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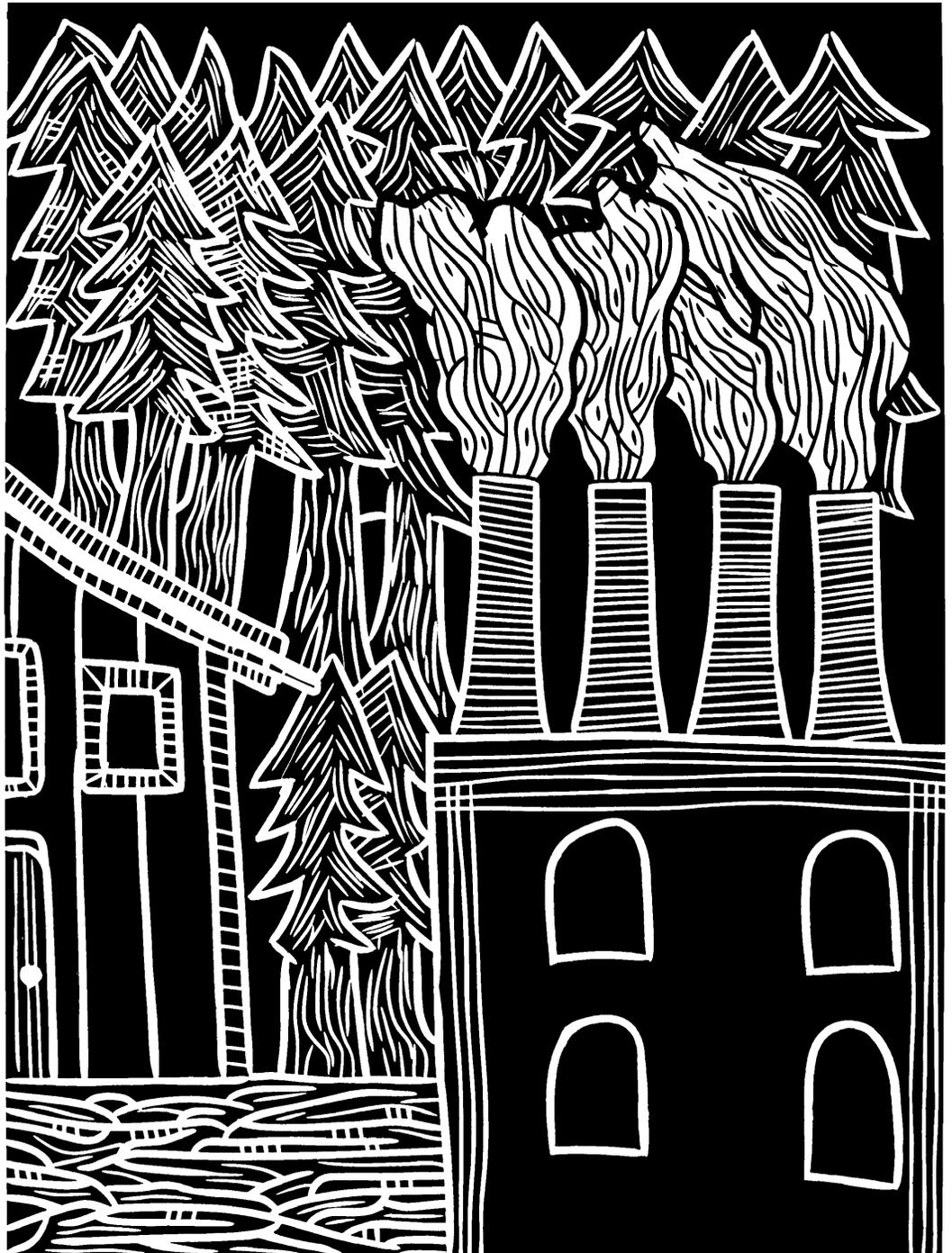
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Carbon Dioxide Reduction Through Urban Forestry:

Guidelines for Professional and Volunteer Tree Planters

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Abstract

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Carbon dioxide reduction through urban forestry—Guidelines for professional and volunteer tree planters has been developed by the Pacific Southwest Research Station's Western Center for Urban Forest Research and Education as a tool for utilities, urban foresters and arborists, municipalities, consultants, non-profit organizations and others to determine the effects of urban forests on atmospheric carbon dioxide (CO₂) reduction. The calculation of CO₂ reduction that can be made with the use of these Guidelines enables decision makers to incorporate urban forestry into their efforts to protect our global climate. With these Guidelines, they can: report current and future CO₂ reductions through a standardized accounting process; evaluate the cost-effectiveness of urban forestry programs with CO₂ reduction measures; compare benefits and costs of alternative urban forestry program designs; and produce educational materials that assess potential CO₂ reduction benefits and provide information on tree selection, placement, planting, and stewardship.

Retrieval Terms: urban forestry, carbon dioxide, sequestration, avoided energy

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Contents

Preface.....	v
Acknowledgments.....	vi
Guide for Users.....	vii
Chapter 1	
Urban Forests and Climate Change.....	1
What is Climate Change?.....	1
Human Activities and Climate Change.....	2
How Urban Forests Can Influence Atmospheric CO ₂	2
Carbon Dioxide Sequestration.....	3
Avoided Power Plant Emissions.....	5
Carbon Dioxide Release.....	7
Net Carbon Dioxide Reduction.....	8
Potential CO ₂ Reductions and Costs.....	8
Ancillary Benefits of Shade Tree Programs.....	9
Chapter 2	
Program Design and Implementation.....	13
Program Design and Delivery.....	13
General Guidelines for Residential Yard Trees.....	15
Location for Solar Control.....	15
Location for Wind Control.....	16
Selection.....	17
General Guidelines—Trees in Public Places.....	18
Location and Selection.....	18
General Guidelines—Establishing Healthy Trees for Long-Term Benefits.....	20
Increasing Program Cost Effectiveness.....	21
Information and Sources of Assistance.....	22

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General Technical
Report
PSW-GTR-171

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Chapter 3

General Information about These Guidelines for Calculating CO₂

Reductions from Urban Forestry Programs	27
Introduction	27
Who Should Use These Guidelines..and When?	27
Getting Started—Frequently Asked Questions	27
Short Form or Long Form?	28
Collect and Record Data	30
Calculate CO ₂ Reduction and Release for Mature Trees	38
Calculate CO ₂ Reduction and Release for 40 Years	39
Calculating Cost per Tonne	42

Chapter 4

Illustrative Examples	45
Proposed Program in Boulder City, Nevada	45
Background Information (Table I)	46
Site and Building Data (Table II)	46
Tree Data (Table III)	50
Planting and Stewardship Costs (Table IV)	52
Look-up Table (Short Form) (Table V)	54
Worksheet 1 (Table VIII)	56
Worksheet 2 (Table IX)	62
Boulder City Case Study Summary	65
Existing Program in Tucson, Arizona	67
Background Information (Table I)	68
Site and Building Data (Table II)	68
Tree Data (Table III)	70
Planting and Stewardship Costs (Table IV)	72
Long Form Adjustment Table (Table VI)	74
Look-up Table (Long Form) (Table VII)	78
Worksheet 1 (Long Form) (Table VIII)	82
Worksheet 2 (Table IX)	88
Tucson Case Study Summary	91
References	97
Appendix A. Short Form Data Input Forms and Look-up Tables	103
Appendix B. Long Form Data Input Forms and Look-up Tables	123
Appendix C. Regional Climate Information	156
Instructions for Climate Region Selection	156

Appendix D. Tree Information	161
Tree Growth Zones	161
Tree Selection	162
Tree Growth Rates, CO ₂ Sequestration, and Tree Decomposition	168
Tree Types	168
Tree Growth Zones	168
Develop Growth Curves	168
Select Biomass Equations	171
Compute CO ₂ Sequestration	173
CO ₂ Release Through Tree Decomposition	175
Tree Program-Related CO ₂ Release	175
Survey of Tree-Related CO ₂ Emissions	175
Municipal Tree Care	176
Tree Production	177
Tree Program Operations	178
Appendix E. Information on CO₂ Emission Factors, Building Characteristics, and Energy Performance	179
Appendix F. Instructions for Adjusting Tree Distributions to Customize Avoided Carbon Dioxide Emissions	183
Default Tree Distribution by Size and Location with Respect to Buildings	183
Adjusting Avoided Carbon Dioxide Emissions Data for Tree Location	185
Change in Cooling Energy Use (kg CO ₂ /Tree) for Each Climate Region by Mature Tree Size, Type, Distance and Azimuth	191
Default Values for Avoided Energy Due to Climate and Shade by Climate Region for Use in Long Form Analysis	202
Appendix G. Energy Simulation Methods	212
Building Energy Use	212
Shade Effects	213
Windbreaks	214
Climate	215
Appendix H. Instructions for Adjusting Tree Age/Survival Tables	219
Tree Survival Rates	219
Tree Age/Survival Tables	219
Custom Tree Age/Survival Tables Based on User-Supplied Tree Survival Rates	219
Appendix I. Glossary	227
Appendix J. Acronyms and Abbreviations	231
Appendix K. List of Figures and Tables	232

Preface

This Forest Service publication is timely as the climate change discussion moves away from arguments over the science toward the design of policies to limit greenhouse gas emissions. It presents a cogent approach to evaluating the economics of urban forestry for atmospheric carbon dioxide (CO₂) reductions. By providing this method, the authors have elevated urban and community forestry to the same status as other CO₂ reduction measures such as rural forest restoration, tree planting on non-forest land, and improved forest management practices. For the first time, electric utilities, corporations, and government agencies have the tool they need to assess the economics of investing in America's urban and community forests. This report will also be a valuable resource for international users interested in expanding their local urban forests to protect global climate.

Urban and community forestry programs that are designed to maximize CO₂ reductions should appeal to those interested in both environmental conservation and sustainable development. Conservationists can achieve success by planting trees to protect climate, restore urban habitats, and increase biodiversity; while businesses and industries that emit CO₂ can offset their emissions by funding the planting and stewardship of these trees. This is a win-win transaction and the handbook can be used as a ledger to quantify CO₂ debits and credits.

Eighty percent of Americans live in towns and cities. These urban forests in which we live provide a host of benefits that make our communities more livable. Just as importantly, they connect people with the land and people with one another. Our Urban Resources Partnerships and Community Forestry programs are fostering neighborhood action and a new land stewardship ethic. This emerging stewardship ethic is essential to the successful implementation of policies designed to protect our climate, as well as our forests.

The Forest Service is committed to working with partners to expand our urban and community forests and to improve their health. We know today that healthy urban forests can "grow" more sustainable communities and contribute to a more stable climate. I encourage you to use this report to plan and manage urban and community forests to conserve energy, sequester carbon dioxide, and deliver a full array of other products essential to a healthy environment.

Hal Salwasser

Director, Pacific Southwest Research Station, USDA Forest Service

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Guide for Users

How to Use These Guidelines

The *Carbon Dioxide Reduction Through Urban Forestry—Guidelines for Professional and Volunteer Tree Planters* have been developed by the Pacific Southwest Research Station's Western Center for Urban Forest Research and Education as a tool for utilities, urban foresters/arborists, municipalities, consultants, non-profit organizations and others to determine the effects of urban forests on atmospheric carbon dioxide (CO₂) reductions.

The calculations of CO₂ reductions that can be made with the use of these Guidelines enables decision-makers to incorporate urban forestry into their efforts to protect our global climate.

With these Guidelines you can:

- Report current or future CO₂ reductions through a standardized accounting process
- Evaluate the cost-effectiveness of urban forestry programs with other CO₂ reduction measures
- Compare benefits and costs of alternative urban forestry program designs
- Produce educational materials that quantify potential CO₂ reduction benefits and provide guidelines on tree selection, placement, planting, and stewardship.

The four chapters and appendices in the publication will provide you with basic information you need to calculate CO₂ reductions through urban forestry programs.

Chapter 1: Urban Forests and Climate Change

Chapter 1 presents readers with background information on global climate change and the role of urban forests as one strategy for reducing atmospheric CO₂ concentrations. The implication of global climate change on communities is described, and our current knowledge regarding urban forestry as a CO₂ reduction measure is reviewed.

Chapter 2: Program Design and Implementation

Chapter 2 provides information on the design and implementation of urban forestry programs specifically aimed at reducing atmospheric CO₂. We share lessons learned from previous programs that have succeeded and failed, as well as general guidelines for selecting and locating trees to maximize energy and CO₂ reduction benefits. Current information on tree planting and stewardship techniques is presented as well as sources of technical assistance.

Chapter 3: General Information about These Guidelines for Calculating CO₂ Reductions from Urban Forestry Programs

Chapter 3 presents a general description of methods and assumptions for calculating CO₂ reductions from urban forestry programs. The chapter objectives are to (1) familiarize you with the data collection and calculation process, (2) help you determine what data are required and how it can be obtained, and (3) explain certain key modeling assumptions.

Chapter 4. Illustrative Examples

Chapter 4 provides case studies of how to apply these guidelines. In one example, estimates of future CO₂ reductions for a proposed utility-sponsored program are described. The second example reports future reductions from an existing planting in a residential neighborhood.

Appendices

The Appendices contain information that you will reference while applying the guidelines. They also contain more detailed information on techniques used to develop the guidelines and reference material, including Glossary (Appendix I), Acronyms and Abbreviations (Appendix J), and List of Figures and Tables (Appendix K).

Chapter 1

