IMPLEMENTATION AND MONITORING

CONTENTS

Figures

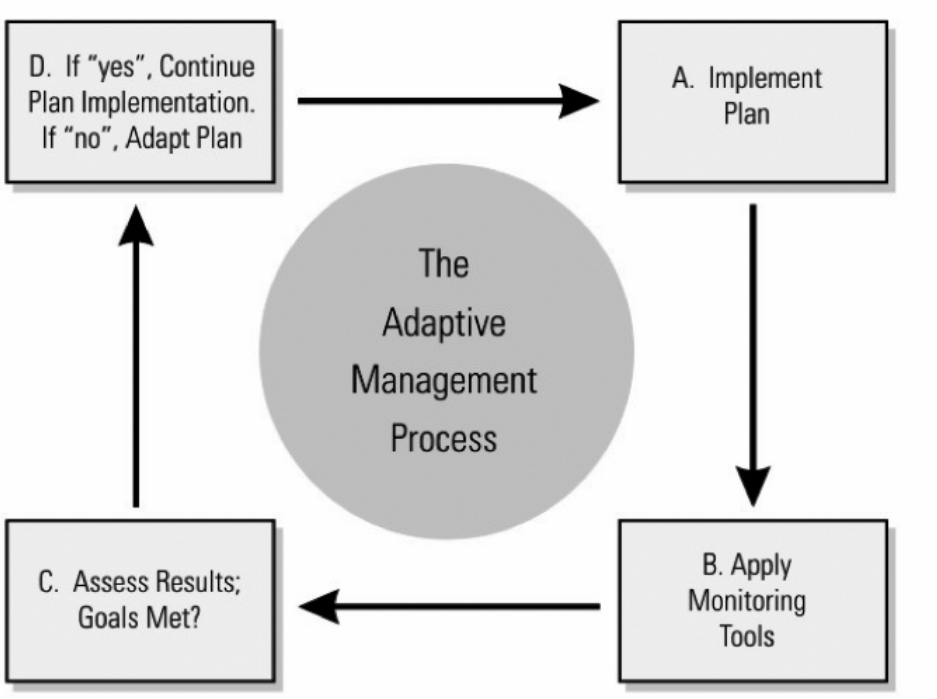
Tables

MONITORING AND EVALUATION

Adaptive management is a flexible approach to long-term management of biotic resources. It allows for management to be shaped and directed over time by the results of ongoing monitoring activities and other information discovered (see Figure 6). More specifically, adaptive management is a process by which projects are implemented within a framework of scientifically driven experiments to test the predictions and assumptions outlined within a plan. On-the-ground observations of responses to management by habitats and wildlife are also factored in. Analysis of results helps managers determine whether current management should continue or whether it should be modified to achieve desired conditions. Changes and adjustments to management and operations are considered utilizing the best information that is currently available.

To apply adaptive management, specific survey, inventory, and monitoring protocols will be adopted for the National Elk Refuge and Grand Teton National Park. The habitat management objectives and strategies identified in this plan will be systematically evaluated to determine management effects on wildlife populations. This information will be used to refine approaches and determine how effectively the objectives are being accomplished. If monitoring and evaluation indicate undesirable effects for target and nontarget species or communities, alterations to the management projects will be made. Specific monitoring and evaluation activities are part of the step-down management plan process for the U.S. Fish and Wildlife Service (see "**Error! Reference source not found.**," page **Error! Bookmark not defined.**), and the NPS *Management Policies 2006* guide activities in the National Park System.

FIGURE 6. ADAPTIVE MANAGEMENT SEQUENCE FOR THE BISON AND ELK MANAGEMENT PLAN



PARTNERSHIPS

In implementing the *Bison and Elk Management Plan*, ongoing partnerships such as the Jackson Interagency Habitat Initiative and the Jackson Hole Cooperative Elk Studies Group, as described under "State Plan and Agreements with Other Agencies" (page 18), and many others will continue to working in a collaborative effort to address many of the issues identified in this plan, particularly habitat conservation.

Additionally, the potential exists for the National Elk Refuge and Grand Teton National Park to establish new partnerships with individual citizens, sportsmen groups, schools, conservation agencies, Native American tribes, and community organizations at the local, regional, and state levels to identify solutions and educational opportunities for resolving elk and bison conflicts on private and public land.

FUNDING AND PERSONNEL

Table 13 identifies one-time costs for implementing the *Bison and Elk Management Plan*, and Table 14 shows annual costs, including additional staffing costs. Projects required to implement the plan will be funded through several separate systems specific to each agency. For the U.S. Fish and Wildlife Service, projects and maintenance needs will be funded through the Refuge Operations Needs System and the Maintenance Management System.

Grand Teton National Park will maintain key elements of the program, such as bison and elk monitoring and management of the elk reduction program, to the extent possible with existing base funds. The park has and will continue to seek special project dollars through programs such as the Natural Resource Preservation Program to support the restoration of former agricultural lands. A base increase request has been written into the NPS Operations Formulation System and is a high priority for Grand Teton National Park; however, limited increases in the number of park base operations are approved each year.

The projected funding levels required to implement the plan for a 15-year period are the best estimates, considering normal circumstances and they are based on assumptions outlined in Table 14. This document does not constitute a commitment for funding, and future budgets could influence implementation priorities.

TABLE 13. ONE-TIME COSTS OF BISON / ELK MANAGEMENT PLAN
(2006 dollars, not adjusted for inflation)

One-Time Costs	Total Cost
U.S. Fish and Wildlife Service	
Woody Vegetation Protection	
• Materials (14.59 ac @ $11,270/ac)	164,429
• Labor (14.59 ac @ $9,280/ac)	135,395
Subtotal	299,824
Forage Production Five-Year Setup Costs*	2,847,113
Winter Feeding Program Equipment/Supplies	
1 Challenger	140,000
1 Road grader	176,000
1 Feed wagon	50,000
2 Forklifts	46,000
1 Set challenger tracks	10,000
2 Buckets	9,000
1 Set feed trailer tires	2,000
Subtotal	433,000
Refuge Hunting Program Supplies	5,000
USFWS Total	**3,584,937**
National Park Service	
Park Habitat Restoration	
• Fencing	45,000
• Drill supplies	42,000
NPS Total	**87,000**
GRAND TOTAL	**3,671,937**

***** One-time costs for forage production on the refuge are for a five-year setup period and are due to converting to sprinkler irrigation on more of the refuge. These estimates are from the *Irrigation System Rehabilitation Plan Environmental Assessment* (USFWS 1998).

TABLE 14. ANNUAL PROGRAM COSTS
(2006 dollars, not adjusted for inflation)

Program	Annual Cost
USFWS ANNUAL COSTS	
Elk/Bison Monitoring	
•Equipment/Supplies	
Radio collars (FWS share: 25% of 20 = 5 @ $250 ea)	1,250
Immobilizing supplies/drugs (25% share)	500
Additional immobilizing supplies	1,500
Disease surveillance/blood analyses (staff est.)	1,000
Subtotal: Equipment/Supplies	4,250
•Flights	
Elk flights (FWS share: 15 hrs/yr @ $250/hr)	3,750
Spring bison hazing (possible future helicopter flights: 1 hr @ $600)	600
Subtotal: Flights	4,350
•Staffing Needs	
Biologist (GS-11/5, 0.35 FTE @ $80,475/yr)	28,166
Biological technician (GS-6/1, 0.3 FTE @ $32,038/yr)	9,611
CWD surveillance / sample analysis	7,000
Subtotal: Staffing	44,777
Subtotal — Elk/Bison Monitoring	**53,377**
Refuge Habitat Restoration	
Woody vegetation protection	
Monitoring (2 people for 2 days/yr @ $464/day)	928
Maintenance (2 people for 15 days after 10 years; $6,960/15 yrs = $464 annual cost)	464
Subtotal — Refuge Habitat Restoration	**1,392**

Program	Annual Cost
Refuge Forage Production — Enhanced with side roll and center pivot sprinkler irrigation (plan years 6 –10; annualized over 15 years)	**145,517**
Invasive Plant Species Control	**10,000**
Hunting Program on the Refuge	
•Equipment/Supplies	7,798
•Additional bison hunter mailing costs	464
•Staffing needs (2 additional LE staff (GS-9/2) for 10 years and 1 additional for 5 years)	43,428
Subtotal — Hunting Program on the Refuge	**51,690**
Refuge Winter Feeding Program	
•Equipment/Supplies	6,712
•Alfalfa Pellet Costs (mid-range pellet cost)	35,992
•Staffing Needs	
Mechanic (GS-9/5, 2 mos. during 7.5 years/15)	5,540
Other ($29/hr)	22,475
Subtotal — Refuge Winter Feeding Program	**70,719**
Elk/Bison Conflict Resolution on Adjacent Lands — $100,000/yr for 5 years (average cost per year for 15 years)	**33,333**
Subtotal — USFWS Annual Costs	**366,028**
Less Local Contributions to Refuge Programs	
Boy Scout sales contributions (a midpoint based on the expected number of elk that would winter on the refuge)	42,930
Sleigh ride program contributions	0
USFWS Total Annual Cost	**323,098**
NPS ANNUAL COSTS	
Elk Monitoring Program	
• Equipment/Supplies	
Radio collars (NPS share 25% of 20 = 5 @ $250)	1,250
Immobilizing supplies/drugs (25% share)	500
Subtotal: Equipment/Supplies	1,750
•Flights	
Summer classification flight time (6 hrs @ $1,000/hr)	6,000
Elk flights (NPS share: 15 hrs/yr @ $250/hr)	3,750
Parkwide summer census (every 5 yrs @ $7,500; 3 censuses @ $7,500 = $22,500 / 15 yrs)	1,500
Winter helicopter classification flight (6 hrs @ $1,000/hr)	6,000
Subtotal: Flights	17,250
•Staffing Needs	
Data collection, input, analysis (GS-11/5; 0.04 FTE @ $80,475/yr)	3,219
Capture, radio-tracking, data (GS-11/5; 0.04 FTE @ $80,475/yr)	3,219
Winter classification flight (GS-11/5, 0.01 FTE @ $80,475/yr)	805
Program oversight, data analysis, interagency coordination:	
– Senior wildlife biologist (GS-13/5, 0.20 FTE @ $114,643/yr)	22,929
– Ungulate biologist (GS-11/5, 0.15 FTE @ $80,475/yr)	12,071
– SRM division chief (GS-14/3, 0.10 FTE @ $135,474/yr)	13,547
Elk reduction coordination, season formulation:	
– Senior wildlife biologist (GS-13/5, 0.10 FTE @ $114,643/yr)	11,464
– Ungulate Biologist (GS-11/5, 0.15 FTE @ $80,475/yr)	12,071
– Project Bio-Tech (GS-8/5, 0.10 FTE @ $ 135,474/yr)	13,547
Subtotal: Staffing	92,872
Subtotal — Elk Monitoring Program	**118,872**
Bison Monitoring Program	
•Equipment/Supplies	
Radio collars (5/year @ $250 ea)	1,250
Telemetry equipment	250
Immobilization drugs	2,000
Subtotal: Equipment/Supplies	3,500

Program	Annual Cost
• Flights	
Flight time (60 hrs @ $250/hr)	15000
Winter helicopter classification flight (6 hrs @ $1,000/hr)	6,000
Subtotal: Flights	21,000
• Staffing Needs	
Seasonal biological technician (GS-5/5, 1.0 FTE @ $32,576/yr)	32,576
Project biological technician, wtr grd class (GS-9/5, 0.3 FTE @ $66,480/yr)	19,944
SCA intern ($2,500/season)	2,500
Winter classification flight (GS-11/5, 0.02 FTE @ $80,475/yr)	1,610
Program oversight, data analyses, interagency coordination	
– Senior wildlife biologist (GS-13/5, 0.20 FTE @ $114,643/yr)	22,929
– Ungulate biologist (GS-11/5, 0.15 FTE @ $80,475/yr)	12,071
– SRM division chief (GS-14/3, 0.10 FTE @ $135,474/yr)	13,547
Subtotal: Staffing	105,177
• Disease Surveillance and Management	
Bison blood sampling and analyses	1,000
Subtotal — Bison Monitoring Program	**130,677**
Elk Reduction Program in the Park	
• Equipment/Supplies	
Permit printing	800
Toilet rental/maintenance	4,500
Trash dumpsters (average cost per year for 15 years):	
– three 8-yd dumpsters @ $36/wk × 6 wks × 5 years = $3,240	
– two 4-yd dumpsters @ $18 /wk × 6 wks × 5 years = $1,080	
– two 8-yd dumpsters @ $36/wk × 6 wks × 10 yrs = $4,320	576
Process elk teeth (average cost per year for 15 years):	
– 650 teeth × 0.70 × 5 years = $2,275	
– 287 teeth × 0.70 × 10 years = $2,009	286
Signs and supplies	200
Permit mailing — $0.67 postage + $0.10 envelope = $0.77/permit (average cost per year for 15 years):	
– 2,200 permits × $0.77/permit × 5 yrs = $8,470	
– 957 permits × $0.77/permit × 10 yrs = $7,369	1,056
Subtotal: Equipment Costs	7,418
• Staffing Needs (Direct Labor):	
Permit mailings (average cost per year for 15 years):	
– 20 people (GS 7/4) @ $26.16/hr × 2 hrs × 5 yrs = $5,232 / 15 yrs	
– 20 people (GS 7/4) @ $18.04/hr × 1 hr × 10 yrs = $5,232 / 15 yrs	698
Maintenance refuse collection: 1 employee (WG 8/5 @ $30.55/hr × 1 hr/wk × 6 wks)	184
Permit and hunter contact	
– Primary contact:	
Weekends: 1 GS 11/4 @ $38.72/hr × 8 hrs/day × 2 days/wk × 6 wks	3,718
Weekdays: 1 GS 11/4 @ $38.72/hr × 4 hrs/day × 5 days/wk × 6 wks	4,646
– Secondary contact: 1 GS 9/4 @ $38.72/hr × 8 hrs	257
TIDC radio dispatcher: 1 GS 7/4 @ $26.16/hr × 16 hrs/day (6 a.m.–10 p.m.) × 6 wks	17,578
Law enforcement rangers	
– North District:	
1 LE 9/4 @ $33.22/hr × 16 hrs/day (6 a.m.–10 p.m.) × 6 wks	22,324
1 LE 9/4 @ $33.22/hr × 6 hrs/day (7–10 a.m.; 3–6 p.m.) × 6 wks × 5 years = $8,371/15 yrs (annualized cost for life of plan); next 10 years on furlough	2,790
– South District:	
1 LE 9/4 @ $33.22/hr × 16 hrs/day (6 a.m.–10 p.m.) × 6 wks	22,324
1 LE 9/4 @ $33.22/hr × 6 hrs/day (7–10 a.m.; 3–6 p.m.) × 6 wks × 5 years = $8,371/15 yrs (annualized cost for life of plan); next 10 years on furlough	2,790
Hunt coordinator 1 GS 11/4 @ $38.72/hr	
– Prehunt: 15 hrs/wk × 4 wks	2,323
– During hunt: 2 hrs/wk × 6 wks	465
– Posthunt: 10 hrs	387
Subtotal: Staffing	80,484
Total — Park Elk Reduction Program	**87,902**

Program	Annual Cost
Habitat Restoration in the Park	
• Equipment/Supplies	
Fencing	7,000
Vehicle (GSA rental)	3,000
Travel / collaborators	700
Subtotal: Equipment/Supplies	10,700
• Treatment	
Universal herbicide (4,500 ac × $56/ac = $252,000/15 yrs)	16,800
Forb herbicide (4,500 ac × $26/ac = $117,000/15 yrs)	7,800
Sterile cultivar (4,500 ac × $65/ac = $292,500/15 yrs)	19,500
Universal herbicide (4,500 ac × $56/ac = $252,000/15 yrs)	16,800
Prescribed burn (2,250 ac × $30/ac = $67,500/15 yrs)	4,500
Seed collection (4,500 ac × $360/ac = $1,620,000/15 yrs)	108,000
Increased seed bed preparation (4,500 ac × $60/ac = $270,000/15 yrs)	18,000
Subtotal: Treatment	191,400
• Staffing Needs	
Equipment operator (WG-9) or contractor (1,040 hrs @ $32.60/hr)	33,900
One seasonal (6 mos.) biological tech (GS-5/5, 0.5 FTE @ $32,576/yr)	16,288
Two seasonal (5 mos.) biological techs (GS-5/5, 0.84 FTE @ $32,576/yr)	27,364
One seasonal (6 mos.) ecologist (GS-9/5 @ $66,480/yr)	33,240
Subtotal: Staffing	110,792
Subtotal — Park Habitat Restoration	**312,892**
NPS Total Annual Cost	**643,343**
USFWS & NPS TOTAL ANNUAL COST	**966,441**

NOTES: Federal labor costs include a 3% per year for a cost of living adjustment.
Costs for programs that occur only for a few years during the life of the plan have been annualized over a 15-year basis.

TABLE 15. TOTAL PROJECTED PLAN COSTS
(2006 dollars, not adjusted for inflation)

One-Time Costs	
• U.S. Fish and Wildlife Service	3,584,937
• National Park Service	87,000
Total One-Time Costs	**3,671,937**
Total Annual Plan Costs (annual cost × 15 yrs)	
• U.S. Fish and Wildlife Service	4,846,470
• National Park Service	9,650,145
Total Annual Costs	**14,496,615**
TOTAL COST	**18,168,552**