



**AN INDEPENDENT EVALUATION
OF THE EFFECTIVENESS
OF THE U.S. FISH AND
WILDLIFE SERVICE'S
NATIONAL WILDLIFE REFUGE SYSTEM**

JUNE 2008

FINAL REPORT



600 Water Street, S.W.
Washington, D.C. 20024
USA

202/484-7170
Fax: 202/488-0754
mfanning@msi-inc.com

CONTENTS

ACRONYMS	vi
I. Introduction	1
II. The NWRs’ Operating Context.....	9
III. SOG Analysis	19
SOG 1: Conserve, manage, and where appropriate, restore fish, wildlife, and plant resources and their habitats to fulfill refuge purposes, trust resource responsibilities, and biological diversity/integrity.....	20
SOG 2: Provide Quality Environments with Adequate Water – Refuges/WMDs have clean air, water, and soils (meet federal and state standards) and they have ready access to adequate quantities of water to fulfill the purposes of each refuge and the mission of the NWRs.	41
SOG 3: Ensure that unique values of wilderness, other special designation areas, and cultural resources are protected.....	52
SOG 4: Welcome and orient visitors.	59
SOG 5: Provide Quality Wildlife-Dependent Recreation and Education Opportunities.	72
SOG 6: Facilitate partnerships and cooperative projects to engage other conservation agencies, volunteers, friends, and partners in the Refuge System mission.	97
SOG 7: Protect resources and visitors through law enforcement.	115
SOG 8: Provide infrastructure and equipment adequate to support mission and maintained in good condition.	131
SOG 9: Complete quality and useful comprehensive conservation plans on schedule and with full engagement of partners.	146
SOG 10: Strategically grow the Refuge System.....	157
SOG 11: Reduce Wildfire Risks and Improve Habitats—Reduce the threat, risk, and adverse effects of unwanted wildland fires by reducing hazardous fuels, restoring and maintaining fire adapted ecosystems in lower condition classes, and improving fire prevention and suppression capabilities of the Service and of neighboring rural and volunteer fire departments.	172
SOG 12: Promote and Enhance Organizational Excellence.	186

TABLES

Table 1. National Wildlife Refuge Site Visits	7
Table 2. Maintenance Funds	11
Table 3. Operation Funds.....	12
Table 4. PEER Survey (2006) – Adequate Staff Levels.....	13
Table 5. Refuge Managers Survey (2007) – Administrative Reporting.....	15
Table 6. PEER Survey (2006) – Administrative Reporting.....	15
Table 7. Effectiveness Ratings.....	19
Table 8. Annual Performance Measures and RAPP Reporting, 2005-2006.....	26
Table 9. Refuge Managers Survey (2007) – Annual Work Planning.....	29
Table 10. Refuge Managers Survey (2007) – Achievement of Goals	32
Table 11. Percent Composition of NWRs versus the Conterminous United States	33
Table 12. Definition of Refuge Condition Classes (RAPP Workbook, 2006)	34
Table 13. Hypothetical Refuge Habitat Management & Restoration Costs	36
Table 14. Performance Measures (FY 2005-2010) and RAPP Reporting Data	42
Table 15. Performance Measures (FY 2005-2010) and RAPP Reporting Data	44
Table 16. Performance Measures (FY 2005-2010) and RAPP Reporting Data	45
Table 17. RAPP Reporting Data – Air and Water Quality	46
Table 18. Refuge Managers Survey (2007) – Water	46
Table 19. Refuge Managers Survey (2007) – Water	47
Table 20. RAPP Reporting Data – Water	48
Table 21. RAPP Reporting Data – Contaminants.....	49
Table 22. RAPP Reporting Data – Air and Water Quality Data Limitations.....	49
Table 23. Wilderness Acreage	53
Table 24. RAPP Performance Measures – Wilderness Management.....	54
Table 25. RAPP Data for SOG #4 – Annual Performance Measures.....	62
Table 26. Refuge Managers Survey (2007) – Facilitating Visitation through Signage	64
Table 27. NWRS Website Analysis – Getting Visitors to the Refuge.....	65
Table 28. Refuge Managers Survey (2007) – Providing Refuge Info to Visitors	66
Table 29. Visitor Satisfaction Surveys – Providing Refuge Info to Visitors.....	66
Table 30. NWRS Website Analysis – Consistent Messaging to Build a Public Identity.....	67
Table 31. RAPP Performance Measures – SOG 5.....	74
Table 32. Refuge Managers Survey (2007) – Wildlife-Dependent Recreation Goal.....	77
Table 33. RAPP Reporting Data – Wildlife-Dependent Recreation.....	80
Table 34. Ethnicity of Refuge Visitors	80
Table 35. Wildlife-Dependent Recreation - Trends.....	81
Table 36. Refuge Managers Survey (2007) – Hunting and Fishing Opportunities	83
Table 37. Refuge Managers Survey (2007) – NWRS Support for Hunting and Fishing	83
Table 38. Partner Survey (2008) – Hunting and Fishing Opportunities.....	84
Table 39. State Fish and Game Agency Survey (2008) – Hunting and Fishing Opportunities	85
Table 40. Refuge Managers Survey (2007) – Environmental Education and Interpretation.....	88

Table 41. Refuge Managers Survey (2007) – Program Support for Environmental Education and Interpretation.....	89
Table 42. Partners Survey (2008) – Environmental Education	90
Table 43. State Fish and Game Agency Survey (2008) – Environmental Education	90
Table 44. Refuge Managers Survey (2007) – Wildlife Viewing and Photography	91
Table 45. Refuge Managers Survey (2007) – Program Support for Wildlife Viewing and Photography	91
Table 46. Refuge Annual Performance Plan Summary -- Partnerships and Volunteers.....	98
Table 47. Number of Volunteer Hours per Region.....	102
Table 48. Refuge Managers Survey (2007) – Volunteer and Partner Contributions	103
Table 49. The Level of Effort Partners Bring to Habitat Restoration.....	107
Table 50. Refuge Managers Survey (2007) – Partners: Role and Management.....	108
Table 51. Refuge Managers Survey (2007) – Partners: Habitat Mgmt and Public Use	109
Table 52. Partners Survey (2008) – Overall Quality of Relationships with NWRS.....	109
Table 53. State Fish and Game Agency Survey (2008) – Overall Quality of Relationship with NWRS	110
Table 54. Refuge Managers Survey (2007) – Partners: Fire	111
Table 55. RAPP Annual Performance Measures – Strategic Goal #7	117
Table 56. Overall Law Enforcement Staffing – Recommended and Actual	118
Table 57. Regional Law Enforcement Staffing – Recommended and Actual FTEs.....	119
Table 58. Refuge Managers Survey (2007) – Law Enforcement Officer Skills Sufficiency	123
Table 59. RAPP Data – Law Enforcement Activities.....	124
Table 60. PEER Survey (2007) – Resource Protection and Safety	124
Table 61. Refuge Managers Survey (2007) – Law Enforcement Officers FT Shift.....	127
Table 62. NWRS Asset Inventory – FY 2006	132
Table 63. Annual Performance Measures – Strategic Goal #8.....	134
Table 64. NWRS Maintenance Budget (FY 97 – 07).....	136
Table 65. NWRS Maintenance Staff – Per Capita Responsibilities	140
Table 66. NWRS Asset Inventory, Prioritization, Valuation and Condition – FY 2006	141
Table 67. Refuge Managers Survey (2007) - Assessment of Field Station’s Assets.....	142
Table 68. Refuge Managers Survey (2007) – Additional Facilities Needed	143
Table 69. Visitor Satisfaction Survey (2002/2004) – Refuge Facilities	143
Table 70. Annual Performance Measures – Strategic Objective #9	147
Table 71. Completed Comprehensive Conservation Plans by Region	148
Table 72. Refuge Managers Survey (2007) – CCP Process Usefulness.....	150
Table 73. Refuge Managers Survey (2007) – CCP Usefulness	150
Table 74. Refuge Managers Survey (2007) – CCP Impact	151

Table 75. Refuge Managers Survey (2007) – CCP Activities versus Budget and Staffing	152
Table 76. State Fish and Game Agency Survey (2008) – CCP Involvement	152
Table 77. Annual Performance Measures – Strategic Objective #10	158
Table 78. NWRS Growth 1996 to 2006.....	159
Table 79. Acres Available for Purchase	162
Table 80. NWRS Funding FY96 – FY07	163
Table 81. Properties Requested to be Purchased	164
Table 82. Refuge Managers Survey (2007) – Land Acquisition Strategy	164
Table 83. Refuge Managers Survey (2007) – DOI Real Estate Appraisal Process	165
Table 84. Land Acquisition Purchases and LAPS Ranking	166
Table 85. Annual Performance Measures – Strategic Objective #11	175
Table 86. Wildland Fire Management Budget, FY 2004-2006	177
Table 87. Total Wildfire Acres Burned in United States, 1990-2004	179
Table 88. Refuge Managers Survey (2007) – Fire Management.....	182
Table 89. Annual Performance Measures – Strategic Objective #12	188
Table 90. Refuge Managers Survey (2007) – Planning Process.....	190
Table 91. Refuge Managers Survey (2007) – Annual Planning and RAPP Relationship	192
Table 92. NWRS Reported Performance.....	195
Table 93. NWRS (Minus Alaska).....	196

FIGURES

Figure 1. NWRS Appropriations: Actual Dollars.....	9
Figure 2. Refuge Operations & Maintenance Funding in Constant Dollars.....	10
Figure 3. Maintenance Funding in Constant Dollars from FY1996 to FY2004.....	11
Figure 4. Operations Funding in Constant Dollars FY1996 to FY2004.....	12
Figure 5. Refuge Biological Management Processes	23
Figure 6. Visitor Satisfaction Survey (2004) – Signage at High Visit Refuges	64
Figure 7. Selection of Logos and Slogans from Refuge Websites	68
Figure 8. NWRS Annual Visitors	75
Figure 9. Number of Refuges Offering Hunting & Fishing.....	82
Figure 10. Number of Refuges Operating EE Programs	86
Figure 11. Annual Volunteer Hours Contributed to the Refuge system.....	100
Figure 12. Comparison of 2005 Annual Volunteer Hours by Region/Task	101
Figure 13. Volunteer Hours/Refuge by Region in 2005	101
Figure 14. NWRS Law Enforcement Budget (in constant dollars)	121
Figure 15. Refuge Managers Survey (2007) – Law Enforcement Coverage.....	125
Figure 16. Refuge Managers Survey (2007) – Percent of Refuge Managers, by Region, Indicating Law Enforcement Coverage at Their Refuge is Sufficient or Insufficient.....	125
Figure 17. Refuge Managers Survey (2007) – Percent of Refuge Managers, by Level of Visitation, Indicating Law Enforcement Coverage at Their Refuge is Sufficient or Insufficient.....	126
Figure 18. NWRS Maintenance Budget Trends	136
Figure 19. NWRS Maintenance Budget Trends – Current versus Constant Dollars.....	137

Figure 20. Comparing Maintenance Backlog and Annual Budget	138
Figure 21. Comparing NWRS Annual Maintenance Budget to Industry Standards.....	139
Figure 22. Land Acquisition: All Funds	161
Figure 23. Wildfire and Prescribed Fire on NWRs, 1997-2006	179
Figure 24. Fire Regime Condition Classes for United States, 2000	180
Figure 25. FWS/Refuge Evaluation: Analytic Framework	Error! Bookmark not defined.
Figure 26. FWS Management Structure: The National Wildlife Refuge System.....	202

ACRONYMS

ABC	Activity Based Costing
AFWA	Association of Fish and Wildlife Agencies
AHWP	Annual Habitat Work Plan
API	Asset Priority Index
BLM	Bureau of Land Management
CARE	Cooperative Alliance for Refuge Enhancement
CCP	Comprehensive Conservation Plan
CMR	Charles M. Russell
CNO	California/Nevada Operations
DOI	Department of the Interior
DU	Ducks Unlimited
EE	Environmental Education
ESA	Endangered Species Act
FCI	Facility Condition Index
FMP	Fire Management Plan
FWS	Fish and Wildlife Service
GSA	General Services Administration
HAPET	Habitat and Population Evaluation Team
HMP	Habitat Management Plan
IACP	International Association of Chiefs of Police
IPA	Interagency Personnel Agreement
MSI	Management Systems International
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NWR	National Wildlife Refuge
NWRA	National Wildlife Refuge Association
NWRS	National Wildlife Refuge System
OMB	Office of Management and Budget
RAPP	Refuge Annual Performance Plan
RIA	Refuge Improvement Act
RLGIS	Refuge Lands Geographic Information Systems
RO	Regional Office
SAMMS	Service Asset Management and Maintenance System
SHCI	Strategic Habitat Conservation Initiative
SNWA	Southern Nevada Water Authority
SOG	Strategic Outcome Goal
TNC	The Nature Conservancy
TPL	The Trust for Public Lands
VSP	Visitor Services Plan
WMA	Wildlife Management Areas
WMD	Wetland Mangement District
WUI	Wildland Urban Interface

"If you travel much in the wilder sections of our country, sooner or later you are likely to meet the sign of the flying goose — the emblem of the national wildlife refuges.



*You may meet it by the side of a road crossing miles of flat prairie in the Middle West, or in the hot deserts of the Southwest. You may meet it by some mountain lake, or as you push your boat through the winding salty creeks of a coastal marsh. **Wherever you meet this sign, respect it.** It means that the land behind the sign has been dedicated by the American people to preserving, for themselves and their children, as much of our native wildlife as can be retained along with our modern civilization. Wild creatures, like men, must have a place to live. As civilization creates cities, builds highways, and drains marshes, it takes away, little by little, the land that is suitable for wildlife. And as their space for living dwindles, the wildlife populations themselves decline. Refuges resist this trend by saving some areas from encroachment, and by preserving in them, or restoring where necessary, the conditions that wild things need in order to live."*

—Rachel Carson (1907-1964), Scientist, US Fish and Wildlife Service

I. INTRODUCTION

THE REFUGE SYSTEM'S MISSION

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.¹

To accomplish its mission the Refuge System has developed a strategic plan, which contains twelve discrete strategic outcome goals (SOGs). These objectives cover the areas of habitat and wildlife conservation, wildlife-dependent recreation, law enforcement, fire management, conservation planning and organizational excellence, among others. This evaluation report reviews each of the Refuge System's twelve strategic outcome goals and provides an assessment as to how well the system is doing in accomplishing each goal. Each section analyzes the Refuge System's progress and concludes with recommendations for how the system can strengthen its future performance.

This evaluation was undertaken to provide an objective analysis of performance; however, the evaluation team would like to note that one of the strongest findings we take away from the study – and one that is not necessarily objectively verifiable or quantifiable – is that the Refuge System has a workforce that is tremendously talented and has an extraordinary commitment to its mission and to protecting the nation's wildlife. It was impossible for the evaluation team not to

1

be impressed with the passion and commitment of the staff at all levels of the organization — together with its land base, the workforce is truly the Refuge System’s greatest asset.

THE NATIONAL WILDLIFE REFUGE SYSTEM

The US National Wildlife Refuge System (NWRS) was created by Executive Order on March 14, 1903 when President Theodore Roosevelt established the country’s first wildlife refuge on Florida’s central Atlantic coast – the Pelican Island National Wildlife Refuge (NWR). Pelican Island NWR was established to conserve shorebird populations, particularly egrets, that were being decimated by commercial hunters who were filling a fashion demand for bird plumes for women’s hats.

From its modest beginning on Pelican Island the Refuge System has expanded into a network of over 550 distinct units that encompasses over 95 million acres. The largest refuges, the Artic NWR and the Yukon Delta NWR, both in Alaska, are each over 19 million acres (larger than Maryland). The National Wildlife Refuge System, which is the world’s largest system for managed and protected wildlife, is the only federal land management system created principally for the benefit of wildlife. In addition to being grand in magnitude, the Refuge System contains some of the country’s most spectacular wildlife and includes habitat critical to maintaining wildlife populations, especially endangered species, migratory birds and large mammals.

Strategic Conservation: The routes followed by North American migratory birds generally involve north-south travel, as many birds breed and summer in the northern climates, including Alaska, and then in the winter migrate south in search of food and milder weather. The term “flyway” has come to define the major north-south migration routes in North America, of which there are four principal flyways: the Atlantic, Mississippi, Central and Pacific Flyways. Hundreds of National Wildlife Refuges have been strategically established north to south along these flyways – creating stepping stones and feeding stations to enable millions of birds to be able to complete their annual migrations. Today, there are more refuges established for supporting migratory bird habitat than for any other purpose. (National Wildlife Refuge System Improvement Act of 1997; Public Law 105-57)

The Refuge System contains 96 million acres of many of the nation’s most important conservation landscapes and is characterized by its proponents as “the most biologically diverse lands in America.”² The system contains representative landscapes of virtually all of the country’s natural ecosystems and is critical to the health and survival of many migratory birds, endangered species, fish and resident wildlife. In addition, the Refuge System annually hosts over 34 million visitors, who engage in hunting, fishing and wildlife viewing, which makes the Refuge System one of the country’s premier assets for supporting wildlife-dependent recreation. The system also serves as an important educational resource, as it annually provides over 800,000 environmental education opportunities to school children.

² “Managing Biological Integrity, Diversity, and Environmental Health in the National Wildlife Refuges: An Introduction to the Symposium,” Robert Fischman and Vicky Meretsky, Natural Resources Journal, University of New Mexico School of Law 44(2004): page 940.

The following refuges are illustrative of the system's importance to America's wildlife.

- **Sacramento NWR** is part of a complex of six refuges that contain nearly 35,000 acres of engineered and refuge-managed wetlands, which are used by over 300 species of birds. Over 95% of California's central valley wetlands have been lost to development, which makes the Sacramento NWR a critical stopover and winter feeding ground for millions of migratory waterfowl. Through collaboration with neighboring land owners, the refuge has been able to secure conservation easements on an additional 30,000 acres to further increase the conservation impact of its work.
- **Alaska Maritime Refuge**, which stretches over 1,000 miles into the Bering Sea, provides a nesting habitat for approximately 40 million seabirds, or about 80% of Alaska's nesting seabird population. In addition to seabird conservation, the refuge's purpose also includes research. To fulfill this purpose the refuge operates a research vessel – *the M/V Tiglax* – that travels up to 20,000 miles a year to conduct seabird surveys and fish, oceanographic and marine mammal studies. The refuge is also home to a joint FWS-NOAA Oceans and Islands Visitor and Research Center.
- **Chincoteague NWR**, located on Virginia's Assateague Island, consists of more than 14,000 acres of beach, dunes, marsh, and forest. The refuge was established to provide protective habitat for migratory birds, with an emphasis on wintering greater snow geese, and today provides habitat for more than 320 species of birds. The refuge has been designated by the American Bird Conservancy as a Globally Important Bird Area, is one of the National Audubon Society's top ten birding hotspots and is part of the Western Hemisphere Shorebird Reserve Network. In addition, the refuge hosts over 1.4 million visitors a year, which makes Chincoteague NWR an important center for providing public environmental education opportunities – which is also part of the Refuge System's mandate.
- **Cabeza Prieta NWR**, located in southwest Arizona, is 86,000 square miles – about the size of Rhode Island. The refuge, which is mostly designated wilderness, was established in part for the protection of the endangered Sonoran Pronghorn, but the refuge also contains over 300 other wildlife species, including bighorn sheep and desert tortoises. The Refuge System contains more than eighty refuges that were established for the purpose of protecting endangered species, including several refuges that have been important to the recovery of bald eagles in the lower 48 states.

These are just a few examples of the roles the 545+ National Wildlife Refuges fill in the areas of conservation, ecological research, wildlife-dependent recreation and environmental education.

The Refuge System is part of the United States Fish and Wildlife Service, which is managed by the Department of Interior. The National Wildlife Refuge System collaborates closely with other Fish and Wildlife Service programs, including the migratory birds, endangered species and fisheries programs.

THE EVOLVING REFUGE SYSTEM AND THE REFUGE IMPROVEMENT ACT

The Refuge System did not start as a system but began as a patchwork of individual units created under different laws for different purposes. Between 1903 and 1909 President Roosevelt decreed a total of 52 bird reserves and four big game reserves. In the Refuge System's initial years, as with the Pelican Island NWR, many refuges were created by Executive Order. Such refuges included the National Bison Range (1908) and the National Elk Range (1912). In 1918, the North American Migratory Bird Act was signed into law and this created a further impetus for the rapid expansion of the Refuge System. After passage of the treaty, refuges were increasingly created to protect important bird habitats and numerous refuges were created along the major migratory bird flyways.

Another major legislative stimulus for the Refuge System came in 1934 with the passage of the Migratory Bird Hunting and Conservation Stamp Act (commonly known as the Duck Stamp Act). The act established a dedicated fund for purchasing wetlands important to migratory waterfowl through the sale of Federal Duck Stamps. With the passage of the Duck Stamp Act, for the first time, the Refuge System had a dedicated source of funding to acquire land. Since 1934, the federal government has collected more than \$500 million in revenue from duck stamp sales and this revenue remains the most important source of funding for the continued expansion of the Refuge System.³

Over the years the Refuge System grew and advanced but, for the most part, historically remained more a collection of disparate units than a coherently managed system. Up until 1997, with the passage of the Refuge Improvement Act (RIA), the Refuge System did not operate under any guiding organic legislation or overall mission, but rather operated principally in support of the purposes of each individual refuge. The 1997 bill summarized the legal status of the Refuge System as follows... "Unlike the National Parks, National Forests and Bureau of Land Management lands, the National Wildlife Refuge System remains the only major Federal lands management system without a "true" organic act, a basic statute providing a mission for the System, policy direction, and management standards for all units of the system."⁴ The passage of the RIA was an important milestone in the Refuge System's development and provides it the opportunity to be managed as a coherent and effective *system*.

The RIA marks a major point of departure for the Refuge System, and the period since its inception is often used in this evaluation as the timeframe over which system changes and management practices are examined. The RIA's major implications include the following:

- **Increased System Clarity and Coherence:** With the passage of the 1997 RIA, for the first time the Refuge System is operating under an "organic act." This legislation establishes a purpose and objectives for the system and clearly defines a hierarchy of uses. The RIA made clear that the system operates for the primary purpose of conservation or "wildlife first," which is the term that Refuge System staff often use to succinctly describe their mission.

³ Fischman, Robert, *The National Wildlife Refuges: Coordinating a Conservation System through Law*, Island Press, 2003.

⁴ US House of Representatives, 1997.

The National Wildlife Refuge System has multiple objectives but is considered a “dominant use” system, which is to say that the principal purpose of the Refuge System is to conserve fish and wildlife and that all other authorized uses become subservient to the primary conservation objective. Out of this mission the Refuge System has developed two important policies to ensure that wildlife conservation remains its predominant focus: 1) appropriate use, and 2) compatible use. These policies define what activities can be undertaken on refuges and make clear that all refuge-based activity should be compatible with the Refuge System’s mission or a particular refuge’s purpose. These policies have had a major impact on refuge planning and management in the time since the RIA’s inception and have served to better define and limit the types of activities that are allowed to take place on refuges. The Refuge System has established databases on compatibility and appropriate use and these tools are being used to introduce greater consistency into how refuges operate.

- **Increased Emphasis on Providing Public Wildlife-Dependent Recreation:** In addition to its conservation mission, the RIA mandates the Refuge System to provide six designated wildlife-dependent recreational uses – hunting, fishing, photography, wildlife observation, interpretation and environmental education – when such uses are compatible with the Refuge System’s mission or a particular refuge’s purpose, and when adequate resources are available to manage such programs. As distinct from the National Park Service, the RIA expressly clarifies that hunting and fishing are legitimate wildlife-dependent recreation activities to be allowed on refuges. This is consistent with the historic use of refuges and the symbiotic ties between hunting and refuges; for example, hunting fees collected through the Duck Stamp Act have been a major source of funding for purchasing refuge land. The RIA greatly clarified the public uses to be allowed on refuges and allows for a more consistent refuge-to-refuge approach.

The Refuge System developed a Wildlife-Dependent Recreation Policy in July of 2006 to guide the management of recreation use activity. In the time since the RIA’s inception, the number of refuges offering hunting, fishing and environmental education programs has increased significantly.

- **Improved Conservation Planning and Increased Public Participation:** The RIA mandated that all refuges in existence at the time of the act’s passage must complete Comprehensive Conservation Plans (CCPs) by 2012, and that more recently created refuges must have such plans no later than 15 years after their establishment. A CCP is a 15-year plan that identifies issues, goals, objectives, and strategies for refuge management. Issues to be clarified in a CCP include identifying a refuge’s goals and articulating a strategy for how those goals will be accomplished. CCPs also serve the following purposes:
 - Through a public consultation process, determine the recreational and public use activities that are permitted on a refuge;
 - Provide a clear statement of direction for managers and a mechanism to ensure management consistency when staffs rotate; and
 - Provide neighbors, visitors and stakeholders a clear understanding of a refuge’s objectives and uses.

In 2000, the Refuge System developed a Refuge Planning Policy to guide CCP development and this policy requires extensive consultation (and NEPA compliance) with public stakeholders and with state fish and game agencies. The requirement to develop refuge comprehensive plans has been a significant factor in improving resource and public use management, and provides a mechanism to enable greater consistency in approaches among and between individual refuges. In the time since the RIA was passed over 200 refuges have completed CCPs.

Prior to the development of the RIA, the frame of reference that guided the Refuge System's management and decision-making was the Refuge Manual. This manual provided refuge managers and supervisors guidance and provided a mechanism for consistency in how business was done. The evaluation team was told by some Refuge System senior managers that the system was managed more consistently when the Refuge Manual was the reference document that guided the system, but that in more recent times the manual has not been used, or at least not used to extent that it was previously.

In analyzing the Refuge System's performance, as per its strategic plan, it is useful to keep in mind that it is really only since the passage of the 1997 RIA that there has been an organic policy in place to provide a foundation to enable refuges to be managed under a unified system. The Refuge System's transition from a collection of refuges to a coherently managed system is a work in progress. In many ways, the progress has been remarkable – as hundreds of management plans have been developed and public consultation processes have been instituted and undertaken. A wide range of policies have been drafted to guide decision-making and increase consistency; but there is still work that remains to be done to increase overall effectiveness, as should be expected at this point in time. In reviewing the performance of the Refuge System's individual strategic outcome goals it is important to remember that the Refuge System is in the midst of a significant organizational cultural change and that such changes do not happen overnight. The Refuge System goals are ambitious and progress, not surprisingly, has been somewhat uneven. Uneven progress, however, should not be allowed to detract from the remarkable transition that the Refuge System is moving forward with, nor should it detract from the incredible network of refuge lands that are being protected for the benefit of the nation's wildlife.

EVALUATION METHODOLOGY

This evaluation's design was built on a multi-method and multi-source methodological process of data collection. MSI used a multi-source methodology to overcome the limitation of having to base analysis on a single source of information; single-source data may have weaknesses or unduly bias conclusions. In addition, a multi-method approach allows for a greater depth of understanding of particular issues. For example, MSI's Refuge Manager Survey may highlight the strength of workforce viewpoints on any given issue, but interviews are required in order to understand the complexity of underlying issues and the reasons for particular ratings.

The principal sources/processes for data collection used in this evaluation have included:

- **FWS and Partner Interviews:** Interviews have been conducted with senior national-level NGOs, senior NWRS staff, the directors of the Migratory Bird and Fisheries Programs, and members of Congressional appropriations committees. All FWS Refuge

Division Chiefs were interviewed at least once. In total, nearly 250 interviews were conducted as part of this evaluation.

- **Site Visits to Regional Offices:** The evaluation team visited all eight of the Refuge System’s regional offices, where meetings were held with regional directors, refuge chiefs, refuge supervisors, planners, and law enforcement supervisors, among others.
- **Refuge Site Visits:** The following is a list of refuges visited during this evaluation. Site visits included visits to a minimum of two refuges in each FWS region.

Table 1. National Wildlife Refuge Site Visits

Refuge/Office	Dates
Minneapolis RO, Minnesota Valley, Fergus Falls	December 4–8, 2006
Denver RO, Rocky Mountain Arsenal	December 6 & 8, 2006
Charles M Russell NWR	January 11 & 12, 2007
Atlanta RO, Eufaula, Okefenokee	January 16–24, 2007
Mason Neck/Potomac Complex NWR	February 2, 2007
Sacramento RO, Sacramento River NWR Complex, SF Bay NWR Complex	February 12-16, 2007
Portland RO, Oregon Islands, and Willamette Complex	February 12–16, 2007
Hadley RO, Parker River, Silvio Conte,	February 12-16, 2007
Cabeza Prieta, Buenos Aires, RO - Albuquerque	February 26 – March 2, 2007
Blackwater NWR (Chesapeake Marshlands Complex)	March 12, 2007
Anchorage RO, Kenai, Alaska Maritime NWRs	March 20-30, 2007

- **FWS Staff Survey:** An on-line Refuge Manager’s Survey was conducted between March 21st and April 19th, 2007. The survey was a combination of closed-ended and open-ended questions and was structured to collect information on the implementation and effectiveness of the Refuge System’s twelve strategic outcome goals. A survey pre-test was conducted with NWRS managers and division chiefs prior to the survey’s release.

A total of 312 refuge managers completed the survey, which represents a completion rate of over 90%.

- **Partners and State Fish and Game Surveys:** Two additional surveys were also undertaken to survey Refuge System partners on their views of the quality of their partnerships with the Refuge System and on their views of the Refuge System’s

effectiveness. These surveys were: A survey of local Partners and Friends Groups, which was undertaken from March 17-25, 2008. A total of 83 responses were received from 98 potential respondents. The response rate was 85%. Most respondents were Friends Groups, but the survey also includes several Audubon Society operations that serve as Friends Groups.⁵

- **A survey of officials from state fish and game agencies was conducted April 29–May 16, 2008.** Responses were limited to one response per state agency. A total of 32 states responded to the survey, and the Alaska Department of Fish and Game sent a letter on their views of the relationship with the NWRS in lieu of completing the survey. The thirty-two responses received constitute a response rate of 64%. However, many of the respondents did not complete all of the questions and the response rate for most questions was relatively low – often there were 18 or 19 responses for each survey question. There were very few responses provided to open-ended questions.

The evaluation team for this study was as follows:

Keith Brown: Senior Evaluator

David Callihan: Team Leader/ Senior Evaluator

Neal Sigmon: Senior Evaluator

Whitney Tilt: Senior Evaluator

Barbi Broadus: Evaluation and Research Assistant

Dennis Marotta: Evaluation and Research Assistant

Amanda Stark: Research Assistant

The next chapter presents the Refuge System's operating context and is followed by chapters analyzing each of the Refuge System's twelve strategic outcome goals (SOGs).

⁵ **Note:** The Partners survey is used in this report to provide supplemental data to other findings. A representative sample of NWRS partners could not be developed because there was not adequate information on the current total universe of NWRS partners. As a result, the data from this survey is not generalizable to the overall population of partners. However, the information provides value by providing additional perspective on the Refuge System's performance and is considered, along with other data, in the analysis of the Refuge System's effectiveness.

II. THE NWRS' OPERATING CONTEXT

This section reviews aspects of the NWRS operating environment that have significantly impacted the program over the past five to ten years. The first aspect is that of budget trends, including the level of overall funding. The operating context area considered is that of workload requirements and reporting, particularly the increase in administrative requirements.

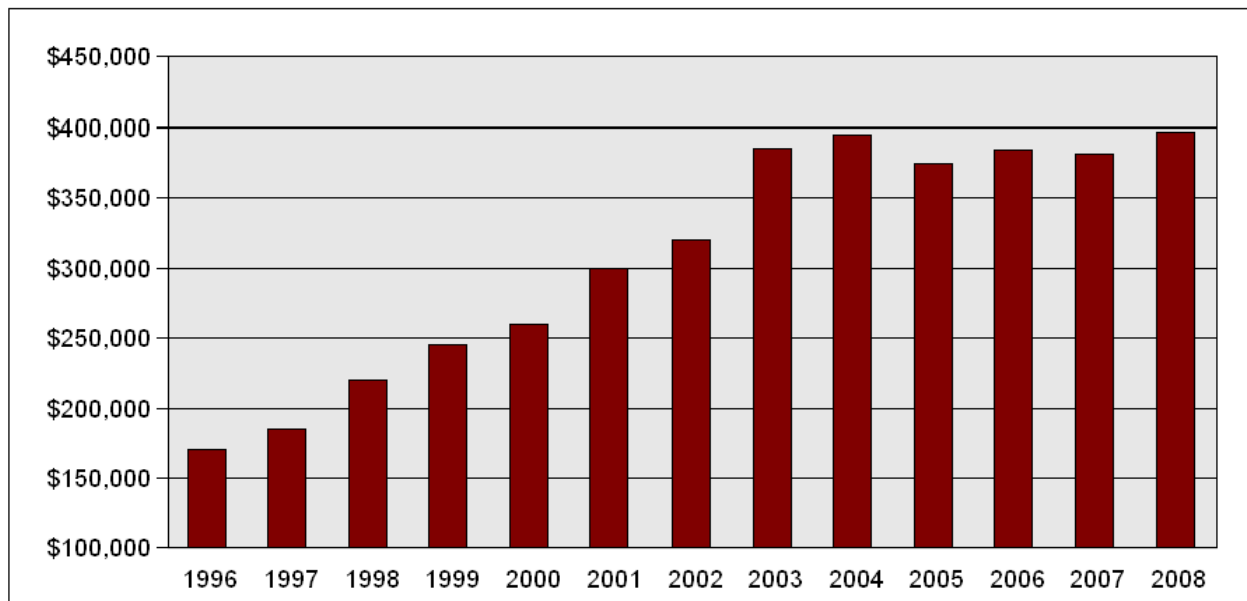
BUDGET TRENDS

The resources available to the NWRS provide an important contextual element for this assessment and have a strong influence on the NWRS' ability to achieve its mission.

It is worth noting that the NWRS budget format was changed in Fiscal Year (FY) 2005, and now includes the following categories: Wildlife and Habitat Management; Visitor Services; Refuge Law; Enforcement; Conservation Planning; and Maintenance. Prior to FY 2005, the budget was presented in two categories – Operations and Maintenance. It is possible to compare budget data separately for Operations and Maintenance from FY 1996 to FY 2004, and from FY 2005 to FY 2008, but due to the change in budget format, it is not possible to directly compare individual budget elements for the entire period from FY 1996 to FY 2008.

NWRS Funding: The chart below portrays the NWRS' overall funding levels from FY 1996 through FY 2008 (requested).

Figure 1. NWRS Appropriations: Actual Dollars
(by fiscal year in hundreds of millions)



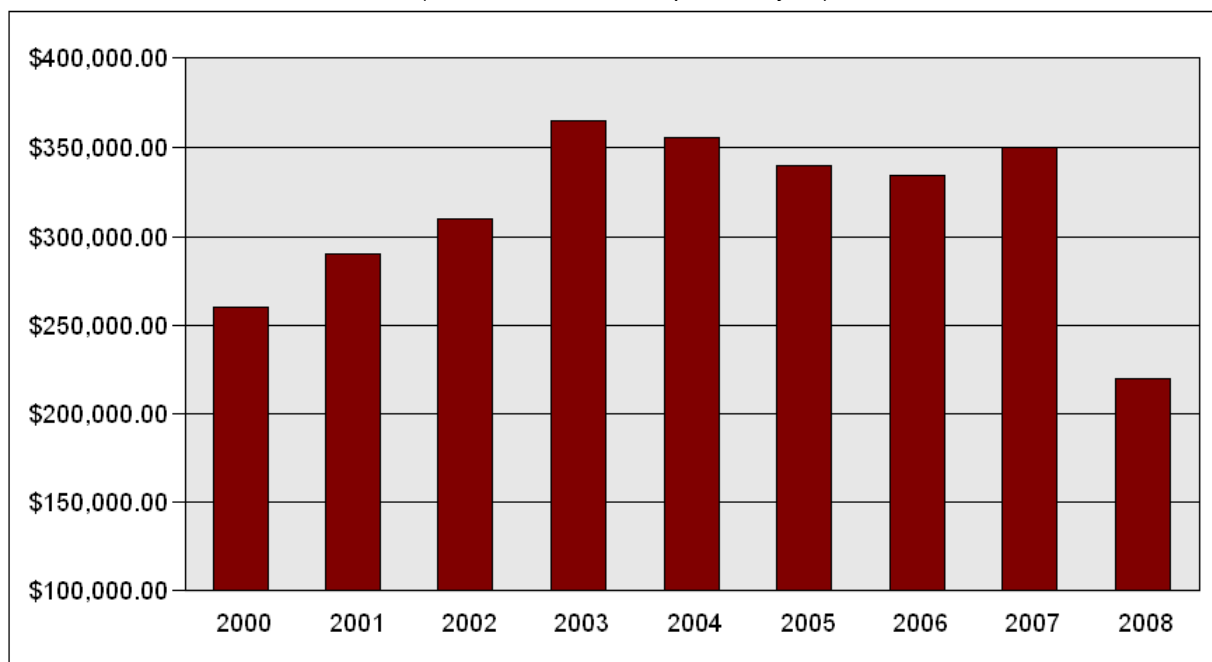
Budget trend highlights of the past decade have included:

- The NWRS experienced a 126% increase in funding (current dollars) between FY 1996 and FY 2003;
- The NWRS' peak in funding came in FY 2003, when it reached \$391.5 million;
- The recent low was in FY 2005 at 375.8 million, which represented a decline of about 4% from the FY 2003 high.

In order to get a more accurate picture of the changes in the NWRS' fiscal situation over time, it is necessary to adjust the budget numbers to account for inflation. This is done by adjusting actual budget levels to portray deflated values.⁶ The remaining charts in this section use deflated numbers based on the Department of the Interior "deflators" (as used by the DOI Budget Office).

The following chart presents operations and maintenance budget totals from FY 2000 through the proposed request for FY 2008 in constant dollars.

Figure 2. Refuge Operations & Maintenance Funding in Constant Dollars
(in thousands of dollars per fiscal year)



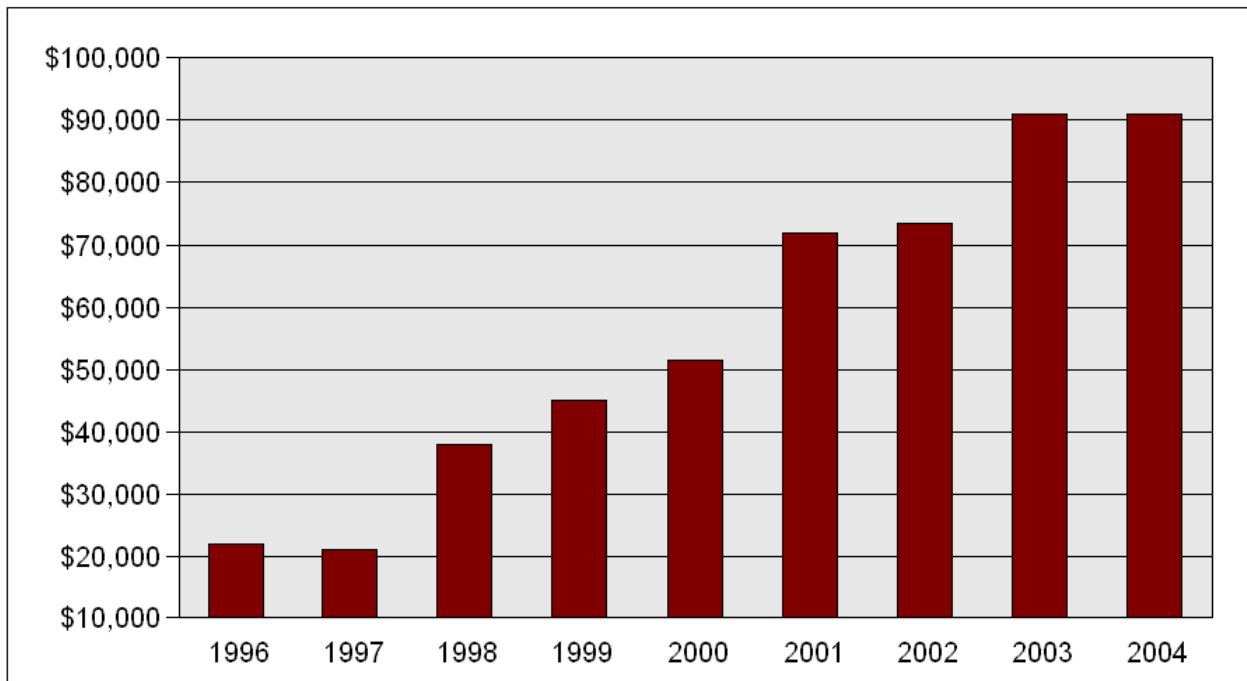
After several years of increases, funding for the Refuge System peaked in FY 2003, the year of the Refuge Centennial. From the peak in FY 2003, NWRS budgets decreased in real terms by 9.6% through the last full year (FY 2006). In FY 2007, a slight increase of less than 1%

⁶ Deflated values are the level of goods and services that can be purchased with a nominal dollar amount after the purchasing power of that amount has been adjusted for inflation. That is, \$1 dollar in 2004 will purchase the goods and services that cost \$.92 in 2000, the base year.

emerged, but the requested appropriation for FY 2008 represents a total decrease of 11.1% in the NWRS budget in real terms from the FY 2003 peak.

Maintenance Funding: It is helpful to look behind the trends of the overall NWRS budget in order to better understand the budget parameters of specific Refuge System programs. The following chart illustrates that maintenance funding increased substantially between FY 1996 and FY 2004.

Figure 3. Maintenance Funding in Constant Dollars from FY1996 to FY2004
(in thousands of dollars)



The leap from \$21 million in FY 1996 to \$91.5 million in FY 2004 for maintenance is significant – an increase of 436% over eight years.

Table 2. Maintenance Funds

FY 2005-2008 (deflated)	
2005	\$118,021
2006	\$115,076
2007	\$112,838
2008	\$109,745

However, as can be seen in the table at left, since FY 2005, when the change in budget structure occurred, maintenance funding has declined about 7%. (Note: Because salary costs were not included in the Maintenance line item prior to FY 2005, the numbers before and after salary cost inclusion cannot be directly compared.)

Operations Funding: Operations appropriations also grew substantially from FY 1996 to the peak in FY 2003. Yet, since FY 2004, operations funding has been stagnant.

Figure 4. Operations Funding in Constant Dollars FY1996 to FY2004
(in thousands of dollars)

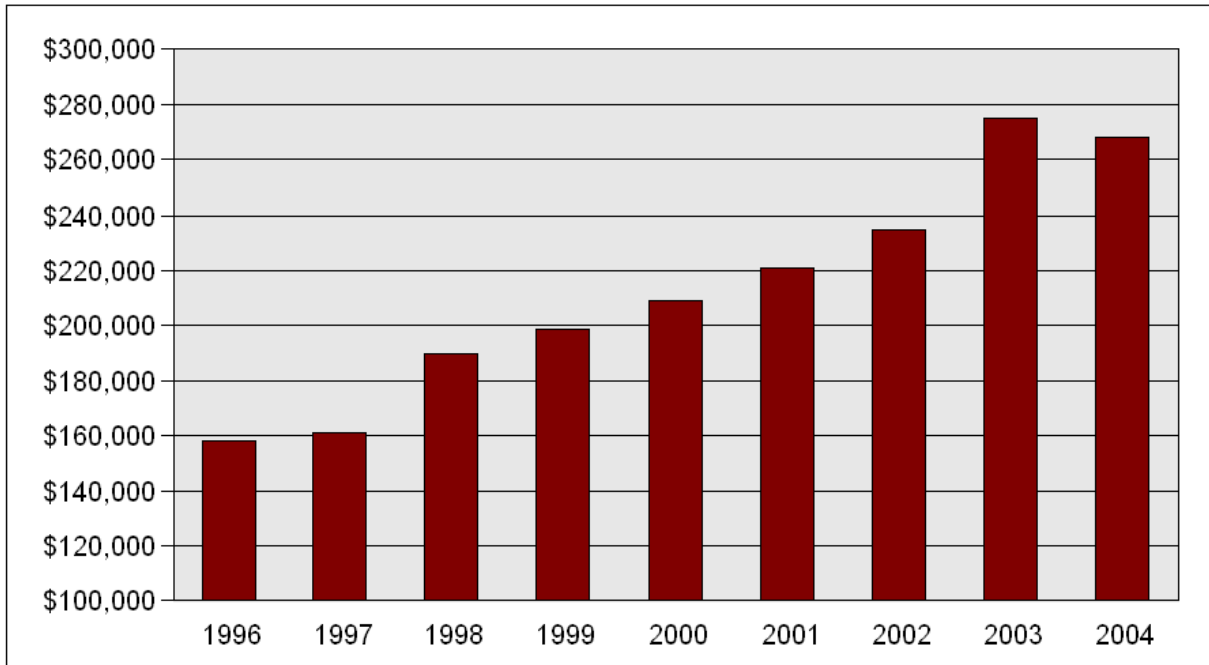


Table 3. Operation Funds

FY 2005-2008 (deflated)	
2005	\$215,953
2006	\$214,724
2007	\$219,659
2008	\$214,397

As can be seen in the table at the left, since FY 2005, when the change in budget structure occurred, Operations funds have remained fairly constant, but are below FY 2003 levels. (Note: Because salary costs were not included in the Maintenance line item prior to FY 2005, the numbers before and after salary cost inclusion cannot be directly compared.)

Other Considerations: Aside from inflation, there are a number of other factors that erode the Refuge System’s financial resources. These factors include budget requests and appropriations that do not fully cover all fixed cost increases. For example, refuges do not receive fixed cost adjustments for FWS owned space—the OMB allows fixed cost adjustments for GSA space but not for FWS owned space. This results in an estimated unbudgeted cost to the Refuge System of as much as \$5 million each year.

Federal pay raises are another area where the Refuge System absorbs increases. The amount of absorption (the level of budget increase provided to cover the full cost of pay raises) varies from year to year. In past years, the amount of salary absorption requested has been as low as 50% of need. In FY 2007, it was 70%, and in the fiscal year 2008, the request is 100%. In addition to the effects of inflation on purchasing power in years when budget increases are not provided, these increased salary costs also decrease the annual funds available to operate the Refuge System.

The MSI Refuge Manager’s Survey elicited a large number of comments having to do with budgets and funding. In response to the open-ended question that asked refuge managers whether the Refuge System was achieving its purpose (SOG 1), the MSI team received 263 comments, and **94% of the responses related to the issue of budgets and staffing being insufficient for the Refuge System to accomplish its core mission.**

The following comments are typical:

- Current budget and staffing is insufficient to support the mission and goals of the refuges I manage. A significant increase in both is necessary to effectively manage our national wildlife refuges and protect/conserves/restore the wildlife and habitat we are responsible for managing on behalf of the American people.
- Simply put, funding is inadequate to maintain quality habitats for wildlife, or to provide the type of quality, wildlife-dependent recreation the American people deserve. The vision of the National Wildlife Refuge System is currently unrealized on most of the refuges in the System.
- We have been at or below minimum staffing and funding levels for over 10 years now and watching weeds grow, encroachment issues compound, water quality and quantity diminish.
- I am tired of managing tens of thousands of acres with duct tape and bailing wire. These lands and the public deserve better. Anything we do that doesn't increase discretionary spending ability on habitat and wildlife is nibbling around the edges of the problem.
- The NWRS has always been under-staffed and under-budgeted. Congressional Reps and Committees have expressed exasperation with our agency because we don't push for or even ask for all of the funds that we really need.
- The NWRS is currently experiencing flat to declining budgets. As a result, significant staff reductions are taking place. Such reductions are placing tremendous stress on an already stressed system. Without immediate relief, the NWRS will suffer greatly for years to come.

Staffing: The MSI Refuge Managers Survey did not directly ask about staffing levels, but a 2006 survey undertaken by the non-profit Public Employees for Environmental Responsibility (PEER) did publish the following finding:⁷

Table 4. PEER Survey (2006) – Adequate Staff Levels

<i>My refuge is adequately staffed to meet its core conservation mission.</i>	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
	6%	8%	1%	35%	49%
<i>The PEER Survey received 176 responses.</i>					

⁷ PEER is a national non-profit alliance of local, state and federal scientists, law enforcement officers, land managers and other professionals dedicated to upholding environmental laws and values.

The table on the preceding page indicates that by a significant margin, refuge managers feel that they do not have adequate staff to meet their core mission – with 84% of respondents indicating this to be the case.

Workforce Planning: Over the past year, the NWRs has been involved in a workforce planning exercise to attempt to re-balance funding between personnel costs and operational costs. The goal of the Refuge System is to bring all regions into a balance whereby 75-80% of funds are used for personnel and 20-25% of funds are used for operations. This is being done because, over the past five years or so, as real budgets have been in decline, refuges in several administrative regions have found that they have been expending upwards of 90% of their operations and maintenance funds on personnel costs, which leaves insufficient funds for operational tasks and projects such as habitat restoration. While some regions have been able to maintain what is considered to be a reasonable balance between personnel and operations costs – for example the approximate balance in the CNO region is 70/30 and in the Alaska regions is below 80% for personnel costs – several regions have experienced a severe imbalance, such as Region 4, where upwards of 93% of funds have been used for personnel costs.

The result of this re-balancing exercise has been to revisit and reduce staff in several regions, which also means reducing programs and operations. Some of the impacts of the workforce planning exercise have included:

- In **Region 4**, up to 20% of the workforce is expected to be eliminated (from its peak in FY2003), which will result in a significant cutback in some services. For example, these cutbacks will include: reducing the number of days per week that some refuge visitor centers are open; reducing trail maintenance; reducing biological inventory and survey work; cutting back or eliminating visitor service programs, such as environmental education; and operating some refuges without any staff (de-staffing);
- In **Region 5**, a number of refuges are being de-staffed as a means to move forward with staff cuts, while full biological and public use programs will be maintained only at select “stay strong” refuges. In addition, recognizing the need to “do less with less,” the Regional Office is asking all refuges to focus their visitor service programs on two public uses, rather than each of the “Big 6.”

In other regions the staff cutbacks under workforce planning have not been as severe, for example the CNO and Alaska regions have not had to make any significant cut-backs in staffing. In a recent report entitled *Restoring America's Wildlife Legacy: 2007*, the Cooperative Alliance for Refuge Enhancement (CARE) cites staff shortfalls as the most critical problem facing the Refuge System. The report estimates that the Refuge System has lost 227 staff between 2004 and 2006, and that current workforce planning projections indicate that another 338 jobs will be eliminated by 2010.

WORKLOAD AND ADMINISTRATIVE TRENDS

Over the past several years, and in particular within the past five, there has been an increase in the Refuge System's workload and administrative reporting requirements. Increases have included additional required management processes, such as the need to develop CCPs, as well

as the introduction of new administrative and accountability systems, such as SAMMS and ABC budget code tracking. This sub-section examines these issues.

Administrative Reporting: The table below presents refuge managers responses when asked about the burden of administrative reporting (from the MSI Refuge Managers Survey).

Table 5. Refuge Managers Survey (2007) – Administrative Reporting

<i>Please estimate the amount of time you spend on administrative reporting. (Enter the percent of time spent in a typical month.)</i>							
	0 – 10%	10 – 20%	20 – 30%	30 – 40%	40 – 50%	50 – 60%	60% or More
Currently	3%	10%	20%	21%	11%	13%	22%
Five years ago	17%	36%	22%	16%	5%	2%	2%
<i>No of Responses: currently – 291, five years ago – 281.</i>							

As evidenced by the table, there has been a significant increase in the amount of time refuge managers report they spend on administrative reporting.

- **Currently**, 46% of refuge managers indicated they spend 40% or more of their time on administrative reporting. By comparison, only 9% of refuge managers estimated they spent a similar amount of time on administrative responsibilities **five years ago**.
- Looking at this trend from another angle, 53% of refuge managers estimate they spent less than 20% of their time on administrative duties five years ago; only 13% of current managers report spending similar amounts of time on administrative reporting.
- The results of MSI’s survey, which indicate a significant increase in administrative reporting over the past five years, are consistent with results obtained from a 2006 survey undertaken by PEER.

Table 6. PEER Survey (2006) – Administrative Reporting

<i>What percent of time do you now spend on mission-related refuge conservation work, as opposed to purely administrative tasks?</i>	Under 25%	Between 25-50%	Between 51-75%	More than 76%
	45%	41%	12%	1%
<i>The PEER Survey received 176 responses.</i>				

In the PEER survey, 13% of refuge managers indicated that they spend 50% or more of their time on mission-related conservation work. By contrast, 86% report that they spend more than 50% of their time on administrative tasks.

In part, the increase in workload and administrative requirements are the result of new systems introduced to increase accountability. These systems have included:

- Introduction of the Refuge Annual Performance Plan (RAPP) Workbook and Annual Report. Since 2005, these workplans and reports are completed annually to address OMB strategic planning and performance management requirements.
- ABC – Activity-based Budgeting Costs. This is a system to track and align the staff hours of all personnel against the objectives of the NWRS (and the FWS).
- SAMMS – a database system used to document all costs – labor and fixed – related to maintenance of the Refuge System’s infrastructure (including facilities and vehicles).

It was noted during site visits that several of these reporting systems require redundant information input. For example, there are up to three separate reporting processes that require maintenance employees to account for their time and the costs of funds they expend. An employee undertaking maintenance on a water control structure would enter the time spent on this task on his payroll timekeeping report, in the SAMMS database, and in the ABC report. Similarly, the cost of this activity would be recorded in the accounting/finance system and in the SAMMS system. The utility of these administrative systems is discussed in subsequent sections of this report; e.g., the utility of the RAPP reporting system is discussed under SOG 12 – Organizational Excellence.

The MSI Refuge Managers Survey did not specifically ask a question about administrative workload, but we did receive a number of comments that directly addressed this issue under the open comment question where respondents were asked to make suggestions to improve the Refuge System. In addition, during field site visits, the need to reduce administrative reporting was an issue that refuge management emphatically emphasized at every refuge visited. The following comments are illustrative of responses received through the survey.

- Every week, if not more often, new reporting requirements, training requirements, and data calls are implemented. If this continues, refuge managers and wildlife biologists will manage and operate refuges totally disconnected from the resource. In every area of refuge management we will be operating using guess work instead of sound science. The NWRS and natural resources within and without will suffer greatly.

Accountability Concerns: Refuges with limited budgets and few staff have to live within the same rules and regulations as Federal Departments with billions of dollars at risk, such as the Department of Defense. At the Potomac River Complex, in a typical year, after salaries, about \$80,000 is available to operate three refuges. Fixed costs for utilities and buildings use \$60,000, which leaves only \$20,000 as truly discretionary. This leaves little money for waste, fraud, and abuse, but the financial controls, the checks and balances, and the multiple NWRS reporting requirements are the same as refuges operating with substantially larger budgets, and are seen as out of line with the risk. Since the complex does not make more than 25 purchases of over \$3,000 per year, it does not have warrant authority and has to obtain multiple bids (for purchases of goods and services), send proposed expenditures to the regional office, and await approval. Meanwhile, on the ground, needs are delayed and staff resources are consumed complying with rules and regulations that are appropriate when millions of dollars are at stake, but not when, relatively speaking, pennies are at risk. In addition, it is common that the refuge may not receive its budget until April or May, which leaves only a few months to implement maintenance and habitat management activity.

- If funding is allowed to stay level or decrease each year the Refuge System as we know it will come to a grinding halt. We either need to do away with most of the reporting requirements to free up personnel to complete needed habitat work or hire additional staff to complete that work.
- Funding and Full-Time Equivalent staff (FTE) are insufficient to meet the minimum needs of the Complex. SAMMS and other paper requirements command so much of the work year that little else can be accomplished by the professional staff and now by the maintenance staff.
- The constant request for data calls for information that can be found on already established databases is crippling our effectiveness to do our job in the field!!! We need relief from the numerous reports and data calls which keep us from accomplishing management in the field.

CONCLUSION

Budget Trends: NWRS budgets have declined over the past several years, with actual purchasing power having declined about 11% between the FY 2003 peak and the requested FY 2008 budget. Maintenance funding, however, has significantly increased – with a jump of 436% over eight years (FY 1996 – FY 2004).

Recent budget declines appear to have severely affected refuge operations. This is evident based on a number of findings, including:

- 94% of refuge managers' survey comments indicated an inability on the part of the NWRS to accomplish its mission due to inadequate budgets and staffing;
- Workforce planning exercises are leading to significant cutbacks in personnel and services; for example, the Region 4 plan calls for a 20% reduction in staff;
- In several regions, key services such as visitor programs, environmental education, and biological monitoring are being curtailed or eliminated; and
- A number of refuges are being de-staffed; for example, in Region 5, seven of 71 refuges will be de-staffed within the next year.

Administration/Workload: Refuge System administrative reporting has reached an unbalanced and critical level and is diverting time and resources away from mission-critical activities. There has been a clear trend, particularly over the past five years, of increased workload requirements and increased administrative reporting. While some of the workload requirements, such as the need to produce CCPs, directly support the core mission of the Refuge System, much of the work relates to administrative requirements, such as the implementation of multiple and apparently redundant timekeeping and accountability processes. Much of the effort to address accountability concerns is disproportionate to the resources involved; for example, small refuges must use the same complex systems as large refuges even though their discretionary annual operations budgets may be as small as \$20,000-\$30,000 per year. The Refuge System places

an emphasis on accountability that often times appears to be disproportionate to the level of resources being monitored, which is not cost effective and is a distraction to a focus on the organization's core conservation mission.

Overall Operating Context: The confluence of declining budgets, declining staff, and a significant increase in administrative workload has impaired the Refuge System's ability to focus on and accomplish its core mission – that of conserving habitat and resources.

III. SOG ANALYSIS

INTRODUCTION

Each of the Refuge System’s twelve SOGs was assigned an effectiveness rating based on our assessment of how well each SOG program area is doing in achieving its intended outcome (as per the NWRS strategy). Following the overview of performance, each SOG chapter contains a description of the objective, performance findings, conclusions and recommendations.

A summary of the ratings for each the strategic outcome goal is provided in the table below.

Table 7. Effectiveness Ratings

Ratings	Goals
	<p>Operating Context: Budgets have been in decline over the past several years, actual purchasing power has declined about 11% between the FY 2003 and the requested FY 2008 budget and administrative non-core requirements have increased. This has had a negative effect on the Refuge System’s ability to achieve its core goals.</p>
<p>Highly Effective</p>	<p>SOG 6: Facilitate Partnerships and Cooperative Projects to Engage Other Conservation Agencies, Volunteers, Friends, and Partners in the NWRS Mission.</p>
<p>Effective</p>	<p>SOG 5: Provide Quality Wildlife-Dependent Recreation and Education Opportunities. SOG 8: Provide Infrastructure and Equipment Adequate to Support Mission and Maintained in Good Condition. SOG 9: Complete Quality and Useful Comprehensive Conservation Plans on Schedule and with Full Engagement of Partners. SOG 11: Reduce Wildfire Risks and Improve Habitats.</p>
<p>Partially Effective</p>	<p>SOG1: Conserve Manage, and Where Appropriate, Restore Fish, Wildlife and Plant Resources and Their Habitats SOG 3: Ensure that Unique Values of Wilderness, other Special Designation Areas, and Cultural Resources are protected. SOG 4: Welcome and Orient Visitors. SOG 12: Promote and Enhance Organizational Excellence.</p>
<p>Ineffective</p>	<p>SOG 7: Protect Resources and Visitors through Law Enforcement. SOG 10: Strategically Grow the System.</p>
<p>Unable to Evaluate</p>	<p>SOG 2: Provide Quality Environments with Adequate Water.</p>

The remaining chapters provide an analysis of the performance of each individual SOG. The sections are structured as follows: a descriptive overview, performance findings, conclusions and recommendations.

SOG 1: Conserve, manage, and where appropriate, restore fish, wildlife, and plant resources and their habitats to fulfill refuge purposes, trust resource responsibilities, and biological diversity/integrity.

<p>Performance Rating: Partially Effective</p>	<p>This objective is rated “Partially Effective” because of the significant amount of refuge land that is in need of additional management attention and due to the inconsistent application of science-based management across the Refuge System. As per the Refuge System’s RAPP performance reporting system, 89% of refuge lands – 76.5 million acres – are in Class I condition, which means the land is receiving needed management action or does not require additional management action at this time. For NWRS habitats outside of Alaska, 59% of the 18.9 million acres were reported as Class 1 in 2006. Assuming RAPP data provide an overall indication of overall habitat conditions on NWRs outside of Alaska, 41% of refuge habitats, or 8 million acres, are in need of management and/or restoration to achieve the Refuge System’s habitat objectives. Of refuge managers surveyed, 77% indicated that they believe their refuge is not meeting, or is only partially meeting, its habitat management goals. A majority of refuge managers (65%) also indicated they thought that staffing and budgets are insufficient to achieve the priority goals in their Comprehensive Conservation Plans.</p> <p>A significant portion of refuges have not developed Habitat Management Plans, and there is an insufficient level of biological inventory and monitoring work being done – only 11% of refuge managers surveyed described the current level of inventory and monitoring work as being mostly or fully sufficient. At refuges with proper staffing and adequate budgets, this program is “effective,” but many refuge units do not have proper staffing and adequate budgets. While increasing the funds available to address adaptive management will go a long way to improving the Refuge System’s science-based approach to management, greater attention also needs to be given to developing a better system for monitoring habitat improvement and for better connecting the Refuge System’s work with the larger mosaic of conservation lands. Despite the lack of consistent, system-wide practices, the Refuge System contains many examples of excellent habitat planning and monitoring systems. The Refuge System’s challenge is to better define high-priority system-wide needs, identify best practices that meet these needs, and replicate these systems in an increased number of locations. However, while a better defined monitoring system is needed, it should also be recognized that current levels of funding and staffing are not sufficient to enable the Refuge System to conduct the level of biological monitoring that is required to operate an effective science-based adaptive management system.</p>
---	---

A. Context/Background

The conservation, restoration, and management of fish, wildlife, and plant resources and their habitats are the central tenets of the NWRS. It is often reduced by refuge managers and NWRS proponents to the seemingly straightforward phrase “wildlife first.”

As outlined in the NWRS Strategic Plan, “successful implementation of this goal will result in habitats being maintained so that they effectively contribute to the biological integrity, diversity, and environmental health of the Refuge System.”

Key Definitions (as codified by NWRS):

Biological Diversity. The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and communities and ecosystems in which they occur.

Biological Integrity. Biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms, and communities.

Conserve. To sustain and, where appropriate, restore and enhance, healthy populations of fish, wildlife, and plants using, in accordance with applicable Federal and State laws, methods and procedures associated with modern scientific resource programs. Consistent with amendments to the National Wildlife Refuge System Administration Act made by the National Wildlife Refuge System Improvement Act of 1997, such methods and procedures include protection, research, census, law enforcement, habitat management, propagation, live trapping and transplantation, and regulated taking.

(PART 601 FW 1 National Wildlife Refuge System Mission and Goals and Refuge Purposes)

Environmental Health. Composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.

Refuge Purpose. Purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit.

Strategies: *Natural resource management responsibilities of the Refuge System are varied and complex. A wide range of planning, inventory, monitoring, and analysis actions are necessary to determine the status and condition of natural resources, and to effectively guide their stewardship. A systematic, science-based approach is to be applied to meet this need. Such actions include: 1) establishing a process for setting conservation priorities for both species and habitats that allows quantification of national, regional, and local objectives; 2) establishing standardized protocols for a systematic nationwide approach to conducting inventory and monitoring of species and their habitats; 3) utilizing state-of-the art technology such as Geographic Information Systems and other information technology applications to analyze and apply all information; and 4) dedicating appropriate multi-disciplinary staffing to enable effective utilization of the overall strategy. These four steps are recognized by the NWRS as essential first steps to carry out the Refuge Improvement Act’s directive to preserve the biological integrity, diversity, and environmental health of the NWRS and, where possible, adjacent non-refuge lands. Implementing these strategies offers opportunities to collaborate*

*with numerous conservation partners, including state fish and wildlife agencies, federal land managers, private landowners, and many others.*⁸

Integrity-Diversity-Health Policy: The stated philosophy of the NWRS is: “To strive to manage in a holistic manner the combination of biological integrity, diversity, and environmental health.”

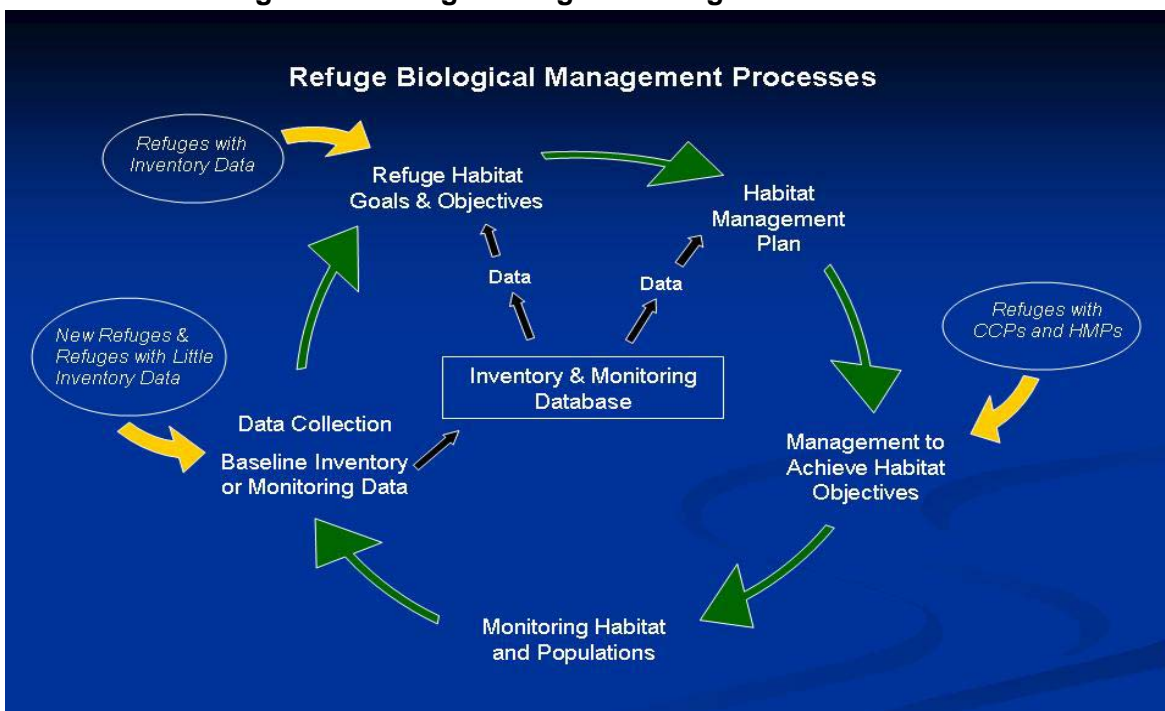
The Biological Integrity, Diversity, and Environmental Health Policy applies to all units of the NWRS and outlines policy for refuge managers to follow consistent with achieving refuge purpose(s) and system-wide mission.⁹ The policy provides for the consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on refuges, and provides refuge managers with an evaluation process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions and, where appropriate, restore lost or severely degraded components. Among the policy’s principal objectives are: 1) describing the relationships among refuge purposes, NWRS mission, and the effort to maintain biological integrity, diversity, and environmental health; 2) providing guidelines for determining what conditions constitute biological integrity, diversity, and environmental health; 3) developing guidelines for determining how and when it is appropriate to restore lost elements of biological integrity, diversity, and environmental health; and 4) establishing guidelines to deal with external threats to biological integrity, diversity, and environmental health.

Performance: A paradigm for biological management processes for individual refuges is illustrated in Figure 5 presented on the next page. It identifies the iterative relationship between planning, inventory and monitoring, and management. Consistent with this paradigm, the NWRS established the following performance goal (emphasis added): “Performance is gauged by the *condition of habitat acres* and by the *response of fish, wildlife, and plant populations to management actions*. Developing the standard protocols, the *capability to carry out inventory and monitoring programs*, and then to *complete associated data analysis to guide management adjustments* is an essential first step in making progress toward this goal.”

⁸ Final Strategic Plan for the National Wildlife Refuge System, FY 2006 –2010, US Fish and Wildlife Service, December 2006.

⁹ PART 601 FW 3 National Wildlife Refuge System – Biological Integrity, Diversity, and Environmental Health.

Figure 5. Refuge Biological Management Processes



(Source: NWRs Strategic Plan)¹⁰

Taken collectively, four distinct assessment areas emerge:

1. Evidence of adequate planning;
2. Presence of adequate inventory and monitoring (with associated analysis);
3. Translation of #1 and #2 into management (implementation and adaptive management); and
4. Condition of habitat and plant and animal populations to management (status).

The NWRs must undertake planning, inventory and monitoring, and management (#1-3) in order to achieve habitat and wildlife goals (#4).

Planning: FWS policy states that refuge habitats will be managed in accordance with approved Comprehensive Conservation Plans (CCPs) and Habitat Management Plans (HMPs) that, when implemented, will help achieve refuge purposes, fulfill the System mission, and meet other mandates.¹¹ See SOG 9 for further discussion on CCPs.

Refuges are required to have an HMP and, where appropriate, an Annual Habitat Work Plan (AHWP). HMPs are a step-down management plan of the refuge CCP, and the AHWP is an annual work plan that provides specific guidance in support of HMPs. HMPs are defined by FWS policy as dynamic working documents that provide refuge managers a decision-making process, guidance for the management of refuge habitat, and long-term vision, continuity, and

¹⁰ Final Strategic Plan for the National Wildlife Refuge System, FY 2006 –2010, US Fish and Wildlife Service, December 2006.

¹¹ U.S. Fish and Wildlife Service Manual, 630 FW 1, Habitat Management Plans (<http://www.fws.gov/policy/620fw1.html>).

consistency for habitat management on refuge lands. The lifespan of an HMP is fifteen years, and they are to be reviewed every five years. It is encouraged that refuges utilize peer review in the revision process. AHWPs are reviewed annually and restructured based on results and observations of previous years' work plans and goals and objectives outlined in refuge CCPs and HMPs. If active manipulation is not necessary on an annual basis, AHWPs may not be necessary on all refuges to meet habitat goals and objectives outlined in refuge CCPs or HMPs.

In establishing refuge habitat goals, objectives, and subsequent management strategies and decisions, HMPs will: 1) be consistent with individual refuge purpose(s), NWRS mission, and special designations (e.g., designated wilderness); 2) utilize best available biological information and ecological principles in obtaining the largest sustainable amount of biological integrity, diversity, and environmental health; 3) use adaptive management to assess and modify management strategies; 4) manage invasive species to improve or stabilize biotic communities; and 5) consider a range of habitat management strategies in consultation with state, tribal, and other partners and use peer review to provide credible, independent, and expert assessment of refuge habitat management and ensure use of appropriate techniques, protocols, and processes in the management of refuge habitats.

Inventory and Monitoring: Service policy is to: collect baseline information on plants, fish, and wildlife; monitor, as resources permit, critical parameters and trends of selected species and species groups on and around refuge units; and base management on biologically and statistically sound data derived from such inventory and monitoring. Refuges are to conduct a basic inventory of flora and fauna, focus limited resources on data collection pertinent to FWS policies and programs and on management objectives of FWS units, and promote the use of coordinated, standardized, cost effective, and defensible methods for gathering and analyzing population data.¹²

The central role that inventory and monitoring plays in proper management of NWRs is clearly outlined in Figure 5.

Management: Natural resource management on refuges most frequently occurs through habitat management that falls into three broad categories: habitat restoration, habitat management, and invasive species management.¹³

Habitat management includes a broad array of habitat manipulation methods that occur either every year or on a repeating basis. It includes fire management activities related to rehabilitation and hazardous fuels reduction, which are treated separately under SOG 11. Active habitat management occurs on over 3.5 million acres of refuge habitats every year and includes: managing extensive wetland impoundments and other bodies of water by adjusting water levels; managing vegetative habitats through prescribed burning, farming, mowing or haying, and grazing; forest treatment by harvest or selective thinning; mechanical treatments such as disking, plowing, or root raking; and application of herbicides to control pest plants.

¹² U.S. Fish and Wildlife Service Manual, 701 FW 2, Inventory and Monitoring of Populations (<http://www.fws.gov/policy/701fw2.html>).

¹³ Final Strategic Plan for the National Wildlife Refuge System, FY 2006 –2010, US Fish and Wildlife Service, December 2006.

Habitat restoration includes: restoration of hydrology and functions of wetlands; restoration of upland habitats by re-vegetation (generally either reforestation or reestablishment of grassland or shrub habitats); rebuilding of riffles, pools, and similar structural components within stream channels or other water bodies; restoration of riparian zones by stabilizing stream banks and reestablishing vegetation immediately adjacent to stream channels; and restoring degraded marine or estuarine habitats. Wetland restoration within this work process also provides for the installation or expansion of water management facilities such as dikes, levees, pumps, spillways, water level control structures, and associated facilities needed to initiate water level control within impoundments.

Invasive species management includes all actions to prevent the introduction and spread of invasive plants or animals, and to control or remove them where they are already established. Use of integrated pest management techniques is applied wherever feasible, but mechanical removal or herbicide application is often necessary where extensive infestations of invasive plants occur. Early detection and treatment of newly emerging problems is sought wherever possible to prevent problems from growing to the point of requiring more difficult and costly treatment regimes. Regular assessment of habitats is needed to detect invasions, and rapid deployment capabilities are vital. Cooperative work with other entities is necessary to have the greatest opportunity to successfully control invasive plants and animals.

Due to the need to collaborate with an array of partners and to keep all apprised of sometimes contentious management decisions, it is essential that resource management efforts include a focused communications program to keep key internal and external audiences advised as activities proceed.

A central premise to effective biological management is the use of adaptive management. Refuge managers are directed to use adaptive management to assess and modify management strategies and prescriptions as necessary, and to achieve habitat goals and objectives. By comparing results to desired outcomes, managers evaluate management strategies and prescriptions and determine if the strategies and prescriptions are effective. Refuge managers may modify the CCP and/or HMP if significant new information suggests that plans are inadequate or refuge resources would benefit from changes. The appropriate level of NEPA compliance is required if significant changes are proposed.

Status of Habitat and Plant and Animal Populations: The primary method for the NWRS to determine the condition of refuge habitats and populations is data collected from each refuge and reported in the Refuge Annual Performance Planning system (RAPP). In turn, these measures are presented as an extensive set of performance measures in the NWRS Strategic Plan (Table 8).

Table 8. Annual Performance Measures and RAPP Reporting, 2005-2006

Annual Performance Measures	FY 05	FY 06	FY 07
	Actual	Actual	Target
1.1) # refuges/WMDs with approved Wildlife Inventory and Monitoring Plans as prescribed in 701 FW 2.	18.21%	20.79%	28.01%
	106	121	163
	582	582	582
1.2) % of needed wildlife inventory and monitoring actions actually completed. ¹⁴	100.00%	107.42%	100.00%
	4,997	5,223	4,599
	4,997	4,862	4,599
1.3) % of needed population management actions completed to benefit native fish, wildlife, and plants that are not threatened or endangered. ¹⁵	100.00%	116.57%	100.00%
	1,347	1,555	1,467
	1,347	1,334	1,467
1.4) % of populations of indicator species with improved or stable numbers.	66.00%	83.00%	53.00%
	294	370	327
	444	444	615
1.5) % of actions prescribed in approved recovery plans completed for the benefit of threatened and endangered species	36.33%	59.90%	97.60%
	803	1,374	1,327
	2,210	1,329	1,355
1.6) % of refuges/WMDs with approved Habitat Management Plans as prescribed in 620 FW 1 ¹⁶	13.40%	19.93%	33.85%
	78	116	197
	582	582	582
1.7) % upland habitat acres in class 1 status (receiving needed treatments or where no active manipulation is needed [good condition])	83.72%	90.67%	90.86%
	48,746,138	52,791,511	52,901,557
	58,224,901	58,224,901	58,224,901
1.8) # wetland habitat acres in class 1 status (receiving needed treatments or where no active management is needed [good condition])	90.00%	89.57%	89.96%
	23,634,639	21,357,697	21,450,067
	23,844,210	23,844,210	23,844,210
1.9) # riparian habitat miles in class 1 status (receiving needed treatments or where no active management is needed [good condition])	n/a	87.94%	83.24%
		61,614	58,321
		70,061	70,061
1.10) # marine habitat acres in class 1 status (receiving needed treatments or where no active management is needed [good condition]) ¹⁷	n/a	54.05%	55.26%
		2,359,228	2,411,988
		4,365,158	4,365,158
1.11a) # upland acres restored annually	174,421	198,663	126,034

¹⁴ Denominator is actually the target number of actions planned for that year except for '05 baseline.

¹⁵ Ibid.

¹⁶ Plan year estimates generated from the year selected by field stations in RAPP.

¹⁷ Defined as Class 1 habitat for 159 coastal refuges excluding Alaska. Comparable numbers were not available for '05.

Annual Performance Measures	FY 05	FY 06	FY 07
	Actual	Actual	Target
1.11b) # wetland acres restored annually	40,027	49,765	35,316
1.11c) # riparian miles restored annually	80	97	71
1.11d) # marine acres restored annually. ¹⁸	n/a	5,897	13,550
1.12) # wetland acres restored per million dollars of gross investment. ¹⁹	7,591	8,288	8,537
	40,027	49,765	35,316
	\$5.273M	\$6.005M	
1.13) ratio of acres treated for invasive plants to acres infested with invasive plants	4.78%	13.90%	12.42%
	111,630	284,363	250,317
	2,335,987	2,045,243	2,015,841
1.14) # of refuge acres infested with invasive plants that have been controlled at the end of the year	111,630	95,217	94,384
1.15) % of invasive animal populations at the beginning of the plan year that have been controlled at the end of the year	3.10%	6.00%	7.00%
	155	288	331
	4,964	4,471	4,493

B. Principal Findings

The NWRS encompasses a 96 million acre network of reserves and easements that is characterized by the system’s proponents as “the most biologically diverse lands in America.” The System provides key habitats for migratory birds, endangered species, fish, and resident wildlife. The Refuge System’s mandate to maintain biological integrity, diversity, and environmental health is the “most expansive ecological mandate in U.S. public law,” according to Robert Fischman and Vicky Meretsky.²⁰

Such accolades must be tempered with a clear-eyed recognition that, as big and impressive as the NWRS system is, it is merely a representation of the biological diversity of habitats and animals in the United States, not a replacement for the larger whole. This was recognized in the 2004 Conservation Summit when the Wildlife and Habitat team noted:

In meeting its challenge, the Refuge System faces exotic and invasive species, growing restrictions on uses of fire and pesticides, increased competition for water, degraded water and air quality, and the need to embrace a range of nontraditional resources such as corals. Success requires that refuges be seen as critical pieces of a puzzle, the full picture of which is only viewed in the context of landscapes and seascapes, ecosystems, and flyways. The efforts of individual

¹⁸ Defined as acres restored for 159 coastal refuges excluding Alaska (wetland and open water). Comparable numbers were not available for 05.

¹⁹ Assume that dollars increase by 0.1 percent and efficiency stays the same.

²⁰ “Managing Biological Integrity, Diversity, and Environmental Health in the National Wildlife Refuges: An Introduction to the Symposium,” Robert Fischman and Vicky Meretsky, Natural Resources Journal, University of New Mexico School of Law 44(2004): page 940.

*refuges will come to fruition only through myriad partnerships that identify their roles in the larger conservation picture.*²¹

The Charles M. Russell NWR (CMR) is illustrative. Located in central Montana, the CMR is the second largest refuge in the lower 48 states, encompassing 1.1 million acres, including 150,000 acres of proposed or designated wilderness. The CMR represents a sizable block of Missouri Breaks ecotype surrounded by extensive tracts of short-grass prairie. Bighorn sheep, black-footed ferrets, and Greater Sage Grouse are three species of management importance on the refuge. The black-footed ferret is federally listed as endangered; the Greater Sage Grouse has been proposed as a candidate for listing under the Endangered Species Act, and the bighorn sheep is an important game species for Montana and other western states. The CMR provides important habitat for each of these species, yet even with its size, it cannot maintain viable populations of these species in isolation of the larger landscape in which it lies.

In a handful of cases, a refuge may hold an entire population or subpopulation of a species, as in the case of the Lange's metalmark butterfly, which is only found at the 55-acre Antioch Dunes NWR. In such cases, however, the species population may be so diminished, or the species so endemic, that its very survival is in question. Consider the case of the Masked Bobwhite on the Buenos Aires NWR in southeastern Arizona. Established in 1985 specifically for the protection and conservation of the Masked Bobwhite, the 118,000 acre refuge encompasses extensive tracts of semi-desert grasslands vital for a large number of plants and animals, yet may host fewer than five pairs of the Masked Bobwhite today.

Annual Habitat Management Planning at the Sacramento NWR: Every year before the spring work cycle begins the Refuge implements its annual planning process. This process involves all key refuge staff – including managers, biologists, visitor services, law enforcement and maintenance staff – traveling together to each of the refuge's more than 40 management units. While in the field, the team discusses the issues associated with each management unit, identifies the tasks to be undertaken over the coming year, and develops a list of priorities for the year. This activity can take several weeks to complete but has proven to be an excellent process for annual planning and for ensuring that the activities of all staff are coordinated to achieve common goals. Once the field-based planning is complete a detailed written workplan is developed. The annual workplan is used for developing individual performance goals, scheduling staff time, allocating the refuge's budget and for periodically monitoring and reviewing progress.

Habitat Planning: While Habitat Management Plans (HMPs) are clearly established in policy as a critical part of NWRS habitat management, 54% of respondents (162 of 303) to an MSI survey indicated that they did not have a HMP. RAPP reports only 20 % of refuge units reported that they had approved HMPs as prescribed in 620 FW1. Concerning an annual refuge work planning process, only 9% of respondents indicated that they produced an annual workplan that actually guided their annual activities and reporting of accomplishments (Table 9).

While a refuge may or may not have some form of HMP, its absence is not necessarily an indication that the refuge lacks a thoughtful habitat management approach. Conversely, a refuge may have a HMP but may not have the funds or staff to fully implement it. Evidence from the field visits suggest that individual

refuges have a clear understanding of the set of habitat management actions that need to be conducted whether or not a HMP is in place; however, the team also heard several examples of

²¹ *Conservation in Action Summit, Wildlife and Habitat Management*, U.S. Fish and Wildlife Service (2004).

habitat management actions and plans changing as a result of CCP planning processes. Rather than uncertainty on what needed to be done, the team found refuges constrained by staff shortages and budget constraints operating on the basis of what *could* be done within the larger set of what *should* be done. Quite simply, it appears that many refuges find themselves operating reactively to available budgets and pressing habitat needs rather than operating proactively under budget certainty and habitat management planning.

Table 9. Refuge Managers Survey (2007) – Annual Work Planning

“Which of the following best describes your annual work planning process?”	
We do not produce a formal written annual workplan - we work from what we did last year and available budget	11% (31)
We have an informal workplan, which loosely outlines anticipated activities and is discussed periodically at staff meetings	36% (105)
We produce an annual workplan that outlines items such as priority tasks, responsible staff, and implementation schedule – but available staff and budget dictate what we do	44% (130)
We produce an annual workplan that outlines items such as priority tasks, responsible staff, and implementation schedule – it guides our annual activities and reporting of accomplishments	9% (26)
Skipped the question	(20)

Inventory and Monitoring: The level of inventory and monitoring within the NWRS is clearly inadequate. Twenty-one percent of refuge units reported that they had approved wildlife inventory and monitoring plans in 2006, according to RAPP. Sixty-five percent of respondents to the MSI survey indicated that the level of biological monitoring and survey work was insufficient or mostly insufficient on their refuge. Only 33 of the 303 refuge manager respondents (11%) described their monitoring and survey work as mostly or fully sufficient. When asked to rate the level of survey and monitoring work presently being conducted, 41% stated it to be mostly or significantly less than that conducted five years prior. This observation was also consistent with field interviews conducted by the evaluation team. This stands in sharp contrast to Performance Measure 1.3, which reports that 107% of the needed wildlife inventory and monitoring

HAPET: Was established in 1987 to coordinate the annual USFWS Waterfowl Breeding Population and Production Survey. Since its inception, its mission has expanded to include strategic planning and evaluation for the full range of migratory birds occurring in the tall grass prairie portion of the U.S. Prairie Pothole Region. The HAPET, a part of the U.S. Fish and Wildlife Service’s (USFWS) Migratory Birds and State Programs, provides technical assistance to USFWS National Wildlife Refuge System and the Partners for Fish and Wildlife Program, as well as to a host of partners comprising the Prairie Pothole Joint Venture.

Objective: To work in partnerships, providing information and tools needed to conserve and restore landscapes to meet the habitat needs of wildlife and the environmental quality needs of humans while ensuring regional economic viability.

- Provide biological decision support through regional conservation planning
- Develop and apply models that relate bird populations to their habitats
- Integrate continental avian conservation initiatives through landscape design
- Assess the impacts of habitat management on bird populations
- Act as a liaison manager and researcher, insuring that management information needs are met and that research results are relevantly applied.

actions were actually completed in 2006. This is one example of the recurring theme of RAPP's failure to elicit accurate data and report meaningful information at a national level.

The 1998 FWS Biological Needs Assessment states that “existing baseline data on refuge biotic communities are inadequate for monitoring trends in those communities. Instead, [FWS staff] intensively manipulate refuge habitats without knowing the full complement of resources affected.”²² In 2001, CARE noted the NWRS' hindered ability to conduct proper monitoring and evaluation, stating that “refuge managers currently cannot conduct surveys, monitor or inventory the vast array of fish, wildlife and plants that inhabit refuge lands as directed by the [1997 Refuge Improvement Act].” Without this basic biological understanding of plant and animal communities, many other programs cannot be initiated.

In contrast to the RAPP and survey data that indicate that the level of monitoring and inventory work is inadequate, there is a great deal of effort going into developing improved monitoring processes and protocols. This effort includes the formation of a Biological Monitoring Team, which was initiated in 1997, as part of the *Promises* effort. This effort has produced several monitoring protocols for particular species and guilds, such as shorebird and marsh bird monitoring protocols.²³ It was unclear to the assessment team the degree to which these protocols are being used and consistently applied across the Refuge System. In addition, high-level support within the FWS has been voiced recently in support of agency-wide adoption of the Strategic Habitat Conservation Initiative (SHC), which is a landscape-level planning and monitoring system that seeks to identify the habitat needs of key species and then monitoring the development, management and adequacy of existing and new habitat. These efforts, including the RLGIS, while promising, are decentralized and it is not clear that a clear system-wide process will emerge from these efforts, or that the various efforts will be replicated, adequately resourced or coordinated between regions.

Refuge System Geographic Information System (RLGIS): The Refuge System has spent considerable time and effort developing a geographic information system to map and track habitat conditions.

RLGIS Purpose and Background: *RLGIS was developed to assist FWS managers and biologists in the collection, organization, and use of spatial data for their day-to-day management activities as well as the development and implementation of biological programs. Field Station managers and wildlife biologists within the National Wildlife Refuge System indicated a need to collect and manage spatial information in a consistent and effective manner. Based on the data requirements submitted by the field stations, regional GIS support staff developed the data structures, protocols, and applications for creating spatial data, populating databases and managing the resulting information. The product resulting from this effort was and is RLGIS.*

The roots of the RLGIS began in Region 3 in the late 1990's. This initial start was successful, but limited in scope and applicability to the NWRS as a whole. A subsequent review of the Region 3 start was conducted by Region 6 in 2001 and from it the early version of RLGIS was created.

²² Biological Needs Assessment, U.S. Fish and Wildlife Service (1998), page 10.

²³ The *Promises* process was a strategic planning effort that helped to focus Refuge System efforts on the accomplishment of objectives in the areas of wildlife and habitat, people and leadership, and resulted in the 1999 publication, *Fulfilling the Promise: The National Wildlife Refuge System*.

The early version of RLGIS was very successful and demonstrated how well the utility of a well designed and focused GIS tool could support day-to-day management activities and implementation of biological programs on field stations. In 2004, Regions 1, 2 and 6 organized the Spatial Information Management (SIM) team to develop a new RLGIS that would support Refuge Field Station needs across the 3 Regions; and in 2005, the initiative was expanded to include participation from all Regions.

*The implementation of RLGIS in Region 6 has demonstrated the utility of this tool to support field station resource management and decision support needs. RLGIS will allow users to collect information in a consistent and efficient manor and use that information to conduct spatial inventory and analysis. RLGIS can be implemented partially or completely by field stations. The pace and priority that RLGIS data is collected is determined by the field station.*²⁴

While a lot of effort has gone into RLGIS development, at this time there is not a formal, standard system for the collection, storage, and analysis of GIS data in the Refuge System. However, beginning in 2004, Regions 1, 2 and 6 began work on a single, "comprehensive" data model and toolset to support common refuge information needs. This effort eventually expanded to include all Regions and funding was provided from all regions to complete the development of the RLGIS data model and GIS tools within the existing FWS standard GIS software. The companion data model and tools were completed in February 2007 as a distributed system. Training materials and a web page were developed to provide resources for the various Regions to use to train their field personnel on the use of RLGIS. The development of RLGIS was and continues to be a bottom up approach in which field personnel provide the core development team with the information that the Field wished to store in a GIS concerning the NWR land units, features that exist on the units, and the management that is conducted on the units.

While RLGIS is not a national standard, it is available to all field personnel nationally, and training is being conducted in all regions as interest and opportunity arise. For example, in Region 6 where training support and RLGIS demands are high, 127 field personnel were trained in the usage of RLGIS in 2007. In Region 1 where training support is minimal and RLGIS interest is moderate, no training has taken place but training is scheduled for the next fiscal year. At the current time, NCTC does not offer RLGIS training, but the topic has been discussed and it is possible a future course may be developed.

Ongoing and future development of RLGIS continues on two fronts. A RAPP tool is currently being developed to harvest management related information from the RLGIS data model to provide the best available information to RAPP in an efficient manner. Additionally, the RLGIS data model and tools will be updated periodically beginning in December based on feedback from the field to accommodate information and process needs not addressed in earlier RLGIS versions.

Management: As indicated in Table 10, refuge managers were divided on their field station's ability to achieve their wildlife and habitat goals. Thirty five percent responded that their field station is not achieving the goal, 42% believed their field station is partially achieving the goal, and 24% responded that their station is mostly or fully achieving the goal. This finding is further reinforced by 65% of responding managers who reported that current staffing and budget were

²⁴ FWS/Refuge System intranet webpage, 2007.

insufficient to implement priority activities in their CCPs (with the assumption that the majority of priority activities identified in refuge CCPs have wildlife and habitat benefits).

Table 10. Refuge Managers Survey (2007) – Achievement of Goals

<i>Indicate the extent to which you feel your field station is achieving the following goal of the Refuge System: Conserve, manage, and where appropriate, restore fish, wildlife, and plant resources and their habitats to fulfill refuge purposes, trust resource responsibilities, and biological diversity/integrity.</i>				
1 Not Achieving	2 Mostly Not Achieving	3 Partially Achieving	4 Mostly Achieving	5 Fully Achieving
4%	31%	42%	20%	4%
35%		42%	24%	
314 responses received; 11 respondents skipped this question.				

The Cooperative Alliance for Refuge Enhancement (CARE) and other proponents of the NWRS have consistently voiced their concern that the NWRS represents “Conservation on a Shoestring.” The MSI evaluation team frequently encountered the concern in the field that refuge staffs were increasingly being asked to “do more with less.” According to benchmarking analysis conducted by Federal Management Partners, Inc., the NWRS has a smaller average staff size per field unit than other federal land management agencies. This affects the ability of refuges to provide for the degree of specialization that habitat management often requires, as well as the necessary monitoring and evaluation for effective adaptive management.

Speaking to the concept of strategic habitat conservation, the National Ecological Assessment Team notes that the “FWS has traditionally approached conservation with an emphasis on ‘more’ - more protection, more restoration, and more management.” The agency finds opportunities, takes action, and then reports on progress using standard measurements, such as number of acres, river miles, and funds expended. But a growing emphasis on landscape conservation required the agency to move away from activity-based conservation to the science of “how much more” and “where.” In examining ways that the NWRS can successfully address this mandate, a 2004 symposium made similar findings, specifically: 1) refuges need to carefully identify priorities as they will never have sufficient funding, staff, and capacity to conduct complete, robust, adaptive management pursuant to the integrity-diversity-health policy; and 2) refuges need to manage on a larger, more systematic scale to achieve the integrity-diversity-health goal than the traditional inside the refuge approach.²⁵

The National Ecological Assessment Team noted that the NWRS’ progress on protecting its biological assets is promising but inconsistent. The team concludes: “In many cases, we lead the conservation community, while in others we simply seek to keep pace with partners and stakeholders. To take the next step, we need an organizational response that uses the principles

²⁵ “Managing Biological Integrity, Diversity, and Environmental Health in the National Wildlife Refuges: An Introduction to the Symposium,” Robert Fischman and Vicky Meretsky, *Natural Resources Journal*, University of New Mexico School of Law 44(2004): page 941.

of adaptive management. Our conservation actions for federal trust resources should increasingly flow from a cycle of 1) Biological Planning, 2) Conservation Design, 3) Conservation Delivery, and 4) Monitoring and Research.”²⁶

As the intended outcome of planning, inventory and monitoring, and habitat management is not the mere completion of the actions but improved habitat and wildlife, their collective impact is found in the status of habitat and plant and animal populations.

Status of Habitat and Plant and Animal Populations: In the conterminous United States, 554 units of the NWRS are distributed unevenly across the landscape.²⁷ Four eco-region groups are the best represented (western rangelands, the Atlantic and Gulf coastal eco-regions, and northern grasslands) while 15 of the 84 eco-regions in the United States have no representation within the NWRS at all.²⁸ As Table 11 illustrates, the NWRS is representative of grasslands, shrublands, wetlands, and open water at, or above, their relative occurrence in the conterminous United States, but fall well behind in forest land representation.

Table 11. Percent Composition of NWRs versus the Conterminous United States

Land Cover	NWRs	Conterminous U.S.
Urban and Built-Up	0.35%	2.8%
Agricultural, Mining, Disturbed	7.0%	27.6%
Grassland	11.1%	9.4%
Shrubland	27.2%	12.3%
Deciduous Forest	3.9%	15.8%
Needleleaf Forest	5.4%	17.0%
Mixed Forest	1.2%	5.8%
Herb Wetlands	13.2%	1.7%
Wooded Wetlands	14.8%	3.8%
Water	13.7%	1.7%
Snow and Ice	0.0%	0.3%
Barren	2.2%	1.9%

Source: Scott et al, 2004

The size of refuges within the NWRS varies widely, ranging from the 0.6 acre Mille Lacs NWR unit in Wisconsin, to the 19.3 million acre Artic NWR in Alaska. To put the size of refuge lands

²⁶ *Strategic Habitat Conservation*, a report from the National Ecological Assessment Team, U.S. Geological Survey (2006), page 6.

²⁷ For purposes of consistency, in this report the number of refuges reported is 554, as this is the actual number listed on reference lists provided by FWS in late 2006. However, as of August, 2007, the number of refuges in the system is said to number 568.

²⁸ “National Wildlife Refuge System: Ecological Context and Integrity” J. Michael Scott, Thomas Loveland, Kevin Gergely, James Stritholt & Nancy Staus, *Natural Resources Journal*, University of New Mexico School of Law 44(2004): 1040-1066. Ecoregions as defined by James Omernik, *Ecoregions of the Conterminous United States*, 77 *Annals Assn. of American Geographers* 118 (1987).

into perspective, all 554 refuge units in the conterminous U.S. and Hawaii (19.021 million acres) would fit inside the Yukon Delta NWR in Alaska (19.162 million acres).

In the conterminous U.S, the average size of NWRs is 20,186 acres, but fully one-half of the NWRs are less than 5,550 (median size).²⁹ In concluding their ecological context assessment, Scott *et al* observed that “most refuges are too small to maintain viable populations of mid-sized carnivores and mid-to large sized herbivores, and fall short of what is required to maintain many ecological processes (e.g., fire disturbance regimes) and to sustain evolutionary processes.” To overcome these threats, refuge managers must build partnerships with adjacent landowners and develop cross-boundary programs that benefit all landowners while benefiting wildlife and enhancing ecological integrity.³⁰

RAPP tracks a number of indicators seeking to assess the status of habitats and associated fish, wildlife, and plants (Table 8). The primary method for refuges to report habitat condition is to rate their habitats through a three class system. Class 1 indicates acres in good condition and capable of meeting management objectives, while Class 2 or 3 indicates where needed management or restoration has been deferred due to lack of funds (Table 12).

Table 12. Definition of Refuge Condition Classes (RAPP Workbook, 2006)

Class 1A- No Management Needed	Acres of pristine/undisturbed habitat or simply acres that don't need active management. Examples include wilderness areas and much of the land in Alaska.
Class 1B–Receiving Needed Management	Acres which receive needed level of active management. Examples include acres farmed, grazed, burned, thinned, flooded, etc., and sufficient to maintain intended habitat function.
Class 2 – Management Needed, But Deferred	Acres which need active management, but are not receiving it due of lack of funds. Examples include moist soil impoundments not receiving needed disking, grasslands not receiving prescribed grazing, forested areas not receiving needed thinning, etc.
Class 3 – Restoration Needed, But Deferred	Acres which need restoration, but are not receiving it due to lack of funds. Compared to Class 2 acres, these acres need more drastic work such as restoring contour, restoring hydrology, re-planting vegetation, or wholesale removal of invasive species.

Alaska’s sixteen refuges report that 98% of their habitats were in Class 1 condition in 2006, with 74,965,379 acres classified as needing no active management and 192,581 acres receiving needed management in the 2006 RAPP. Examining the net change of habitat conditions, as reported by RAPP, 8.4 million acres were added to Class 1A habitats from 2005 to 2006, suggesting a change in habitat classification and/or reporting capability as opposed to a change in actual habitat condition (one more example of the need to exercise caution when using RAPP data).

²⁹ *Id* at 1049.

³⁰ *Id* at 1053.

For NWRs habitats outside of Alaska, 59% of the 18.9 million acres were reported as Class 1 in 2006. RAPP reported the addition of 1.68 million acres from Class 2 or 3 to Class 1 between 2005 and 2006. As in Alaska, this improvement likely reflects a change in habitat classification and/or reporting capability as well as a smaller change in actual habitat conditions.

Assuming RAPP data provides an overall indication of overall habitat conditions on NWRs outside of Alaska, 41% of refuge habitats, or 8 million acres, are in need of management and/or restoration to achieve habitat objectives. The negative impact of these degraded lands on the NWRs' ability to conserve fish, wildlife, and plant resources is not quantified. Nor are the lost opportunities of NWRs to fulfill their refuge purposes and trust resource responsibilities and to contribute to biological diversity and integrity measured.

Further, it should also be noted that, while RAPP tracks habitat condition by upland, wetland, and open water, all acres of habitat are not equal. Certain habitats are much more time intensive and expensive to manage and restore. There is a significant difference between the time and effort necessary to restore one acre of Longleaf Pine and one acre of Loblolly Pine, and there is a large differential in time and effort between restoring one acre of herb wetland through re-flooding and that of restoring forested wetlands from lands converted to agriculture. Given this, it is logical to assume that the "easier" habitats are those already in Class 1 condition, while the more complex, time-consuming and expensive habitat management and restoration acres – where proactive management has been deferred – are predominantly listed as Class 2 or 3. Similarly, certain habitats provide greater fish and wildlife benefits per acre than the benefits of other habitat types based on the habitat's relative abundance and nature of fish and wildlife species using them. While individual refuges may be in a position of quantifying these important factors, merely tabulating areas at the national level fails to be useful except as an extremely coarse filter for management.

On numerous occasions during the course of interviews, refuge biologists stressed that "an acre is not an acre," since burning one acre on one refuge is different than burning one acre on another, just as restoring one particular type of wetland is more difficult than another wetland in terms of effort, cost, time frame, etc. RAPP data ignore this distinction, placing an emphasis on measuring the number of acres relative to the size of the total refuge, rather than the conservation value of acres. As such, it may provide an incentive to target management actions toward land that can be most easily "improved." Table 13 illustrates the issue by summarizing habitat costs on a hypothetical refuge. Typical of many refuges, our hypothetical was originally established to provide nourishment for migratory waterfowl (cropland) but has important riparian forest and wetland habitats as well. Cropland and upland management are relatively inexpensive to bring under management, especially where the refuge and its partners have the capability to use mechanical, herbicide, and fire treatments. Management and restoration costs for the riparian and wetland habitats are likely to be substantially higher (again dependent on refuge and partner capabilities). From an integrity-diversity-health standpoint, improving the riparian and wetland acres are the highest priorities, but also incur the highest cost. Under RAPP, however, greatest improvement in overall habitat improvement can be achieved by attention to the cropland and uplands.

Table 13. Hypothetical Refuge Habitat Management & Restoration Costs

Habitat Type	Cropland	Upland	Riparian Forest	Wetland
Types of Rx needed	Tilling, fertilizer, herbicide, seeding	Mowing, herbicide, burning	Invasive plant removal, tree planting, purchase/leasing of water	Contouring, water enhancements, leasing of water
Cost of Rx/acre ³¹	\$10-1,000	\$10-1,500	\$500-10,000	\$2,000-50,000

In addition to the planning, inventory and monitoring, management, and condition status aspects described above, three additional aspects merit discussion here: refuge purposes, co-management, and islands of excellence.

Islands of Excellence: Assessed solely on the basis of land size; one-half of the refuge units in the NWRS are smaller than 5,000 acres – arguably too small to achieve biological integrity, contribute meaningfully to biological diversity, or protect their own environmental health. But such an assessment proves myopic, since it fails to recognize how these same units of the NWRS conserve small endemic populations occupying remnant habitats (e.g., Coachella Valley, Moapa Valley, and Guadalupe-Nipomo Dunes NWRs) or critical nesting areas for sea turtles and seabirds (e.g., Hobe Island, Sandy Point, Oregon Islands, and Farallon NWRs). Such an examination also fails to place many of these refuges inside the larger state-federal-international system of conservation lands – for example, Lost Lake NWR in the context of the larger Prairie Pothole Joint Venture, or the Colorado River WMA within the Lower Colorado Multi-Species Habitat Plan.

While many proponents of the NWRS seek a system of protected lands managed under a uniform set of management dictates, the inherent diversity of refuge lands, the purposes for which they were created, and the unique biological and sociological factors that govern them make this vision a difficult one to achieve. But this diversity becomes an asset, rather than a liability, when viewed as a source for innovation and management excellence. Recognizing the relatively small size of refuge units and associated ecological implications in the conterminous U.S. (Scott *et al*), a principal benefit of the NWRS is to serve as incubators of innovation and models of management excellence in developing practices that can be replicated across the larger landscape. Whether through good land tenure, technical assistance to neighboring landowners, or simply being a good neighbor, refuges can have an impact larger than their limited boundaries. From interviews conducted with state fish and wildlife agencies and others, it appears that many refuges do serve as islands of excellence. Fergus Falls WMA and the development of HAPET is one example of a refuge serving as an island of excellence (see SOG section on Strategic Growth). However, the refuge strategy does not include an explicit goal related to using refuges as catalysts to influence larger conservation landscapes, and there are no RAPP indicators that measure activity in this area.

³¹ Costs of habitat management and restoration vary widely based on a range of factors. Per acre costs provided here are extracted from FWS Partners in Fish and Wildlife projects and Katharine Wellman, *Understanding the Estimation and Uncertainty in the Cost of Ecosystem Restoration*, Battelle Seattle Research Station.

C. Conclusions

The principal components of the Refuge System's adaptive management process, as per the Biological Management Process defined in the Refuge System's strategy, are: 1) develop habitat goals and objectives (which is part of the CCP process); 2) habitat management planning; 3) management to achieve habitat objectives; 4) monitoring habitat and populations; 5) maintaining an inventory and monitoring database (including establishing baseline data). Conclusions for particular aspects of the Refuge System's adaptive management process follow.

Status of Habitat: As per the Refuge System's RAPP performance reporting system, 89% of refuge lands – 76.5 million acres – are in Class I condition, which means the land is receiving needed management action or does not require additional management action at this time. Alaska's sixteen refuges report that 98% of their habitats were in Class 1 condition in 2006, with 74,965,379 acres classified as needing no active management and 192,581 acres receiving needed management (as per 2006 RAPP data). Examining the net change of habitat conditions, as reported by RAPP, 8.4 million acres were added to Class 1A habitats from 2005 to 2006, suggesting a change in habitat classification and/or reporting capability as opposed to a change in actual habitat condition (an example of the need to exercise caution when using RAPP data).

For NWRS habitats outside of Alaska, 59% of the 18.9 million acres were reported as Class 1 in 2006. RAPP reported the addition of 1.68 million acres from Class 2 or 3 to Class 1 between 2005 and 2006. As in Alaska, this improvement likely reflects a change in habitat classification and/or reporting capability as well as a smaller change in improved habitat conditions.

Assuming RAPP data provides an overall indication of overall habitat conditions on NWRs outside of Alaska, 41% of refuge habitats, or 8 million acres, are in need of management and/or restoration to achieve the Refuge System's habitat objectives. The negative impact of these degraded lands on the NWRS' ability to conserve fish, wildlife, and plant resources is not quantified.

Habitat Management Planning: The Refuge System's emphasis on the development of Habitat Management Plans (HMPs) to guide the system's adaptive management process is not yet fully effective. This is a result of the fact that many refuges – 54% – do not have HMPs and that current funding is inadequate to properly implement an adaptive management process across the Refuge System.

Monitoring Habitat and Populations/Inventory and Monitoring: In order to operate an effective adaptive management system of wildlife refuges, the Refuge System must have the ability to conduct adequate inventory and monitoring. As a system, such capability is not in evidence. Only 11% of refuge managers surveyed indicated that current levels of monitoring and inventory work are mostly to fully sufficient to accomplish the Refuge System's mission. While budget and insufficient personnel appear to be primary reasons why inventory and monitoring work is insufficient, the absence of systematic standards and protocols is also a major contributing factor.

The Refuge System, however, does operate exemplary inventory and monitoring systems at numerous individual refuges – the HAPET system in Fergus Falls is one such example, as is the monitoring work being done at the Sacramento NWR. In both of these cases, systems are in

place to identify priority species goals, identify the habitat requirements to maintain or expand species populations, and test the impact of habitat management and restoration on species populations. A challenge for the Refuge System is to learn from and document what makes these systems successful (document best management practices) and then develop a process/protocols and allocate the resources to replicate the systems on a larger scale throughout the Refuge System. As appropriate, refuges in the same geospatial ecological regions should be encouraged to operate complementary or collaborative monitoring systems for key species.

The Refuge System has invested considerable time and effort into the development of specific monitoring systems and protocols. Such systems include the Refuge Lands Geographic Information System (RLGIS), which is most active in Region 6, and the development of particular species protocols by Biological Monitoring Teams, such as the shorebird and marsh bird protocols. While all of these efforts seem promising and useful, they have do not appear to have been adopted as standard monitoring processes across the Refuge System.

In addition, momentum is gathering within the FWS in support of implementing a Strategic Habitat Conservation Initiative (SHCI), which is a planning and monitoring system that is largely based on the work of HAPET and other similar efforts. While this initiative shows promise for helping the Refuge System improve its monitoring and inventory program, the operational implementation of this program remains somewhat vague. The practices, standards, processes, and organizational support that will be required to make this initiative effective have not yet been well defined or adequately resourced.

Management to Achieve Habitat Objectives: There is not sufficient data, or analysis of the data that does exist, to draw a conclusion as to the effectiveness of the Refuge System's habitat management and restoration activity. In part, the RAPP system was designed to provide information on habitat management effectiveness, but the information is not analyzed and is not presented in the context of overall system goals, targets, or needs. Of refuge managers surveyed, 77% indicated that they believe their refuge is not meeting, or is only partially meeting, its habitat management goals. A majority of refuge managers (65%) also feel that staffing and budgets are insufficient to achieve the priority goals in their CCPs.

As currently constructed, RAPP imposes a top-down set of reporting definitions that are not useful for refuge-level assessment as the level of detail is too general to inform specific actions. The current RAPP system for habitat management and restoration has the potential to usefully report on system-wide accomplishments but could benefit from some modification and increased effort toward interpretation and analysis. RAPP data are currently not receiving adequate quality control review and correction.

Influence of Scale/Islands of Excellence: Many refuges are too small to achieve biological integrity, contribute meaningfully to biological diversity, or protect their own environmental health by themselves – one-half of the refuge units in the NWRS are smaller than 5,000 acres. In order for the Refuge System's many smaller units to play a critical role in species conservation, they need to become fulcrums for influencing conservation actions in larger landscapes, either through becoming catalysts for habitat prioritization and land use, or through developing innovative habitat management practices and ensuring those practices are replicated in larger landscapes. It is not clear that the Refuge System currently places adequate emphasis on this role.

D. Recommendations

Hire Additional Biologists: As noted in the conclusion section, in part, the Refuge System is unable to fulfill its commitment to manage refuges using an adaptive management system because of a shortage of biologists (approximately 20% of the Refuge System's workforce are biologists). It is recommended that the Refuge System review the adequacy of its biology workforce as compared to system needs. For example, an assessment could be undertaken on the number of biologists that are required to implement currently approved CCPs versus the number of biologists now employed by those refuges. Such a study would provide a sense of the extent of the gap that currently exists. The White Paper produced for the *Conservation in Action Summit* recommended that biological teams be added to the top 50 refuges. An assessment should be undertaken to determine the degree that this has happened. Consideration should also be given to adding a performance measure on the adequacy of the biological workforce to RAPP reporting data under SOG 1.

Habitat Management Planning: A clarification should be made regarding whether detailed habitat management planning is incorporated into the CCP documents or becomes a separate stand-alone document – it is currently difficult to know the level of adequacy of habitat management planning as CCPs sometimes include habitat plans and sometimes do not.

The development and implementation of habitat management plans are one of several significant operational areas that appear to be under-resourced. Given the Refuge System's plethora of planning and management requirements, and a shortage of funding to do all that is required, it is probably worthwhile to:

- 1) Prioritize the planning and management actions that refuge managers are expected to undertake annually;
- 2) Differentiate management requirements as per refuge and staff sizes, so that smaller refuges can have more time and resources to focus on core activities (and be excused from select other functions) and enable larger refuges to take on an expanded role and focus on an increased number of biological and monitoring priorities; and
- 3) Better define regional biological priorities/objectives so that refuges can structure their activities to support these goals.

Inventory and Monitoring: As small budgets and limited staffs are unlikely to improve significantly in the near future, refuges need to carefully identify priorities within their capacity to conduct complete robust adaptive management pursuant to the integrity-diversity-health policy. The Refuge System should give consideration to developing a higher level of monitoring and inventory standardization among its refuges and, in part, focus those systems toward the management needs of regional priorities. At the current time, there is a substantial amount of monitoring and inventory work taking place but the effort has not been well coordinated or standardized. In addition, effort toward developing a system-wide geographic monitoring capability should be continued and provided increased emphasis (RLGIS).

Scale of Influence: As refuge appropriations represent only a small portion of the funding available for conservation, NWRs must continually engage and broaden partnerships with states,

tribes, federal agencies, and others to combine existing funding for priority projects and create new funding opportunities (see Partnerships section). Incentives, measurement systems, and planning processes should be developed to ensure that increased emphasis is given to the Refuge System's role in influencing larger conservation landscapes through planning leadership and developing habitat management approaches that can be replicated by others. This *beyond the boundaries* perspective is also required to conduct large scale planning and identify regional conservation priorities at the landscape level (as discussed under SOG 10 - Strategic Growth of the NWRS). Management actions and performance measures should be adopted to ensure this issue receives adequate emphasis and analysis.

SOG 2: Provide quality environments with adequate water – refuges/WMDs have clean air, water, and soils (meet federal and state standards) and they have ready access to adequate quantities of water to fulfill the purposes of each refuge and the mission of the NWRS.

Performance Rating: Unable to Evaluate	<p>This objective is rated “Unable to Evaluate” as a result of the limited information available against which to undertake an assessment of this strategic goal. It is recommended that the Refuge System work to develop a water management strategy and policy in order to provide increased support to water issues, including addressing issues of water rights, quality, and quantity.</p>
---	--

A. Context/Background

To maintain, enhance, or restore NWR systems and provide for the fish, wildlife, and plant resources they support, refuges must have access to clean air, clean water, and environments free of contaminants at concentrations that affect environmental health. Due to the nature of environmental quality problems, pursuit of this goal requires extensive coordination and cooperation with other entities.

Water: The Refuge System represents a richness of aquatic habitats that encompasses the salt marshes of Maryland’s Blackwater NWR, the desert oases of Ash Meadows NWR in Nevada, the prairie potholes of Minnesota’s Fergus Falls WMD, and the cypress swamps of the Great Dismal Swamp NWR in Virginia. Sonoran pronghorn depend on Cabeza Prieta NWR’s water catchments during increasingly frequent drought cycles in the desert Southwest, while a rich variety of waterfowl utilize refuge-managed wetland units throughout the United States for breeding, feeding, and migration. Adequate supplies of surface and subsurface water are crucial to nourish fish, wildlife, and plant populations. The NWRS faces a broad range of challenges in ensuring adequate water is available to refuge lands. The timing and duration of water availability and its flows is also essential, as are issues of water quality, as illustrated by the recurrent outbreaks of avian diseases at Sonny Bono Salton Sea NWR in southern California. The arid western states have long been concerned with adequate water delivery and flows, but this concern is arising increasingly throughout the country. Drought models for the southwestern United States are unanimous in their caution that the west faces a long-term drying trend (*LA Times*, April 6, 2007). The observation that “whiskey is for drinking, water is for fighting over” is more prescient today than when first attributed to Mark Twain in the late 1800s.

Some refuges manage their water within duly recognized and adequate water rights. Many others, however, are forced to rely on the actions of upstream and senior water rights holders for needed water. Others are the sink for agricultural drain waters or flood waters diverted from adjoining lands whose quality and quantity the refuge is powerless to control.

The NWRS states its intent to work with states on all matters related to water use and water rights and, to the maximum extent possible, to seek resolution of conflicts through negotiation in coordination with the Department of the Interior’s Office of the Solicitor. The Refuge System’s Strategic Plan points out that water needs are part of ongoing management needs and represent a vital element to be assessed during planning activities, such as with acquisition of new lands or

when Comprehensive Conservation Plans are prepared. Also, the Conservation in Action Summit identified attention to water quantity needs as a priority need.

Water quality monitoring is not normally completed by refuge staff, which generally relies on other entities to monitor water quality. Increasingly, state water boards are requiring refuges to monitor the water quality of water released from refuges. Refuges in California's central valley are currently developing management practices to meet these requirements. Refuge management options to alleviate water quality problems are often limited, as corrective actions on water quality issues generally require working cooperatively on a broader scale.

Table 14. Performance Measures (FY 2005-2010) and RAPP Reporting Data

Performance Measures	FY 05 RAPP	FY 06 Plan	FY 06 RAPP	FY 07 Plan	FY 08 Plan	FY 09 Plan	FY 10 Plan
2.3) Percent of refuge/WMD surface water acres that meet EPA approved water quality standards	87.0%	87.2%		87.4%	87.6%	87.8%	88.0%
	4,672,421	4,697,118		4,707,891	4,718,664	4,729,437	4,740,211
	5,386,603						
2.4) Percent of refuges/WMDs without documented water quality problems serious enough to trigger a 303d listing under the Clean Water Act	36.4%	36.2%	33.8%	36.0%	35.8%	35.6%	35.4%
	212	211	197	210	208	207	206
	582	582	582	582	582	582	582
2.5) Percent of refuges/WMD's free of other documented water quality problems (i.e. other than 303d listings)	18.6%	18.4%	17.5%	18.2%	18.0%	17.8%	17.6%
	108	107	102	106	105	104	102
	582	582	582	582	582	582	582
2.6) Number of surface or groundwater systems directly managed or influenced by refuges/WMD's	21,115	21,221		21,326	102	21,643	21,748
2.7) Percent refuges/WMD's that have conducted a baseline inventory of water resources necessary to support habitat and other management goals	25.6%	27.6%	35.1%	29.6%	31.6%	33.6%	35.6%
	149	161	204	172	102	196	207
	582	582	582	582	582	582	582
2.8) Percent of refuges where water rights are sufficiently protected to maintain use	48.8%	49.3%	51.2%	49.8%	50.3%	50.8%	51.3%
	284	287	298	290	293	296	299
	582	582	582	582	582	582	582

Air Quality: The Refuge System is responsible for protecting the air quality and air quality-related values of Wilderness areas from man-made air pollution. Polluted air injures wildlife and vegetation, acidifies water, degrades habitats, and impairs visibility. Pursuant to the Clean Air Act, the Service has an affirmative responsibility to protect air quality-related values on National Wildlife Refuges, in particular the 21 Class 1 Wilderness Areas within the Refuge System (see Map 1 on next page).³² FWS presently monitors air quality at 20 of the 21 Class 1 Wilderness areas. Very limited air quality monitoring or information is available on the NWRS outside of these areas.³³ Monitoring is also conducted on 48 Class 1 areas managed by the National Park System and 88 areas managed by the U.S. Forest Service (Map 2, page 51).

Concerns that man-made pollution was affecting visibility even in remote areas of the country arose in the mid-1970s. As part of the 1977 Clean Air Act Amendments, Congress determined that visibility in mandatory Class 1 areas required additional protective regulations and set as a national goal remedying existing visibility problems in Class 1 areas and preventing future impairments. Under the 1999 Regional Haze Rule, states must undertake appropriate actions to ensure that they reach “natural background conditions” in 60 years. That states must develop enforceable strategies to improve visibility on the haziest days, ensure no degradation occurs on the clearest days over the implementation period, and demonstrate their rate of improvement during each 10-15 year planning period is consistent with the glide path toward achieving natural background conditions.

Five multi-state regional planning organizations are currently working together to develop the technical basis for state plans.³⁴ FWS actively participates with each of these regional planning organizations. The first plans will appear in 2007 and will cover 10 to 15 years, with reassessment and revision of those goals and strategies to occur in 2018 and every 10 years thereafter. Once state plans are released, refuges with Class 1 airsheds will be able to report their monitoring against each state plan’s glide path. The states, federal agencies, and refuge managers will use data from the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to measure progress and set goals for their long-term strategies. The majority of Class 1 areas have IMPROVED monitors located in or near them, and these data are vital to the regional haze process and development of state plans.

³² Areas in excess of 5,000 acres formally designated as Wilderness prior to August, 1977.

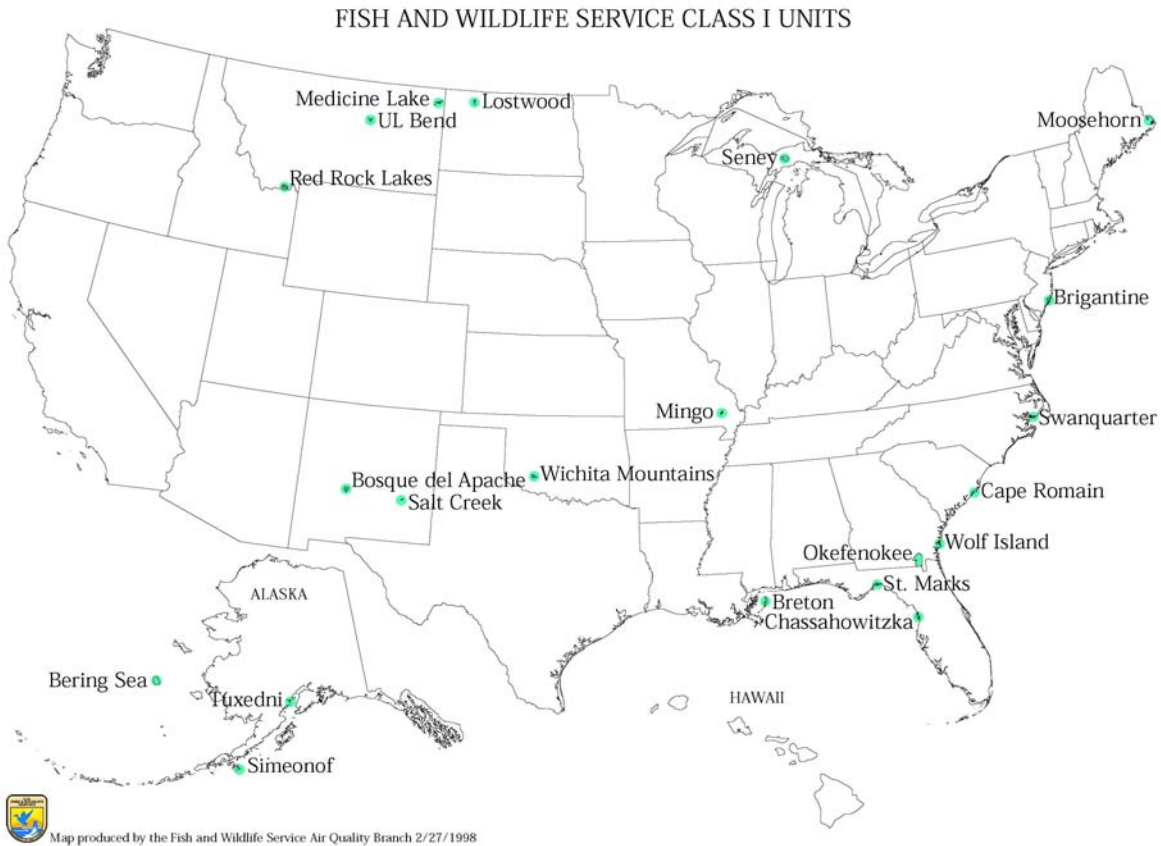
³³ Breton NWR’s monitor in Louisiana was destroyed by Hurricane Katrina in 2005 and has not been replaced.

³⁴ For additional information and links to the regional planning organizations’ see www.fws.gov/refuges/AirQuality/rhr.html

Table 15. Performance Measures (FY 2005-2010) and RAPP Reporting Data

Performance Measures	FY 05 RAPP	FY 06 Plan	FY 06 RAPP	FY 07 Plan	FY 08 Plan	FY 09 Plan	FY 10 Plan
2.1) Percent of 21 Class 1 Wilderness units that meet national ambient air quality standards	95%	95%	95%	95%	95%	95%	95%
	20	20	20	20	20	20	20
	21	21	21	21	21	21	21
2.2) Percent of 21 Class 1 Wilderness units that meet air quality visibility objectives	Numerator and percentage cannot be calculated until states establish their individual visibility standards.						
	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	21	21	21	21	21	21	21

Map 1: Class 1 Airsheds within the National Wildlife Refuge System



Contaminants: Impacts to refuges from contaminants range from large scale clean-ups of known contaminants such of those being remediated on the Rocky Mountain Arsenal in Colorado, to off-refuge contaminants that impact refuge lands through ground and surface waters (to name two pathways), to unknown contaminants that may be present on site from previous use and/or illegal dumping. Investigation and clean-up of contaminant problems are site-specific

with attendant issues of cost, jurisdictional authority and responsibility, risk analysis, and effectiveness of corrective actions to be resolved.

Refuge staff work closely with the FWS’ Division of Environmental Quality and other agencies to design and implement actions to clean up oil and hazardous material on refuge lands. Data collected in contaminant assessments is often used to secure compensation for resources lost or degraded by hazardous waste releases or spills. These efforts are part of the Natural Resource Damage Assessment and Restoration Program. FWS also takes part, through contaminants identification, assessment, planning, and restoration, in the Department of Interior’s National Irrigation Water Quality Program. FWS contaminant specialists are often called in by the EPA, U.S. Coast Guard, or various other federal or state agencies responsible for cleaning up a contaminated area to ensure that fish and wildlife and their habitat are adequately protected during, and upon completion, of the clean-up.

Table 16. Performance Measures (FY 2005-2010) and RAPP Reporting Data

Performance Measures	FY 05 RAPP	FY 06 Plan	FY 06 RAPP	FY 07 Plan	FY 08 Plan	FY 09 Plan	FY 10 Plan
2.9) Percent of known contaminated sites remediated during this fiscal year	13.6%	14.0%		16.3%	19.5%	24.3%	32.0%
	19	17		17	17	17	17
	140	121		104	87	70	53

B. Principal Findings

Some refuges are blessed with clean air, uncontaminated habitats, and clean and adequate water. Many are not. Site assessments and evaluations of air, contaminants, and water are highly variable across the NWRS making it difficult to determine performance as a single system.

Air Quality: The RAPP reporting data for air quality is presented below. Twenty of the 21 Class 1 airsheds meet air quality standards (the other is not being monitored at present)—the mark for basic human health. Conformity with air visibility standards (haze) awaits completion of state plans, beginning in 2007. NWRS Class 1 units are part of a larger federal wilderness system which, taken as a whole, provides an important regional and national monitoring network. See map at end of section on NPS and USDA-FS Class 1 areas. As state plans for regional haze are finalized and implemented, visibility trends for refuges with Class 1 airsheds will be measurable against state and regional glide paths. While air quality concerns are not limited to Class 1 airsheds, it appears to be the primary focus within the NWRS.

Air pollution in wilderness areas on refuges can come from a range of sources, including power plants, incinerators, automobiles, dust, and fires that can originate far beyond refuge boundaries or state borders. Strong regional cooperation and communications are required for maintaining and improving air quality as individual refuges can be threatened by actions outside state borders that affect air quality. For example, the air quality of Lostwood NWR’s wilderness area has been impaired by existing coal-fired power plants in the U.S. and Canada, while the construction of one or more coal-fired power plants in southern Illinois could further aggravate problems with

haze and deposition of contaminants like mercury, nitrates, and sulfates in Mingo NWR, in southeastern Missouri.³⁵

Table 17. RAPP Reporting Data – Air and Water Quality

RAPP: Air and Water Quality	NWRS Total		
	2005 Total	2006 Target	Variance
2.01) If the refuge has a Class 1 Wilderness Unit, does it meet or is expected to meet national ambient air quality standards?	20	20	0.00%
2.02) If the refuge has a Class 1 Wilderness Unit, does it meet or is expected to meet air quality visibility objectives?	0	0 ³⁶	0.00%

Water Quality and Quantity: The MSI survey of refuge managers found 76% of respondents reporting that their refuge had a sufficient quantity of water, of satisfactory quality, to meet refuge purposes. Responding to the question of water rights, 61% of respondents (who found the question of water rights applicable to their unit/s) reported that they had sufficient water rights to achieve refuge purposes. However, 79% of these same respondents indicated that, in their judgment, they had limited to no influence over factors affecting water quality and quantity on their refuge.

Table 18. Refuge Managers Survey (2007) – Water

Question/Response	1 Insufficient	2 Mostly Insufficient	3 Generally Sufficient	4 Mostly Sufficient	5 Fully Sufficient	N/A	Total Responses
Water Quality & Quantity: Does your refuge have a sufficient quantity of water, of satisfactory quality, to meet the purposes of the refuge?	9% (26)	14% (42)	29% (87)	13% (38)	29% (87)	6% (16)	N=299
Acquired Water Rights: Have you secured water rights sufficient to achieve the refuge’s purpose?	15% (44)	8% (24)	17% (51)	9% (26)	9% (27)	42% (124)	N=296

³⁵ Refuges at Risk, Defenders of Wildlife (2004 and 2005); Mingo National Wildlife Refuge, Draft Comprehensive Conservation Plan.

³⁶ RAPP data reported one but FWS Air Quality Branch Chief reports “0” since state plans not released.

Table 19. Refuge Managers Survey (2007) – Water

<i>In your judgment, to what extent does your field station have the ability to influence factors affecting water quality and quantity?</i>				
No Influence	Limited Influence	Substantial Influence	Complete or Near Complete Control	Skipped Question
17% (52)	62% (185)	18% (54)	3% (8)	(13)
79%		21%		

RAPP reported that 284 units of 582 (49%) had sufficient legal protection to maintain habitat and management goals. That a range of 49-71% of refuges appearing to have sufficient water and water rights for their mission is not an indication of success itself. Many refuges face critical water flow issues as well as water quality issues. For some refuges, water flow issues may hamper habitat quality, while other refuges experience water flow issues that render habitat useless for refuge purposes. In point of fact, the first NWR ever de-authorized, Winnemucca NWR, literally ceased to exist as a consequence of water diversions from a federal water project drying up its wetland habitats.³⁷ An unknown but significant number of refuges are likely to face increased water-related challenges to their mission in the future.

As water demands increase, especially in the western United States, the NWRS will face increased demand for unsecured water that refuges have traditionally relied on, as well as increased pressure on water that may be presently secured but of interest to other water users. For example, the Southern Nevada Water Authority (SNWA) is pursuing development of additional surface and groundwater resources in Northern Nevada and Utah to provide water to the Las Vegas metropolitan area. While SNWA faces a formidable set of challenges in securing access to such sources, this increased thirst for water throughout the arid West can have profound impacts on national wildlife refuges such as Moapa Valley NWR.³⁸

FWS states that with adoption of the Strategic Plan, data collection will begin on their water-related performance elements in a more systematic manner. For example, performance measures for adequate water will focus on identification, quantification, and adjudication of water rights throughout the NWRS. According to the 2005 RAPP, 149 refuges had conducted a baseline assessment of the water resources necessary to support habitat and other management goals. In 2006, the number reportedly increased to 399 (well above the stated target of 204). As with much of the RAPP's data, however, it is difficult to ascertain the nature of the change – be it improved reporting or increased water resource assessments.

Water – Refuge System Activity to Date: At various times over the past several years the Refuge System has emphasized the need to be more systematic to water issues and to give the issue increased attention. For example,

³⁷ Winnemucca Lake NWR was established in 1936 in part because of its status as a prime feeding area for white pelicans. Water diversions took place as part of the Newlands Project. Initiated in 1903, Newlands was the first Federal Reclamation project of its kind in the U.S. As a result, the overflow of Pyramid Lake ceased and Lake Winnemucca dried. The refuge was deauthorized in 1962 (Restoring America's Wildlife, FWS, 1987).

³⁸ Refuges at Risk, Defenders of Wildlife, 2004.

- Between 1990 and 1993 Congress recognized the need for the FWS to address water rights issues and to participate in state water rights adjudications. The Congressional focus was on the western U.S. and eventually about \$3.5 million was added to the FWS budget to address water rights issues. These funds were used to hire between four to eight hydrologists in the western FWS regions – 1, 2, 6 and 7. An FWS Western Water Rights Coordination Group was established to facilitate technology and knowledge transfer between regions.
- The Promises document identified water issues under the Wildlife and Habitat Recommendation Five: *Conduct comprehensive assessment of water rights*. As a Western Water Rights Coordination Group was already established, a decision was made to work through this group in conducting water rights assessments; however, the task of conducting comprehensive water rights assessments was never completed.
- At the Conservation in Action Summit, participants voted water rights to be a high priority action item requiring Refuge System attention. However, since the Summit, refuge budgets have declined and this initiative did not gain traction.

To date, there has not been a great deal of progress in documenting water rights and in conducting water rights assessments. In part, this is because the Refuge System does not appear to be staffed or structured to be able to address the issue. For example, the Refuge System has not defined the steps involved in measuring and cataloging water quality needs, nor is there anyone designated to lead this effort.

Table 20. RAPP Reporting Data – Water

RAPP: Water Number of NWR units = 582	NWRS Total		
	2005 Total	2006 Target	Variance
2.03) Is there a State, 303d-listed water on or adjacent to the refuge/WMD? ³⁹	212 (36%)	197	-7.61%
2.04) Other than 303d-listed waters, does the refuge/WMD have documented water quality problems with significant negative impacts to natural resources?	108 (19%)	102	-5.88%
2.05) Has the refuge/WMD conducted a baseline assessment of the water resources necessary to support habitat and other management goals?	149 (26%)	204	26.96%
2.06) Of those water resources identified as necessary to support habitat and other management goals, does the refuge have sufficient legal protection to maintain use?	284 of 582 (49%)	298 (51%)	4.70%

³⁹ Section 303(d) of the Clean Water Act requires states list waters for which technology-based limits alone do not ensure attainment of applicable water quality standards (the 303(d) list). EPA maintains list at <http://cfpub.epa.gov/surf/locate/index.cfm>.

Contaminants: RAPP contains a single question on contaminants related to refuges: the number of contaminated sites that the refuge is responsible for remediating that are not covered by some form of dedicated hazardous materials clean-up fund. In the 2005 RAPP, 378 such sites were identified by refuge management. The Strategic Plan calls for establishing a target percentage of known contaminated sites remediated annually – targeting 14% of total sites in FY 2006 and 32% in FY 2010. The Refuge System as a whole has demonstrated its ability to assess levels of contamination, large and small, and conduct the necessary remediation. In the case of many larger contaminated sites, the NWRS was aware of the contamination when it was transferred to the Refuge System from other federal agencies, such as the Department of Defense (e.g., Rocky Mountain Arsenal, Rocky Flats, Midway Atoll, Hanford Reserve, etc.). This has enabled the NWRS to seek necessary funding and assistance as part of the refuge designation. In other areas, illegal dumping and impacts from salts and other contaminants in irrigation drain waters are more difficult to quantify, and therefore to secure necessary funding for clean-up.

Absent additional data, it is impossible for the evaluation team to determine the overall success of the NWRS in addressing the level and effectiveness of remediation being conducted within the NWRS.

Table 21. RAPP Reporting Data – Contaminants

RAPP: Contaminants	NWRS Total		
	2005 Total	2006 Target	Variance
2.07) Number of contaminated sites not identified in Hazmat and Refuge Cleanup Funds	378	302	-25.17%

C. Conclusions

In general, the MSI evaluation team found it difficult to assess air and water conditions and the level of impact from contaminants at the NWRS level. The data collected by RAPP has limited value for assessment purposes due to the nature of data collected, the lack of consistency of data collected, and overall usefulness of the information collected. Three examples, displayed in Table 22, are illustrative of the difficulties encountered.

Table 22. RAPP Reporting Data – Air and Water Quality Data Limitations

Issue	2005 RAPP	2006 RAPP
Changed Indicator	2.03) 303d-listed waters = 197	2.04) On-refuge acres of State 303d-listed water = 488,398
Suspect Data	2.05) Water resource assessments conducted = 149 (2006 target = 204)	2.06) Water resource assessments conducted = 399
Usefulness of Information Collected	303d-listed waters as a NWR metric is of limited value since NWR has little control over designation and remediation, and the impact of these waters on the Refuge Mission is not quantified.	

Water: Many refuges face critical water flow concerns, as well as water quality issues. As regional demands for water rise, select refuges will face increased demand for water they already rely on, and increased difficulty in securing new sources. The NWRS is directed to be an advocate for its trust resources in the adjudication and allocation of water rights, but they face heavy competition for these water resources from a wide range of agricultural and development interests.

Overall, the Refuge System does not currently operate a well defined and structured water resources program, as there is a lack of guidance as to how refuges should be addressing water rights issues and what information should be collected. In addition, there is no individual or office designated to coordinate the program.

Air Quality: Along with other areas managed by the National Park Service and U.S. Forest Service, the Refuge System's 21 Class 1 airsheds provide an important national barometer for overall air quality and the nation's growing interest in air visibility. Continued strong cooperation with the National Park Service, U.S. Forest Service, and states will be critical for viable monitoring and development of appropriate solutions, especially in the current fiscal climate.

Contaminants: The evaluation team was unable to determine the adequacy of the Refuge System's management of contaminants.

D. Recommendations

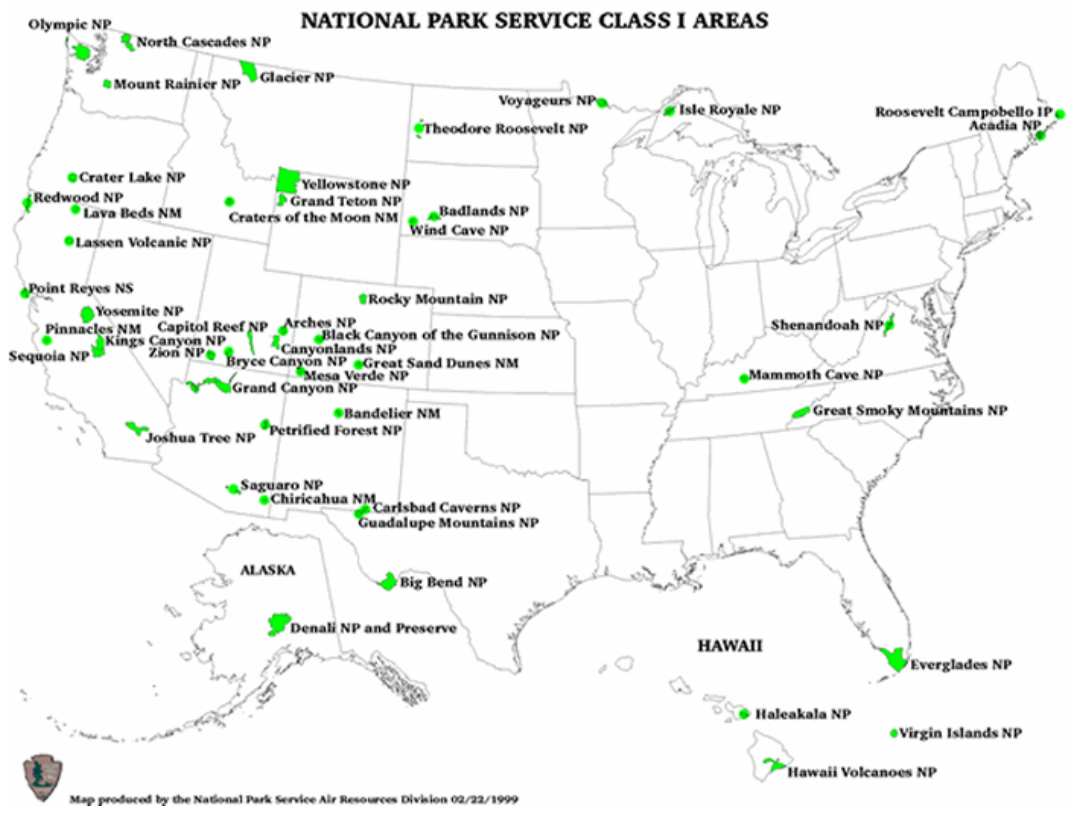
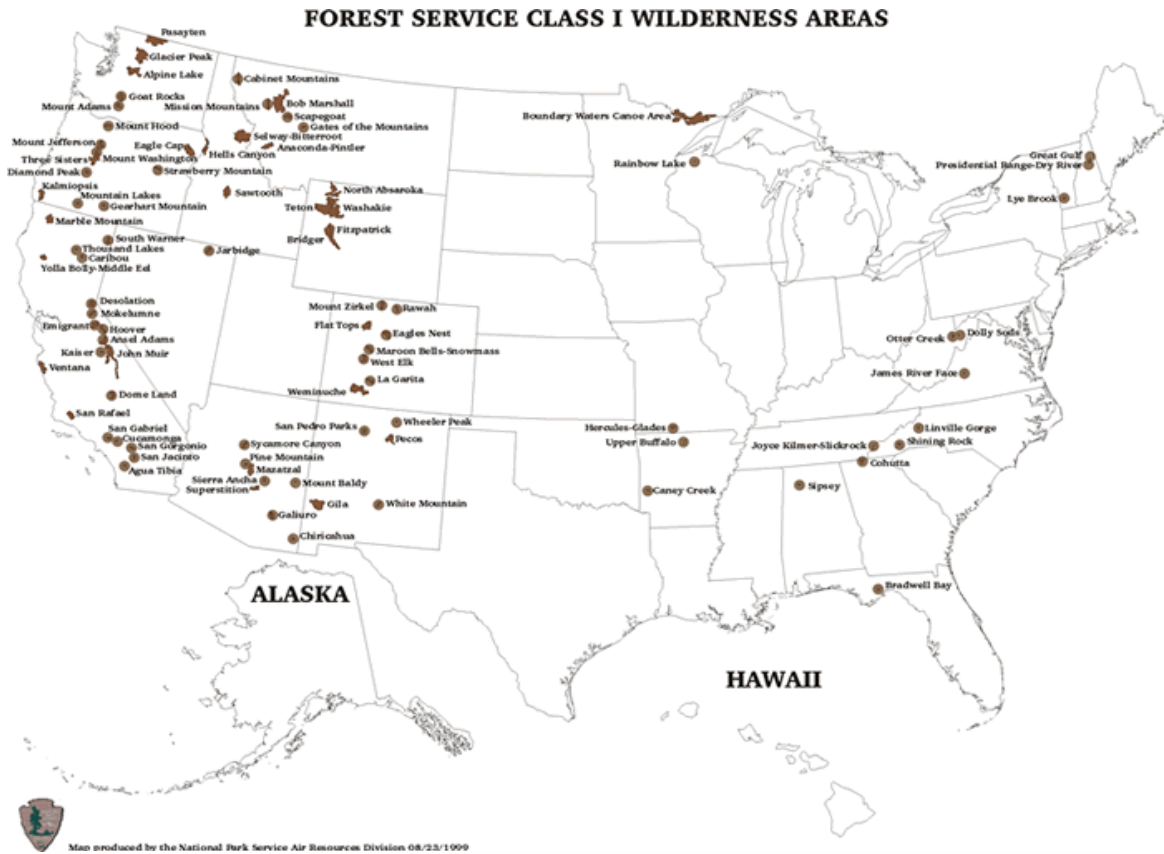
Develop a Water Strategy: The Refuge System should develop an overall strategy and management structure to more effectively assess and address water management issues. Steps to develop such a program would include:

- Appoint a Water Resources Coordinator, who would work full-time on Refuge System water rights issues.
- Develop a policy, or at least a defined process, for how refuges should assess water rights needs; define what information should be collected and how it should be catalogued; construct meaningful RAPP reporting measures, which will provide an indication of system progress; and develop an inventory of unresolved water impacts and required solutions by refuge unit.
- Convene a working group to better define the management of a water resources program.

In addition, the Refuge System should ensure that these issues are addressed in existing or pending CCPs and progress should be reviewed and reported on an annual basis.

Develop an Operational Water Management Program: Once an overall water management strategy is developed, the Refuge System should create a staffing structure and budget to support required implementation and support actions in this area.

Map 2: Class 1 Airsheds within the National Park and Forest System



SOG 3: Ensure that unique values of wilderness, other special designation areas, and cultural resources are protected.

<p>Performance Rating:</p> <p>Partially Effective</p>	<p>The Refuge System is currently operating under a 1986 Wilderness Policy, which needs to be updated in consideration of the 1997 RIA and to provide better guidance on the actions that are appropriate for managing wilderness areas. A new draft policy was developed and released for public comment in 2001, but the policy has never been finalized and the process that has been used to finalize the policy has been inefficient and lacks transparency. At this time, there is a lack of systems for managing or tracking wilderness lands system-wide; for example, there is no central repository of Wilderness Management Plans, no documentation on threats and violations to wilderness areas, and no information available on <i>minimum requirements analysis</i>, which are required of refuge managers to determine appropriate wilderness management actions. The NWRS, however, has supported the development of wilderness training courses and refuge managers overwhelmingly feel these courses have been effective in enabling them to acquire the skills necessary to manage wilderness areas. In addition, efforts are currently underway to support the development of an interagency wilderness monitoring protocol. Despite the shortcomings in policy development and information systems, the NWRS has successfully addressed the most important factor for managing wilderness areas: it has provided the training necessary to ensure most on-the-ground managers have adequate wilderness management skills.</p>
---	---

A. Context/Background

The Wilderness Act was established by Congress in 1964 and defines designated wilderness as follows:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

The characteristics key to wilderness include land that is untrammeled (free from man's control), undeveloped, natural, and that offers outstanding opportunities for solitude. Proposed wilderness and wilderness study areas are managed as de facto wilderness, as per draft FWS policy. The

NWRS contains about 20.7 million acres of wilderness, of which approximately 90%, or 18.6 million acres, is in Alaska. In addition, about 1.9 million of proposed acres of wilderness exist in the NWRS. The largest wilderness area in the Refuge System is the 8 million acres of the Arctic NWR, followed by 2.3 million acres in Alaska’s Togiak NWR. In the lower 48 states, the largest refuge wilderness areas are within the Cabeza Prieta (803,418 acres), Kofa (516,200 acres), and Okefenokee (353,981 acres) refuges.

NWRS wilderness areas comprise spectacular landscapes and are home to some of the highest concentrations of wildlife in North America. The Arctic NWR contains vast numbers of animals, including brown bears, wolves, musk oxen, Dall sheep, and a migratory caribou herd that numbers well over 100,000. The Alaska Maritime NWR, which stretches over a thousand miles into the Bering Sea, contains seabird populations that number up to 40 million. Georgia’s Okefenokee NWR, which is about 87% wilderness, includes a swamp that is rich in birdlife and is 38 miles in length and up to 25 miles wide. All of these refuges offer spectacular opportunities for solitude in untrammelled areas and are among the nation’s most treasured natural landscapes.

Table 23. Wilderness Acreage

Agency	Wilderness Acres	
	Acres	Percent of Total
Bureau of Land Management	7,796,837	7%
Fish & Wildlife Service	20,693,596	19%
Forest Service	35,372,522	33%
National Park Service	43,536,647	41%
<i>Source: Wilderness.net, 2007</i>		

NWRS Strategic Outcome Goal: The following description of the Strategic Outcome Goal is from the Strategic Plan for the National Wildlife Refuge System (December 2006):

In addition to being afforded protective status under the National Wildlife Refuge System Improvement Act of 1997, a number of areas within the Refuge System have been designated for unique natural resource values through legislation, executive orders, or policy. These areas are protected and managed with special attention given to the unique values and goals in their establishment documents. Special management areas incorporated in this strategic plan include Wilderness, Wild and Scenic Rivers, and Marine Managed Areas. Evaluation of potential designation of new special management sites is also included here.

Actions to improve stewardship of Wilderness Areas emerged as a priority at the Conservation in Action Summit.

Performance Measurement: Special designation areas will be monitored to determine whether they meet unique criteria in their authorizing legislation or documents. Cultural resources will be monitored to assure that they are adequately inventoried, protected from harm, and maintained in good condition.⁴⁰

⁴⁰ Final Strategic Plan for the National Wildlife Refuge System, FY 2006 –2010, US Fish and Wildlife Service, December 2006.

Specific performance measures listed in the RAPP related to wilderness management are identified in the table below.

Table 24. RAPP Performance Measures – Wilderness Management

SOG 3: Ensure that unique values of wilderness, other special designation areas, and cultural resources are protected			
Annual Performance Measures		FY 05	FY 06
3.1) % of Wilderness acres with wilderness character protected as prescribed in the Wilderness Act	Percent protected	88.47%	88.68%
	Acres protected	18,308,501	18,351,938
	Total wilderness acres	20,693,596	20,693,596
Note: This SOG, in addition to wilderness, covers other special designation areas, such as wild and scenic rivers and cultural resources. However, due to resource limitations the analysis in this report is limited to wilderness management.			

B. Principal Findings

Key findings related to the Wilderness SOG are presented below and are organized under the following issue areas: policy development, wilderness management planning and monitoring, and training.

Wilderness Policy Development: The NWRS currently operates under the 1986 Wilderness Stewardship Policy. This policy is outdated and does not provide refuge managers adequate guidance regarding permissible management actions. For example, the current policy does not adequately provide guidance on conducting *minimum requirements analysis*.

Minimum requirements analysis is a documented process used to determine the appropriateness of all actions affecting wilderness (NPS 1999). It is a two step process that documents 1) a determination as to whether or not a proposed management action is appropriate or necessary for the administration of the areas as wilderness, and does not pose a significant impact to the wilderness resources and character; and, 2) if the project is appropriate or necessary in wilderness, the selection of the management method that causes the least amount of impact to the physical resources and wilderness character.⁴¹

NWRS managers recognized in the late 1990s, after passage of the 1997 Refuge Improvement Act (RIA), that the Refuge System’s wilderness policy needed to be updated. The process to develop a new policy followed the FWS’ standard policy development process – that is, the initial draft policy was developed in-house by FWS specialists, circulated internally and within the regions for review and revision, and then released for public comment through the Federal Register process. The draft updated FWS Wilderness Policy was announced in the Federal Register in 2001 and made available for public comment.

Once the public review was concluded, a redrafting process began in which there was substantial involvement by state Fish and Game representatives. These representatives were working as

⁴¹ From the National Park Service, Wilderness Minimum Requirements Analysis.

members of an FWS policy consultative group under an Interagency Personnel Agreement (IPA) between the FWS and the Association for Fish and Wildlife Agencies.⁴² The states, through the IPA, have been given special opportunity to provide input into the policy as they are the only group that is mandated by law to manage wildlife and are thus a key partner and collaborator with the FWS. The IPA process was initiated by a Director's Order in December 2002 and has since been extended through a series of four amendments, with the latest amendment active through December 2007. The wilderness management policy has not yet been finalized or released for further review.

During interviews conducted for this evaluation, each of the national NGOs that track the wilderness issue, as well several senior FWS officials at the national and regional levels, raised the following concerns related to the process used to develop the wilderness policy:

- A lack of efficiency and transparency in the policy formulation process: in the six years since the policy was released for public review, the policy has not been approved and there have not been any additional versions released for review;
- Disproportionate state role and influence in policy development: the AFWA policy team was allowed the opportunity to make changes to the policy after internal FWS review and after the policy was released for public comment;
- Limited cooperation from senior FWS staff: national NGOs stated that there has been very little cooperation or sharing of information with regard to the status or development of the wilderness policy from higher Refuge System organizational levels and virtually no transparency related to the FWS' policy-making and decision processes.

Robert Fischman, a Professor of Law at Indiana University, has conducted an analysis of recent FWS policies. While he did not review the wilderness policy, as it has not yet been approved, he did have this to say about the FWS' use of its current policy development process:

While states are important, legitimate stakeholders in refuge policies, the timing of the IPAs and the post-comment revisions of the draft policies raise troubling questions. If states, which took the opportunity to comment on draft policies along with other interested parties, had a special avenue for advancing their agenda outside of the notice-and-comment process, then it would seem fair to provide other commenters with a similar opportunity or at least another chance to respond to the revised policies before final promulgation.⁴³

The current Comprehensive Conservation Policy requires that a wilderness review be conducted as part of the CCP development process. According to MSI's survey of refuge managers, 49% of managers said that there has been a wilderness review for the refuges they manage. Currently, per a Director's Memo, no wilderness reviews are being conducted in Alaska. This decision was based on FWS' expressed interest in avoiding a conflict between the current CCP Policy, which

⁴² This same IPA process was also used to provide input into the following policies which were issued in mid-2006: Mission and Goals and Refuge Purposes; Appropriate Refuge Uses; and Wildlife-dependent Recreation Uses.

⁴³ Fischman, Robert L., *From Words to Action: The Impact and Legal Status of the 2006 National Wildlife Refuge System Management Policies*; Stanford Environmental Law Journal, drafted November 19, 2006.

requires wilderness reviews as part of the CCP process, and the updated Wilderness Stewardship Policy, which has not yet been released or approved.

Wilderness Management Planning and Monitoring: Of the 312 responses received from the Refuge Managers Survey, 67 (about 22%) indicated that there is designated wilderness in the refuges they manage. The answers below are based on this group of respondents; i.e., those who manage wilderness areas.

- 28 respondents (44%) said they do not have a Wilderness Management Plan.
- Of the 30 respondents who provided an answer to the question “When was your wilderness plan approved?” 29 said before 1998, and one said in 2000.

In accordance with current policy, refuges that contain wilderness are supposed to develop Wilderness Management Plans. In some cases these may be step-down plans, and in other instances wilderness management direction may be adequately covered within a CCP. There is no central repository of Wilderness Management Plans within the Refuge System, and there has been no review as to the adequacy of existing plans – nor were such plans reviewed as part of this assessment. Since there has been no central review of wilderness plans, information is not available as to the adequacy or shortcomings of these plans, or the degree to which they are being implemented.

An inter-agency working group headed by the U.S. Forest Service and including the FWS, BLM, and NPS is currently developing a set of monitoring protocols to be used by all federal agencies that are responsible for managing wilderness areas. Contributions from FWS are funding this effort, which is expected to produce a draft monitoring protocol for review within the current calendar year. The working group is expected to develop indicators for the following focus areas:

- Vegetation condition;
- Infrastructure developments; and
- Authorized or unauthorized use.

Once developed, the FWS and the other federal agencies managing wilderness will have a standard process to assess wilderness quality in relation to the conditions called for by the Wilderness Act. Currently, the Refuge System does not have a standard process for collecting such information. The RAPP reporting system does collect information on the “percent of wilderness acres with wilderness characteristics protected,” but the Refuge System does not have, and has not developed, an operational definition of this indicator. In addition, and partially as a result, NWRS cannot explain why 12% of the wilderness lands within its system have reported that they are unable to meet this goal.

Monitoring of wilderness areas and conditions is currently overseen by refuge managers who make assessments and take actions based on their interpretation of the Wilderness Act and the NWRS’ 1986 Wilderness Stewardship Policy – currently, no policy guidance on conducting wilderness reviews exists and there is no central information database that tracks minimum requirements analysis. Minimum requirements determinations are formal determinations that must be documented in order to undertake any mechanized management actions in a wilderness

area. For example, in Okefenokee NWR, a minimum requirements determination has been made that allows the refuge to use motorized boats for water trail maintenance, as this is necessary to fulfill the purpose of the refuge and adequate trail maintenance would be impractical without the use of motor boats.

Without policy guidance or a database relevant to conducting minimum requirements analysis, there is no way, for example, for an individual refuge manager to know how many wilderness areas allow horseback riding and under what conditions it may be considered appropriate. Without such an information system, it is difficult for a manager to consider the experience of other refuges or for the Refuge System to develop consistent approaches. The NWRS plans to develop *minimum requirements analysis* guidance once the updated Wilderness Stewardship Policy is approved. It is not clear why NWRS has decided not to develop guidance or an information database of experience/practice prior to the promulgation of the updated Wilderness Policy.

It is also worth noting that actions to improve stewardship of Wilderness Areas emerged as a priority at the Conservation in Action Summit. However, it does not appear that any specific actions were taken subsequent to the Summit to increase attention given to wilderness issues.

Training: A series of well-developed wilderness management courses have been developed by the Federal Interagency Arthur Carhart National Wilderness Training Center, which was established in 1993 to “foster interagency excellence in wilderness stewardship by cultivating knowledgeable, skilled and capable wilderness managers and by improving public understanding of wilderness philosophy, values and processes.” According to its website:

The Carhart Center has grown from its original staff of one and a half Forest Service employees to an interagency staff of seven with representatives from the Bureau of Land Management, Fish & Wildlife Service, Forest Service and National Park Service. Each of these agencies contributes funding in support of the organization. Using an interagency team approach, the staff works with experts within and outside the agencies to develop comprehensive interagency solutions to critical wilderness stewardship issues. Achieving interagency staffing, funding, and product development has been and continues to be one of the most demanding, challenging and rewarding accomplishments of the Center.⁴⁴

The following responses were received from the Refuge Manager’s Survey regarding wilderness training:

- 64% of refuge managers who oversee wilderness in their refuge indicated they had completed the Carhart Center’s National Stewardship Wilderness Course, as is required by a Director’s Order;
- Of those completing the Carhart Center Wilderness training courses, 98% rated the courses *effective to fully effective* in providing the skills needed to manage wilderness (from the MSI Refuge Managers Survey), a full 20% of whom provided the highest possible score – that of *fully effective*.

⁴⁴ The Arthur Carhart National Wilderness Training Center, Who We Are, Website.

C. Conclusions

Policy Development: The current NWRS Wilderness Policy is outdated and needs to be revised and finalized. The process used by the Department of Interior to update its wilderness policy has been inefficient and has lacked transparency. The lack of an updated Wilderness Policy hinders the NWRS' ability to manage wilderness areas in a consistent manner and has prevented the establishment of clear guidelines for conducting minimum requirements analysis.

Wilderness Management Planning and Monitoring: The degree to which refuges have acceptable and consistent Wilderness Management Plans is unclear as there is no central repository of these plans and thus there is no way to review the adequacy of these plans on a system-wide basis. In addition, there is not sufficient monitoring data, or a sufficient monitoring system, to track the status and quality of wilderness conditions within the NWRS. However, effort is currently underway to develop an interagency wilderness monitoring system, and the NWRS has played a lead role in funding this effort. It is expected that monitoring protocols will be available for review sometime in the current calendar year. The RAPP system data do not appear to be of much value for understanding wilderness decisions or informing management decisions, nor is the data utilized other than for reporting.

Training: The NWRS has played a key role in supporting the Carhart National Wilderness Training Center and in developing and delivering wilderness training. Through this interagency approach, refuge managers are able to access high-quality wilderness training courses that provide them with the skills they need to manage wilderness areas. The training provided is considered to be effective and a majority of refuge managers responsible for managing wilderness areas have completed wilderness training (64% of refuge managers who manage wilderness areas indicated they have completed the required National Wilderness Stewardship Course).

D. Recommendations

Policy Development: Given the extended time period since the draft wilderness policy was released for public comment (about six years), it is recommended that the NWRS re-release the proposed wilderness policy for an additional round of public comment prior to its finalization.

Wilderness Management Planning and Monitoring: The NWRS should increase its ability to collect information on wilderness conditions, threats, and best practices, particularly regarding minimum requirements analysis. Once the new wilderness monitoring protocols are developed by the interagency coordination group, these indicators, or at least a sub-set of proposed indicators, should be considered as reporting measures for the RAPP system.

Training: The NWRS should continue to support the interagency training process being implemented through the Carhart National Wilderness Training Center. Additional effort should be made to ensure that a higher percentage of refuge managers who are responsible for managing wilderness areas are able to complete the National Wilderness Stewardship Course. The number of managers completing this course should be considered as a performance measure in this area (as part of a revised RAPP system).

SOG 4: Welcome and orient visitors.

Performance Rating:

Partially Effective

The NWRS operates its public use program based on a set of visitor use standards, including standards that focus on the orientation and welcoming of refuge visitors. Indications are that NWRS performance against these standards - which include, for example, guidelines for appearance and placement of signage, brochure and publication formats, and website design protocols - has been improving (RAPP data show that the number of field stations meeting each of seven related standards increased between 12% and 29% from 2005 to 2006). Despite these recent improvements, a substantial portion of refuges and wetland management districts are not currently meeting standards related to welcoming and orienting visitors. For example, depending on the data source, between 33% and 47% of field stations have inadequate or inappropriate signage. Similarly, approximately one-third of refuges have websites that do not meet NWRS standards, are not current, or are deemed by the relevant refuge manager to be insufficient. Somewhat in contrast to this general NWRS picture is the situation at high visitation refuges, and more specifically, high visit refuges with visitor centers and comparatively well-developed visitor programs. For this group of NWRS field stations, informative brochures and publications are readily available; signs are useful, adequate in number, and appropriate in placement; and visitor interactions with staff and volunteers are overwhelmingly positive - i.e., courteous and informative. On all of these factors, and a number of others, greater than 90% of surveyed visitors indicate strong performance by this specific category of refuges. In summary, the NWRS is moving in the right direction with regard to welcoming and orienting visitors, but it still has a ways to go.

A. Context/Background

During the earliest days of the refuges - prior to the formal designation of the National Wildlife Refuge System - public use of refuge lands was not a driving concern of refuge administration - e.g., the 1929 Migratory Bird Conservation Act stated that refuges should "serve as inviolate sanctuaries for migratory birds."⁴⁵ However, hunting and other public uses expanded throughout the 1940s and 50s, and by 1960 the Refuge System received approximately 11 million visitors a year (this compares to 38 million visitors to the Refuge System in 2006).⁴⁶ As public use expanded, relevant legislation established some general boundaries regarding the nature and extent of public use,⁴⁷ but little attention was paid to the provision of visitor services or to the definition and implementation of visitor service standards. In fact, the earliest reference to visitor service standards for the Refuge System that the MSI evaluation team was able to identify was found in the 1984 *Public Use Minimum Requirements Handbook*.

⁴⁵ Fischman, Robert L., *The National Wildlife Refuges: Coordinating a Conservation System Through Law*, pp 36-37.

⁴⁶ *Ibid*, pp 41.

⁴⁷ Both the 1962 Refuge Recreation Act and the 1966 Refuge Administration Act indicated that public use should be consistent with the objectives and purposes for which each individual refuge was established.

The attention paid by the Refuge System to the experience of visitors has shifted dramatically over the past ten years. The 1997 Refuge Improvement Act unequivocally establishes compatible public use as a focus of the Refuge System. With the explicit focus on public use, the RIA placed the full range of visitor experience – from the ease with which visitors access refuges to their experience interacting with a refuge’s resources (via hunting or wildlife observation, for example) - at the center of NWRS mission and purpose. Visitor satisfaction surveys, first administered in 2002, addressed all aspects of visitors’ interaction with the Refuge System and clearly evidenced the increased attention being paid by the NWRS to visitors.⁴⁸

As attention to visitors increased, the Refuge System identified two distinct visitor-related objectives. One of these objectives, to improve capabilities to welcome and orient visitors, has now been an explicit NWRS priority for more than five years. The 2004 Conservation in Action Summit identified this objective as a “high priority need” and noted specifically that the Refuge System should, “Standardize and make distinct our appearance and messages to make (the Refuge System) more welcoming to the public.⁴⁹” And as is evident by this section of the report, the NWRS has included the welcoming and orientation of refuge visitors as one of its core strategic goals for its current strategy, which runs through 2010.

It is useful to note that the Refuge System’s objective to welcome and orient visitors has shifted somewhat – or perhaps expanded – and now appears to incorporate several elements or aspects. These include:

- Getting visitors to the refuge: provide public information through numerous vehicles in order to facilitate the public’s awareness of a given refuge and, once aware of the refuge, provide sufficient information through directions, maps, and signage to ensure that visitors can physically find the refuge;
- Engaging the visitors once they arrive at the refuge: provide refuge-specific information through brochures and miscellaneous visitor center resources to help visitors understand the purpose and main characteristics of a given refuge and to allow visitors to better enjoy refuge resources (this is distinct from environmental interpretation);
- Creating a consistent and widely held identity of the NWRS: through the use of consistent messages and appearances in public outreach media and materials (publications, web sites, signage, information kiosks, etc.), create – and expand – a readily recognized public identity for the Refuge System;
- Interacting with visitors in a helpful, informative, and courteous manner: when welcoming visitors, answering visitors’ questions, or providing visitors with refuge information, always act in a friendly, professional, and polite manner.

⁴⁸ Visitor satisfaction surveys were conducted by the NWRS in 2002 and 2004. A 2006 survey was not conducted and no decisions have yet been made regarding future visitor surveys. Importantly, the surveys were not random surveys, but instead targeted high visitation refuges (with visitor centers). The findings and conclusions from the surveys, therefore, can only be applied to the “population” of high visitation refuges.

⁴⁹ Final Strategic Plan for the National Wildlife Refuge System: FY 2006-2010, U.S. Fish and Wildlife Service, December 2006. Appendix C, pp 30-31.

The Refuge System is pursuing this strategic goal and its specific component parts by defining relevant visitor service standards that are to be followed by all Refuge System field stations. These standards address, for example, publications (brochures, reports, and other paper and electronic documents), signage, websites, informational kiosks, etc. The narrative and the performance measures for this strategic goal, as presented in the current NWRS Strategic Plan, reflect this “standards-driven” approach. The relevant portions of the NWRS Strategic Plan are presented below.

Means and Strategies: *Refuge field stations have consistent messages and appearance so they are readily recognized by the public as a unit of the Refuge System. This gives visitors a clearer understanding of the Refuge System mission, the types of uses appropriate to these lands, and their ability to volunteer to assist with activities.*

This goal will be pursued through use of consistent messaging and appearance. For messaging, we will use common information themes at all levels that describe how the work of individual refuges fits within the overall framework of the entire Refuge System and accomplishment of the mission nation-wide. For appearance, System-wide standards have been established for readily observed physical elements of signs, boundaries, publications, and web-sites. Standards are to be unique to the Refuge System and consistently applied so that a brand identity is reinforced and the public can easily distinguish between the Refuge System and other land management entities.

The goal of improving capabilities to welcome and orient visitors was identified by the Conservation in Action Summit as a high priority need.

Performance Measurement: *Compliance with all standards is expected in order to provide multiple methods for the public to recognize Refuge System field units.⁵⁰*

⁵⁰ IBID, pp 36-37.

Table 25. RAPP Data for SOG #4 – Annual Performance Measures⁵¹

Performance Indicators	2005		2006		% Change 2005-2006 Actuals
	Planned	Actual	Planned	Actual ⁵²	
4.1) % of refuges/WMDs with adequate directional signs in place to help visitors find the refuge as prescribed in sign standards		47.6% (277 of 582)	57.6% (335 of 582)	53.4% (311 of 582)	12.2%
4.2) % of refuges/WMDs with adequate directional signs in place on the refuge to help orient visitors as prescribed in sign standards	-	51.5% (300 of 582)	63.2% (368 of 582)	60.5% (352 of 582)	17.5%
4.3) % of refuges/WMDs with ≥ 70% of directional, safety and interpretive signs in good condition	-	50.0% ⁵³ (291 of 582)	65.1% (379 of 582)	64.4% ⁵⁴ (375 of 582)	28.8%
4.4) % of refuges/WMDs with the standard entrance sign in place	-	57.0% (332 of 582)	68.7% (400 of 582)	63.6% (370 of 582)	11.6%
4.5) % of refuges/WMDs with ≥ 70% of boundary miles posted consistent with boundary standards	-	49.5% (288 of 582)	61.0% (355 of 582)	58.4% ⁵⁵ (340 of 582)	18.0%
4.6) % of refuges/WMDs with adequate supplies of general brochures that are up-to-date and follow established standards	-	47.8% (278 of 582)	62.9% (366 of 582)	55.5% (323 of 582)	16.1%
4.7) % of refuges/WMDs with a website that follows prescribed standards and is kept current	-	59.3% (345 of 582)	76.1% (443 of 582)	67.9% (395 of 582)	14.5%

The NWRS performance indicators for SOG 4 present two pictures of effectiveness. On the one hand, each performance indicator showed strong positive movement from 2005 to 2006, with annual increases ranging from a low of 11.6% to a high of 28.8%. On the other hand, as of 2006,

⁵¹ IBID, pp 38-39.

⁵² The denominator values for 2006 actuals are inconsistent with the denominator values presented in the 2006 RAPP Excel Sheet provided by NWRS to the MSI evaluation team. The denominators for the SOG 4 indicators presented RAPP Excel sheet vary from 577 to 597, depending on how the denominators are calculated (including or excluding missing observations).

⁵³ The 2005 values presented in the *Final Strategic Plan* for Performance Indicators 4.3, 4.4, 4.5, and 4.7 are incorrect. Each of these indicators presents a value of 51.5%, though completing the calculation using the numerator and denominator provided indicates that 51.5% is a correct value only for Performance Indicator 4.2. “Corrected” 2005 values for each of these indicators are presented above in Table 23.

⁵⁴ It appears the 2006 actual value for Performance Indicator 4.3 is not calculated correctly; i.e., the eighteen field stations that reported 70% of their signs are in good condition are not included in the numerator, as currently presented. When these field stations are included in the calculation, the 2006 value increases to 67.5% (393 of 582).

⁵⁵ Consistent with footnote #52, it appears the 2006 actual value for Performance Indicator 4.5 is calculated incorrectly. The 25 field stations that reported 70% of their boundary miles are posted correctly are not included in current indicator calculation. When they are included, the 2006 actual value increases to 62.7% (365 of 582).

between 35% and 45% of the field stations in the Refuge System were not meeting the selected basic visitor service standards indicated by the seven performance indicators. Of particular note, the Refuge System is projecting only modest annual improvements for these indicators over the next four years – in approximate terms; FY 2010 targets will still feature between 25% and 40% of field stations not meeting these visitor service standards.

The self-reported RAPP data is one source of information when looking at NWRS effectiveness in achieving SOG 4. The following discussion will provide some context to the RAPP numbers by presenting the broader set of findings that have been identified and examined by the MSI evaluation team.

B. Principal Findings

As noted above, the Refuge System’s approach to achieving SOG 4 has been to define and pursue standards that will, if widely followed, serve to better welcome and orient refuge visitors, particularly as described by the four standards outlined above. Though it is outside the scope of this evaluation to gather and analyze the full range of data that would allow for an independent assessment of the status of all related NWRS visitor service standards, it is possible to review several standards that are directly relevant to the achievement of SOG 4.

Getting Visitors to the Refuge: The standards most directly related to this component of SOG 4 address directional signage. The 2006 RAPP data for Performance Indicator 4.1, presented in Table 25, indicate that 46% of refuges and wetland management districts feel they do not have adequate signs in place to direct visitors to their field station “*as prescribed in (FWS) sign standards.*” It is not clear what sign standards apply to this indicator. Most standards in the FWS Sign Manual that relate to “advance notice signs” (these are the category of signs refuges use to guide visitors to refuge lands) address design considerations such as letter size and font, proper ordering of sign messages, and sign size. The sign manual does not provide guidance regarding how many advance notice signs to place, where and how frequently to place them, etc. In addition, the RAPP Workbook provides no guidance for determining whether directional signs (advanced notice signs) are or are not “adequate” to help potential visitors find a refuge or WMD. Therefore, the data for Performance Indicator 4.1 is difficult to interpret. At a minimum, we can say that, according to RAPP, a large portion of NWRS field stations feel signage is inadequate to get visitors to their front gate.

The RAPP numbers are illuminated somewhat by the 2007 MSI Refuge Managers Survey. Refuge managers were asked if their field station had adequate signage “to enable visitors to easily locate the refuge.” Sixty-eight percent of the refuge managers indicated that signage was generally to fully sufficient with regard to helping visitors find their refuge (See Table 26). This is a more “positive” number than is reflected by the RAPP data, but it still highlights the fact that, based on the opinion of NWRS field staff, at least one-third of refuges and wetland management districts do not have sufficient signage to facilitate visitor access to refuge units.

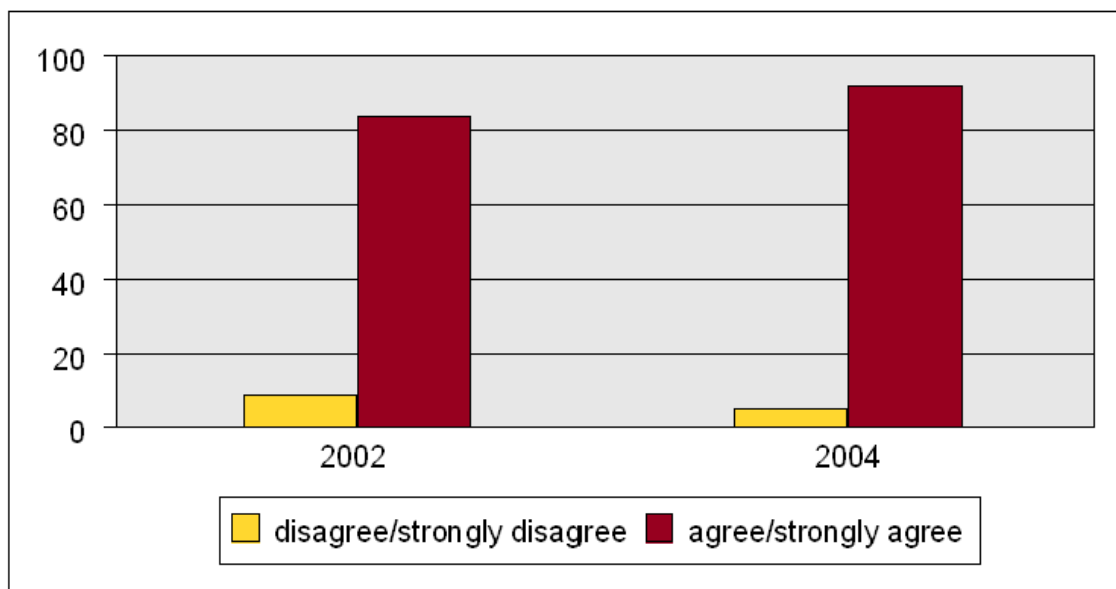
Table 26. Refuge Managers Survey (2007) – Facilitating Visitation through Signage

MSI Survey Data:	Level of Sufficiency				
	1 Insufficient	2	3 Generally Sufficient	4	5 Fully Sufficient
Does your refuge have sufficient signage to enable visitors to easily locate the refuge?	15%	17%	36%	18%	14%
	32%			32%	

Source: 2007 MSI Refuge Managers Survey, Question 26. 13 respondents skipped this survey question and 9 respondents indicated their field station “does not have this product” (this was an available response category).

Figure 6. Visitor Satisfaction Survey (2004) – Signage at High Visit Refuges

Percent agreeing/strongly agreeing that “Maps and/or signs made it easy for me to find the National Wildlife Refuge”



It is also useful to look at the data from the NWRS 2002 and 2004 Visitor Satisfaction Surveys. Both surveys examined visitor experience at high visitation refuges (at least 75,000 visitors per annum), and for this sub-population of refuges, visitors indicated they were well served by the existing directional signage.⁵⁶ As presented in Figure 6 above, over 91% of the respondents in the 2004 Visitor Satisfaction Survey agreed or strongly agreed with the statement, “Maps and/or signs made it easy for me to find the National Wildlife Refuge,” an increase from approximately 85% of respondents in the 2002 survey.⁵⁷

⁵⁶ A total of 43 refuges participated in the 2002 survey (3280 completed questionnaires) and 47 refuges in the 2004 survey (2,456 completed questionnaires).

⁵⁷ It is important to avoid making a direct comparison between the data from the visitor satisfaction surveys and the data from either MSI’s Refuge Managers Survey or the RAPP data. This is due to two considerations: the visitor

Signage is not the only means to facilitate visitor access to refuges. Refuge websites represent an important potential source of relevant and helpful contact information for potential refuge visitors. The MSI evaluation team conducted an analysis of the content and functionality of a sample population of NWRS websites. MSI drew a systematic random sample of 60 NWRS field station websites and then analyzed each website, targeting a set of website characteristics and functions that directly support the goal of welcoming and orienting refuge visitors. Some of the items reviewed for each website are required standards and some are not. The table below presents a summary of the portion of the MSI website analysis that is focused on facilitating visitor access to refuges.

Table 27. NWRS Website Analysis – Getting Visitors to the Refuge

Item – Contact Information	Frequency
Refuge Address	86% (50 of 58)
Refuge Phone Number	93% (54 of 58)
Directions to Refuge	52% (30 of 58)
Map (to assist in finding the refuge) ⁵⁸	48% (28 of 58)
“Contact Us” Information/Function (<i>Standard</i>)	86% (50 of 58)

Note: two of the sixty field stations included in the random sample do not have websites.

Perhaps the most surprising finding highlighted in Table 27 is the fact that approximately half of refuge websites do not include directions to help visitors get to the relevant refuge or WMD. Some of the websites that do not include directions do have maps with sufficient information and details to help visitors locate the refuge. However, fully 35% (20 of 58) of the sample of websites included neither directions nor maps.

Engaging Visitors at the Refuge: Refuges use several means to introduce visitors to the main characteristics of their refuge lands and programs – principal among these are brochures, videos, websites, and personal interaction. The scope of the evaluation did not allow for a comprehensive examination of this component of SOG 4, but it is possible to point to several relevant and important findings:

- Seventy-four percent of refuge managers indicate that their refuge either does not have a video/CD introducing the purpose and programs of the refuge, or if they do, it is inadequate (see Table 28 on the next page);

satisfaction surveys reflect only high visit refuges; and respondents to the visitor surveys are being asked about both maps and signs, whereas the MSI survey and the RAPP data focus on signs only. It is also worth noting that the respondents to the visitor satisfaction surveys are all people who found the refuge. It is not possible to know how many potential visitors tried and failed to find the refuge.

⁵⁸ Refuge maps that did not include sufficient information on local and area roads, i.e., that did not include information that would help visitors drive to the refuge, were not included in this count. Similarly, maps that required multiple clicks to find were also not included in this count.

- By contrast, 67% of refuge managers indicate their field stations have brochures that are generally to fully sufficient for explaining refuge purpose and programs (see Table 28 below);
- MSI’s website analysis indicates that 78% (45 of 58) of the assessed websites include information on the relevant refuge’s purpose or objectives;
- The same analysis shows that 78% (45 of 58) of the assessed websites include a description of the relevant refuge’s public use program.

Table 28. Refuge Managers Survey (2007) – Providing Refuge Information to Visitors

MSI Survey Data:	Do Not Have Product	Level of Sufficiency				
		1 Insufficient	2	3 Generally Sufficient	4	5 Fully Sufficient
Does your refuge have brochures that include information explaining the refuge’s purpose and its link to the NWRS?	4%	9%	11%	32%	25%	19%
		20%			44%	
Does your refuge have a video/CD to explain the refuge’s purpose and its link to the NWRS?	52%	15%	7%	12%	9%	4%
		22%			13%	
<i>Source: 2007 MSI Refuge Managers Survey, Question 26. 299 respondents to this question (13 respondents skipped this question).</i>						

When reviewing this component of SOG 4, it is also helpful to look at the 2002 and 2004 Visitor Satisfaction Surveys, remembering that this data reflect only high visitation refuges. As Table 29 makes clear, visitors to these refuges were able to easily access printed material about the refuge. In addition, visitors received helpful information about the refuge when directly interacting with refuge staff and volunteers.

Table 29. Visitor Satisfaction Surveys – Providing Refuge Information to Visitors

Survey Question	2002	2004
Printed information about this National Wildlife Refuge (e.g., maps and brochures) was easy to find.	90% (2447 of 2744)	94% (1919 of 2048)
Employees or volunteers answered my questions about this National Wildlife Refuge.	93% (2398 of 2587)	95% (1811 of 1898)
Employees or volunteers answered my questions about the National Wildlife Refuge System.	90% (1861 of 2077)	93% (1372 of 1473)
<i>% of respondents who agree or strongly agree</i>		

Use Consistent Messages and Appearance to Build Public Identity and Understanding: As is the case for the previously discussed component of SOG 4, brochures, websites, and videos/CDs are the main avenues through which the Refuge System pursues its objective to “use consistent messaging and appearance ... (to) describe how the work of individual refuges fits within the overall framework of the entire Refuge System and accomplishment of the mission nation-wide.⁵⁹” For this SOG 4 component, refuge websites, and the standards that guide the development of such websites, are a good place to begin our review. The current NWRS website standards focus predominantly on “administrative” and statutory items; i.e., those issues related to legal requirements, privacy concerns, and security protocols. Though there is little in terms of detailed guidance related to the *substance* that could or should be included on a refuge website, Chapters 3 and 4 of the February 2007 FWS’ *Draft Web Standards Handbook* outline several requirements that clearly should contribute to the achievement of this component of SOG 4. For example, the requirement that each refuge web page include the proper FWS logo, as well as multiple links “back” to the FWS homepage, should help to facilitate the development of a consistent FWS and NWRS identity with the public. Selected data from MSI’s refuge website analysis, as presented below in Table 30 provide additional relevant findings.

Table 30. NWRS Website Analysis – Consistent Messaging to Build a Public Identity

Item	Frequency
Statement or Description of NWRS Mission and/or Goals	16% (9 of 58)
NWRS Blue Goose Logo	66% (30 of 58)
FWS Logo with Link to FWS Home Page (<i>Standard</i>)⁶⁰	43% (25 of 58)
Footer with Prescribed Links to FWS, DOI and USA.gov (<i>Standard</i>)⁶¹	22% (13 of 58)
All Links on Website are Operable (<i>Standard</i>)	79% (46 of 58)

Websites are increasingly a principal source of information for the American public and seemingly an important avenue through which NWRS can present consistent messages and build a stronger public identity. Within this context, the following findings can be drawn from Table 30 above:

- Eighty-four percent of the sample of websites analyzed do not include a description of the mission and objectives of the overall Refuge System;

⁵⁹ Final Strategic Plan for the National Wildlife Refuge System: FY 2006-2010, U.S. Fish and Wildlife Service. December 2006, pp 19.

⁶⁰ Per FWS web standards, each web page should include the FWS logo, which should function as a link to the FWS home page. Virtually every refuge web page included the FWS logo, but in many cases the logo did not link to the FWS home page.

⁶¹ This number reflects footers that include all required elements/links and precisely match the standard footer format, and footers that are very close to matching required elements/links and format. The footers included on refuge web pages vary, and many include some of the required elements/links. However, unless a footer matched or as greatly

- Fewer than half of the sample websites include prescribed links to the home pages of FWS and DOI;
- The NWRS Blue Goose logo was not included on 34% (20 of 58) of the sample refuge websites, and for the websites that included an NWRS logo, two different Blue Goose logo formats were used;
- In addition to multiple NWRS logo formats, the refuge websites that were reviewed included an array of slogans, institutional logos, and depictions of the NWRS Blue Goose. A selection of these graphics is presented in Figure 7 on the next page.

Figure 7. Selection of Logos and Slogans from Refuge Websites



Beyond these specific findings, a broader observation is that refuge websites vary widely in content and format⁶². The evaluation team reviewed well in excess of 100 refuge websites during the course of the evaluation and, though an anecdotal finding, was struck by the dozens of different “looks” of refuge websites, as well as by the large differences in depth and nature of the content provided (though in a majority of cases, the refuge websites reviewed include quite limited substantive information).

With regard to brochures and videos/CDs, the evaluation can only offer anecdotal evidence for this component of SOG 4:

- All of the brochures collected during refuge and regional office visits by the evaluation team share a similar appearance – taken as a group, the brochures’ consistent appearance

⁶² The website of the National Wildlife Refuge System – i.e., the central website – includes data pages for each individual refuge. These data pages, which contain only basic demographic and descriptive information for each refuge - are similar in format. Virtually every refuge and WMD has developed its own website, independent of the data page on the central website. These refuge-specific websites, though they vary greatly, provide a much fuller set of information than the very simple data pages on the central Refuge System website. The analysis for this evaluation focused on the refuge websites, not the refuge data pages on the central NWRS website.

implies a single organization and system. However, content areas and topics covered by NWRS brochures vary from refuge to refuge and, at least for the small number of brochures reviewed by the evaluation team (approximately 20), the national level system and mission is rarely mentioned;

- The evaluation team was fortunate enough to review several outstanding videos and CDs during field visits to refuges. Similar to refuge brochures, however, the videos frequently did not touch upon the national mission and goals of the NWRS. In such cases, the relevant refuge was essentially presented as a single distinct unit, rather than as one unit of a larger system pursuing shared goals.

Interacting with Visitors in a Helpful, Informative and Courteous Manner: The evaluation data related to this component of SOG 4 are somewhat limited, but as the findings presented below make clear, the data are noteworthy in their strength and consistency.

- In the 2002 Visitor Satisfaction Survey of high visitation refuges, 96% of refuge visitors (2907 of 3019) agreed or strongly agreed with the statement, “Employees or volunteers were courteous.”
- In the 2004 Visitor Satisfaction Survey – also of high visitation refuges – 97% of refuge visitors (1982 of 2043) agreed or strongly agreed with the same statement.
- As noted above under the discussion of the second component of SOG 4, more than 90% of the respondents to both the 2002 and 2004 Visitor Surveys felt refuge employees or volunteers were able to answer their questions about the specific refuge they were visiting, as well as any questions they had about the Refuge System as a whole.
- The 2004 Visitor Satisfaction Survey asked visitors to provide feedback on their *overall* satisfaction with the service provided by employees or volunteers, and 97% of survey respondents indicated they agreed or strongly agreed with the statement, “Everything considered, I am satisfied with the service provided by the (refuge) employees or volunteers.”
- Though anecdotal, and recognizing the high likelihood of receiving particularly engaged attention, the evaluation team was nonetheless impressed by the professional, informative, and friendly assistance provided by virtually every refuge staff member, partner, and volunteer encountered during the conduct of this evaluation.

C. Conclusions

The Refuge System’s performance with regard to facilitating visitor access to refuges is uneven. Approximately one-third of NWRS websites include neither directions nor maps that would help visitors find specific refuges. Similarly, one-third of refuge managers feel signage is

insufficient in terms of helping visitors find their refuge or wetland management district⁶³. High visitation refuges may represent an exception to this situation – visitors to these refuges indicate signs and other materials have done a good job of helping them find the refuge they are visiting.

Related to the first conclusion, the current standards for signage and websites do not fully address this objective of the Refuge System. Sign standards provide little, if any, guidance regarding how off-refuge signs should be used and/or placed to facilitate visitor access to a refuge. Similarly, both the current and soon-to-be released FWS web standards include no requirement that refuges incorporate maps, directions, and other information that would assist individuals trying to visit a refuge or WMD (only a “contact us” function is required).

NWRS is reasonably effective in terms of informing and engaging refuge visitors but could easily improve its performance in this area. Brochures are generally informative and available at refuges, and refuge employees and volunteers are able to provide helpful and informative answers to visitor questions. However, videos and CDs – very engaging and effective means of providing information to refuge visitors - are substantially underutilized. The information provided on refuge websites is very inconsistent from refuge to refuge and frequently provides only the most basic information.

The NWRS is not, in many instances, consistent in its public messages or appearance. Refuge websites present perhaps the best illustration of this conclusion. Refuge websites vary widely in appearance, format, and content, and it is highly unlikely that a visitor to multiple NWRS websites would have the sense that they have just viewed the websites of entities within a single organization. By contrast, brochures and related published materials (e.g., maps) do present a common appearance and a single public identity.

As a corollary to the preceding conclusion, refuge websites are currently inconsistent in appearance, provide widely different types and levels of content, are not always updated, and are underutilized as a means of providing information and engaging the public. Many NWRS shortcomings related to SOG 4 could be at least partially addressed by improved and more consistent NWRS websites.

Refuge staffs are fully meeting the objective of interacting with visitors in a professional, courteous, and helpful manner.

D. Recommendations

Website Formats: Develop a single website format/architecture for each refuge and WMD website. A working team consisting of field, regional office, and Washington office staff should develop a website “template” that can be used by each NWRS field station to create refuge-specific websites. Though not intended to be an exhaustive list, any website template should at least include the following⁶⁴:

⁶³ During a workshop held after the conclusion of field level data collection by the evaluation team, Refuge System staff from both Washington and the field noted that state and county departments of transportation often pose a substantial constraint to the placement of directional signage on non-refuge roads.

⁶⁴ The Refuge System should review the format and content of the websites of other USG land management agencies to provide ideas and possible options for any revisions to the Refuge System websites. The website of the

- Use of the same logos and slogans (including placement);
- Presentation of maps and directions to help visitors find the refuge (i.e., not just maps of the refuge lands alone) and days/hours of operation;
- Description of the main elements of the public use program;
- Description of the refuge purpose and objectives; and
- Description of the national-level mission and goals of the NWRS.

There are several options available in terms of the approach used to manage specific refuge websites; however, the most efficient option would be to centralize the management function in a single office or under a single contract. Placing responsibility for website development and maintenance in a single office will help to ensure consistent format and appearance, will greatly facilitate development and rollout of new website features and options system-wide, and will increase the efficiency and effectiveness of on-going website maintenance. While a central website office would have responsibility for placing updated content on specific refuge websites (new content would be provided by each refuge), the Refuge System website “template” could include a page that would allow individual refuges to post refuge-specific information, e.g., upcoming public events, etc.⁶⁵

Video Production: Produce a high quality video presentation that describes the national mission and goals of the NWRS, as well as the principal programs and characteristics of the Refuge System. Distribute the video to all field stations and encourage its presentation at visitor centers, during school visits (at the refuge or in the schools themselves), at community meetings, etc. A summary clip from the complete video presentation should also be made available so that refuges can incorporate a brief piece on the national system in any refuge-specific videos they produce.

[Note: Subsequent to making this recommendation the assessment team was told that there is a national 11- minute video of the Refuge System that has been produced for use throughout the system. However, the team did not view this video and it was not available at any of the refuges visited during site visits, nor was it ever mentioned by field staff. Assuming the video does exist, and is current and of high quality, then it should be distributed and promoted for use at refuges, and particularly for use at refuges that have public facilities to show videos and have not produced their own video.]

Review and revise standards and guidance related to visitor services to more clearly support the achievement of SOG 4. For example, provide improved guidance related to the placement of off-refuge signs and, as per the first conclusion under this section, develop a website template with specific guidelines related to format and content.

Signage: Given that refuge field staffs have clearly identified both on- and off-refuge signage as a current need, the number of refuge (directional) signs should be increased.

⁶⁵ National Park Service – and the websites of each National Park – are particularly instructive. That is, the Park Service website format is exactly consistent for all Park Service units, but allows flexibility for content specific to each Park. Use of a consistent format has two obvious advantages: (1) it presents to the public a single institutional identity, and (2) it greatly increases the ease with which a user can navigate any individual website within the system and quickly locate the information they are interested in.

SOG 5: Provide quality wildlife-dependent recreation and education opportunities.

Performance Rating: Effective	The Refuge System has done a good job at expanding the number of refuges that offer wildlife-dependent recreation opportunities and, overall, the visitor satisfaction rate at refuges is very high –above 90% in the 2002 and 2004 surveys. Among the six mandated wildlife-dependent recreation activities, hunting, fishing, wildlife viewing, and photography programs are widely available and adequately run. The Refuge System needs to make a concerted effort to improve its environmental education and interpretive programs, as these programs are not well defined or supported and are not able to adequately meet public demand (as per refuge manager comments). The Refuge System has taken steps to begin to develop an environmental education strategy, but additional focus and resources are needed to give this program greater direction and effectiveness.
--	---

A. Context/Background

The following description of the Strategic Outcome Goal is from the Strategic Plan for the National Wildlife Refuge System (December 2006).

Means and Strategies: Public enjoyment of the Refuge System, consistent with its wildlife first mission, is provided wherever appropriate through adequate programs supporting the six priority uses of the Refuge System.

This strategy supports hosting an array of recreation and education opportunities that allow visitors to enjoy and appreciate America’s fish, wildlife, and plants as called for in the Refuge System Improvement Act. Wildlife-dependent recreation (wildlife observation, hunting, fishing, nature photography, environmental education (EE), and interpretation) is provided to the extent compatible with Refuge System and individual refuge purposes. When managed in accordance with principles of sound fish and wildlife management, fishing, hunting, wildlife observation, and EE in national wildlife refuges have been and continue to be generally compatible uses. Non-wildlife-dependent outdoor recreation (e.g., swimming, sunbathing, recreational boating, picnicking, camping) will be considered on a case-by-case basis. Also, not all refuges are suited to wildlife-dependent recreation or a particular type of wildlife-dependent recreation. All activities must be compatible with the mission of the Refuge System and the purposes of the individual refuge before they can be allowed. For example, a small refuge with fragile habitats for an endangered species may not lend itself to public use of any kind.

Hunting and fishing on refuges is a long standing traditional recreational use that will continue wherever feasible. Programs will be managed in such a way as to provide reasonable access and avoid problems such as overcrowding or other conflicts among users. Development and implementation of hunting and fishing programs is an area where especially close coordination is maintained with state fish and wildlife agencies. Hunting and fishing programs will be managed consistent with state laws and regulations to the extent practicable and compatible. We work closely with states in planning these activities so that our efforts complement one another.

The Refuge System seeks to provide visitors direct contact with the natural world wherever feasible and consistent with wildlife management goals. In providing for public use, limited impact facilities such as trails, boardwalks, observation platforms, and self-guided auto tour routes are delivery mechanisms that are preferred over the construction of large-scale visitor centers. Visitor centers are an appropriate mechanism for interpretational and educational activities; however, we seek to keep them modest in size and heavily supplemented by less facility-dependent trails, boardwalks, and interpretive kiosks.

The Refuge System strives for quality recreation and EE opportunities. This is tempered by practical considerations such as whether the quality of the experience and level of public interest allows efficient and effective use of funding and staff relative to the availability of similar opportunities at other locations. Quality components include adequacy of signage, brochures, and interpretive materials, adequacy and accessibility of recreational facilities, and availability of staff. User satisfaction with recreational opportunities is gauged through periodic use of formal surveys along with direct feedback and interaction with on-site staff. Availability of staff, to a large extent, determines interpretive activities that include talks, tours, staffed exhibits, demonstrations, and special events; and EE activities that involve structured classroom activities for teachers, students, or others. Professional workshops or structured instructional programs to learn bird watching, natural resource management, land stewardship, or wildlife management are also included. These activities are provided both on- and off-site to the extent they contribute to the accomplishment of the Refuge System goals. Teacher workshops are an especially effective mechanism to reach out to local school districts and provide a service that teachers can then relay to their students. Volunteers often play a significant role in these activities. These activities also encompass the management of entrance fees, various recreation user-fees, commercial visitor service permits, and concessions.

The Conservation in Action Summit identified EE as one of the highest future priorities for the Refuge System. The broader need of providing quality wildlife-dependent recreation was also identified. Both are associated with this strategic goal.

Performance Measurement: The number of refuges with programs for each of the six priority wildlife-dependent recreation uses, the quality of those programs, and the number of people participating in them is reported in the Refuge Annual Performance Planning module of the Refuge Management Information System. A customer service survey of visitors provides feedback on satisfaction with services and programs provided.⁶⁶

Specific performance measures reported in the RAPP can be seen in Table 31.

⁶⁶ Final Strategic Plan for the National Wildlife Refuge System, FY 2006 –2010, US Fish and Wildlife Service, December 2006.

Table 31. RAPP Performance Measures – SOG 5

Strategic Goal 5. Provide Quality Wildlife-Dependent Recreation and Education Opportunities		
Annual Performance Measure	FY 05	FY 06
	Actual	Actual
5.1) % of refuges that provide compatible wildlife-dependent recreation programs where compatibility determinations indicate such programs can exist.	N/A	90% 522/528
5.2) % of refuges/WMDs open to public visitation with a current Visitor Services Plan (minimum public use standard #1)	18.12% 85/463	24.95% 117/463
5.3a) where hunting is offered, % of refuges/WMDs that have quality hunting programs (minimum public use standard #3)	70.70% 253/358	76.50% 280/366
5.3b) total hunting visits	812,770	2,286,711
5.4a) where fishing is offered, % of refuges/WMDs that have quality fishing programs (minimum public use standard #4)	53.8% 189/351	59.4% 209/352
5.4b) total fishing visits	6,177,779	6,057,233
5.5a) where wildlife observation is offered, % of refuges/WMDs that have quality wildlife observation programs (minimum public use standard #5)	63.50%	69.77%
	297	330
	468	473
5.5b) total wildlife observation visits	23,380,889	24,498,107
5.6) where wildlife photography is offered, % of refuges/WMDs that have quality wildlife photography programs (minimum public use standard #5)	52.50%	58.85%
	234	266
	446	452
5.6b) total wildlife photography visits	5,814,736	5,466,819
5.7a) where EE is offered, % of refuges/WMDs that have quality EE programs (minimum public use standard #6)	64.40% 232/360	69.17% 258/373
5.7b) total EE visits	781,712	774,213
5.8a) where interpretation is offered, % of refuges/WMDs with quality interpretive programs (minimum public use standard #7)	61.60% 252/409	67.45% 286/424
5.8b) total interpretation visits	4,136,505	3,228,185
5.9a) where other recreational uses are compatible, % of refuges/WMDs open to other recreational uses (minimum public use standard #8)	45.70% 266/582	45.70% 266/582
5.9b) total visits in other recreational uses	11,711,018	10,579,329
5.10) # of acres made available for recreation	90,490,541	93,748,439
5.11) total facilitated visits	11,441,551	8,510,958
5.12) % of visitors satisfied with the wildlife-dependent recreation/education opportunities provided	85%	85%
5.13) % of recreation fee revenues spent annually on fee collection	15%	20%

B. Principal Findings

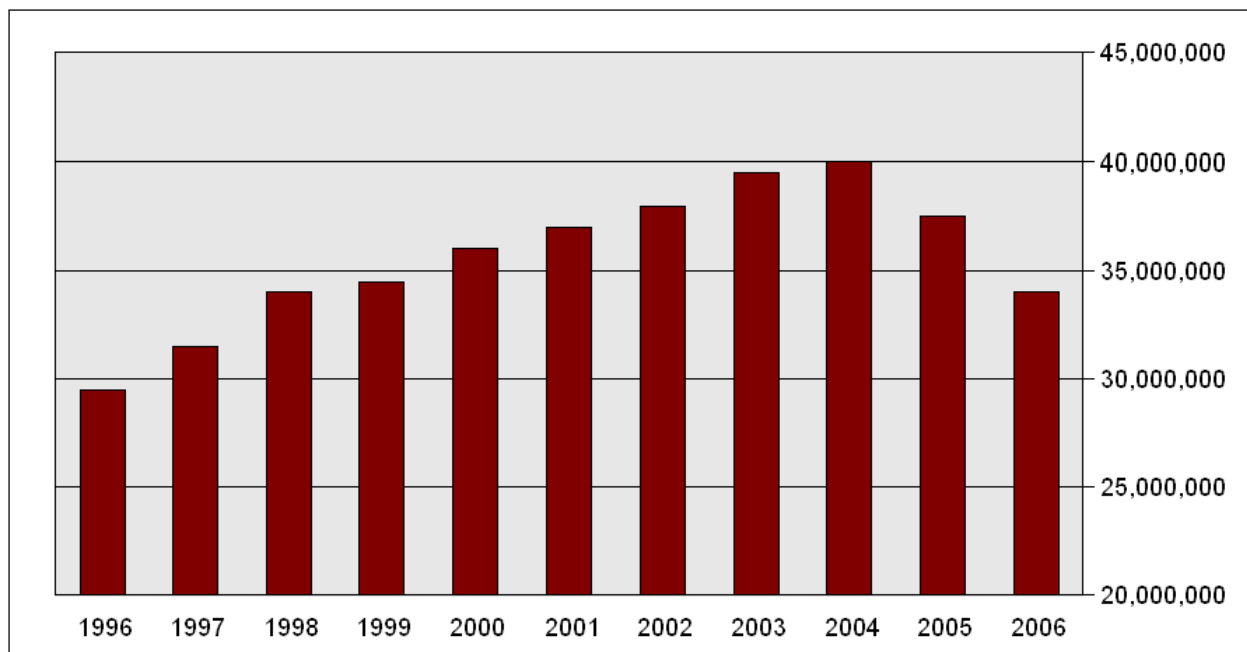
The National Wildlife Refuge System Improvement Act of 1997 identifies six wildlife-dependent priority uses for National Wildlife Refuges: hunting, fishing, photography, wildlife observation, interpretation, and EE. These six designated wildlife-dependent recreation activities are commonly referred to as the “Big 6.” These recreational uses are the only public uses that have been pre-defined as “appropriate” wildlife-dependent recreation; other uses, such as canoeing, may be considered appropriate on a case-by-case basis, but only if they are determined to be compatible with a refuge’s purpose and do not interfere with Big 6 activities. The Refuge System’s Wildlife-Dependent Recreation Policy requires that refuges strive to offer Big 6 public uses in cases when they do not interfere with a refuge’s primary purpose, which is to say that recreational uses must be compatible with an individual refuge’s wildlife and habitat objectives. The policy also states that Big 6 activities do not have to be offered if there is not sufficient staff and funding to do so.

This section begins with an overview of general visitor trends, which is followed by a discussion of the six specific wildlife-dependent recreation uses identified in the Refuge Improvement Act.

1. General Visitation and Overall Satisfaction

The following chart is a presentation of the numbers of annual visitors to the Refuge System.

Figure 8. NWRS Annual Visitors



Between 1996 and 2006 total visitors to the Refuge System increased by about 15%; however, the number of visitors peaked in 2004 and has since declined 15%. Between 2005 and 2006, visitation declined by about one million visits per year in Regions 1 and 4, increased by about a million visitors in Region 3, and stayed more or less level in other regions.

Two Refuge Visitor Satisfaction Surveys have been conducted in the past ten years – one in 2002 and one in 2004. MSI conducted the 2002 survey, which was based on survey data from 43 high visitation refuges; the survey was administered in the summer. The survey's principal conclusion was as follows:

The most important and most evident conclusion to take away from the survey data is that refuge visitors have a high level of satisfaction with regard to their refuge visits. **Slightly more than ninety percent of visitors reported satisfaction with their experiences at refuges and almost 90% indicated that they would likely visit a refuge again within two years.** Importantly, satisfaction was, to a large extent, consistent across all sub-populations. Similarly, the primary purpose of an individual's visit to a refuge, as well as the range of activities s/he participated in while at the refuge, had very little apparent impact on his or her satisfaction – in all cases, satisfaction was very high.

Similarly, a 2004 Visitor Satisfaction Survey also showed a high degree of general satisfaction among refuge visitors. This survey concluded:

Ninety-five percent of visitors at 47 refuges covered in the survey said they "agreed" or "strongly agreed" that they were satisfied with their experience. Respondents' overall satisfaction rating was a 4.48 on a 5.0 scale. Only two percent of respondents reported they were dissatisfied with their overall experience.

The 2004 survey was conducted from individuals who visited one of 50 participating National Wildlife Refuges from September 8 – October 27, 2004. To be considered for inclusion in the survey, refuges had to have the following: a visitor center, EE programs, annual visitation of more than 75,000 people, and full-time staff or volunteers (to distribute and supervise the survey). Out of the refuges that met these requirements, FWS selected the 50 that had the highest visitation.

It should be noted that while these 2002 and 2004 surveys provide useful information on general visitor satisfaction rates, both surveys had the following limitations: 1) the surveys were conducted only at the Refuge System's most highly visited refuges, which are refuges that are likely to be better staffed and have the most comprehensive facilities; and 2) the surveys targeted general visitors rather than the users of specialized services; for example, the 2002 survey was not conducted during hunting season and therefore is not likely to be instructive on the levels of satisfaction of hunters. Neither survey provided an in-depth review of the EE program.

The 2007 MSI Refuge Manager Survey asked the following question on the degree to which the Refuge System is achieving its wildlife-dependent recreation goal.

Table 32. Refuge Managers Survey (2007) – Wildlife-Dependent Recreation Goal

Refuge Goal: Provide quality wildlife-dependent recreation and education opportunities, including, wildlife observation, hunting, fishing, nature photography, interpretation and EE.	1 Not Achieving	2	3	4	5 Fully Achieving
	6%	22%	40%	28%	4%

Refuge managers felt the Refuge System is doing an “average” job of achieving this goal – with approximately equal numbers of respondents feeling that performance leaned toward “not achieving” as those who felt the goal was being “fully achieved” – with most responses in the middle, or average/medium, achievement range.

Policy: The work of the NWRS Recreation Program is guided by the Wildlife-Dependent Recreation Policy, which was published in July 2006. The policy states:

“The National Wildlife Refuge System Improvement Act of 1997...defines and established that compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and EE and interpretation) are the priority general public uses of the Refuge System and will receive enhanced and priority consideration in refuge planning and management over other general public uses.

The Wildlife-Dependent Recreation Policy is fairly non-specific in terms of how activities should be structured, or what should be emphasized, but it does emphasize the following:

- There should be diligent monitoring of the impact of recreational uses on wildlife;
- Refuges should work collaboratively with states, tribes, schools, and others in the design of their programs; and
- To the extent practical, the wildlife-dependent recreation programs should be consistent with state laws.

The policy does not distinguish as to the type of recreation activities that the system should promote. The Wildlife-Dependent Recreation Policy includes a chapter on each of the Big 6 uses, but, for the most part, these chapters appear to be copy-and-paste duplications of one another which are fairly generic and do not provide guidance as to the types of programs that should be offered or a strategy to do so.

The first chapter of the policy, “General Guidance,” states that it “provides Service policies, strategies and requirements concerning the management of wildlife-dependent recreation programs within the Refuge System.” However, there are no strategies or objectives put forward in the policy, nor do they exist elsewhere.

Visitor Services Plans: The key element for defining what recreational uses will be allowed on a refuge is the Visitor Services Plan. This plan is required as a CCP step-down plan and may be incorporated into a CCP or produced as a stand-alone document. The development of a CCP and/or Visitors Services Plan is the process by which allowed recreational uses on the refuge are

identified and approved, including Big 6 recreational uses, and the extent and limits of allowed uses are defined.

The NWRS Recreational Use Policy Guidance (July 26, 2006) states:

The VSP is usually a step-down management plan of the refuge's CCP and is the overarching document for providing visitor services in the Refuge System. This plan is an integrated analysis of all applicable aspects of visitor service programs on a refuge. Generally, a refuge is opened to wildlife-dependent recreation by submitting a VSP covering all proposed uses and any other appropriate documents to the Regional/CNO office. The Regional Director/CNO Manager reviews and approves the plan, and the Regional/CNO coordinator forwards a copy of these documents to the Refuge System Headquarters office (Headquarters).

... (1) Elements of the VSP. The development of this plan must follow all appropriate NEPA guidelines, contain the required NEPA documentation and decision document, and, if necessary, contain the ESA section 7 consultation. Additionally, it must include compatibility determinations on any wildlife-dependent recreation programs. If the refuge has not yet completed a CCP, we consider the VSP a stand-alone document until completion of the CCP, and then we reevaluate and incorporate the uses into the CCP. When a refuge develops a VSP, we incorporate existing refuge hunting and fishing plans and any other visitor services plans into the VSP. The VSP must provide documentation of the wildlife-dependent recreation allowed on a refuge, including the relationship of wildlife-dependent recreation to refuge purpose(s), goals, objectives, and the Refuge System mission. Exhibit 1 contains an example of a VSP outline.

In response to the question, "Does your refuge have a Visitors Services Plan?"

- Sixty-four percent of refuge managers said they do not have a Visitors Services Plan;
- Thirty-six percent indicated they do have a Visitors Services Plan; however, of these, 42% were produced in 2000 or earlier.

Only about 20% of refuge managers indicated that they have a VSP that has been developed in the past five years. NWRS policy is not specific on how often Visitor Services Plans need to be reviewed and updated; however, from the above data, it can be seen that a relatively small portion of refuges have recently-developed Visitor Services Plans.

The Conservation in Action Summit, which was held in 2004, developed a series of recommendations for each of the Refuge System's principal areas of operation. The number three priority recommendation within the area of wildlife-dependent recreation was as follows: "Involving our partners, develop comprehensive Visitor Service Plans that identify appropriate recreational activities, partners and funding needs and opportunities." As far as the evaluation team is aware, Visitor Services Plans are not collected in a central repository nor has there been any system-wide review of the adequacy of Visitor Service Plans.

Washington Office Structure: The Washington Visitor Services Division is divided into several offices, which include specialized positions and offices to manage communications, friends groups, the Uniform Program, Fees, and Visitor Satisfaction. The following specialist/program coordinator positions also exist but are currently vacant: hunting, birding, wildlife photography, interpretation, and EE. The EE position is a relatively new position that was created within the past year but has not yet been advertised or staffed. Regional offices also have visitor service specialists; for example, two visitor services positions exist in Atlanta and Albuquerque and one in Sacramento, but the qualifications and focus of those positions vary by region.

Quality Assessment: The Refuge System measures (in RAPP) the number of refuges offering each of the Big 6 recreational uses and provides each activity at each refuge a quality rating. A refuge is considered to have a “quality” recreational program if 8-11 of the following criteria are met:

- Promotes safety of participants, other visitors, and facilities;
- Promotes compliance with applicable laws and regulations and responsible behavior;
- Minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan;
- Minimizes or eliminates conflicts with other compatible wildlife-dependent recreation;
- Minimizes conflicts with neighboring landowners;
- Promotes accessibility and availability to a broad spectrum of the American people;
- Promotes resource stewardship and conservation;
- Promotes public understanding and increases public appreciation of America’s natural resources and our role in managing and protecting these resources;
- Provides reliable/reasonable opportunities to experience wildlife;
- Uses facilities that are accessible and blend into the natural setting; and
- Uses visitor satisfaction to help define and evaluate programs.

As per RAPP data, the following are the percentage of Big 6 recreation programs that are considered to be “quality” programs.

Table 33. RAPP Reporting Data – Wildlife-Dependent Recreation

	2005	2006
Where hunting is offered, % of refuges/WMDs that have quality hunting programs	70.7%	76.5%
Where fishing is offered, % of refuges/WMDs that have quality fishing programs	53.8%	59.4%
Where wildlife observation is offered, % of refuges/WMDs that have quality wildlife observation programs	63.5%	69.8%
Where wildlife photography is offered, % of refuges/WMDs that have quality wildlife photography programs	52.5%	58.9%
Where EE is offered, % of refuges/WMDs that have quality EE programs	64.4%	69.2%
Where interpretation is offered, % of refuges/WMDs with quality interpretive programs	61.6%	67.5%

The RAPP data indicate that between 2005 and 2006 the quality of each of the six wildlife-dependent recreational programs has improved. However, the above ratings on the proportion of refuges that offer “quality” recreational programs are determined by self-assessments conducted by refuge staff. The evaluation team is unaware of any system-wide performance reviews of recreational programs that are based on independent assessments or user surveys, although some individual refuges have undertaken such surveys and evaluations.

The remainder of this section presents findings specific to particular wildlife-dependent recreation programs (the Big 6).

2. General Demographic Trends

The following trends were examined in terms of the profile of visitors to the NWRs: the general ethnicity of refuge visitors in comparison to the U.S.’ overall population; and the public’s participation in nature-based recreational activity.

Table 34. Ethnicity of Refuge Visitors

Ethnicity	US Population: – as per 2000 Census Estimates	Refuge Visitors: – as per 2004 Visitor Satisfaction Survey
White	69%	86%
Asian	4%	3%
Black/ African American	12%	1%
Hispanic	13%	3%

Trends Concerning Recreational Use: The following provides information of the population trends between 2001 and 2006 on the number of Americans who hunt, fish and observe wildlife and their expenditures in each of those activities.

Fishing: Fishing continues to be a favorite pastime. In 2001, 13% of the U.S. population 16 years old and older spent an average of 17 days fishing. Comparing results of the 2006 Survey and 2001 Surveys reveals that although the number of all anglers declined 12%, their expenditures for fishing equipment (rods, reels, etc.) and fishing trips increased 5% and 7%, respectively. There were drops in expenditures for auxiliary equipment (special clothing, tents, etc.) and special equipment (big ticket items such as boats) by -14% and -12%, respectively.

The biggest declines in fishing participation were Great Lakes fishing which dropped 23% and saltwater fishing which dropped 15%. Excluding the Great Lakes, freshwater fishing participation decreased by 10%.

Hunting: Five percent of the U.S. population 16 years old and older, 12.5 million people, hunted in 2006. They spent an average of 18 days pursuing their sport. The number of all hunters declined by 4% from 2001 to 2006 and there was a 3% drop in overall expenditures (not a statistically significant change).

Although the total number of hunters declined from 2001 to 2006, the number of big game hunters held their own. The biggest declines were in migratory bird hunting (-22%) and small animal hunting (-12%).

As in the case of fishing expenditures, expenditures for hunting equipment (firearms, ammunition, etc.) actually increased 3%, as did hunting trips which rose by 13%. The biggest drop in expenditures was for special equipment—big ticket items like trucks and cabins—which declined by 30%.

Wildlife Watching: Thirty-one percent of the U.S. population 16 years old and older fed, observed, or photographed wildlife in 2006. These wildlife watchers increased in number by 8% from 2001 to 2006. Their expenditures for trips, equipment, and other items increased 2%.

From 2001 to 2006, expenditures for wildlife-watching equipment (binoculars, cameras, etc.) increased by 20% and for wildlife-watching trips by 40%.⁶⁷

In summary, the recent public use trends in fishing, hunting, and wildlife watching are as follows:

Table 35. Wildlife-Dependent Recreation - Trends

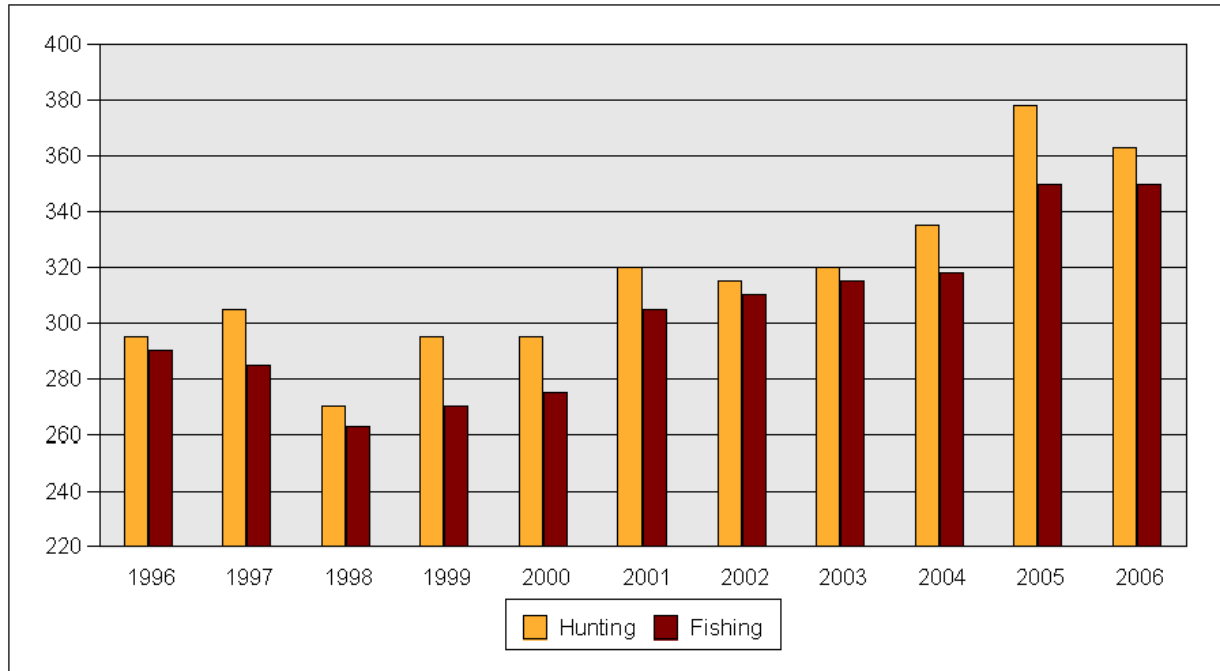
	Change in percentage of population participating from 2001 to 2006	Percent of population 16+ participating in the activity
Fishing	Declined by 12%	13%
Hunting	Declined by 4%	5%
Wildlife Watching	Increased by 8%	21%

⁶⁷ The National Survey of Fishing, Hunting and Wildlife-Associated recreation, US Fish and Wildlife Service, July 2007

3. Hunting and Fishing

The chart below documents the number of refuges that allow hunting and fishing, covering the period from 1996 – 2006. During this period, the number of refuges offering hunting increased from 294 to 366, and the number of refuges offering fishing increased from 288 to 352.

Figure 9. Number of Refuges Offering Hunting & Fishing



As per the above chart, between 1996 and 2006:

- The number of refuges allowing hunting increased by 24%; and
- The number of refuges allowing fishing increased by 22%.

As per the 2002 Visitor Satisfaction Survey, of the visitors that engaged in hunting and fishing activities, 89% were satisfied with their hunting experience, and 90% were satisfied with their fishing experience. The 2004 survey did not collect information on this question.

The data in the next table are from the 2007 MSI Refuge Managers Survey and explore whether refuges are able to meet the demand for hunting and fishing opportunities (within the limits of compatibility considerations).

Table 36. Refuge Managers Survey (2007) – Hunting and Fishing Opportunities

<i>Considering compatibility limits and the public use objectives defined by your CCP or management plans, are you able to meet public demand for the following services?</i>					
	1 Unable to Meet Demand	2	3 Generally Able to Meet Demand	4	5 Fully Able to Meet Demand
Hunting	6%	9%	32%	23%	30%
Fishing	5%	11%	38%	23%	23%

Per the data in the above table, a majority of refuge managers say that they are able to meet the public’s demand to provide hunting and fishing opportunities:

- Regarding hunting, 85% of refuge managers say they are generally to fully able to meet the demand for hunting, with 30% saying they are able to fully meet demand;
- Regarding fishing, 84% of refuge managers say they are generally to fully able to meet the demand for hunting, with 23% saying they are able to fully meet demand.

The data in the following table are from the 2007 MSI Refuge Manager Survey and explore whether refuge managers feel they receive adequate support from the NWRS to operate their hunting and fishing programs.

Table 37. Refuge Managers Survey (2007) – NWRS Support for Hunting and Fishing

<i>Whether from a Regional Office or from the Washington Office, to what extent is NWRS technical program support and guidance adequate to support the development and management of the following programs?</i>					
	1 Inadequate	2	3 Generally Adequate	4	5 Fully Adequate
Hunting and Fishing	13%	15%	53%	11%	9%
	28%			20%	

Per the above table, 73% of refuge managers indicate the support they receive is generally to fully adequate to support their program.

Partner Views: The following data provide partner’s views of the refuges system’s effectiveness at offering hunting and fishing recreational opportunities (from the MSI Partners Survey, 2008).

Table 38. Partner Survey (2008) – Hunting and Fishing Opportunities

<i>For Programs for which you have an active partnership with the refuge system, provide a rating of the refuge system's effectiveness.</i>					
	Ineffective	Somewhat Ineffective	Moderately Effective	Very Effective	Extremely Effective
Hunting	0%	5%	31%	51%	13%
	5%		95%		
Fishing	6%	0%	30%	46%	18%
	6%		94%		
<i>Total number of responses = 39 for hunting; and 33 for fishing.</i>					

Partners gave the refuge system high marks for its effectiveness in providing hunting and fishing opportunities.

- 64% of partners rated the refuge system as being very effective to highly effective in providing hunting opportunities; 95% of partners provided a rating of between moderately to extremely effective.
- 64% of partners rated the refuge system as being very effective to highly effective in providing fishing opportunities; 94% of partners provided a rating of between moderately to extremely effective.

A number of comments were received from partners on the effectiveness of various programs; however, as reported in the partnership section, many of the comments dealt with the inadequacy of resources and funding and the effect this has had on the refuge system's effectiveness. The following comments are illustrative:

- All of the problems that I see at Refuges are tied to insufficient funding. Dedicated employees and volunteers can only achieve so much with so little. Whenever I travel I route my trips via refuges and I have found unstaffed, understaffed and unmarked Refuges are scattered across the system. The condition of roads and signs is really sad.
- The effectiveness in all areas would be heightened if staffing were adequate.
- Without funds -- wilderness management, fire management, wildlife inventory and monitoring, habitat management and restoration, and land acquisition -- it makes it impossible to be effective in these areas. Volunteers can not do it all!

State Fish and Game Agency Views: The following data provide the views of state fish and game agencies on the refuge system's effectiveness at offering recreational hunting and fishing opportunities (from the MSI State Fish and Game Agency Survey, 2008).

Table 39. State Fish and Game Agency Survey (2008) – Hunting and Fishing Opportunities

<i>For Programs for which you have an active partnership with the refuge system, provide a rating of the refuge system's effectiveness.</i>					
	Ineffective	Somewhat Ineffective	Moderately Effective	Very Effective	Extremely Effective
Hunting	0%	17%	50%	28%	6%
	17%			30%	
Fishing	0%	29%	29%	29%	14%
	29%			43%	
<i>Total number of responses = 18 for hunting, and 14 for fishing.</i>					

State fish and game agencies provided generally favorable views regarding the refuge system's effectiveness in providing hunting and fishing opportunities.

- 34% of partners rated the refuge system as very effective or extremely effective at providing recreational hunting opportunities; 50% of survey respondents rated effectiveness for this area as moderately effective.
- 43% of partners rated the refuge system as very effective or extremely effective at providing recreational fishing opportunities.
- 29% of respondents rated the system's ability to provide fishing opportunities as "somewhat ineffective."
- The views of state agencies are significantly below those of partners in regard to the refuge system's ability to provide quality fishing opportunities: 94% of partners rated this capability as between moderately to extremely effective, whereas state agencies provide a rating of 71%.

4. Environmental Education and Interpretation

The distinction most often made between EE programs and interpretation is that EE involves a structured program, most often delivered to school children and based on a school district's curriculum, whereas environmental interpretation is generally a self-guided activity that is available to all refuge visitors through trails, sign boards, movies, and exhibits.

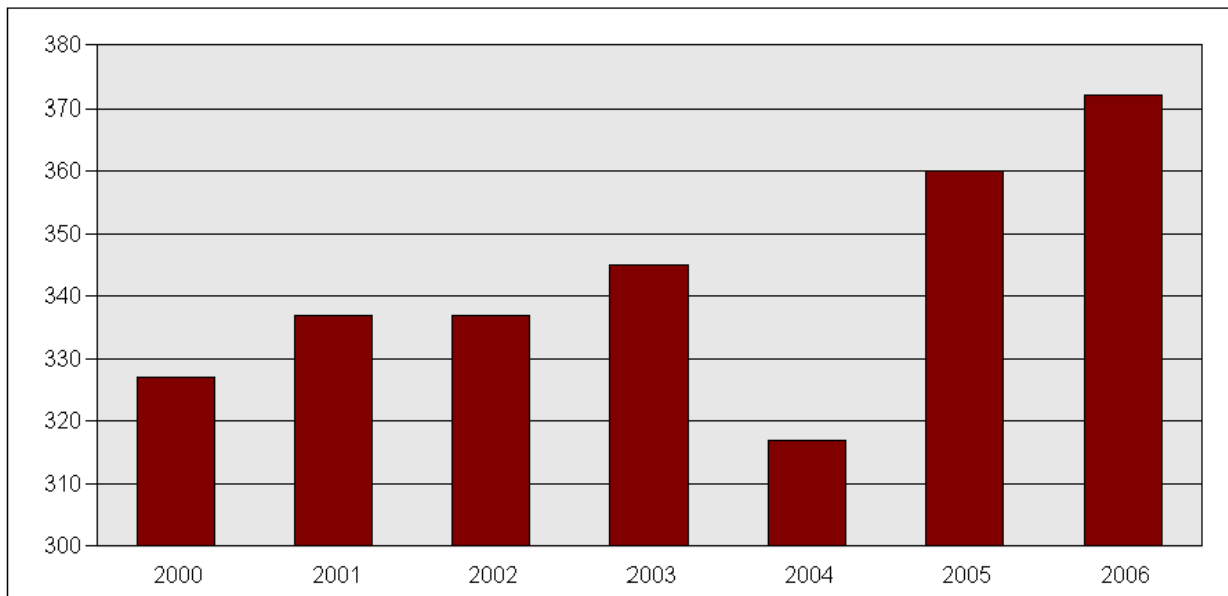
EE – Overview: As of 2006, 373 refuges offered EE programs. These programs are targeted toward school-aged youth and by definition should be designed to fit within the local school district's approved curriculum. The programs may be offered either on-site or off-site, meaning that the students and teachers may come to the refuge to learn or the learning may take place off-refuge – many EE programs are a combination of on-site and off-site programs. There is virtually no discussion of the Refuge System's EE program in its strategy, other than to say such

programs are developed based on community interest and that teacher workshops are often conducted by refuge staff to help teachers gain skills to deliver the programs.

The Refuge System’s EE programs are demand-driven, which is to say that it is up to individual refuge managers, or other designated personnel, to collaborate with the local school district to determine if there is sufficient interest and capability to develop an EE program. The Refuge System does not have an EE strategy, so there is no guidance as to how the program should be structured – for example, what age groups should be targeted. As such, refuge EE programs vary widely from refuge to refuge, with some programs consisting of a once-a-year visit, whereas other programs involve repeat visits throughout the school year. At the Fergus Falls WMD, fifth grade students spend half of each day of the school year studying at the refuge, including having their math, science, and literature classes taught at the refuge and tied to conservation themes. This is perhaps the Refuge System’s most ambitious and impressive EE program, and one that has been subject to rigorous evaluation, but it is also atypical and cannot be easily replicated.

The chart that follows illustrates the expansion of the number of refuges offering EE programs, which increased from 327 in 2000 to 373 in 2006.

Figure 10. Number of Refuges Operating EE Programs



(Note: It is unclear why the Refuge System reported a significant decline in EE programs from 2003 to 2004. It is most likely due to anomalies in the reporting system.)

The Refuge System’s EE program is nationally overseen by the Washington-based Visitor Services Office. The responsibilities for providing support to the program are currently handled by the Director of Visitor Services, as the recently created EE Specialist position is currently vacant. Also, at the current time, no central staff supporting the EE program has professional qualifications in EE.

As with other programs in the Refuge System, there is a great deal of variance in terms of how EE programs are managed. For the most part, programs are largely opportunistic and demand-driven. Most refuge EE programs rely heavily on the use of volunteers and community members. For example, under most programs, school teachers guide the actual groups; in turn, teachers are provided orientation or guidance from refuge staff, often through workshops. The Refuge System's Visitor Services Office currently has a Cooperative Agreement in place with the University of Wisconsin-Stevens Point to study the Refuge System's EE programs. This contract is expected to lead to a number of products, including the development of a Refuge System EE program strategy. The University of Wisconsin's work began in July 2006 and runs through December 2008.

The Conservation in Action Summit, which was held in 2004, developed a series of recommendations for each of the Refuge System's principal areas of operation. The highest priority recommendation within the area of wildlife-dependent recreation was as follows: "Develop a National Environmental Education Program that integrates curriculum-based programs and focuses on long-term partnerships with schools and other organizations. Programs will include teacher training through workshops and continuing education credits."

The Refuge System does not have an environmental strategy, which means that the program's objectives are unclear, and it is difficult to make an assessment of the program's effectiveness. For example, there is no guidance on the following issues: which refuges should operate EE programs, what level of staffing is required to run an EE program, what is the focus/target audience for EE services, or how the effectiveness of EE programs should be assessed. The lack of guidance and strategy leaves each refuge and region more or less on its own in defining and structuring its program.

In or around 1999, the Refuge System did develop a white paper entitled, *Connecting People to Wildlife: Environmental Education in the National Wildlife Refuge System*. The paper does define some basic parameters for a Refuge System approach to environmental education but is not operationally specific. For example, while the paper defines four tiers of refuge environmental education programs – minimum level, standard level, enhanced level, and flagship level – it is not clear which refuges should offer which level of program. In addition, the paper calls for establishing EE partnerships at 50% of refuges by 2003 but this indicator is not measured in the RAPP reporting system. In short, while the white paper provides a useful framework for the development of a Refuge System EE program, it is not specific on the level of resources that will be required to support such a program or on how to decide what level of EE program is appropriate on a given refuge.

Minnesota Valley NWR Focuses its EE

Program: Until recently, the Minnesota Valley NWR structured its program to provide education services and orientation to whichever groups happened to call and schedule a visit. However, the demand for visits and education services recently began to exceed the staff's ability to provide such services. The refuge is now in the process of shifting from a responsive EE program to a more focused program targeted to 4th – 6th graders, which will only be offered to specific partner schools. This will be a curriculum-based program that will have children re-visit the refuge during their 4th, 5th, and 6th grade years. As part of this strategy shift, the refuge will no longer develop EE programs (or visits) for those outside of its target group; e.g., no EE programs will be provided to Pre-K children. At the national level, there is no guidance or policy as to what lessons should be taught, which refuges should offer EE services, or what audience should be targeted. The Refuge Managers Survey indicated that, on a national level, refuge managers are unable to meet public demand for EE programs.

Environmental Interpretation: A significant number of refuges – 424 as of 2006 – offer interpretive services for visitors. Interpretive services are designed to be self-managed activities that visitors can use to understand the refuge, its purpose, and its ecology. Common interpretive activities are trails, boardwalks, driving tours, blinds and observation platforms, exhibits, and movies or videos. Videos and exhibits are often housed in visitor centers, which 44 refuges had as of 2006.

The National Park Service’s Discovery Backpack Program: Many national parks offer “discovery backpacks” for use by visiting school children. The backpacks may contain binoculars, bird lists, and guides on local ecology, such as wetland areas or upland forests. The topical material included in the backpacks varies from park to park and is selected from available natural resources, based on the ecology or geography of the area. Typically, a park will have 50 or more backpacks available for use by visiting school groups. This service provides a low-cost way to provide environmental interpretation services and can be managed by minimal staff.

Many of the aspects of the Refuge System’s interpretive programs, including brochures and websites, have been discussed in the previous section on Welcoming and Orienting Visitors (SOG 4).

The data in the following table are from the 2007 MSI Refuge Managers Survey and explore whether refuges are able to meet the demand for environmental education and interpretation services (within the limits of compatibility considerations).

Table 40. Refuge Managers Survey (2007) – Environmental Education and Interpretation

<i>Considering compatibility limits and the public use objectives defined by your CCP or management plans, are you able to meet public demand for the following services?</i>					
	1 Unable to Meet Demand	2	3 Generally Able to Meet Demand	4	5 Fully Able to Meet Demand
Environmental Education	25%	30%	26%	11%	8%
	55%			19%	
Interpretation	20%	28%	34%	11%	7%

Per the data in the above table, in both the EE and the interpretive program areas a significant number of refuge managers indicated that they are not able to meet the demand for services.

- In EE programs, 55% of refuge managers surveyed indicated that their capability to meet demand is somewhere below that of being “generally able to meet demand,” with 25% saying they are unable to meet demand.
- At refuges with seven or fewer full-time staff, 64% of refuge managers indicated they were not able to meet the demand for EE services. For interpretive services, the number was 55%.

- The Refuge System’s ability to meet the demand for interpretive services is somewhat better than in EE, but answers also indicate that this in an area where the Refuge System overall is having difficulty meeting the public’s demand for services.

The following table examines the issue of whether refuge managers feel they receive adequate support to manage EE and interpretive programs.

Table 41. Refuge Managers Survey (2007) – Program Support for Environmental Education and Interpretation

<i>Whether from a Regional Office or from the Washington Office, to what extent is NWRS technical program support and guidance adequate to support the development and management of the following programs?</i>					
	1 Inadequate	2	3 Generally Adequate	4	5 Fully Adequate
Interpretation	19%	22%	41%	14%	5%
	41%			19%	
Environmental Education	22%	26%	37%	10%	5%
	48%			15%	

Per the above table, most refuge managers feel the support they receive is less than adequate to support their program.

- Regarding environmental interpretation, 41% of refuge managers say that the support they receive to run their programs is inadequate or less than adequate (as compared to 19% who say support is above adequate or fully adequate).
- Regarding environmental education, 48% of refuge managers say that the support they receive to run their programs is inadequate or less than adequate (as compared to 15% who say support is above adequate or fully adequate).

It is worth noting that, both in terms of the ability to meet public demand, and in terms of the adequacy of program support received, the areas of interpretive and EE programs received the lowest scores of adequacy – and the EE area is the only area where a majority of refuge managers said that their ability to meet public demand is less than generally adequate.

Partner Views: The following data provide the views of partners on the refuge system’s effectiveness at offering environmental education and interpretive opportunities (from the MSI Partners Survey, 2008).

Table 42. Partners Survey (2008) – Environmental Education

<i>For Programs for which you have an active partnership with the refuge system, provide a rating of the refuge system's effectiveness.</i>					
	Ineffective	Somewhat Ineffective	Moderately Effective	Very Effective	Extremely Effective
Environmental Education & Interpretation	8%	5%	34%	29%	25%
	12%			54%	
<i>Total number of responses = 65 for environmental education and interpretation.</i>					

Partners gave the refuge system generally high marks for their effectiveness in providing environmental education and interpretation services.

- 54% of partners rated the refuge system as very effective or extremely effective at providing environmental education and interpretation activities; however, 34% rated this capability as moderately effective.

State Fish and Game Agency Views: The following data provide the views of state fish and game agencies on the refuge system's effectiveness in offering environmental education and interpretive opportunities (from the MSI State Fish and Game Agency Survey, 2008).

Table 43. State Fish and Game Agency Survey (2008) – Environmental Education

<i>For Programs for which you have an active partnership with the refuge system, provide a rating of the refuge system's effectiveness.</i>					
	Ineffective	Somewhat Ineffective	Moderately Effective	Very Effective	Extremely Effective
Environmental Education & Interpretation	0%	0%	53%	33%	8%
	0%		100%		
<i>Total number of responses = 12 for environmental education and interpretation.</i>					

- 53% of state agencies rated the refuge system as moderately effective in providing environmental education and interpretation activities; however, 100% of respondents rated the refuge system's performance at between moderately to extremely effective.

5. Wildlife Viewing and Photography

The data in the following table are from the 2007 MSI Refuge Managers Survey and explore whether refuges are able to meet the demand for wildlife viewing and photography services (within the limits of compatibility considerations).

Table 44. Refuge Managers Survey (2007) – Wildlife Viewing and Photography

<i>Considering compatibility limits and the public use objectives defined by your CCP or management plans, are you able to meet public demand for the following services?</i>					
	1 Unable to Meet Demand	2	3 Generally Able to Meet Demand	4	5 Fully Able to Meet Demand
Photography	3%	10%	41%	25%	20%
Wildlife Viewing	3%	8%	39%	24%	26%

Per the data in the above table, a high proportion of refuge managers surveyed feel that they are able to adequately meet public demand for photography and wildlife viewing – 86% said they are generally to fully able to meet demand for photography services, and 89% said the same for wildlife viewing.

The following table examines the issue of whether refuge managers feel they receive adequate support to manage wildlife viewing and photography programs.

Table 45. Refuge Managers Survey (2007) – Program Support for Wildlife Viewing and Photography

<i>Whether from a Regional Office or from the Washington Office, to what extent is NWRS technical program support and guidance adequate to support the development and management of the following programs?</i>					
	1 Inadequate	2	3 Generally Adequate	4	5 Fully Adequate
Photography/ Wildlife Viewing	14%	21%	47%	12%	5%
	35%			17%	
<i>Note: Percentages are only for those refuges offering specified Big 6 service.</i>					

Per the above table, 64% of refuge managers indicate the support they receive is generally to fully adequate to support their program.

C. Conclusions

The NWRS received nearly 35 million visitors in 2006. For the most recent years in which visitor satisfaction surveys were conducted (2002 and 2004), visitor satisfaction levels were very high, with general visitor satisfaction levels being above 90% in both surveys. Overall, the Refuge System has done a good job of increasing recreational opportunities – over 90% of the refuges that are able to provide wildlife-dependent recreational opportunities now do so. Also, the number of refuges offering hunting, fishing, and environmental education programs has expanded steadily over the past 5-10 years.

In terms of the individual Big 6 recreational activities, the operation of hunting, fishing, wildlife viewing, and photography programs are generally operating at a satisfactory level in terms of the Refuge System's ability to provide an adequate level of service and in terms of the support provided to those programs by the Refuge System. The environmental education and interpretive programs, on the other hand, are not able to meet public demand and are not adequately supported by the Refuge System. This latter conclusion is based solely on the view of refuge managers: 55% of refuge managers surveyed indicated they are not able to adequately meet the demand for environmental education services and 48% indicated they are not able to meet the demand for interpretive services.

Conclusions on particular aspects of the wildlife-dependent recreation program follow.

Visitor Services Planning: The NWRS is not doing an adequate job in meeting its policy requirement that all refuges develop Visitor Services Plans (a requirement that was elevated in importance by the 1997 Refuge Improvement Act). Currently, two-thirds of refuges do not have such plans; of the one-third of refuges that have VSPs, a majority of these plans (about 70%) were produced prior to 2002. In addition, there has been no system-wide review of the adequacy of the plans that do exist. While most refuges do not have formal Visitor Services Plans, most do have hunting and fishing plans, which are key components of a Visitor Services Plan.

Perhaps more significantly, there is no system-wide Visitor Service Plan or strategy for the Refuge System. In a time when many refuges have recently faced staffing and budgetary reductions, it would be useful to be able to provide regions and individual refuges guidance as to system-wide priorities and objectives for the Visitor Service Program.

Hunting and Fishing: The Refuge System has done a good job at increasing hunting and fishing opportunities over the past decade. Between 1996 and 2006, the number of refuges offering hunting increased 24%, to 366 refuges, and the number offering fishing increased 22%, to 352 refuges. Also, 85% of refuge managers indicate that they are generally to fully able to meet public demand for hunting, while 84% express similar sentiments regarding demand for fishing. Per RAPP data, 77% of refuges indicate that their hunting programs meet a high level of quality as determined by a set of twelve quality criteria standards; the fishing program scores somewhat lower at 59%.

All refuges that provide hunting and fishing opportunities have hunting and fishing plans, which are a significant part of an overall Visitor Services Plan. These plans are required to adhere to National Environment Policy Act (NEPA) requirements and, as such, have been developed in consideration of public input and stakeholder views.

In general, partners felt the Refuge System does a good job at providing hunting and fishing opportunities: 34% of partners rated the refuge system as very effective or extremely effective at providing recreational hunting opportunities; 50% survey respondents rated effectiveness for this area as moderately effective. Forty-three percent of partners rated the Refuge System as very effective or extremely effective at providing recreational fishing opportunities.

State fish and game agencies provided generally favorable views regarding the refuge system's effectiveness in providing hunting and fishing opportunities, although there were a significant number of responses indicating that fishing services are "somewhat ineffective."

- 84% of survey respondents rated effectiveness as between moderately effective and extremely effective.
- 72% of state agencies rated the refuge system as moderately effective to extremely effective at providing recreational fishing opportunities; however, 29% of respondents rated the system's ability to provide fishing opportunities as "somewhat ineffective."

Environmental Education: On a national level, the Refuge System operates a highly decentralized and somewhat *ad hoc* environmental education program – which is often legitimately characterized as a "demand-driven" system. The Refuge System does not have adequate policies, staffing, or strategy in place to operate an effective national-level environmental education program. While there are numerous examples of highly impressive and innovative programs at individual refuges, there is no process for analyzing and disseminating best practices, nor is there any way to judge how well the program is operating overall, as there is no defined target audience, objectives, or standards. In addition, a majority of refuge managers indicate they are not able to adequately meet public demand for environmental education services, and a majority indicated they do not receive adequate program support to operate environmental education programs. Among refuge managers, the environmental education program was considered to be the least well supported program of any of the six mandated wildlife-dependent recreation programs, and this was particularly true for smaller refuges.

A further consideration regarding environmental education is that programs *can be* relatively expensive to develop and operate. Thus, while the Refuge System has demonstrated its ability to offer exceptional environmental education programs, it is not clear what the proper balance or tradeoff should be in terms of dedicating tight resources to environmental education versus dedicating resources to other Refuge System priorities. At the current time the level of resources and attention provided to environmental education appears to be somewhat arbitrary. In or around 2001, the Refuge System developed a white paper on environmental education. The paper defines different tiers of environmental programs as being appropriate for different refuges, but does not present criteria as to which refuges should offer which tier of program, or which refuges should not offer environmental education programs.

Interpretive Programs: Based on the Refuge System's basic information outreach capability and its challenge in meeting the demand for interpretive services, the system as a whole is underperforming in providing adequate interpretive services. In large measure this conclusion is based on the views of refuge managers as 48% of managers said they are not able to adequately meet public demand for services and 41% said they do not receive adequate technical support and guidance to manage such programs. These figures are offset by the RAPP data, which indicate that 68% of the 286 refuges (as of FY2006) that do operate interpretative programs have "high quality" programs. A significant number of refuges do provide a wide variety of interpretive services, such as kiosks, refuge videos, and even guided-tour radio programs.

This objective is closely intertwined with SOG 4 – Welcoming and Orienting Visitors, which includes providing visitors basic information about a refuge’s program and purpose (including information on its species and habitat goals). The following conclusions relate to interpretive activities and are carried over from the analysis of SOG 4:

NWRS is reasonably effective in terms of informing and engaging refuge visitors but could easily improve its performance in this area. Brochures are generally informative and available at refuges, and refuge employees and volunteers are able to provide helpful and informative answers to visitor questions. However, videos and CDs – a very engaging and effective means of providing information to refuge visitors – are substantially underutilized. The information provided on refuge websites is very inconsistent from refuge to refuge and frequently provides only the most basic information.

Refuge websites are currently inconsistent in appearance, provide widely different types and levels of content, are not always updated, and are underutilized as a means of providing information and engaging the public. Many NWRS shortcomings related to SOG 4 could be at least partially addressed by improved and more consistent NWRS websites.

Refuge managers expressed concern that they are unable to adequately meet the public’s demand for interpretive services, with 48% percent saying they are operating at a level below that of being able to “generally meet demand.” Refuge managers also expressed concern that they do not receive adequate program support to operate interpretive programs, with 41% indicating that support is below adequate as compared to 19% saying that support is above adequate or fully adequate.

Wildlife Viewing and Photography: In general, the level of wildlife viewing and photography opportunities that currently exist on refuges seem adequate and probably do not require significant additional focus. The one caveat is that about one-third of refuge managers indicated that the technical support and program guidance they receive in this area is less than generally adequate, which would indicate opportunity for improvement in this area. The Refuge System can probably do a better job in expanding opportunities for wildlife viewing and providing better guidance and resources to its managers in how this can be done. This is an area that probably offers one of the most cost-effective opportunities for the Refuge System to disseminate its message to a significant number of visitors.

Demographic Trends of Wildlife-dependent Recreation: There are a couple of changing trends that should be considered by the Refuge System as it continues to develop system-wide priorities and programs: 1) non-white ethnic groups are an expanding part of the U.S population and are under-represented among Refuge System visitors; for example 25% of the US population is either Hispanic or African-American but these groups represent a total of four percent of refuge visitors; and 2) wildlife-dependent recreational uses are changing, as hunting activities are on the decline in the U.S. and non-consumptive activities are on the increase. The latter category includes activities such as nature walks and bird watching. The Refuge System is in the process of developing a partnership-based Birding Initiative but, in general, probably needs to give greater attention to maintaining its public support and relevance in relation to these changing trends.

D. Recommendations

Prioritize Services: In light of a high public demand for wildlife-dependent recreation and the Refuge System's limited and stretched budgets, the Refuge System should prioritize the services it will offer and provide some guidance to refuges and regions as to how limited resources should be allocated among the various recreational activities. Region 5's experience in developing two priority Big 6 uses for each of its refuges could be instructive in terms of how a prioritization process could be developed.

Visitor Services Planning: A more concerted effort should be made to complete Visitor Services Plans for all refuges. However, this effort should probably be preceded by the development of a clear program strategy, guidance, and objectives as to what the Visitor Service Program hopes to accomplish and how refuges should prioritize visitor services (in light of limited resources). In particular, the strategy should:

- Set guidance on how to prioritize the types and levels of programs that can be offered at different refuges, based on refuge characteristics and available staff and budget;
- Identify priority Big 6 uses for each refuge; and
- Develop and distribute a simplified Visitor Services Plan template along with examples of a useful and not too complicated completed plan.

Hunting and Fishing: There are no major recommendations in this area, although it would be useful to conduct a targeted evaluation of the satisfaction level of the Refuge System's hunting program. The wildlife-dependent recreation policy does mention that the Refuge System should offer "quality" hunting experiences, but this has never been defined by the system. Defining the type of "quality" hunting experience the Refuge System endeavors to promote provides an opportunity to further define and improve refuge hunting programs and to distinguish a refuge hunting experience from that available on other lands.

Environmental Education: Significant attention is needed to strengthen the Refuge System's performance in these areas. Specific actions for consideration include:

Establish a dedicated environmental education support team/unit to develop programs in this area and provide leadership to the Refuge System. This unit should be headed by an experienced professional who has environmental education credentials or, at a minimum, extensive experience and expertise. The unit does not necessarily need to be located in the Washington office.

Develop an environmental education strategy. The Refuge System currently has a Cooperative Agreement (CA) with the University of Wisconsin-Stevens Point to develop a Refuge System environmental strategy – the CA runs through December 2008. In the interim, however, the Refuge System itself can become better organized and begin to provide greater strategic direction to the program. This would include a clarification of the terms and programs related to interpretation and environmental education and developing a set of guidance or core activities for each program area.

Develop guidance on appropriate levels of programming based on refuge profiles and staff/resource availability. One step in this process might be to develop case studies of successful environmental education programs that can be managed by differing staff and resource levels. For example, profiles could be put together of a half-dozen environmental education programs operated at large, medium, and small refuges, and best practice guides could be developed and tailored to staffing and resources. This information could also help the Refuge System to prioritize where it offers environmental education programs and identify what types of programs it can offer – for example, due to cost and staffing issues the Refuge System may wish to define which refuges are appropriate for offering EE programs, and which are not, as a way to guide resource allocation decisions.

Engage more widely with potential partners to develop research-driven EE programs. Partners could include universities, NGOs, other DOI agencies, and various specialized groups, such as the North American Association for Environmental Education. This effort should result in criteria, standards, and basic materials to guide the EE program.

Interpretive Programs: Develop environmental interpretation support packages for refuges (particularly for smaller refuges). Using the model of “discovery backpacks” or other similar strategies, environmental resources/toolkits should be developed for use by refuges throughout the system. In particular, simple self-guided activities and toolkits should be developed for use by refuges that do not have dedicated full-time environmental education or interpretive staff.

Development of national interpretive resources, for example the development of “discovery backpacks,” could be a cost-effective way to provide interpretive tools and support to refuges of all sizes and to ensure that refuges have the ability to host interpretive groups even if they do not have the time and resources to develop the materials themselves. This would be an example of a cost-effective self-guided interpretive activity that could be offered at a significant number of refuges. Centralizing the management of this program function would likely lead to increased efficiency in program development and enable the Refuge System to offer standard materials at a greater number of refuges.

SOG 6: Facilitate partnerships and cooperative projects to engage other conservation agencies, volunteers, friends, and partners in the Refuge System mission.

**Performance
Rating:**

**Highly
Effective**

This objective was rated highly effective for several reasons: over the past ten years the Refuge System has been able to significantly expand participation by volunteers and Friends Groups; partnerships with thousands of local and national organizations make a significant contribution to the accomplishment of the Refuge System’s key objectives, particularly in the areas of habitat restoration and visitor services; and partnerships bring a tremendous amount of funding into the system – in 2005 alone the total value of partnership contributions to the Refuge System exceeded \$50 million, with over \$30 million of the total being in direct cash contributions. Although the level of volunteer support has increased dramatically over the past ten years – from 383,983 hours in 1987 to 1,478,797 in 2005 – volunteer hours have somewhat declined in recent years as the system’s capacity to manage volunteers has likely been reached (with the limits of current budgets and staff). Given the value of volunteer and partner contributions to the system, it is recommended that the Refuge System explore ways to assign dedicated staff to manage volunteer programs in locations where doing so is likely to be the most cost effective.

A. Context/Background

NWRS Strategic Outcome Goal: The following description of the Strategic Outcome Goal is from the Strategic Plan for the National Wildlife Refuge System (December 2006).

Private citizens are afforded meaningful opportunities to assist in achievement of the mission of the Refuge System by volunteering their talents, working with Friends Groups to support a refuge, or cooperatively completing projects on refuges. In a similar manner, conservation partners such as state and federal government agencies, tribes, and non-government organizations are regularly engaged in mutually beneficial projects and programs.

This process includes support of volunteerism and community partnership efforts provided for in the Volunteer and Community Partnership Act of 1998 and collaborative efforts with a variety of entities including cost sharing of projects by any non-federal entity. Nearly 20% of the work on refuges is accomplished by volunteers and over 250 organized Friends Groups work to assist refuges in meeting public use and natural and cultural resource management goals. Support for volunteers and Friends is provided through on-site training, mentoring, workshops, and awards. Other partnership programs include the Challenge Cost Share program which involves the completion of cost shared conservation or visitor service projects using financial contribution or in-kind contributions of labor and materials. Agreements with neighboring landowners to manage their lands in a network that complements refuge management efforts are included here as are cooperative programs with universities for research programs, and

voluntary partnership agreements and partnerships with gateway communities regarding recreational programs.

Participants at the Conservation in Action Summit affirmed that involving volunteers and Friends advances all aspects of the NWRS mission. For this reason, they identified several action items to maintain and improve these cooperative relationships.

Performance measurement: The number of refuges with programs for each of these partnership types is reported in the Refuge System Annual Performance Plan module of the Refuge Management Information System. While this captures quantitative information, there is frequently a more qualitative impact associated with these collaborative efforts that is difficult to capture through collection of a data metric. This goodwill and cooperative spirit captured in these efforts often elicits future reactions that cannot be readily predicted or measured.

The most recent data are included below:

Table 46. Refuge Annual Performance Plan Summary -- Partnerships and Volunteers

Annual Performance Measures	FY 05	FY 06
	Actual	Actual
6.1) % of refuges/WMDs with a volunteer program	72.70% (423/582)	72.85% (424/582)
6.2) # hours of volunteer assistance annually contributed	1,284,857	1,277,523
6.3) # of individuals who provided volunteer assistance during the year	34,034	32,321
6.4) % of refuges/WMDs with a Friends Organization ⁶⁸	42.80% (249/582)	49.48% (288/582)
6.5) % of refuges/WMD with one or more community support groups working with them	41.20% (240/582)	50.52% (294/582)
6.6) % of refuges/WMD's with at least one non-Federal partnership project	44.80% (261/582)	45.88% (267/582)
<i>Source: Final Strategic Plan for National Wildlife Refuge System FY 2006-2010, December 2006</i>		

As can be seen from the NWRS RAPP data, nearly three-quarters of refuges have volunteer programs, and half of all refuges have a Friends program. In addition, about half of all refuges

⁶⁸ Friends Groups are not-for-profit organizations that are established for the specific purpose of supporting one or more NWRs. These groups often provide assistance with fundraising, help to staff visitor service operations, such as bookstores, and may become involved in advocacy initiatives related to the NWRS.

have at least one non-federal partnership. These non-federal partnerships make contributions across the Refuge System's range of programs; for example, partnerships with Ducks Unlimited contribute to wetlands restoration; projects with universities and research institutes such as the Point Reyes Bird Observatory provide species monitoring and inventory work; and partnerships with Friends Groups help to staff visitor centers and provide environmental interpretation services.

B. Principal Findings

Partnerships play a significant role on many refuges and provide opportunities to increase the level of services and habitat management actions beyond what can be directly funded from the NWRS budget. Monetary partner contributions to the National Wildlife Refuge System were reported to be \$30,213,887 in 2005, with the cash value of in-kind partner contributions listed at an additional \$20,155,955. Thus, the total value of partnership contributions to the Refuge System in 2005 was \$50,369,842. Partnership projects in 2005 numbered 1,819 or more than three per station, on average.⁶⁹

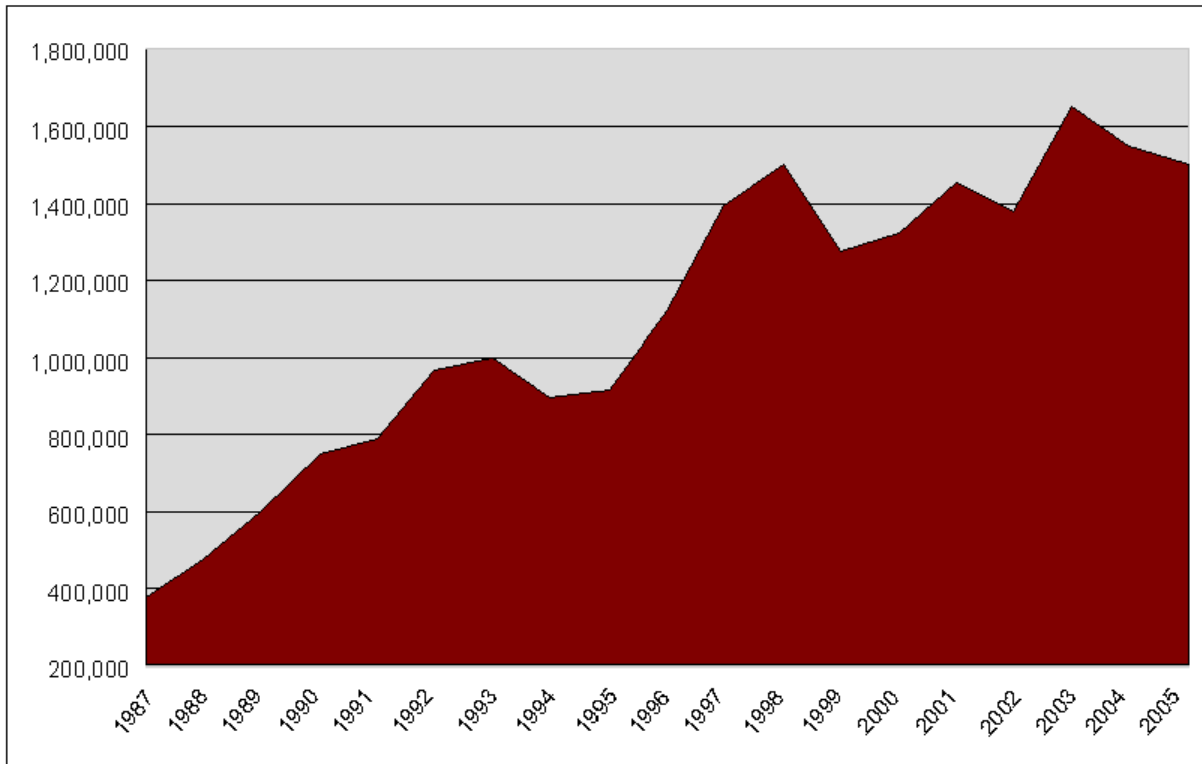
1. Volunteers and Friends Groups

Volunteers: The Refuge System has fostered and benefited from tremendous growth in numbers of volunteers. In 1980, less than 5,000 volunteers contributed services to refuges; by 2006, that number had grown to more than 32,000. These volunteers are active on 423 stations and contributed about 1.5 million hours of assistance in 2005, which was valued at approximately \$25 million.

The number of volunteer hours contributed to the Refuge System has increased substantially over the past twenty years. The table below shows that the number of volunteer hours increased from 383,983 in 1987 to 1,478, 797 by 2005 (which is the equivalent of 710 additional full-time employees per year).

⁶⁹ Refuge Annual Performance Plan Regional Summary for FY 2005 Accomplishments and FY 2006 Targets, updated 01-03-06.

Figure 11. Annual Volunteer Hours Contributed to the Refuge system⁷⁰
(Number of Hours)



Volunteer hours have contracted since the peak year of 2003, when the number of hours contributed was 1,628,650⁷¹ and staff and operations budgets were at their peak. The number of Refuge volunteers declined from 44,126 in 2003 to 37,996 in 2005, a drop of 14%.

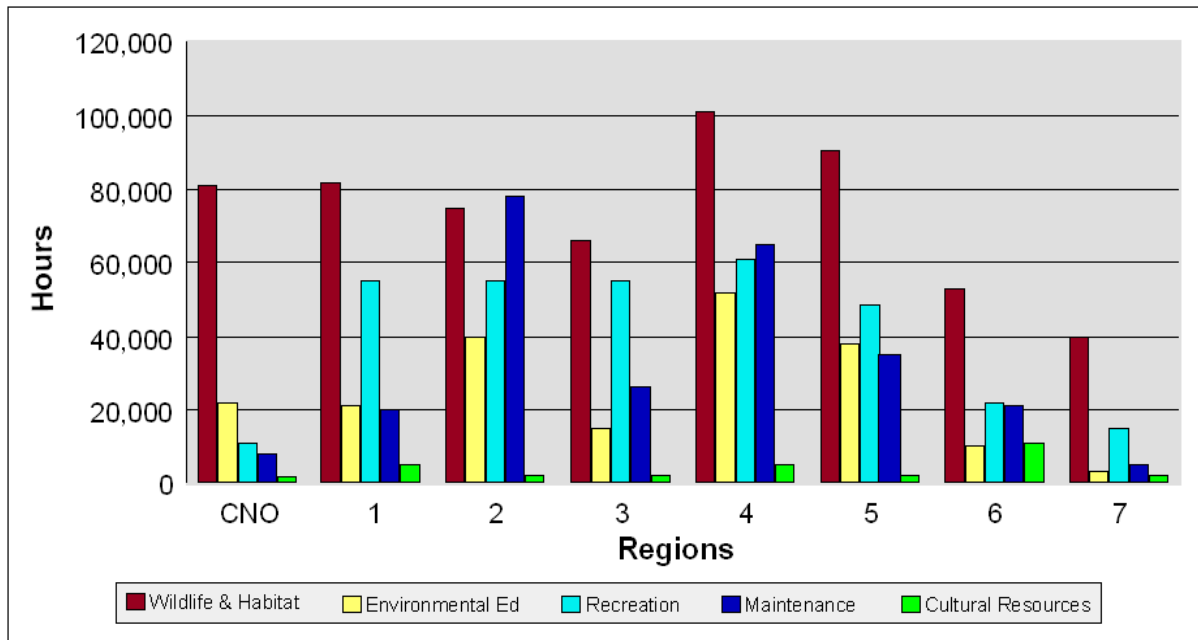
Volunteer hours have dropped as well, declining from 1,628,650 in 2003 to 1,487,797 in 2005, a decrease of 9%. Because this decrease is less than the decrease in the number of volunteers, it is an indication that some volunteers are contributing more hours.

Use of volunteers varies significantly across the regions as the chart on the next page indicates:

⁷⁰ Note: The data in the chart is taken from the 2005 Annual Volunteer Report in order to have comparable data over a longer time period. RAPP data on page 2 varies from the information in the Annual Volunteer Report

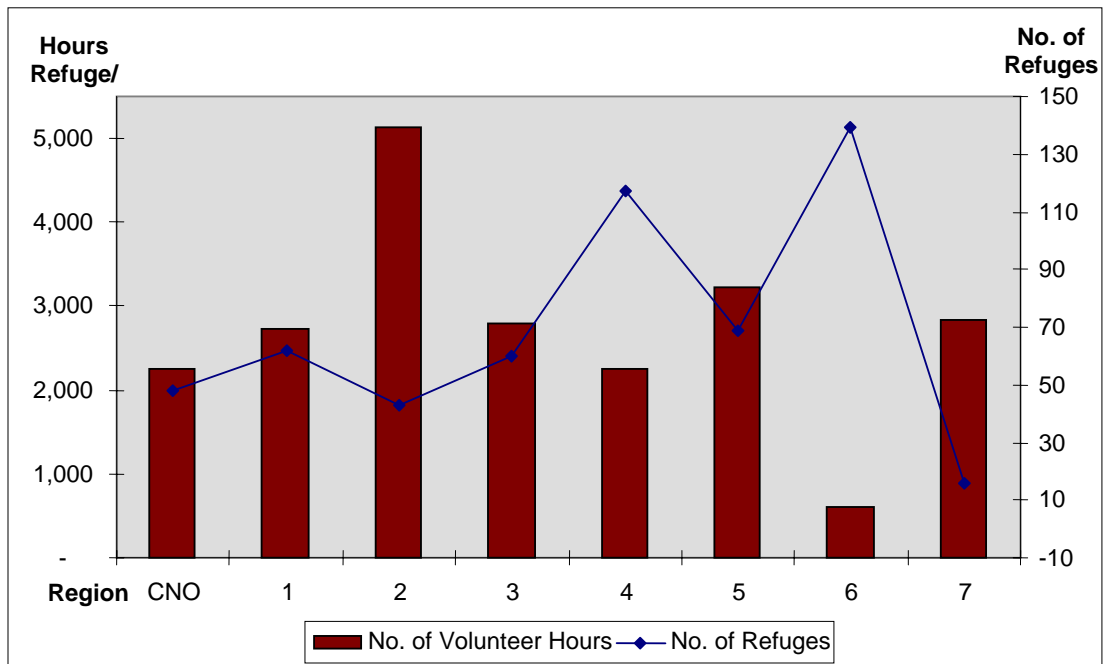
⁷¹ Annual Volunteer Report for 2005: dated July 2006

Figure 12. Comparison of 2005 Annual Volunteer Hours by Region/Task



While in almost every region volunteers are most active in the wildlife and habitat management activities, this is particularly true in CNO and Region 7, where well over half of volunteer hours focused on wildlife and habitat. Region 2, on the other hand, used volunteers for maintenance more than any other region.

Figure 13. Volunteer Hours/Refuge by Region in 2005



With the exception of regions 2 and 6, all regions averaged between 2,200 and 3,200 volunteer hours/refuge during 2005. Region 2, with just over 5,141 average volunteer hours per refuge, benefits from volunteers far more than other region. Region 6, with an average of less than 614 volunteer hours per refuge, has the least participation by volunteers.

Note on Volunteer Hours: Data on the number of volunteer hours per region were examined from two sources: 1) 2005 RAPP data; and 2) data from the 2005 Refuge System’s Friends and Volunteers Report, which was published in July 2006. Both sources of data provide information on the number of volunteer hours contributed by region, and both cover the 2005 fiscal year; however, the numbers reported in the two reports differ. For the purpose of the analysis used in this report, the FY 2005 RAPP numbers have been used. The differences in volunteer hours reported can be seen in the table above.

Table 47. Number of Volunteer Hours per Region

FY 2005			
Region	RAPP Data 2005	Volunteer Report 2005	Difference
CNO	108,416	127,165	17%
1	169,666	197,553	16%
2	221,057	239,162	8%
3	167,865	202,118	20%
4	264,400	306,030	16%
5	222,666	243,584	9%
6	85,320	86,197	1%
7	45,468	69,336	52%
Total	1,284,857	1,471,145	14%

Friends Groups: 2007 marks the thirteenth year of the Friends program as a formal organized effort. Since the program’s inception, the number of Friends Groups and community-based support groups has grown from about 75, to approximately 250. These organizations represent an estimated membership base of more than 40,000.⁷²

The refuge system, just as with the volunteer program, has been designed, and continues to operate programs designed, to support the development of Friends Groups and to improve their capabilities. National partnerships, including the National Fish and Wildlife Foundation, the National Wildlife Refuge Association, and the National Audubon Society, have assisted in the growth and development of local community-based support organizations, which support the refuges in a number of ways, including staffing visitor services and environmental education programs. Support for this effort has included national and regional workshops, training courses offered at the National Conservation Training Center, and a mentoring program – all of which have supported the expansion and vitality of the Friends program.

In July 2007, the first-ever Friends Academy will debut at the National Conservation Training Center in Shepherdstown, WV. The Academy will offer advanced training to 30 people from 30 different Friends Groups. A grant program begun in 1998 for refuge support groups is another tool NWRS offers through the National Fish and Wildlife Foundation to assist Friends/support groups with start-up, capacity building, and specific projects. This program provides competitive seed grants (\$1,500 - \$5,000) to support creative and innovative proposals from

⁷² Friends web page of the United States Fish and Wildlife Service web site.

Friends Groups to increase the number and effectiveness of organizations interested in assisting the Refuge System nationwide. Now in its tenth year, the grant program has provided support for 326 projects with a value of \$1.5 million. In FY 2005, more than 30 Friends Groups across the country received grants totaling \$142,000. Examples of recent grants include:

- Six start-up grants to help establish new Friends Groups;
- Eight grants related to improving habitat through invasive species control;
- Habitat improvement grants, for projects such as watershed restoration and a coastal prairie seed production plot; and
- Eight grants related to improving the visitor experience, including four that either improve or create interpretive trails and three related to education.

As the table below demonstrates, 85% of refuge managers agree that volunteers, Friends Groups, and other partners are essential to the accomplishment of refuge missions.

Table 48. Refuge Managers Survey (2007) – Volunteer and Partner Contributions

MSI Survey Data:	Level of Agreement				
	1 Strongly Disagree	2	3 Generally Agree	4	5 Strongly Agree
The contributions of volunteers and partners are essential to our ability to accomplish our mission	3%	10%	20%	13%	52%
	13%			65%	

In open-ended comments submitted as part of the survey, 58 of the 137 comments from refuge managers referenced their reliance on partners and volunteers when asked to provide comments concerning the role of partners and volunteers. Comments from seventeen refuge managers noted that it is a lack of refuge staff that prevents them from expanding their use of volunteers. Comments included:

- ...much of our large scale (high \$) habitat work and wetland management infrastructure work is funded through grants and the work is done by contractors. We couldn't maintain our wetland management infrastructure if we had to rely on our base budget. It would be a disaster.
- Our public use program would not function at an acceptable level at the one refuge in the complex with the most visitors if it were not for all the good work of volunteers who meet and greet the visiting public.
- The refuge is dependent on partners for all major habitat accomplishments including work for threatened and endangered species.
- We could not do the job we do now without volunteers. We have one endangered species program where over 50% of the time on the program is volunteer time. In addition, the reduction in programs caused by loss of one maintenance worker has been 80% restored by use of volunteers.

- We would not be able to conduct any invasive species control or much wildlife monitoring without interns and volunteers. Our contact station/visitor center is entirely staffed by volunteers.
- Volunteers and partners need to have well-trained Service staff to work with and take guidance from. Limited resources prevent us from recruiting more volunteers.

It should also be noted that 83% of refuge managers report adequate policy and guidance for working with partners and volunteers, in spite of the NWRS not having a policy on how to work with Friends Groups and partners. Such a policy is under development, but its review process has not yet been completed.

2. National Organizations

Partnerships with national organizations cover a wide range of activities that involve most, if not all, SOGs. These partnerships encompass a variety of organizations with a variety of interests and implementation strategies. A brief overview of some of the NWRS' most significant partnerships are presented below.

The National Fish and Wildlife Foundation: The NFWF's relationship with the U.S. Fish and Wildlife Service was established by law in 1984.⁷³ Since 1984, the National Fish and Wildlife Foundation, which is primarily a grant-making institution, has disbursed over 8,800 conservation grants and has leveraged \$374 million in direct federal funds into more than \$1.2 billion in total conservation funding, with much of this funding directly or indirectly supporting the Refuge System, with some of this funding supporting activities to strengthen and enhance the Refuge System. In 2006, the NFWF received \$10.6 million in FWS-appropriated funds, which were leveraged into \$42 million in conservation grants. Funds from the FWS support projects to address at-risk species, habitat enhancement, community-based stewardship, and education.⁷⁴

Ducks Unlimited: Since 1985, Ducks Unlimited (DU) has been one of the Refuge System's most active and important partners. From 1985-2002, DU completed over 1,100 projects affecting over 558,000 acres of refuge land.⁷⁵ Projects typically include wetland restoration, land acquisition, purchase of easements, working with private land owners to improve conservation management, and advocating for stronger government conservation support.

Much of DU's work with the Refuge System involves enhancing and restoring wetlands. DU is a particularly active NWRS partner in the Prairie Pothole Region and along the Mississippi flyway, but has projects in partnership with the NWRS throughout the country. Examples of DU's current collaboration with the NWRS include: a \$1 million project to restore riparian habitat along the Sacramento River in California; a project to remove invasive species (phragmites) on two Rhode Island refuges and adjacent private lands; and providing financing, design, and engineering support for wetlands development on the Eufaula NWR in Alabama.

⁷³ National Fish and Wildlife Foundation Establishment Act (16 U.S.C. 3701 et seq.)

⁷⁴ The National Fish and Wildlife Foundation, 2006 Annual Report, Washington, D.C.

⁷⁵ Alan Wentz, Long-term challenges for our nation's refuges. Transactions of the Sixty-eight North American Wildlife and Natural Resources Conference

The Nature Conservancy (TNC): TNC has completed more than 1,200 projects on refuge lands, adding more than 1.5 million acres to the System at a cost in excess of \$400 million. Glacial Ridge National Wildlife Refuge in Minnesota typifies the benefits the Refuge System gains through partnerships. TNC donated 2,000 acres to become the core of the refuge in October 2004. Working with 30 other organizations, including both state and federal agencies, TNC has restored several thousand acres of Northern Tall Grass Prairie habitat at what is now Glacial Ridge NWR.

The National Wildlife Refuge Association: The National Wildlife Refuge Association (NWRA) has been building a powerful advocacy base of grassroots Friends' organizations to collectively support the Refuge System since its founding in 1975. NWRA's website succinctly describes its role as an organization devoted to protecting, enhancing, and expanding the Refuge System.⁷⁶

While many national conservation organizations and their members are sporadically engaged in protecting the Refuge System and individual refuges, none has a focused constituency working constantly to improve local refuges and serve as an advocate at the national level. As a result of efforts by the NWRA and its partners over the past eight years, there is now a network of 220 refuge Friends Groups, representing 45,000 individuals across the country that provides volunteer support for refuges.

The NWRA lobbies members of Congress for additional Refuge System funding on issues that have broad national implications, such as land expansion, invasive species control, and water quality improvement. The association also has a variety of activities targeting the expansion and strengthening of Friends Groups, including: sponsoring national and regional Friends Conferences; developing and disseminating tools to assist Friends Groups in fundraising, board management, and organizational development; and operating a mini-grants program that has awarded over \$773,000 over the past five years for "start-up, capacity-building, and project-specific initiatives."⁷⁷

Cooperative Alliance for Refuge Enhancement: CARE was created in 1995 as a collaboration of organizations devoted to protecting America's natural resources and, in particular, the National Wildlife Refuge System. CARE has been one of the Refuge System's most vocal advocates through lobbying efforts to Congress and through public media campaigns. An example of CARE's work is the report it authored entitled, *Restoring America's Wildlife Legacy: A Plan to Restore Our National Wildlife Refuge System*, which detailed the need for increased operations and maintenance funding. CARE has also worked to highlight the shortage of funds to contend with issues such as invasive species management, environmental education and interpretation, water quality, and endangered species through its report, *Shortchanging America's Wildlife: A Report on the National Wildlife Refuge System Funding Crisis*. These efforts are not only targeted to members of Congress, but are also used to bring awareness to a broader public audience.

⁷⁶ <http://www.refugenet.org/new-about/about%20nwra.html>

⁷⁷ <http://www.refugenet.org/new-about/about%20nwra.html>

National Audubon Society: The National Audubon Society’s mission is to “conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth’s biological diversity,” which has led to the development of a long-lived partnership with the Refuge System. The two organizations have a memorandum of understanding that commits them to working collaboratively at both the national and local level on projects that will strengthen individual wildlife refuges and the Refuge System.⁷⁸ The purpose of this agreement is to promote partnerships that will benefit conservation of federal trust species and wildlife habitat. The Audubon Society is a leader in the area of conservation-related public awareness through its creative and innovative education programs. Through its work and magazine articles, the Audubon Society has helped the Refuge System obtain significant public exposure and recognition. Joint projects are varied and include building interpretative trails, operating environmental education programs, restoring habitat, and conducting bird surveys that examine nesting, breeding, and population patterns.⁷⁹

The Conservation Fund: The Fund was established in 1985 with a mission to form “partnerships to conserve America’s legacy of land and water resources. Through land acquisition, sustainable programs and leadership training, the Fund and its partners demonstrate balanced conservation solutions that emphasize the integration of economic and environmental goals.” Central to the Conservation Fund’s mission is working with government partners and other NGOs, including the FWS, to acquire critical conservation land. Illustrative of the Fund’s work is its partnership with BASS Pro Shops, which has sponsored the Chesapeake Conservation Challenge. Through this initiative over \$400,000 was raised and used for resource protection, including the purchase of the 200 acre Garrett island, which was transferred to the Refuge System in 2005.⁸⁰

The Trust for Public Land (TPL): TPL “conserves land for people to enjoy as parks, gardens, and other natural places, ensuring livable communities for generations to come.” TPL often purchases land of high habitat value that is adjacent to wildlife refuges with the intent of having the land added to the Refuge System. For example, TPL purchased 197 acres to add to the San Bernard NWR in Texas in 2006. The 2006 land addition marked the ninth time that TPL had purchased land to add to the San Bernard NWR and brought its total additions to the refuge to over 6,000 acres. This is just one of dozens of purchases TPL undertakes annually to add lands to the Refuge System. Since its founding in 1972, the Trust for Public Land has helped protect more than 2.1 million acres of land in 46 states.⁸¹

The above mentioned refuge partners are some of the larger and better known national NGO partners. The Refuge System, however, has hundreds of partners across the country, which range from local hunting clubs, to school systems and to community-based NGOs. The support of these organizations significantly adds to the accomplishments of the Refuge System – in improving and expanding habitat to providing visitor services.

⁷⁸ The latest of which was signed on October 3, 1996

⁷⁹ www.fws.gov/refuges

⁸⁰ The Conservation Fund, www.conservationfund.org

⁸¹ The Trust for Public Land, www.tpl.org

Table 49. The Level of Effort Partners Bring to Habitat Restoration

	2005 Actual	2006 Actual
1.1.3 -# of wetland acres restored through voluntary partnerships	40,027	49,765
1.2.2 - # of upland acres restored through voluntary partnerships	174,421	198,663
<i>Source: FWS FY 2008 Budget Justification, p.137.</i>		

In 2006 alone, nearly 250,000 acres of refuge land were restored through voluntary partnerships. This is particularly noteworthy because, according to the Refuge System’s own data, virtually all upland and wetland habitat restoration by the Refuge System in 2006 was completed through collaborative partnerships.⁸² RAPP data also reported that in 2006 partnerships were used to restore 97 miles of riparian habitat and 5,897 marine acres.

Special Initiatives: The NWRS also has a significant number of local and specialized partners who provide single-issue support to the Refuge System. An example of such a partnership would be the National Environmental Education Training Foundation, which works with the Refuge System on a major effort to produce volunteers for National Public Lands Day. Student Conservation Association volunteers provide help ranging from environmental education, to public use, to projects related to habitat needs or monitoring.

The NWRS has also recently launched or joined several special initiatives to advance particular Refuge System agendas. One such partnership initiated by the Refuge System is the Birding Initiative, which brings together fifteen nationally recognized birding experts with NWRS staff to identify ways that refuges can become more birding friendly and to increase the number of birders visiting refuges. Another similar special initiative is the Children and Nature National Dialogue, which is co-hosted by the FWS and brings together NWRS staff with other interested parties from FWS, NGOs, universities, and other land management agencies for the purpose of identifying ways to increase the participation of children in nature-based activities.

The Management Costs and Challenges of Partnerships: The essential nature of partnerships with the Refuge System is shown in the MSI Refuge Manager Survey. Operating an extensive partnership activity has costs. The cost reported to manage the volunteer program in 2005 was \$4,282,262. In addition, costs are associated with operating the grant programs. The Refuge System also made monetary contributions of \$13,734,930 toward conservation partnership projects, and the cash value of in-kind NWRS contributions was \$5,491,116.⁸³

The MSI Refuge Manager Survey provides information on refuge manager’s views on their ability to effectively manage partnerships and on the role partner’s play, per the table on the next page.

⁸² Draft Strategic Plan, December 2006, p.35.

⁸³ Refuge Annual Performance Plan updated 01-03-06.

Table 50. Refugee Managers Survey (2007) – Partners: Role and Management

<i>To what degree do you agree with the following statements on the involvement of volunteers and partners at your refuge?</i>	Level of Agreement				
	1 Strongly Disagree	2	3 Generally Agree	4	5 Fully Agree
We have an adequate number of staff to manage volunteer and partner programs.	46%	34%	14%	4%	1%
	80%			5%	
The selection of volunteers and partner projects are driven by refuge needs.	4%	14%	37%	25%	19%
	20%			44%	
We have become reliant on volunteers and partners to manage activities that should be managed by NWRS staff.	9%	26%	15%	13%	34%
	35%			47%	

As can be seen from the above table:

- Refugee managers overwhelmingly feel that they do not have adequate staff to manage partner and volunteer programs (80% of managers indicate this is the case); and
- A majority of refuge managers also indicated that volunteers and staff are performing duties that that should be managed by refuge staff (63% generally to fully agreed this is the case).

From the above table, it can be seen that refuge managers agree by a strong majority that the selection of volunteers and partners is driven by refuge needs, as 81% of refuge managers surveyed generally agree that this is the case. This question was asked because some refuge managers expressed concern that the extensive use of partners and volunteers was driving the agenda of refuges rather than having partners and volunteers selected to address refuge priorities.

It was also found, as per the Refugee Manager Survey, that the smaller the size of the refuge (by staff), the greater proportion of refuge managers who disagreed with the statement “we have an adequate number of staff to manage volunteer and partner programs.” For refuges with more than 15 full-time equivalent staff, 73% indicated that they strongly disagreed that they had an adequate number of staff to manage volunteers; at stations with seven or fewer staff, 87% disagreed.

MSI received 135 open-ended comments from refuge managers regarding partners and volunteers. The most common themes or patterns of comments are presented below.

- Fifty-seven (of 135 comments) comments: Volunteers and partners are essential to the refuges and make a critical contribution to the achievement of the Refugee System’s mission.
- Twenty-six comments: Volunteer and partner programs require substantial investment in the areas of recruiting, training, managing, and oversight.

- Seventeen comments: Volunteers are difficult to recruit and/or there are often availability issues, which is particularly the case for refuges located in rural and/or remote locations.
- Sixteen comments: Refuges need or do not have a dedicated staff position responsible for managing volunteer and partner programs.

The table below shows how refuge managers report their use of partners and volunteers in the area of habitat management and public use.

Table 51. Refuge Managers Survey (2007) – Partners: Habitat Mgmt and Public Use

MSI Survey Data:		Percent				
		0-20%	20-40%	40-60%	60-80%	80-100%
Approximately what percent of habitat management activity was conducted by, or funded by, partners and volunteers	Over the past year	68%	18%	7%	6%	1%
	Five years ago	73%	14%	7%	5%	1%
Approximately what percent of public use activity was conducted by, or funded by, partners and volunteers	Over the past year	55%	24%	9%	9%	2%
	Five years ago	64%	17%	9%	7%	3%

The data in response to the use of partners and volunteers for habitat management and public use activity indicated that over the past five years, growth in usage has been slight, which is in line with the leveling off of volunteer hours and the number of staff who are available to work with partners.

Data from Partners and Friends Groups Survey: Data from the Partners Survey indicated a high degree of satisfaction among partners with both the quality of their partnership with the refuge system and with their overall view of the effectiveness of the Refuge System. The following tables present data from the MSI Partners and Friends Groups Survey (Partner Survey), conducted March 17-25, 2008.

Table 52. Partners Survey (2008) – Overall Quality of Relationships with NWRS

Partner Survey Data: Summarize the Overall Quality of the Working Relationship between your Organization and the NWRS					
	Poor	Fair	Good	Very Good	Excellent
Regional/Washington Office	7%	13%	27%	27%	25%
	21%			52%	
Individuals Refuges	3%	6%	13%	24%	56%
	8%			80%	
<i>Total number of responses = 67 for Washington/regional Office; 72 for local refuge.</i>					

As can be seen from the above table, a majority of partners who responded to the survey rated the quality of their relationship with the refuge system as very good to excellent.

- 52% of partners rated the quality of their relationship with the regional/Washington office as excellent or very good; and
- 80% of partners rated the quality of their relationship with individual refuges as excellent or very good (and 56% rate the quality of the relationship as excellent).

3. State Programs

Partnerships with states and localities exist in a number of program areas, including research, planning, wildland fire suppression, and natural resources, as well as hunting and fishing planning and policy. The most important collaborative policy area between the NWRS and the states is in the area of resource management – in particular, the area of setting hunting quotas and cooperating on hunting management.

Data from the State Fish and Game Agency Survey: Data from this survey also indicated a high degree of satisfaction among state fish and game agencies with both the quality of their partnership with the refuge system and with their overall view of the effectiveness of the refuge system. The following table presents data from the State Fish and Game Agency Survey, which was conducted April 29-May 16, 2008.

Table 53. State Fish and Game Agency Survey (2008) – Overall Quality of Relationship with NWRS

<i>Summarize the Overall Quality of the Working Relationship between your State Agency and the NWRS</i>					
	Poor	Fair	Good	Very Good	Excellent
Regional/Washington Office	7%	7%	43%	14%	29%
	14%			43%	
Individuals Refuges	0%	12%	41%	29%	18%
	12%			47%	
<i>Total number of responses = 17 for Washington/regional Office, 17 for local refuge.</i>					

As can be seen from the above table, a majority of state agencies who responded to the survey rated the quality of their relationship with the refuge system as being between good and excellent.

- 43% of state agencies rated the quality of their relationship with the regional/Washington office as excellent or very good; 86% rated the quality of the relationship as being between good and excellent.

- 47% of state agencies rated the quality of their relationship with individual refuges as excellent or very good; 88% rated the quality of the relationship as between good and excellent.

States are also involved with the Refuge System through their colleges and universities in the Cooperative Research Units of the United States Geological Survey. This program is not exclusive to National Wildlife Refuges, but does provide a research tool for refuges. Forty colleges and universities participate in the program, representing 38 different states. The mission of the Cooperative Units is research, education, and technical assistance on issues related to fish, wildlife, ecology, and natural resources. In FY 2006, Cooperative Units had 1,052 active research projects, completed 140 federal projects, and began 108 new projects initiated in response to federal agency needs. The number of active projects in FY 2006 represents a 10.2 percent decrease from the peak year of FY 2004, when 1,172 projects were active.⁸⁴

Wildland fire suppression is another program area where interaction with states and localities is prominent. The survey of refuge managers conducted for this assessment shows that most managers (73%) report their ability to partner with state and localities on fire issues is generally to fully sufficient.

Table 54. Refuge Managers Survey (2007) – Partners: Fire

MSI Survey Data:	Level of Agreement				
	1 Insufficient	2	3 Generally Sufficient	4	5 Fully Sufficient
Our ability to partner with state and local agencies on fire issues is...	12%	14%	33%	21%	19%
	26%			40%	

State agencies are also invited to participate in the development of Comprehensive Conservation Plans for each refuge. According to RAPP data, states have participated in the development of all CCPs completed in 2005 and 2006; in some instances, state agencies are represented on CCP steering committees.

Examples from Eufaula NWR in Alabama and Sacramento River NWR in California provide a look at how the Refuge System partners with states. At Eufaula NWR, the Alabama Department of Wildlife and Fish has participated in a biological review and assisted with work done by Auburn University on bird banding. The Department also coordinates with the refuge on hunting issues, specifically with regard to ensuring synchronicity of hunting seasons and quotas. At Sacramento River NWR, through a partnership, the state monitors all hunting on the refuge and fully staffs all of the refuge’s hunting check stations.

When interviewed for this evaluation, a representative of Arizona Fish and Game noted that twelve years ago his agency had to invite itself to the table with the Refuge System, but now it comes much more naturally to keep the state involved. Arizona Fish and Game works with the

⁸⁴ USGS FY 2008 Budget Justification, p. J-49.

Refuge System on a variety of issues related to hunting and fishing, wildlife management, law enforcement, and CCPs.

4. The Conservation in Action Summit

The Refuge System's 2004 Conservation in Action Summit brought together 250 partners and refuge staff to identify future Refuge System priorities and to identify areas in which to strengthen partnership cooperation. The Summit was a major attempt to engage partners in setting priorities for the Refuge System. A series of recommendations emerged from the Summit, and several directly involved the role of partners.

- Working with partners, establish **System-wide Invasive Species and Habitat Restoration Management Plans** and funding mechanisms to set ecosystem priorities, establish scientific protocols for inventory, monitoring, and database development, and coordinate management strategies using internal and external task forces.
- Implement **Early Detection/Rapid Response Activities for Invasive Species** throughout the Refuge System. Utilize volunteers for early detection efforts and direct newly formed Invasive Species Strike Teams to concentrate on incipient infestations.
- **Develop a National Environmental Education Program** that integrates curriculum-based programs and focuses on long-term partnerships with schools and other organizations. Program will include teacher training through workshops and continuing education credits.
- **Assess Surface and Ground Water Resources** (quantity, quality, and timing) and needs and threats throughout the Refuge System to prepare refuge staff and partners to develop effective responses to water issues (and meeting Refuge System water needs).
- Involving our partners, **Develop Comprehensive Visitor Service Plans** that identify appropriate recreational activities, partners, and funding needs and opportunities.

The Refuge System followed up on the recommendation related to invasive species and habitat restoration by creating a partnership grant program. This program includes the Refuge System, the NWRA, TNC, and the US Geological Survey, and provides grant funding to Friends Groups to use GPS technology to monitor and remove invasive species. In 2005, 56 Friends Groups received grants that enabled 876 volunteers to participate in the treatment, inventory, and restoration of 72,931 acres of refuge land.

The Refuge System has not moved as forcefully on several of the other partner-related recommendations. Specific recommendations that appear not to have been implemented include: the development of a National Environmental Education program (although some initiatives are under development); improvement of the Refuge System's science and research capability; development of an increased number of visitor services plans; and conduct of surface and ground water assessments. (Note: Environmental education and visitor services plans are discussed under SOG-5 and water resources are discussed under SOG 2.)

C. Conclusions

The partnership and volunteer SOG is considered highly effective, for the following reasons.

Partnerships are responsible for critical contributions to the achievement of NWRS goals.

Partnerships operate across a wide range of refuge activities and make a critical contribution to NWRS accomplishments, including land acquisition, habitat management, (especially wetlands restoration), monitoring and research, and environmental education. In 2005, the total value of partnership contributions to the Refuge System exceeded \$50 million, with over \$30 million of the total being cash contributions and the rest received in in-kind support. According to the NWRS' own data, 100% of habitat restoration on refuges in 2006 was the result of collaborative projects with partners.

The use of volunteer support has increased significantly over the past twenty years. The Refuge System has fostered and benefited from tremendous growth in numbers of volunteers. In 1980, less than 5,000 volunteers contributed services to refuges, but by 2006 that number had grown to over 32,000. In 2005, volunteers were active on 423 stations and contributed approximately 1.5 million hours of assistance that were valued at approximately \$25 million. Partnerships and volunteers supplement refuge staff, thus increasing the amount of work that gets done on refuges. In recent years, the use of volunteers has somewhat declined in concert with fluctuations and declines in the NWRS budget.

There has been impressive growth in Friends Groups and the contribution they make to the Refuge System. Since 1994, the number of Friends Groups has expanded from 75 to approximately 250. These organizations represent an estimated membership base of more than 40,000. The NWRS support of these groups through Refuge System investments in training, grant programs, workshops, and mentoring has been responsible for their expansion, which has been a great asset to the Refuge System.

National Organizations: The NWRS has close and productive partnerships with a number of major national conservation organizations, including Ducks Unlimited, the Nature Conservancy, the Audubon Society, the Conservation Fund, the Trust for Public Land and others. The NWRS also benefits from funds provided by the National Fish and Wildlife Foundation, which provides tens of millions of dollars in grants each year for projects that benefit fish and wildlife management, often in collaboration with refuges.

State Programs: TBD – pending survey

Benefits, Costs, and Challenges of Partnerships: The use of partnerships and volunteers has been actively promoted in the Refuge System and has been a cost effective way to increase the level of habitat management and visitor services the NWRS is able to provide. The management and care of these programs, however, require staff time, and a large portion of refuge managers (80%) indicate that they do not have adequate staff to manage volunteers and partners. While the growth in the use of partnerships and volunteers has been highly effective, it is likely that these levels are at or near capacity due to limited refuge funding and staff.

The Conservation in Action Summit: The Conservation in Action Summit, held in 2004, was a Refuge System-sponsored event that brought together 250 refuge employees and partners to

identify future conservation priorities and areas in which to strengthen partnership. While the Conservation in Action Summit was a significant effort to involve partners in determining Refuge System priorities, many of the recommendations identified at the summit appear to have not been implemented, particularly in areas related to environmental education and research, the use of the Habitat Goals Process to develop stronger eco-regional plans, and implementation of a system-wide bird and habitat monitoring program. In part, these recommendations were not implemented because they coincided with a decline in the Refuge System's budget. In addition, it does not appear there was a sufficiently structured follow-up process to develop workplans to implement the Summit's priorities.

D. Recommendations

Volunteers: Volunteers make a tremendous contribution to the Refuge System and are a cost-effective way to accomplish many tasks. The Refuge System should endeavor to continue its efforts to develop stronger partnerships across the system. This would include continuing to provide grants for volunteer development and providing leadership training to volunteer groups.

If the Refuge System wants to further increase the use and contributions of volunteers, it may need to commit additional staff to the task. The Refuge System should look to develop dedicated positions for managing volunteer and partner contributions, particularly where geography and interest provide good possibilities for doing so. In addition, the Refuge System should consider identifying best practices, both programmatically and managerially, for managing the use of volunteers. One way to proceed might be to develop profiles identifying which refuges have the best prospects for attracting volunteers and partnerships, e.g., those near population centers of a reasonable size and with a modest or higher level of visitation, and then explore the possibilities of assigning dedicated staff for partnership and volunteer development at the refuges where such an approach is likely to produce the most benefits.

Friends Groups: The Refuge System should continue to invest in the Friends program through the actions that have nurtured the existing groups. Grant programs are a strong mechanism for strengthening these programs, as are national and regional workshops that serve as forums for sharing best practices.

SOG 7: Protect resources and visitors through law enforcement.

Performance Rating:

Ineffective

There are a number of positive developments to point to when considering the state of law enforcement at NWRS: law enforcement training is sound and is improving; Refuge law enforcement officers are judged by their supervisors and colleagues to have the skills, abilities, and commitment necessary to meet their responsibilities; and policies to guide and manage the law enforcement program are beginning to be developed and disseminated. This good news, however, is offset by a very serious shortcoming: there is a critical lack of law enforcement coverage at most of the system's field stations (more than 70% of refuge managers feel law enforcement coverage is insufficient at the refuge they manage). In addition, it appears that this problem, which began with law enforcement reforms in 2003, is probably trending in the wrong direction, i.e. coverage may fall to even lower levels in the near future. This is a particularly troubling issue given that serious crime on refuges has increased in recent years and will likely continue to do so as more refuges find themselves located near population centers. Until there is a significant increase in the number of trained law enforcement officers deployed at NWRS field stations performance against this SOG will remain ineffective.

A. Context/Background

Law enforcement has long been recognized as central to the Refuge System's ability to achieve its natural resource and public use objectives. The law enforcement function of the NWRS has changed substantially over the past twenty years and, as a result, the Refuge System has actively pursued reforms aimed at improving both officer safety and the effectiveness of law enforcement on refuge lands. The point of departure for these reforms was the 1998 National Wildlife Refuge System Conference in Keystone, Colorado. Work conducted during the conference resulted in a recommendation to, "Assess the status of public safety and resource protection provided by refuge law enforcement officers, and make recommendations for the future direction of law enforcement in the system."⁸⁵ This recommendation led, in 2000, to a formal external assessment of Refuge law enforcement, conducted by the International Association of Chiefs of Police (IACP). The IACP assessment outlined dozens of recommendations aimed at many aspects of Refuge law enforcement, including staffing levels, organizational structure, partnerships (i.e., resource leveraging), and training.⁸⁶ During the same timeframe, the Office of the Inspector General conducted a review of all law enforcement programs in the Department of the Interior (DOI). The OIG report, issued in January of 2002, was highly critical and offered 25

⁸⁵United States Department of the Interior. United States Fish and Wildlife Service. The National Wildlife Refuge System. (March 1999). *Fulfilling the Promise: Visions for Wildlife, Habitat, People, and Leadership*.

⁸⁶The report completed as a product of this assessment is titled, *Protecting the National Wildlife Refuge System: Law Enforcement Requirements for the 21st Century*, and is dated December, 2000.

recommendations aimed at “improving the leadership, organization, control and accountability of Departmental law enforcement.”⁸⁷

As a result of the OIG report and the subsequent internal DOI report, *Secretary’s Law Enforcement Review Panel Report*, an NWRS “Leadership Team” was formed. This team was tasked with determining how best to address both the Secretarial mandates that derived from the OIG report and the recommendations from the IACP assessment. In a report entitled, *Interim and Long-Term Deployment of Law Enforcement Resources of the National Wildlife Refuge System*, the Leadership Team defined specific actions and reforms to be undertaken by the Refuge System law enforcement program. These reforms were made operational through Director’s Order 155 and were further institutionalized with the roll-out of the long-term NWRS law enforcement deployment model, most recently updated in May of 2005.⁸⁸

The law enforcement Strategic Goal that is included in the 2006-2010 Strategic Plan for the National Wildlife Refuge System is framed around the reforms reflected in DO 155. This evaluation focuses on both the implementation of the reforms and the resulting impact on the effectiveness of the Refuge law enforcement program. The following describes the law enforcement strategic goal—to protect resources and visitors through law enforcement—as presented in the NWRS 2006-2010 Strategic Plan.

Means and Strategies: *The Refuge System law enforcement program seeks to: 1) protect natural and cultural resources from overharvest, poaching, or other abuse; 2) enable visitors to enjoy recreation, interpretation, and environmental education without fear of crime or incident; and 3) protect government property from vandalism, abuse, destruction, and terrorist threat. Conservation education is also an integral function of Refuge law enforcement officers.*

This activity encompasses prevention, enforcement, protection and security activities to assure compliance with wildlife laws, refuge regulations, and related laws. A variety of different strategies are being employed to modernize the Refuge System law enforcement program. These strategies are carried out to implement recommendations from the Secretary’s Law Enforcement Review Panel Report and the International Association of Chiefs of Police Report. These documents along with other ongoing activities within the refuge law enforcement program, led to the completion in May 2003 of the plan titled, Interim and Long-Term Deployment of Law Enforcement Resources of the National Wildlife Refuge System. Many of the policy decisions from that plan were incorporated in July 2003 into Director’s Order #155. The plan and Director’s Order called for immediate implementation of several reforms dealing with headquarters and regional structure, zone system implementation, collateral duty officer reforms, and centralized recruitment. The plan also called for a long-term staffing study to assess, quantify, and strategically locate the law enforcement resources of the

⁸⁷ United States Department of the Interior, Office of Inspector General (No. 2002-I-0014). (January 2002). *Disquieting State of Disorder: An Assessment of Department of the Interior Law Enforcement* (introductory memorandum). Washington, DC: U.S. Government Printing Office.

⁸⁸ The long-term deployment model was developed by IACP in close coordination with NWRS staff. Work on the model began in spring of 2003, and the most recent update to the model was completed in May of 2005.

Refuge System. A community policing effort is also being initiated to encourage a more structured approach to coordinating, interacting, and instilling cooperation with other State, Federal, and tribal law enforcement agencies.

Refuge law enforcement was not identified among the highest priorities at the Conservation in Action Summit; however, it is a priority need as identified by the Department and the Service.

Performance Measurement: *Reporting currently relies on the Refuge Annual Performance Planning database module of the Refuge Management Information System. An upcoming Department-wide incident management system will provide a more detailed monitoring tool in the future. Staffing needs are quantified in the refuge law enforcement deployment model.⁸⁹*

Annual performance measures, as listed in Appendix D of the *Final Strategic Plan for the National Wildlife Refuge System, 2006 – 2010* are compiled in the following table.

Table 55. RAPP Annual Performance Measures – Strategic Goal #7

Performance Indicators	2005		2006		% Change 2005-2006 Actuals
	Planned	Actual	Planned	Actual	
7.1) % of refuges/WMDs with law enforcement staffing comparable to the need identified in the NWRS Law Enforcement Deployment Model		10% (24 of 233)	-	7.9% (18 of 227)	-21%
7.2) # of actual LE field hours (excludes training, administrative functions, physical fitness time)	-	284,446	332,015	326,728	14.8%
7.3) # of notices of violation (NOVs) issued	-	7,069	9,167	7,860	11.2%
7.4) # of criminal law enforcement incidents documented	-	68,932	70,435	71,807	4.2%
7.5) # other law enforcement incidents documented	-	11,286	12,530	11,230	-.5%
7.6) % of easement contracts being complied with	-	98% (31,914 of 32,565)	-	95.4% 31,189 of 32,678)	-2.7%
7.7) % of refuges/WMDs with a community policing program in place	-	2.7% (16 of 582)	4.5%	7.2% (42 of 582)	166.7%

Progress towards the NWRS law enforcement strategic goal, as measured by NWRS annual performance measures and presented in the table above, was inconsistent. Law enforcement activity increased as evidenced by field hours and violations issued, and the number of

⁸⁹ Final Strategic Plan for the National Wildlife Refuge System, FY 2006 –2010, US Fish and Wildlife Service, December 2006.

community policing programs expanded. By contrast, law enforcement deployment was far below recommended levels and, at least in terms of Performance Indicator 7.1, grew worse from 2005 to 2006. The evaluation findings presented below provide a more complete, yet largely consistent picture of NWRS performance towards its law enforcement goal.

B. Principal Findings

The following presentation of findings is organized under four main topics: (1) progress against the deployment plan; (2) budget and resources; (3) training and skills; and (4) law enforcement effectiveness.

Progress Against the NWRS Law Enforcement Deployment Plan: The current long-term deployment plan is based on a model developed by the IACP. The model consists of 25 quantitative and qualitative refuge-specific workload variables (e.g., number of visitors, road mileage, presence of campgrounds, presence of facilities, county population, total acreage, hunting volume, frequency of offenses/crimes, etc.) and can use updated data to produce new recommendations for law enforcement staffing levels and deployment. The current deployment plan, which is based on data provided by NWRS in May of 2005, recommends 845 full-time equivalents (FTEs) for a fully staffed law enforcement function for the Refuge System.⁹⁰ The plan does not specify how staffing recommendations should be met, indicating that Refuge System decision makers are best positioned to determine the most appropriate mix of resources to be used, e.g., full time officers, dual function officers, partnerships with local law enforcement agencies, etc.⁹¹ The tables below present the recommended staffing levels based on 2005 data, as well as actual staffing levels in 2005 and in early 2007.

Table 56. Overall Law Enforcement Staffing – Recommended and Actual⁹²

	Total FTEs	Fulltime Officers	Dual Function Officers (FTEs) ⁹³	LE Agency Partnerships
Recommended – 2005	845	-	-	-
Actual – 2005	330	202	72	56
Actual - 2007	310	208	46	56 ⁹⁴

⁹⁰ *A Deployment Model for the National Wildlife Refuge System*, The International Association of Chiefs of Police. May 2005, pp 3.

⁹¹ *IBID*, pp4.

⁹² The IACP Deployment Model presents 2005 summary data on LE staffing and deployment on pages 3 and 4. However, these data have a number on internal inconsistencies—essentially, it is not possible for all of the data presented in the tables and narrative on pages 3 and 4 to be valid. The MSI evaluation team used the data included in the IACP report and constructed these tables to allow for the best possible comparison between 2005 and 2007 data.

⁹³ FTEs for dual function officers are calculated based on a 25% law enforcement workload. For example, the 72 FTEs listed as 2005 actuals indicate 290 dual function officers.

⁹⁴ No updated data on the FTE equivalent of active law enforcement partnerships was available at the time of the evaluation. Therefore, the 2007 figure included for the FTE value of LE partnerships is an estimate, based on the assumption that active partnerships with LE agencies remained unchanged from 2005 to 2007.

Table 57. Regional Law Enforcement Staffing – Recommended and Actual FTEs⁹⁵

	Region 1 (plus CNO)	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Recommended – 2005	100	104	127	233	85	134	62
Actual – 2005	34	40	27	73	32	39	17
Actual – 2007	31	38	21	73	33	36	16
Actual 2007 as % of 2005 Recommended	31%	37%	17%	31%	39%	27%	26%

The preceding tables highlight several noteworthy findings:

- As a whole, the Refuge System currently has 37% of the law enforcement staff capability that is recommended by the deployment plan;
- Law enforcement deployment shows an even more pronounced shortfall at the field level, with the largest gap evident in Region 3, where only 17% of recommended law enforcement staff are in place;
- Law enforcement staff at field stations and regional offices consist of 202 full-time officers and 184 dual function officers (spending 25% of their time on law enforcement duties) to provide law enforcement services to more than 550 refuges, wetland management districts, and wildlife management areas;
- Full-time officers in the field have increased slightly since 2005, from 190 to 202 (per Table 57, full-time officers based in Washington, DC have decreased over the same timeframe from 12 to 6, thus the overall change in full-time officers from 202 to 208). However, this increase has been offset by a decrease in the number of dual function officers over the same timeframe, from 290 in 2005 to 184 in 2007. Overall, law enforcement staffing levels have decreased by 20 FTEs over the past two years, including a decrease of 14 FTEs in the field stations and regional offices.

The preceding staffing data, as per the Refuge System’s law enforcement deployment model, imply that the law enforcement function in the Refuge System is critically understaffed; however, it is important to balance this data with findings derived from interviews conducted with law enforcement personnel in Washington, Regional Offices, and refuges. Though all law enforcement personnel interviewed indicated that additional staff is needed, they also noted that it would be possible to provide effective law enforcement coverage with substantially fewer staff than recommended by the deployment plan. Estimates varied, but all interviewees put the number of law enforcement FTEs necessary for effective coverage between 400 and 500, not

⁹⁵ Please refer to footnote 8 regarding the inconsistency of 2005 NWRS LE staffing data. This table presents 2005 data indicating 264 LE FTEs deployed to the field. In 2005, there were also 12 LE officers deployed to Washington and FLETC, fully accounting for the 274 NWRS FTEs presented in Table 47.

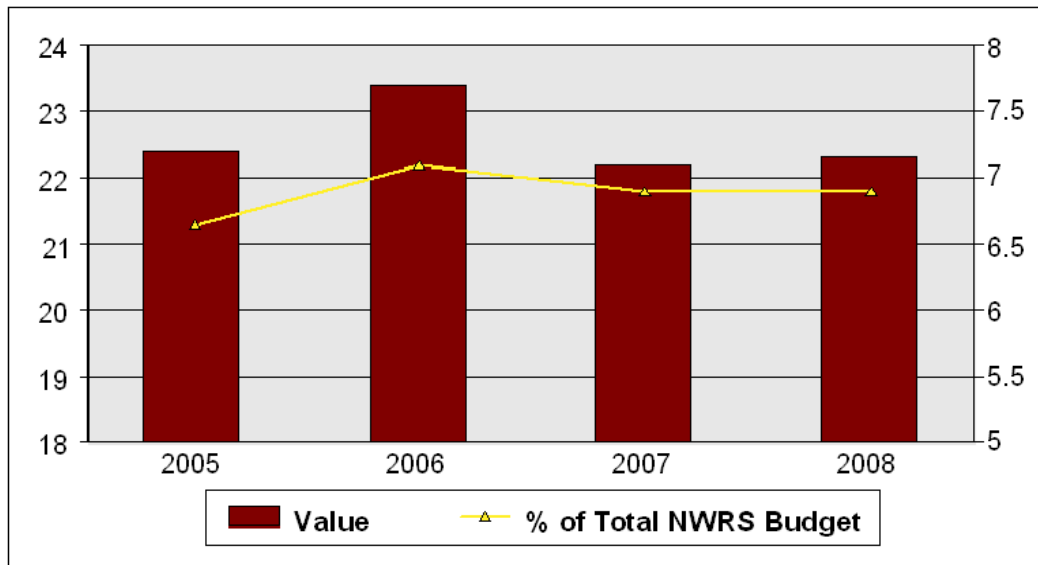
including FTEs resulting from partnerships with non-refuge law enforcement agencies (this compares to 274 actual FTEs in 2005 and 254 actual FTEs in 2007). Though this finding is based on fewer than a dozen interviews, all of the interviewees' statements on this issue were highly consistent.

An element of law enforcement staffing that requires further review is the Refuge System's use of zone officers. Zone officers are seen as a response to the OIG's and Secretary of the Interior's call for a centralized chain of command in all DOI law enforcement programs. Arguing the need for refuge managers' oversight of LE personnel (i.e., LE personnel and activities are seen as important pieces in the overall process of managing a refuge's land and resources and thus need to be under the management authority of refuge managers), the NWRS proposed the use of zone officers as a way to improve LE methods and standards overall, without taking LE supervisory authority away from refuge managers. Though the majority of the data collected during the evaluation concerning zone officers is represented by approximately a dozen interviews in the field and in Washington, these interviews point to an uneven roll-out of the zone officer concept at NWRS. More than half of the interviewees— both law enforcement staff and refuge staff— indicated that in terms of their experience, LE officers in the field utilize zone officers to an only limited extent. In addition, though very anecdotal, several interview comments imply an inconsistent understanding regarding the roles and responsibilities of zone officers.

Budget and Resources: The increase in attention paid to Refuge law enforcement, beginning around 2000, was accompanied by an increased commitment on the part of DOI and FWS, particularly after the Secretary mandated a number of Department-wide law enforcement reforms in July of 2002. Though it is not possible to track a law enforcement specific budget prior to 2005,⁹⁶ all senior NWRS staff interviewed agreed that substantial budget increases were made available to the Refuge law enforcement program for several years running. The annual increases have not, however, been sustained. As Figure 14 illustrates, the law enforcement budget from FY 2005 through FY 2008 has remained essentially constant, both in terms of value in real dollars and as a proportion of the overall Refuge System budget. While it is true that the law enforcement budget has not been eroded, as has been the case with other NWRS programs (e.g. conservation planning) it is also true that budget increases that initially supported law enforcement reforms have not been maintained. As the staffing data presented in the preceding tables illustrate, it appears unlikely that the Refuge System can make substantial progress towards recommended deployment levels for law enforcement officers given recent LE budget trends.

⁹⁶ Prior to 2005, budget resources for law enforcement were included in the general "operations" line item in the NWRS budget.

Figure 14. NWRS Law Enforcement Budget (in constant dollars)⁹⁷



Training and Skills: The training program required for Refuge law enforcement officers combines classroom and field-level training, as well as periodic refresher courses. Whether as a full-time officer or a dual function officer, in order to initially obtain a law enforcement commission, a candidate must first complete 21 weeks of “basic training” at the Federal Law Enforcement Training Center (FLETC), followed by ten weeks of the Field Training and Evaluation Program (FTEP). The FLETC portion of training consists of nineteen weeks of the Land Management Police Training Program (LMPT), which all USG land management agencies utilize, and two weeks of the Refuge Officer Basic School, which is classroom training specific to FWS and NWRS.⁹⁸ The Basic School covers FWS-relevant legislation (e.g., the Migratory Birds Act, the Endangered Species Act, etc.) as well as community policing, tracking, trapping, and FWS and NWRS-specific policies. The FTEP component of law enforcement training is structured to: 1) place a candidate for one month with a commissioned law enforcement officer at a field station; 2) place the same candidate for another month with a second commissioned law enforcement officer at a different field station; and 3) return the candidate to his/her first officer mentor for two weeks to wrap up the field portion of the training program. During FTEP, candidates are evaluated and provided with feedback on a daily basis. In addition, candidate placements are targeted to field stations that will allow them to be exposed to the range of law enforcement activities and situations they are likely to encounter as commissioned officers.

Though it is not within the boundaries of this evaluation to conduct a comprehensive assessment of the LE training program through, for example, direct observation, curricula review, representative surveys of trainees, etc.; it is possible to make some observations that speak to the issue of the quality of LE training.

⁹⁷ Neal’s source for the budget numbers

⁹⁸ As a point of comparison, the U.S Park Police follow LMPT with a four-week “add-on” training program and a twelve-week field training and evaluation program; BLM follows LMPT with a three-week “add-on” training program and a twelve-week FTEP program; and the National Park Service follows LMPT with a two-week “add-on” training program and a twelve-week FTEP program.

- FLETC utilizes a fully developed training evaluation program aimed at ensuring that all of their training programs are relevant and effective. The FLETC Automated and Testing System (FATES) is based on the Kirkpatrick Model and tracks not only trainee reaction to and assessment of the training program but also skills acquisition (through knowledge and operational/field tests) and application/use (through a “continuous validation process” that tracks trainees for 6-18 months after graduation). FLETC uses FATES to facilitate on-going adjustments and improvements to their training programs, including LMPT.⁹⁹
- FLETC has more than 30 years experience providing law enforcement training to USG agencies and currently trains law enforcement officers from more than 80 federal agencies.
- LMPT was academically accredited by Michigan State University in the spring of 2006.
- FLETC is required by policy to conduct a formal curriculum review for all of their training programs every two or three years. This continual review process has contributed to the regular evolution of LMPT, from the nine-week Police Integrated Training program (1970s and 1980s), to the twelve-week Natural Resources Police Training (1990s), to the current nineteen-week course, which was inaugurated in 2005.
- Though the Refuge Officer Basic School and FTEP are not covered by the curricula review requirement, NWRS initiated a modified curriculum review of the Basic School in 2005 and will conduct a full curriculum review in the summer of 2007. FTEP will also undergo a full curriculum review this coming summer.

One aspect of law enforcement training that has not been addressed in the preceding discussion and presentation of findings, and that is specifically called for in both the May 2003 report, *Interim and Long-Term Deployment of Law Enforcement Resources of the National Wildlife Refuge System*, and DO 155, is the training and certification of all refuge staff who supervise LE officers but have never held an LE commission themselves. A curriculum review of the Law Enforcement for Supervisors program, the course that had been used to train LE supervisors for more than a decade, was conducted in February 2006. The review resulted in the development of three distinct programs: a three-week course for supervisors with no LE experience (a one-time course); a one-week course for supervisors who currently or previously held LE commissions (a refresher course); and a two-day course for senior officials (a refresher course). The revamped one week course was rolled out in early spring of 2006 but was not well-received by initial participants. The course has since been re-tooled and was delivered for the first time in June of 2007. Course evaluations indicate a much higher level of participant satisfaction with course focus and content. The remaining two courses have not yet been delivered, and thus it is not possible to assess the quality or effectiveness of this training at this time.¹⁰⁰

⁹⁹ United States Department of Homeland Security, Federal Law Enforcement Training Center (FLETC). 11 February 2003, available from <http://www.fletc.gov/> ; Internet; accessed 13 February 2003.

¹⁰⁰ Information on training programs provided by Washington and FLETC-based NWRS staff.

The value of the NWRS law enforcement training program is perhaps best evidenced by the skills and knowledge acquired—and subsequently applied—by NWRS law enforcement officers. The vast majority of refuge managers, who frequently serve as supervisors to LE officers on their refuges, believe that LE officers have the skills necessary to meet their law enforcement responsibilities. As Table 58 indicates, 93% of refuge managers feel that dual function officers¹⁰¹ have sufficient law enforcement skills, and 94% believe full-time officers have sufficient skills. It is worth noting that refuge managers indicate that full-time officers have a more complete skills set than dual function officers, with 58% stating that full-time officers’ skills are fully sufficient, as compared to 42% for dual function officers.

Table 58. Refuge Managers Survey (2007) – Law Enforcement Officer Skills Sufficiency

<i>How would you characterize the following?</i>	1 Insufficient	2	3 Generally Sufficient	4	5 Fully Sufficient
The law enforcement skills of the full-time law enforcement staff	4%	2%	14%	22%	58%
	6%			80%	
The law enforcement skills of collateral duty officers	3%	4%	26%	25%	42%
	7%			67%	
<i>NOTE: There were a high number of “N/A” responses for the questions related to the skills of full time and dual function officers (80 N/A responses regarding full time officers and 98 N/A responses regarding collateral duty/dual function officers). The likely explanation is that a substantial number of refuges have only dual function OR full time officer(s).</i>					

Law Enforcement Effectiveness: One of the most basic approaches to understanding effectiveness is to look at the activities of an office or program—that is, what it has done given available resources and staff. In the case of the Refuge law enforcement program, this is a useful place to begin a review of effectiveness. The RAPP data, presented below in Table 59, indicate recent and expected increases in most indicators tracking LE activity. It is interesting to note that the law enforcement program does not anticipate continuing increases in LE activities beyond 2007; i.e., all target numbers show maintenance of a status quo from 2008 onwards.

¹⁰¹ During various stages of data collection for this evaluation, NWRS staff referred to “collateral duty” officers and “dual function” officers interchangeably. In fact, the two terms are meant to indicate distinct categories: dual function officers have only one non-LE set of responsibilities and must spend at least 25% of their time on LE activities; collateral duty officers – a job label that no longer formally exists at NWRS – had no minimum level of LE activity and could engage in multiple job tasks/responsibilities.

Table 59. RAPP Data – Law Enforcement Activities

Annual Performance Measures	FY 05 Actual	FY 06 Actual	FY 07 Target	FY 08 Target	FY 09 Target	FY 10 Target
7.2) # of actual LE field hours (excludes training, administrative functions, and physical fitness time) carried out during the year	284,446	326,728	341,756	288,713	290,135	291,557
7.3) # of notices of violation (NOV's) issued (report only, not a target)	7,069	7,860	8,519	Report only	Report only	Report only
7.4) # of criminal law enforcement incidents documented	68,932	71,807	67,733	67,898	67,553	67,209
7.5) # of other law enforcement incidents documented	11,286	11,230	11,173	11,117	11,060	11,004

Another, perhaps more substantial way to look at effectiveness is to get a sense of progress towards expected outcomes and results. The law enforcement strategic goal, as presented above and in the NWRS Strategic Plan SOG 7, includes three main elements: “1) protecting natural and cultural resources from over harvest, poaching, or other abuse; 2) enabling visitors to enjoy recreation, interpretation, and environmental education without fear of crime or incident; and 3) protecting government property from vandalism, abuse, destruction, and terrorist threat.” When the question of effectiveness is viewed through progress towards these three elements, the following findings are relevant:

- Over 60% of the 176 refuge managers who completed the 2007 PEER Survey indicated that visitor safety and law enforcement had declined at their respective refuges, as compared to five years ago (see Table 60).

Table 60. PEER Survey¹⁰² (2007) – Resource Protection and Safety

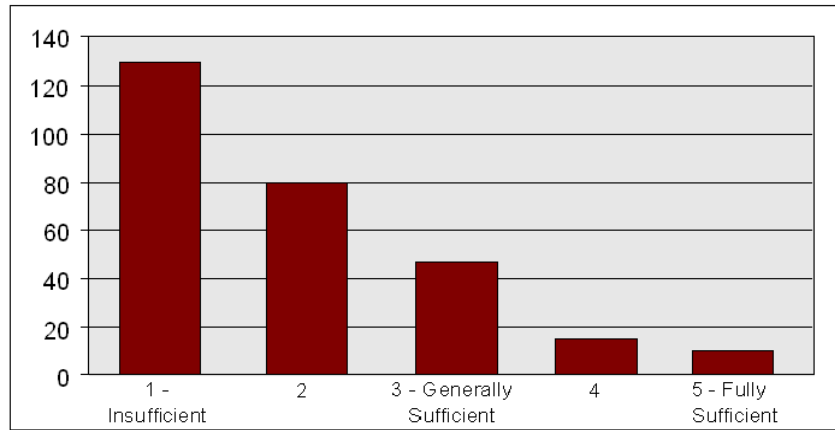
Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Visitor Safety is better protected at my refuge than it was five years ago.				
3%	24%	12%	32%	28%
Resource law enforcement is stronger at my refuge than it was five years ago.				
3%	24%	5%	26%	41%

- The 2007 MSI Refuge Managers Survey produced findings consistent with the PEER Survey. Fully 72% of the nearly 300 refuge managers who responded to the question indicated that law enforcement coverage is insufficient on the refuges they manage. (See Figure 15 below).

¹⁰² Public Employees for Environmental Responsibility (PEER). *2007 Refuge Managers Survey*. http://www.peer.org/docs/nwr/07_5_2_survey.pdf It is important to note that the 2007 PEER Survey is a mail-in survey, with 176 of 337 Refuge Managers providing survey responses. Even though the survey produced a 52% response rate, respondents do not reflect a random sample and thus it is not possible to generalize the findings of the survey to the entire refuge manager population.

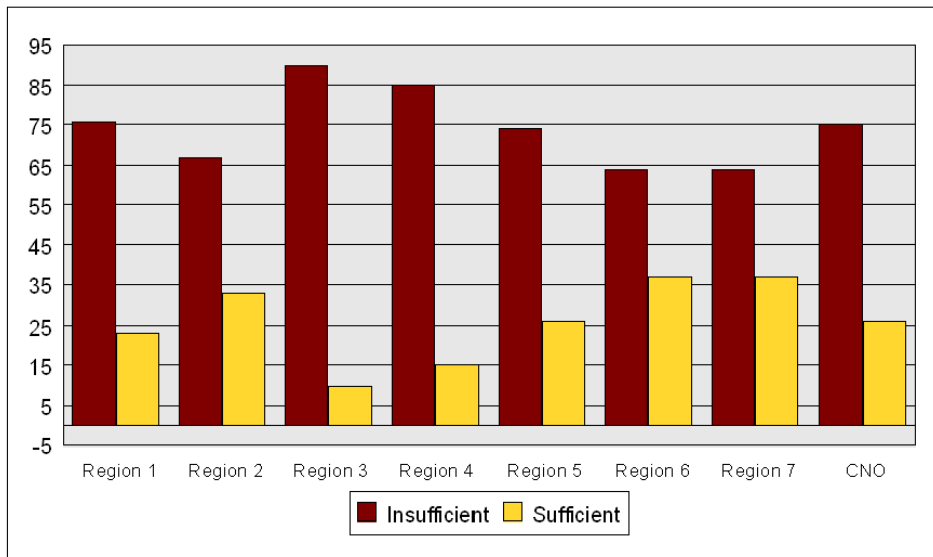
Figure 15. Refuge Managers Survey (2007) – Law Enforcement Coverage

How would you characterize the level of law enforcement coverage on the refugees you oversee?



- The significance of the issue of inadequate law enforcement coverage appears to vary from region to region. As Figure 16 illustrates, refugee managers indicate that law enforcement coverage is most adequate in Regions 6 and 7—37% of refugee managers responding from these regions noted that LE coverage was at least “generally sufficient” at their refuges. This compares to Region 3, where the lack of law enforcement coverage appears to be most severe—only 11% of refugee managers responding to the survey from Region 1 noted that LE coverage was at least “generally sufficient” at their refuges.

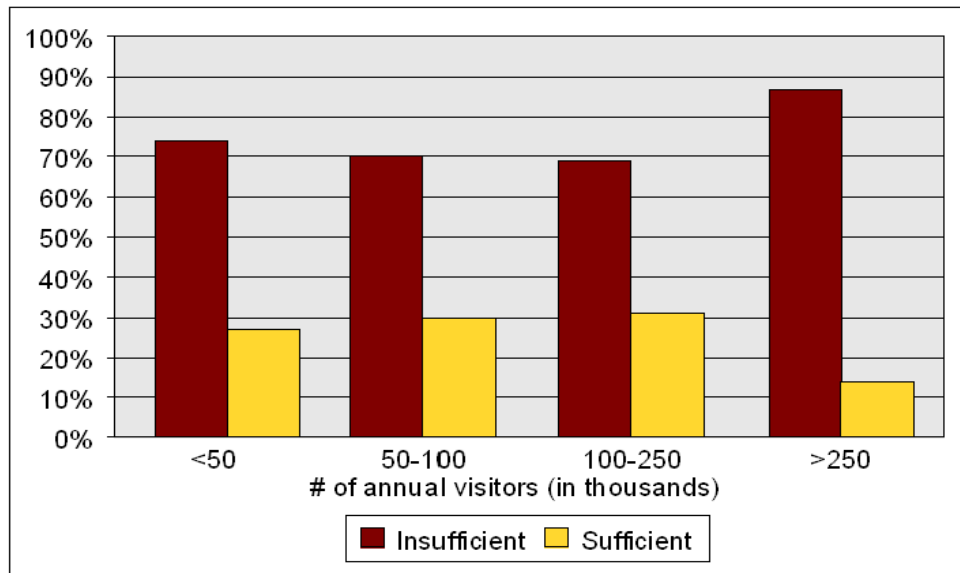
Figure 16. Refuge Managers Survey (2007) – Percent of Refuge Managers, by Region, Indicating Law Enforcement Coverage at Their Refuge is Sufficient or Insufficient¹⁰³



¹⁰³ Data for Figure 16 were compiled from a cross tabulation of survey questions 39c and 2. Question 39c includes six possible response categories: a five-point scale running from a value of 1 (insufficient) to a value of 5 (fully sufficient) and an “N/A” option. For the purposes of Figure 16, a response of “1” or “2” on the five point scale is judged to indicate insufficient law enforcement coverage, while a response of “3” or higher is judged to indicate sufficient law enforcement coverage.

- It is also useful to examine the issue of law enforcement coverage at field stations within the context of staffing levels and visitation. With regard to the size of a field station’s staff, 32% of refuge managers who work with staffs of fifteen or more indicated on the MSI survey that LE coverage at their refuges is at least generally sufficient. Perhaps not surprisingly, this compares to somewhat lower numbers for smaller field stations; only 24% of refuge managers with staffs of seven or fewer, and 22% with staffs of 8-15, indicate sufficient LE coverage at their field stations. When correlating LE coverage to visitation levels, the data are generally consistent, with one important exception: approximately 30% of managers of refuges with annual visitation of less than 250,000 people indicate LE coverage is at least generally sufficient. These numbers drop substantially for refuges hosting more than 250,000 visitors per year; only 14% of refuge managers, just seven of the 50 responding to the survey, feel LE coverage is sufficient at their refuge. (See Figure 17 below).

Figure 17. Refuge Managers Survey (2007) – Percent of Refuge Managers, by Level of Visitation, Indicating Law Enforcement Coverage at Their Refuge is Sufficient or Insufficient¹⁰⁴



- When asked about the impact of the move towards full-time officers, over 60% of refuge managers responded that law enforcement capability on their refuges had decreased since the initiation of the relevant reforms, compared to 17% who indicated that their refuges had experienced improved law enforcement. (See Table 61 on the next page.)

¹⁰⁴ Data for Figure 17 were compiled from a cross-tabulation of questions 39c and 27. Refer to the preceding footnote for an explanation of how the data for the two categories “sufficient” and “insufficient” were derived.

Table 61. Refuge Managers Survey (2007) – Law Enforcement Officers FT Shift

<i>How has the shift to the use of full-time LE Officers affected the performance of the law enforcement program on your refuge?</i>				
1 Decreased Substantially	2	3 About the Same as Before	4	5 Increased Substantially
42%	19%	22%	9%	8%
61%			17%	

- The MSI Survey invited refuge managers, through an open-ended question, to offer any observations or comments concerning the law enforcement program. One hundred eighty-seven refuge managers took the opportunity to provide comments. Content analysis of the responses indicated two predominant messages:
- One hundred seventeen of the comments indicated a concern regarding inadequate law enforcement coverage or capability on their refuge and/or across the system as a whole. It is important to recognize that more than one-third of refuge managers felt this issue important enough to offer additional comments. (See text boxes below.)
- Sixty-two refuge managers noted that the role of dual function (or collateral duty) LE officers is critical to meeting NWRS law enforcement responsibilities. A substantial number of this group offered the opinion that the move to full-time officers has been implemented too quickly and the resulting lack of collateral duty officers has worsened the coverage problem.
- Senior managers of the law enforcement program—both in Washington and in Regional Offices—who were interviewed for this evaluation also noted that law enforcement coverage was an important problem facing the Refuge System. As noted earlier, fewer than a dozen LE managers were interviewed, but each of them raised this issue.
- An April 2006 OIG Report entitled, *Progress Report: Secretary’s Directives for Implementing Law Enforcement Reform*, indicates that NWRS has made good progress toward addressing a number of the Secretarial directives issued in July of 2002. However, many of the directives tracked for NWRS relate to specific policy, and, as the OIG makes clear, its progress report focuses on the existence of policy or administrative changes, not on their impact. In addition, when the report does discuss

“The Refuge complex is made up of five different geographically located units covering 115,000 acres. The Refuge has only one full time Park Ranger to cover this land base, which is totally inadequate. Additionally, most new officers are trained toward the non-resource protection enforcement with few ambassador skills. The abolishment of collateral officers has significantly hampered the Refuge’s ability to protect resources and the public.”

“We have no law enforcement officers on any of the 3 refuges. We rely on officers from other stations to help us. The LE situation is embarrassing. We are not protecting our natural resources or our visitors. It all started when the Service drastically reduced the use of dual function officers. The full time officers are good officers, we just need a lot more officers to protect our refuges.”

more substantive or operational change, it seems to be somewhat off target, e.g., regarding the issue of officer safety, the report states, “NWRS has also implemented a zone officer system to cover law enforcement needs when officer safety issues arise due to lack of coverage.”¹⁰⁵ This evaluation has collected no data that implies the zone officer system was developed to address inadequate law enforcement coverage on field stations.

C. Conclusions

Staffing levels: Low staffing levels are leading to a substantial and critical lack of law enforcement coverage and capability at many refuges across the system. At many refuges, law enforcement coverage is insufficient to ensure the protection of resources and the safety of visitors and refuge staff. A substantial majority of refuge managers (over 70%) feel visitor safety and law enforcement performance have declined in recent years. The issue of public safety is of particular concern given that only seven of the refuge managers from 50 high visitation refuges (with annual visitation in excess of 250,000) who responded to the MSI survey indicated that law enforcement coverage is sufficient on their refuge.

Law enforcement staffing levels are far short of both the recommendations of the IACP deployment model and more conservative NWRS internal law enforcement needs assessments. In addition, as LE budgets have leveled off in recent years, the move towards an improved staffing situation has stalled. It is highly unlikely that any meaningful progress towards improving the Refuge System’s law enforcement capability under current and expected budget allocation levels.

Shift to Dedicated Law Enforcement Officers: As noted by refuge managers, the move away from collateral duty officers to develop a more professional law enforcement capability composed of full-time officers has not been implemented to the extent that is required. The number of full time officers in the field has increased slowly since reforms began in 2003, but the increase has been insufficient to fill the gaps left by “decommissioned” collateral duty officers. Though the various reviews and reports of the law enforcement function at DOI and the Refuge System made clear the need to move away from the use of collateral duty officers, the lack of substantial increases in the deployment of full time officers has left refuge managers feeling that the “old” system of law enforcement deployment was dismantled and that the “new” system was never implemented.

Though all regions have too few LE staff to provide adequate law enforcement coverage to their field stations, Region 3 is particularly hard hit. The region has only 17% of the law enforcement officers recommended by the IACP model—by far the largest regional gap between recommended and actual LE staff levels. Not surprisingly, only 11% of Region 3 refuge managers indicate that LE coverage is adequate on their refuge.

Training: The training of law enforcement officers appears to provide officers with the skills and knowledge necessary to meet their LE responsibilities in an appropriate and effective

¹⁰⁵ United States Department of the Interior. Office of the Inspector General. (April 2006). *Progress Report: Secretary’s Directives for Implementing Law Enforcement Reform* (PI-EV-MOI-0001-2006). Washington, DC: U.S. Government Printing Office. http://www.doi.ig.gov/upload/Law_Enforcement_Reform.pdf

fashion. However, it is not yet clear if the training of NWRS LE officer supervisors will adequately prepare the supervisors for their role.

Role of Zone Officers: Though additional data are required to confirm initial anecdotal findings, nearly three years after relevant reforms were initiated, it appears zone officers are not fully utilized as law enforcement resources, particularly by field stations. This is particularly troubling given staffing shortages at the field station level. It is also an issue because zone officers were intended to address—in a compromise fashion—the OIG’s call for centralized lines of command.

D. Recommendations

Increase the Number of Full-time Law Enforcement Officers: Increase the number of commissioned law enforcement officers deployed in the field in order to address the critical lack of law enforcement coverage across the Refuge System. The severe gap in staffing can only be addressed by hiring additional full-time law enforcement officers—moving from current levels of around 200 full-time officers to at least 400 full-time officers. Refuge managers clearly see this as a critical issue, noting that a continuing increase in the risks to public safety, staff safety, and resource protection are unacceptable. Implementation of this recommendation will require substantial resources, but an acceptable improvement in law enforcement coverage is of fundamental importance to the on-going effectiveness of the Refuge System.

Prioritize the Deployment of New Officers to Address the Most pressing Needs: Any new law enforcement officers should be deployed to those regions and refuges at highest risk. For example, Region 3 may warrant first consideration, and special attention should be paid to high visitation refuges.

Retain Existing Dual-Function Officers as Possible and Necessary: Do not push to replace existing dual-function officers as dual-function officers will continue to play a critical role in refuge law enforcement until such time that more full-time LE officers can be hired; however, this is a stop-gap measure, at best, because the nature of law enforcement and the increasing complexity of crime on refuges requires that the Refuge System move to an adequate force of full-time officers as quickly as possible.

Explore the Use of Interim Measures to Address the Most Severe Gaps in Law Enforcement Coverage. The parameters of the evaluation did not allow for thorough examination of all potential options for interim measures. However, the evaluation team directly observed or discussed with Refuge System staff several ideas, including, for example:

- **Utilize Short-Term Deployments to “Share” Law Enforcement Officers During Periods of Low Law Enforcement Activity:** Many Refuges experience seasonality with regard to law enforcement requirements, i.e., there will be peak months during which law enforcement coverage is critical, but also months during which LE demands are greatly reduced. The Refuge System should explore the possibility of deploying officers, on a short term basis, from refuges with low seasonal LE demand to refuges with high seasonal LE demand. Similar to the preceding recommendation, this should be seen only as a near term, stop gap measure.

- **Expand Partnerships with State Law Enforcement Staff Wherever Practical:** State law enforcement officers currently work with Refuge System officers to support—or fully manage—select public use activities on refuge lands (e.g., managing hunts). Opportunities for such partnerships should be fully explored and, wherever practical, put into place.
- **Close Refuges to the Public:** In order to focus scarce law enforcement resources on the highest priority needs, close selected refuges in each region until such time that adequate law enforcement capability exists. The Refuge System should identify criteria to facilitate the process for identifying refuges for closure, perhaps using the process Region 5 utilized for similar purposes as a roadmap.

Improve Recruitment and Retention of Law Enforcement Officers: The current pay grades and opportunities for advancement available to Refuge System law enforcement officers provide minimal incentives for individuals to pursue—or remain in—law enforcement positions within the Refuge System. Better pay grades and opportunities available to law enforcement officers at other USG land management agencies put the Refuge System at a distinct disadvantage in its efforts to recruit and retain law enforcement personnel. The Refuge System should modify the job descriptions for law enforcement officers to allow for higher GS pay grades and/or more attractive mid-career opportunities (including lateral moves out of law enforcement to other positions in the Refuge System). In addition, the recruitment process should be reviewed with an eye to developing new recruitment vehicles or better utilizing existing Refuge System programs such as the Student Temporary Employment Program (STEP) and the Student Career Experience Program (SCEP).

Review the Role and Deployment of Law Enforcement Zone Officers: At a minimum, Zone Officers are underutilized in some NWRS regions. This situation may be a result of: a) the number of zone officers deployed is based on the assumption that there would be a much greater contingent of full-time officers to oversee than is currently the case or; b) a lack of operational clarity regarding the role and responsibilities of zone officers, given the lack of line authority between zone officers and the refuge-based officers they “oversee.” Consideration should be given to adjusting the responsibilities and tasks currently defined for Zone Officers and perhaps deploying fewer. The savings in resources from a reduction in the current number of Zone Officers could be used to hire additional full-time officers. In addition, an assessment of the role of zone officers may identify useful “best practices” that could be standardized as required tasks across the system, e.g., refuge level “law enforcement assessments” that identify important law enforcement risks and opportunities.

SOG 8: Provide infrastructure and equipment adequate to support mission and maintained in good condition.

<p>Performance Rating:</p> <p>Effective</p>	<p>In the mid-1990s, the maintenance of the Refuge System’s infrastructure and equipment was a critical concern, and the maintenance budget increased dramatically - from \$21 million in 1996 to \$91.5 million in 2004 (a 336% increase over eight years). The availability of increased funds over the past seven or eight years has allowed the Refuge System to effectively address preventive maintenance requirements, target the most urgent deferred maintenance projects, and selectively add new facilities. Largely as a result of these additional resources, the majority of refuge managers do not currently view maintenance concerns as a constraint to achieving their refuge’s purpose: 75% of refuge managers indicate that the condition of the facilities on their refuge is at least sufficient to support the purposes of their respective refuges (2007 MSI Refuge Managers Survey). Subsequent to 2004, however, maintenance funding dipped substantially – a decline of 30% from 2004 to 2007. It is important to note that if the recent backsliding in maintenance funding is not reversed infrastructure maintenance will soon become a critical problem again.</p> <p>An important NWRS initiative in this area over the past several years has been the implementation of the Service Asset Maintenance Management System (SAMMS), a maintenance management software system intended to provide better information to guide decision-making at the national, regional, and refuge levels. SAMMS is starting to provide improved information at the national level, but it has not been well-received at the field level. SAMMS is viewed as one of the major sources of the recent increase in administrative burden being shouldered by field station staff, and that burden has not been offset by any perceived value—80% of refuge managers feel their ability to manage maintenance needs is about the same or has decreased with the introduction of SAMMs. NWRS headquarters, recognizing the issue, has continually modified SAMMS to reduce the burden of data input and management at the field level. It is still unclear, however, whether SAMMS will ever be of substantial value to refuge managers.</p>
---	--

A. Context/Background

When President Theodore Roosevelt established Pelican Island as the first of the nation’s wildlife refuges in 1903, there were not many concerns about real or personal property assets. There were no roads or buildings to maintain, no visitor centers to build, no interpretive kiosks to update, and the vehicle fleet consisted only of Paul Kroegel’s boat.¹⁰⁶ From that point forward, however, things have changed dramatically. By 1945 there were more than 200 wildlife refuges,

¹⁰⁶ Pelican Island was protected by President Roosevelt as the first “federal bird reservation” - the first time the federal government had protected land for the sake of wildlife. Pelican Island is widely regarded as the first national wildlife refuge (all of the bird reservations and game reserves that President Roosevelt established would later be included in the National Wildlife Refuge System).

a number of which grew to over 300 by 1970 and over 500 by the mid-1990s. Today the Refuge System includes 547 refuges and 37 wetland management districts and covers all fifty states and several U.S. territories. The growth in the number of refuges has been accompanied by a similar increase in the number of people visiting refuges. In the mid-1950s approximately 5 million people visited refuges each year, a number that more than doubled, to 11 million, by 1960.¹⁰⁷ By 1996, the Refuge System was receiving 30 million visitors a year, and in 2004, nearly 40 million visits were made to national wildlife refuges.¹⁰⁸

Not only have the number of refuges and annual visitation levels increased, a greater range of activities is now being pursued on refuge lands. The majority of refuges host each of the Big Six compatible public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation), and refuges throughout the system support additional public uses. In addition, the work of habitat management and restoration has expanded, both in terms of acreage covered and the types of interventions utilized. In short, an increasing number of field stations are receiving a growing number of visitors, who are involved in an expanding range of activities.

To support the management of a constantly expanding resource base and dramatically increased levels of public use, the Refuge System has had to build and/or maintain an extensive inventory of real and personal property assets. Though raw asset numbers provide only a piece of the picture, they are instructive (see Table 62).

The majority of these assets are fundamental to the mission of the Refuge System and to the achievement of the system’s long-term biological and public use objectives. The ability of the NWRS to effectively manage (including disposal) and maintain these assets impacts directly and significantly on refuge wildlife and visitor experience, e.g., it isn’t possible to effectively manage wetlands in a waterfowl production area if water management structures

Table 62. NWRS Asset Inventory – FY 2006

Maintenance/Asset Category	# of Assets
Conservation/water management facilities	11,973
Historic/heritage facilities	297
Visitor facilities	3,151
Buildings	5,926
Public roads, bridges and parking	6,513
Administrative roads, bridges and parking	3,060
Other structures	9,244
Total	40,164

are broken and in disrepair. It is understandable, therefore, that the Refuge System has identified infrastructure management and maintenance as one of its core long-term goals.

The NWRS strategic plan presents this Strategic Outcome Goal as follows:

¹⁰⁷ Fischman, Robert L. The National Wildlife Refuges: Coordinating a Conservation System through Law. Washington: Island Press, 2003. Pg 96.

¹⁰⁸ It is helpful to remember that NWRS visitation numbers track the number of *visits* made to refuges, not the number of *visitors*.

Means and Strategies: *Facilities and equipment are available where needed and are maintained in good condition so that they can effectively and reliably contribute to the Refuge System mission.*

This activity involves adding new facilities where critical to mission needs and maintaining the Refuge System's \$15 billion portfolio of existing facilities. In addition, an extensive vehicle and equipment fleet of over 16,000 items must be maintained in good condition. This is an especially urgent need for new or recently acquired refuge lands. To assure reliable and functional facilities and equipment, we strive to: a) complete adequate preventive and cyclical maintenance; b) complete deferred maintenance projects; c) replace facilities and equipment before they have exceeded their useful lives; and d) excess or demolish assets in poor condition that do not contribute to accomplishing the purposes of the refuge or the mission of the Refuge System. New facilities will selectively be added where needed to achieve mission goals and objectives. Collectively, these efforts allow facilities and equipment to be maintained in good condition so that they can effectively and efficiently contribute to the Refuge System mission.

Preventive maintenance, which includes scheduled servicing, repairs, inspections, adjustments, and replacement, results in fewer breakdowns, fewer premature replacements, and assists in realizing the expected life of facilities and equipment. Deferred maintenance projects repair, rehabilitate, dispose of, or replace buildings and other facilities. Deferred maintenance is maintenance that was not performed when it should have been and which, therefore, was put off or delayed for a future period. Replacement schedules are gauged against industry accepted standards for useful life of various facilities or equipment. Use of comprehensive condition assessments and state-of-the-art maintenance management software to guide management decisions are inherent in this goal.

The Conservation in Action Summit did not identify this goal as among the highest priority needs; however, by inference, high priority activities may be involved when they provide direct support of other identified activities. For example, quality recreation was identified as a high priority and adequate facilities at some locations could be a limiting factor for quality recreation.

Performance Measurement: *Condition of facility assets is measured by the Facility Condition Index (FCI), which is the ratio of deferred maintenance needs to replacement cost. This is an indicator of condition commonly applied in both private industry and government. Comprehensive condition assessments are completed on all facility assets over \$50,000 in replacement cost once every 5 years to better plan and budget for repair costs. Five year maintenance and capital improvement plans are completed each year to enhance planning for major asset projects. A comprehensive commercial maintenance management system is also being deployed to document all maintenance expenditures and help plan for needed investments. This software (MAXIMO) will be integrated with the new Department-wide enterprise management system to allow direct linkage with financial management programs. The Refuge System is also fully engaged in implementing the Department initiatives under Executive Order 13327 on Federal*

Real Property Asset Management, which applies a variety of metrics to instill a portfolio-based approach to improving the management of facility assets.

Annual performance measures, as listed in Appendix D of the *Final Strategic Plan for the National Wildlife Refuge System, 2006 – 2010*, include:

Table 63. Annual Performance Measures – Strategic Goal #8

Performance Indicators	2005		2006		% Change 2005-2006 Actuals
	Planned	Actual	Planned ¹⁰⁹	Actual	
8.1) Average FCI for conservation, cultural, recreation, buildings, and other facilities (5 subcategories below)		N/A	-	.1000	N/A
8.1a) FCI of conservation and biological research facilities	-	.0605	-	.0507	-16.2%
8.1b) FCI of cultural and natural heritage facilities	-	.1365	-	.1095	-19.8%
8.1c) FCI of recreation assets	-	.0877	-	.0833	-5.0%
8.1d) FCI of buildings (Administrative, Employee Housing, etc.)	-	.1249	-	.1264	1.2%
8.1e) FCI of other facilities (roads, dams, trails and bridges)	-	.0923	-	.0943	2.2%
8.2) % of equipment (\$5-\$25K) replaced consistent with prescribed normal useful life replacement standards	-	59% (6,056 of 10,241)	-	65.05% (6,056 of 9,310)	10.3%
8.3) % of heavy equipment (>\$25K) replaced consistent with prescribed normal useful life replacement standards		49% (1,668 of 3,446)	-	43.6% (1,720 of 3,945)	-11.0%
8.4) % of universally accessible facilities in relation to total number of recreation areas (i.e. refuges open to public)		57.14% (268 of 463)	-	63.0% (293 of 463)	10.3%

B. Principal Findings

The following presentation of findings is organized under three main topics: (1) budget and staffing; (2) asset management—processes and systems; and (3) condition of Refuge System assets. Importantly, the following presentation of findings, as well as the discussion of conclusions and recommendations, focuses only on the real property assets of the Refuge System. Based on scoping interviews with senior NWRS officials at the outset of the evaluation, a decision was made to set aside consideration of personal property assets (i.e., the vehicle fleet and other movable assets) for the purposes of this evaluation.

¹⁰⁹ The RAPP spreadsheet provided by NWRS included FY 2006 targets for all of the performance indicators for SOGs 1 thru 7. There were no targets provided for the remaining SOGs and therefore 2006 planned data are not included in Table 8.1

1. Budget and Staffing

By the early 1990s, it was becoming increasingly clear to a broad audience that funding levels were not keeping pace with the needs of the Refuge System, particularly in terms of maintaining the system's infrastructure. A 1992 Department of Interior Inspector General audit found that an extended period of limited funding for asset maintenance had resulted in many NWRS facilities falling into poor condition and had led to large and growing maintenance backlog.¹¹⁰ Though not a focus of the report, the 1994 internal *FWS Refuge Operations Subactivity Report* echoed the findings of the 1992 IG audit, noting that the requirements of the Refuge System's maintenance sub-activity had increased at a more rapid rate than both the requirements of refuge operations and the NWRS budget.¹¹¹ In 1997 testimony before the House Subcommittee on Fisheries and Conservation, then acting Director of the FWS John Rogers highlighted the growing problem of deteriorating Refuge System assets: "Unfortunately, over the years we have not committed the necessary financial resources to properly maintain the Refuge System, and we are reaping the consequences of those actions today. We have more than \$4.5 billion in assets on national wildlife refuges ... [and] many of these facilities are in poor condition."¹¹²

In 1996, concerned that inadequate funding was seriously and substantially undermining the ability of the Refuge System to pursue its core wildlife conservation mission, a group of 20 diverse conservation and recreation organizations formed the Cooperative Alliance for Refuge Enhancement (CARE) to push for increased funding for the Refuge System. From its beginning, the CARE group, which includes such diverse organizations as the National Rifle Association of America, the Defenders of Wildlife, and the American Birding Association, identified maintenance funding as one of the critical concerns for the Refuge System.

These multiple calls for enhanced funding for maintenance were effective in securing increased budgets, at least for a number of years. Figure 18, on the following page, shows that overall maintenance budgets (excluding salaries) increased each year from FY 1997 to FY 2004. Over the seven-year span, the overall maintenance budget increased by a total of \$79.35 million, a 386% increase. Both annual maintenance and deferred maintenance budgets also increased during this timeframe (budget numbers for these line items are only available from 2000 onward). However, as Figure 18 makes clear, these increased trends have not been sustained. From 2004 to 2007, the overall maintenance budget, again excluding salaries, decreased by approximately \$16 million, a decline of approximately 16% over the three-year span. This decrease was evidenced most substantially in the deferred maintenance budget, which decreased by approximately \$12 million, a 22% cut from FY 2004 to FY 2007.

¹¹⁰ Include full reference to the 1992 IG audit of DOI.

¹¹¹ *Refuge Operations Subactivity Report*, 1994, United States Department of Interior, Fish and Wildlife Service. PP10.

¹¹² John Rogers testimony in an oversight hearing before the House Subcommittee on Fisheries Conservation, Wildlife and Oceans, April 21, 1997. PP 14-15.

Figure 18. NWRS Maintenance Budget Trends
(in millions)

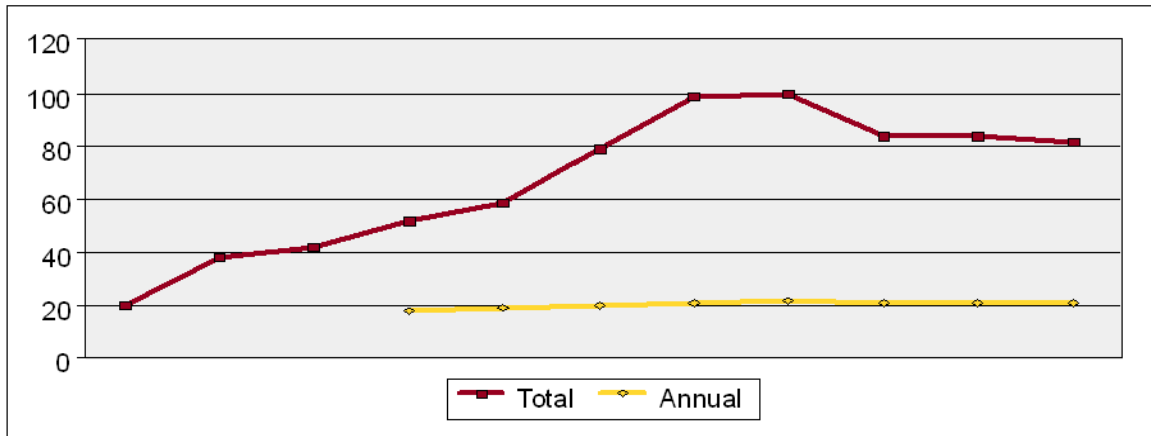


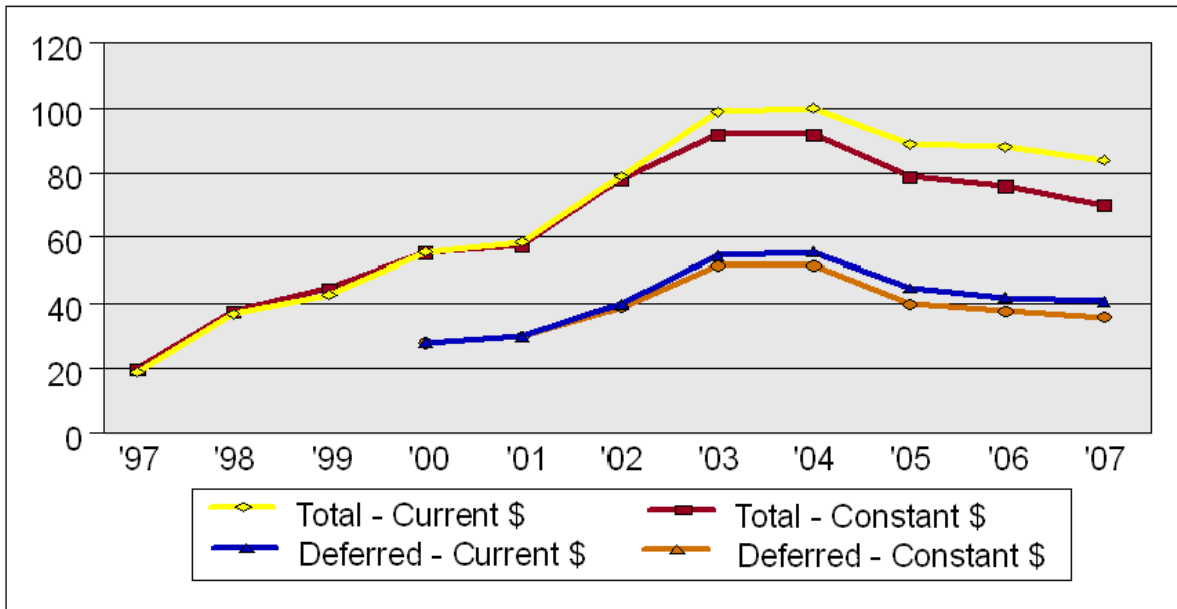
Table 64. NWRS Maintenance Budget (FY 97 – 07)

Maintenance Category	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07
Maintenance Support (salaries)										46,837	47,673
Annual Maintenance				16,935	18,577	20,704	23,054	24,830	22,491	22,986	22,986
Small Equipment/vehicles				7,471	8,179	8,179	9,119	9,066	6,873	6,471	6,076
Heavy Equipment						7,000	6,955	6,914	6,818	6,812	5,875
Deferred Maintenance				27,585	29,946	38,877	53,774	54,913	45,077	44,146	42,908
Regional/central support						2,269	4,192	4,167	6,248	6,213	6,213
Total – excluding M support (salaries)	20,539	35,689	43,689	51,991	56,702	77,029	97,094	99,890	87,507	86,628	84,058
Total Refuge Maintenance										133,465	131,731

The recent declines are even more noteworthy when budget levels are adjusted for inflation. Using 2000 as a base year, Figure 19 shows the trends of Refuge System’s maintenance budget in current versus constant dollars. As the chart indicates, the budget declines from 2004 to 2007 are substantially more severe when adjusted for inflation. The total maintenance budget (in constant dollars) declines over \$21 million from FY ‘04 to FY ‘07, a drop of nearly 23% (this compares to a 16% drop in current dollars, as noted previously). The deferred maintenance

budget over the same three year timeframe decreased nearly \$15 million, when adjusted for inflation. This constitutes a 30% reduction in three years.

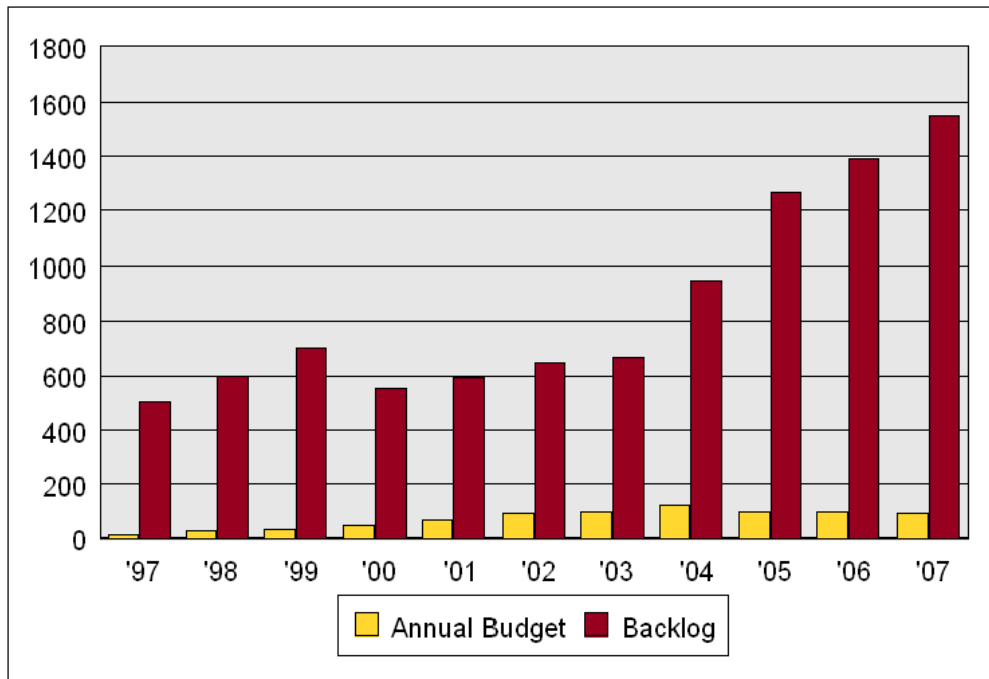
Figure 19. NWRS Maintenance Budget Trends – Current versus Constant Dollars
(in millions)



Though the budget decreases of the past three years are substantial, it is important to recognize the budget trends over the full 1997-2007 time span. Even with the recent budget reductions, the overall maintenance budget increased \$63.5 million over the ten-year period, a jump of 306% (current dollars). Adjusting for inflation brings the numbers down somewhat, but they still represent very marked increases— i.e., a jump of \$49.2 million, an increase of 229%.

The Deferred Maintenance Backlog: The maintenance budget picture presented above— funding increases overall with some backsliding in recent years—is best understood within the context of one or two related and important factors. The first of these factors is the deferred maintenance backlog. The backlog was already substantial in 1997, estimated at \$505 million. The increases in maintenance funding through FY 2004, though significant, did not keep pace with maintenance needs and the backlog grew to over \$640 million in 2002, reaching \$930 million by FY 2004. With the recent budget reductions, the maintenance backlog has soared and, as of FY 2007, had reached \$1.53 billion. When compared to annual maintenance budget numbers, the weight of the deferred maintenance backlog seems overwhelming (see Figure 20).

Figure 20. Comparing Maintenance Backlog and Annual Budget
(in millions)



It is, however, important to recognize one or two points when considering the estimated value of the Refuge System’s deferred maintenance backlog. First, senior NWRS managers note that internal reviews indicate that cost estimates for deferred maintenance projects can vary substantially between the NWRS Facility Coordinators who conduct facility assessments. Second, because the NWRS DM budget is allocated to Regions on a proportional basis, determined by the value of each Region’s DM backlog, incentives do exist for Regions to maintain high value DM backlogs.¹¹³ It was beyond the scope of this evaluation to fully examine the effect of these two factors on the valuation of the deferred maintenance backlog, but it is helpful to keep them in mind when considering the DM issue.

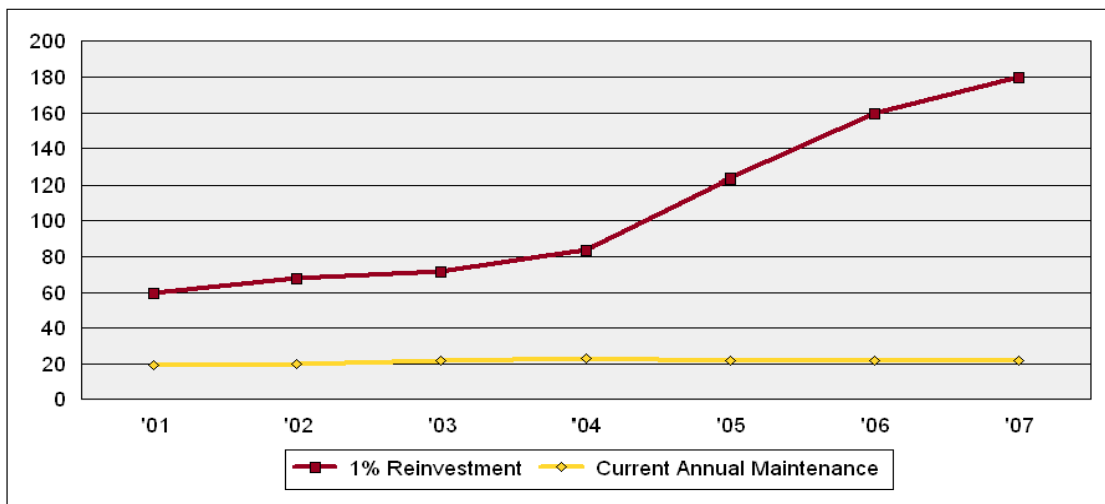
It is helpful to look at one additional consideration when thinking about the Refuge System’s current, and expected, maintenance backlog. The complete inventory of NRWS’ real property assets is now valued at more than \$19 billion (as measured by current replacement cost), an increase of more than 300% since 1997, when all NWRS assets were valued at \$4.5 billion.¹¹⁴ The \$19 billion number takes on significance when considering that industry standards for annual maintenance reinvestment rates stand at between 1.5% and 4%. That is, it is expected that between 1.5% and 4% of the total value of assets held will need to be reinvested annually to maintain the value of those assets. Even at a below industry standard reinvestment rate of 1%, the NWRS would need to provide approximately \$190 million in maintenance funds each year to *simply keep the deferred maintenance backlog from growing*. The current annual maintenance budget of \$22.3 million is only one tenth of one percent (.12%) of the total value of NWRS

¹¹³ NWRS is the only agency in DOI that allocates its DM budget on a regional basis. Both the Bureau for Land Management and the National Park Service develop national/agency-wide lists of prioritized DM projects and allocate funding based on the national list.

¹¹⁴ Budget data provided by the NWRS Office of Technology and Maintenance.

assets. It is important to note that the Refuge System is not an “industry” per se, and that Refuge System assets have different characteristics of use than would be the case in an industrial setting. Nonetheless, the large and growing gap between the budgets allocated by the Refuge System for annual maintenance (i.e., not deferred) and the presumed required annual maintenance budget, defined here as 1% of the current replacement value for all real property assets, is an important issue for NWRS (see Figure 21).

Figure 21. Comparing NWRS Annual Maintenance Budget to Industry Standards
(in millions)



Maintenance Staffing: Unfortunately, the Refuge System’s human resources data files do not easily facilitate the construction of a time series data set for maintenance staffing. Nonetheless, several findings related to current maintenance staffing levels and characteristics are worth noting.

- In FY 2006 there was approximately 640 maintenance staff working at NWRS field stations.¹¹⁵
- Approximately 55% (323 of 584) of field stations have no resident maintenance staff. At these refuges and WMDs, a refuge manager or biologist typically assumes maintenance responsibilities as a collateral function. Only 15% (87 of 584) of field stations have at least three maintenance staff.¹¹⁶
- Maintenance staffs frequently carry out functions beyond their maintenance responsibilities, e.g., operational functions such as manipulating wildlife habitats. An internal review of maintenance staff functions on thirteen field stations indicates that approximately 40% of maintenance staff time is spent on duties other than maintenance.¹¹⁷

¹¹⁵ Briefing Statement, U.S. Fish and Wildlife Service, September 14, 2006.

¹¹⁶ Ibid

¹¹⁷ Ibid. The data presented in the 2006 Briefing Statement is consistent with observations and interview findings from the evaluation team’s field work (18 refuges and all Regional Offices).

- When compared to the Refuge System’s complete inventory of assets, each maintenance staff person, on average, must maintain more than 60 facility assets and 20 pieces of equipment. If the 640 staff positions are converted to 380 FTEs—assuming 60% of staff time being spent on maintenance functions—these numbers jump to more than 100 facility assets and 35 pieces of equipment (See Table 65).¹¹⁸
- Anecdotal data from interviews with maintenance staff and managers in both Washington and the field indicate that the asset management function in the Refuge System is increasing in breadth and complexity. As a result, maintenance staff are being asked to undertake tasks and duties that extend beyond “typical” maintenance activities, e.g., managing SAMMS data input and reporting.

Table 65. NWRS Maintenance Staff – Per Capita Responsibilities

	Total	Per Capita Maintenance Responsibilities	
		640 FTEs (assumes 100% focus)	380 FTEs (assumes 60% focus)
Facility Assets – #	40,164	63	106
Facility Assets – value	\$19.0 billion	\$29,688,000	\$50,000,000
Vehicle Assets – #	13,707	21	36
Vehicle Assets – value	\$547 million	\$855,000	\$1,439,000

2. Asset Management - Processes and Systems

The presentation of findings in this section will focus on the reforms and initiatives taken by the Refuge System over the past five plus years to improve its asset management systems and procedures. The development and roll out of SAMMS will be discussed, as will field station reaction to the various asset management reforms.

3. Condition of Refuge System Assets

The preceding discussion has highlighted key findings related to budget and staffing for maintenance at NWRS and recent initiatives and reforms in asset management being pursued by the Refuge System. This section presents findings that speak directly to the condition of the Refuge System’s real property assets. In a sense, the findings here should reflect and be impacted by the trends and circumstances highlighted in the prior two sections.

A useful place to begin this discussion is with the data on asset condition that is collected by the Refuge System itself. The majority of indicators used by the Refuge System to track asset condition (refer back to Table 63) measure the facility condition index (FCI) of different categories of real property assets. The FCI is the ratio of total deferred maintenance cost (total repair costs) of an asset to the replacement cost for that asset. An FCI of less than 5% (<.05) indicates good condition, an FCI of between 5% and 10% (>.05 and <.10) indicates fair

¹¹⁸ Ibid.

condition, and an FCI in excess of 10% (> .10) indicates poor condition.¹¹⁹ The data presented in the NWRs Strategic Plan for the performance indicators for this SOG show that the two asset categories in the best overall condition in FY 2006 were conservation and biological research facilities and recreation assets, each with an FCI indicating fair condition (.06 for the former and .09 for the latter). On the other hand, two of the asset categories tracked as performance indicators have assets that are considered to be in poor condition: cultural and natural heritage facilities (FCI = .11) and buildings (FCI = .13).¹²⁰

As the preceding might indicate, when looking at the condition of different categories of Refuge System assets, it is instructive to consider the value of those assets in terms of their contribution to the achievement of the purpose and objectives of the refuges. Fortunately, it is possible to do this. The Refuge System prepares an “asset priority index” (API) for each of its real property assets. The API, defined as “a measure of the importance of a constructed asset to the mission of the installation where it is located,” is a score that runs from 1 (no importance) to 100 (highly important).¹²¹ Table 66 below presents the condition of NWRs asset categories within the context of the importance of those categories to the mission of refuges.

Table 66. NWRs Asset Inventory, Prioritization, Valuation and Condition – FY 2006¹²²

Asset Group	# of Assets	Average API	Total CRV (\$)	Average FCI
Fish ladders/screens	43	95	8,231,064	.14
Water Management Facilities	11,494	93	4,225,414,929	.07
Trails, signs, fencing, boardwalks/observation towers, campgrounds	7,622	75	809,910,306	.09
Roads	5,833	75	8,326,799,716	.11
Office Buildings	369	75	233,291,635	.17
Shops	368	73	194,742,683	.18
Telecommunications towers	227	70	9,682,831	.03
Fuel/water/grain storage	975	69	71,512,976	.05
Environmental Education Ctrs	40	69	49,705,932	.12
Communications Buildings	29	65	3,316,458	.10
Visitor centers/contact stations	138	64	211,838,032	.17

¹¹⁹ Memorandum to FWS Directorate; subject – Service Asset and Maintenance Management System (SAMMS) – Business Rules, August 2005. PP A4.

¹²⁰ Final Strategic Plan for the National Wildlife Refuge System: FY 2006-2010, U.S. Fish and Wildlife Service, December 2006. PP 43-44.

¹²¹ Memorandum to FWS Directorate; subject – Service Asset and Maintenance Management System (SAMMS) – Business Rules. PP A1. The API score incorporates two criteria or considerations – “criticality” (80% of the API score) and “substitutability” (20% of the API score).

¹²² FWS Memorandum – FWS Asset Management Plan, June, 2006. PP 39.

Several points drawn from Table 66 are worth highlighting:

- Two of the three most important asset categories have assets in fair condition, and the category that does not—fish ladders and screens—has very few assets, which are of comparably low monetary value. Each of these “most important” categories of assets directly supports either the conservation or public use mission of the refuges;
- Though public use assets such as trails, boardwalks, and campgrounds appear to be in fair condition, visitor centers and contact stations are in poor condition; and
- Office buildings and shops, determined by refuge staff to be of considerable importance, are in the worst condition of any of the listed asset categories.

How do these summary asset condition numbers compare to individual refuge managers’ assessments of the real property assets on their field stations, and the impact of those assets on their ability to meet the purposes and principal objectives of their refuges? The 2007 MSI Refuge Managers survey put that question directly to NWRS refuge managers. The data presented in Table 67 indicate that a substantial majority of refuge managers—3 out of 4—feel that the assets most critical to their refuges’ mission and purpose are maintained in a condition adequate to support and achieve those goals. This is consistent with the RAPP data presented previously; i.e., that the Refuge System’s most important assets are maintained in fair condition.

Table 67. Refuge Managers Survey (2007) - Assessment of Field Station’s Assets

	1 Insufficient	2	3 Generally Sufficient	4	5 Fully Sufficient
To what extent is the condition of your facilities (roads, buildings and infrastructure) sufficient to support the purposes of your refuge?	12%	13%	35%	36%	4%
	25%			40%	

Refuge managers were not as positive when asked about the existing asset inventory (the number and/or type of assets) currently available on their refuges. As Table 68 makes clear, 40% of refuge managers feel they need additional (newly constructed) facilities in order to achieve the purposes of their refuge.

Table 68. Refuge Managers Survey (2007) – Additional Facilities Needed

<i>To what extent are additional facilities (roads, buildings, infrastructure) needed to enable you to achieve your refuge's purpose?</i>				
1 We cannot achieve our purpose w/o significant additional facilities	2	3 We can generally achieve our purpose with what we have	4	5 We have all the facilities we need to fully achieve our purpose
11%	29%	48%	9%	3%
40%			12%	

It is helpful to compare the opinions and data derived from NWRS staff about refuge facilities with the impressions of those who use the Refuge System, i.e., the visitors who take advantage of the various public use programs offered by refuges. The 2002 Visitor Satisfaction Survey asked only one summary question regarding the level of maintenance of roads and parking lots in the given refuge. The 2004 survey was much more detailed, asking visitors a series of questions related to, for example, roads, parking lots, trails, driving conditions, boardwalks, bridges, exhibits etc. The 2004 responses were highly consistent across all categories of facilities and are well-represented by the responses to the summary question from the 2004 survey, which is included in Table 69 below.¹²³ As Table 69 makes readily clear, the overwhelming majority of visitors to high visitation refuges feel the facilities on those refuges are well maintained.

Table 69. Visitor Satisfaction Survey (2002/2004) – Refuge Facilities¹²⁴

Survey Question	Strongly Disagree/Disagree	Strongly Agree/Agree
2002 – The roads and parking lots within this National Wildlife Refuge are well maintained.	4.7%	91.7%
2004 – Everything considered, I am satisfied with the road and transportation systems of this National Wildlife Refuge.	2.3%	93.1%

C. Conclusions

Maintenance Funding: The budget situation for maintenance—both annual and deferred maintenance—has improved dramatically as compared to ten years ago. The increase in maintenance funds, adjusted for inflation, is well over 200% over the recent ten-year time span. Since FY 2004, however, maintenance budgets have declined, particularly the deferred

¹²³ The only question related to assets on the 2004 Survey that reflected a lower level of satisfaction than the summary question presented in Table 60 dealt with the timeliness of trams – and the level of satisfaction was still over 80%.

¹²⁴ As was previously noted in this report, both the 2002 and 2004 Visitor Satisfaction Surveys were conducted only at high visitation refuges (refuges receiving a minimum of 75,000 visitors annually, as well as meeting several other criteria, were eligible to participate in the survey). A total of 43 refuges participated in the 2002 survey (3280 completed questionnaires) and 47 refuges in the 2004 survey (2,456 completed questionnaires).

maintenance budget, which has decreased in real terms by 30% over the past three years. The recent budget declines are especially worrisome because the Refuge System's asset inventory continues to grow every year from both new construction and acquisitions. If the recent declines in maintenance funding are not reversed, the backlog issue will rapidly become a problem that will be difficult to resolve.

Maintenance of Critical Assets: The most important refuge assets—those most necessary to the achievement of refuge conservation and public use objectives— are generally well maintained. These “high API” assets generally have an FCI of less than .10, indicating they are in “fair” condition. In addition, 75% of refuge managers feel that the assets most critical to their refuge's mission and purpose are maintained in a condition adequate to support and achieve those goals. An important caveat to this conclusion is the fact that a substantial minority of refuge managers (40%) believe their refuges require new facilities if they are to meet their purpose and objectives.

Serving as a counterpoint to the preceding conclusion, a number of facility categories rate as being in poor condition. Some of these asset groups, though not of the highest level of importance as defined by the API, still impact substantially on the ability of the refuge to be effective in meeting its conservation and public use objectives, e.g., refuge offices and contact stations.

The process of selecting deferred maintenance (DM) projects for funding does not follow specific system-wide standard procedures. The identification of DM projects to receive funding, conducted at the regional level, follows only general guidelines offered in the FWS Asset Management Plan and the SAMMS Business Rules. These guidelines are very generic and essentially allow any factor to determine selection. Currently, with such a tight DM budget (as compared to the backlog), it is likely that all funded DM projects are of high priority. However, without a *national* or *system-wide* process for identifying the highest priority DM projects it is possible that increases in DM funding will result in lower priority DM projects being funded, *when considered on a national level*.

Maintenance Staffing: Maintenance staff are stretched thin, maintaining on a per capita basis, approximately 60 facility assets and 20 vehicles while also being tasked with non-maintenance responsibilities. Looking ahead, the asset inventory of the system will almost certainly continue to increase, particularly with regards to constructed assets. In addition, the tasks necessary to manage the asset base have increased in breadth and complexity, e.g., managing the SAMMS process, and will likely continue to expand in the years to come. It is not clear that the skills and competencies necessary to effectively carry out some of these emerging maintenance-related tasks are widely evident in the current complement of maintenance staff.

SAMMS: It is still too early to draw a clear conclusion on the value of SAMMS. SAMMS is able to receive and manage a broad spectrum of asset-related data, and it should facilitate integration of asset information with Department-wide budget and information systems currently in development. However, it is also complex, generally not user-friendly, and represents a substantial burden to many field staff who already have too much to do and too little time to do it. To the credit of the central managers of SAMMS, many adjustments aimed at reducing the burden and complexity of SAMMS in the field have been put in place. Still, if SAMMS cannot be shown to have value as an information source (e.g., producing reports that will inform

management decisions at all levels of the Refuge System) it is unlikely that it will ever be perceived by the field as anything more than an administrative burden.

D. Recommendations

Maintenance Funding: Restore maintenance funding to levels in line with the FY 2004 budget. In general terms, the infrastructure and facilities that are most critical to the achievement of the mission and goals of the Refuge System are currently well maintained. However, if funding declines are not reversed, this will soon no longer be true.

Related to the first recommendation, fully recognize and budget for the maintenance costs related to new construction and acquisitions. The Refuge System's asset inventory continues to expand rapidly—a fact which is obvious, but which also seems to be ignored when developing maintenance budgets.

Establish an objective, transparent, and standard process for identifying priority deferred maintenance projects that are to receive funding. The idea is to fund the projects that have the greatest value to conservation and public use objectives *when thinking about the Refuge System as a whole*.

Maintenance Staffing: Managing and maintaining the asset base of the Refuge System is an increasingly complex undertaking, moving beyond the typical current skill set of maintenance staff (and others, such as biologists and refuge managers who are often tasked with the supporting the maintenance function in the absence of sufficient maintenance staff). The Refuge System should examine a move towards a different staffing approach that would utilize a group of “asset management specialists” to meet these more specialized asset management responsibilities (e.g., SAMMS, etc.). This should not only result in more effective and efficient asset management, but will also allow maintenance staff (and others including biologists and refuge managers) to focus on tasks more directly aligned with their skills and competencies. In this light, the experience of Region 4—that is, the deployment of a small group of specialists to handle the majority of SAMMS requirements for all refuge units in the region—may prove instructive.

SAMMS: As the development and refinement of SAMMS continues, focus on developing its ability to produce useful reports or analysis for managers at all levels of NWRS. Start small and simply—there is no need to create a complex series of SAMMS-produced reports. By clearly demonstrating the value of SAMMS to refuge staff there is a greater likelihood that they will be willing (even interested) in putting time into managing and developing SAMMS as a management tool at their field station. In addition, consideration should be given to increasing the user-friendliness of SAMM's computer interface, so that the system becomes more intuitive and does not require extensive training to master or manipulate. If, after some reasonable period of time, SAMMS cannot demonstrate its value to the field, then it should be re-designed to be less burdensome (or dropped in favor of an alternative system/process).

SOG 9: Complete quality and useful comprehensive conservation plans on schedule and with full engagement of partners.

<p>Performance Rating: Effective</p>	<p>The NWRS is required to complete CCPs for 554 refuges by 2012 and to date has completed somewhat over 200. Although the pace of CCP completion has accelerated significantly over the past few years, the Refuge System is slightly behind schedule in terms of meeting its CCP completion target. This is mainly because a few regions are not on pace and may require additional support or additional time. In April 2007, the Refuge System began implementing the <i>2012 Plan, An Action Plan to Meet Our Legislative Mandate</i>, which lays out a series of actions intended to ensure that all required CCPs are completed by 2012.</p> <p>Overall, refuge managers have found CCPs to be a useful tool for clarifying objectives, guiding habitat management decisions, and clarifying public use decisions. The policy to develop CCPs for all refuges has improved the Refuge System’s interaction with stakeholders and has helped to create a more professional approach to planning and management. In response to an MSI survey, 94% of those state agencies that responded agreed or strongly agreed that they had been provided an opportunity to meaningfully participate in the CCP process; and 95% of state agencies agreed or strongly agreed that their participation in the CCP process had improved communication and coordination between their agencies and the Refuge System.</p>
--	---

A. Context/Background

The Refuge Improvement Act of 1997 requires that all refuges established at the time of the act (1997) have completed Comprehensive Conservation Plans (CCPs) by 2012. A CCP is a fifteen-year plan that identifies issues, goals, objectives, and strategies for refuge management. A total of 554 refuge units, including WMDs and WPAs, must be covered by CCPs by 2012.

The following description of the Strategic Outcome Goal is from the Strategic Plan for the National Wildlife Refuge System (December 2006).

Means and Strategies: Private citizens and all other stakeholders are afforded meaningful opportunities to assist in achievement of the mission of the Refuge System by providing their input into planning processes and assisting in plan implementation.

Comprehensive conservation planning includes all activities associated with the completion of single station or multi-station Comprehensive Conservation Plans (CCPs), which are to be prepared every 15 years as called for in the Refuge System Improvement Act. Core aspects of these activities include gathering background data, coordinating with State and local entities, public involvement efforts, determining significant issues, developing and analyzing alternatives, and printing and distributing draft and final plan documents. A variety of landscape-

level planning activities will be drawn upon as refuge CCPs are prepared so that complementary efforts are coordinated with conservation partners. State fish and wildlife agencies are especially important partners in preparing CCPs, and CCPs will complement State wildlife comprehensive plans wherever feasible. CCP preparation provides opportunity for synergy with partners, particularly in the pursuit of broader fish and wildlife conservation goals that extend well beyond refuge boundaries.

This goal was not identified as among the highest priorities by the Conservation in Action Summit; however, successful completion of these plans has tie-ins to the ability to deliver other activities that were identified as priorities. The Refuge System Improvement Act also mandates completion of CCPs for all refuges by 2012.

Performance Measurement: Performance is judged by the number of plans completed on schedule and the usefulness of those plans in guiding management actions at the local level. All planning efforts will invite input from all affected parties. State fish and wildlife agencies will be invited to serve on the planning team for each CCP.¹²⁵

Specific performance measures reported in the RAPP are identified in the Table below.

Table 70. Annual Performance Measures – Strategic Objective #9

SOG 9: Complete Quality and Useful Comprehensive Conservation Plans on Schedule and with Full Engagement of Partners		
Annual Performance Measures	FY 05	FY 06
9.1a) # of refuges/WMDs with a Comprehensive Conservation Plan completed during the year.	40	97
9.1b) # of refuges/WMDs with a Comprehensive Conservation Plan completed, cumulative total.	107	204
9.2) # refuges/WMDs with planning underway at the end of the FY.	192	125
9.3) % of CCPs underway or complete, where the State fish and wildlife agency has been invited to serve on the planning team. - Number of plans underway or complete/number of plans that involve State participation.	100.0%	100.0%
	299/299	329/329
9.4) % of CCP's underway or complete, where effective cooperation and collaboration by stakeholders is underway. - Number of plans underway or complete/number of plans that involve State participation.	100.0%	100.0%
	299/299	329/329

¹²⁵ Final Strategic Plan for the National Wildlife Refuge System, FY 2006 –2010, US Fish and Wildlife Service, December 2006.

B. Principal Findings

There are a total of 554 NWR units that are required to be covered by a CCP by 2012, including 35 Wildlife Management Districts and two Waterfowl Protection Areas. It should be noted that in several cases, including complexes and satellite units, one CCP may cover more than one refuge or management unit. For example, a single CCP will be developed to cover the Sacramento National Wildlife Refuge Complex, which includes four NWRs—the Sacramento, Delevan, Colusa, and Sutter National Wildlife Refuges.

The findings for this SOG are divided into the following sections: 1) CCP Completion Rate; 2) CCP Usefulness; 3) CCP Implementation; and 4) the CCP Development Process.

1. CCP Completion Rate

The following table provides an overview of the number of CCPs completed by each region and is broken out by the year in which the CCPs were completed.

Table 71. Completed Comprehensive Conservation Plans by Region

Year	Region								
	Total	1	2	3	4	5	6	7	CNO
1997	2						2		
1998	5		2			1	2		
1999	6		1				4		1
2000	15	1	2	3	3		6		
2001	8		1	4	2		1		
2002	18			2	1	7	4		4
2003	11		1	6		1	2		1
2004	19		3	8	2	2	2		2
2005	24	4		4	5	8	2		1
2006	97	3	3	3	25	13	45	2	3
Units w/ Completed CCPs	205	8	13	30	38	32	70	2	12
Total Refuge Units	554	62	43	60	117	69	139	16	48
Percent Completed	37%	13%	30%	50%	32%	46%	50%	13%	25%

Per the above table, as of the end of FY 2006, 37% of all required CCPs have been completed. The NWRs got off to a relatively slow pace in completing CCPs, as only 65 had been completed by 2003, six years after the passage of the RIA. However, in the last few years the completion rate has significantly increased (121 CCPs have been completed in the past two years).

Per the chart above, the completion rate between regions varies significantly. The lowest completion rate is for Region 1, where only 13% of refuge units are covered by completed CCPs. Regions 3, 5 and 6 have the highest completion rates of 50%, 46% and 50%, respectively.

The completion rate for Region 7 represents the completion of second-generation CCPs. All fourteen refuges in Alaska (Region 7) currently operate under CCPs that were completed in the mid- to late 1980s, as was required by the Alaska National Interests Lands Conservation Act (ANILCA). Nevertheless, there are many unresolved and complex issues surrounding refuge management in Alaska, and it will be in the NWRS' best interest both to proceed with the development of next-generation CCPs as expeditiously as possible and to do so at a level of detail that will bring as much resolution as possible to current challenges.

The number of CCPs completed per year has increased recently, with CCPs for 97 Refuge units completed in FY 2006. A total of 30% of all required CCPs have been produced in the last five years.

To meet the target of having 554 refuge units covered by completed CCPs by 2012, an additional 349 of total units will need to have completed CCPs within the next five years. As an aggregate number, the expected system-wide target completion date seems feasible; however, for several individual regions—most notably regions 1, 2 and 4—the current pace of CCP completion appears insufficient to meet the NWRS' overall goal. Region 4 must still complete CCPs to cover an additional 79 refuge units, twice the number completed since 1997.

Effective from April 2007, the Refuge System began implementing the *2012 Plan, An Action Plan to Meet Our Legislative Mandate*. This plan identifies ten action items to help ensure that all required CCPs will be completed by the 2012 target completion date. Actions in this plan include: guidance on balancing complexity with the need to finish CCPs in a timely manner; the provision of additional planning training, both classroom and on-line training; and developing a guidance memo system to reemphasize the CCP completion requirement and the actions to be taken to ensure the schedule can be met. The 2012 Plan includes a schedule for completing all CCPs on time, and the regions have agreed that the schedule is feasible.

2. CCP Usefulness

There is a variety of data to draw from that provides insight into the usefulness of CCPs and the process to develop the plans. This data includes the MSI Refuge Manager's Survey, which asked a number of questions related to CCPs, and a 2005 Refuge System survey entitled *National Wildlife Refuge Managers' Evaluation of Comprehensive Conservation Plans*.¹²⁶ Some highlights of these surveys are presented below.

The table below measures the views of refuge managers as to the general usefulness of the CCP and the process used to develop it.

¹²⁶ Schomaker, John, *National Wildlife Refuge Managers' Evaluation of Comprehensive Conservation Plans*, October 18, 2005.

Table 72. Refuge Managers Survey (2007) – CCP Process Usefulness

MSI Survey Data:	Level of Impact				
	1 Not at all Useful	2	3 Useful	4	5 Extremely Useful
How would you characterize the usefulness of your CCP (including the process required to develop it)?	5%	23%	42%	20%	10%
	28%			30%	

Per the above table, 72% of refuge managers found CCPs, including the process used for their development, useful or extremely useful. An internal survey undertaken by the Refuge System in 2005 confirms the results of the more recent MSI survey, and the principal finding from that study on the usefulness of CCPs is presented in the following table.

Table 73. Refuge Managers Survey (2007) – CCP Usefulness

<i>Overall, what is the best characterization of the CCP at your station?</i>		<i>In your opinion, to what extent is the CCP useful to members of station staff?</i>			
1- The CCP is just another shelf document that doesn't get used.	3%			Manager/ Assistant Mgr	Biologists
2 – The CCP has some, but limited uses.	21%	1	Of no use	0%	0%
		2	Of little use	2%	6%
3 – The CCP is useful.	45%	3	Somewhat useful	18%	23%
4 – The CCP has significant usefulness.	31%	4	Useful	27%	40%
		5	Very useful	53%	31%

Further analysis from the 2005 FWS study revealed that CCPs are most useful to refuge managers and biologists and less useful to administrative and maintenance staff. In general, visitor service staff found CCPs to be useful, but not to the same degree as refuge managers and biologists. The Table showing the usefulness to managers and biologists is presented below.

Table 74. Refuge Managers Survey (2007) – CCP Impact

<i>What has been the impact of the CCP process in influencing or informing the following:</i>	Level of Impact				
	1 Low Impact	2	3 Medium Impact	4	5 High Impact
In guiding the development of annual work plans and activities?	18%	10%	29%	30%	11%
	28%			41%	
In establishing/setting conservation priorities?	13%	7%	24%	36%	19%
	20%			54%	
In determining how you manage your refuge's habitat/conservation resources?	15%	9%	27%	31%	17%
	24%			48%	
In determining/clarifying appropriate public uses of the refuge?	13%	11%	19%	34%	22%
	24%			56%	
In improving relationships with the refuge's neighbors and stakeholders?	23%	15%	31%	23%	6%
	38%			29%	

- Overall, a majority of refuge managers felt that the CCP process has had a medium to high impact in the areas of development of their work plans and activities; helping to establish conservation priorities; determining how to manage refuge resources; and clarifying appropriate public uses.

The CCP process apparently did not have as significant an impact in helping to improve relationships with neighbors and stakeholders as it had on other areas. It was often mentioned while speaking with refuge managers during field visits that the CCP process forced clarification and resolution of public use issues, but that not everyone was always satisfied with the outcomes decided.

Per the 2005 FWS survey, the main areas of usefulness of the CCP process were found to be:

- To provide a clear statement of direction for future management;
- To provide clear, measurable objectives;
- To give neighbors, visitors and the public an understanding of the Service's management actions on and around the station;
- To ensure the station's management is consistent with mandates of the NWRS system; and
- To establish continuity in station management as managers come and go.

During the course of field visits, many refuge managers stated that they had found the CCP process to be helpful, and one manager said it was the most useful plan he had worked on in his 20 years with the NWRS.

3. CCP Implementation

This section examines whether refuges are able to implement the activities listed within their CCPs, a determination principally based on an assessment of whether sufficient funding is available.

As can be seen from the Table at right, 92% of refuge managers felt that current budget and staffing were inadequate to implement the priorities identified in their CCPs. In the 2005 FWS survey, 63% of managers indicated that the CCP did not help to secure funding for their operations.

Table 75. Refuge Managers Survey (2007) – CCP Activities versus Budget and Staffing

<i>To what degree is your current staffing and budget sufficient to implement the activities identified as priorities in your CCP?</i>		
1	Insufficient to implement CCP priorities	65%
2		27%
3	Generally sufficient to implement CCP priorities	8%
4		1%
5	Fully sufficient to implement CCP priorities	0%

4. The Participation of State Fish and Game Agencies

The following data provide the views of state fish and game agencies on their participation in the CCP process (from the MSI State Fish and Game Agency Survey, 2008).

State agencies gave the refuge system very high ratings in terms of their participation in the CCP process.

Table 76. State Fish and Game Agency Survey (2008) – CCP Involvement

Indicate your level of agreement with the following statements				
	Strongly Disagree	Disagree	Agree	Strongly Agree
Appropriate members of my organization have been provided an opportunity to meaningfully participate in the development of National Wildlife refuge Comprehensive Conservation Plans in my state	0%	6%	39%	56%
	6%		94%	
My organization's participation in the Refuge System's Comprehensive Conservation Planning Process has improved communication and coordination between my agency and the NWRS	0%	5%	63%	32%
	5%		95%	
<i>Total number of responses = 18 and 19 respectively.</i>				

- 94% of state agencies agreed or strongly agreed that they had been provided an opportunity to meaningfully participate in the CCP process;

- 95% of state agencies strongly agreed or strongly agreed that their participation in the CCP process had improved their communication and coordination with the refuge system.

5. CCP Development Process: Quality, Consistency, and Approval

The Refuge System has taken a number of steps to support a consistent approach to CCP development, and to assess and improve quality. While this evaluation was not able to undertake a qualitative review of CCPs, information is available on practices used to ensure quality, and we gained insight from discussions with field managers and direct observation. Below are some of the actions related to implementing the RIA's CCP requirement.

Policy Development: In May 2000, the Refuge System developed a Refuge Planning Policy which established procedures and guidance for developing CCPs. The policy identifies the steps required to develop a CCP, provides guidance on the role of states and other stakeholders, and mandates how NEPA requirements will be fulfilled.

Training Support: The NWRS has developed a training program for CCP development—a four-day course entitled Refuge Comprehensive Conservation Planning— which is offered at both NCTC and field-based locations and has been provided to a significant number of refuge managers and other staff. All refuge planners are required to take this course, and it is often offered at field sites for refuge planning teams that are about to begin development of a CCP, including managers, biologists, and visitor service personnel.

The NCTC's CCP training course has been active since about 1997, and over 600 refuge staff has participated in the 29 sessions held to date. The informal policy of the planning chiefs is to have all new planners attend the course; it is also recommended that two members of each refuge planning team participate. Training recommendations are also in the formal policy per the Conservation Career Pathways report of 2006.

Success of the course is assessed through two informal surveys of participants: one survey is administered immediately following the course and the other six months later. As a result of feedback gained through these surveys, the course has been re-designed twice. In addition, the training course also goes through continual updates as refuge policy is updated and as better examples become available for use. For example, the course was updated following the development of Appropriate Use guidance and to include an update of standard practices.

CCP Qualitative Assessment: The NWRS has undertaken several studies to review the CCP process, in particular to review the quality of CCPs being produced and to assess their usefulness to refuge staff. These studies include:

- A 2005 evaluation by John Schomaker entitled National Wildlife Refuge Managers' Evaluation of Comprehensive Conservation Plans; and
- A 2006 study by Richard Schroeder (USGS) which resulted in the following publication in the Journal for Nature Conservation: "A System to Evaluate the Scientific Quality of Biological and Restoration Objectives using National Wildlife Refuge Comprehensive Conservation Plans as a Case Study."

- The study written for the Journal for Nature Conservation reached the following conclusion: Overall, “the objectives in these plans [CCPs] generally lack high levels of specificity and documentation.”

Schroeder goes on to make the point that without a greater degree of clarity and specificity of objectives, it will be difficult to properly monitor objectives or to implement rigorous adaptive management systems. However, the study also stated that developing specific and measurable objectives was an inherently difficult process, often because of the large volume of information that could be potentially considered or reviewed and that available resources are not always adequate for this task. Nevertheless, the Refuge System should endeavor to develop more specific objectives, as otherwise implementing rigorous adaptive management processes would not be possible.

CCP Approval Process: CCPs and associated NEPA documents are signed by the regional director. CCPs are approved by the refuge manager, the regional planning chief, refuge supervisor, and the assistant manager for refuges/regional refuge chief (in that order) prior to be approved by the FWS regional directors. This review hierarchy and process serves as a CCP quality control mechanism.

Some regions go beyond the required signatory reviews and also request reviews by key stakeholders, regional staff from other programs, or staff from other refuges. There is a requirement that state fish and wildlife representatives are invited to serve as members of the planning team, and that key stakeholders be consulted as part of a NEPA process. Also there is a requirement that tribal conservation agencies associated with tribes that own land adjacent to refuges be involved in the CCP development process. According to RAPP data, state and stakeholder participation has occurred 100% of the time for CCPs developed in FY05 and FY06.

C. Conclusions

CCP Completion Rate: Throughout the Refuge System, CCP completion activity has increased significantly over the past five years and in particular over the past two years. Two hundred and five refuges are now covered by completed CCPs—about 37% of the system. About half of NWRS regions appear on-track to completing CCPs by 2012. For several regions, most notably 1, 2, 4 and CNO the current pace of CCP completion appears insufficient to meet the NWRS’ overall goal. Region 4 must still complete CCPs for 79 refuge units over the coming five years. However, the Refuge System has recently revisited the rate of CCP completion and has developed a 2012 Plan that lays out actions and a schedule that should enable all required CCPs to be completed by 2012.

While it may be possible to complete all required CCPs by 2012, the accelerated rate of completion required may also raise issues as to whether this will lead to trade-offs in terms of the level of detail included or in the quality of the plan. Currently, there is a great deal of variance between the level of detail contained in CCPs—some are hundreds of pages long and contain enough information to serve as detailed Habitat Management Plans and Visitor Service Plans, whereas others are shorter, less detailed documents that will require the completion of separate step-down plans.

CCP Usefulness: CCPs and the CCP development process have proved to be very useful tools for refuge managers. This is confirmed by the MSI Refuge Managers Survey in which 72% of manager's characterized CCPs as being useful or extremely useful. In particular, refuge managers cited CCPs as being useful for the following: setting goals and objectives; development of annual work plans and activities; managing habitat; and determining appropriate public uses of the refuge.

CCP Implementation: While managers indicate that CCPs are being used to guide goal setting and work plan development, it is also clear that more often than not CCP designs exceed the level of funding that is likely to be able to implement the priorities identified—92% of refuge managers indicated that funds are less than sufficient to implement CCP priorities.

As a general rule, strategic plans are intended to identify future priorities that can be initiated, scaled-up, or cut back as circumstances and funding levels change. In the case of CCPs, it would appear that many plans have not been used to prioritize proposed activities in relation to existing or likely budgets. There is some debate (or lack of clarity) in the Refuge System as to whether the CCP is supposed to serve as a vision document, which lists an ideal set of tasks and objectives to be accomplished irrespective of available or likely funding, or whether the CCP is supposed to be a more practical planning document to prioritize implementation activity over the coming fifteen years.

The Involvement of State Fish and Game Agencies: The policy to develop CCPs for all refuges has improved the Refuge System's interaction with state fish and game agencies. In response to an MSI survey, 94% of those state agencies that responded agreed or strongly agreed that they had been provided an opportunity to meaningfully participate in the CCP process; and 95% of state agencies agreed or strongly agreed that their participation in the CCP process had improved communication and coordination between their agencies and the Refuge System.

CCP Quality and Consistency: CCPs undergo a multi-level review process within Regional Offices. In general, these reviews have been adequate to produce CCPs that refuge managers feel are of adequate quality. A peer review process undertaken by stakeholders and outside experts, including managers from other refuges, is undertaken in some regions.

D. Recommendations

CCP Completion Rate: Additional attention and resources will be required to complete CCPs on time in several regions, including in regions 1, 2, 4, CNO and 7. Under the current pace of CCP completion, it is likely that the Refuge System overall should be able to complete upwards of 90% of required CCPs by 2012 and the Refuge System's recently complete 2012 Plan: Meeting Our Legislative Mandate has developed a schedule that regions have approved and which, if followed, will ensure that all required CCPs are completed on schedule.

CCP Usefulness/Implementation: The NWRS should provide better guidance for what level of budget resource should be assumed when producing CCPs. Since 92% of refuge managers say that budgets are insufficient to implement key priorities, it is clear that there is a gap between the budgets required to implement CCPs and the level of funding available.

It is suggested that refuge managers prioritize the activities in their CCPs so that in the annual work planning process it is clear which activities will be implemented within the parameters of limited funding. For example, managers could note the objectives and initiatives that could be undertaken under current funding scenarios and those activities that would be priorities if funding were to increase (for example, provide a general description of alternative CCP implementation scenarios which factor in inflation costs and are based on existing budgets and a budget increase, for example a 10-15% increase). This will help CCPs to serve as a mechanism for prioritizing refuge activities—i.e., for explicitly identifying what can and cannot be implemented within differing resource ranges (as CCPs becoming laundry lists of activities that are not prioritized and which will not be fully implemented because the cost substantially exceeds likely resources).

CCP Quality and Consistency: There should be a review of CCP content and guidance developed on the appropriate level of detail to be contained in a CCP, in contrast to what should be included in step-down habitat plans. Better guidance on review processes could also be developed to ensure that all CCPs meet high quality standards. In the Fire Program, there is significant cross-refuge collaboration in the development of Fire Management Plans, which serves as a peer review process and mechanism for sharing knowledge and information and helps participating personnel gain skills that they will use in developing their own plans. A similar process might be useful to institutionalize for CCP development. In general, a lot of emphasis has been placed on developing CCPs processes. At this point, it might be worthwhile to increase the standardization of content and review processes, including reviewing the specificity of objectives and ensuring these are linked to monitoring and inventory plans.

SOG 10: Strategically grow the Refuge System

Performance Rating:

Ineffective

This objective was rated ineffective for a number of reasons, including: the rate at which land has been added to the NWRS has declined significantly over the past five years; land purchased by the Refuge System often does not match the priorities identified by the NWRS' Land Acquisition Priority System (LAPS), especially over the past few years; and the current DOI-managed land appraisal process that the NWRS uses is ineffective and cannot be relied upon to produce timely or accurate appraisals and this causes available land deals to be lost. The NWRS does not have a common system-wide approach to landscape-level planning that can drive real estate acquisition decisions; however, several select field stations have developed sophisticated state-of-the-art biological-based planning systems that can serve as models, e.g. HAPET. It is perhaps also worth noting that real estate acquisition is an inherently political process and that ultimately land acquisition decisions are made by the Congress, which does not always base its decisions on the priorities of the Refuge System as defined by LAPS. It is recommended that the Refuge System develop a land acquisition policy that incorporates the principles contained in the Strategic Habitat Conservation Initiative.

A. Context/Background

The following description of the Strategic Outcome Goal is from the Strategic Plan for the National Wildlife Refuge System (December 2006).

Means and Strategies: Continued growth of the Refuge System is planned and directed in a manner best designed to accomplish the mission of the Refuge System, to contribute to the conservation of the ecosystems of the United States, to complement efforts of States and other Federal agencies to conserve fish and wildlife and their habitats, and to increase support for the Refuge System with participation from conservation partners and the public.

The above statement comes directly from the Refuge Improvement Act. Working in association with partners, we are developing a more focused approach to identify and prioritize lands and waters with greatest value and most appropriate for addition to the Refuge System. This includes the full range of habitat types in our nation, including marine resources. Strategies for land acquisition apply to all forms of acquisition, whether from Land and Water Conservation Fund projects, Migratory Bird Conservation Fund projects, donations, transfers, or other mechanisms. As a result of these efforts, we are striving to grow the Refuge System wisely in terms of habitat quantity, quality, and priority with due regard to fiscal responsibilities and ramifications that come with growth. Decisions on acquisition of new lands will include a full analysis of future impacts on operations and maintenance costs.

The Service's first priority for land acquisition is to complete acquisitions within approved refuge boundaries; the second is to expand existing refuges; and the third is to establish new refuges. Landscape-level biological planning will be applied as a

tool to prioritize land acquisitions, and we will work closely with partners to determine whether a particular area is best suited for addition to the Refuge System or whether it is better protected through acquisition and/or management by another conservation entity or retained in private ownership. This landscape-level concept, commonly referred to as the habitat goals process, is described in the document “A Process for Integrating Wildlife Population, Biodiversity, and Habitat Goals and Objectives on the National Wildlife Refuge System: Coordinating with Partners at all Landscape Scales” (January 2004), produced by a Fulfilling the Promise Action Team.

The Conservation in Action Summit identified attention to this goal as a priority need, primarily through collaborative work with partners and the implementation of the “Habitat Goals” process to focus on highest priority lands being added to the Refuge System.

Performance Measurement: Lands added to the Refuge System are currently tracked in the Land Records System database. A fundamental metric is the percentage of refuges that have completed acquisition. The new habitat goals process for prioritizing conservation needs is currently under development and is being merged with the Services Strategic Habitat Conservation efforts. As these efforts evolve, they should develop more meaningful performance metrics; however, they are complex processes and must mature before the basis for metrics are fully established.¹²⁷

NWRS FY 2006 – 2010 Draft Strategic Plan

Specific performance measures listed in the RAPP include:

Table 77. Annual Performance Measures – Strategic Objective #10

SOG10: Strategically Grow the System		
Annual Performance Measures	FY 05	FY 06
10.1) % of land acquisition projects where landscape level planning is completed in collaboration with other Federal agencies, State fish and wildlife agencies and other partners to focus on highest priority needs	n/a	36%
	n/a	15
	n/a	42
10.2) # of fee-title wetland acres added to the NWRS during the fiscal year	18,329	13,246
10.3) # of non fee-title (easements, agreements, etc.) wetland acres added to the NWRS during the fiscal year	19,654	4,725
10.4) # of fee-title upland acres added to the NWRS during the fiscal year	74,570	20,185
10.5) # of non fee-title (easements, agreements, etc.) upland acres added to the NWRS during the fiscal year	95,258	8,977

¹²⁷ Final Strategic Plan for the National Wildlife Refuge System, FY 2006 –2010, US Fish and Wildlife Service, December 2006.

SOG10: Strategically Grow the System		
Annual Performance Measures	FY 05	FY 06
10.6) # of fee-title marine acres added to the NWRS during the fiscal year	n/a	232
10.7) # of non fee-title (easements, agreements, etc.) marine acres added to the NWRS during the fiscal year	n/a	0
10.8) # of fee-title riparian miles added to the NWRS during the fiscal year	n/a	11
10.9) # of non fee-title (easements, agreements, etc.) riparian miles added to the NWRS during the fiscal year	n/a	0

B. Principal Findings

The Strategic Growth SOG is being analyzed as per the following components: land acquisition and funding; land appraisal process; land acquisition strategy; and the use of landscape-level planning.

1. Land Acquisition and Funding

The following table documents the number of refuges and acres in the NWRS and its growth between 1996 and 2006.

Table 78. NWRS Growth 1996 to 2006

Year	Number of Refuges	Number of Acres	Acres Added	Percent Increase
1996	509	89,938,957		
1997	512	90,058,831	119,875	0.13%
1998	516	90,413,560	354,729	0.39%
1999	521	90,644,775	231,214	0.26%
2000	530	90,859,061	214,287	0.24%
2001	537	92,056,213	1,197,152	1.32%
2002	540	92,104,081	47,868	0.05%
2003	542	92,541,358	437,277	0.47%
2004	544	92,623,410	82,052	0.09%
2005	545	92,754,180	130,770	0.14%
2006	547	92,790,425	36,246	0.04%

As per the table on the preceding page:

- The rate of growth in the Refuge System has decreased in recent years. Between 1996 and 2006, the NWRS grew by 2,851,469 acres, or by about 3.17%. More recently, between 2001 and 2006, NWRS land grew by 0.8%
- The number of acres added during FY2006 was the fewest of any year since 1996.
- Funds for the acquisition of National Wildlife Refuges generally come from the following three accounts.

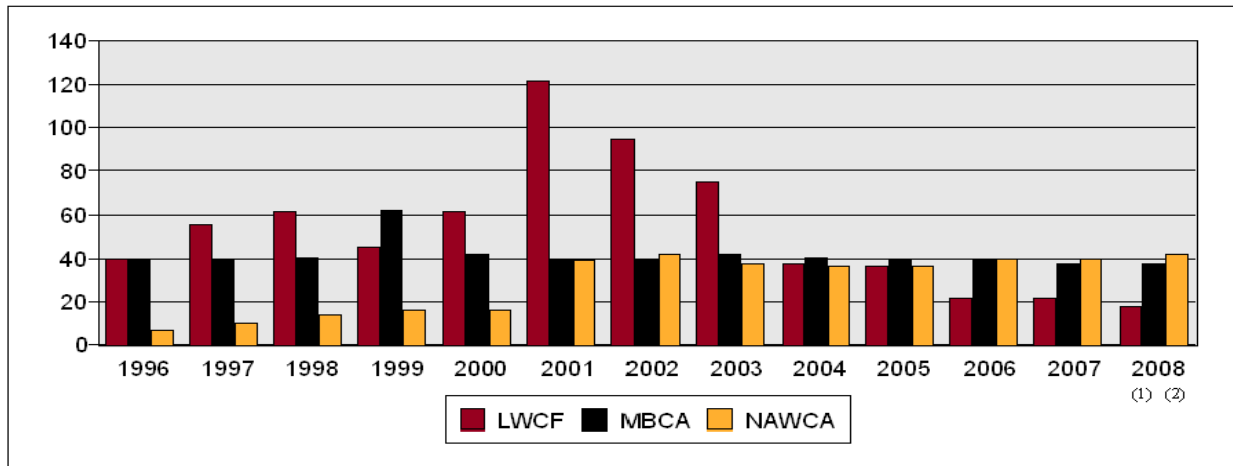
The Land and Water Conservation Fund: Congress established this fund in 1965; it calls for using a portion of receipts from offshore oil and gas leases to annually fund state and local conservation and to make funds available for land purchases by the FWS, the National Park Service, the Forest Service and BLM.

The Migratory Bird Conservation Fund: This fund is managed under the Migratory Bird Conservation Commission, which was established in 1929 by the passage of the Migratory Bird Conservation Act. It was created to consider and approve land recommended by the Secretary of the Interior for purchase by the FWS. The main sources of revenue for the fund are the sale of hunting and conservation stamps (Duck Stamps) and import duties collected on arms and ammunition.

The North American Wetlands Conservation Fund: This Fund was created by the passage of the North American Wetlands Conservation Act (NAWCA) in 1989 and provides matching grants to organizations and individuals who have developed partnerships to carry out wetlands conservation projects in the United States, Canada, and Mexico for the benefit of wetlands-associated migratory birds and other wildlife. In part, the Act was passed to support the activities of the North American Waterfowl Management Plan.

FWS Federal Land Acquisition Appropriations: The following table illustrates the level of funding available to purchase refuge land over the past ten years.

Figure 22. Land Acquisition: All Funds
(in millions)



(1) Based on Public Law 110-5, FY 2007 Continuing Appropriation
(2) Administration Request

There has been a 52% decrease in the funding available to the NWRS for land purchases since 2001—from a high of \$203.3 million in 2001 to \$98.7 million by 2008. The drop in land acquisition funding has been most affected by a decline in annual congressional appropriations (from the Land and Water Conservation Fund), which have declined from a high of \$121.2 million in 2001 to \$23.9 million in 2006, a decline of about 80%.

Relative Levels of NWRS Land Conservation Funding: The following figures provide some context for the relative value of NWRS land acquisitions in comparison to the larger pool of conservation land funding in the U.S.

- \$98.7 million: the amount of funding the NWRS expects to have available in FY08 to purchase additional Refuge System land.
- \$7.2 billion: The amount of conservation funding approved through state and local ballot initiatives in 2006 to make funds available to protect land and water resources.¹²⁸

Between 2000 and 2006, the Conservation Campaign reported that \$23.4 billion in funding was approved through state and local ballot initiatives to make funds available for land conservation. During this same timeframe FWS spent \$996.7 million on land acquisition. The above figures are not as directly comparable as many local initiatives, such as in Arlington, Virginia, are in areas where high-value conservation land is not available as the counties are already densely developed, and the funds are used principally to create urban parks or protect open space. Nevertheless, it is probably safe to conclude that funds available nationally for land conservation are many times greater than what the Refuge System itself has at its disposal.

Supply of Land Available for Purchase: The amount of land that is listed on the FY2008 LAPS priority list, and which is available for purchase from willing sellers, far exceeds the levels of recent purchases by the Refuge System.

¹²⁸ The Conservation Campaign, Boston, MA.

Table 79. Acres Available for Purchase

Total Acres Added to System – FY 2006:	36, 246
Total Acres Available for purchase from willing sellers – FY 2008:	43,738,647

It was not possible to determine the total value of all the land listed on the LAPS priority list; however, in 2004, the President of the National Wildlife Refuge Association estimated the Refuge System’s land acquisition backlog to be valued at \$4 billion.¹²⁹

Refuges with Completed Acquisitions: The strategic plan notes that a “fundamental metric” for measuring the success of this SOG is the percentage of refuges that have completed acquisition. This information, however, is not tracked in the RAPP reporting measures.

Refuge Revenue Sharing Act: This act “authorizes revenues and direct appropriations to be deposited into a special fund, the National Wildlife Refuge Fund (NWRFF), and used for payments to counties in which lands are acquired in fee (fee land) or reserved from the public domain (reserved land) and managed by the Service. These revenues are derived from the sale or disposition of (1) products (e.g., timber and gravel); (2) other privileges (e.g., right-of-way and grazing permits); and/or (3) leases for public accommodations or facilities (e.g., oil and gas exploration and development) incidental to, and not in conflict with, refuge purposes.”¹³⁰

Land that is bought and converted to NWRS land no longer generates tax receipts for local counties. To offset this loss of local revenue the FWS administers a Revenue Sharing Fund, which uses a complex formula to calculate annual revenue payments to local counties where refuges are situated. During the evaluation team’s site visits and interviews we heard from several local officials that, over the past several years, that Refuge Revenue Sharing has not been paying out revenues as per the full valuation assessments and that the assessment formula has not kept pace local property values. As a result, several counties and states have become reluctant to allow new refuges within their jurisdictions. For example, Minnesota now has a law that says there can be no net increase in federal land.

¹²⁹ Hirsche, Evan, President, National Wildlife Refuge Association, Testimony before the Senate Appropriations Subcommittee on Interior and Related Agencies Concerning U.S. Fish and Wildlife Service Fiscal Year 2007 Appropriations, April 28, 2006.

¹³⁰ FY 2008 Congressional Budget Justification, US Fish and Wildlife Service, US Dept. of Interior.

The table at the right documents the funding of the National Wildlife Refuge Fund in deflated dollars, from FY96 – FY07. As can be seen, funding in this account has been stagnant since FY02 and is proposed to decline in FY08.

**Table 80. NWRS Funding
FY96 – FY07**

Fiscal Year	National Wildlife Refuge Fund
1996	\$10,779.000
1997	\$10,779.000
1998	\$10,779.000
1999	\$10,779.000
2000	\$10,739.000
2001	\$11,414.000
2002	\$14,414.000
2003	\$14,320.000
2004	\$14,236.000
2005	\$14,214.000
2006	\$14,414.000
2007	\$14,202,000
2008	\$10,0811,000
<i>2008 = requested funds</i>	

2. Land Acquisition Strategy

The Land Acquisition Priority System (LAPS) is the principal system for prioritizing NWRS land acquisition decisions. The LAPS system enables a prioritization of projects for existing refuge lands, but does not list or assign values to land that is needed for the development of new refuges. As per FWS:

LAPS is an automated resource-based process that provides a uniform and objective approach to prioritizing refuge land acquisition. The LAPS ranking process is used to determine the national priority of a proposed acquisition. It is used in all aspects of the Congressional budget process and provides easily accessible historical and future data on specific projects. The LAPS provides a biological basis for ranking projects and redirects acquisition efforts toward those projects having the highest overall national value.

The LAPS system assigns a relative weight to a number of different biological considerations to produce a ranking of the conservation value of land available from willing sellers and within the approved boundaries of existing refuges. Criteria for ranking scores include: fisheries and aquatic resources; threatened and endangered species; bird conservation; and ecosystem conservation. The proposed land acquisitions that score the highest number of points emerge as the system-wide land acquisition priorities.

LAPS is currently used only for the addition of lands within the approved boundaries of existing refuges and not for ranking the strategic value of potential new refuges. The Refuge System does not currently have a mechanism for comparing the conservation value of potential new refuges against the value of adding land to existing refuges.

The Table 81 compares the ranking of properties on the LAPS priority list with the Refuge System’s annual requests to Congress to purchase new land, as per Congressional Budget Justifications. Table 84 presents this information for fiscal years 2005-2008.

As can be seen from the following table, over the past few years the NWRS has requested to purchase some properties that rank high on the LAPS priority list but, in many cases, the properties listed for purchasing in the FWS Budget Request either are not on the LAPS priority list or do not rank high on the list. For example, in FY07, of the 7 properties requested for purchase only one was ranked within the top ten priorities of LAPS, one was not on the list at all and two of the seven ranked above 100.

This is a summary of the properties requested to be purchased, as per FWS Congressional Budget Justifications, and the rankings of those properties on the LAPS priority list.

Table 81. Properties Requested to be Purchased

FY	Number of Properties Requested	Analysis of Properties Requested through Congressional Budget Justification versus Place on LAPS Priority LIST
FY08	2	The number 1 property on the LAPS list was requested; the second property requested was not listed on the LAPS priority list.
FY07	7	1 of the 10 top LAPS priorities was requested. Properties requested included the following LAPS priorities: 2, 11, 17, 20, 104 and 129. One property requested was not listed on LAPS.
FY06	13	Properties requested included the following LAPS priorities: 5, 6, 12, 28, 31, 82, 89, 97 & 98. Four of the 13 properties requested for purchase were not listed on LAPS.
FY05	20	12 of the top 20 LAPS priorities were requested. Two properties requested were not listed on LAPS.
FY04	21	18 of the 20 top LAPS priorities were requested. One property requested was not listed on LAPS.
FY03	52	28 of the 30 top LAPS priorities were requested. One property requested was not listed on LAPS.

As can be seen from the table above, during FYs 2003 and 2004 there was a high degree of correlation between the priority properties listed on the LAPS and the properties requested for purchase by FWS. In FY 2005, this relationship began to diverge, and from FY 2006 onward there has been a significant variance between priorities identified by LAPS and those properties requested for purchase in the Congressional Budget Justification.

The following table portrays responses from MSI's Refuge Manager's Survey concerning the Refuge System's land acquisition strategy and its effectiveness.

Table 82. Refuge Managers Survey (2007) – Land Acquisition Strategy

Does the NWRS have a clear land acquisition strategy that is consistently implemented?		Does the NWRS have an effective land acquisition process?	
The strategy is clear and is consistently implemented	5%	Our program is highly effective	6%
The strategy is clear and for the most part is consistently implemented	20%	Our program is somewhat effective	27%
The strategy is clear but is not consistently implemented	26%	Our program is somewhat ineffective	24%
There is no clear strategy	29%	Our program is ineffective	30%
Not sure	20%	Not sure	13%

As can be seen from the survey data on the preceding page:

- Forty-nine percent refuge managers felt that there was no clear land acquisition strategy or were not sure if there was, and an additional 26% said there was a clear strategy but that it was not consistently implemented.
- Concerning effectiveness, 54% of managers indicated that the land acquisition process is either ineffective or somewhat ineffective, with an additional 13% indicating that they were not sure if there was an effective strategy. Only 6% of respondents characterized the land acquisition process as highly effective.

3. Land Appraisal Process

One issue that was repeatedly raised during our interviews with realty staff and managers was the issue of whether the Department of Interior-mandated and managed real estate appraisal system was working effectively. The appraisals for land the FWS wants to acquire, either for purchase or as easements, are now conducted through a process managed by the DOI Appraisal Services Directorate (ASD), which was created in 2003 through the consolidation of appraisers from four other DOI Bureaus—Bureau of Land Management (BLM), Bureau of Reclamation (BOR), FWS and the National Park Service.

Prior to the creation of ASD, the NWRS managed its own land appraisal process; under the refuge-managed system half of all appraisals were conducted by refuge staff and half were put out for bid with private sector appraisers. The DOI now requires that the NWRS channel all appraisal requests through the ASD process, which involves filing funds and requests through GovWorks, who then solicits private sector bids. Under the new ASD system, 100% of all appraisals are being contracted.

Table 83. Refuge Managers Survey (2007) – DOI Real Estate Appraisal Process

<i>How does the current Department of Interior real estate appraisal process affect your ability to acquire additional refuge land from willing sellers (in comparison to when the process was directly managed by the NWRS)?</i>	
Significantly increases our ability to acquire land	1%
Somewhat increases our ability to acquire land	1%
No significant difference	14%
Somewhat decreases our ability to acquire land	26%
Significantly decreases our ability to acquire land	58%
<i>Number of responses considered: 209; 83 respondents answered "not sure" and their answers were not considered in the above percentages</i>	

Table 84. Land Acquisition Purchases and LAPS Ranking

Land Acquisition Requests	LAPS Priority	Land Acquisition Requests	LAPS Priority
FY 2008		FY 2005	
National Key Deer NWR	1	Great White Heron NWR	1
Upper Klamath NWR	n/a	Cache River NWR	2
FY 2007		St. Marks NWR	3
St. Marks NWR	2	Upper Mississippi River NWR	6
Cache River NWR	11	Silvio Conte NFWR	7
Northern Tall Grass Prairie NWR	17	Dakota Tallgrass Prairie NWR	10
Yukon Delta NWR	20	Laguna Atascosa NWR	11
Leslie Canyon NWR	104	Lower Rio Grande NWR	12
Rocky Mountain Front Conservation Area	129	San Diego NWR	13
Upper Klamath NWR	n/a	Yukon River Delta NWR	15
FY 2006		Cypress Creek NWR	17
Laguna Atascosa NWR	5	Big Muddy NFWR	19
Dakota Tallgrass Prairie NWR	6	Northern Tall Grass Prairie NWR	26
Northern Tall Grass Prairie NWR	12	Erie NWR	27
Bandon Marsh NWR	28	Edwin B. Forsythe NWR	30
Alaska Peninsula NWR	31	Alaska Peninsula NWR	38
Tensas River NWR	82	Balcones Canyonlands NWR	57
Eastern Shore of Virginia NWR	89	Baca NWR	159
Lake Umbagog NWR	97	Upper Klamath NWR	n/a
Leslie Canyon NWR	98	North Boundary Area, Quinault Reservation	n/a
Cache River NWR	n/a		
Lower Klamath/Tule Lake NWRs	n/a		
Upper Klamath NWR	n/a		
North Boundary Area, Quinault Reservation	n/a		

A September 2006 GAO audit report on the Department of the Interior’s Land Appraisal Services included the following summary statements:

- Interior’s appraisal policies and procedures do not fully ensure compliance with recognized appraisal standards. Of 324 appraisals we evaluated—representing 50 percent (nearly \$3.2 billion) of the total value of the land appraised since ASD’s inception—192 appraisals appeared to be in compliance with recognized appraisal standards. The remaining 132, however, did not meet standards primarily because (1) ASD appraisers appeared to not apply specialized skills needed to perform or review the appraisals of lands involving minerals, timber, and water rights; and (2) ASD review appraisers performed cursory reviews of appraisals and approved them without considering property characteristics that can increase the lands’ value, such as the presence of roads. ASD also

lacked standardized appraisal review procedures, which can provide greater assurance in the consistency of appraisal reviews, as well as assurance that appraisals meet recognized appraisal standards.

- ASD's relationships with its client agencies are hampered by inefficient operations. ASD does not have a system for ensuring that it meets realistic time frames for appraisal delivery.¹³¹

According to staff in the NWRS Realty Office, significant portions of appraisals are currently overdue. The fact that appraisals are often late was also confirmed within the GAO Report:

*Of the 728 appraisal products that clients requested from October 2005 through May 2006, more than 40 percent had a projected completion date later than the requested completion date, with an average difference of more than 60 days.*¹³²

These delays can cause deals with private land purchase opportunities to collapse or be missed as competing offers may be accepted before the FWS can offer a firm price for the purchase.

NWRS land acquisition partnerships with NGOs are also jeopardized as a result of the DOI-managed appraisal process. Several major conservation agencies, including the Nature Conservancy, the Trust for Public Land and the Conservation Fund, sometimes buy high-value conservation lands when they come on the market to ensure the land can be secured for conservation purposes (NGOs can act more quickly than the government to purchase private land). These purchases are often executed with the intent of adding the land to the Refuge System; often, the NGO will only hold the land until such time that the NWRS can gain the approvals and funds necessary to acquire the property. While this process has worked well in the past, the assessment team was told by one of the NWRS' major regional partners that it will no longer buy land for the purpose of adding it to the Refuge System because it no longer considers the NWRS to be a reliable partner in acquiring the land that was purchased on its behalf. The reason cited was that the NWRS no longer has sufficient funds, or a clear process, for purchasing high-value land—even when the land is within the approved boundaries of existing refuges.

A total of 25 comments were received on the Refuge Manager's Survey and 60% of these comments dealt with the timeliness of the appraisal process. The following comments are illustrative of refuge manager's opinions in this area:

- The real estate appraisal process is severely limiting our abilities to acquire lands and work with partners in this area. The process moves at a geologic pace and values are always extremely below what the market seems to be showing.
- The appraisal process is 'very broken'. There is no accountability for timely appraisal preparation and review as well as expense to prepare. Landowners are treated poorly due to the excessive time to prepare and review appraisals, which can be 6-12 months old

¹³² GAO Highlights, Interior's Land Appraisal Services: Actions Needed to Improve Compliance with Appraisal Standards, Increase Efficiency and Broaden oversight, September 2006

when supplied to the USFWS. We need to follow the norms of the private sector. Eliminate ASD and go to contracts with private vendors for preparation and review.

- Our land acquisition process takes too long for most willing sellers. Too often willing sellers find another buyer in the timeframe it takes our process to complete a sale. Also, by the time we do have funds available for completing a sale the value of the property has dramatically increased.
- Lands adjacent to or near refuges are often in high demand with private buyers. Private buyers pay more than the appraised value and move quicker to purchase properties near refuges. The process of acquiring land; like many other processes in refuges, is crippled by long administrative processes.
- The appraisal process is slow and cumbersome. We can't act quickly when land is available on short notice. Our appraisal process takes so long to complete that many times properties sell before we can make an offer.

4. The Use of Landscape-level Planning

The NWRS strategy states that *landscape-level biological planning will be applied as a tool to prioritize land acquisitions, and we will work closely with partners to determine whether a particular area is best suited for addition to the Refuge System or whether it is better protected through acquisition and/or management by another conservation entity or retained in private ownership*. In addition, there is a performance indicator that measures this goal, which is:

- Percent of land acquisition projects where landscape level planning is completed in collaboration with other Federal agencies, State fish and wildlife agencies and other partners to focus on highest priority needs.

No data was reported for the above goal in FY05, but in FY06 RAPPS reporting indicated that 36% of land acquisition projects meet this measure. However, there is no definition in the RAPPS workbook that outlines what constitutes an appropriate landscape-level plan and the assessment team's refuge site visits did not reveal any common approach to refuge landscape-level planning. Some regions have developed landscape level plans, for example region 6 has developed a number of these plans, such as the Upper Missouri, Yellowstone, and Upper Columbia River Ecosystem Plan, but this practice varies between regions. There has not been any directive issued as to the requirement to develop landscape level plans or guidance on how this should be done.

CCP processes do consider larger landscape-scale issues but do so without a defined process as to what level of landscape should be considered or what tools should be employed. While a common process or approach does not currently exist there are several exciting landscape-scale planning models in use within the Refuge System. These planning systems link species goals to habitat requirements and are being used to inform real estate acquisition decisions, particularly in the Prairie Pothole Region (FWS Regions 3 and 6). Exceptional examples of landscape-scale planning and management systems were seen at the Fergus Falls WMD (see box below) and at the Sacramento NWR. In our limited experience, however, these systems were the exceptions rather than the rule.

Under the Habitat and Population Evaluation Team (HAPET) system, in use in Regions 3 and 6, the Migratory Bird staff collects data on species populations and set species goals; the Partners and Refuge Programs use the data to inform habitat acquisition and guide restoration actions; Migratory Bird and refuge staff monitor the impact of habitat actions of species populations; and goals and strategies are revisited in consideration of monitoring data. This system constitutes an exemplary landscape-scale, science-based adaptive management system and is also an example of the benefits that can be achieved from FWS cross-program coordination. In the case of the Fergus Falls HAPET Program, Migratory Bird staff and Partners staff are co-located within a NWRS office and this has led to a particularly effective collaborative relationship.

In mid-2006 a joint FWS-USGS National Ecological Assessment Team issued a report on developing a Strategic Habitat Conservation System, which is a system based on HAPET. The team's principal recommendation was that FWS make an organizational commitment to a Strategic Habitat Management Approach and move forward with implementation of the organizational changes required to implement such a system. In furtherance of this initiative, in February of 2007 the current FWS Director, Dale Hall, issued a communication that endorsed the process of adopting a strategic habitat conservation process to address landscape-scale planning. While this effort is somewhat new, it appears that implementation is being handled in different ways in different regions, as is common to many initiatives within the NWRS.

C. Conclusions

Land Acquisition: The rate at which the Refuge System has acquired new land has slowed markedly over the past five years and the number of acres added to the NWRS between 2002 and 2006 has declined significantly as compared to the preceding five-year period. This has been mainly due to a decrease in allocations in Congressional Appropriations, from \$121.1 million in FY01 to \$24 million in FY06—a decline of about 80%. However, the Refuge System also significantly decreased its requests to add new lands to the system: in FY2008 the Refuge System only requested two new land purchases as compared to a request for 21 purchases in FY2005. Between 1996 and 2006, the NWRS grew by 2,851,469 acres, or by about 3.17%; between 2001 and 2006 the amount of land in the system increased by about 0.8%.

Over the past several years, the NWRS decreased the amount of land it has requested to purchase. The number of requested properties to be added to the Refuge System was 53 in FY03 and has declined every year since. In FY08 only two properties were requested for addition to the NWRS—despite the FY07 LAPS priority list being composed of 128 available properties. (Note: the LAPS system does not currently identify or rate opportunities for adding new refuges but only prioritizes projects that have an acquisition component.) This is likely due to land acquisition being somewhat out of favor with the current administration and also due to declining budgets—which reduces the funds available for acquisitions and also makes it more difficult to justify new land purchases as declining resource levels make it more difficult to adequately maintain existing lands. Over the past several years (since the adoption of the ASD appraisal process), the Refuge System's real estate staff has declined by about half.

Land Appraisal Process: The current DOI-managed land appraisal process is ineffective and represents a step backward in the NWRS' ability to purchase land and easements from willing sellers. In some cases, the process is so slow that opportunities to purchase land and easements

are lost. Fifty-eight percent of survey respondents in the Refuge Manager's Survey said that the current appraisal process "decreases our ability to acquire land."

Land Acquisition Policy/Strategy: The Refuge System does not have an existing Land Acquisition Policy or an effective land acquisition strategy. As recently as FY05, there was a high correlation between the lands that NWRS requested to purchase and the priorities listed on the LAPS system. However, in recent years, there has been a significant divergence between land purchase requests and the priorities indicated by its own system—to the point that the NWRS no longer appears to be using a transparent criteria-based system to prioritize land purchases. It is unclear if the current divergence between acquisition decisions and LAPS priorities is due to deficiencies in LAPS or because of other factors in the decision-making process. A limitation of LAPS is that it only deals with additions of land for existing refuges and does not consider the need for adding new refuges.

Landscape-level Planning: The NWRS does not have a common system-wide approach for landscape-level planning that can be used to identify land acquisition priorities, although excellent models were found at select refuges. In order to identify and prioritize the establishment of new refuges, or to compare the relative value of competing opportunities to add land to existing refuges, there needs to be an overall landscape-scale strategy upon which to base decisions. There are various examples of the use of such systems within the Refuge System, most notably the HAPET system, which is used in the prairie pothole areas of Regions 3 and 6, but such approaches do not appear to be the norm.

D. Recommendations

Land acquisition is among the FWS programs most affected by politics. Political shifts aside, there are nevertheless a number of steps the NWRS can take to improve its land acquisition strategies and processes.

Land Acquisition Policy/Strategy: The Refuge System should develop a Land Acquisition Policy and a corresponding strategy to guide expansion of the system. It is recommended that the Refuge System's new land acquisition policy be developed to be consistent with the Strategic Habitat Conservation Initiative framework.

Land Appraisal Process: The Refuge System should engage in a discussion with the Department of Interior to enable it to cease using the services of ASD and return to its former system of direct management of land appraisal. This would save time and money and would enable the NWRS to increase the effectiveness of its land acquisition program. This would also result in less land purchase opportunities being lost to inefficient and ineffective administrative processes. The appraisal process should include the flexibility to value land based on the inclusion of common valuation considerations used by the private sector, e.g., increased value due to the proximity to designated conservation lands.

Land Acquisition Strategy/Landscape-level Planning: In the near term, the NWRS should revisit its decision-making process and its LAPS process to increase transparency and ensure land acquisition decisions are criteria-based. There will likely always be cases when real estate purchases make sense even though they are not LAPS priorities, but the NWRS should endeavor to have a process that makes this the exception rather than the rule. Possibly, LAPS could be

expanded to be a more all-encompassing land acquisition prioritization system by also ranking opportunities to purchase lands for new refuges.

Over the medium to longer term, the NWRS should engage with FWS to develop a planning system that identifies geo-spatial species priorities and uses this information as a basis for identifying habitat needs and objectives. Such a system would require significant input from other FWS programs—primarily from those parts of FWS responsible for monitoring species and setting species goals, including the Migratory Birds, Endangered Species, and Fisheries Programs, and could possibly be built in collaboration with USGS. Such a system would enable the Refuge System to better plan management actions for existing habitat and better prioritize the acquisition of new habitat, as per species goals. The absence of an FWS overall species-based and landscape-scale planning system limits the Refuge System’s ability to prioritize new land acquisition opportunities. In addition, a better landscape-level planning system could help FWS increase its ability to work effectively in combination with others to build more holistic conservation landscapes (as the amount of funding FWS has to acquire land is relatively modest in comparison to other available sources of conservation financing).

A useful entry point for re-visiting the Refuge System’s approach to land acquisition would be to develop/finalize a land acquisition policy.

SOG 11: Reduce wildfire risks and improve habitats—reduce the threat, risk, and adverse effects of unwanted wildland fires by reducing hazardous fuels, restoring and maintaining fire adapted ecosystems in lower condition classes, and improving fire prevention and suppression capabilities of the Service and of neighboring rural and volunteer fire departments.

<p>Performance Rating: Effective</p>	<p>This objective is rated “Effective” as a result of the systematic planning and execution by which the NWRS utilizes prescribed fire to improve wildlife habitat and reduce fuels loads and also for its ability to fight and suppress wildfires. At refuges with proper staffing and adequate budgets, this program is “Highly Effective,” but many refuge units do not have proper staffing and adequate budgets.</p>
---	---

A. Context /Background

Fire, as a natural process and as an anthropogenic tool has had a profound impact on the American landscape. The longleaf pine forests of the Southeast, the prairie grasslands of the central continent and ponderosa pine forests of the Sierra Nevada, for example, exist in part due to the presence of fire. Its use as a tool to maintain grasslands, concentrate wildlife, and select for desired vegetation was practiced by Native Americans long before European settlement of North America. Fire remained a common and unregulated tool on the landscape through settlement of the West into the later half of the 19th Century when a series of catastrophic fires razed settlements destroying people and property.¹³³ For much of the 20th Century, fire was viewed as something to be avoided as symbolized by Smokey the Bear and his “Only You Can Prevent Forest Fires” motto. This anti-fire cultural climate prevailed during the formation of much of the NWRS but has changed markedly today.

As stated in the strategic objective above, the goal of wildland fire management is to conserve, protect, and enhance fish, wildlife, and plants, and their habitats while protecting NWR facilities and surrounding communities. Fire, therefore, has a habitat management and enhancement side and a hazard prevention and control side. Fire management requires knowledge of fire ecology, a proven firefighting capability, and strong coordination with neighbors, since fire has little respect for property lines. Developing a fire management policy is the process of balancing a set of disparate needs including prevention, suppression, prescribed burning, and letting natural fire burn. Fire management requires a good deal of upfront planning, interagency coordination, and specialized equipment and training for dedicated staffing. Lastly, it is arguably one of the most physically arduous and dangerous natural resource professions.¹³⁴

To the extent practical, wildlife habitat improvement is a concurrent goal with hazard reduction and suppression activities. Fire management in general and prescribed burning more specifically represent important tools for refuge managers to maintain and enhance wildlife habitats. Rehabilitation of burned areas is also critical to restore habitats damaged by past uses or

¹³³ *Fire in America: A Cultural History of Wildland and Rural Fire*, Stephen Pyne, University of Washington Press (1997)

¹³⁴ Adapted from FWS Fire Management Website, <http://www.fws.gov/fire/>

wildland fire—a likely growing concern with climate forecasts predicting markedly drier conditions across the southwestern United States and other regions.

On the hazard side of fire, the desired outcome is to reduce the incidence of severe, unplanned and unwanted wildland fire. To achieve this outcome, FWS and NWRS personnel undertake such activities as establishment and maintenance of fire breaks, work with neighboring jurisdictions in preparing for or responding to wildland fires, and wildland fire suppression. Work within the wildland urban interface is particularly a high priority. Specific objectives of the wildland fire management program are to:¹³⁵

- Protect human life, property, and natural/cultural resources both within and adjacent to agency administered lands.
- Minimize damage and maximize overall benefits of wildland fire within the framework of land use objectives and Resource Management Plans.
- Manage the wildland fire program in accordance with congressional intent as expressed in the annual appropriations act and enabling legislation, and comply with applicable departmental manual and agency policies and procedures.
- Promote an interagency approach to managing fires on an ecosystem basis.
- Employ strategies to manage wildland fires that provide for firefighter and public safety, minimize cost and resource damage, and are consistent with values to be protected and management objectives.
- Restore and rehabilitate resources and improvements lost in or damaged by fire or suppression activities.
- Minimize and, where necessary, mitigate human-induced impacts to resources, natural processes, or improvements attributable to wildland fire activities.
- Promote public understanding of fire management programs and objectives.
- Organize a fire staff that can apply the highest standards of professional and technical expertise.
- Encourage research to advance the understanding of fire behavior, effects, ecology, and management.
- Integrate fire management through all levels of the planning process.
- Prevent and investigate all unplanned human-caused fires.

The Conservation in Action Summit identified fire as one of six essential elements for managing wildlife and habitat. The team identified the ability of the NWRS to define the role of fire on Refuge System lands for habitat restoration and enhancement, and maintenance of natural functions as inadequate.¹³⁶

Fire Management Planning: Refuges with “burnable vegetation” must have an approved Fire Management Plan (FMP). Each FMP is to be based on a refuge’s approved Resource Management Plan and built on a foundation of the best available science with ongoing research to support iterative efforts to increase the scientific knowledge of biological, physical, and sociological factors. FMPs must provide for firefighter and public safety (include fire management strategies, tactics, and alternatives); address values to be protected and public health

¹³⁵ FWS Fire Management Handbook, Ch. 1.

¹³⁶ *Conservation in Action Summit, Wildlife and Habitat Management*, U.S. Fish and Wildlife Service (2004).

issues; and identify strategies to minimize suppression costs consistent with resource management objectives, environmental laws, regulations, etc. As defined by the National Wildfire Coordinating Group, FMPs identify and integrate all wildland fire management and related activities within the context of approved land/resource management plans. Each plan defines a program to manage wildland fires.¹³⁷ The plan is supplemented by operational plans including, but limited to, preparedness plans, preplanned dispatch plans, and prevention plans. FMPs assure that wildland fire management goals and components are coordinated beyond the confines of an individual refuge unit.

FMPs should be reviewed annually and updated, as needed, to reflect current conditions, area fire fighting capacity, and planned fire management activities. The FMP is supplemented by operational plans, including preparedness plans, prescribed fire burn plans and prevention plans.¹³⁸

Wildland fire and disaster operations across federal land management boundaries are coordinated and supported by the National Interagency Fire Center (NIFC) in Boise, Idaho. Member agencies include the Bureau of Indian Affairs, Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service U.S. Forest Service, and state forestry agencies through the National Association of State Foresters. NIFC was formed in the 1960s in response to a series of major fires in the western United State and escalating fire fighting costs to improve coordination and response efficiency and prevent duplication of training and fire-fighting equipment needs. The fires of the 1970-1973 stimulated formation of the National Wildfire Coordinating Group (NWCG) made up of the same organizations listed above. NWCG works to provide a more effective execution of each agency's fire management program and provides a formalized system to agree upon standards of training, equipment, qualifications, and other operational functions.

Fire Training and Qualifications: The Wildland Fire Qualification System Guide, developed under the sponsorship of NWCG, establishes minimum requirements for training, experience, physical fitness level, and currency standards for wildland fire positions which all participating agencies have agreed to meet for national mobilization. As a practice, cooperating agencies jointly agree on training, experience, physical fitness level, and currency standards to meet fire management needs for wildland fire. Lastly, a set of minimum qualifications for personnel involved in prescribed fires have been established for fires of moderate complexity or higher and on which resources of more than one agency are utilized. For prescribed fires of low complexity, agency and local cooperators can determine qualifications.¹³⁹ One example of the qualifications: for lower complexity fires, physical fitness requirements call for a two-mile hike with a 30 pound pack in 30 minutes while higher complexity requirements call for a three-mile hike with 45 pound pack in 45 minutes.

Prior to early 1980's, fire was fought by any and all able-bodied refuge staff. In 1981, two people were killed on Merritt Island NWR while fighting fire.¹⁴⁰ This tragedy and other

¹³⁷ The term *Wildland fire* includes wildfire, wildland fire use, and prescribed fire.

¹³⁸ FWS Fire Management Handbook, Ch. 8.

¹³⁹ Wildland Fire Qualification System Guide, National Wildfire Coordinating Group, PMS 310-1 (2006), <http://www.nwecg.gov/pms/docs/PMS310-1.pdf>

¹⁴⁰ Historical Wildland Firefighter Fatalities 1910-1996, National Wildfire Coordinating Group, PMS 822, 1997.

concerns lead to the development of a professional fire staff. At present some 800 people, paid by fire budget, reside with the NWRS to fight fire. Spread across the 546 units of the NWRS they are divided into zones and districts, assigned to selected refuges in teams. In turn they are deployed to unstaffed refuges to conduct prescribed fire or as larger teams to assist with wildfire suppression. Their efforts are supplemented by 3,000 “red carded” staff that assist in fire management depending on fire complexity and their qualifications.

Performance Measures: All reporting data in RAPP is provided from the National Fire Plan Operations and Reporting System (NFPORS) and the Fire Management Information System (FMIS). Field stations have no reporting requirements but refuge management are directed to work in achieving three principal performance measures related to fire management: 1) treating acres identified as high priority through collaboration consistent with the 10-Year Implementation Plan, 2) moving acres in fire regimes 1, 2, or 3 to better condition classes, and 3) improving control of unwanted wildland fires through initial attack.

Many of the performance measures listed below reference “fire regime condition class” (FRCC). Simply stated, FRCCs are a general classification of “the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning.” Lands are classified as FRCC 1, 2, or 3 based on low (1), moderate (2), and high (3) departure from the “central tendency of the natural (historical) regime.” The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Condition Class 1 is considered to be a low departure and within the natural (historical) range of variability, while Condition Class 2 (moderate departure) and Condition Class 3 (high departure) are outside.¹⁴¹

Table 85. Annual Performance Measures – Strategic Objective #11

Annual Performance Measures	FY 05 Actual	FY 06 Actual	FY 07 Target *	FY 08 Target	FY 09 Target	FY 10 Target
11.1) Number acres in fire regimes 1, 2, or 3 moved to a better condition class that were identified as high priority through collaboration consistent with the Implementation Plan. ¹⁴²	93,557	119,034	48,960	48,960	48,960	48,960
11.2) Number acres in prior measure moved to a better condition class per million dollars of gross investment	3,353	3,611	1,705	1,705	1,705	1,705

¹⁴¹ Fire Regime Condition Class Definition, June 2003 <http://www.frcc.gov/docs/FrccDefinitionsFinal.pdf>.

¹⁴² Fire regime classes 1-3 categorize and describe vegetation composition and structure conditions that currently exist and serve as generalized wildfire rankings. The risk of loss of key ecosystem components from wildfires increases from Condition Class 1 (lowest risk) to Condition Class 3 (highest risk). The intent is to move habitats toward Class 1.

Annual Performance Measures	FY 05 Actual	FY 06 Actual	FY 07 Target *	FY 08 Target	FY 09 Target	FY 10 Target
11.3) Number acres treated in condition classes 2 or 3 in fire regimes 1-3 outside WUI and identified as high priority through collaboration consistent with the Implementation Plan.	154,577	101,972	77,760	77,760	77,760	77,760
11.4) Number acres treated outside the WUI per million dollars of gross investment	20,808	15,893	12,450	12,450	12,450	12,450
11.5) Number acres treated in the WUI and identified as high priority through collaboration consistent with the Implementation Plan.	158,711	173,109	159,250	159,250	159,250	159,250
11.6) Number acres in WUI treated per million dollars gross investment	10,205	8,515	10,448	10,448	10,448	10,448
11.7) Percentage of fuels project funds expended by contract	70%	50%	50%	50%	50%	50%
	9,488,617	TBD	TBD			
	13,606,427	TBD	TBD			
11.8) Number acres treated for hazardous fuels reduction (all funds)	616,841	373,917	325,000	325,000	325,000	325,000
11.9) "Percent of acres treated to reduce hazardous fuels by mechanical means with by-products utilized."	25%	20%	20%	20%	20%	20%
	5,479	TBD	TBD			
	21,734	TBD	TBD			
11.10) Percent of unplanned and unwanted wildland fires controlled during initial attack	95%	95%	95%	95%	95%	95%
	568	TBD	TBD			
	601	TBD	TBD			
11.11) Number acres burned by unplanned and unwanted wildland fires	243,968	127,885	250,000	250,000	250,000	250,000
11.12) Percent of acres degraded by wildland fire with post-fire rehabilitation treatments underway, completed, and monitored	20%	5.1%	20%	20%	20%	20%
	47,531	40,549	TBD			
	836,328	790,025	TBD			

Budget and Staffing: Funding for NWRS fire activities comes from a number of sources largely dependent on the nature of the activity. Prescribed burning is conducted using multiple funding sources depending upon the objective for the project and available personnel. As a general rule:

1. Projects with a primary objective of hazardous fuel reduction (including prescribed burning) are allocated through the DOI Wildland Fire Management appropriation except for base salaries. This includes the Wildland Urban Interface Hazardous Fuels account (WUI) and the non-WUI Hazardous Fuels accounts. All hazardous fuel reduction project accomplishments are reported in the National Fire Plan Operating and Reporting System (NFPORS) for the Service and other DOI bureaus and the U.S. Department of Agriculture’s Forest Service.

2. Prescribed burning with the primary objective of habitat management on both Service and private lands is drawn from Resource Management funds. On Service lands, these projects are funded using direct funding not associated with the DOI Wildland Fire Management account. Funding is not specifically allocated for these activities and there is no specific allocation process among the regions. Funding is provided from base unit funding for projects conducted on Service lands, and the prioritization and use of these funds are at the discretion of the unit manager or project leader. On private lands, these prescribed fire projects are funded through the Private Lands and Coastal programs. The Private Lands, Coastal, Migratory Birds and other Service programs also assist with prescribed burning on private lands through grants to states and other cooperators. No specific allocated funding is specified for these activities.

The Service does not cross-charge base salaries of employees to the benefiting account for any work accomplishments. Since most Service units have small staffs, often less than 10 full-time equivalent positions per station, we have found it beneficial to leverage personnel from all funding sources to accomplish priority work. Although base salaries of staff are charged to the default account code for the employee, overtime, travel, and other costs associated with the project are charged to the benefiting account. (Personal communications – Steve Guertin)

Table 86. Wildland Fire Management Budget, FY 2004-2006

Wildland Fire Management (\$000)	FY 2004	FY 2005	FY 2006
Suppression (includes Emergency Stabilization)	8,444	16,735	16,785
Wildland Urban Interface (WUI) Fuels Reduction	11,068	15,210	19,182
Non-WUI Fuels Reduction	12,562	12,249	12,514
Total Hazardous Fuels **	23,630	27,459	31,696
<i>Source: FWS Budget Office. Final allotment for each fiscal year. Includes current year (new) funding only.</i>			
<i>** Includes more than prescribed burns.</i>			

A high level of cooperation and coordination is conducted by the Fire Program across refuge, agency and state boundaries. According to FWS Fire Management web site, there are approximately 600 fire staff, 39 prescribed fire specialists, and some 3,038 “red card” FWS employees qualified to support wildfire activities. They are supported by 275 wildland fire engines, 40 tractor plow units, 31 water tender trucks, 28 bulldozers, and five fire suppression

boats spread throughout the NWRS. These resources are coordinated and shared to provide prescription fire and fuels reduction on home and area refuges. With the advent of wildfires these same resources can be drawn on for fire suppression. This sharing of equipment, personnel, and even budget, provides a level of efficiency that is requisite for an effective fire program and further helps reduce associated costs.

B. Principal Findings:

Fire Management Planning: The FMP is the most pervasive plan within the NWRS – refuges without a CCP or a formal wildlife management plan, have a FMP. In part this is a logical response to the high level of planning and coordination needed to fight fire and the simple fact that “if you don’t have a good plan, you kill people” (personal communication, Brian McManus). FMPs are to be reviewed annually and revised as needed. FMPs are expected to be updated every five years to reflect current conditions, area fire fighting capacity, and planned fire management activities. At present, the vast majority of NWRS acres are covered under an existing FMP.

Development of FMPs involve local agencies, fire districts, citizens, and others in their initial development. FMPs are reviewed by Regional Office and undergo NEPA-required public review where “interested” parties can become involved. Many of these plans are also reviewed by the national office for consistency. FMPs are not proactively distributed cross-agency or provided to other peers unless specifically requested.

FMPs are to be based on a foundation of the best available science with ongoing research to support iterative efforts to increase the scientific knowledge of biological, physical, and sociological factors. For the NWRS, such information is developed through an integrated interagency fire science program with the hope that scientific results are made available to managers in a timely manner in order to affect development of land management plans, fire management plans, and implementation plans.

Against all the planning, sophisticated equipment, advanced training, and firefighter dedication must be balanced a landscape that is increasingly populated with people and structures, and the vagaries of weather and fire behavior. As Bill deBuys noted in *High Country News* in the aftermath of the 2000 Los Alamos fire in New Mexico, managers “may have overestimated their powers and underestimated the uncertainties of fire and weather, but such hubris explains only part of their decision to proceed with the [prescribed] burn.”¹⁴³ The fire plan called for a 900 acre burn; in the end some 48,000 acres burned.

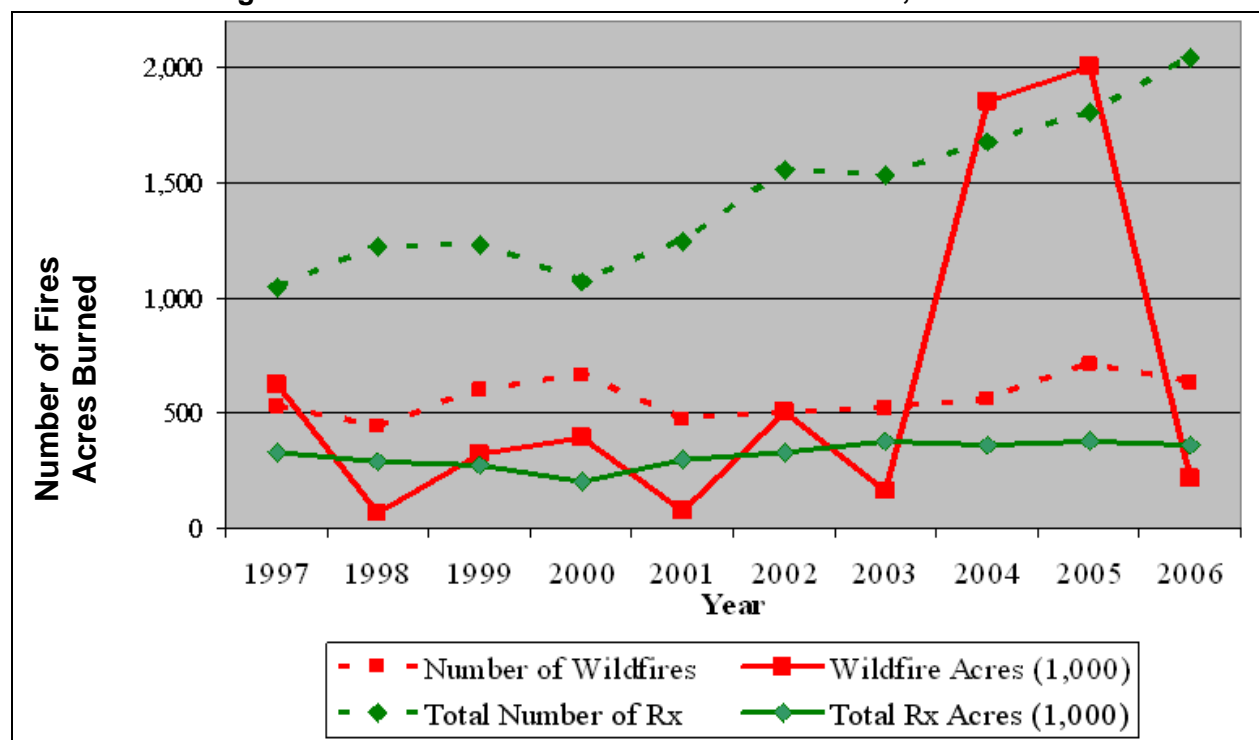
Extent of Wildlife and Prescribed Fire: The NWRS represents the full variety and challenges of keeping fire on the landscape as an ecological tool while fighting wildfire in defense of life and property. For example, sited amid the John F. Kennedy Space Center, in east-central Florida, Merritt Island NWR actively burns to maintain scrub oak habitat vital for Florida scrub jays and other wildlife while suppressing wildfires that threaten people and property. At the other end of the NWRS, the nine million acre Yukon Flats NWR, in eastern interior Alaska, works with state and tribal interests to maintain a “near-natural fire regime” habitat while suppressing wildfire near villages.

¹⁴³ *Los Alamos fire offers a lesson in humility*, William deBuys, *High Country News*, July 3, 2000

Table 87. Total Wildfire Acres Burned in United States, 1990-2004 (Source QFFRR, 2005)

Time Frame	Total Wildfire Acres
1990 – 1994	3,436,537
1995 – 1999	4,136,284
2000 - 2004	6,040,083

Figure 23. Wildfire and Prescribed Fire on NWRs, 1997-2006

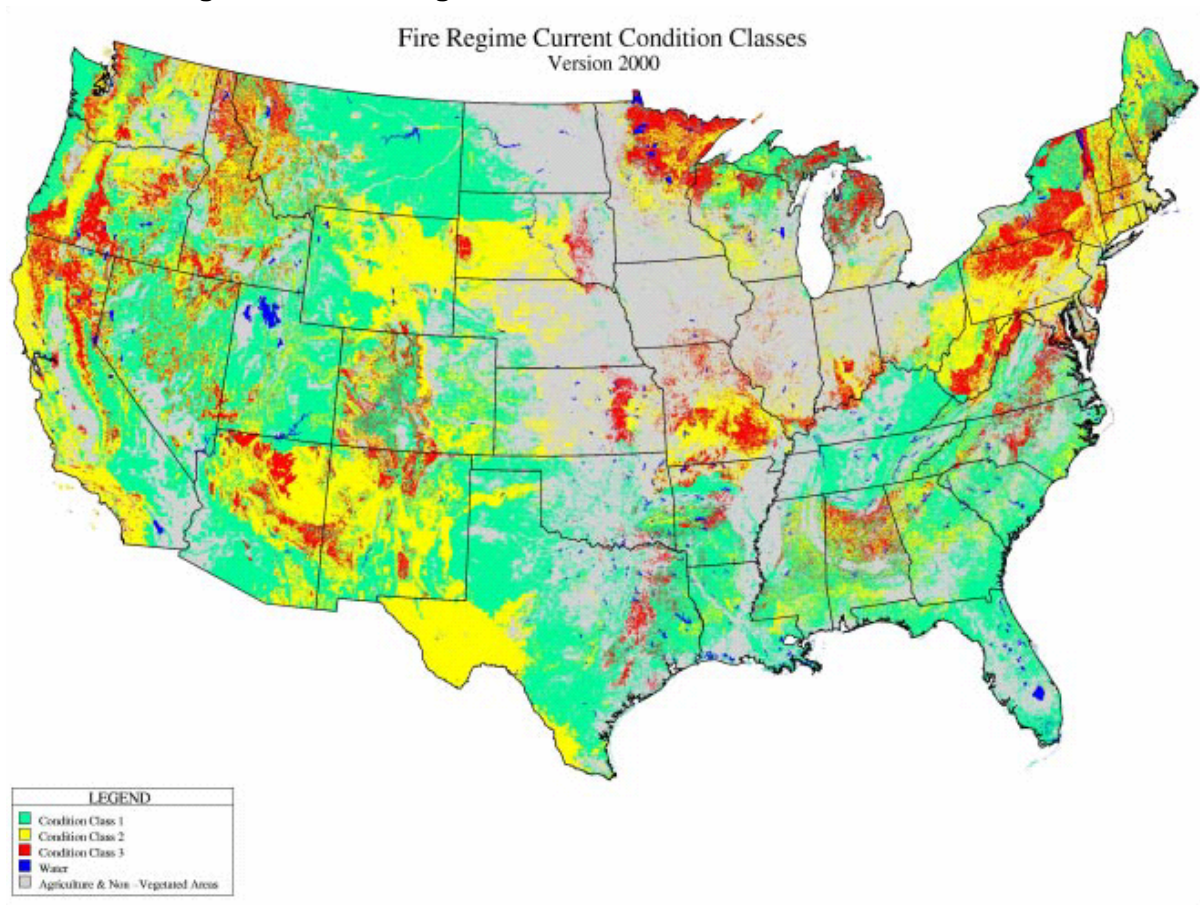


Source: FWS Fire Management Website @ <http://www.fws.gov/fire/>

Total wildfire acres in the United States have increased dramatically since 1990 as illustrated in the above table. Examining causes of fires on refuges, 1997-2006, an annual average of 71 percent of the wildfires were caused by human activity (i.e., campfire, smoking, debris burns, exceeding fire prescriptions, incendiaries, juveniles, etc.). When examined by number of acres burned, however, 92 percent were from natural causes. Figure 23 presents 10-year data for the number and acreage of wildfires and prescribed fires across the NWRs, 1997-2006. The data suggest a steady increase in the number of prescribed fires set (from 1,047 in 1997 to 2,043 in 2006) but the corresponding number of acres receiving the prescription has remained largely steady state (328,706 in 1997, 357,833 in 2006). The general orderliness of prescription fire is dramatically offset by wildfire—the nature of wildfires appears to respond in an opposite fashion with the overall number of conflagrations showing a slight overall increase over the 10-year period while the number of acres burned fluctuates widely in one year from more than 1.9 million acres in 2005 to 214,809 acres the next year.

A total of 1,990,209 and 214,809 acres were burned by wildfire in 2005 and 2006 respectively (www.fws.gov/fire). The NWRS Strategic Plan indicates that 243,968 and 127,885 acres were burned by unplanned and unwanted wildland fires in those same years. The difference is reflective of wildfires that burned unwanted acres versus wildlife that was considered beneficial, or used modified suppression. Fire staff note that they aim for and achieve a 95 percent initial attack success rate on unwanted wildland fires but commented that the potential for wildfires increases annually, which increases the potential for fires to enlarge and escape.

Figure 24. Fire Regime Condition Classes for United States, 2000



Condition Class: NWRS Strategic Plan reports on an annual performance measures of the “number of acres in fire regimes 1, 2, or 3 moved to a better condition class.” As a general rule, the goal is to move habitats toward Fire Regime Condition Class 1. FRCC 1 lands have likely received fire treatment in recent time through fire cycles can range from 2-80 years depending on the vegetation (see FRCC discussion earlier). Fire managers are working on an improved definition of lands that would classify all lands relative to the “desired condition class” relative to habitat values.

In evaluating the Refuge System’s ability to improve the condition class of habitats within the NWRS, the amount of effort needed to move a target parcel of land from CC3 to CC1 must be recognized given initial condition of habitat, fuels loading, and required management. For

example, a target parcel might require extensive mechanical thinning as an initial treatment, followed by prescriptive fire applications relative to what vegetation and safety concerns will allow—it might take 10-15 years to achieve. Once habitats are FRCC1, it becomes a lot easier to maintain them in desired condition. A total of 313,288 and 275,081 acres in FRCC2 or FRCC3 were treated in 2005 and 2006 respectively with 93,557 (30%) and 119,034 (43%) acres classified to a better condition class.

The Conservation in Action Summit judged the NWRS' ability to move fire regimes into desired ecological condition as being "inadequate." The Summit's ranking was as follows:

- 50-74 percent of refuge lands had been inventoried and classified as to FRCC and desired ecological condition;
- Of the lands inventoried, 50-74 percent of refuge fire-adapted habitats are in the desired FRCC or desired ecological condition, which equals inadequate.
- An Adequate rating would require that 75-99% of NWRS land be inventoried and classified, and that 75-99% of the lands inventoried achieve the status of "desired fire condition." An optimal rating would require that 100% of land be inventoried and in desired fire condition.

Management Oversight and Capability: The NWRS Fire Management Branch has national program oversight and intra and interagency coordination responsibility for all aspects of the fire management program. The goal is to review each of the regions every five years. As part of their oversight, they conduct program reviews to assess program administration, preparedness, emergency fire operations, and resource fire management. A team approach is used to conduct program reviews drawing from regional and national expertise and experience outside the individual NWR. The teams, assembled across fire, biology, and administrative lines, review documents, conduct interviews, and undertake on-site review of regional office and one or more unit reviews. In 2006, a program review was conducted in Region 7, and in 2007 program reviews will be conducted in Region 1 and 5.

A survey conducted by MSI found the majority of refuge managers believed their units to be sufficiently trained, capable, and coordinated in fire management. Highest marks were provided for refuge's ability to partner with other federal agencies (70% generally to fully sufficient) and their ability to partner with other state and local agencies on fire management issues (74% generally to fully sufficient). Sixty percent of refuge managers responded that the number of staff trained in fire management was generally to fully sufficient with a similar number judging their ability to respond to wildfires to protect life and property. Managers were split equally over their ability to use fire as a habitat management tool (49% insufficient, 51% sufficient). This question was judged by refuge managers both from the standpoint of their internal capability to utilize fire as a habitat management tool and the refuge's ability to utilize fire to the extent needed given off-refuge concerns on safety and potential threat to property. Among the recurring comments received from refuge managers were:

- Requirements for training, certification, etc. have become cumbersome for some refuges, particularly the smaller units, to conduct needed prescribed fire.
- Fire staff deployments to fight wildfire off-site hamper ability of refuges to conduct prescribed fire.

Table 88. Refuge Managers Survey (2007) – Fire Management

Question/Response	1 Insufficient	2 Mostly Insufficient	3 Generally Sufficient	4 Mostly Sufficient	5 Fully Sufficient	N/A
The number of staff trained in fire management is	20% (59)	18% (54)	31% (94)	12% (35)	11% (34)	8% (23)
Our ability to use fire as a habitat management tool is	21% (64)	25% (74)	23% (70)	14% (42)	10% (30)	6% (18)
Our ability to respond to wildfires to protect life and property is	25% (75)	12% (37)	33% (100)	12% (37)	11% (32)	6% (18)
Our ability to partner with other federal agencies on fire management issues is	10% (29)	19% (56)	29% (88)	18% (53)	18% (53)	7% (20)
Our ability to partner with state and local agencies on fire management issues is	12% (35)	14% (41)	33% (98)	21% (62)	19% (56)	2% (7)
<i>Total Responses = 299</i>						

Wildland Urban Interface: A growing challenge for the NWRS is found at the “wildland-urban interface” (WUI).¹⁴⁴ It is a term with which a growing number of refuge managers are becoming all too familiar. Put in its most simplistic complex, the WUI is that area where residential growth attracted to the amenities of living close to nature meets a system of wildlands shaped by fire.¹⁴⁵ In a perverse sense, NWRS and other wildlands act of an ‘attractive nuisance’ luring residential development as close to the wildland borders as possible. With development of the WUI comes the increasing need to protect life and property. All aspects of handling fire, from smoke management to how a fire is targeted change in the WUI, relative to how fire in managed in the non-WUI. Now instead of letting a wildfire burn as part of a natural fire regime, refuges must commit limited resources and place fire crews at risk for fire suppression—instead of attacking the heart of the fire, fire crews find themselves forced to use their resources to “herd” the fire away from private property.

The size of WUI is increasing daily for all federal agencies with the NWRS especially vulnerable due to the relatively small and fragmented nature of many of its properties and the high appeal of living “next to a wildlife refuge.” NWRS is working using Land Fire GIS process to develop more exact number on the extent of WUI within the NWRS and its growth. In the absence of NWRS-specific numbers, however the findings of the 2005 Quadrennial Fire and Fuel Review Report are sobering. The Report concludes that the WUI will continue to expand and make fire management’s challenge to restore fire’s role in the ecosystem and protect communities near

¹⁴⁴ WUI is defined as “the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.”

¹⁴⁵ QFFR defines WUI as a place with more than 6 housing units per square kilometer or more than 1 house for 40 acres, which has less than 50% vegetation and is within 2.4 kilometers from an area that is 75% vegetated.

public lands more difficult; public expectation for the protection of both communities and surrounding natural values will remain high, and hazardous fuel profiles that are categorized as “at risk” will continue to increase.¹⁴⁶ Specifically the report notes:

Conversion of unpopulated forest and rangeland to housing in the WUI was already increasing faster than population growth in the 1990’s at a rate of 1.2 acres of undeveloped land for every additional person added to the population rolls. Assessments of census data provided to the QFFR New Assumptions Panels concluded that housing growth rates in the WUI are nearly triple the rates of increase outside the WUI. These growth rates for the 1990’s will equate to more than 8 million new houses in the coming decade. Compounding this problem is the fact that the intermix, where housing is likely to be outside of fire districts, has the fastest rate of growth within the over expansion of the WUI. The intermix has less than 10% of the land area but more than 40% of all new houses. In terms of risk, this means an increased probability for more houses and people to be not just on the edge of potential wildland fires, but increasingly in the midst of fires. More structures in the midst of wildland fire also limit the effectiveness of traditional wildland fire suppression tactics and strategies such as backfire and burnout. These two highly significant changes (increased wildland fire and increased population exposed to wildland fire) have altered the nature of wildland fire risk, both now and for the future, as well as greatly increased the levels of complexity and difficulty for wildland fire and fuel management.

Fighting fire in the WUI is dangerous and expensive. The danger is tragically reflected in the Esperanza Fire near Cabazon, California where five federal fire fighters who lost their lives in 2006 attempting to protect a vacant partially-built home. The costs of responding to wildfires with or without human development proximity are very real as illustrated at Okefenokee NWR. In 1990, the Shorts Fire occurred on the edge of the refuge threatening homes and community infrastructure. Over the course of three months thousands of firefighters and equipment conducted direct suppression work. The fire burned 21,000 acres and cost over \$10 million in 1990 dollars. By comparison, the 2002 Blackjack Bay Fire occurred in the interior of the refuge. Due to its limited threat to communities and infrastructure, the fire was managed as a wildland fire use event. This fire burned over 124,000 acres in the course of six months and cost \$8.5 million. The relative cost per acre (unadjusted for inflation) was \$476 per acre for the WUI (Shorts) fire compared with \$68 per acre for non-WUI (Blackjack Bay) fire.

To date, local, state, and federal governments have done little to control development in fire-prone areas, but there is the growing realization that these areas need to be viewed in the same manner as society now views areas prone to earthquakes, floods, and other natural forces. Increasingly, communities throughout the western United States and elsewhere are beginning to acknowledge the need to develop better tools to manage this issue. Land planning, growth management policies, involvement of the home insurance industry, and a clearer understanding by land owners of the potential risks associated with living in the WUI are among the potential avenues to be pursued.

C. Conclusions

Where refuges have the qualified staff and budget, the high level of planning, training, and coordination results in application of prescription fire to improve and maintain habitats, reduce

¹⁴⁶ Quadrennial Fire and Fuel Review Report, 2005, National Advanced Fire and Resource Institute, http://www.nafri.gov/Assets/QFFR_Final_Report_July_19_2005.pdf

fuels loading, and suppress unwanted wildfire. From surveys and interviews, it appears that approximately one-half of the NWRS has the resources it needs – both budget and personnel – to use fire as a habitat management tool. For other units, issues of staffing, available budget, the growing percentage of wildland-urban interface lands (WUI), and the location of a refuge relative to other fire resources, often impairs a refuge’s ability to promote prescription fire while proactively addressing fuels availability and effective wildfire suppression.

Fire Planning: The Refuge System has an excellent system for fire planning. Refuges with “burnable vegetation” must have an approved Fire Management Plan (FMP). These are long-term plans that must be updated annually. Virtually all refuges have completed FMPs. The practice of having neighboring refuge staff participate in the development and review of FMPs is a practical process for ensuring quality control through peer review and for building the experience and skills of fire management officers and other staff.

Budget Structure: The funds available for fire management are currently classified into fire suppression and fuels reduction categories and there are not dedicated funds available for prescription burns that are primarily undertaken for the purpose of habitat improvement. Thus, refuge managers often must creatively try and use funds designated for fuels reduction when the primary purpose of a prescription fire is habitat improvement. This complicates the ability of managers to access funds for habitat improvement burns and likely prevents fire from being used for habitat management to the extent that would be desirable. As WUI issues increase there will be added pressure to continue to use funding for fire suppression and not habitat management.

Increased Cost of Wildfire Management: Similar to the National Forest System and other public lands, the NWRS is experiencing the increased cost, complexity and frequency of fire management in the WUI. Increased staffing and costs related to suppression efforts will pose greater challenges to the NWRS than they have with other federal land management agencies. Increased resource calls on staff and budget to fight fire in the WUI can and will impact the ability of the NWRS to use prescription fire and fuels reduction proactively to benefit habitat condition and reduce wildfire risk. The accelerating growth in the western United States, especially in the WUI, coupled with multiple-year drought conditions, are factors in this equation.

The high level of cooperation and coordination exhibited by the Fire Program across refuge, agency and state boundaries is requisite for an effective fire program, but it also provides a Best Management Practice for possible application to the rest of the NWRS.

Growth of residential development in areas adjacent to refuges will continue. For refuges facing increased difficulty conducting prescribed burns and increased risk of wildfire in the WUI, active involvement with surrounding communities and regional planning agencies is important.

D. Recommendations

Budgetary Restrictions: As guidance is currently structured, it is difficult for some refuge managers to access funds for using fire to manage habitat. This may be because of a misunderstanding in terms of how fire funds can be used, or there may be a need to better communicate to regional staff the flexibility that is possible in using such funds. In either case, there is a need to address this constraint so that refuge managers have greater flexibility to

program funds for using fire to improve habitat. In addition, a separate budget category should be established and funded for using prescription fire for habitat improvement (as distinct from fuel suppression).

Plan for the Increased Frequency and Complexity of Fire in the Wildland Urban Interface. Growth of residential development in the WUI will increasingly impact the ability of the NWRS to manage habitat. This issue clearly illustrates the need for refuges to engage in the larger community, not only in a biological landscape sense, but also to influence regional growth and development. The Refuge System, and other federal agencies, has been able to have some influence on development practices in wildland areas adjacent to refuges through applying “communities at risk” designations. This tool should be reviewed, and possibly more broadly applied, as a way to influence development in fire prone areas adjacent to refuges.

SOG 12: Promote and enhance organizational excellence.

Performance Rating: Partially Effective	<p>The Refuge System has introduced a number of new management and planning systems over the past several years, including a medium-term strategic plan, activity-based costing, RAPP work planning and reporting systems, and refuge-level comprehensive conservation planning. The Refuge System is also currently undertaking a Workforce Planning exercise to help better balance personnel and operational expenditures and to prioritize staffing and programs in consideration of declining budgets. The RAPP system has enabled the NWRS to better track and report on national-level accomplishments and the budget rebalancing exercise will, over time, provide managers greater ability to address local priorities. There are, however, several aspects of the Refuge System’s overall management system that could benefit from additional attention, including: increasing policy implementation consistency across regions; standardizing business management processes across regions, such as annual work planning and budgeting; and building systems to better analyze performance, share best practices and better connect communities of professionals, such as biologists and visitor service staff.</p>
--	---

The description of this SOG in the NWRS strategy is somewhat vague, as are the performance measures. The evaluation expands the topic of Organizational Excellence to examine organizational and management issues that emerged during the course of this evaluation as particularly important to the success of the Refuge System. These issues are presented in the following two sections:

- I. Business Management Processes:** includes strategic planning, annual work planning, the budget development process, the alignment of the budget with CCPs, and operational assessments.
- II. Program and Policy Consistency:** reviews the Refuge System’s operational structure and the ability to manage programs and policies consistently across regions.

The information contained in this section draws substantially from the findings and conclusions contained in preceding sections of this report.

A. Context/Background

The following description of the Strategic Outcome Goal is from the Strategic Plan for the National Wildlife Refuge System (December 2006).

Means and Strategies: The Refuge System mission is achieved through effective and efficient application of organizational resources to include communication, human resources, financial resources, budget and performance integration, information technology, and policy processes.

Recognizing that a motivated and highly skilled workforce is our most important asset, the Refuge System established a Leadership Development Council (LDC) in 1998. The LDC worked on many fronts, such as recruitment and retention, development of core competencies, career ladders, training, and leadership development, to improve management of the Refuge System's workforce. The current workforce planning effort builds on the work of the LDC, but aligns the effort with the initiative in the President's Management Agenda to strategically manage human capital. Development and execution of budgets is also given careful attention to focus available resources on highest priority needs. Assistance of volunteers and a variety of partners is also key to accomplishing Refuge System goals. Policy documents are developed in priority order to effectively and consistently implement the Refuge Improvement Act and other legislative direction. Alignment of human resources, budget structures, strategic planning goals, and policies are pursued to provide for most effective accomplishment of the Refuge System mission. Modern information technology applications are utilized in furtherance of accomplishment of the Refuge System mission.

Performance Measurement: This long-term goal does not lend itself to the use of performance metrics in the same way as other goals. Generally, performance will be measured through the delivery of specific products. For example, in 2006, a comprehensive workforce analysis was completed for the Refuge System. Employee performance plans have been rewritten to focus resources on the highest priorities. Measurable performance goals will be included in performance plans of staff at national, regional, and field offices. An independent review of overall performance of the Refuge System in achieving its mission will be conducted every 3 to 5 years. Refuge System leadership will continue its efforts to provide high levels of job satisfaction, workforce diversity, and training and development for staff at all levels of the organization.¹⁴⁷

In the table below are the accomplishments the NWRS reported for FY 07, which focus on holding meetings, completing a workforce planning exercise and reviewing RAPP performance targets and reporting.

¹⁴⁷ Final Strategic Plan for the National Wildlife Refuge System, FY 2006 –2010, US Fish and Wildlife Service, December 2006.

Table 89. Annual Performance Measures – Strategic Objective #12

Strategic Goal 12. Promote and Enhance Organizational Excellence	
Annual Performance Goals – as taken from FY06 Reporting:	
1)	The NWRS Leadership Team (Chief, Deputy Chief, Regional Chiefs, and Headquarters Division Chiefs) will meet quarterly each FY to consider and implement actions needed to maintain organizational excellence of the NWRS.
2)	National level function-based teams (i.e. Visitor Services, Biology/Natural Resources, Realty, etc.) will meet twice each FY to consider and implement actions needed to maintain organizational excellence of their respective programs, and to elevate necessary issues to the NWRS Leadership Team.
3)	By January 1, 2008, a final workforce analysis will be completed for the NWRS, establishing a strategic and recurring process for managing the NWRS workforce into the future.
4)	All NWRS line officers will review accuracy and rationale of targets and actuals in portions of the Refuge Annual Performance Plan (RAPP) for which they are responsible.

Of the four performance goals listed above (from the NWRS 2006 strategy) three have to do with holding meetings, and the fourth is a review of the RAPP system. These are “soft” performance goals as they measure processes and activities rather than outcomes or improved performance.

The remainder of this section is an analysis of the management and organizational issues that were found by the evaluation team to be critical to the Refuge System’s performance.

I. BUSINESS MANAGEMENT PROCESSES

A. Strategic Planning: Performance Management and Budgeting

The Refuge System has developed a number of planning and reporting systems to guide how it conducts its work. Foremost among these are the NWRS’ Strategic Plan, Comprehensive Conservation Plans (CCPs, which are covered in a separate report chapter), and the Refuge Annual Performance Plan (RAPP) system, which is both a planning and a reporting system. A basic description of these systems follows:

- **Strategic Plan:** The Refuge System’s current strategic plan was finalized in December 2006. This document identifies twelve Strategic Outcome Goals (SOGs) for accomplishing the mission of the Refuge System and includes performance indicators for each SOG. The Strategic Plan serves as the Refuge System’s guiding operational plan for the FY 2006 – FY 2010. This document has not been widely circulated.
- **Comprehensive Conservation Plans:** CCPs are refuge management plans that lay out the objectives to be accomplished on each refuge over a fifteen year period. The Refuge Improvement Act (RIA) requires that 250 refuges complete CCPs by 2012. CCPs contain refuge management goals and are developed with the input of key conservation partners, including state fish and game agencies.

- **Refuge Annual Performance Plan (RAPP) Workbook:** The RAPP workbook is a planning tool that is completed once a year by refuge managers. The workbook is structured as per the Refuge System’s SOGs and requires managers to list their project activities for the coming year along with the expected level of accomplishment in each area, as per SOG performance indicators. The workbook, which has been in place since FY 2006, is intended to “facilitate dialogue between a refuge manager and a refuge supervisor about how work projects should be prioritized over the coming year.” The projects listed in the workbook comprise the refuge’s annual work plan (or at least they comprise the set of accomplishments the refuge expects to achieve over the coming year).
- **RAPP Annual Report:** This report lists progress against SOG performance indicators and is strictly a numeric/quantitative report. Each field station is required to submit an annual RAPP report and these reports are then rolled-up into the NWRS’ annual performance report. The summary RAPP report contained in the FWS FY 2006 strategy contains 106 performance indicators, although the complete RAPP database contains upwards of 180 indicators.
- **Budgets:** There is no standard process by which refuges are allocated budgets as each region has its own process. This section will examine the relationship of the budget allocation process to other planning processes.

The above systems comprise the NWRS’ principal tools and processes for work planning and management. What follows is an analysis of the use and utility of the above planning components. In this section, coverage of CCPs is limited to a discussion of the relationship of these plans to other planning systems. CCPs themselves are covered in detail in the section on SOG 9 – CCPs.

It is worth noting that the Strategic Plan, the RAPP workbook and the RAPP annual performance reporting systems have all been developed within the past few years. As such, there is limited experience in using these systems, and they are still evolving based on a review of early experience. Despite the shortcomings identified with these systems, the NWRS deserves credit for developing and implementing improved processes for managing the Refuge System. These systems represent an important step forward in the process of documenting and understanding system-wide performance and provide a base of experience for instituting revisions to further improve performance.

B. Principal Findings

1. Annual Work Planning:

- The MSI evaluation team was not able to identify any guidance or requirement concerning the development of refuge-level annual work plans.
- In the majority of the eighteen refuges visited during site visits formal work plans did not exist. Several of the refuges visited during field visits did indicate that they developed and operated under annual work plans; however, these plans were often just one page lists of tasks. Many refuge work plans did not include standard work plan elements, such as time schedules; an identification of sub-objective or sub-activity requirements; the identification of a person responsible for the completion of various tasks, although it

some cases the responsibility would be obvious (particularly at smaller refuges); an indication of costs or additional required funding; or any indication as to the role of partners.

- In a few of the refuges visited, particularly in the CNO and Alaska regions, refuges had developed detailed annual work plans. These work plans were detailed documents that identified and prioritized activities for the year and were structured to achieve the longer-term objectives contained in CCPs.
- CCPs do contain objectives to be accomplished during the fifteen year life of the plan. However, and as is noted in the CCP section, the list of objectives in CCPs is often more than can be accomplished in a given year and in almost all cases exceeds what can be accomplished with annual budgets.
- While conceptually one would imagine there would be a link between a refuge’s longer-term plan (the CPP) and its annual plans, there is no guidance or tools in place that explicitly link CCPs and annual work plans (although RAPP guidance does indicate that CCPs should be the basis for driving refuge planning). Although RAPP does not equate to an annual work plan, preparing the RAPP requires a field station to consider many of the elements needed for an annual work plan.

The Refuge Manager’s Survey asked two questions related to planning and budgeting and there were also a significant number of open-ended comments received on these topics. A review of planning and budgeting processes was also conducted during field visits.

The first survey question related to planning is presented below:

Table 90. Refuge Managers Survey (2007) – Planning Process

<i>Which of the following best describes your annual refuge work planning process?</i>		
1	We do not produce a formal written annual work plan – we work from what we did last year and available budget	11%
2	We have an informal work plan, which loosely outlines anticipated activities and is discussed periodically at staff meetings	36%
3	We produce an annual work plan that outlines items such as priority tasks, responsible staff, and implementation schedule—but available staff and budget dictate what we do	45%
4	We produce an annual work plan that outlines items such as priority tasks, responsible staff, and implementation schedule—it guides our annual activities and reporting of accomplishments	9%
<i>There were 292 responses to this question.</i>		

As can be seen by the survey data above, 47% of managers said they do not have formal work plans, and another 45%, who indicated they do develop formal work plans, indicated that it is available staff and budget that dictate what they do.

The Refuge Manager’s Survey provided respondents an opportunity to comment on required planning and reporting processes. There were 106 comments received and 27 addressed the

issue of work planning; however, there was no consistent thread to the comments, perhaps because in the absence of clear guidance or structure, work planning was interpreted in different ways by different respondents, with some respondents referring to the RAPP process as an annual work plan, some referring to CCPs, and some indicating that they develop their own work plans. It was clear both from site visits and from the comments received from the survey that there is not a clear understanding of how to conduct annual work planning within the Refuge System, or even if such planning is required.

The following comments are illustrative of the differing views and perceptions of how refuge-level annual work planning is conducted:

- I have not seen any link to RAPP and our annual work planning and how they affect our budget. Perhaps RAPP has not been implemented long enough, but I have not seen any correlation.
- I had no idea there was supposed to be a tie between RAPP and our annual planning and budgeting.
- We have a plan, but this plan is so utterly dependent upon available funding and staffing that it makes no sense to produce a formal annual work plan (it would be useless and not worth the time). Our general plan is our CCP. Opportunities come and go and sometimes money, staff, and planning match up.
- We are working hard in developing an annual work plan so all employees understand priority needs, and we are striving for team efforts; however, this is new to our staff and the learning curve is steep. The reporting and administrative process is overwhelming at times.
- We produce a written work plan that outlines routine task and priority projects for the year. Specific responsibilities are assigned via annual performance plans. Implementation is based on budget availability.

The RAPP work planning process, whereby refuge manager's list their priorities and expected accomplishments for the coming year, is in theory supposed to serve as a mechanism for linking work plans and budgets—this according to NWRS managers in Washington and the description of the RAPP Workbook as contained in the workbook. The issue was explored in the following survey question.

Table 91. Refuge Managers Survey (2007) – Annual Planning and RAPP Relationship

How would you characterize the relationship or linkage between the Annual Performance Plan Workbook/Refuge Annual Performance Plan (RAPP) and the process you use for refuge annual planning and budgeting?		
1	There is virtually no linkage between the RAPP process and how we plan refuge activity and prioritize our budget	29%
2		30%
3	There is a general relationship, e.g. there is a significant overlap between the two	30%
4		6%
5	There is a strong linkage—the RAPP process and our refuge work planning process are virtually the same	5%
<p><i>There were 290 responses to this question; 14 indicated “not sure” and were not included in the above responses—although “not sure” would also seem to indicate that the respondents did not see a clear relationship between annual performance planning and the RAPP process.</i></p>		

As can be seen from the above responses, very few refuge managers see a strong linkage between RAPP workbook planning and the process used for annual work planning at their individual refuges. Fifty-nine percent said there is little to no relationship between the two processes.

In a prior refuge review report—the 1994 Refuge Operations Subactivity Report¹⁴⁸—the following recommendations were made concerning the development of annual work plans:

- Prepare formal annual work plans that are stepped down from the comprehensive management plan.
- Hold refuge managers and line supervisors accountable through performance plans for developing, implementing, and following their annual work plan and comprehensive management plan.

The evaluation team did not find evidence that the above recommendations have been fully implemented.

C. Developing Refuge Budgets

The evaluation reviewed the process for developing refuge budgets and how the process supports CCP and annual work plan implementation. The evaluation did not find a common process for developing refuge budgets from region to region—the process appears to be highly variable and often somewhat *ad hoc*. In all regions it is the Regional Office that decides and allocates refuge budgets. The various processes for refuge budget development were as follows:

- In some regions, there seems to be virtually no formal interactive process – refuges at some point are simply provided a budget from the regional office based on funding

¹⁴⁸ Rogers, John, et. al., Refuge Operations Subactivity Report - Reinventing Refuges: The Challenge to Change!, the National Wildlife Refuge System, October 1994.

availability and some analysis of past year expenditures. Under this process, refuges will provide a list of priorities to the regional office, for example an email listing what they would like to fund over the coming year, but there is very little, if any, dialogue or discussion.

- In some regions there appears to be a significant iterative dialogue between refuge managers and refuge supervisors to discuss what will be funded over the coming year.
- In at least two regions—CNO and Alaska—there are base budgets in place that serve as a basis for budget allocation. The process to establish base budgets is based on a review of past expenditures and future requirements and discussions to set base budgets involve substantial participation by refuge managers. Establishment of a base budget enables refuges to understand in advance what their minimum likely funding levels will be and assists them in planning.

In regions that do not have a base budgeting process, which is most regions, the process of allocating budgets seems somewhat ad hoc, as funding levels can never be assured from one year to the next, and the criteria for allocating resources between refuges is not clear to refuge managers. It is difficult to exactly define which regions use which budget process, and to what extent there is interaction between the regions and refuges in setting budgets, because there are varying ranges of the level of interaction between refuges and regional offices among the different regions. It is perhaps worth noting that the two regions that use base budgeting are also the two regions that appeared to have the most well developed annual work planning processes (Alaska and CNO) —at least this appeared to be the case based on the limited number of refuge site visits conducted (18 refuges were visited). The CNO and Alaska regions are also the only regions to have thus far met the required budget ratio balance between salaries and operational costs.

The Refuge Manager’s Survey provided respondents an opportunity to comment on required planning and reporting processes. There were 106 comments received and 39 of these comments had to do with the budget process. A majority of these comments (25) addressed the following point:

- There is not much practical value to developing annual work plans since budgets are uncertain and/or often received very late in the fiscal year; and

As was verified from field visits and other survey questions (see Partnership SOG and budget analysis section), budgets have been in decline over the past several years. This has resulted in a situation whereby many refuges do not have any “extra” operating budget and thus they only activity they are planning is how to use the staff’s time, which is already mostly dedicated to year-over-year core tasks—which is to say that virtually all funds are used to conduct core required management activity, and there are not funds left over that can be “flexibly” programmed or planned.

The following comments were received from the survey and are illustrative of comments on these points:

- As a refuge within a Complex, I have never seen a budget or been a part of a Complex budget meeting. Since we have no control over the funds at the refuge level, we are at the mercy of the Administrative Officer, who does not give any budget information. We develop our work plan here at the refuge and have never worked together as a Complex on budget plans.
- The FWS doesn't really 'budget' in the real sense of the word, like the Forest Service - where they plan this year what they want/need to do next year and then they receive a budget to do all/part of their plan. FWS allocates and spends—more often than not on crisis type projects rather than real priorities. Here it is almost April and we have no budget—so how do you expect an agency to 'plan' what they intend to do when they rarely know from year to year how much money they will have to do it with?
- Can not plan when you do not know what or when you will get a budget or when a vacancy will be allowed to be filled. The layers of decision makers are stifling.
- Almost impossible to plan when we do not get our budgets until the year is half over.
- Budget and staff drive most of what we do in regards to on the ground work. As we often do not know what projects will be funded until the fiscal year is half over (this year was especially bad) we have difficulty initiating projects in a timely manner or spreading out the workload over a reasonable amount of time.
- I don't see budgets until the 2nd or 3rd quarter, Washington Office and Regional Office priorities and reporting demands are in constant flux, and emerging issues change priorities so it's not worth the effort to develop detailed annual work plans.
- How can an annual work plan be seriously addressed when our budgets are not even known until halfway, or more, through the fiscal year?

Several of the above comments illustrate the linkage between annual work plans and budgets, and note that if budgets are not provided in a timely manner then it is difficult, or not very useful, to develop annual work plans.

D. RAPP/Performance Reporting

During the course of this evaluation the MSI team spent a fair amount of time reviewing, analyzing and trying to understand the data presented in the NWRS RAPP performance reporting system. Based on this work, we have a number of observations, including a general observation that the RAPP system provides a large amount of data but often does not provide a clear picture of key performance trends and issues. The following are the evaluation team's principal findings concerning the RAPP reporting and performance measurement system.

- **There is inconsistency in data reporting:** We reviewed NWRS performance data presented in multiple documents—including the RAPP database/excel report for FY 2005 and FY 2006, the FY 2008 Congressional Budget Justification (CBJ)—and found two

types of problems: 1) there is inconsistency in the language of the indicators; and 2) there is inconsistency in the data presented. The tables below illustrate a few examples of these problems, which we found to be pervasive.

Table 92. NWRS Reported Performance

Performance Indicator	Source	Actual Reported Performance	
		FY 2005	FY 2006
13.3) % of NWRS recovery actions for T&E species prescribed in recovery plans are completed. (PART - Refuges)	CBJ FY 2008	40.5% 895/ 2,210	59.9% 1,374/ 2,292
1.5) % of actions prescribed in approved recovery plans completed for the benefit of threatened and endangered species	Dec 2006 Strategic Plan	36.33% 803/ 2,210	59.90% 1,374/ 1,329
1.51) Number of T&E actions	RAPP Excel Sheet	895 (no denominator reported)	103% 1,374/ 1,330
14.2) % of acres infested with invasive plants that are treated	CBJ FY 2008	12% 238,752/ 1,996,273	12% 284,363/ 2,356,740
1.13) Ratio of acres treated for invasive plants to acres infested with invasive plants	Dec 2006 Strategic Plan	4.78% 111,630/ 2,335,987	13.90% 284,363/ 2,045,243
1.33) Total acres treated for invasives 1.32) Total acres known to be infested by invasives	RAPP Excel Sheet	10.2% 238,753/ 2,335,987	13.9% 284,364/ 2,045,243
No. of refuges/WMDs with a Friends Organization	CBJ FY 2008	249	384
No. of refuges/WMDs with a Friends Organization	RAPP	249	288

In the table above the reported numbers differ as per different document sources, percentages are calculated incorrectly (indicator 1.5), and the percentages sometimes match even though the numerators and denominators may widely differ.

- A number of performance indicators are not defined and are self-interpreted:**
 Without precise indicator definitions the decision about what and how to measure—and report on—specific indicators is left to individual refuge managers. This, in turn, greatly limits the comparability of the data across refuges and makes data aggregation very problematic, i.e., data that is “rolled up” to the regional or national level will have low validity and reliability. Three examples include:
 - Under the Wilderness SOG (SOG 3) one performance indicator is stated as “percent of wilderness acres with wilderness character protected as prescribed in the Wilderness Act.” There is no definition for this indicator or criteria for assessing whether or not it is being met. In addition, there was no information available in Washington as to

which refuges were not meeting this condition or why. The evaluation team was told by Washington staff that the data for this particular SOG are not considered to be reliable or necessarily meaningful.

- Under the Law Enforcement SOG (SOG 9) there is a performance indicator that states “percent of refuges/WMDs with a community policing program in place.” There is no description or definition as to what a community policing program is, nor did the concept seem clear to the limited number of field staff who were asked about this program during interviews.
- Under the Strategic growth SOG (SOG 10) one of the performance indicators is stated as “the percent of land acquisition projects where landscape level planning is completed in collaboration with other federal agencies, state fish and wildlife agencies and other partners to focus on highest priority needs.” There is no definition or standard as to what constitutes a landscape level plan or what level of landscape scale planning a refuge needs to engage in to satisfy this indicator (and report that they have completed landscape level plans with other agencies, including states).

As stated, this is a very complex measure. This is due in part to the multi-dimensional nature of the indicator: 1) what constitutes landscape level planning (versus other biological planning), which is not clearly defined; 2) partner groups—federal states and NGOs, are all listed as collaborators, but it is not clear if all have to be involved in each planning effort and to what extent they need to be involved; and 3) the statement “highest priority needs” is not clear in terms of what these needs are and who decides if they are high priority.

- **RAPP Data are Not Analyzed and are Difficult to Interpret:** For example, it can be difficult to understand the performance of the NWRS land restoration efforts based on the information provided in RAPP. The following table represents the number of acres in the NWRS, minus Alaska, and the condition of the habitat between FY 2005 and FY 2006, as reported by RAPP:

Table 93. NWRS (Minus Alaska)

	2005	2006
Class 1A – No mgmt needed	5,813,676	7,918,657
Class 1B – Receiving needed mgmt	4,181,099	3,753,116
Class 2: Mgmt Deferred	6,224,653	5,019,451
Class 3: Restoration Deferred	3,223,641	2,987,690
Total	19,443,069	19,678,914
<i>Source: FY 2005 RAPP Data Sheet</i>		

The data in the above table raise a number of questions, and are presented as one example of the limitations of the current RAPP system:

- Class 1A lands increased by over 2 million acres, but the amount of land receiving management only decreased by .4 million acres. Based on the reporting it is not clear how 2 million acres were improved.
- What does it mean that fewer acres are receiving needed management? Is this because there are less funds to conduct required management activity or because the previous management actions enabled land that formerly required management to move into the class of land that no longer requires management? Should this trend be read positively or negatively?
- There is no indication of the total number of acres requiring restoration or management, which makes it difficult to know what portion of this requirement is being addressed, i.e. what is the scope of the problem?—the indicator only measures what has been deferred (what is not being done). Presumably, all acres except those in Class 1A status need management and the Class B are those receiving management. In this case, it might be useful to have an indicator as to the percentage of lands requiring restoration and management that are receiving adequate attention, or it might be more straightforward to state the number of acres requiring restoration and the number of acres currently being restored. This would enable an assessment as to whether the backlog of restored lands is growing or decreasing.
- Most importantly, there is no narrative discussion or analysis as to what the RAPP data mean and the implications of the data for managing the NWRS program. This is the case for the entire RAPP system, which as currently constituted only reports numbers.

Similarly, in the FY 2008 CBJ there is an indicator for “wetland acres restored through voluntary partnerships” —which equals 49,765 in FY 2006; however, when this indicator appears in the Excel RAPP database and in the performance presentation in the strategic plan, it does not mention the term “voluntary partnerships.” The following indicator appears in the strategic plan: “number wetland acres restored annually” —the value of which is also 49,765. It is unclear whether or not the NWRS is stating that 100% of wetland restoration done on refuges is done through a voluntary partnership – which is what is implied by the reporting.

- **There is no overall performance monitoring plan (documentation for the data system, list of data collection responsibilities and schedules), and responsibility for management of the system appears diffuse.** It is not clear that there is any central repository of data or that any one person is responsible for the management of the overall system. It was often difficult for the evaluation team to obtain current data, and it sometimes had to be sourced from different people in different offices. There is also no comprehensive data manual, where the following can be found in one location—data definitions, persons responsible for the collection of individual data, baseline data and data collection methodologies.
- **There appears to be inadequate quality control over the RAPP system.** It does not appear that data from individual refuges have ever been validated as a way to check on the integrity, reliability, and consistency of the data collection system. In addition, it would appear that there is not a careful review of the numbers contained in the overall system or of the numbers reported out in various documents.

The Refuge Manager's Survey elicited 35 comments on RAPP (out of 109 comments received under the general category of work planning and required reporting). These comments match the evaluation team's observations and notes from site visits, which is that refuge managers do not feel the RAPP System is helpful for management of individual refuges. Comments illustrative of this point include the following:

- The RAPP takes a lot of time but is not beneficial to the refuge.
- RAPP attempts to be quantitative but is very ineffective from a qualitative standpoint.
- RAPP just meets the data requirements and does nothing but take time. We write an annual work plan and use it to guide our activities. The old narratives were the best historical document for future refuge staff. It has been replaced by meaningless number records.
- RAPP was not well vetted with the field when it was created and generally has only loose ties to the work of refuges here in Alaska.
- The annual work plan that we produce for RAPP is not relevant. We were better off with our original work plans.
- The RAPP is a time consuming report that is in no way used by the field to manage annual work activities. The RAPP is somehow expected to be used by refuges to adhere to projected goals and objectives based on unknown budgets and staffing constraints. The report is worthless and is nothing more than an additional administrative burden being placed on the field stations.

The comments on the RAPP system received from the survey were consistent with what was heard during field visits—namely that the RAPP system helps the NWRS meet external reporting requirements and is therefore necessary, but it is not valuable as a refuge management tool.

The US Department of Interior's Office of Inspector General (OIG) conducted a review of the NWRS strategic planning and performance reporting system in early 2007.¹⁴⁹ This study resulted in number of findings and recommendations related to the NWRS strategic planning and performance monitoring system, including:

- The [NWRS] draft strategic plan lacks quantitative outcome measures with baselines for each goal.
- The plan contains 100 annual performance measures and targets for the 12 strategic goals. It is unclear how these measures can be used to assess the long-term progress in a particular area....Tracking approximately 100 annual measures and developing related targets, while maintaining high quality supporting data is a challenge for refuge field offices. **OIG Recommendation:** Ensure that each long-term strategic goal has specific

¹⁴⁹ Program Assessment Rating Tool, Review of the Fish and Wildlife Service National Wildlife Refuge System, US Department of Interior Office of Inspector General, March 2007.

outcome measures and related targets ...and [m]atch long-term goals with a limited number of specific annual performance measures;

- Unfortunately, because the RAPP and ABC codes were developed separately, ABC codes do not align with RAPP system performance measures. **OIG Recommendation:** Establish activity codes that clearly show the relationship between RAPP and ABC.
- The evaluation contractor (MSI) provides an analytic framework for the evaluation demonstrated in a tiered approach. The top tier provides two high-level NWRS program objectives linked to the middle tier of seven intermediate objectives. The bottom tier addresses cross-cutting support activities. **OIG Recommendation:** We believe this hierarchical framework of objectives could be used by FWS to develop fewer, consolidated, long-term strategic goals with intermediate, measurable outcomes or objectives (see chart on following page).

In the NWRS Strategic Plan the following performance indicator is included: “All NWRS line officers will review accuracy and rationale of targets and actuals in portions of the Refuge Annual Performance Plan (RAPP) for which they are responsible.”

E. Refuge Performance Evaluations

The MSI evaluation team determined that most regions, at some point in time, conducted evaluation reviews of various refuges, which were referred to by some refuges as Refuge Operational Assessments. Currently, however, we found that no region in the Refuge System is conducting routine evaluations of refuge operations—although CNO is developing a protocol for such assessments and reportedly plans to begin evaluating refuge operations for all refuges, on a rotating basis, beginning later this year.

In the past, and as recently as a few years ago, there were refuge assessments being conducted in a several regions, including in regions 3 and 4. However, as budgets have tightened, these assessments appear to have fallen by the wayside, and we did not find any examples of refuge assessments being conducted over the past year, nor do any of the regions have a schedule for conducting such assessments. System-wide, there does not appear to be guidance on the need to conduct evaluations or on the process that should be used when assessments are conducted.

Figure 25.

FWS/Refuge Evaluation: Analytic Framework

Mission-level performance measures:

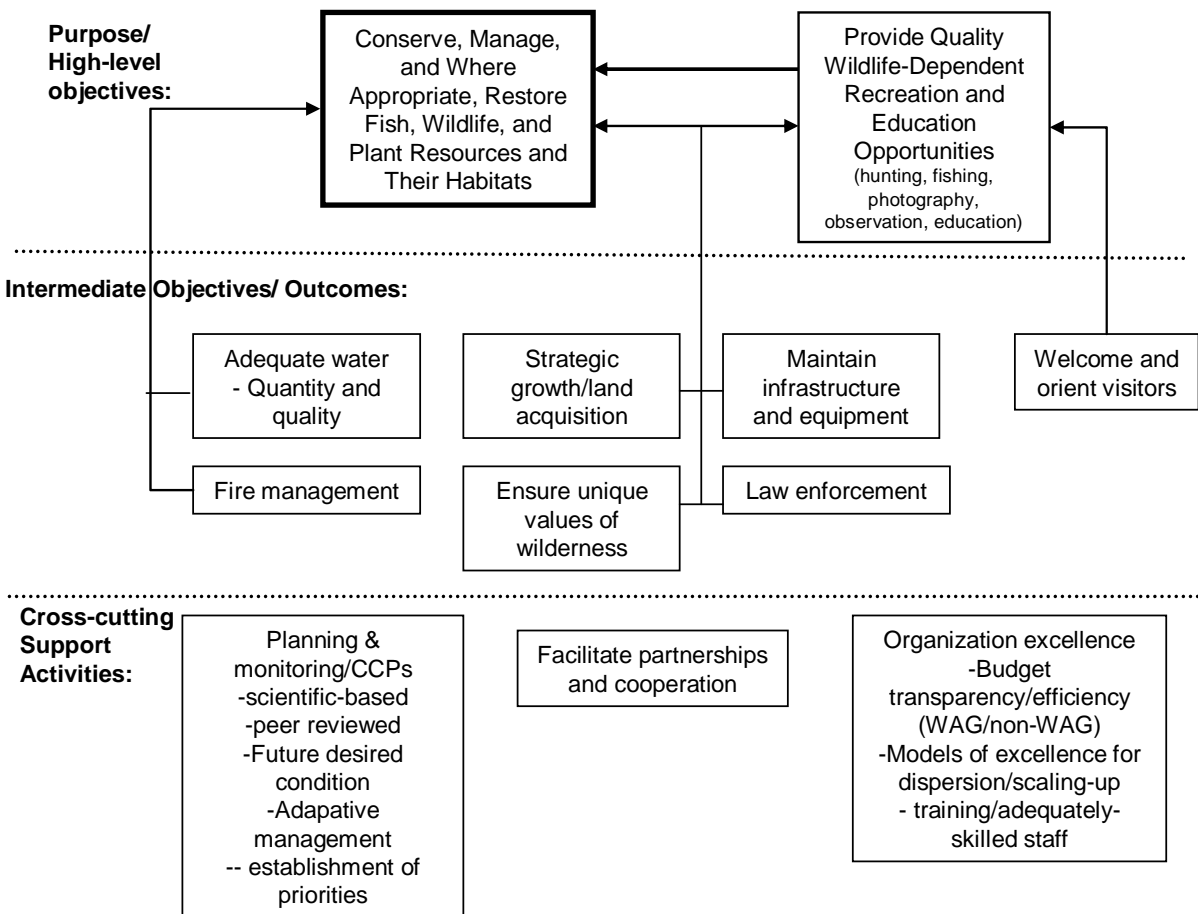
Habitat: Percent of acres of NWRS lands and waters with habitat in good condition.

Migratory birds: Percent of migratory bird species achieving healthy and sustainable levels.

Threatened and endangered species: Percent of threatened or endangered species listed a decade or more that are stabilized or improved.

Fisheries: Percent of depleted native and inter-jurisdictional fish species achieving healthy and self-sustaining levels.

Recreation: Percent of Refuges that provide compatible wildlife-dependent recreation programs where compatibility determinations indicate such programs can exist.



In addition, there does not appear to be a larger NWRS evaluation plan or process. Such a plan, for example, could include the following:

- Undertaking comparative studies of particular practices on similar refuges to identify best practices, for example a study of riverine habitat restoration.
- A review of the structure and role of NWRS regional offices.
- Or, a comparative study on how to best operative environmental education programs at small refuges.

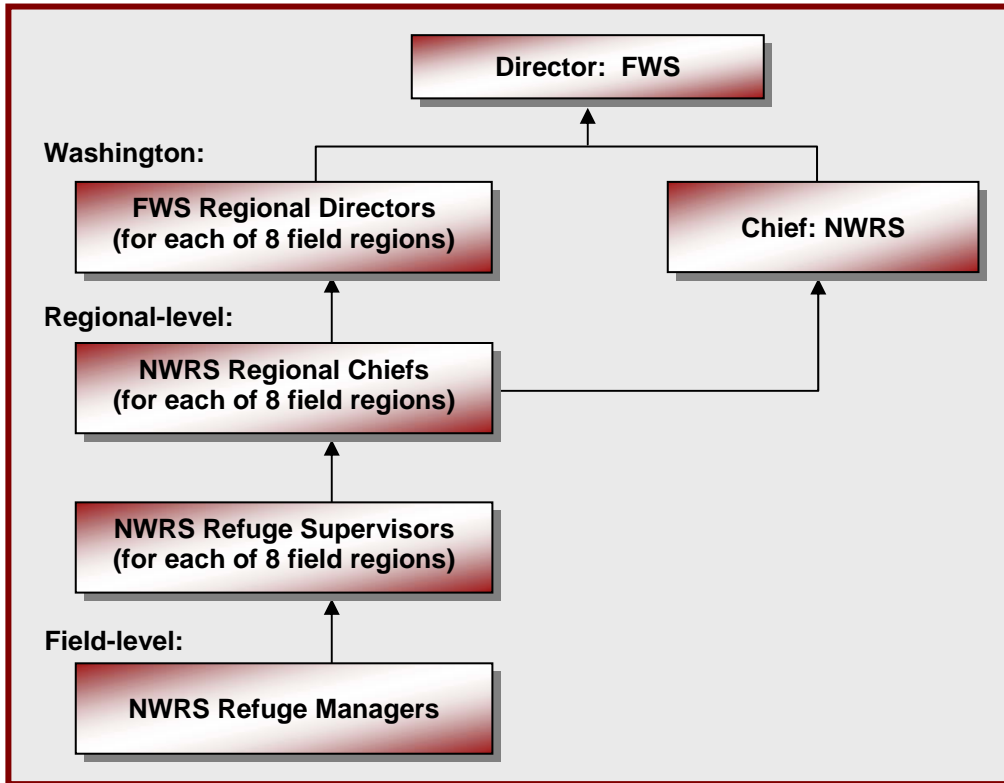
Under the current NWRS structure, it is not clear how such a function would be managed. Options could include assigning dedicated personnel, forming virtual teams around particular topics, of providing each of the various program offices resources to carry-out evaluative initiatives on topics of particular importance.

II. PROGRAM STRUCTURE AND POLICY AND PROGRAM CONSISTENCY

The organizational structure of the NWRS within the FWS is as follows:

- The NWRS Chief reports directly to the Director of the Fish and Wildlife Service.
- In the field, the NWRS and the individual refuges are overseen by eight NWRS Regional Chiefs.
- The NWRS Regional Chiefs report directly to the FWS' Regional Directors (not to the Chief of the NWRS) who in turn report to the FWS Director. There is no centralized line authority within the NWRS whereby Refuge Regional Chiefs report directly to the Chief of the Refuge System.

Figure 26. FWS Management Structure: The National Wildlife Refuge System



In terms of overall policy and decision-making, the FWS is overseen by a Directorate, which is composed of 18 members, including all regional directors, the chiefs of the various programs (e.g., such as Fisheries, Endangered Species, Migratory Birds), and the budget and program offices. The Refuge System, which comprises about half of the FWS' staff and budget, currently has one seat on the 18 member directorate -- the Chief of the NWRS -- and there are only two members of the current FWS Directorate who have worked for the Refuge System. The lack of proportionate/adequate representation by refuge staff on the directorate was a topic often mentioned by NWRS employees. In particular, many senior Refuge System staff raised a concern that the Refuge System does not have an adequate voice or representation in the FWS decision-making structure. As a consequence, there is a perception among many senior refuge staff that the FWS Directorate does not always have sufficient understanding of Refuge System issues and policies and does not give these issues adequate attention.

The Refuge System is a highly decentralized structure (as is FWS). One manifestation of the organization's decentralization is that there is significant inconsistency between Refuge System policies and programs among the various regions. Examples of inconsistent practices are provided throughout this report and, for example, include:

- Prioritization and implementation of Big 6 recreational activities has varied between regions.

- There is inconsistent implementation of biological monitoring and inventory practices, including the use of GIS systems. The RLGIS system appears to be the GIS system most widely used by the Refuge System, but there are a number of different systems in use across the different regions. This means that the collection of biological information on the status of lands is not collected in compatible formats, which makes it difficult and inefficient to gather and analyze system-wide information, or information on particular issues.
- There is not a consistent work planning or budgeting process among regions.
- Refuge workstation assessments (evaluations) do not follow common protocols or guidance and are undertaken with differing levels of frequency in different regions, and in several regions are not undertaken at all.
- Law enforcement vehicles do not always meet guidelines for color and marking.
- Refuge websites use different formats, contain different types of information and are managed individually by different refuges.
- The development and format of regional workforce plans has varied between regions.
- The process of “complexing” has varied considerably between regions, with some regions embracing the concept and others not fully committing to the concept, or implementing some variation of the concept.
- And, the implementation of the congressionally mandated invasive strike force teams has varied between regions and made, consistent and required, reporting challenging.¹⁵⁰

The Refuge System’s decentralized structure, and the tensions between the current structure and a more centralized structure, is not a new topic of discussion. To provide some historical context on this issue we have included related comments raised by two previous reports:

- The National Wildlife Refuge System, Report of the Advisory Committee on Wildlife Management, Appointed by Secretary Stewart L. Udall, Leopold, A. Starker, et. Al., 1968
- The Defenders of Wildlife Report, *Putting Wildlife First*, Robert Weeden, Mollie Beattie, et. al., 1992

Below are some pertinent excerpts from these reports.

From the 1968 “Leopold” Report: *When the Refuge System was smaller, it was operated successfully from a strong, central administrative office in Washington. This form of management gave way in recent years to an almost completely decentralized system in which the operations, policies and goals of the refuges were delegated largely to the regional offices and in some cases were assigned in turn to individual refuge*

¹⁵⁰ Several of these concerns were raised in a workshop with Refuge System managers, including the lack of consistency in the procurement of law enforcement vehicles and the lack of adherence to requirements in the work of the invasive species strike force teams.

managers. The Refuge System has lost much of its cohesiveness; in fact, it can scarcely be designated functionally as a system. The morale of the personnel has decreased accordingly.

It is the strong recommendation of this Board that the Division of Wildlife Refuges be given far more centralized authority in setting policies and objectives of the Refuge System and in seeing that individual refuges are managed in compliance with the updated goals of the Bureau. The size and complexity of the system dictate that normal administrative systems be followed, utilizing the machinery of the regional offices. But the reconstruction of an integrated, vitalized Refuge System can only be done from a central office with considerable authority and responsibility.¹⁵¹

From the 1992 “Beattie” Report: Restructuring Refuge Administration: *We recommend that refuge administration be reorganized. The new structure should make the NWRs better known to the public, strengthen refuge programs in overall federal wildlife conservation efforts, and give the system autonomy for planning, budgeting, research support, and policy implementation commensurate with the importance of the refuges to all Americans.*

There are a number of ways to accomplish this. One is to retain present refuge agency structure but elevate its administrator, currently the Assistant Director for Refuges and Wildlife, to Deputy status and give the Deputy Director line authority over the refuge managers. ...Another option is to expand the scope of the present refuge administration and simultaneously give its head the position of Deputy Director for Wildlife Refuges and Lands.A third option is to remove refuges from the Fish and Wildlife Service, establishing a new Wildlife Refuge Service....We did not study these or other feasible options in depth. For that reason we did not chose among them. However, we are convinced that the full potential of federal wildlife refuges can never be achieved under the organizational structure now in place.

This assessment did not study the issue of line management authority and therefore does not make a conclusion or recommendation as to whether or not such a line management structure would meaningfully improve the Refuge System’s performance. The issue is noted here because it was frequently raised as an area of concern by refuge staff, because it has been raised by prior studies, and because the Refuge System operations experience significant program and policy inconsistency across regions.

F. Conclusions

The NWRs has made a significant progress in recent years in several key management areas. These accomplishments include:

- The completion of a medium-term strategy, which defines the NWRs priorities and guides its programs.

¹⁵¹ The National Wildlife Refuge System, Report of the Advisory Committee on Wildlife Management, Appointed by Secretary Stewart L. Udall, Leopold, A. Starker, et. Al., 1968.

- The completion of a significant number of refuge Comprehensive Conservation Plans, which set refuge objectives and engage partners and stakeholders in planning how objectives will be accomplished.
- The development of the Refuge Annual Performance Plan planning and reporting system, which has enabled the NWRS to track and report national-level accomplishments.
- Instituting a Workforce Planning process that will restructure refuge expenditures so that all refuges will have an appropriate balance between personnel costs and operational funds (which has been variously defined as an 80/20% or a 75/25% balance). This will increase the ability of refuges to respond to and manage annual needs, although it will also leave some regions with fewer staff.

These improvements have definitely strengthened the Refuge System's management operations. Management improvement, however, is a continual process. While it is certainly the case that important progress has been made in recent years there is also more that needs to be done. In particular, attention needs to be given to the following areas:

- There is a need to increase policy and program consistency across regions. The Refuge System often does not operate as a system but is more akin to collection of eight parallel regional efforts. Some advantages of operating more as a more coherent system would include better cost controls, not having to reinvent practices in each region, and learning from and applying best practices across regions so that minimum quality standards can be achieved in different practice areas.
- There is need to establish a refuge budget allocation process that is consistent across regions and is able to deliver budgets to refuge managers in a timely manner and provides the flexibility refuges need to respond to changing situations and challenges. While some of the delay in provision of refuge budgets can be attributed to delays in congressional appropriations, there are opportunities to improve the efficiency of the Refuge System's budget allocation process.
- It would be beneficial to create formal processes to analyze and take stock of experience and to create a system that will effectively identify and disseminate best practices and better connect communities of professionals.

The advantage of having greater consistency in management approaches and practices is twofold: 1) to ensure that all managers are using the most effective and efficient approach possible; and 2) to ensure that all managers can apply standard practices to enable their operations to achieve defined quality levels, which would include learning from and applying the lessons from similar experience gained elsewhere in the system.

A series of decisions and actions will be required to create a more effective NWRS management system as there are a number of inter-related issues that could benefit from attention. Specific issues and opportunities are discussed in the conclusions that follow.

Business Management Processes: The Refuge System has not developed and implemented a consistent set of standard business operating practices, and this has led to a great degree of variance within the system in terms of how work is planned, budgeted, and assessed. At the

refuge level, there is no standard or required annual work planning process, there is no standard budgeting process, and assessments/ evaluations of refuge effectiveness are not generally being conducted. Despite the lack of standard business processes, this assessment did find that the Refuge System has a highly motivated and highly experienced cadre of refuge managers. Thus, while some and/or many refuges are well managed, there also appear to be many refuges that appear to fall short of achieving desired standards. Furthermore, the lack of standard approaches makes it difficult to assess how the system is performing overall or to introduce improvements system-wide to help all refuges reach a level of minimum acceptable quality.

Comments on specific business practices follow:

- **NWRS Strategy:** The current strategic plan does not contain a causality logic model, whereby one can identify how long-term objectives will be achieved and whether the linkage between program objectives and program activities is successful. This makes it difficult to determine if the overall strategy is meeting with success or to determine weaknesses in the strategy's logic, assumptions, or implementation. A logic model helps to ensure that all activities, existing or anticipated, contribute directly to the achievement of outcomes and results. Logic models can also help to "focus and concentrate" resources against key objectives, which can be particularly beneficial and when funding is tight.
- **Work Planning:** There is no standard approach for refuge-level work planning. Many or most refuges do not have annual work plans, and among the ones that do the format and level of detail vary widely. Without a plan as to what is to be accomplished and how it will be accomplished, it is difficult to assess performance and hold managers and other staff accountable for results that should be achieved within a particular timeframe. The lack of work plans also makes it more difficult for partners to know how they can contribute to refuge needs or where in the program they may fit.
- **RAPP Performance Reporting:** As currently constructed, the RAPP system is of limited use to refuges/field units. This leaves the primary purpose as reporting program-wide accomplishments to external audiences; however, RAPP collects information on substantially more performance indicators than would seem to be required to meet external reporting needs. In addition, there is insufficient quality control in the data collection process (leading to substantial data inconsistencies and calling into question the validity of the RAPP data), and the overall process is not managed in a way that permits the system to have an analytic or management benefit to the NWRS.

Among the evaluation team's concerns with the RAPP system is that there is no strong ownership of RAPP (or performance monitoring) within the NWRS; the data are housed in multiple locations, which makes access difficult; the data itself are often difficult to interpret; errors in consistency are common; and the system is incomplete. For example, a number of indicator definitions have not been developed, and baseline measures have not been defined. Perhaps most significantly, there is virtually no analysis of the data collected. This is somewhat understandable given the issues of data quality and the system's overall complexity, but it does limit the system's utility. The NWRS would likely be better served by a somewhat simpler data monitoring system that collects less information and is more focused on providing information that can be used to analyze

key aspects of NWRS' performance (i.e. collect less data, target the data collection on key issues, and analyze and use the information to understand how the NWRS is performing). The current RAPP system provides a useful foundation for building a program-level reporting system but could benefit from substantial revision and streamlining.

- **Budgeting:** There are a number of issues with the budget process that could benefit from attention: 1) there is no standard process for budgeting within the NWRS, which makes the budget allocation process in some regions seem somewhat capricious; 2) the lack of base budgets in nearly all regions makes it more likely there will be substantial variance in budget levels from year to year and this makes it difficult for refuge managers to plan activities; and 3) because refuge budgets may shift from year to year based on regional office decisions refuge managers often do not receive their budgets until very late in the fiscal year, after the overall budgets have been received by the regional office and allocated between refuges.
- **Evaluation:** There is relatively little formal assessment or evaluation work conducted to assess the degree that individual refuges, and refuge managers, are accomplishing their objectives. As per the above point, if individual work plans are not developed then it is difficult to assess results as management is likely to “do what was done last year” or “do what is needed” without creating any baseline or metric as to what would be a reasonable level of accomplishment within a particular period of time.

Policy Consistency: This assessment has found that there is significant variance from region to region in how the Refuge System operates. Variances in practices include the lack of consistent approaches to interpreting and enforcing policy and inconsistent use of basic business management processes, such as work planning, staff deployment, and budgeting.

A few examples of inconsistent practices include:

- Prioritization and implementation of Big 6 recreational activities has varied between regions.
- There is inconsistent implementation of biological inventory and monitoring practices, including the use of GIS systems. The RLGIS system appears to be the GIS system most widely used by the Refuge System, but there are a number of different systems in use across the Refuge System's different regions. This means that the collection of biological information on the status of lands is not collected in compatible formats, which can make it difficult and inefficient to gather and analyze system-wide information.
- There is not a consistent work planning or budgeting process among regions.
- The development and format of regional workforce plans has varied between regions.
- Refuge workstation assessments (evaluations) do not follow common protocols or guidance and are undertaken with differing levels of frequency in different regions, and in several regions are not undertaken at all.
- Law enforcement vehicles do not always meet guidelines for color and marking.

- Refuge websites use different formats, different logos and contain different types of information.
- The process of “complexing” has varied considerably between regions, with some regions embracing the concept and others not fully committing to the concept, or implementing some variation of the concept.
- The implementation of the congressionally mandated invasive strike force teams has varied between regions and made consistent and required reporting challenging.¹⁵²

The high degree of variance in the system can be attributed to some combination of the following: 1) the lack of clear and consistent policies and standard operating procedures within the Refuge System; and 2) the lack of a decision structure to ensure that policies and practices are consistently interpreted and applied across regions.

Knowledge Management: There is not a formalized system to identify best practices, to share knowledge or to routinely bring together practitioners around common topics. The NWRS has developed many creative and highly successful programs but has not undertaken significant analysis to understand what makes these programs successful or what would be required to replicate such programs. This issue spans the range of the NWRS work—from riparian riverine restoration, to moist soils management to operating environmental education programs.

The experiences of the Refuge System are not well captured or catalogued. While there have been a significant number of studies undertaken and reports written, it can be difficult to access this information. The Refuge System does not have an effective information archive or document management system, which makes it difficult for staff to access the information that does exist.

G. Recommendations

Reduce administrative and reporting requirements: The Refuge System should strive to reduce administrative and reporting requirements—particularly for smaller refuges (e.g. seven or fewer staff). This will not likely be an easy task, as specific solutions are needed and many current reporting practices are required by policies generated outside of the Refuge System, e.g. DOI policies. Particular areas that may help to reduce to reporting could include:

- Exempt smaller refuges from certain reporting requirements to reduce the reporting/administration burden on refuge managers and allow them to spend more time on core biology and visitor services tasks.
- Streamline RAPP reporting.
- Prioritize planning tasks and limit the number of these tasks that are emphasized in any given year.

¹⁵² Several of these concerns were raised in a workshop with Refuge System managers, including the lack of consistency in the procurement of law enforcement vehicles and the lack of adherence to requirements in the work of the invasive species strike force teams.

- Revisit the necessity and utility of all annual reports, such as the energy report.
- Identify and reduce redundant data collection requirements between different systems, e.g. multiple entries for purchases and timekeeping.
- Establish a central information office to help reduce “data calls” to the field.
- Raise the accountability authority of field-based contracting managers across all regions, as has been done in Region 6.

Business Management Processes:

- **NWRS Strategy/ RAPP Performance Reporting:** The NWRS should revisit and adjust its strategy. There may be benefits to developing a logic model that clarifies the causal linkages that underpin the program. A causality model would help the Refuge System to clarify the cause and effect relationships between its principal activities and the results it hopes to accomplish and would place increased emphasis on the achievement of high-level results, such as providing satisfactory visitor services and adequate management of habitat and species. To the extent possible, habitat needs (and strategic growth decisions) should be species-driven, which will require a collaborative process with other programs within FWS (or be based on a species-driven landscape scale FWS strategy, which currently does not exist).
- **The RAPP Reporting System:** This system should be redesigned based on a clarification of its purpose. If the system is to remain primarily an external reporting tool – for reporting to FWS, DOI, OMB, and Congress—then the system should be substantially simplified to focus on areas of key interest and the number of indicators tracked should be significantly reduced (by at least 50-60%). The RAPP system would best serve the Refuge System if it were better designed to provide information that was analyzed and used to inform performance and management decision-making – it should be possible to redesign the system for this purpose while also reducing the volume of data collection (and the number of performance indicators).
- **Annual Work Planning:** A simple annual work plan template should be developed and used by all refuges. Mindful that a goal of the Refuge System should be to reduce administrative requirements placed on refuge managers, the annual work plan’s format should be a relatively simple, but it should include elements that are considered standard to work planning, including assigning responsibilities, establishing a schedule and identifying the major sub-activities that are required to complete a given objective. The annual work plan should be explicitly tied to a refuge’s CCP and should be used as a basis for conducting periodic refuge operational assessments. The current RAPP process helps to set annual targets but is not itself a work plan (at least as currently used by most refuges).
- **Budgeting:** A system of base budgeting should be developed for all refuges and a standard process for developing and administering base budgets should be put into place system-wide. It is suggested that this system be based on the system that is currently used in Alaska. In order to increase flexibility, consideration could be given to two-year spending authority.

Policy Development: The NWRS could benefit from a clarified policy development process. In particular, the sequence of input from various parties and the conditions that should trigger additional public review and comment opportunities should be clarified. One consideration might be to require a second round of public comment for any policy that has not been finalized within a specified period of time, for example, when a policy has not been finalized within two years of the initial public comment period.

In addition, the Refuge System could explore the feasibility of establishing an advisory council that could act as a science-based advisory group on policy development (and other initiatives). A council similar to the US Park Service's Science Advisory Council could be examined as a potential model to help ensure that NWRS policies conform to standard and best scientific practices and are consistent with the mandates of the Refuge System and the FWS. An advisory board could potentially be helpful in balancing political and science-based interests in the policy development process.

Evaluation: Periodic refuge operational assessments should be undertaken and should be a responsibility of refuge supervisors. Guidelines should be developed and implemented system-wide to ensure that some minimum number of assessments are conducted annually in each region. The evaluation process itself should draw on the involvement of staff from other refuges to provide cross-learning and should be used to identify lessons and best practices. It might also be useful to involve partners and academics in some of these assessments—or to conduct a batch of assessments that compares management practices across regions, or across a number of similar refuges (e.g. coastal wetlands), as a way to identify innovative practices.

The purpose of assessments/station reviews would be to increase performance accountability and also to generate lessons learned and best practices that could have broader application across the system. Station reviews/assessments could be conducted of refuges, regional offices and/or particular program components, e.g., wilderness management or environmental education.

Policy and Program Consistency: It is recommended that changes be implemented to enable the refuge system program to operate in a more consistent and structured manner. This should be done to promote greater program and policy consistency across regions and to increase administrative and program efficiency. While increased structure and consistency should provide several benefits to the refuge system such adjustments should not be over-done, i.e. flexibility should be maintained to continue to allow regions to prioritize issues and approaches based on local conditions.

There are a number of potential actions that could be taken to increase the Refuge System's ability to increase policy consistency and standardize business practices. The Refuge System, itself, can implement many of the steps necessary to increase policy and operational consistency under its existing operational structure. Actions that should be considered include the following:

- Develop a better-defined set of decision-making rules and norms for use by the Regions. For example, the Regions could agree on a decision-making model and agree that the Regional Directors or Regional Chiefs would oversee the refuge system as a stewardship board (similar to how a board of directors oversees a company). This could mean, for example, that rules are put into place as to how decisions will be made (consensus,

majority, or two-thirds vote) and the group could agree to abide by its decision process. The role of the oversight board/committee could include policy and program direction and oversight, annual and periodic performance review, strategic planning, and budget allocation and review.

- Develop a list of practices and policies that will be considered as priorities for increasing consistency and improving performance, particularly in the areas of policy implementation and businesses processes.
- Implement a set of standard operating procedures that would apply to business management practices across all regions. In particular, practices could be standardized in the areas of budgeting, work planning, and station assessments/evaluation.
- Annually prioritize programmatic areas that can be reviewed and improved based on analysis, evaluations and the identification of best practices.
- When providing outreach and orientation services on refuge policy the Refuge System should be mindful to include Regional Directors and their staff. This may help to build a common base of knowledge and familiarity on refuge policies across the FWS' leadership cadre.

These above measures should help to improve policy and operational consistency within the Refuge System.

While the above steps will help to improve consistency, these steps principally rely on voluntary cooperation and goodwill and stop short of identifying a clear policy enforcement authority or mechanism for ensuring policy implementation consistency when there are professional differences of views between FWS senior decision makers.

The MSI evaluation team noted that several well-respected study teams have previously raised the issue of refuge system's structure and authority. Such studies include the 1968 *Leopold Report* and the 1992 *Beattie Report*, both of which recommended the refuge system be managed under a centralized line authority structure. This assessment did not study the issue of line management authority and therefore does not make a conclusion or recommendation as to whether or not such a structure would meaningfully improve the refuge system's performance or consistency. The issue is noted for the following reasons: it has been commented on by prior studies; it was a topic raised in MSI interviews by a large number of refuge managers and senior staff, and; this evaluation concluded that inconsistent policies and practices are a hindrance to improving the refuge system's overall effectiveness. As noted earlier, however, the refuge system does have the authority and ability to implement meaningful improvements in this area under its existing structure of operations.

Knowledge Management: The NWRS should implement a Knowledge Management System. The goals of the system should include:

- Develop an electronic library of key documents that would be easily accessible to all staff;

- Conduct program-level and topical studies to identify best practices and to then publish and identify such practices;
- Incorporate best practices into training materials, guidance, reviews, and standard practices so as to raise the quality level of implementation practices across the Refuge System;
- Establish topical learning communities and provide practitioner communities the resources required to develop and analyze strategies and approaches and to be able to get together periodically to share information.

Consideration should be given to creating a Knowledge Management Unit, which would be responsible for program reporting (RAPP), evaluation, generating, and disseminating lessons learned and best practices, archiving documents and responding to external information requests (together with public relations staff).

ADDENDUM: KNOWLEDGE MANAGEMENT

The field of Knowledge Management has developed over the past ten years or so in response to the rapidly increasing body of knowledge available in the world and to the improvements in technology that make it possible to easily collect and share knowledge across geographic boundaries and professional disciplines. Knowledge Management comprises a range of practices used by organizations to identify, create, represent, and distribute knowledge for reuse, awareness, and learning. It has been an established discipline since 1995 with a body of university courses and both professional and academic journals dedicated to it. Most large companies have resources dedicated to Knowledge Management, often as a part of 'Information Technology' or 'Human Resource Management' departments, and sometimes reporting directly to the head of the organization. Knowledge Management programs are typically tied to organizational objectives and are intended to achieve specific outcomes, such as shared intelligence, improved performance, competitive advantage, or higher levels of shared innovation. Observations on this topic from our assessment include:

- It was difficult to obtain historical documents on the performance of the NWRS or on particular programs within the NWRS—there does not appear to be an electronic library or database of documents, or an easy way to know what documents exist. Key documents of significance to this evaluation were found only through happenstance or serendipity as, for example, when an evaluation of the CCP process was “discovered” accidentally in the course of a site visit.
- There is a lack of guidance in terms of how to implement specific programs. For example, there does not appear to be much guidance for structuring interpretive or environmental education programs, including what types of activities are most effective for which age groups. Another example is the Refuge System’s experience with “complexing,” which differs from region to region without a clear understanding of the differences in approaches or the benefits of one approach over another.

Knowledge Management (KM) is the process through which organizations generate value from their intellectual and knowledge-based assets. Most often, generating value from such assets involves codifying what employees, partners and customers know, and sharing that information among employees, departments and even with other companies in an effort to devise best practices. It's important to note that the definition says nothing about technology; while KM is often facilitated by IT, technology by itself is not KM.

There are exceptions to the above observations, such as the process used to analyze the effectiveness of CCPs and to incorporate what is learned into updated training courses. And it should also be noted that program implementation guidance and best practices are included in many of the refuge management courses provided by the National Conservation Training Center. In general, however, the NWRS operates with a great deal of autonomy from one region to the next, and there has not been sufficient analysis of many of the system’s most important areas of emphasis, such as comparative studies on biological monitoring practices.

Without a more cohesive approach to analyzing program effectiveness, identifying best practices, and disseminating this information the Refuge System is not able to take advantage of the opportunities offered by a “systems” approach to management and too often results and learning are limited by the skills and experience of individuals. While these individuals may be

highly skilled they often work in isolation from other specialists working on similar approaches and challenges. Because the Refuge System is so decentralized, there are a large number of examples within the system of highly creative and effective programs—such as the environmental education program at Fergus Falls, or the fire management program at Okefenokee—but the lessons from these programs are not well known throughout the Refuge System.

There are a number of advantages the Refuge System could gain from adopting a Knowledge Management approach to how it conducts business. Basic opportunities include:

- Analyzing program approaches to gain increased effectiveness and cost efficiency: For example, the NWRS has substantial experience with “complexing”, which has been implemented differently in different regions. This experience could be reviewed to determine if there are guiding principles that can be applied across the system.
- Reduce the development of redundant systems. For example, it is not necessary that all regions develop their own work planning or budgeting processes, have their own process for evaluating refuge performance, or develop their own environmental education materials. Common systems and approaches could be developed and then applied throughout the system.
- Develop tool kits for use by refuge managers across the system. For example a toolkit/backpack could be developed for use by small refuges in offering environmental education opportunities to school kids. The kits could be adapted for use in different habitats but could be general enough to allow programs to be offered at many of the smaller refuges that do not have the staff to develop such materials.

Best practices should be identified by analyzing similar and contrasting experiences and identifying factors that lead to increased effectiveness. As necessary, best practice approaches should be supported through document development, networking groups, periodic professional meetings of practitioners, development and dissemination of tool kits, and establishment of support centers that can provide support material and expertise.

Within all management systems there is a need to balance flexibility with structure. Flexibility enables managers to be responsive to local circumstances and to develop creative systems to address issues, whereas structure takes advantage of opportunities to ensure that best practices are identified and adopted throughout the system, provides structured opportunities for professionals to learn from one another, and seeks opportunities to gain efficiencies through standardization and establishment of central support structures. The Refuge System is replete with examples of innovation and creativity but does not have systems in place to ensure that best practice ideas are well-known or can be widely adopted.