

# Draft Comprehensive Conservation Plan and Environmental Impact Statement

*San Luis Valley National Wildlife Refuge Complex*

**Colorado**

**August 2014**

***Prepared by***

San Luis Valley National Wildlife Refuge Complex  
8249 Emperius Road  
Alamosa, Colorado 81101  
719 / 589 4021

U.S. Fish and Wildlife Service  
Region 6, Mountain–Prairie Region  
Division of Refuge Planning  
134 Union Boulevard, Suite 300  
Lakewood, Colorado 80228  
303 / 236 8145

**CITATION**

U.S. Fish and Wildlife Service. 2014. Draft comprehensive conservation plan and environmental impact statement, San Luis Valley National Wildlife Refuge Complex. Lakewood, CO: U.S. Department of the Interior, Fish and Wildlife Service, Mountain–Prairie Region. 363 p.



# Abstract

## **Draft Comprehensive Conservation Plan and Environmental Impact Statement**

*San Luis Valley National Wildlife Refuge Complex: Alamosa, Monte Vista, and Baca National Wildlife Refuges, Colorado*

**Type of Action:** Administrative

**Lead Agency:** U.S. Fish and Wildlife Service

**Responsible Official:** Noreen Walsh, Director, Region 6, U.S. Fish and Wildlife Service

This *Draft Comprehensive Conservation Plan* and Environmental Impact Statement identifies the purpose and need for a management plan, outlines the legal foundation for management of the San Luis Valley National Wildlife Refuge Complex (refuge complex), and describes and evaluates four alternative plans for managing wildlife, habitat, and wildlife-dependent public use. This process has involved the development of a vision, goals, objectives, and strategies that meet the legal directives of the U.S. Fish and Wildlife Service (Service) and considered stakeholder input.

Under alternative A, No-Action, we would make few changes in how we manage the various habitats and wildlife populations throughout the refuge complex. Generally, we would continue to manage habitats on the Alamosa and Monte Vista Refuges through the manipulation of water, as described in the 2003 CCP (FWS 2003) or under the guidance found in the conceptual management plan for the Baca Refuge. All the refuges would adhere to new State regulations regarding water use. There would be few additional public uses outside of what already occurs on the Monte Vista and Alamosa refuges. The Baca Refuge would remain closed to public use except for access to a refuge office or contact station. We would continue to maintain our existing partnerships in and around the refuge complex. Future land protection efforts would be restricted to the acquisition of private inholdings within existing refuge boundaries, conservation easements identified in the Sangre de Cristo Conservation Area, or easements or acquisitions identified in the San Luis Valley Conservation Area.

Under alternative B, Wildlife Populations, Strategic Habitat Restoration, and Enhanced Public Uses (draft proposed action), we would approach management with an emphasis on maintaining or restoring the composition, structure, and function of natural

and modified habitats. We would take into greater consideration the ecological site characteristics and wildlife species requirements on our refuge lands by developing sound and sustainable management strategies that maintain and/or restore the ecological integrity, productivity, and biological diversity. We would apply strategic habitat conservation principles (a structured, science-driven, and adaptive approach) in determining where and how to best benefit native fish, wildlife, and plant species, emphasizing migratory birds, waterfowl, and declining or listed species. Compatible wildlife-dependent public uses and access would be enhanced and expanded to include all three refuges. We would facilitate the protection, restoration, and conservation of important water resources through partnerships, public education, and our stewardship.

Under alternative C, Habitat Restoration and Ecological Processes, we would take all feasible actions to restore or mimic, where needed, the native vegetative community based on ecological site characteristics and other abiotic factors as well as ecological processes (such as hydrologic conditions and other natural disturbances such as grazing and fire). We would continue to maintain compatible wildlife-dependent public uses, but they could be adapted in response to changes in area management. Our partnership efforts would be broadened and geared toward restoring native vegetative communities and historic hydrologic conditions.

Under alternative D, Maximize Public Use, we would manage existing wildlife and their habitats consistent with our mission and purposes of the refuges while emphasizing quality visitor experiences and compatible wildlife-dependent public uses. Partnerships that complement our efforts to accommodate and provide for the priority public uses would be strengthened.

## Commenting

Comments should be mailed to the U.S. Fish and Wildlife Service, attn: Laurie Shannon, Planning Team Leader, Division of Refuge Planning, P.O. 25486, Denver, CO 80225 or delivered to: 134 Union Blvd., Lakewood, CO 80028. Comments are due 60 days after the notice of availability is published in the Federal Register. Comments may be sent by email to: <slvrefugesplanning@fws.gov>. All comments received from the public and other stakeholders will be placed in the agency's record for this planning process. Comments will be made available for inspection by the general public, and copies may also be provided to the public. For further information contact Laurie Shannon at (303) 236-4317.

## Cooperating Agencies

Bureau of Land Management, Bureau of Reclamation, USDA Forest Service, National Park Service, Natural Resources Conservation Service, Colorado Parks and Wildlife, and Colorado Division of Water Resources.

# Contents

<b>ABSTRACT</b> .....	I
<b>SUMMARY</b> .....	XI
<b>ABBREVIATIONS</b> .....	XXVII
<b>CHAPTER 1—Introduction</b> .....	1
<b>1.1 Purpose and Need for Action</b> .....	3
<i>Decision to Be Made</i> .....	3
<b>1.2 U.S. Fish and Wildlife Service and Refuge System</b> .....	3
<i>U.S. Fish and Wildlife Service</i> .....	3
<i>National Wildlife Refuge System</i> .....	4
<b>1.3 National and Regional Mandates</b> .....	7
<b>1.4 Other National Conservation Efforts</b> .....	10
<i>Recovery Plans for Threatened and Endangered Species</i> .....	10
<i>Bird Conservation</i> .....	10
<i>Partners in Flight</i> .....	10
<i>North American Waterfowl Management Plan</i> .....	11
<i>State Comprehensive Fish and Wildlife Conservation Strategy</i> .....	11
<b>1.5 Planning Process</b> .....	11
<b>1.6 Public Involvement</b> .....	13
<i>Cooperating Agencies</i> .....	14
<i>Native American Tribes</i> .....	14
<b>1.7 Significant Issues to Address</b> .....	14
<i>Habitat and Wildlife Management</i> .....	14
<i>Water Resources</i> .....	15
<i>Landscape Conservation and Wilderness Review</i> .....	15
<i>Visitor Services</i> .....	16
<i>Partnerships and Refuge Operations</i> .....	16
<i>Cultural Resources and Tribal Coordination</i> .....	17
<i>Research, Science, and Protection of the Physical Environment</i> .....	17
<b>1.8 Issues Not Addressed</b> .....	18
<i>Development of Mineral Rights</i> .....	18
<i>Baca Oil and Gas Environmental Assessment</i> .....	18
<i>Closed Basin Project</i> .....	18
<i>Refuge Revenue-Sharing Payments</i> .....	18
<i>Military Overflights</i> .....	19
<i>Water Rights and Water Use Off the Refuge Complex</i> .....	19
<b>1.9 Scope of the Document</b> .....	19
<i>Decision Area</i> .....	19
<i>Analysis Area</i> .....	19
<b>CHAPTER 2—The Refuge Complex</b> .....	21
<b>2.1 Establishment, Acquisition, and Management History</b> .....	26

<i>Monte Vista and Alamosa National Wildlife Refuges</i> . . . . .	26
<i>Baca National Wildlife Refuge</i> . . . . .	30
<i>Sangre de Cristo Conservation Area</i> . . . . .	32
<b>2.2 Special Values</b> . . . . .	33
<b>2.3 Vision Statement</b> . . . . .	35
<b>2.4 Goals</b> . . . . .	35
<i>Habitat and Wildlife Goal</i> . . . . .	36
<i>Water Resources Goal</i> . . . . .	36
<i>Visitor Services Goal</i> . . . . .	36
<i>Partnerships and Refuge Complex Operations Goal</i> . . . . .	36
<i>Cultural Resources Goal</i> . . . . .	36
<i>Research, Science, and Wilderness Review Goal</i> . . . . .	36
<b>CHAPTER 3—Alternatives</b> . . . . .	37
<b>3.1 Criteria for Alternatives Development</b> . . . . .	37
<b>3.2 Elements Common to All Alternatives</b> . . . . .	38
<b>3.3 Structure of Alternative Descriptions</b> . . . . .	39
<b>3.4 Alternative A (No Action)</b> . . . . .	39
<i>Habitat and Wildlife Resources</i> . . . . .	39
<i>Water Resources</i> . . . . .	39
<i>Visitor Services</i> . . . . .	39
<i>Cultural Resources and Tribal Coordination</i> . . . . .	43
<i>Partnerships and Refuge Complex Operations</i> . . . . .	43
<i>Research, Science, and Wilderness Review</i> . . . . .	43
<b>3.5 Alternative B—Wildlife Populations, Strategic Habitat Restoration, and Enhanced Public Uses (Draft Proposed Action)</b> . . . . .	43
<i>Habitat and Wildlife Resources</i> . . . . .	44
<i>Water Resources</i> . . . . .	44
<i>Visitor Services</i> . . . . .	48
<i>Cultural Resources and Tribal Coordination</i> . . . . .	48
<i>Partnerships and Refuge Complex Operations</i> . . . . .	48
<i>Research, Science, and Wilderness Review</i> . . . . .	48
<b>3.6 Alternative C—Habitat Restoration and Ecological Processes</b> . . . . .	49
<i>Habitat and Wildlife Resources</i> . . . . .	49
<i>Water Resources</i> . . . . .	49
<i>Visitor Services</i> . . . . .	49
<i>Cultural Resources and Tribal Coordination</i> . . . . .	49
<i>Partnerships and Refuge Complex Operations</i> . . . . .	53
<i>Research, Science, and Wilderness Review</i> . . . . .	53
<b>3.7 Alternative D—Maximize Public Use Opportunities</b> . . . . .	53
<i>Habitat and Wildlife Resources</i> . . . . .	53
<i>Water Resources</i> . . . . .	60
<i>Visitor Services</i> . . . . .	60
<i>Cultural Resources and Tribal Coordination</i> . . . . .	60
<i>Partnerships and Refuge Complex Operations</i> . . . . .	60
<i>Research, Science, and Wilderness Review</i> . . . . .	60
<b>3.8 Objectives and Strategies</b> . . . . .	60
<i>Organization of Objectives and Strategies</i> . . . . .	61
<b>3.9 Foreseeable Activities</b> . . . . .	132
<i>Federal Land Management</i> . . . . .	132
<i>Southwestern Willow Flycatcher Critical Habitat Designation</i> . . . . .	132
<i>Great Sand Dunes National Park and Preserve Ungulate Management Plan</i> . . . . .	132

<i>Baca Mountain Tract and Camino Chamisa Project Management Plan</i> .....	133
<i>Blanca Wetlands ACEC Enlargement and Grazing Plan</i> .....	133
<i>San Luis Lakes Wetland Restoration</i> .....	133
<i>Village at Wolf Creek Land Exchange</i> .....	133
<i>Land and Infrastructure Development</i> .....	134
<i>Resource Management and Conservation</i> .....	134
<i>Sangre de Cristo National Heritage Area</i> .....	135
<i>Climate Change</i> .....	136
<b>3.10 Elements Considered but Eliminated from Further Consideration</b> .....	136
<i>Natural Predators</i> .....	136
<b>3.11 Partnerships</b> .....	137
<b>3.12 Monitoring and Evaluation</b> .....	137
<b>3.13 Plan Amendment and Revision</b> .....	138
<b>3.14 Funding and Personnel</b> .....	138
<b>3.15 Comparison of Alternatives</b> .....	143
<b>CHAPTER 4—Affected Environment</b> .....	155
<b>4.1 Topics Not Analyzed Further</b> .....	155
<b>4.2 Physical Environment</b> .....	155
<i>Topography</i> .....	156
<i>Climate</i> .....	156
<i>Geology and Geomorphology</i> .....	159
<i>Water Resources</i> .....	165
<i>Visual Resources and Night Skies</i> .....	177
<i>Soundscapes (Acoustical Environment)</i> .....	178
<b>4.3 Biological Resources</b> .....	180
<i>Habitat and Wildlife</i> .....	180
<i>Threatened and Endangered Species (Federal) and Species of Concern</i> .....	199
<i>Bird Species</i> .....	207
<i>Other Wildlife Species</i> .....	210
<i>Hunting</i> .....	214
<i>Wildlife Observation and Photography</i> .....	215
<i>Interpretation</i> .....	215
<i>Environmental Education</i> .....	215
<i>Outreach</i> .....	215
<i>Commercial Recreation</i> .....	215
<i>Facilities and Staff for Visitor Contacts</i> .....	216
<i>Roads and Access</i> .....	216
<b>4.4 Human History and Cultural Resources</b> .....	216
<i>Prehistoric History</i> .....	220
<b>4.5 Socioeconomic Environment</b> .....	226
<i>Regional Economic Setting</i> .....	226
<b>4.6 Special Management Areas</b> .....	229
<i>Sangre de Cristo Conservation Area</i> .....	229
<i>San Luis Valley Conservation Area</i> .....	230
<i>Sangre De Cristo National Heritage Area</i> .....	230
<i>Other Jurisdictions</i> .....	230
<b>CHAPTER 5—Environmental Consequences</b> .....	231
<b>5.1 Analysis Method</b> .....	231
<b>5.2 Assumptions</b> .....	233

<b>5.3 Cumulative Impacts</b> .....	233
<b>5.4 Environmental Consequences for the Physical Environment</b> .....	233
<i>Climate Change</i> .....	233
<i>Effects on Air Quality</i> .....	234
<i>Effects on Soils</i> .....	236
<i>Effects on Water Resources</i> .....	239
<i>Effects on Visual Resources and Night Skies</i> .....	240
<i>Effects on Soundscapes</i> .....	241
<i>Cumulative Impacts on the Physical Environment</i> .....	242
<b>5.5 Effects on the Biological Environment</b> .....	242
<i>Riparian Habitat</i> .....	242
<i>Wetland Habitat</i> .....	244
<i>Playa Habitat</i> .....	247
<i>Upland Habitat</i> .....	248
<i>Threatened and Endangered Species</i> .....	249
<i>Sandhill Crane</i> .....	251
<i>Focal Bird Species</i> .....	252
<i>Bison Management</i> .....	253
<i>Rocky Mountain Elk</i> .....	254
<i>Native Fish Populations</i> .....	255
<i>Other Wildlife Species</i> .....	255
<i>Mitigation for Biological Resources</i> .....	256
<i>Cumulative Impacts on the Biological Environment</i> .....	256
<b>5.6 Effects on Visitor Services</b> .....	257
<i>Effects on Hunting</i> .....	257
<i>Effects on Fishing</i> .....	262
<i>Effects on Environmental Education</i> .....	264
<i>Effects on Outreach</i> .....	265
<i>Cumulative Impacts on Visitor Services</i> .....	265
<b>5.7 Effects on Special Management Areas</b> .....	265
<i>Conservation and Natural Heritage Areas</i> .....	265
<i>Wilderness Review</i> .....	265
<i>Cumulative Impacts on Special Management Areas</i> .....	266
<b>5.8 Effects on Cultural Resources</b> .....	266
<i>Mitigation for Cultural Resources</i> .....	267
<i>Cumulative Impacts on Cultural Resources</i> .....	267
<b>5.9 Effects on the Socioeconomic Environment</b> .....	268
<i>Methods for a Regional Economic Impact Analysis</i> .....	268
<i>Impacts of Current and Proposed Management Activities</i> .....	269
<i>Effects of Refuge Staff Salary Spending within the Local Economy</i> .....	269
<i>Effects of Refuge Complex Purchases of Goods and Services within the Local Economy</i> .....	270
<i>Effects of Visitor Expenditures</i> .....	271
<i>Summary Across All Alternatives</i> .....	274
<i>Summary and Conclusions</i> .....	276
<i>Environmental Justice</i> .....	277
<i>Cumulative Impacts on the Socioeconomic Environment</i> .....	277
<b>5.10 Irreversible and Irretrievable Resource Commitments</b> .....	277
<b>5.11 Short-term Uses of the Environment Versus Maintenance of Long-term Productivity</b> .....	278
<b>5.12 Adherence to Planning Goals</b> .....	278
<i>Habitat and Wildlife Management</i> .....	279
<i>Water Resources</i> .....	280
<i>Visitor Services</i> .....	280
<i>Partnerships and Refuge Complex Operations</i> .....	280

<i>Cultural Resources and Tribal Coordination</i> . . . . .	280
<i>Research, Science, and Wilderness Review</i> . . . . .	281
<b>5.13 Unavoidable Adverse Effects</b> . . . . .	281
<b>5.14 Conflicts with Federal, Tribal, State, and Local Agencies</b> . . . . .	282
<b>5.15 Comparison of Environmental Consequences</b> . . . . .	282
<b>GLOSSARY</b> . . . . .	289
<b>BIBLIOGRAPHY</b> . . . . .	347
<hr/>	
<b>APPENDIXES</b>	
<b>Appendix A</b>	
<i>Key Legislation and Policies</i> . . . . .	297
<b>Appendix B</b>	
<i>Preparers and Contributors</i> . . . . .	301
<b>Appendix C</b>	
<i>Public Involvement</i> . . . . .	305
<b>Appendix D</b>	
<i>Compatibility Determinations</i> . . . . .	311
<b>Appendix E</b>	
<i>Wilderness Review</i> . . . . .	327
<b>Appendix F</b>	
<i>Species Lists</i> . . . . .	337
<hr/>	
<b>FIGURES</b>	
Figure 1. Vicinity map of the San Luis Valley National Wildlife Refuge Complex, Colorado . . . . .	2
Figure 2. Basic strategic habitat conservation process . . . . .	7
Figure 3. Map of the bird conservation regions in North America. . . . .	8
Figure 4. Map of the South Rockies Geographic Area. . . . .	9
Figure 5. Steps in the comprehensive conservation planning process . . . . .	13
Figure 6. Analysis and decision areas for the CCP and environmental analysis. . . . .	20
Figure 7. Base map and elevation for Monte Vista National Wildlife Refuge, Colorado . . . . .	22
Figure 8. Base map and elevation for Alamosa National Wildlife Refuge, Colorado . . . . .	23
Figure 9. Base map and elevation for Baca National Wildlife Refuge, Colorado . . . . .	24
Figure 10. Aerial photograph of Monte Vista National Wildlife Refuge, Colorado in 1941 . . . . .	27
Figure 11. Aerial photograph of Alamosa National Wildlife Refuge, Colorado in 1941 . . . . .	29
Figure 12. Aerial photograph of Baca National Wildlife Refuge, Colorado in 1941 . . . . .	31
Figure 13. Map of alternative A for Monte Vista National Wildlife Refuge, Colorado . . . . .	40
Figure 14. Map of alternative A for Alamosa National Wildlife Refuge, Colorado . . . . .	41
Figure 15. Map of alternative A for Baca National Wildlife Refuge, Colorado . . . . .	42
Figure 16. Map of alternative B for Monte Vista National Wildlife Refuge, Colorado . . . . .	45
Figure 17. Map of alternative B for Alamosa National Wildlife Refuge, Colorado . . . . .	46
Figure 18. Map of alternative B for Baca National Wildlife Refuge, Colorado . . . . .	47

Figure 19. Map of alternative C for Monte Vista National Wildlife Refuge, Colorado . . . . .	50
Figure 20. Map of alternative C for Alamosa National Wildlife Refuge, Colorado . . . . .	51
Figure 21. Map of alternative C for Baca National Wildlife Refuge, Colorado . . . . .	52
Figure 22. Map of alternative D for Monte Vista National Wildlife Refuge, Colorado . . . . .	54
Figure 23. Map of alternative D for Alamosa National Wildlife Refuge, Colorado . . . . .	55
Figure 24. Map of alternative D for Baca National Wildlife Refuge, Colorado . . . . .	56
Figure 25. Map of alternatives B, C, and D of the potential future habitat conditions for Monte Vista Refuge, Colorado . . . . .	57
Figure 26. Map of alternatives B, C, and D potential future habitat conditions for Alamosa Refuge, Colorado . . . . .	58
Figure 27. Map of alternatives B, C, and D potential future habitat conditions for Baca Refuge, Colorado . . . . .	59
Figure 28. Map of the adaptive management process for implementing the CCP . . . . .	137
Figure 29. Total water precipitation (inches) for Del Norte, Colorado, 1925-2010 . . . . .	156
Figure 30. Total water precipitation (inches) for Saguache, Colorado, 1925-2009 . . . . .	156
Figure 31. Total water precipitation (inches) for Manassa, Colorado, 1925-2009 . . . . .	156
Figure 32. Mean temperature for Upper Rio Grande Basin from the 1890s to 2010 . . . . .	157
Figure 33. Simplified geological map of the San Luis Basin showing generalized geology and drainage patterns for the time intervals A) 3.5-5 million years before the present (BP); B) 440,000 years BP; and C) current . . . . .	160
Figure 34. Soils map for Monte Vista National Wildlife Refuge . . . . .	162
Figure 35. Soils map for Alamosa National Wildlife Refuge . . . . .	163
Figure 36. Soils map for Baca National Wildlife Refuge . . . . .	164
Figure 37. General water flow paths for Monte Vista National Wildlife Refuge, Colorado . . . . .	166
Figure 38. General water flow paths for Alamosa National Wildlife Refuge, Colorado . . . . .	167
Figure 39. General water flow paths for Baca National Wildlife Refuge, Colorado . . . . .	168
Figure 40. Water wells and diversions for Monte Vista National Wildlife Refuge, Colorado . . . . .	170
Figure 41. Water wells and diversions for Alamosa National Wildlife Refuge, Colorado . . . . .	171
Figure 42. Water wells and diversions for Baca National Wildlife Refuge, Colorado . . . . .	172
Figure 43. Vegetation classes for Monte Vista National Wildlife Refuge, Colorado . . . . .	181
Figure 44. Vegetation classes for Alamosa National Wildlife Refuge, Colorado . . . . .	182
Figure 45. Vegetation classes for Baca National Wildlife Refuge . . . . .	183
Figure 46. Location of historical creeks flowing into and through Monte Vista National Wildlife Refuge, Colorado . . . . .	189
Figure 47. Location of upper and lower sump area on Baca National Wildlife Refuge, Colorado . . . . .	191
Figure 48. All wells on or adjacent to Baca National Wildlife Refuge, Colorado . . . . .	192
Figure 49. Summer and winter elk concentration areas in the San Luis Valley . . . . .	211
Figure 50. Roads and management activities on Monte Vista National Wildlife Refuge, Colorado . . . . .	217
Figure 51. Roads and management activities on Alamosa National Wildlife Refuge, Colorado . . . . .	218
Figure 52. Roads and management activities on Baca National Wildlife Refuge, Colorado . . . . .	219
Figure 53. Wilderness Inventory for Baca Refuge . . . . .	331

---



---

**TABLES**

Table 1. Planning process summary for the CCP and EIS for San Luis Valley Refuge Complex, Colorado . . . . .	12
Table 2. History of significant land authorizations for the San Luis Valley National Wildlife Refuge Complex, Colorado . . . . .	25
Table 3. Focal bird species for wetland habitats . . . . .	92
Table 4. Focal bird species for upland habitats . . . . .	95
Table 5. Focal bird species for riparian habitats . . . . .	96
Table 6. Costs over 15 years to carry out the CCP alternatives . . . . .	138
Table 7. Personnel to carry out the CCP alternatives . . . . .	141
Table 8. Summary of alternatives actions for San Luis Valley Refuge Complex CCP and EIS . . . . .	143
Table 9. Background concentrations, ambient standards, and significant impact levels of regulated air pollutants . . . . .	159
Table 10. Typical A-weighted sound levels . . . . .	179
Table 11. Human response to different levels of ground-borne vibration . . . . .	179
Table 12. High-priority invasive weeds found on the San Luis Valley Refuge Complex . . . . .	196
Table 13. Threatened, endangered (Federal), and other species of concern that potentially occur on the refuge complex . . . . .	199
Table 14. Visitor use days on the Monte Vista and Alamosa Refuges . . . . .	214
Table 15. Public access on the Refuge Complex . . . . .	216
Table 16. Population of counties in the San Luis Valley, Colorado . . . . .	227
Table 17. Income, unemployment, and poverty statistics . . . . .	227
Table 18. Employment by sector . . . . .	228
Table 19. Market value of agricultural products sold, employment in agriculture . . . . .	229
Table 20. Public access on Refuge Complex by alternative . . . . .	259
Table 21. Comparison of access, visitation, and facilities of the CCP alternatives . . . . .	260
Table 22. Annual impacts of refuge revenue-sharing payments . . . . .	269
Table 23. Annual impacts of salary spending . . . . .	270
Table 24. Breakdown of current purchases of goods and services . . . . .	270
Table 25. Annual impacts of purchases of goods and services . . . . .	271
Table 26. Estimated annual refuge complex visitation by alternative . . . . .	272
Table 27. Annual impacts of non-local visitor spending by alternative . . . . .	273
Table 28. Annual economic impacts for alternative A . . . . .	274
Table 29. Annual economic impacts for alternative B . . . . .	274
Table 30. Change in economic impact from alternative B compared to alternative A . . . . .	275
Table 31. Annual economic impacts for alternative C . . . . .	275
Table 32. Change in economic impact from alternative C compared to alternative A . . . . .	275
Table 33. Annual economic impacts for alternative D . . . . .	276
Table 34. Change in economic impact for alternative D compared to alternative A . . . . .	276
Table 35. How well the actions meet the goals for the Refuge Complex . . . . .	279
Table 37. Summary of environmental consequences for the CCP and EIS for San Luis Valley refuges . . . . .	283
Table 38. Evaluation of wilderness values on Alamosa Refuge . . . . .	329
Table 39. Evaluation of wilderness values on Baca Refuge . . . . .	335



# Summary



*A herd of bull elk on Baca National Wildlife Refuge.*

We, the U.S. Fish and Wildlife Service, have developed a draft comprehensive conservation plan and environmental impact statement (draft CCP and EIS) to describe alternatives and identify potential consequences for the management and use of the San Luis Valley National Wildlife Refuge Complex (refuge complex, the refuges) in Colorado. The alternatives are the result of extensive public input and working closely with several cooperating agencies: Bureau of Land Management, National Park Service, Natural Resources Conservation Service, Bureau of Reclamation, Colorado Parks and Wildlife, and Colorado Division of Water Resources. Other governmental agencies, tribal agencies, nongovernmental organizations, businesses, and private citizens contributed substantial input to the plan.

The refuge complex includes Monte Vista, Alamosa, and Baca National Wildlife Refuges, and it covers parts of Rio Grande, Alamosa, Costilla, and Saguache counties within the San Luis Valley in Colorado. The San Luis Valley is about 80 miles long, and runs from Poncha Pass to the north and south into New Mexico. It is about 50 miles wide at its widest point. The foothills of the San Juan Mountains lie directly west of the Monte Vista National Wildlife Refuge, immediately south of where the Rio Grande enters the San Luis Valley. Across the valley, the linear Sangre de Cristo Range rises sharply from the eastern boundary of the Baca National Wildlife Refuge, reaching heights of over 14,000 feet.

Wildlife habitat within the three refuges includes diverse wetlands, riparian areas, playas, grasslands, and shrublands that provide important resources for many migratory birds, elk, deer, and a variety of other wildlife. About 18,000 to 20,000 greater sandhill cranes migrate through the valley every spring and fall, where they spend several weeks resting and foraging for food on and around the Monte Vista National Wildlife Refuge. The federally endangered southwestern willow flycatcher breeds along the Rio Grande on the Alamosa National Wildlife Refuge. Baca National Wildlife Refuge has one of two aboriginal (natural) populations of Rio Grande suckers found in the State, which were proposed for listing under the Endangered Species Act in 2013.

Visitors take part in a variety of wildlife-dependent recreational activities on the refuge complex. Every year, the Monte Vista Crane Festival attracts thousands of visitors who come to see sandhill cranes and waterfowl. The Monte Vista and Alamosa National Wildlife Refuges are also open for waterfowl hunting and wildlife observation. This CCP and EIS would consider opening the Baca National Wildlife Refuge for hunting, wildlife observation, photography, interpretation, and environmental education.

Over 12,000 years of prehistory and history have been recorded in the San Luis Valley, and all three national wildlife refuges contain significant cultural resources.

We could not accomplish our conservation mission without the many partner organizations who we

work with in the valley, including the Friends of the San Luis Valley National Wildlife Refuges; The Nature Conservancy; local land trusts; schools; Federal, State and local governmental agencies; Native American tribes; and interested citizens.

## The San Luis Valley National Wildlife Refuge Complex

The Monte Vista National Wildlife Refuge was established in 1952 as the first national wildlife refuge in Colorado, and its approved acreage is about 14,834 acres. The Alamosa National Wildlife Refuge was established in 1962, and its approved acreage is about 10,291 acres. Both refuges were established under the authority of the 1929 Migratory Bird Conservation Act (45 Stat. 122; 16 U.S.C. §715d) “...for use as inviolate sanctuaries, or for any other management purposes, for migratory birds.”

The Baca National Wildlife Refuge was authorized by Public Law 106-530 on November 22, 2000, as part of the Great Sand Dunes National Park and Preserve Act of 2000, and its authorized boundary is about 92,500 acres. It was established in 2003 with the acquisition of the first parcel. The purpose of the refuge is to “restore, enhance, and maintain wetland, upland, riparian, and other habitats for native wildlife, plant, and fish species in the San Luis Valley.” Additionally, in administering the refuge, we are to “(A) emphasize migratory bird conservation; and (B) take into consideration the role of the Refuge in the broader landscape conservation efforts; and (C) [subject to any agreement in existence as of the date of enactment of this paragraph, and to the extent consistent with purposes of the refuge] “use decreed water rights on the refuge in approximately the same manner that the water rights have been used historically.”

## PURPOSE AND NEED FOR THE PLAN

The purpose of this draft CCP and EIS is twofold: to describe the role of each refuge in the complex in supporting the mission of the National Wildlife Refuge System, and to provide long-term guidance for the management of refuge programs and activities. The CCP is needed to help us achieve the following:

- communicate with the public and other partners about our efforts to carry out the mission of the Refuge System and meet the purposes of the refuges;
- provide a clear statement of direction for management of the refuge complex;
- ensure that the refuges within the refuge complex continue to conserve fish, wildlife, and ecosystems in the face of ongoing drought, water shortages, and climate change;
- provide neighbors, visitors, and government officials with an understanding of our management actions on and around the refuge complex;
- ensure that our management actions are consistent with the mandates of the National Wildlife Refuge System Improvement Act of 1997;
- ensure that management of the refuge complex considers other Federal, State, and local government plans;
- provide a basis for development of budget requests for the operation, maintenance, and capital improvement needs of the refuge complex.

We are committed to sustaining the Nation’s fish and wildlife resources through the combined efforts of governments, businesses, and private citizens.

## National Wildlife Refuge System

Like all national wildlife refuges, the refuge complex is administered under the National Wildlife Refuge System Administration Act of 1996 as amended in 1997.

*The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

## Public Involvement

In March 2011, we began our public scoping for this project with the release of a public involvement summary and a planning update that described the CCP process and its anticipated schedule. We published a notice of intent to prepare a CCP in the Federal Register on March 15, 2011 (76 FR Doc. 2011-5924). Since then, we conducted six public meetings during the scoping and development of the alternatives; mailed two planning updates; posted information on our Web page for the CCP; and coordinated with Federal, State, and local agencies and Native American tribes.

## Significant Issues

The scoping process identified many qualities of the refuge complex along with issues and recommendations. Based on this information as well as guidance from the National Wildlife Refuge System Improvement Act of 1997, National Environmental Policy Act, and planning policy, we identified seven significant issues to address:

- Habitat and wildlife management
- Water resources
- Landscape conservation and wilderness review
- Visitor services
- Partnerships and operations
- Cultural resources and tribal coordination
- Research, science, and protection of the physical environment

## Habitat and Wildlife

The draft CCP and EIS addresses the following habitat and wildlife issues:

- The future management of a wide variety of habitats on the three national wildlife refuges including wet meadows, playa wetlands, riparian areas, desert shrublands and grasslands, and croplands. Some of these habitats may not be sustainable without a continued emphasis on water management.
- Whether we should continue to provide barley, which is a nonnative crop that provides sandhill cranes and waterfowl with a high-

carbohydrate food source in a small area, but which also removes that land and associated water from the production of native vegetation.

- The issues associated with increasing elk populations across the refuges. On both the Baca and Alamosa National Wildlife Refuges, elk are having a significant effect on some resources, particularly riparian areas.
- On the Alamosa National Wildlife Refuge, we have seen that impacts to the hydrology of the refuge have affected the federally endangered southwestern willow flycatcher.
- There has been interest expressed in the reintroduction of the American bison on the Baca National Wildlife Refuge. Whether the refuge could support free-roaming bison without negatively affecting other species is an issue of concern.
- Other issues include the use of prescribed fire, livestock grazing, haying, farming, control of invasive species, wildland fire suppression, and management of diseases.



© Joe Zimm

*Large colonial birds, sandhill cranes find rest and food during their long migration.*

## Water Resources

The topic of water is one of the biggest concerns for the refuge complex. The draft CCP and EIS addresses the following concerns:

- Amount and timing of water use
- Water quality

- Pumping from wells and use of irrigation across the refuge complex
- The management and protection of wetlands including playas, riparian areas, and the river corridor

## Landscape Conservation and Wilderness Review

We work closely with many individuals, organizations, and agencies in protecting wetlands and other areas in the San Luis Valley. The draft CCP and EIS addresses whether any areas within the refuge complex meet the values expressed in the Wilderness Act of 1964 and the Service’s Wilderness Stewardship Plan.

## Visitor Services

Types of visitor opportunities and access considerations include:

- Opening the Baca National Wildlife Refuge for public uses including hunting and non-consumptive uses
- Expanding the hunting program to include elk hunting
- Providing opportunities for interpretation and environmental education
- Allowing biking, walking, cross-country skiing, or horseback use to facilitate wildlife-dependent recreation
- Providing opportunities for fishing access along the Rio Grande on the Alamosa National Wildlife Refuge.

## PARTNERSHIPS AND REFUGE OPERATIONS

Many agencies, organizations, and landowners are working in partnership with us to accomplish many of our common goals. How we manage the refuges, particularly our operational and infrastructure needs, are being considered.

## Cultural Resources and Tribal Coordination

Only about 5 percent of the refuge complex has been comprehensively inventoried for cultural resources. We are concerned that the lack of information could lead to destruction of important sites. Lack of research, concerns about vandalism, lack of staff to maintain our legal obligations, and ongoing relations with tribes, collectors, and other agencies are important issues to be addressed.



© Joe Zimm

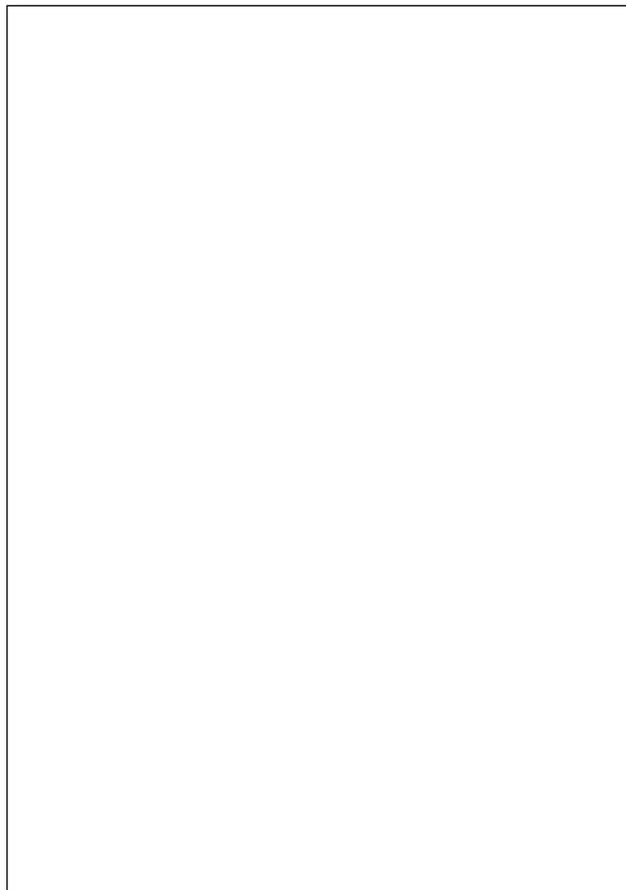
*Researchers and volunteers examine a cultural resource site on Monte Vista National Wildlife Refuge. There are 12,000 years of history and prehistory in the San Luis Valley.*

## Research, Science, and Protection of the Physical Environment

The refuge complex is surrounded by large, contiguous tracts of open land. There are many opportunities to work with others to achieve our research and science needs. Baca National Wildlife Refuge is adjacent to designated and proposed wilderness and a class 1 air quality area. Other physical attributes include the immense dark night sky and quiet soundscapes. These were identified as important qualities for many residents in the surrounding community. Climate change is one of our biggest issues affecting plants and wildlife across our lands. Strategies for managing the refuges in light of climate change, a declining aquifer, energy development, wildlife diseases, and invasive species are important issues to address.

## Vision

We developed a vision for the refuge complex at the beginning of the planning process. The vision describes the focus of refuge complex management and portrays a picture of the refuge complex in 15 years.



## Goals

We developed six goals for the draft comprehensive conservation plan.

## Habitat and Wildlife Goal

Conserve, restore, and enhance the ecological diversity and function of the San Luis Valley ecosystem to support healthy populations of native fish and wildlife, with an emphasis on migratory birds.

## Water Resources Goal

As climate patterns change, protect, acquire, and manage surface and ground water resources to maintain and support management objectives.

## Visitor Services Goal

Provide safe, accessible, and quality wildlife-dependent recreation and perform outreach to visitors and local communities to nurture an appreciation and understanding of the unique natural and cultural resources of the refuge complex and San Luis Valley.

## Partnerships and Refuge Complex Operations Goal

Secure and effectively use funding, staffing, and partnerships for the benefit of all resources in support of the refuge complex purposes and the mission of the National Wildlife Refuge System.

Actively pursue and continue to foster partnerships with other agencies, organizations, the water community, and private landowners to conserve, manage, and provide for the long-term sustainability of working landscapes within the San Luis Valley.



*Western chorus frogs provide an important food source for migratory birds.*

## Cultural Resources Goal

Protect significant cultural resources within the San Luis Valley National Wildlife Refuge Complex.

## Research, Science, and Wilderness Review Goal

Use sound science, applied research, monitoring, and evaluation to advance the understanding of natural resource functions, changing climate conditions, and wilderness values in the management of the habitats within the San Luis Valley ecosystem.

## Alternatives

Following the scoping process in 2011, we carried forward the following four alternatives and analyzed them in detail in this draft CCP and EIS.

### Alternative A (No Action)

Under the no-action alternative, we would make few changes in how we manage the various habitats and wildlife populations throughout the refuge complex. We would continue to manage habitats on the Monte Vista and Alamosa National Wildlife Refuges through the manipulation of water as described in the 2003 CCP (FWS 2003). Water management on the Baca National Wildlife Refuge would continue under the guidance found in the conceptual management plan for the Baca National Wildlife Refuge. All the refuges would adhere to new State regulations regarding water use. There would be few added public uses outside of those that already occur on the Monte Vista and Alamosa National Wildlife Refuges. The Baca National Wildlife Refuge would remain closed to public use except for potential access to a refuge office or contact station. We would continue to collaborate with our partner agencies and organizations to achieve our conservation goals.

### Habitat and Wildlife Resources

On all three refuges, we would continue to manage wetland areas and wet meadows to provide habitat for a variety of waterbirds. Riparian and upland habitats would be managed for migratory birds. We

would continue to produce small grains at current levels on the Monte Vista National Wildlife Refuge (up to 270 acres, depending on water availability and crop rotation) to provide food for spring-migrating sandhill cranes.

There would be few changes made in managing big game populations on the refuge complex. Elk numbers would continue to fluctuate from 1,000 to 4,000 individuals on the Baca National Wildlife Refuge and smaller herds on the Monte Vista and Alamosa National Wildlife Refuges. Population distribution and control would be limited to nonlethal dispersal, agency culling, and the public dispersal hunts (also called distribution hunts) on the former State lands of the Baca National Wildlife Refuge.

We would continue to protect populations of, and manage habitats for, threatened and endangered species as well as for species of concern. These species include southwestern willow flycatcher, Rio Grande sucker, Rio Grande chub, and northern leopard frog.

We would phase out the existing arrangement with The Nature Conservancy for season-long bison use on those parts of the Medano Ranch that are within the Baca National Wildlife Refuge boundary, and we would not use bison as a management tool in the future.

We would continue to use prescriptive livestock grazing, haying, and cooperative farming as management tools for maintaining habitats within the refuge complex. We would continue to control invasive and noxious weeds. Similarly, we would continue to follow fire funding guidelines in the prioritization of fuels treatments and use of fuels funding. We would pursue alternative funding sources for prescribed fire implementation.

### Water Resources

We would keep our ability to use our water rights within the refuge complex. The use of ground water would continue, except as modified by changing State rules, regulations, and policies. We will augment water supplies in accordance with State law.

### Visitor Services

Compatible wildlife-dependent public uses, including waterfowl and small game hunting, would continue to be allowed on the Monte Vista and Alamosa National Wildlife Refuges, but we would not seek to establish elk hunting on any of the refuges other than the authorized distribution hunts on the Baca National Wildlife Refuge.

The auto tour routes and the existing nature and walking trails on the Alamosa and Monte Vista National Wildlife Refuges would continue to provide some wildlife observation, interpretation, and photo-

graphic opportunities. We would open the visitor center on the Alamosa National Wildlife Refuge on a part-time basis as volunteer resources allow. Our primary environmental education events, such as the Monte Vista Crane Festival, the Kids Crane Festival in the fall, Kid's Fishing Day, would continue.

Public access via trails or a tour route would not be established on the Baca National Wildlife Refuge, and the refuge would remain closed to the public except for occasional staff-led tours and access to an office or visitor contact station. A refuge office with a visitor contact station was recently approved for construction at the Baca National Wildlife Refuge, and a few interpretive kiosks or other facilities would be installed.

### ***Cultural Resources***

Under Section 106 of the National Historic Preservation Act, we would continue to conduct cultural resource reviews for projects that disturb the ground or affect buildings or structures over 50 years of age. We would avoid disturbing significant cultural resources unless disturbance is required by unusual circumstances. In addition we would continue to conduct law enforcement patrols and monitor sensitive sites. As required, we would consult with the Colorado State Historic Preservation Office and Native American tribes and adhere to cultural resource laws.

### ***Partnerships and Refuge Complex Operations***

We would continue to work with a variety of other agencies and non-profit organizations, including the Friends of the San Luis Valley National Wildlife Refuges, to achieve our goals for habitat and wildlife management. Refuge complex operations would continue within existing funding levels. As such, there would be few new financial resources available to increase programs or services. We would continue to coordinate and work with adjacent landowners to reduce potential conflicts.

In accordance with the provisions of the interim elk management plan, we would work with Colorado Parks and Wildlife to coordinate dispersal hunts, hazing, and lethal removal of elk by agency staff to reduce damage to the lands next to the refuges and riparian habitats on the refuges.

The use of haying, livestock grazing, and other habitat management tools that would provide an economic benefit would be managed through special use permits and would conform to all of our policies. We would work with owners of separated mineral rights to limit potential effects on the surface estate and

other associated resources. We would continue to be active and contributing partners in the San Luis Valley Interagency Fire Management Unit. This partnership includes the USDA Forest Service, National Park Service, Bureau of Land Management, the State of Colorado, and the Service.

Across the refuge complex, we would continue to inventory, maintain, rehabilitate, and replace structures, including those with historic significance. When practical, unneeded structures that are not historically significant would be removed and not replaced. We would continue to maintain our fencing, including constructing new fences, removing unnecessary fences, and retrofitting fences for compatibility with wildlife.

### ***Research, Science, and Wilderness Review***

Within existing funding levels, we would continue to inventory and monitor habitat and wildlife resources with existing refuge staff as well as by working with the U.S. Geological Survey and other agencies and organizations.

In keeping with current management, we would not recommend additional protection for any areas having wilderness characteristics or values.

---

## **Alternative B—Wildlife Populations, Strategic Habitat Restoration, and Enhanced Public Uses (Draft Proposed Action)**

Under this alternative, we would approach management with an emphasis on maintaining or restoring the composition, structure, and function of the natural and modified habitats within the refuge complex. We would consider the ecological site characteristics and wildlife species needs on our refuge lands by developing sound and sustainable management strategies that preserve and restore ecological (biological) integrity, productivity, and biological diversity. We would apply strategic habitat conservation principles (a structured, science-driven, and adaptive approach) in determining how to best manage our lands for native fish, wildlife, and plant species, with a particular emphasis on migratory birds, waterfowl, and declining or listed species. Compatible wildlife-dependent public uses would be enhanced and expanded to include all three refuges. We would facilitate the protection, restoration, and conserva-

tion of important water resources through partnerships, public education, and stewardship.

## **Habitat and Wildlife Resources**

We would manage wetland areas within the refuge complex to achieve a variety of wetland types and conditions to support a diversity of migratory birds and other wildlife, with a specific focus on focal species that represent the Service's and other partners' larger conservation goals. To maintain the biological integrity, productivity, and function of our wetland habitat, we would restore historical water flow patterns in specific areas through more effective water management practices. A top priority would be to restore riparian habitat along streams in the Baca National Wildlife Refuge as well as specific areas along the Rio Grande in the Alamosa National Wildlife Refuge. We would manage our upland habitats to create a variety of seral stage conditions that provide habitat for a diverse array of wildlife species, particularly nesting and migratory focal birds. To manage our habitats, we would continue using tools such as prescriptive grazing, haying, fire, mowing, and herbicides.

We would use public hunting to complement the State's management, working together to keep elk populations at levels that would allow us to sustain healthy plant communities both in the refuge complex and on neighboring lands. This would include opening portions of Baca National Wildlife Refuge to public hunting and opening parts of Alamosa and Monte Vista National Wildlife Refuges to a limited public dispersal hunt. We would work with our agency partners (Colorado Parks and Wildlife, National Park Service, USDA Forest Service, Bureau of Land Management, and other conservation organizations) in managing elk populations.

We would work with other Federal and State agencies as well as other conservation partners to improve habitats for threatened and endangered species and other species of concern. Particular focus would be on riparian areas, which provide essential habitat for southwestern willow flycatcher, and riverine systems, which are habitat for Rio Grande sucker and Rio Grande chub. In addition, habitats for other native species of concern such as Gunnison's prairie dog, and northern leopard frog would be protected, restored, and enhanced where practical and necessary.

As with alternative A, the existing arrangement with The Nature Conservancy for bison management on former State lands within the Baca National Wildlife Refuge would be phased out. Since bison are important to other stakeholders and partners, we would research the feasibility, potential, and suitability of introducing semi-free-ranging bison year-

round to effectively maintain and enhance certain refuge habitats.

We would continue to grow limited amounts of small grain on the Monte Vista National Wildlife Refuge (about 190 acres) to provide necessary food for the Rocky Mountain population of greater sandhill cranes, as specified in the management plan of the Pacific and central flyways for the Rocky Mountain greater sandhill cranes.

We would control and reduce the incidence of invasive weeds such as tall whitetop, Russian knapweed, Canada thistle, saltcedar, and reed canarygrass through more effective management and by using chemical, mechanical, prescribed fire, and biological control methods. We would make every effort to increase weed control in sensitive habitats or where there is a risk of weeds spreading to neighboring private land.

We would strengthen the fire program within the refuge complex by improving fire management planning and by increasing coordination with partners. We would use prescribed fire to achieve habitat management objectives, and we would conduct prescribed fires at a more acceptable and reliable frequency. We would pursue more funding to protect property and human safety under the wildland-urban interface guidelines, and, where possible, we would reduce the number of individual facilities that would require fire protection.

## **Water Resources**

We would continue to work with other landowners and agencies throughout the watershed to maintain flexibility as well as to protect and, if necessary, aug-



USFWS/Menke

*Tall-emergent vegetation on the refuges provides favorable nesting conditions for colonial waterbirds such as the white-faced ibis.*

ment our water rights as State regulations evolve. Water quality standards would be established, and studies initiated to help protect water rights, prioritize habitat management and planning, and develop concise water use reporting methods. Our ground water use would comply with new State ground water rules and regulations through augmentation plans or by working with others and contracting with ground water management subdistricts.

We would achieve our habitat management objectives while providing for quality visitor experiences. Our water infrastructure, delivery, and efficiencies would require upgrades to make sure that habitat and visitor services objectives are met.

### **Visitor Services**

We would continue to offer waterfowl and limited small game hunting on the Monte Vista and Alamosa National Wildlife Refuges. We would open the Baca National Wildlife Refuge for big and small game hunting, and we would offer public dispersal elk hunts and conduct agency dispersal hunting on the Monte Vista and Alamosa National Wildlife Refuges. This would provide recreational opportunities while enabling us to manage the numbers and distribution of elk or other ungulate species. Access points and parking areas would be developed on the Baca National Wildlife Refuge.

General public access would be improved on the Monte Vista and Alamosa National Wildlife Refuges and established on the Baca National Wildlife Refuge. We would allow for more access from about July 15 to February 28 for wildlife viewing and interpretation on roads that are currently open to hunters only during the hunting season. Modes of access such as cross-country skiing and bicycling that facilitate wildlife-dependent uses would be favored on all three refuges. Portions of the Baca National Wildlife Refuge would be opened for limited public use, and non-motorized access, including walking, biking, and horseback riding, would be allowed. An auto tour route would be built on the Baca National Wildlife Refuge. The construction of more trails or viewing platforms on the Monte Vista and Alamosa National Wildlife Refuges would be considered. Limited commercial opportunities such as photography could be considered. We would seek funding to build a visitor center and refuge complex staff offices at Monte Vista National Wildlife Refuge to better serve the public, provide for safer access to our offices, and provide a modern work environment for our employees. In coordination with the Friends of the San Luis Valley National Wildlife Refuges, which leads this event, we would continue to host the Kid's Fishing Day on the Monte Vista National Wildlife Refuge.

### **Cultural Resources**

Most of our actions would be similar to alternative A, plus we would increase our efforts toward identifying and protecting significant resources.

### **Partnerships and Refuge Operations**

When the Baca National Wildlife Refuge was established under the Great Sand Dunes National Park and Preserve Act of 2000, operations funding did not come with the added management responsibilities. We absorbed these added responsibilities across the refuge complex, which has impacted our operations. In order to meet our future needs, we would seek more funding for the refuge complex for habitat conservation, visitor services, and maintenance. Overall, refuge complex offices are inadequate and provide for little visitor contact. We would seek to increase our staff levels of both full-time and seasonal employees, as well as seek funding for safe access and accessible offices for our staff and visitors.

We would continue to collaborate with Colorado Parks and Wildlife and other agencies to effectively manage elk, which would hopefully result in an improved distribution across the local game management units. We would continue to work closely with the San Luis Valley Interagency Fire Unit to achieve habitat management objectives while minimizing risk to sensitive habitats and human structures. We would seek funding for a more dependable prescribed fire program. We would develop working relationships with neighboring landowners and others to address interface issues such as invasive species control, shared fence management, elk management, and other concerns.

On the Baca National Wildlife Refuge we would work extensively with owners and developers of third-party-owned mineral rights to find ways to reduce the effects of any future exploration activities on visitors and wildlife and to locate exploration and production facilities away from visitors.

### **Research, Science, and Wilderness Review**

We would increase monitoring efforts, in part to gain an increased understanding of the effects of our management actions on habitat conditions, wildlife populations, and water resources, but also to learn more about the effects of drought and climate change on our wildlife and habitat resources. We would recommend protection of the wilderness values and characteristics found along the eastern boundary of Baca National Wildlife Refuge and adjacent to pro-

posed wilderness on Great Sand Dunes National Park and Preserve (about 13,800 acres). We would manage this area as a wilderness study area to be considered for eventual wilderness designation.

## Alternative C—Habitat Restoration and Ecological Processes

We would take all feasible actions to restore or mimic, where needed, the native vegetation community based on ecological site characteristics, ecological processes (hydrologic conditions and other natural disturbances such as grazing and fire), and other abiotic factors. We would continue to provide compatible wildlife-dependent public uses, but they would be adapted in response to changes in area management. Our partnership efforts would be broadened and geared toward restoring native vegetation communities and mimicking natural hydrologic conditions.

### Habitat and Wildlife Resources



USFWS/Dewhurst

*Waterfowl such as the green-winged teal breed and nest on Alamosa and Monte Vista Refuges.*

We would restore vegetative communities in the refuge complex to mimic the ecological conditions that existed before Euro-American settlement of the area. For example, we would restore the function of both the riparian areas and playas on the Baca National Wildlife Refuge and identify potential habitat conditions for the three refuges.

We would apply natural disturbance regimes such as prescribed grazing and fire in other habitats. Where practical, we would restore natural waterflow patterns. We would end production of small grains

for migrating sandhill cranes on the Monte Vista National Wildlife Refuge.

We would use hunting to manage elk populations or their distribution and improve the long-term health of riparian habitat. Similar to alternative B, our priority would be to improve habitat for all native species, but particularly threatened and endangered species and other species of concern. For example, we would actively restore additional cottonwood and willow riparian areas for southwestern willow flycatcher along the Rio Grande on the Alamosa National Wildlife Refuge and reintroduce Rio Grande chub and Rio Grande sucker along creeks on the Baca National Wildlife Refuge where they historically occurred.

As with alternative B, we would phase out the existing arrangement with The Nature Conservancy for bison on former State lands. Knowing that bison occurred historically to some extent in the San Luis Valley, we would attempt to periodically (not every year) use bison on the Baca National Wildlife Refuge to mimic the ecological benefit they may have once provided.

Similar to alternative B, we would intensify our efforts to combat invasive plants. Steps would be taken to strengthen the fire program within the refuge complex and use prescribed fire to restore and maintain native plant communities.

### Water Resources

We would manage water to restore the hydrologic conditions with less focus on habitat management for specific species or for providing wildlife viewing. We would evaluate the need to supplement existing water supplies while considering restoration of historic hydrology, especially on the Monte Vista and Alamosa National Wildlife Refuges. In some years, water might not be available to meet life cycle needs for some waterfowl species. Existing water infrastructure would be removed or modified as needed. Water quality monitoring would also be increased.

### Visitor Services

We would continue to allow waterfowl and limited small game hunting on the Monte Vista and Alamosa National Wildlife Refuges. Similar to alternative B, we would open the Baca National Wildlife Refuge for big game and small game hunting. On the Monte Vista and Alamosa National Wildlife Refuges, we would rely on public hunting or agency dispersal methods for elk management.

There may be changes in public use, depending on the habitat management action. Some areas could be closed. Current public access would be evaluated on the Alamosa and Monte Vista National Wildlife Refuges. If existing roads or trails are not needed or if

these facilities fragment habitat, they could be removed or altered. Viewing areas for sandhill cranes may be moved, depending on restoration efforts. Service participation in the Monte Vista Crane Festival could be adjusted, depending on changes in the location and concentration of sandhill cranes. We would provide on-site interpretation and environmental education programs on the Alamosa and Monte Vista National Wildlife Refuges as funding allows, and our key messages would relate to our restoration efforts. Similar to alternative B, we would also allow for walking and biking on trails and roads within the hunt boundary from July 15 to 28.

Except for limited hunting access to achieve management objectives, there would be no facilities or programs on the Baca National Wildlife Refuge. For example, an auto tour route, nature trails, and restrooms would not be developed.

### ***Cultural Resources***

Actions would be similar to those under alternative B.

### ***Partnerships and Refuge Complex Operations***

We would seek to increase partnerships with a variety of agencies, organizations, and universities to achieve management objectives, restore ecological processes, and improve the efficiency of overall refuge management operations. On the Baca National Wildlife Refuge, current Lexam and gravel roads would be evaluated, and roads that are not needed or that are fragmenting habitat would be removed. As with alternative A, the use of haying, livestock grazing, and other habitat management tools with an economic benefit would be managed through special use permits and would conform to all Service policies.

### ***Research, Science, and Wilderness Review***

Similar to alternative B, we would increase efforts in studying habitats and wildlife, particularly with respect to climate change as well as land and water protection.

Similar to alternative B, we would recommend protection of the wilderness values and characteristics found along the eastern boundary of Baca Refuge (about 13,800 acres).

## **Alternative D—Maximize Public Use Opportunities**

We would manage wildlife and habitats on the refuge complex consistent with our mission and purposes of the refuges while emphasizing quality visitor experiences and compatible wildlife-dependent public uses. Partnerships that complement our efforts to accommodate and provide for the priority public uses would be strengthened.

### ***Habitat and Wildlife Resources***

Similar to alternative A, we would manage wetlands to maximize waterbird production at the Monte Vista and Alamosa National Wildlife Refuges. We would also irrigate areas that are closer to public access and viewing areas at the Baca Refuge to enhance wildlife viewing. Riparian and upland habitats would be conserved for migratory birds. We



*Environmental education programs on Alamosa Refuge provide opportunities for children to learn about nature.*

would increase the agricultural production of small grains for sandhill cranes on the Monte Vista National Wildlife Refuge (about 230 acres), and grain production could also be used in a specific place or time to enhance wildlife viewing. A key difference from alternatives A and C, but similar to alternative B is that we would improve public education about and interpretation of the role that the refuge complex plays in the San Luis Valley and across the National Wildlife Refuge System.

We would offer opportunities for elk hunting and viewing. Elk numbers would be managed at levels that would restore and foster the long-term health of native plant communities.

We would collaborate with other agencies for public access, law enforcement, and management of elk. Similar to alternative B, habitats for native species and threatened, endangered, and other species of concern would be improved, but we would emphasize public education in our restoration efforts.

Similar to alternatives B and C, the existing arrangement with The Nature Conservancy for bison management on former State lands at the Baca National Wildlife Refuge would be phased out. We would introduce and manage a small bison herd on a confined area of the Baca National Wildlife Refuge. Wildlife viewing and interpretation opportunities would be emphasized and incorporated into this program.

Similar to all the other alternatives, invasive and noxious weeds would be controlled using chemical, mechanical, or manual methods or through the use of livestock grazing. Under this alternative, however, public education and awareness of the effects that invasive weeds have on native plant communities would be a key message for interpretation.

As under all alternatives, prescribed fire would be used. There would be a concerted effort to talk with the public about the role of fire on the landscape and garner support for strengthening the fire program. Similar to alternative B, we would pursue more funding for the protection of human safety following local, State, and National guidelines and strategies, but would limit having to maintain facilities that could increase the Service's legal obligations on and off the site.

## **Water Resources**

We would manage water in a manner similar to alternative B except that more effort would be given to making sure there is water in specific areas or at specific times to enhance wildlife viewing. The spatial distribution of water would be managed to make the visitor's experience richer. A high priority would be placed on maintaining operation of wells that provide important wildlife viewing habitat. All of our

wells will be augmented and will comply with Colorado water law. More water could also improve viewing opportunities. Ground water and surface water could be used to enhance areas used by sandhill cranes or provide more opportunities to see wildlife rather than merely providing for the life cycle needs of species less important to public uses. Similarly, we would improve infrastructure in areas that are highly valued by visitors to better facilitate wildlife observation. Water quality monitoring would be increased, and collaboration with a citizen scientist group or with schools or universities would be sought out.

## **Visitor Services**

This alternative would provide for the widest variety of compatible wildlife-dependent recreation. We would encourage and provide for big game hunting on the Baca National Wildlife Refuge, with public dispersal hunts on the Monte Vista and Alamosa National Wildlife Refuges and limited small game hunting opportunities for all, including youth hunts and considerations for accessibility. Similar to alternative B, access would be expanded for all refuges, including opening the Baca National Wildlife Refuge for public uses. More trails, viewing blinds, restrooms, parking areas, and access points would be constructed.

Although our responsibilities for habitat and wildlife management come first, we would also consider and emphasize visitor experience when designing or locating visitor access or using existing infrastructure. With more staff and volunteers to support a wider range of compatible programs and facilities, we would increase interpretation and educational opportunities. Limited fishing access would be allowed on the Alamosa National Wildlife Refuge. Commercial uses, such as photography or art groups, would be considered. Public education and interpretation would highlight how visitor behavior can be modified to reduce wildlife disturbance.

## **Cultural Resources**

Actions would be similar to alternative B, except there would be a greater emphasis on using students or volunteers to survey areas with high potential for cultural resources. We would work with local and tribal educators to develop interpretive materials.

## **Partnerships and Refuge Complex Operations**

Actions would be similar to alternative B, except we would pursue more partnerships and funding for

priority public uses as well as securing resources to protect, enhance, and interpret significant cultural resources.

Similar to alternative B, we would work with mineral developers to place resource extraction away from public use facilities.

## **Research, Science, and Wilderness Review**

Similar to alternative B, we would increase efforts to study habitats and wildlife, particularly with respect to understanding the effects of climate change and its effects on the resources of the San Luis Valley. How climate change affects the resources on the refuge complex would be incorporated into public use themes and messages.

Similar to alternatives B and C, we would recommend that wilderness values on the Baca National Wildlife Refuge be protected.

## **Affected Environment**

The draft CCP and EIS describes the characteristics and resources of the refuge and how existing or past management or other influences have affected these resources. The affected environment addresses the physical, biological, and social aspects of the refuge complex that could be affected by management under the four alternatives. These aspects include the physical and biological environment, visitor services, cultural resources, special management areas, and the socioeconomic environment. We used published and unpublished data as noted in the bibliography to quantify what we know about the refuge complex resources.

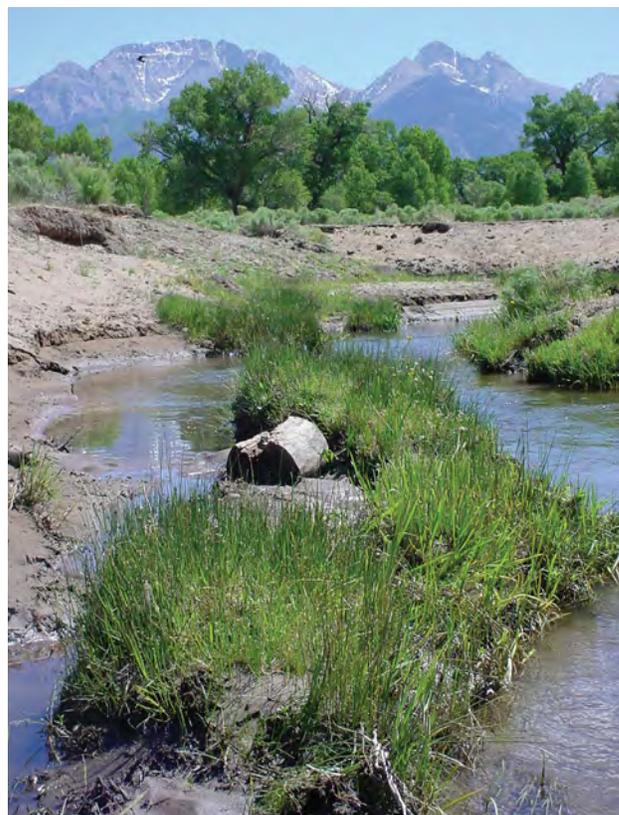
## **Environmental Consequences**

The alternatives for managing the refuge complex would provide a variety of positive effects (benefits) as well as potential negative effects (impacts) to the resources of the refuge complex. Under alternatives B–D, some of the greatest benefits would come from restoration of riparian habitat along the creek drainages on the Baca National Wildlife Refuge and where possible by improving the hydrology and function of selected areas along the Rio Grande through the Alamosa National Wildlife Refuge. In particular, this would benefit several focal bird species including

southwestern willow flycatcher and western wood pewee.

There would be minor improvements for general public access under alternative C on the Monte Vista and Alamosa National Wildlife Refuges, but only limited access would be allowed on the Baca National Wildlife Refuge. A significant benefit for the refuge complex would occur from opening Baca National Wildlife Refuge to small and big game hunting, and opening Monte Vista and Alamosa National Wildlife Refuges to limited big game hunting. In addition to providing additional recreational opportunities across the refuge complex, these hunting opportunities would enable us manage the numbers and distribution of elk.

Generally, the restoration activities described under alternatives B, C, and D provide many long-term benefits to refuge complex resources, but there would be some short-term negative impacts, although most could be minimized. Disturbance caused by activities such as planting, fencing, use of prescribed fire, grazing, and mowing could result in localized, short-term erosion, soil loss, and even the release of soil particles (dust) into the air. Upon project completion and revegetation, soil protection and productivity would be preserved. Sediment that was being retained behind an existing levee would be pulled



USFWS

*Under alternatives B–D, some of the greatest benefits would result from restoration of riparian habitat along the creek drainages on Baca National Wildlife Refuge.*

down to the next levee. There would be negligible changes to soil resources under alternatives A and D. Under alternatives B and C, restoration activities would require more removal of levees, ditches, dikes, and ponds. Restoration could be as simple as removing a board or other infrastructure, but could also require more disturbance. As with wetland habitat, the restoration of former agricultural fields could result in negligible erosion to soils. Under alternative C, the potential for soil erosion would be greater than under B due to increased restoration of upland areas. All restoration activities would follow a phased approach, and would reduce the amount of soil disturbance at any given time. On the Baca National Wildlife Refuge, under alternatives B–D, the restoration of riparian habitat would require the need for heavy equipment, which would result in more short-term minor to major disturbances to soils. The development of visitor services facilities under alternative B would result in minor to moderate short-term disturbances to soils. Negative impacts could be reduced by following best management practices such as controlling erosion, minimizing grading, and installing culverts where necessary.

Under alternatives A, B, and D, over the long-term, there would be negligible to minor short-term impacts for waterfowl hunting due to limited water availability and reduced hunting participation and minor to moderate long-term impacts due to a continued reduction in available water to support waterfowl. This would be offset with minor to moderate benefits for small and big game hunting opportunities across the refuge complex with the opening of Baca National Wildlife Refuge to hunting and limited big game hunting on the Monte Vista and Alamosa National Wildlife Refuges. Alternative C would result in moderate long-term impacts to waterfowl opportunities due to less water availability.

Under alternatives B–D, with successful restoration of willow and cottonwood riparian areas along the Rio Grande, there would be minor long-term benefits for southwestern willow flycatcher due to habitat enhancement efforts along the Rio Grande. However, under alternatives B and C, there could be minor impacts to southwestern willow flycatcher from increased trail use along Rio Grande nature trail on the Alamosa National Wildlife Refuge and from increased access for biking and walking during the period from July 15 to about September 1, when birds are still on the refuge. This would affect the portions of the Rio Grande trail and the southern loop that follow along the river. Under alternative D, impacts could increase to moderate levels with the addition of allowing for fishing access. With mitigation measures put into place, such as requiring visitors to stay on the nature trails, rerouting a portion of a trail, improving signage, increasing education

and law enforcement, and use closures if needed, any negative impacts to southwestern willow flycatcher would be minimized.

Under alternatives A, B, and D, continuing to provide agricultural grains for greater sandhill cranes would continue to provide minor to moderate benefits for cranes migrating through the San Luis Valley as well as for wildlife viewing. Alternative C would result in moderate to even major long-term impacts for crane migration through the San Luis Valley in addition to wildlife viewing.

Concerning the use of bison on the Baca National Wildlife Refuge as a management tool and the ability of the larger landscape to support bison conservation, there would be no effect under alternative A, alternative B would provide a minor long-term benefit for habitat and bison conservation, and alternative C would provide negligible benefits for habitat and bison conservation. Under alternative D, a small demonstration herd would result in minor benefits for bison conservation.

For elk management, there would be negligible long-term benefits from our ongoing population management efforts. Elk would continue to have moderate impacts on riparian habitats on the Baca National Wildlife Refuge and Alamosa National Wildlife Refuges. Under alternatives B, C, and D, there would be minor to moderate benefits for population and disease management as well as benefits for riparian habitat.

Concerning lands that have wilderness values, under alternative A, there would be no further protections afforded these lands other than our refuge management policies and the guidance afforded in the CCP. Existing wilderness values could be negatively affected, but the level of effects would be negligible to minor. Under alternatives B, C, and D, the wilderness values and characteristics along the eastern boundary of Baca National Wildlife Refuge would be protected long term, resulting in moderate benefits for wilderness values and the characteristics of the Great Sand Dunes ecosystem.

Under all alternatives, there would be negligible benefits or effects to the regional economy. Under alternative A, the total economic impact is 13 jobs; under alternative B, two additional jobs would be added; alternative C would be similar to alternative A; and under alternative D, five new jobs would be added.

## What Happens Next?

The draft CCP and EIS will be available for a 60-day public review. Following the review, we may change the alternatives, the impact analysis, or other

features as a result of the comments we receive. We will then revise the draft document and produce a final CCP and EIS for distribution. It will identify any changes we made to our preferred alternative.

Our final decision will be documented in a record of decision that is published in the Federal Register, no sooner than 30 days after we file the final CCP and EIS with the U.S. Environmental Protection Agency

and have distributed it to the public. We will begin to implement our final stand-alone CCP immediately upon publication of the decision in the Federal Register. Selected management activities will be implemented as funds become available. The final CCP does not constitute a commitment for funding, and future budgets could influence our implementation priorities.



# Abbreviations

<b>ACEC</b>	Area of Critical Environmental Concern
<b>AFY</b>	acre-feet per year
<b>Alamosa Refuge</b>	Alamosa National Wildlife Refuge
<b>ATV</b>	all-terrain vehicle
<b>AUM</b>	animal-unit month
<b>Baca Refuge</b>	Baca National Wildlife Refuge
<b>BCR 16</b>	Southern Rockies Bird Conservation Region
<b>BLM</b>	Bureau of Land Management
<b>BOR</b>	Bureau of Reclamation
<b>CCP</b>	comprehensive conservation plan
<b>CFR</b>	Code of Federal Regulations
<b>cfs</b>	cubic feet per second
<b>CNEL</b>	Community noise equivalent level
<b>CO<sub>2</sub></b>	carbon dioxide
<b>CPW</b>	Colorado Parks and Wildlife; formerly Colorado Division of Wildlife (CDOW)
<b>dB</b>	decibel
<b>dBA</b>	A-weighted decibel
<b>DOI</b>	U.S. Department of the Interior
<b>EIS</b>	environmental impact statement
<b>FWS</b>	U.S. Fish and Wildlife Service
<b>GIS</b>	Geographic Information System
<b>GMU</b>	game management unit
<b>gpm</b>	gallons per minute
<b>GPS</b>	Global Positioning System
<b>GS</b>	General Schedule employment type
<b>HCP</b>	habitat conservation plan
<b>HMP</b>	habitat management plan
<b>IMPLAN</b>	Impact Analysis for Planning

<b>Improvement Act</b>	National Wildlife Refuge System Improvement Act of 1997
<b>Ldn</b>	day-night level
<b>Leq</b>	equivalent energy noise level
<b>MBCC</b>	Migratory Bird Conservation Commission
<b>Monte Vista Refuge</b>	Monte Vista National Wildlife Refuge
<b>NEPA</b>	National Environmental Policy Act
<b>NRCS</b>	Natural Resources Conservation Service
<b>Refuge complex</b>	San Luis Valley National Wildlife Refuge Complex, Alamosa, Monte Vista, and Baca National Wildlife Refuges
<b>Refuge System</b>	National Wildlife Refuge System
<b>Region 6</b>	Mountain-Prairie Region of the U.S. Fish and Wildlife Service
<b>RLGIS</b>	Refuge Land Geographic Information System
<b>SEL</b>	sound exposure limit
<b>Service</b>	U.S. Fish and Wildlife Service
<b>TEA-21</b>	1998 Transportation Equity Act for the 21st Century
<b>TES</b>	threatened and endangered species
<b>TNC</b>	The Nature Conservancy
<b>U.S.C.</b>	United States Code
<b>USDA</b>	U.S. Department of Agriculture
<b>USFS</b>	USDA Forest Service
<b>USGS</b>	U.S. Geological Survey
<b>WG</b>	wage grade employment type
<b>WSA</b>	wilderness study area

*Definitions of these and other terms are in the glossary.*

