These proceedings summarize the results of a symposium designed to address current issues about wildfire and prescribed fire in both the wildland-urban interface and in wildlands. Thirty-eight invited oral papers and 23 poster papers describing the issues and state-of-the-art solutions to technical, biological, and social challenges currently facing land and fire managers were presented at The Biswell Symposium held February 15-17, 1994, in Walnut Creek, California.

Retrieval Terms: community response, ecosystem management, fire ecology, fire management, fuel management, prescribed burning

Technical Coordinators:

David R. Weise is Project Leader—Prescribed Fire Research at the Station’s Forest Fire Laboratory, 4955 Canyon Crest Drive, Riverside, CA 92507. Robert E. Martin is Professor Emeritus, Department of Environmental Science, Policy, and Management, University of California, 145 Mulford Hall, Berkeley, CA 94720.

Publisher:

Pacific Southwest Research Station
Albany, California
(Mailing address: P.O. Box 245, Berkeley, CA 94701-0245
Telephone: 510-559-6300
http://www.pswfs.gov/

August 1995
The Biswell Symposium: Fire Issues and Solutions in Urban Interface and Wildland Ecosystems

February 15–17, 1994 Walnut Creek, California
David R. Weise Robert E. Martin Technical Coordinators

Contents

In Brief ................................................................. v
Preface ................................................................. vi
Memorial Dedication to Dr. Harold H. Biswell ...................................... 1
James K. Agee
Acknowledgments

PLenary Session—Issues ................................................. 5
The Oakland-Berkeley Hills Fire of 1991 ........................................ 7
P. Lamont Ewell
Dr. Biswell’s Influence on the Development of Prescribed Burning in California ............................................. 11
Jan W. van Wagendonk
“What Do We Do Now, Ollie?” ............................................. 17
Robert L. Irwin
Fire History of the Local Wildland-Urban Interface ............................................. 23
Neil R. Honeycutt

Panel Discussion: Prescribed Fire: Why Aren’t We Doing More? ............. 25
Local, State, and National Perspectives
Donald A. Pierpont ........................................................ 27
Ken Nehoda ................................................................. 29
Jerry T. Williams ............................................................ 31
Institutionalizing Fire Safety in Making Land Use and Development Decisions ............................................. 33
Marie-Annette Johnson and Marc Mullenix
A Synopsis of Large or Disastrous Wildland Fires ..................................... 35
Robert E. Martin and David B. Sapsis
Cooperative Efforts in Fuels Management ............................................ 39
Gerald L. Adams
Contents

PANEL DISCUSSION: Barriers to Fuel Management .................................................. 43
Organizational Barriers ................................................................. 44
   Kenneth S. Blonski
Legal Barriers ................................................................. 45
   Anita E. Ruud
Federal Disaster Assistance Programs ........................................ 45
   William J. Patterson

CONCURRENT SESSION I—Wildland Ecosystem Topics ......................................... 47
Fire in Wildland Ecosystems—Opening Comments ..................................... 49
   Tom Nichols
Interagency Wilderness Fire Management .................................... 51
   Jim Desmond
FARSITE: A Fire Area Simulator for Fire Managers .................................. 55
   Mark A. Finney
Funding Fuels Management in the National Park Service: Costs and Benefits .. 57
   Stephen J. Botti
Ecosystem Management Issues ..................................................... 63
   Jim Boynton

PANEL DISCUSSION: Prescribed Burning in the 21st Century ................................ 65
   Jerry Hurley ................................................................. 67
   Ishmael Messer ............................................................ 70
   Stephen J. Botti ............................................................ 70
   Jay Perkins ................................................................. 71
   L. Dean Clark ............................................................. 75

CONCURRENT SESSION II—Urban Interface Topics .............................................. 79
Use of Class A Foams on Structures and Wildlands .................................... 81
   Paul Schlobohm
Structure Ignition Assessment Model (SIAM) ....................................... 85
   Jack D. Cohen
Strategies for and Barriers to Public Adoption of Fire Safe Behavior .......... 93
   Ronald W. Hodgson
Neighborhood Organization Activities: Evacuation Drills, Clusters, and Fire Safety Awareness ........................................ 99
   Dick White
Conflicts Between Natural Resources and Structural Protection .............. 105
   Stephen Bakken

PANEL DISCUSSION: Regional Approaches to Urban Interface Problems ........... 109
Moderator’s Comments ............................................................ 111
   Neil R. Honeycutt
Contents

The East Bay Vegetation Management Consortium:
A Subregional Approach to Resource Management and Planning ...................... 112
Tony Acosta

East Bay Fire Chiefs’ Consortium ......................................................... 113
Michael Bradley

The Bay Area Wildfire Forum ............................................................... 115
Todd E. Bruce

Social and Environmental Issues in Developing Vegetation and Fire Management Plans ........ 117
Leonard Charles

**PLENARY SESSION—Solutions** ......................................................... 123

Working to Make the Clean Air Act and Prescribed Burning Compatible .................. 125
Trent Procter

Comprehensive Fire Prevention Legislation Enacted by the California Legislature in 1992 After the East Bay Firestorm ......................................................... 129
Rachel Richman

Florida’s Solution to Liability Issues ..................................................... 131
Dale Wade and James Brenner

The Role of Fire in Ecosystem Management ............................................. 139
Jerry T. Williams

Structural Wildland Intermix ............................................................... 141
Ronny J. Coleman

A Balanced Approach: Dr. Biswell’s Solution to Fire Issues in Urban Interface and Wildland Ecosystems ......................................................... 147
Carol Rice

**POSTER SESSION** ................................................................. 149

Use of Aerial Photography for Fire Planning and Suppression ........................... 151
Alan H. Ambacher

Characteristics of Coastal Sage Scrub in Relation to Fire History and Use by California Gnatcatchers ............................................................. 153
Jan L. Beyers and Ginger C. Peña

The Quest for All-Purpose Plants ......................................................... 155
Susan L. Frommer and David R. Weise

A High-Resolution Weather Model for Fire Behavior Simulations ..................... 157
Francis M. Fujioka, John O. Roads, Kyozo Ueyoshi, and Shyh-Chin Chen

Using a Geographic Information System (GIS) to Assess Fire Hazard and Monitor Natural Resources Protection on the Mount Tamalpais Watershed ..................... 159
Thomas H. Gaman and Philip Langley

Homeowner Intervention in Malibu ....................................................... 161
Tom Gardner

Contents

The Legacy of Harold Biswell in Southern California: His Teaching Influence on the Use of Prescribed Fire .......................................................... 163
   Walter L. Graves and Gary Reece

Helping Wildland-Urban Interface Residents Reduce Wildfire Hazards .......................................................... 165
   Warren E. Heilman, Jeremy S. Fried, William A. Main, and Donna M. Paananen

Mt. Diablo Park: The Role of Fire in a Controversy About Cattle Grazing at the Urban Fringe .................. 167
   Lynn Huntsinger, Jeremy Fried, and Lita Buttolph

Fire in a Tropical Savanna—a Double-Edged Sword .......................................................... 169
   Andrea L. Koonce, Timothy E. Paysen, and Bonni M. Corcoran

People—Fire Managers Must Talk With Them .................................................................................. 171
   Arthur W. Magill

The Effects of Forest Fire Smoke on Firefighters .................................................................................. 173
   Richard J. Mangan

Burning in Arizona’s Giant Cactus Community .................................................................................. 175
   Marcia G. Narog, Andrea L. Koonce, Ruth C. Wilson, and Bonni M. Corcoran

A Computer Program for Evaluating Prescribed Fire Costs .......................................................... 177
   Philip N. Omi, Douglas B. Rideout, and Stephen J. Botti

Potential Nitrogen Losses due to Fire from *Pinus halepensis* Stands in the Alicante Province (Southeastern Spain): Mineralomass Variability .......................................................... 179
   Antonio Pastor-Lopez and Joaquin Martin-Martin

Susceptibility to Potential Erosion After Fire in Mediterranean Ecosystems in the Alicante Province (Southeastern Spain) .................................................................................. 183
   Antonio Pastor-Lopez and Joaquin Martin-Martin

Operational Fire/GIS Dilemmas—The Fire Report Form Example .................................................. 185
   Lucy Anne Salazar and Martha Shea Flattley

Progression of the Oakland/Berkeley Hills “Tunnel Fire” ...................................................................... 187
   David B. Sapsis, Donald V. Fearman, and Robert E. Martin

Comparison of Fuel Load, Structural Characteristics and Infrastructure
   Before and After the Oakland Hills “Tunnel Fire” .................................................................................. 189
   Scott L. Stephens, Domingo M. Molina, Ron Carter, and Robert E. Martin

FireNet—A Forum for International Curriculum Development in Fire Science and Management? .................................................................................. 191
   A. Chris F. Trevitt, David G. Green, and David B. Sapsis

Lightning Strikes and Natural Fire Regimes in San Diego County, California .................................. 193
   Michael L. Wells and David E. McKinsey

Modern Fire Test Methodologies for Building Materials ...................................................................... 195
   Robert H. White and Mark A. Dietenberger

Brush Fire Hazard: An Analysis of the Topanga Fire Storm ...................................................................... 197
   James A. Woods
Fire has been and continues to be both a threat and benefit to humans and ecosystems. Recent large or costly fires have occurred in both the wildland-urban interface and in the wildlands. These phenomena are not new events but merely recurrences of long-standing challenges. The values at risk include, but are not limited to, human life and property, rare or unique cultural and natural resources, and ecosystem health. Much progress has been made during the past several decades regarding fire’s role in wildland systems, but many issues still remain to be resolved.

This volume presents the proceedings of the symposium, “Fire Issues and Solutions in Urban Interface and Wildland Ecosystems” held February 15-17, 1994 in Walnut Creek, California. The primary objective of the symposium was to describe fire issues and problems currently facing land managers and to present state of the art solutions that are currently being implemented by local, State, and Federal organizations concerned with fire management. The focal point of the symposium was the 1991 Oakland/Berkeley Hills “Tunnel Fire”; however, the issues and solutions described are certainly regional and national in scope.

Several key issues regarding the role of fire in wildlands and in the urban interface include social barriers, fire safety, fuel management, legal barriers, multiple jurisdictions, program cost and benefits, wildland health, conflicts between wildland resources and residential structures, air quality, and liability. Social barriers include lack of general knowledge of fire’s role, as well as recognition of its hazards and benefits. Legal barriers include laws, ordinances, and regulations that either restrict fire use or do not provide incentives for fire use. Implementing fire use on an ecosystem level requires cooperation between neighbors. The safety of structures built in urban interface settings or adjacent to wildland boundaries is an issue the owner faces; the liability associated with destruction by wildland fire is an issue that land managers face.

Because of the complexity of the issues regarding fire and its use, many different solutions have been developed. Researchers have identified social barriers and concerns that hinder adoption of fire safe practices by the general public. Educational efforts to prevent the public from forgetting the losses associated with catastrophic wildfires have been developed. Legal solutions to fuel management and fire hazard reduction have been developed in California and Florida to address liability issues. Community and neighborhood-based associations have developed to promote fire-safe wildland-urban interfaces. Interagency agreements were developed to apply prescribed fire at ecosystem levels to mutual benefit. Environmentally safe fire suppression techniques have also been developed.

Many proactive approaches to solving these and other fire issues were presented at the symposium. It is our hope that the symposium attendees as well as readers of these proceedings benefit from the array of topics discussed, and that the information gained from the technical sessions and this proceedings provides a starting point to solving local fire issues. This symposium presents a snapshot of the continually evolving dialogue about fire and its role as a shaper of ecosystems.
Preface

Fire has been and continues to be both a threat and benefit to humans and ecosystems. Recent large or costly fires have occurred in both the wildland-urban interface and in the wildlands. These phenomena are not new events but merely recurrences of long-standing challenges. The values at risk include, but are not limited to, human life and property, rare or unique cultural and natural resources, and ecosystem health. Much progress has been made during the past several decades regarding the recognition of fire’s role in wildland systems, but many issues still remain to be resolved.

Dr. Harold “Doc” Biswell was a pioneering advocate for the study of the ecological role of fire, for the use of prescribed fire in land management, and for fuels management. He worked to reduce fire hazard in urban-wildland interface areas and lived to see one of his most dire predictions come true in the Oakland/Berkeley Hills “Tunnel Fire” of October 1991. A conference to honor Dr. Harold H. Biswell was proposed shortly after his death in January 1992. This symposium was organized to honor Dr. Biswell by addressing wildland and urban-wildland fire issues and solutions—subjects dear to his heart. We dedicate this symposium and proceedings to the memory of Dr. Harold Biswell.

Approximately 350 managers, researchers, planners, former students of Dr. Biswell and other individuals attended the symposium in Walnut Creek, California. Because the wildland and structural fire communities were equally represented in attendance, the goal to bring both groups together in a common forum was accomplished. The symposium consisted of two and one-half days of technical presentations, a one-half day field trip touring the 1991 Oakland/Berkeley Hills “Tunnel Fire,” a poster session, and an evening session dedicated to Dr. Biswell’s life and legacies led by Dr. James K. Agee. The technical presentations were structured around issues/problems and solutions in both wildland and urban interface ecosystems. The major topics were developed by a Steering Committee representing Federal, State, and local agencies, and university and non-governmental organizations. Speakers were selected to address the major topics. Each technical session was chaired by a moderator and included the following topics:

- History, safety, and legal and social barriers to prescribed fire (moderator—Sue Husari, USDA Forest Service)
- Wildland topics including funding of fire programs, ecosystem management, and prescribed fire (moderator—Tom Nichols, USDA National Park Service)
- Urban-wildland interface topics including use of foams, neighborhood action groups, and fire safety (moderator—Steve Bakken, California Department of Parks and Recreation)
- Legislation and ecosystem management solutions (moderators—Bruce Kilgore, USDA National Park Service; Carol Rice, Wildland Resource Management, Inc.).

The technical sessions included expert panel discussions. In addition to the session moderators, the panel moderators included Dr. Ron Wakimoto, University of Montana; Chief Neil Honeycutt, California Office of Emergency Services; and Chief Rich Aronsen (retired), California Office of Emergency Services.

In addition to the technical sessions, the conference featured a keynote speech by Chief Lamont Ewell, Oakland Fire Department, describing the 1991 Oakland/Berkeley Hills “Tunnel Fire” and a banquet with a memorial dedication to Dr. Biswell by Dr. James Agee, University of Washington. The symposium concluded with a summary of the events and issues by Robert Mutch, USDA Forest Service (retired).

Acknowledgments

A conference and proceedings of this size require a great deal of effort from many individuals. We thank the members of the Symposium Steering Committee—Rich Aronsen, Steve Bakken, Todd Bruce, Neil Honeycutt, Sue Husari, Ken Nehoda, Tom Nichols, Carol Rice, Joe Rubini—for putting together a dynamic and interesting symposium agenda. The Steering Committee was organized using the Incident Command System as the basic organizational framework. Robert Martin initiated the idea for the conference, organized the Steering Committee and served as Incident Commander (Symposium Chair); Carol Rice (Operations) was assisted by Ken Nehoda; Joe Rubini (Logistics) was assisted by Neil Honeycutt and Todd Bruce; Sue Husari (Finance) was assisted by Tom Nichols and Steve Bakken; and David Weise (Planning) was assisted by Rich Aronsen. The efforts of Sandy Cooper and Bruce Winner, University Extension - University of California, Davis, were key to providing the logistical support of program materials, registration, hotel negotiations, bus negotiations, and other activities too numerous to mention. Joe Rubini and Neil Honeycutt with the assistance of University of California, Berkeley graduate students David Sapsis, Scott Stephens, Robert Schroeder, and Maria Gutierrez developed an informative tour of the 1991 “Tunnel Fire” and fuel management activities in the Oakland/Berkeley Hills.

We further acknowledge the efforts of Eugene Hanson and Bonnie Corcoran, Prescribed Fire Research Unit located at the Forest Fire Laboratory in Riverside, California in assembling the proceedings, and the editorial and graphics assistance of Sandy Young, Laurie Dunn, Kathy Stewart, and Robert Robinson of the Station’s Research Information Services. Thanks to all the authors during the long process of manuscript preparation, editing, and production. Lastly, we acknowledge the support provided by the following sponsors: University of California at Berkeley; Bay Area Wildfire Forum; City of Oakland; East Bay Regional Parks; California Departments of Forestry and Fire Protection, Parks and Recreation, Emergency Services, and the Fire Marshall’s Office; USDI National Park Service; USDA Forest Service, Region 5; USDA Forest Service, Pacific Southwest Research Station; and the Society of American Foresters.