

United States
Department of
Agriculture

Forest Service

National Technology &
Development
Program

Watershed, Soil, Air Management
0625 1801—SDTDC
December 2006

The BAER logo is a large, stylized graphic. It consists of two overlapping circles, one orange and one green, forming a shape similar to a yin-yang symbol. Overlaid on this graphic is the word 'BAER' in large, blue, 3D block letters.

BAER

Burned Area Emergency Response Treatments Catalog

Acknowledgements

The Burned Area Emergency Response Treatments Catalog (BAERCAT) was developed with the support and contributions of numerous individuals. The following regional and national Burned Area Emergency Response coordinators provided direction on the design, format, and content of the BAERCAT.

Bruce Sims (R1)
Jerry Freeouf (R2)
Penny Luehring (R3)
Jeff Bruggink (R4)
Brent Roath (R5)
Steve Howes (R6)
Emanuel Hudson (R8)
Bonnie Ilhardt (R9)
Meredith Webster (WO)

Technical review and contribution of drawings, photos, treatment implementation techniques, and effectiveness monitoring was provided by the following USDA Forest Service, BLM, and FHWA individuals. Their participation and willingness to share their time and expertise in the field of Burned Area Emergency Response helps to make the BAERCAT a valuable tool in future BAER assessments and implementation.

Peter Robichaud (RMRS, research engineer)
Gregory Kuyumjian (R3, hydrologist)
Annette Parsons (BLM/FS, soil scientist, GIS)
George Toyama (SDTDC, visual information specialist)
Mike Nolan (R3, engineer)
Eric Brown (FHWA hydraulic engineer)
Donna Sheehy (R1, engineer)
Ken Hubbert (soil scientist)
Gregory Napper (SDTDC, engineer)
Ken Kanaan (R2, soil scientist)
Annetta Mankins (R5, watershed specialist)
Cheryl Taylor (R1, hydrologist)
Jim Fitzgerald (R5, hydrologist)

Technical review of the BAERCAT was conducted by the following individuals from the USDA Forest Service, Department of the Interior, and Ministry of Forest Research. Their comments and experience in BAER provided invaluable input.

Jeff TenPas (R5 soil scientist)
Tommy John (R2, soil scientist)
William Fowler (R9, hydrologist)
Pam Stachler (R9, hydrologist)
Bill Crane (SDTDC, engineer)
Doug Hyde-Sato (R3, contract officer)
Richard Schwab (NPS BAER)
Mike Smith (R4, hydrologist)
Jim Bergman (R4, hydrologist)
Robin Pike (Ministry of Forest Research, British Columbia)
Scott Miles (R5, soil scientist)
Rhonda Helzner (R4, hydrologist)



Burned Area Emergency Response Treatments Catalog

Carolyn Napper
Soil Scientist
USDA Forest Service

San Dimas Technology &
Development Center
San Dimas, California

December 2006

Information contained in this document has been developed for the guidance of employees of the U.S. Department of Agriculture (USDA) Forest Service, its contractors, and cooperating Federal and State agencies. The USDA Forest Service assumes no responsibility for the interpretation or use of this information by other than its own employees. The use of trade, firm, or corporation names is for the information and convenience of the reader. Such use does not constitute an official evaluation, conclusion, recommendation, endorsement, or approval of any product or service to the exclusion of others that may be suitable.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Burned Area Emergency Response Treatments Catalog

Table of Contents

Chapter 1 Introduction

Starting the BAER Assessment Process	1
Areas To Review	1
Defining the Emergency	2
Treatment Selection	2
Land Treatments	3
Channel Treatments	4
Road and Trail Treatments	5
Protection and Safety Treatments	6
Summary	7
BAER Treatment Selection Tool	9

Chapter 2 Land Treatments

Aerial Hydromulch	13
Ground Hydromulch	21
Straw Mulch	25
Slash Spreading	31
Erosion Control Mats	35
Log Erosion Barriers	41
Fiber Rolls or Wattles	49
Silt Fences	55
Soil Scarification	59
Seeding	63
Invasive Plants	69
Hazardous-Material Stabilization	73
Heritage-Site Stabilization	75

Chapter 3 Channel Treatments

Checkdams	81
In-Channel Tree Felling	89
Grade Stabilizers	93
Stream Channel Armoring	97
Channel Deflectors	99
Debris Basins	101

Chapter 4 Road and Trail Treatments

Outsloping	105
Rolling Dips	109
Overflow Structures	113
Low-Water Stream Crossings	121
Culvert Modification	127
Debris Rack and Deflectors	131
Riser Pipes	139
Catchment-Basin Cleanout	145
Storm Inspection and Response	149
Trail Stabilization	153
Road Decommissioning	159

Chapter 5 Protection and Safety Treatments

Facility-Safety Work	161
Flood Warning Systems	163
Hazard-Trees and Unstable Rocks	165

Protection Enforcement.....	169
Protective Fences and Barriers.....	173
Warning Signs.....	179
References	183
Appendix A	
Section 1 Excerpts From “Aerial Helimulching Lessons Learned and Recommendations”	191
Section 2 Aviation Safety Plan.....	199
Section 3 Contract Example for BAER Helimulching.....	205
Section 4 Straw Delievery Accounting Form	211
Section 5 Helicopter Straw Accounting Form	212
Appendix B	
BAER Treatments Sample Contract Specifications by Gregory Napper and Carolyn Napper	213
Appendix C	
Low-Water Stream Crossing Calculations	235
Appendix D	
BAER Job Hazard Analysis	237
Appendix E	
Riprap Class and Size Gradation: Requirements for Riprap	243
Appendix F	
Storage Capacity Reference for Contour Felled Log Erosion Barriers by Peter Robichaud.....	245