

Volunteer-Based Urban Forest Inventory and Monitoring Programs*

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I. Introduction

Over two-thirds of the American public live in communities and depend on community forests for a wide range of ecological, economic, and health-related benefits. Threats to the health of urban and community forests imperil the realization of these benefits. Such threats include attacks by pests and disease, new urban development, climate change, invasive species, natural disasters, and public apathy. Protecting the health of urban and community forests is essential to enhancing quality of life in our communities.

The Forest Service and state forestry organizations have partnered to develop effective programs for monitoring the health of rural forests. Activities in communities have been limited to technical assistance, suppression of pests and disease, wildland fire control, and financial support of outreach efforts. The number of urban forest health activities led by state and federal agencies vary by region, with more work occurring in the Northeast and Midwest than in the South and West. Urban forest inventory and monitoring is becoming more prominent as forestry agencies expand programs that are sensitive to the needs of communities. A national agenda for inventory and monitoring of urban forests is emerging. The National Association of State Foresters has approved the concept and the Forest Service has implemented pilot programs. To date, these pilot programs rely on professional foresters for data collection, collect little data directly related to tree management needs, do not address the social/policy environment in which trees exist, and do not establish a link for education/outreach with local communities. In this "top-down" approach the role for trained volunteers is limited because of concerns about the cost of training and the quality of data that volunteers will collect.

There are hundreds of thousands of volunteer citizen/scientists who perform fundamental science every day for government agencies: observing and recording weather, sampling in streams, and counting birds. Each bit of data that they collect helps us better understand the world in which we live. Studies have shown that data collected by amateur scientists can be every bit as accurate as data collected by professionals. Participation by trained volunteers in urban forest inventory and monitoring can provide benefits beyond extending the ability of forestry agencies. For example, the capacity of local communities to better manage their urban forests can be enhanced by involving volunteer citizen/scientists in inventory, monitoring, and planning. Direct participation in urban and community forest monitoring fosters 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 that is the essence of community-based land stewardship.

II. Workshop Overview

This workshop was dedicated to identifying key components of successful volunteer-led inventory and monitoring programs in the field of urban forestry. Workshop participants divided into working groups to develop the outline for programs from the perspective of five different stakeholders: schools and students; community sustainability; municipal urban forest management; small communities and unincorporated areas; and neighborhood-based urban forest activities. Thirty-eight participants attended the workshop (see Appendix A), which included representatives from the federal, state, local, private, nonprofit and education sectors from across the nation. Designed as a participatory workshop in which the sharing of experiences and ideals by the participants would shape the outcomes, a pre-workshop Participant Assessment Survey was undertaken by the Sacramento Tree Foundation to identify their specific areas of interest, key findings and priority resources for developing successful programs (Appendix B). Review of literature was undertaken in preparation of the workshop by the Forest Service Western Center for Urban Forest Research and Education (Appendix C). Special presentations focusing on specific programs were delivered during the workshop and presenters are listed in Appendix D. The workshop was made possible through a grant from the USDA Forest Service's Pacific Southwest Research Station's Natural Resource Conservation Education Program. It was designed and coordinated in a collaborative approach by the USFS Western Center for Urban Forest Research and Education and the Sacramento Tree Foundation.

The workshop commenced with a general discussion on the importance of community forest inventory and monitoring programs and trained volunteers' roles in them. Participants identified three underlying principles for establishing volunteer-based programs in urban forestry: to provide a direct connection between people and their urban and community forest; to enhance the public's understanding of the value and benefits of healthy urban and community forests; and to facilitate support for planning, management and stewardship of urban forests.

An additional point of this discussion was the importance of the commitment by the stakeholders to work together in a collaborative climate. Stakeholders were defined as individuals who participate in volunteer-based inventory and monitoring programs, as well as individuals who directly use the collected data or information generated from these programs. Stakeholders may be urban forest managers, arborists, elected officials, neighborhood residents, students, faculty or interested nonprofits, businesses, and public agencies.

First, in order to create similar structures for their model templates, the five stakeholder groups addressed the following questions:

- 🌳 What are the **objectives, benefits** and **obstacles/issues** associated with volunteer inventory and monitoring?
- 🌳 What are the **data** and **resources** needed for **successful implementation** of a monitoring program?
- 🌳 What are the **resources** and **skills** needed to **engage volunteers** in these programs?

Each stakeholder group was encouraged to develop their own working definitions for key words such as *community, neighborhood, volunteer-based*, etc. They were asked to identify the appropriate scope and scale for their hypothetical volunteer-based program, the interest groups that would be asked to join a stakeholder group, and potential outcomes of the program. The first day of the workshop concluded with representatives from each stakeholder group presenting their group findings and direction.

The second day of the workshop was dedicated to development of the five stakeholder models.

Each group focused their program around the motivations, needs, and interests specific to each stakeholder. All of the stakeholder groups shared the following objectives:

- 🌳empowering of stakeholders
- 🌳increasing visibility of urban forests
- 🌳improving forest health and management
- 🌳increasing benefits and decreasing costs
- 🌳increasing local collaboration and investment.

Program outlines developed by each of the five stakeholder groups follow.

III. Volunteer-Based Inventory and Monitoring Program Outlines

III.A. Education and Schools

Participants: Stephanie Alting-Mees, California Releaf; Mark Beaudoin, City of San Jose; Bruce Hagen, California Department of Forestry; Ray Tretheway, Sacramento Tree Foundation

Stakeholders: School faculty, students and administrators

Objectives:

Encourage participation in volunteer activities.

Raise levels of awareness and education on the value inherent in trees and the urban forest.

Encourage stewardship of trees and the urban forest.

Assist local governments and school districts gather urban forest information to plan sustainable school grounds.

How: Development of an education and school focused volunteer-based inventory and monitoring program requires a long period of time and a substantial commitment to pre-planning and long term implementation. The key is developing a curriculum to educate students on their school environment and the value of community service; a curriculum that helps students think globally and to act locally. Responsibility for the development of a flexible, age-dependent curriculum rests with a team of teachers, urban foresters and community service professionals. The curriculum would focus on urban forest concepts, including trees' relationships to ecological processes such as water, air and energy, arboricultural and the environmental needs of healthy trees, and on the benefits trees produce.

Numerous available resources ensure this project's success. Partnership opportunities exist with such organizations as the California Oak Foundation, Trust for Public Lands, Nature Conservancy, American Land Trust. and Watershed Council. These organizations offer assistance to school

districts and local government by providing funds, or fund-raising strategies, as well as experience-based advice on how educationally-based inventory and monitoring projects have worked in the past.

Data collection: The stakeholder planning team will provide their students with accurate maps that label the major geomorphic features of the school grounds, including areas designated for buildings. A student tool kit should be assembled with tree identification guide, tape measure, temperature gauge, wind speed gauge, ozone meters, soil measuring materials and other relevant tools for data collecting. Access to computers and urban forest software programs are needed to generate the school environment and modeling scenarios.

Data analysis, management and application: In planning the ideal school urban forest, students will identify potential planting sites on school grounds using methods specified in the curriculum, matched by school district, faculty and student preferences. Students will learn to recognize and monitor microclimatic differences among shaded and unshaded sites, wet and dry surface areas, and from different types of reflective surfaces. They will examine and plan for differences in soil compaction, fertility, and chemistry from samples taken from different environments.

The key component in application is the commitment to stewardship. This should be accomplished by increasing the student and faculty's understanding and appreciation of their school grounds environment and their respective responsibilities for its health and benefits.

Evaluation: Evaluation for this type of project should take place annually to provide ample opportunities for teachers and students to present what they have learned. Evaluations should be shared with local government and school board officials as outcomes may influence policy, and consequently adjustments in the curriculum or planning or stewardship aspects of a volunteer-based school urban forest inventory and monitoring program.

III.B Community Sustainability

Participants: Jane Bender, Sonoma ReLeaf; Phil Hoefer, Colorado State Forest Service; Marty Hughes, Sacramento County; Sabrina Mathis, Western Center for Urban Forest Research and Education; Eleanor Torres, TreePeople

Stakeholders: Federal, state, and municipal policy makers; school-board administrators, neighborhood-level activities coordinators.

Objective: The development of a dynamic and sustainable community model that will encourage individuals from all types of communities to personally involve themselves in shaping the fate of their urban forests.

How: The protocol was designed for application to public lands only. Project coordinators will stratify the community into four land-use categories: parks/recreational areas, business districts (city and suburban), older residential areas and newer residential areas. Volunteer groups will survey street trees in each of these areas. Municipal authorities will use information gathered from these volunteer surveys to identify and sort potential hazards and to perform an assessment of the city's ability to maintain trees.

Volunteer recruitment is crucial to the development and implementation of this project. Volunteers may be recruited through various media, including newspapers, an Internet website, etc. Interested individuals should receive a clear job description and skills criteria. If a class of students shows interest, the person(s) responsible for coordinating the volunteers (a professional tree expert(s))

should also work with the class teacher. If a service organization shows interest, the volunteer coordinator(s) should attempt to work within the existing structure of that organization. The volunteer coordinator(s) should also keep track of the fiscal value of the hours the volunteers spend and provide volunteers with premiums such as water bottles, badges, snacks, etc. Project coordinators need to establish partnerships with Realtors, community service organizations, transit system officials, local newspapers, service agencies, school districts, local utility companies, local departments of public works, and local law enforcement officers. Project coordinators will also establish communication with the city, so that a liaison may be designated to assist them with the implementation of the inventory and monitoring project.

Data collection and management: Equipment needed for the project includes: inventory sheets, pencils, clipboards, tape measuring diameter at breast height (d.b.h.), tree identification keys, and informational brochures (for residents). Tree care professionals will educate volunteers about how trees work, and what roles trees play in cities (why they are important). They should also point out how the volunteer's personal role helps out the urban forest. Once they have received their training, volunteers will check/measure tree d.b.h.; tree condition; the size of planting space; whether power lines are affecting the existing tree; whether the site is eligible for tree removal, planting or replanting; and the number of trees at each address. This information will be entered into a database by either a trained volunteer or a tree care professional.

Quality control: To ensure that volunteers are getting the most out of their experiences as volunteers, project coordinators and volunteer coordinator(s) will develop feedback loops. In each feedback loop, volunteers will state their thoughts or concerns to another volunteer who has been designated to take their comments to a volunteer coordinator, who will in turn take those comments to a project manager. To ensure that volunteers collect data accurately, professionals and volunteers will assess the same sample section separately, and then compare the two data sets.

Evaluation: Project evaluation should determine the accuracy of the data and the effectiveness of volunteer training by professional tree care experts. The project evaluation will include a section in which volunteers to state what their opinions are about the project. More specifically, the questionnaire asks volunteers to state what they learned, whether their project received funding or not, what they liked and disliked about the project, and what they could have done better.

III.C. Municipal Government and Non-profit Organizations

Participants: Ben Addlestone, East-West Forestry; Anne Cumming, USDA Forest Service; Martin Fitch, City of Sacramento Tree Service; Ashley Fasler, Friends of Trees; Greg McPherson, Western Center for Urban Forest Research and Education; Casey Monear, Sacramento Tree Foundation

Stakeholders: Municipal foresters, natural resource managers and non-profit organizations (NPOs) concerned with the municipal urban forest. Members of this group divided their program into three sections: inventory, special problem monitoring, and continuous monitoring.

Objectives:

Inventory: Determine what the critical forest health issues are as a basis for strategically targeting management and monitoring

activities.

Special Problem Monitoring: Track and remedy overt threats to urban forest health.

Continuous Monitoring: Detect, diagnose, and treat new threats before they become serious problems.

Inventory

This program proposes two types of inventories: a questionnaire and a tree inventory. Purposes of the questionnaire are to: 1) determine what people view as most important tree/natural resource issues, 2) foster interest and investment in resource stewardship, 3) identify potential volunteers. Purposes of the tree inventory are to 1) accurately assess the extent and condition of the existing urban forest resource, 2) identify critical overt threats to urban forest health, as well as more subtle chronic stressors and, 3) increase public awareness of urban forest benefits.

How: Inventory and monitoring will require a full-time liaison working with municipal forestry and the NPO. If this person has technical expertise in the areas of computer databases/spreadsheets, statistics, and urban forestry, they may be able to perform much of the data management and analysis work. Otherwise, technical assistance will be needed. To insure consistency in data collection the liaison will lead all training programs.

Data Collection and Management: The questionnaire will be developed with assistance from a professional who knows how to properly word questions. It will be distributed by the NPO to a non-biased sample of residents. Similarly, the tree inventory will be designed to collect the data required in a statistically valid manner. Trained volunteers or professional foresters will collect tree data. Once the database structure is developed, information can be entered from the questionnaire and tree survey by trained volunteers. The liaison will teach volunteers how to enter data, perform quality control checks, and implement data archiving protocols.

Data Application: Results from the questionnaire and tree survey will be reported in a State of the Urban Forest Report. The report will quantify urban forest benefits and costs, describe attitudes and perceptions of critical issues identified by residents, assess current health and sustainability, and identify future management challenges. Forest health information in the report will provide direction for the monitoring program. Local media will be contacted to increase public awareness and investment in management and monitoring issues. Feedback from the public will assist in volunteer recruitment.

Special Problem and Continuous Monitoring

Two types of monitoring are proposed: Special Problem Monitoring to track and remedy existing threats to urban forest health and Continuous Monitoring to detect and treat new threats before they become serious problems.

How: Special Problem Monitoring is designed to meet needs associated with the remediation of specific problems. Examples of special problems warranting monitoring include problem pests/disease (e.g., Asian long horn beetle, Dutch elm disease), tree failure/hazards, decline of landmark trees, excessively high mortality rates, and vandalism problems. Also, Special Problem Monitoring can track compliance with street or parking lot shading ordinances and habitat mitigation. Plans, design and delivery will be a team effort involving the liaison, forest health specialists, and representatives from NPO and municipal forestry. Special problems will need to be prioritized and those that represent the most serious threats will be monitored and treated. As

these threats abate monitoring resources will need to be redirected to other existing or emerging problems. To identify new forest health issues inventories can be conducted on a frequent basis or Continuous Monitoring can occur.

Continuous Monitoring provides a means for detecting the onset of new threats and gauging their seriousness. Continuous Monitoring is an early warning system that allows for resources to be mobilized before forest health is adversely affected. This type of monitoring relies on the willingness of landscape professionals who work with plants on a daily basis to report signs of stress to the program liaison.

Data Collection and Management: Specialists and trained volunteers will conduct most Special Problem Monitoring activities. Researchers and Specialists will identify causes of problems and evaluate the success of treatments.

Continuous Monitoring requires a reporting mechanism that will make it relevant and meaningful for landscape professionals to take the extra step needed to report the problems that they observe in the field. Problems need to be reported to one person, the liaison, to promote a consistent evaluation of the severity of reported problems. A daily tally will provide information on the number of occurrences and their spatial distribution. This information could be posted daily or weekly on a local web-site.

Data Application: Special Problem Monitoring can help save trees that are threatened. It can result in design and management prescriptions that will improve forest health in the long term. By directing monitoring resources to treat recognized problems, the program can establish its accountability with the public as these problems are mitigated.

Continuous Monitoring can help protect the urban forest from catastrophic loss by detecting threats before they become widespread problems. In some cases, new methods for treating threats will be needed to effectively control stressors. Data from Continuous Monitoring can be used to revise and update the prioritized list of local urban forest health issues.

Evaluation: Not discussed.

III.D. Neighborhood

Participants: Ed Dickerhoof, USDA Forest Service; Jennifer Lystrup, Sacramento Tree Foundation; Paula Peper, Western Center for Urban Forest Research and Education; Joe Poracsky, Portland State University

Stakeholders: Municipal foresters, non-profits, local government, schools, businesses, citizens.

Objectives:

- ✿ Establish communication and build trust.
- ✿ Educate neighborhood/community on benefits reaped from a healthy urban forest
- ✿ Establish a neighborhood inventory and monitoring program.

Building Communication and Trust

How: Prior to recruiting volunteers and establishing an I&M program, organizers must carefully assess the proposed neighborhood. This includes exploring the existing cultural and ethnic diversity, income levels, types of resources available to residents (businesses, religious institutions, schools, and neighborhood associations), and overall condition of the urban forest. Project coordinators will employ their findings to begin building communication links to establish trust

between themselves and residents. Key neighborhood leaders (council members, religious leaders, teachers, principals, business leaders) can assist with hosting several informational meetings, advertised through fliers distributed throughout the area. Social service organizations, like Asian Resources, may be available for translation assistance in culturally diverse neighborhoods.

Initial meetings should entail residents assessing and describing their perceptions of the needs of their neighborhoods. Community visualization can spur communication. This involves showing a short slide show displaying the range of neighborhood landscaping, from absolutely no greenscaping to well-landscaped, attractive street scenes. Participants rate their feelings about each slide on a scale of 1 to 4, 1 signifying that they did not like the landscaping presented in the slide, and 4 signifying that they liked it a great deal. Discussion of their ratings should be linked directly to current conditions within their neighborhood. This process can help breakdown initial barriers to communication and encourage ownership of the neighborhood by its inhabitants.

Education

How: A second objective of these meetings is to use them as stepping stones, linking the residents' visualization assessments to issues of green space, air quality, energy savings (economic savings) and the overall benefits of better tree-scaped neighborhoods. I&M program managers should design subsequent meetings to demonstrate how a volunteer-based neighborhood I&M program contributes to the education and involvement of youth, deters less desirable groups from conducting activities, and improves overall neighborhood design (i.e. traffic flow, parking, and other issues of concern). By assisting in creating and maintaining a healthy urban forest, residents will also increase self-esteem, safety, and the overall quality of life.

Inventory

How: The third objective is the organization and establishment of the I&M program. Project coordinators will form a technical advisory committee (TAC) including neighbors and representatives from the organizations with whom partnerships have been established. The TAC will establish short and long-term goals of the neighborhood as gleaned from the previous meetings. They will determine: 1) data necessary to inventory and monitor, 2) who will conduct the analysis, and 3) how the data will be applied. Project coordinators will enlist the aid of schools, clubs, neighborhood organizations, and others to organize the I&M volunteers. A citizen-partners committee will be assigned to seek funding sources for tools, equipment, mileage, and other items. Stakeholders will assist in developing volunteer training programs that help prepare volunteers for all phases of the work to be accomplished--collection, analysis, and application of data.

Data collection: Trained volunteers will collect data on two levels: individual trees and the overall neighborhood. For individual trees, volunteers will record the following:

- 🌳 address, species, d.b.h., tree and bole height, crown width
- 🌳 photos: to use as visual record, also backup for double checking measurements
- 🌳 condition class- good, fair, poor, dead
- 🌳 location code: yard, planting strip, street
- 🌳 utilities nearby
- 🌳 pruning level
- 🌳 pests
- 🌳 care/treatment needed (yes or no)
- 🌳 type of care: list prune, disease/pest, homeowner education on care

On the neighborhood level. volunteers will assess the structure of the urban forest by assianina

percentage values to the amount of pavement, tree cover, shrub cover, and buildings present. They will note types of wildlife present and the quality of water. Volunteers should always have a panel of experts to call upon for advice with species identification or questions.

Data management: Depending upon funding and equipment, data will be collected using portable data loggers or handwritten and later entered into simple spreadsheet form on a computer. All data should be downloaded daily onto a central computer.

To ensure quality control, repeated measurements will be made on the same trees using different volunteer crews (i.e., in schools, different grade level science classes can repeat measurements). When differences are found between data sets collected on the same tree, volunteers will collect a third set of measurements and resolve the issue.

Data analysis and application: Ultimately, volunteer supervisors and partners will determine the use of the data once it has been analyzed. In any case, GIS or other mapping strategies may be used to assist neighbors with seeing the big picture of their neighborhoods. Analyses of tree cover will help to identify potential planting sites. Analyses of species and age diversity will assist understanding the current forest and planning for the future forest. Disease analysis will identify areas to tackle first to improve forest health. Data can be used to project benefit-cost scenarios when planning the future forest.

The data will provide tree services and arborists with information for tree pruning, care, and maintenance. It will help tree crews plan and design a sustainable urban forest with adequate species and age diversity. Most importantly, the project coordinators and neighbors can use the data to influence government and municipal decisions about community needs and help the neighborhood obtain grant money for internal improvements.

Evaluation: All partners will monitor the outcomes of the project to determine whether the structure, function, and sustainability of the neighborhood forest is improving. Regular review of data collection protocols should be conducted and protocols revised as necessary to better meet the needs of partners. Volunteers will evaluate the program's effectiveness in improving personal and neighborhood quality of life (e.g., barriers between neighbors reduced, decrease/increase in crime). Volunteer input is essential to the project evaluation (and possible revision) process. It is also vital that other partners recognize the contributions of volunteers on a regular basis via awards or media coverage to encourage continued participation in the program.

III.E. Small Communities and Unincorporated Areas

Participants: Mary Ellen Dix, FS Forest Health Protection; Rosemary Flynn, Integrated Urban Forestry; Susan Ford, USDA Forest Service; Paul Sacamano, Davey Resource Group; Julie Sacco, Openlands Project

Stakeholders: Small communities and unincorporated areas.

Individuals who live in smaller communities face extra challenges when attempting to organize projects like this one. Small communities and unincorporated areas have a strong sense of the existing community and a strong sense of values. Both of these positive characteristics can leave individuals within those small communities less open to outside influences. Project coordinators must take extra steps in establishing trust among small communities. They will have to make sure that the goals and objectives of volunteer-based I&M projects coincide with community members' objectives for each of their particular communities. This includes setting issue-based goals and

objectives that are locally relevant.

Objectives: Educating the public, improving the public's understanding of how trees impact the quality of life.

How: Project coordinators will tailor the program to suit community needs by putting together an advisory/steering/oversight committee. This committee will identify funding mechanisms (i.e., USDA Forest Service, grant projects through the state, NUCFAC, the Tree Trust, ISTE, EPA, donations from private industry and foundations, and other local organizations), and create a strategic plan for engaging volunteers and establishing relationships within the community. The steering committee will start the planning process by conducting a socioeconomic survey to assess and evaluate community needs.

Volunteer coordinators (identified by the oversight committee) will plan a time line for the inventory and recruiting of volunteers. The Inventory plan identify the initial project's scope, types and amount of equipment required for implementation, and existing data sources. Volunteer coordinators will identify training protocols and a time frame for data collection.

Data application and management: Volunteers should have computer and organizational skills. Individual volunteer teams should consist of both experienced and novice volunteers. Coordinators will train teams in the protocols of the inventory process, a survey of ecological/natural resources that addresses characteristics of the plant and animal communities, street trees, available wildlife habitat, water and air resources, potential hazards and/or sources of pollutants, the landscape and land use, and soil structure. At each street address, the volunteer teams will record tree size, age distribution, tree condition, and percent canopy cover; plus plot size, land use, and the plant and animal species composition of each particular site. Either a volunteer or professional project coordinator will enter the collected data into a GIS database for assessment.

Evaluation: Not discussed.

IV. Workshop Assessment

Representatives from the Sacramento Tree Foundation and the US Forest Service Western Center for Urban Forest Research and Education met to evaluate effectiveness of the workshop. They used the response and comments from the workshop participant evaluation forms.

What worked:

Attendance: Representatives from many sectors, including federal, state, and municipal authorities, private industry, academia, and non-profit organizations shared interests, success stories and innovative research techniques that focused on developing areas of volunteer-based urban forestry.

Networking: Ample networking opportunities existed because of the diversity of conference attendees and adequate break time.

Stimulated Interests: Overall, participants left the conference with more ideas, strategies, and tangible approaches to inventory and monitoring than they came with. Individual presentations

were especially helpful in illustrating how many opportunities there are for volunteer-based inventory and monitoring.

What didn't:

Participant Details: Breakout session room logistics and transportation to and from hotels were difficult for some.

Goals and Objectives: The goals and objectives, although clearly outlined in the beginning of the workshop, were not referred to throughout its duration. As more and more information and experiences were shared, the focus of discussion would shift accordingly. Consequently, the participatory, shared-learning process designed for the workshop may have diluted the anticipated outcomes.

Agenda Time Frame: Particularly with regards to the breakout sessions, not enough time was allotted for thorough attention to fully address all items on the agenda. Breakout sessions could have benefitted from facilitators, and from stakeholders being assigned to their respective stakeholder groups. Establishment of a written format for each group's final report could have helped eliminate confusion about what was expected for each stakeholder group's program.

V. Summary and Conclusion

In the prospectus for the Workshop on Volunteer-Based Community Forest Inventory and Monitoring, workshop organizers identified the following key issues in creating a successful volunteer-base inventory and monitoring program:

Who are the stakeholders?

What are their purposes and capabilities?

What are the approaches best suited to their purposes?

What resources and support are available? Unavailable but needed?

How will data that are collected be applied? By whom?

How well do the approaches match stakeholder needs and capabilities?

How best to evaluate program success and inadequacies?

Workshop participants held a shared understanding for what makes volunteer-based inventory and monitoring compelling. That successful programs will empower neighborhoods, contribute to sustainable environments and increase the understanding of the importance of trees and urban forest and may in the long term be the catalyst for healthier environments and neighborhoods.

Breakout groups explored ways to integrate volunteer-based monitoring in schools, neighborhoods, municipal and non-profit partnerships, and small community and unincorporated areas. A fifth group considered the broader concept of sustainable communities.

Participants faced the challenge of developing a level of communication with one another that would enable them to collectively define terms like urban forest, forest health, and empowerment. It became apparent as the workshop progressed that consensus on the definition of these terms was lacking. Stakeholder groups progressed from being groups of individuals with separate agendas, to groups of specific interests with overlapping concerns and shared goals for a relative common volunteer based urban forest vision of the future.

The time participants spent finding common ground with one another took away from the time dedicated to developing the stakeholder program outlines. This does not translate to wasted time. In fact, the ability and commitment to make the time necessary to create successful, collaborative volunteer based programs may be the most significant component.

The workshop demonstrated time and again the true potential to engage volunteers, engender active interest in the trees and urban forest and provide a platform from which community concerns and participation can be addressed. However, this workshop concluded that it is the vision and commitment of the stakeholder group that occurs prior to the engagement of volunteers that first needs to be established. The more aware project coordinators are of each other's mission, goals, interests and limitations, resources and investments the more likely this stakeholder group will have the capacity and capability to create programs that will tap the spirit of volunteerism and community service to address the health of our trees and urban forests.

VI. Appendices

VI.A. Workshop Participant Roster

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VI.B. Participant Assessment Survey

1. What is your interest in volunteer-based inventory and monitoring of our urban forest?

California ReLeaf would like to be of greater assistance to the groups that call us for information and advice on carrying out tree inventories in their communities. Specifically, they've asked us how to deal with inventorying trees on private property, how to deal with the data that's collected, what to include in the inventory, how to train the volunteers, where to get funds for such an undertaking, etc. I'd like to find out what technical and financial resources are available.

California ReLeaf

From our perspective of a nonprofit organization, we are interested in increasing our community's understanding and involvement of our urban. The largest sector of that community is the general public. These manager and stewards, while their tree activities are individualistic and specific. have the greatest overall impact on our urban forest. Volunteer-

based inventory and monitoring programs offer our organization an inviting venue that combines learning and involvement for the general public to enter the world of trees and urban forestry. Further, this community involvement offers a direct avenue to improving urban forest health.

Sacramento Tree Foundation

In order to assess current street tree conditions, identify planting opportunities, and assess changes in the street tree population through time, it is necessary to have an inventory. Preferably, the inventory should be in a geographical information system (GIS) format, combining the ease of analysis and updating offered by a digital database and the analytical and visual utility of easy-to-prepare digital maps.

Most cities cannot afford the cost of hiring professional arborists or commercial tree inventory firms to collect data on street trees. Volunteer-based inventory procedures can provide the necessary data at a fraction of the cost of professionals.

Portland State University

The U.S. Forest Service is interested in learning from constituent groups what information they would like compiled on the status and condition of urban forests, and how this information could best be obtained and recorded through help from volunteer-based constituent organizations.

U.S. Forest Service, Washington, DC

We work with our clients - urban forest managers, decision makers and their constituencies - in the planting and management of their tree populations. Helping these stakeholders to implement volunteer-based inventory and monitoring can:

Improve the understanding of the importance of the trees to the quality of life in our communities through public involvement and education programs that use volunteers. This in turn will shore up grass roots support for urban forestry programs.

Assist interested agencies and organizations with the gathering of descriptive information regarding the extent and characteristics of their tree populations. Tracking the population over time will reveal changes in urban forest structure and function, giving decision makers the information they need to evaluate their programs and respond to problems or opportunities.

Pull together many diverse interests, such as citizen tree groups, utilities, corporations, neighborhood groups, etc., in a coordinated effort that can help break down barriers and improve communication among these stakeholders.

These and other benefits of volunteer programs are an important part of our efforts to help our clients to plan for and manage their urban forests.

Davey Resource Group

We are interested in possibly working in the arena of the urban forestry and feel there is a

niche for easy, user friendly software.

East - West Forestry

Knowing the condition of the Colorado's community forests helps determine management needs. The Colorado State Forest Service assists communities in periodic inventories of their trees. At times the CSFS does the inventory completely, but in most cases, tree board members assist.

Colorado State Forest Service

Our interest in volunteer-based inventory and monitoring stems from our need for information to better model urban forest benefits and costs. We need to know more about things like:

tree growth rates in different types of locations

mortality rates and causes of mortality, actual life spans

success of different species in different situations (soils, cut-outs, under power lines, etc.)

replacement rates and preferences for certain species,

management practices (frequency and cost) by residents, contract arborists, and city tree crews,

why people remove, plant and prune trees,

connections between tree health and performance

Also, we see volunteer-based inventory and monitoring as a powerful way to encourage residents in transforming their landscapes and their neighborhood into places that are more sustainable.

The FS is interested in identifying realistic ways to assess the health of our nation's urban forests and we will be assisting with this effort during 1999. As part of this effort we plan to demo an approach in the West next year.

As a research unit we are interested in establishing a limit number of permanent plots to collect long term data for the reasons described above. Permanent plots may also involve periodic measurements of climate, air quality, stormwater runoff, and altitudinal surveys to determine if vegetation change is impacting people and the environment.

USFS Western Center for Urban Forest Research

2. What experience (if any) does your organization have in urban forest inventory and monitoring? Additionally, what key lessons have been learned?

We administer a grant program that has funded several inventory projects. I can go into more detail about the specific projects at the meeting. Two key things that stand out about the inventories we've funded:

It takes time and resources to coordinate and train volunteers. but in cities that lack the funds (or will) to do an

inventory, volunteers are the way to go. It's also an excellent educational tool and a way for cities to gain citizen buy-in for tree programs.

Inventorying the trees is only one part. Dealing with the data that's collected is another.

California ReLeaf

Minor and not will executed in terms of our community-based public planting projects were we set up a program and protocol for bi-annual maintenance reporting by the volunteer project manager.

Extensive experience in the development and implementation of our Save the Elms Program, a trained-volunteer monitoring program for Dutch Elm disease (see related survey from STEP).

Sacramento Tree Foundation

Since Spring, 1993, I and several of my graduate students at Portland State University have been developing and refining a Citizen-Volunteer-Based (CVB) Street Tree Inventory procedure. These CVB street tree inventory efforts are intended to become the nucleus of a city-wide street tree inventory that will be carried on at the local level in each of Portland's 95 neighborhoods.

The over-riding lesson of our six-years of experience is that volunteer-based inventory works, as both a data collection and a public education effort. But to be successful, partnerships are essential. The inventory must produce data that is available in both a statistical summary and a map form.

Portland State University

We monitor the health of our Urban Forest each year utilizing hand held counters. Volunteers could help us do this.

City of San Jose

The U.S. Forest Service has extensive experience in non-urban forest inventory and forest health monitoring, but little experience in urban inventory and forest health monitoring. We are beginning to learn that different data and information criteria are needed for the urban task.

U.S. Forest Service, Washington, DC

We have implemented and supervised inventories of municipal, utility, commercial, and university urban forests throughout the U.S. Tree inventories and work histories have been tracked over time for a number of our clients. In some cases, these projects have included volunteers for the local community.

Through our experience, we have learned that:

The primary benefit of including volunteers in any tree program is public education that can enhance the understanding of urban forest benefits, the need for long term planning and maintenance and in general a more informed and supportive constituency.

Quality control is even more important to ensure to

integrity of the data when volunteers are used as opposed to professional urban forest data collectors. With more complex inventories that require specific arboricultural knowledge, volunteers should be accompanied by a professional forester or arborist.

Training in the inventory and monitoring program as well as the specific type of assessments and information needed is critical. Put together a training document to be referenced in the field when questions arise.

To enlist the support of corporate volunteers, such as utility foresters, be sure that they understand the benefits they will receive, including positive publicity. Make sure they get that publicity.

It is important to reward participants in volunteer programs with a certificate or some other form of acknowledgment as thanks for their help.

Davey Resource Group

We have been active in the urban forestry community in California for a long time.

East - West Forestry

One key lesson learned from developing inventory programs was to keep the information collected at the basic level. The more complex the system, the less it was used by the community. It isn't necessary to focus on having an "up-dateable" system. Rather, doing a new inventory every 5 - 10 years is more appropriate. Another lesson learned related to the management plans that were written following the inventory. Seldom were they followed completely. Tree value information impressed many community leaders. Species diversity and size distribution information was fascinating too. It helped make city councils aware of the asset they had. Some management followed but often not to the zeal the city forester, parks director, public works director, or tree board chair would like to have seen.

Colorado State Forest Service

Our experience lies in development of statistically valid tree inventories, data management and analysis, GIS, and monitoring environmental factors such as microclimate. We have learned that there is a lot of variability within urban settings, that training is critical to collecting reliable data, data on private property is not too difficult to obtain, and advance planning pays off.

USFS, Western Center for Urban Forest Research

3. To perform successful volunteer-based inventory and monitoring, what resources do you / would you need?

As mentioned above, groups need technical and financial assistance to carry out an inventory / set up a monitoring system. They need to know how to get started, who to involve, what information to collect, how to store and retrieve and update the information, how to publicize / leverage the results, etc.

California ReLeaf

The first resource would be in the terms of real world time. Time for the lead team or partnership to agree on the values, guiding principles and purpose of the purpose program; including but not limited to the articulation of the value of volunteers and the value of volunteer-led programs. In addition, time is needed to create a shared understanding of the investments and partnership requirements required for the successful community-based programs.

The second resource would be in the terms of education, training and skills development for the leaders / teachers of the volunteer-based programs.

The third set of resources would be dependent upon and identified by the specific nature of the inventory and monitoring program.

Sacramento Tree Foundation

Volunteers willing to be trained and donate their time.

City of San Jose

The U.S. Forest Service needs information from volunteer groups and other organizations about resources needed.

The U.S. Forest Service, Washington, DC

Agency or group identified as responsible for oversight and coordination.

Clearly defined goals for the program.

Qualified trainers and a well defined training program with instructional materials including a training manual.

Quality control procedures.

A method to get the word out to prospective volunteers. This might include coverage in the local paper, on the radio and through presentations in the evenings or on weekends.

A data collection form. Hard copy may be preferable to handheld computers which add a whole dimension of computer competency for the volunteers.

A computer for compiling the collected data.

A database designed for easy data entry, querying and reporting.

Davey Resource Group

We would need easy to use field data collection devices such as data recorders and all the proper field tools. Easy, user friendly computer software that would allow data entry and produce easy to grasp results.

East-West Forestry

Resources needed to conduct a basic inventory and monitoring effort are simple. Trained people, inventory sheets, pencil, and a system of data collection are all that is needed. Today, of course, the means of manipulating collected information has reverted to the computer and a data base program. The CSPF presently uses Microsoft Access with several tables, queries, and reports that produce valuable management information. Some cities have more complex systems which require more time and effort to maintain. The CSFS encourages small communities to use the simpler systems.

Colorado gathers information on paper which is later transferred to the database or on a portable computer. Information collected is: Management Unit, Species, Size (diameter), Condition Class, Placement Class, Management Need, Growth Stage, and Location.

Colorado State Forest Service

VI.C. Literature Review

1. Andresen, J.W., 1989. *Tree City USA: Volunteer urban forestry*. In: *Arboricultural Journal*. 13(4):333-343.

As endorsed by 1050 volunteer municipalities, the Tree City USA program owes its success to close cooperation and coordination between five major public organizations. At the national level, Tree City USA integrates the efforts and resources of the National League of Cities and the U.S. Conference of Mayors. Both the League and the Conference strive to upgrade the greenspace status of America's community and urban areas. Information exchange and coordinating expertise comes from the State and Private Forestry Division of the USDA Forest Service. The majority of the organizing efforts and guidance of local, municipal tree boards comes from the National Association of State Foresters. And the National Arbor Day Foundation headquartered in Lincoln, Nebraska maintains national records as well as providing logistical support for the entire Tree City USA program.

2. Ball, J., 1986. *Urban forestry and volunteer management*. In: *Journal of Arboriculture* 12 (7):182-184.

Urban foresters are relying on volunteers to fulfill some of the goals of their programs. While utilizing volunteers can add much to a program, the mismanagement of this same resource can lead to problems. Volunteers should have the same quality of administration as the paid workers. Some concepts of volunteer management are discussed through the use of a real example.

3. Berry, R., 1993. *Nature and culture: Building community from the ground up*. In: *American Forests* (Ed.). 6th National Urban Forest Conference, Minneapolis, MN. Pp. 226-228.

Today's urban dwellers are disconnected from nature. It is not that the connection doesn't exist, but rather that they are not aware of it. Community tree plantings allow residents to get back in touch with nature while having ownership for the trees they plant and care for. They teach that every citizen can make a tangible contribution in healing their community. They work because they create ways for citizens to play a meaningful role in shaping their environment. This relationship fosters the reconnection between nature and culture to build sustainable communities.

4. Bloniarz, D.V. and Ryan, H.D.P., III, 1996. *The use of volunteer initiatives in conducting urban forest resource inventories*. In: *Journal of Arboriculture* 22(2): 75-82.

The accuracy and validity of urban forest resource data collected by trained volunteers were established, using an actual case study in Brookline, Massachusetts. Results indicate that the data collected by trained volunteers are valid, and the accuracy compares favorably with levels found among a control group of certified arborists. Indirect benefits associated with this type of volunteer effort include the development of a more informed urban forest

constituency, increased environmental awareness, an increased political voice, and an improved quality of life for urban residents. The cost of utilizing community volunteers to conduct urban forest inventories is competitive with similar programs conducted by professional arborists.

5. Bone, P. *Master gardener and trees: the volunteer in urban forestry*. In: Proceedings of the 2nd National Urban Forestry Conference, Cincinnati, Oct. 1982. Washington, DC, American Forestry Association. Pp. 287-281.

Increased urbanization has caused a dramatic change in the type of information requested from county Cooperative Extension agents in California. In order to meet this demand for horticultural and gardening information, rather than the traditional agricultural information, the Master Gardener program (patterned after a Washington state model) was begun. Master Gardeners are local community members trained by Cooperative Extension experts in the area of plant science. In exchange, Master Gardeners volunteer their time to the Cooperative Extension office. Another volunteer program, TREES, trains individuals in the principles of urban forest management and tree maintenance. Both of these programs have increased service to the users of Cooperative Extension information and provided tremendous benefits to the urban forest at a large cost savings.

6. Buchanan, E.L., 1991. *Who should conduct street tree inventories*. In: American Forests (Ed.). 5th National Urban Forest Conference, Los Angeles, CA. Pp. 155-158.

Restricted funding is a major reason for conduction of street tree inventories by volunteers and high school youth instead of professional-level personnel. Limitations to using volunteers and high school youth should be considered. Volunteers and high school youth require significant amounts of the supervisor's time. Neither group displays the same degree of accuracy, quality control, and rate of production as professionals or even in-house forestry personnel and college interns.

7. Chiosso, T.E. *Mobilizing volunteer and community support*. In: Proceedings of the 2nd National Urban Forestry Conference, Cincinnati, Oct., 1982. Washington, DC, American Forestry Association. Pp. 83-85.

The San Francisco Recreation and Park Department recently created a new position, The Coordinator of Special Projects. This office has three major goals in working with volunteers: (1) improving the quality of parks; (2) increasing public participation; and (3) linking volunteers with agencies. A case example of Mountain Lake Park demonstrates this partnership in action. Other current projects, including an Urban Forestry Program that utilizes a Mobile Training Van, are discussed.

8. Cole, D.W.. 1979. *Oakland urban forestry experiment: a*

cooperative approach. In: Journal of Forestry 77:417-419.

Oakland, California's pilot program in inner-city urban forestry proves that citizen participation is essential to the success of tree planting and environmental education efforts. Started in 1977, the Oakland Tree Task Force was one of the first community-based, self-help urban forestry programs of its kind in the country. Organizations like the California Department of Forestry, USDA Forest Service, Cooperative Extension Service, Trust for Public Land, Society of American Foresters, etc., have helped by providing support and funding to the Oakland Tree Task Force. Perhaps the most important lesson to be learned from the Oakland experience is that broad-based community participation provides the best insurance for inner-city tree planting efforts.

9. Evans, L. 1993., *People empowerment through trees 1: ShadeMakers.* In: American Forests (Ed.). 6th National Urban Forest Conference, Minneapolis, MN. Pp. 135-136.

ShadeMaker was developed by Low County Releaf in response to the need to successfully plant trees after Hurricane Hugo. ShadeMaker instructors use a hands-on approach to teach their students how to plan, plant, fund-raise, organize volunteers and ensure the long-term viability of their newly planted trees. ShadeMaker volunteer training is completed in a seven week, one-meeting per week course. ShadeMaker successes are due to the financial commitment and the emotional stake its volunteers have with the project.

10. Greer, J.D., 1984. *How to run a volunteer program.* In: Journal of Forestry 82:660-662.

Volunteers are becoming increasingly important to public agencies as they attempt to compensate for reduced budgets. The greatest value in having a volunteer program is not in supplement diminished budgets; rather, the greatest value in having a volunteer program is in involving members of the public in the day-to-day management of their public lands. There are many steps a supervisor needs to take when establishing a volunteer program. Before volunteers begin working, a supervisor should always have a clear picture of what project he/she wants the volunteer to undertake. One of the dangers of separating volunteers from paid staffers is that paid staff sometimes feel their jobs are threatened by volunteers. Given a fair chance with continued doses of encouragement, volunteer programs can provide significant sources of talent that can greatly improve an agency's ability to protect and manage natural resources.

11. Hoefer, P.J., 1992. *Special planting considerations.* In: Rodbell, P.D., ed. Proceedings of the 5th National Urban Forest Conference, Los Angeles, Nov., 1991. Washington, DC, American Forestry Association. Pp. 172-173.

Growing trees in an urban or community environment is difficult. By giving consideration in incorporating these three special planting considerations--proper plant material handling to guarantee live trees are being planted. development of good training program for volunteers

prior to the planting, and planning ahead for two or three years of establishment maintenance of trees--the result can be a successful tree planting project. Volunteers are a particularly major resource for tree planting. Volunteers should be trained to plant and supervise, as well as to get involved with routine maintenance in their community.

12. Iles, Jeffery K., 1998. *Inclusive urban and community forestry programs: Using all of your community's cultural resources*. In: *Journal of Arboriculture* 24(6):316-321.

The thoroughly documented benefits from healthy, properly managed tree populations and less intensively managed greenbelts are not immediately apparent to all members of a community. Most citizen volunteers, local professional arborists and horticulturalists, and the occasional politician that involve themselves in planting and maintaining their community's tree resources have at least a cursory understanding of the social, psychological, economic and environmental benefits provided by trees. Yet many other segments of the population have had little to do with urban and community forestry issues. Enlisting the support of nontraditional audiences can only enhance urban and community forestry programs and strengthen the argument for increased funding needed to sustain the valuable resource.

13. Lindhult, M.S. and H.D. Ryan, III. 1988. *Street tree management: the next generation*. In: *Arbor Age* 3(7): 12-20.

To develop a useful tree management system, it is first necessary to explore and understand the urban forester's needs. The basic components of a tree management system are: inventory information (tree name, condition, and work priority), locational data, data manipulation (how many trees have certain characteristics, etc.), and report and map generation. For a tree management system to retain its validity, it must be utilized and updated daily. Computer databases are easily updated. Using microcomputers for the production of contracts, reports, and plans proves to be a more cost-effective and efficient way of doing tree management.

14. Makra, E.M. and Andresen, J.W., 1990. *NeighborWoods: Volunteer community forestry in Chicago*. In: *Arboricultural Journal*. 14(2):117-127.

Open space preservation is critical in the rapidly developing suburban areas surrounding Chicago. NeighborWoods, a special program of the Open Lands Project, works to enhance the dimensions and quality of the urban forest in the Chicago area by advocating policies that protect and expand the urban forest. NeighborWoods focuses on elevating the public's awareness of the importance of urban trees and directly involving volunteers in tree planting and care. So far NeighborWoods has been successful and highly visible urban forestry initiative.

15. Matz. J.R.. 1993. *Organizing citizen involvement*. In:

American Forests (Ed.). 6th National Urban Forest
Conference Proceedings, Minneapolis, MN. pp. 46-48.

The Valley Proud Environmental Council is an example of a successful grassroots community organization. James R. Matz, Chairman of the Valley Proud Environmental Council, offers advice on the best ways to start a volunteer organization. According to Mr. Matz, there are four questions any group of people interested in starting an environmental group should ask themselves: What are we organizing for?, What are our goals?, What is our mission statement?, and What kind of organization do we want?. Each of these questions should be asked so that volunteers get a better grasp of their own desires and each others. They give each volunteer an opportunity to see what resources they have to work with to define their position as a member of an their particular organization.

16. McBride, J.R. and D.J. Nowak., 1989. *Urban park tree inventories*. In: *Arboricultural Journal* 13:345-361.

A survey of published reports on urban park tree inventories in the United States and the United Kingdom reveal two types of inventories: (1) Tree Location Inventories and (2) Generalised Information Inventories. Tree location inventories permit managers to relocate specific park trees, along with providing individual tree characteristics and condition data. In contrast, generalised information inventories do not allow for specific tree relocation, and often use sampling procedures to obtain stand characteristics and condition information. Various methods and specific examples of the two inventory types are discussed with the purpose of helping the reader decide which methods are most useful.

17. McPherson, E.G., 1993. *Monitoring Urban Forest Health*. In: *Environmental Monitoring and Assessment* 26:165-174.

Renewed interest in urban forestry has resulted in significant public investment in trees during the past few years, yet comprehensive urban forest monitoring programs are uncommon. Monitoring is an integral component of a program to sustain healthy community forests and long term flows of net benefits. Volunteer-based monitoring will promote continued public involvement and support in community forestry. To overcome constraints to monitoring in urban environments, programs must be personally relevant, socially desirable, scientifically credible, and economically feasible. A three-tiered monitoring approach is presented. Canopy cover analysis documents net gains and losses in regional urban forest cover. Simplified detection monitoring uses trained volunteers to better understand tree population dynamics, while intensive monitoring characterizes urban forest functions and stressors. Implementation of an urban forest health initiative to develop, place, and evaluate monitoring programs is advocated.

18. Moll, G., 1987. *The state of our city forests*. In:
American Forests 93:61-64.

It is time to look long and hard at the value of our urban forest and create the broad-based

efforts-in research, handing, and citizen involvement-needed to improve it. The condition of the urban forest is declining at an alarming rate. One-third of twenty major U.S. cities plant one tree for every eight trees they remove. Large cities on average spend more resources on removing trees than replacing or maintaining them. The only thing that will reverse this downward spiral is a complete urban forest management program. Ideally, the program would consist of four parts: planting, maintenance, removal, and administration. Unfortunately, cuts in city program handing make this sort of total management scheme highly difficult, if not impossible, to implement.

19. Monear, J. 1993. *Volunteer pro's and con's: The seven C's of success*. In: American Forest (Ed.). 6th National Urban Forest Conference Proceedings, Minneapolis, MN. Pp. 132-134.

Community projects need a captain but they also need a crew that can cooperate with the captain and sail the ship along a mapped-out course. The seven "C's" can help make for a smoother journey. When a project manager makes a commitment to the project and people involved; coordinates to map the project's course; communicates with volunteers for better understanding; cooperates in order to keep the ship afloat and headed on course; compromises to involve everyone's ideas; reaches a consensus to reinforce support for everyone's ideas, talents, and skills; and offers congratulations for a job well done will more than likely achieve success for everyone who has invested in the project and for the project itself.

20. Probart, S. 1993. *Effective volunteerism*. In: American Forests (Ed.). 6th National Urban Forest Conference, Minneapolis, MN. pp. 49-50.

Effective volunteerism plays a vital role in helping agencies achieve their tree planting goals. More than just getting a group of people together to plant a tree, effective volunteerism is achieved by developing strong liaisons with public agencies and can provide community education, trained hands-on participation, volunteer coordination, and expanded programs. All of these serve the community in the face of shrinking public funding.

21. Skiera, R.W. 1993. *Building urban forestry structure in a community*. In: American Forests (Ed.). 6th National Urban Forest Conference, Minneapolis, MN. pp. 246-247.

The support structure of a well-informed, organized, highly motivated and persistent citizen constituency driving political and financial decisions is a prerequisite for the success of quality tree care programs. In the past, where local government had not recognized the benefits of a sound tree program, citizens would organize to motivate them and then out of sheer desperation would feel compelled to start citizen planning a maintenance programs. Citizen forestry groups provide government tree managers with several economic advantages. However, they often do not understand that total tree management involves not iust plannina and plantina. but maintenance as well. A successful citizen group which

creates a structured program must be convincing, persistent, flexible, and patient with local governments. The mission of the combined structure of local citizen groups, professional consultants, and government tree managers should be to build a realistic, dedicated source of funding for the planning, planting, and maintenance of all the trees under local government's responsibility.

22. Summit, J. and E.G. McPherson, 1998. *Residential tree planting and care: A study of attitudes and behavior in Sacramento, California*. In: Journal of Arboriculture 24(2):89-97.

Site surveys were conducted on residential properties in Sacramento, California, and residents were given questionnaires about whether they had added trees to their properties. These surveys indicate that most residents (68% of the sample) plant trees on their properties; that residential areas are relatively densely planted (with room for about 9% more trees than are already in place); that issues of comfort (shade) and appearance play more of a role in the decision to plant trees than do concerns about energy savings, environmental benefit, or privacy; that tree planting tends to be greatest early in a resident's tenure in a home; and that convenience is a strong predictor of the types of tree maintenance provided by residents relative to that provided by contractors.

23. Westphal, L.M. 1993. *Urban forestry volunteers and effective outreach*. In: Society of American Foresters 1993 National Convention Proceedings. Indianapolis, Indiana. pp. 436-441.

Working with urban forestry volunteers can be an effective outreach tool for urban foresters. By participating in training programs and workdays, the urban forester can create better lines of communication with the people they serve. Valuable information flows two ways, both from and to the urban forester. The information from the urban forester moves beyond the volunteer to the neighborhood and community because the volunteers themselves are turned to as valued sources of information. For these partnerships to be successful, however, trust is needed. A part of establishing this trust is understanding why the volunteer is interested in the project. Deep values appear to be a major motivator, and these values are more than beautification and more than liking trees; they are important values for many urban forestry volunteers, regardless of their demographic profile. One of the best outreach tools we have is working with volunteers. By doing so, urban foresters will find how much they can teach, how much more effective they can be, *and* how much they can learn.

24. Westphal, L.M. *Birds do it, Bees do it, but why do volunteers do it? A look at motivations*. Available at <http://www.epa.gov/grtlakes/oaklwestphal.html>.

Volunteers play a crucial role in the restoration of savanna ecosystems, but little is known about the motivations of these volunteers. Recent research indicates that a desire for an improved connection with nature, an ability to do something tangible to help the

environment, and a deep appreciation of the aesthetic and emotional benefits of nature play a key role in a volunteer's choosing to work in urban ecosystem restoration. Some volunteers work toward becoming citizen scientists due to their intense curiosity and desire to lead others in volunteer projects. Understanding existing volunteers' underlying values and motivations can help with outreach and recruitment of new volunteers.

25. Westphal, L. and Childs, G., 1994. *Overcoming obstacles: Creating volunteer partnerships*. In: Journal of Forestry 92(10):28-32.

Volunteers bring many benefits to an urban forestry program: opportunities for effective outreach, skills not available among current staff, ability to accomplish more work, new ideas, and increased public support for budgets and other necessities. In order to be most effective it is important that urban foresters receive appropriate training and have the necessary time and commitment to work with volunteers. Many programs may need a staff person dedicated to volunteer coordination.

VI.D. Special Program Presentations

Joe Poracsky - School-based street tree inventory and planning program in Portland, OR.

Mark Beaudoin - Volunteer-based municipal street tree inventory program in San Jose, CA.

Eleanor Torres - TreePeople's partnership programs aimed at engaging youth and others in environmental action such as the Special Agent - Clean Water program, Sustainable Schools, and T.R.E.E.S.

Stephanie Alting-Mees - Overview of volunteer-based inventory and monitoring activities by community groups affiliated with California ReLeaf.

Susan Ford and Phil Hoefer - Colorado's street tree inventory program and stewardship/monitoring programs in the Denver metro area.

Greg McPherson - Parking lot tree shade monitoring program using trained volunteers in Davis, CA.

***Results from A Two-Day Workshop: February 17 and 18, 1999, Sacramento, California**

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