tribal interests, Urban Resource Partnerships, and development interests are needed to broaden the application of urban and community forestry. In larger communities, local non-profits will play an increasingly important role in technology transfer by extending knowledge and technologies to diverse user groups and potential investors. Emerging developments in technology transfer could include:

- Implement demonstration projects that support sustainable urban forest ecosystems, build capacity of local communities, and develop applications that can be transferred to other communities in the West.
- Develop conservation education projects that increase public awareness of the many benefits of healthy, sustainable community ecosystems. Efforts should be focused on at-risk youth, ethnic minorities, and other population sectors that have a large stake in the future health of communities.
- Deliver training sessions in the use of tree inventory/management software and GIS-based programs to evaluate community forest benefits and costs.
- Create regional Centers of Excellence and Advisory Committees to prioritize and coordinate projects in a focused and cost effective manner. Projects would be solicited from and accomplished by local partners and cooperators.

To accelerate the delivery of research results to users in the West, scientists will need to work more closely with partners such as State Foresters, municipalities, cooperative extension, grass root non-profits, universities, and others.

Resources for Research and Development

The paramount resource we have, and it is an asset of immeasurable political value, is the 19 million acres of urban forests in this nation. This forest resides in the backyards of more than 200 million people. This is the forest most of the voters know and care about! Unfortunately, the importance of this resource is not reflected in the level of investment made to support its management. An anti-urban bias has existed historically in federal and state natural resource management agencies. This bias is rooted in our agrarian past and the political forces that developed to maintain allocations of research funding. For example, less than 2% of the total Forest Service Research budget is allocated to urban and community forest research. Furthermore, of the national total for urban and community forest research, only 15% is received in the West.



There are some signs that this trend may be changing. Recently the National Science Foundation established its first urban Long-Term Ecological Research Sites in Baltimore and Phoenix. Cooperative Extension and Agriculture Experiment Stations in states like Nevada and Utah are showing increasing interest and support for urban forestry issues. The new journal Urban Ecosystems has an international audience for articles related to urban and community forestry. The Center for Urban Horticulture at the University of Washington, the Urban Forest Ecosystems Institute at California Polytechnic State University in San Luis Obispo, and the Department of Environmental Horticulture at UC Davis provide university-based research expertise and technical assistance. Our Western Center for Urban Forest Research and Education is the only Forest Service research unit west of Chicago with an emphasis on urban ecosystem science.

Summary

Urban and community forests are where most of the American public experiences forests, forestry, and community-based land stewardship. The essence of urban and community forestry lies in the people-to-land and people-to-people connections that can transform the way we live. Making these connections instills a land ethic and a spirit of can-do cooperation. Another result of these connections are the environmental and aesthetic benefits that urban and community forests produce. Research and development can help inform people, provide useful technologies, and quantify the social, environmental and economic costs and benefits of urban and community forest programs. But the total investment in research and development to date is a very small portion of total investment in natural resources research. This will not change until people like you make your voices heard and your needs compelling.