TABLE OF CONTENTS

EXECUTIVE SUMMARY **Exec-1**

CHAPTER 1—PROPOSED ACTION AND ALTERNATIVES **1-1**
Introduction **1-3**
Purpose and Need for Action **1-3**
Program Objectives **1-3**
Legal Mandates for the Program **1-13**
NEPA Requirements of theProgram **1-13**
Public Involvement **1-13**
Program Areas **1-15**
Proposed Action and Alternatives **1-17**
Alternative 1: Proposed Action **1-17**
Alternative 2: No Aerial Application of Herbicides **1-17**
Alternative 3: No Use of Herbicides **1-17**
Alternative 4: No Use of Prescribed Burning **1-17**
Alternative 5: No Action (Continue Current Management) **1-19**
Standard Operating Procedures **1-19**
Treatment Method Descriptions **1-20**
Inert Ingredients **1-32**
Mitigation **1-33**
Project Design Features **1-33**
Herbicide Treatments **1-33**
Other Treatments **1-33**
Special Precautions **1-35**
Summary of Impacts by Alternative **1-37**
Implementation **1-37**
Monitoring **1-37**
Requirements for Further Environmental Analysis **1-42**
Interrelationships **1-42**
Other Federal Entities **1-42**
State and Local Governments **1-43**
Private Landowners **1-44**
Limitations of This Draft EIS **1-44**

CHAPTER 2—AFFECTED ENVIRONMENT **2-1**
General Description **2-3**
Analysis Region Descriptions **2-6**
Vegetation **2-6**
Climate **2-17**
Air Quality **2-21**
Geology and Topography **2-26**
Soils **2-27**
Aquatic Resources **2-30**
Fish and Wildlife **2-39**
Cultural Resources **2-47**
Recreation and Visual Resources **2-50**
Livestock **2-52**
Wild Horses and Burros **2-52**
Special Status Plant and Animal Species **2-53**
Wilderness and Special Areas **2-54**
Human Health and Safety **2-55**
Social and Economic Resources **2-57**

CONTENTS

CHAPTER 3—ENVIRONMENTAL CONSEQUENCES 3-1
Introduction 3-3
SECTION 1—IMPACTS OF THE VEGETATION TREATMENT METHODS 3-5
Vegetation 3-7
Manual Methods 3-9
Mechanical Methods 3-9
Biological Methods 3-13
Prescribed Burning 3-14
Chemical Methods 3-22
Climate and Air Quality 3-29
Manual and Mechanical Methods 3-29
Biological Methods 3-30
Prescribed Burning 3-30
Chemical Methods 3-31
Geology and Topography 3-31
Soils 3-31
Manual Methods 3-31
Mechanical Methods 3-31
Biological Methods 3-36
Prescribed Burning 3-37
Chemical Methods 3-40
Aquatic Resources 3-41
Manual Methods 3-41
Mechanical Methods 3-41
Biological Methods 3-42
Prescribed Burning 3-43
Chemical Methods 3-43
Fish and Wildlife 3-46
Manual Methods 3-47
Mechanical Methods 3-47
Biological Methods 3-50
Prescribed Burning 3-51
Chemical Methods 3-53
Chemical Treatment Risk Analysis 3-57
Cultural Resources 3-58
Manual Methods 3-58
Mechanical Methods 3-58
Biological Methods 3-59
Prescribed Burning 3-59
Chemical Methods 3-59
Recreation and Visual Resources 3-59
Manual Methods 3-60
Mechanical Methods 3-60
Biological Methods 3-61
Prescribed Burning 3-61
Chemical Methods 3-61
Livestock 3-61
Manual Methods 3-61
Mechanical Methods 3-61
Biological Methods 3-61
Prescribed Burning 3-62
Chemical Methods 3-62
Wild Horses and Burros 3-62
Manual Methods 3-62
Mechanical Methods 3-62

CONTENTS

Biological Methods 3-62
Prescribed Burning 3-62
Chemical Methods 3-63
Special Status Plant and Animal Species 3-63
Wilderness and Special Areas 3-63
Manual Methods 3-63
Mechanical Methods 3-63
Biological Methods 3-64
Prescribed Burning 3-64
Chemical Methods 3-64
Human Health and Safety 3-64
Manual Methods 3-64
Mechanical Methods 3-65
Biological Methods 3-65
Prescribed Burning 3-65
Chemical Methods 3-67
SECTION 2—IMPACTS BY ALTERNATIVE 3-95
Vegetation 3-97
Alternative 1: Proposed Action 3-98
Alternative 2: No Aerial Application of Herbicides 3-100
Alternative 3: No Use of Herbicides 3-102
Alternative 4: No Use of Prescribed Burning 3-104
Alternative 5: No Action (Continue Current Management) 3-106
Climate and Air Quality 3-107
Alternative 1: Proposed Action 3-107
Alternative 2: No Aerial Application of Herbicides 3-107
Alternative 3: No Use of Herbicides 3-107
Alternative 4: No Use of Prescribed Burning 3-108
Alternative 5: No Action (Continue Current Management) 3-108
Geology and Topography 3-108
Soils 3-108
Alternative 1: Proposed Action 3-108
Alternative 2: No Aerial Application of Herbicides 3-108
Alternative 3: No Use of Herbicides 3-109
Alternative 4: No Use of Prescribed Burning 3-109
Alternative 5: No Action (Continue Current Management) 3-109
Aquatic Resources 3-109
Fish and Wildlife 3-109
Alternative 1: Proposed Action 3-110
Alternative 2: No Aerial Application of Herbicides 3-111
Alternative 3: No Use of Herbicides 3-111
Alternative 4: No Use of Prescribed Burning 3-112
Alternative 5: No Action (Continue Current Management) 3-113
Cultural Resources 3-113
Alternative 1: Proposed Action 3-113
Alternative 2: No Aerial Application of Herbicides 3-113
Alternative 3: No Use of Herbicides 3-113
Alternative 4: No Use of Prescribed Burning 3-113
Alternative 5: No Action (Continue Current Management) 3-113
Recreation and Visual Resources 3-113
Alternative 1: Proposed Action 3-114
Alternative 2: No Aerial Application of Herbicides 3-114
Alternative 3: No Use of Herbicides 3-114
Alternative 4: No Use of Prescribed Burning 3-115
Alternative 5: No Action (Continue Current Management) 3-115
Livestock 3-115

CONTENTS

Alternative 1: Proposed Action 3-115
Alternative 2: No Aerial Application of Herbicides 3-115
Alternative 3: No Use of Herbicides 3-116
Alternative 4: No Use of Prescribed Burning 3-116
Alternative 5: No Action (Continue Current Management) 3-116
Wild Horses and Burros 3-116
Alternative 1: Proposed Action 3-116
Alternative 2: No Aerial Application of Herbicides 3-116
Alternative 3: No Use of Herbicides 3-116
Alternative 4: No Use of Prescribed Burning 3-117
Alternative 5: No Action (Continue Current Management) 3-117
Special Status Species 3-117
Wilderness and Special Areas 3-117
Alternative 1: Proposed Action 3-117
Alternative 2: No Aerial Application of Herbicides 3-117
Alternative 3: No Use of Herbicides 3-117
Alternative 4: No Use of Prescribed Burning 3-117
Alternative 5: No Action (Continue Current Management) 3-118
Human Health and Safety 3-118
Alternative 1: Proposed Action 3-118
Alternative 2: No Aerial Application of Herbicides 3-118
Alternative 3: No Use of Herbicides 3-118
Alternative 4: No Use of Prescribed Burning 3-118
Alternative 5: No Action (Continue Current Management) 3-118
Social and Economic Resources 3-119
Social Resources 3-119
Economic Resources 3-119
Unavoidable Adverse Environmental Effects 3-121
Energy Requirements 3-122
Irreversible and Irretrievable Commitment of Resources 3-122
Irreversible Resource Commitment 3-122
Irretrievable Resource Commitment 3-122
Short-Term Uses Versus Long-Term Productivity 3-122

CHAPTER 4—CONSULTATION AND COORDINATION 4-1
Public Involvement 4-3
Summary 4-3
Public Participation 4-4
Issues/Concerns 4-5
Specific Comments and Responses 4-14

CHAPTER 5—LIST OF PREPARERS AND REVIEWERS 5-1

REFERENCES Ref-1

Tables

Table 1-1. Estimated Average Annual Acreage Treated by Program Alternative and Treatment Method 1-5
Table 1-2. Estimated Average Annual Acres Treated by State: Alternative 1 1-6
Table 1-3. Estimated Average Annual Acres Treated by State: Alternative 2 1-7
Table 1-4. Estimated Average Annual Acres Treated by State: Alternative 3 1-8

CONTENTS

Table 1-5. Estimated Average Annual Acres Treated by State: Alternative 4 1-9
Table 1-6. Estimated Average Annual Acres Treated by State: Alternative 5 1-10
Table 1-7. Typical Herbicide Application Rates by Area (pounds active ingredient per acre) 1-25
Table 1-8. Maximum Herbicide Application Rates by Area (pounds active ingredient per acre) 1-26
Table 1-9. Summary of Impacts by Alternative 1-38
Table 2-1. Acreage of BLM-Administered Lands and Percentage of State, 1987 2-3
Table 2-2. Climatic Data 2-19
Table 2-3. Federal Air Quality Standards (micrograms per cubic meter) 2-22
Table 2-4. Number of Suspected and Known Nonattainment Areas in the Study Area 2-24
Table 2-5. Number of PSD Class 1 Areas in the Study Area 2-24
Table 2-6. Summary of the Principal Physical and Hydrologic Characteristics of the Ground-Water Regions of the States in the Study Area 2-33
Table 2-7. Common Ranges on the Hydraulic Characteristics of Ground-Water Regions of the States in the Study Area 2-34
Table 2-8. Estimated Recreation Hours on BLM-Administered Lands in the Study Area 2-51
Table 2-9. Mortality per 100,000 Population and Causes of Death in BLM Program States in the Study Area 2-56
Table 2-10. Population Distribution and Density of the States in the Study Area 2-57
Table 2-11. Employment by Industry in the States in the Study Area 2-59
Table 3-1. Generalized Influence of Selected Brush Control Treatments on Vegetation and Soils 3-7
Table 3-2. Sprouting Response of Brush Species for the Principal Rangeland Areas in North America 3-9
Table 3-3. General Description of Vegetation Susceptibility to Herbicides 3-23
Table 3-4. Mortality of Forbs on Areas Sprayed With 2,4-D to Control Big Sagebrush 3-24
Table 3-5. Annual Prescribed Burning Pollutant Emissions by Program Alternative (tons) 3-30
Table 3-6. Chemical and Environmental Properties of Herbicides Used on Rangeland 3-45
Table 3-7. High Risks to Members of the Public From Herbicide Use on Rangeland 3-75
Table 3-8. High Risks to Workers From Herbicide Use on Rangeland 3-78
Table 3-9. High Risks to Members of the Public From Herbicide Use on Public-Domain Forest Land 3-78
Table 3-10. High Risks to Workers From Herbicide Use on Public-Domain Forest Land 3-81
Table 3-11. High Risks to Members of the Public From Herbicide Use on Oil and Gas Sites 3-81
Table 3-12. High Risks to Workers From Herbicide Use on Oil and Gas Sites 3-84

CONTENTS

Table 3-13. High Risks to Members of the Public From Herbicide Use on Rights-of-Way 3-84
Table 3-14. High Risks to Workers From Herbicide Use on Rights-of-Way 3-87
Table 3-15. High Risks to Members of the Public From Herbicide Use on Recreation and Cultural Sites 3-88
Table 3-16. High Risks to Workers From Herbicide Use on Recreation and Cultural Sites 3-91
Table 3-17. High Risks From Accidents From Herbicide Use on Rangeland 3-91
Table 3-18. High Risks From Accidents From Herbicide Use on Public-Domain Forest Land 3-92
Table 3-19. High Risks From Accidents From Herbicide Use on Oil and Gas Sites 3-93
Table 3-20. High Risks From Accidents From Herbicide Use on Rights-of-Way 3-93
Table 3-21. High Risks From Accidents From Herbicide Use on Recreation and Cultural Sites 3-94
Table 3-22. Annual Vegetation Treatment Costs by Program Alternative 3-120

Figures

Figure 1-1. How This EIS Is Organized 1-4
Figure 1-2. States Included in the Vegetation Treatment Program 1-12
Figure 1-3. The Process 1-14
Figure 1-4. Proportion of Acreage Treated Annually by TreatmentMethod 1-18
Figure 1-5. Mechanical Disking Equipment 1-21
Figure 1-6. Grazing Biological Treatment Using Sheep 1-22
Figure 1-7. Drip Torch Used To Ignite a Prescribed Burn 1-23
Figure 1-8. Helicopter Herbicide Application 1-24
Figure 2-1. Bureau of Land Management Lands in the Western United States 2-4
Figure 2-2. Vegetation Analysis Regions of the United States 2-5
Figure 2-3. Physiography of the United States 2-8
Figure 2-4. Average Annual Precipitation in the Western United States 2-20
Figure 2-5. Air Quality Class I Areas of the Western United States 2-23
Figure 2-6. Major Soil Orders of the Western United States 2-29
Figure 2-7. Ground-water Regions of the Western United States 2-31
Figure 2-8. Categories of Ground-Water Vulnerability 2-32
Figure 3-1. Helicopter Igniting a Prescribed Burn 3-14
Figure 3-2. Crew Member Monitoring Prescribed Burn Aimed at Improving Forage and Wildlife Habitat 3-15
Figure 3-3. Oral LD_{50}s in Rats (mg/kg/day) 3-69
Figure 3-4. Systemic NOELs (mg/kg/day) 3-70
Figure 3-5. Reproductive NOELs (mg/kg/day) 3-71
Figure 3-6. Aerial Herbicide Application 3-100
Figure 3-7. Equipment for Ground Application of Herbicides 3-101
Figure 4-1. Relationship of EIS to BLM Field Offices 4-9
Figure 4-2. Summary of Letters Received by State 4-15
Figure 4-3. Expressed Preference on Proposed Alternatives 4-16