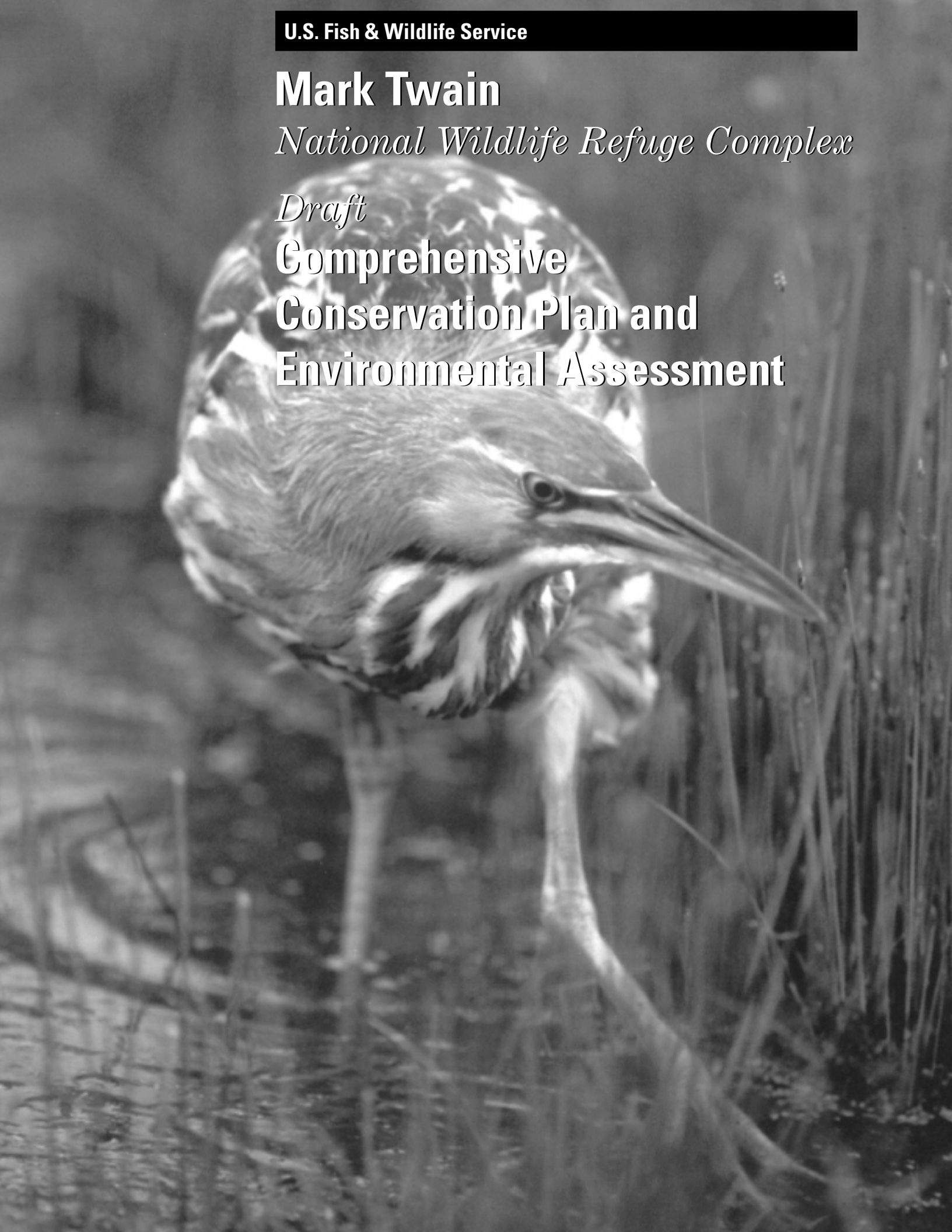
U.S. Fish & Wildlife Service

Mark Twain

National Wildlife Refuge Complex

Draft

Comprehensive Conservation Plan and Environmental Assessment



Comprehensive Conservation Plans provide long-term guidance for management decisions; set forth goals, objectives and strategies needed to accomplish refuge purposes; and, identify the Fish and Wildlife Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Bishop Henry Whipple Federal Building
1 Federal Drive
Fort Snelling, MN 55111-4056

IN REPLY REFER TO:

FWS/NWRS/CP

JUL 24 2003

Dear Reviewer:

The attached Draft Comprehensive Conservation Plan is a vital part of the future of the Mark Twain National Wildlife Refuge Complex.

The purpose of the Comprehensive Conservation Plan is to guide Refuge management decisions over the next 15 years. We intend that the Plan provide a clear statement of the desired future condition of the Refuge. The Plan should provide a clear understanding of Refuge management actions to all who are interested in the Mark Twain refuges, and it should provide a sound basis for long-term operations, maintenance and capital improvement budget requests.

We invite you to review the Plan and tell us what you think. Your comments on the draft plan will help us write a final plan that is both visionary and practical.

Please address written comments to: U.S. Fish and Wildlife Service, Branch of Ascertainment and Planning, Attn: Mark Twain CCP Comment, BHW Federal Building, 1 Federal Drive, Ft. Snelling, MN 55111. Comments can also be sent through the Service's Web site for the Mark Twain National Wildlife Refuge Complex planning project: http://midwest.fws.gov/planning/marktwaintop.htm.

In order for the Planning Team to consider your comments when writing the final plan, we need to receive your comment by September 30, 2003. However, comments received after that date are welcome and we will consider them in future management decisions.

Again, thank you for your time, thoughts and interest in planning for Mark Twain National Wildlife Refuge Complex.

Sincerely,

Thomas J. Larson

Thomas J. Larson
Chief of Conservation Planning, Region 3

Acknowledgments

Because it will serve as a guide to management of the Refuges that comprise Mark Twain National Wildlife Refuge Complex over the next 15 years, public input into the draft comprehensive conservation plan is vital. We would like to thank all of the people who have contributed their time, expertise and ideas to this planning process, and we would like to invite you to review the draft plan and let us know what you think. All of your ideas are valuable and will contribute to the success of the plan.

In addition o the public input received during the planning process, Refuge staff engaged individuals from other Service programs, other Federal agencies, state agencies – particularly field biologists from Illinois, Iowa and Missouri – as well as non-governmental agencies that all made contributions to the material presented in this draft comprehensive conservation plan. Refuge involvement established in interagency teams resulted in an ongoing collaborative effort in identifying issues and planning treatments to restore and maintain natural resource values within the Upper Mississippi River System. Projects such as the development of the Habitat Needs Assessment (HNA) and the Upper Mississppi River Conservation Committee "A River that Works and A Working River," to name two examples, were particularly helpful in ensuring that the draft comprehensive conservation plan was developed in concert with broad systemic efforts. Input from the Ecological Services offices at Rock Island and Marion was essential in developing workable solutions for Refuge management. Data provided by the U.S. Geological Survey, Upper Midwest Science Center, funded by the U.S. Army Corps of Engineers, provide the backbone of strategies that can be evaluated in a seamless, systemic manner. The continuing availability of the data will provide the basis for future adaptive management strategies.

The primary writer/contributors on the Refuge staff were: Karen Westphall, wildlife biologist; Amy Sprunger-Allworth, Refuge Operations Specialist; Dave Ellis, Great River and Clarence Cannon National Wildlife Refuge Manager; Howard Phillips, former Two Rivers National Wildlife Refuge Manager; John Mabery, Two Rivers National Wildlife Refuge Manager; Kathy Maycroft, former Port Louisa National Wildlife Refuge Manager; Tom Cox, Port Louisa National Wildlife Refuge Manager; Sara Hollerich, Port Louisa National Wildlife Refuge wildlife biologist; Michael Dixon, interpretive ranger atRiverlands Project; Durinda Hulett, former Complex administrative officer; Donna Zanger, Complex administrative officer; and Dick Steinbach, Refuge Complex Manager.

We are especially grateful to Jim Rathert of the Missouri Department of Conservation for the use of his superb photographs in this draft comprehensive conservation plan.

And, finally, we are grateful to everyone who contributes time and energy as a Refuge volunteer. You are truly the backbone of conservation.

Contents

Chapter 1: Introduction/Background 1
Vision Statement 1
Manager's Note on the CCP 2
Refuge System Mission 3
National Wildlife Refuge System Goals 3
Mark Twain Refuge Complex Goals2 3
Area of Ecological Concern3 4
Need for Action/Planning Perspectives 5
Organizational Change in Stations within Mark Twain Complex 8
Legal, Policy and Administrative Guidelines 11
Legal Mandates (including FWCA, Refuge Improvement Act) 11
Relationship to Other Plans 11
Migratory Bird Conservation Initiatives 11
Upper Mississippi River/Tallgrass Prairie Ecosystem Team 12
Upper Mississippi River Conservation Committee 13
Army Corps of Engineers St. Louis District Master Plan 14
Army Corps of Engineers – Rock Island District Land Use Allocation Plan 14
Army Corps of Engineers Operational Management Plans (OMP) 15
Other Plans / Studies Relevant to This Document 15
Upper Mississippi River Summit 15
Report of the Interagency Floodplain Management Review Committee to the Administration Floodplain Management Task Force (The "Galloway Report") 16
The Floodplain Management Assessment of the Upper Mississippi and Lower Missouri Rivers and their tributaries (FPMA) 17
Upper Mississippi River System Habitat Needs Assessment - 2000 17
Special Land Use Designations 18
Wilderness Review 18
Other Special Land Designations 18
Cooperative Agreement with COE for General Plan (GP) Lands 18
Other Interagency Coordination 19
Spill Response 19
Channel Maintenance and Dredge Disposal 20
U.S. Department of Agriculture 22
Natural Resources Conservation Service 22
Farm Service Agency (FSA) 22

Chapter 2: Public Involvement and Identification of Refuge Planning Issues 23
Issues 24

Chapter 3: Refuge and Resources Description 25
History and Establishment of Mark Twain NWR 12 25
Pre-Refuge History 25
Corps of Engineers Activity on the UMR 26
The 1945 Cooperative Agreement 27
The 1954 Cooperative Agreement and General Plan 28
The 1961 General Plans and 1963 Cooperative Agreement 30
Mark Twain Refuge Established 31
General Plan (GP) Lands and the National Wildlife Refuge System 32
Description of Existing Units within Mark Twain NWR Complex 34

Port Louisa NWR 35
Big Timber Division 35
Louisa Division 36
Horseshoe Bend Division 36
Keithsburg Division 37
Great River NWR 38
Fox Island Division 38
Long Island Division 39
Delair Division 40
Clarence Cannon NWR 41
Two Rivers NWR 41
Batchtown Division 42
Calhoun Division 42
Gilbert Lake Division 43
Portage Islands Division 44
Middle Mississippi River NWR 44
Meissner Island Division 45
Harlow Island Division 45
Wilkinson Island Division 45
Service Fee Title Properties Acquired From USDA 46
Area of Ecological Concern Setting 46
Climate 46
Geomorphology of the Upper Mississippi River 20 47
Lateral Variation of Geomorphology 50
Socioeconomics 52
Current Status of Area of Ecological Concern Resources 55
Fish and Wildlife 55
Birds 55
Waterfowl 55
Shorebirds and Marsh Birds 59
Songbirds 61
Raptors 62
Fish 63
Freshwater Mussels 65
Macroinvertebrates 66
Reptiles and Amphibians 67
Endangered Species 68
Indiana Bat (Myotis sodalis) 68
Pallid Sturgeon (Scaphirynchus albus) 69
Higgins' Eye Pearlymussel (Lampsilis higginsi) 70
Fat Pocketbook Mussel (Potamilus capax) 71
Winged Mapleleaf Mussel (Quadrula fragosa) 71
Bald Eagle (Haliaeetus leucocephalus) 71
Interior Least Tern (Sterna antllarum athalassos) 72
Decurrent False Aster (Boltonia decurrens) 72
Habitat 23 73
Wetland 74
Forest 75
Grassland 76
Soils 76
Water Quality 77
Sedimentation 77
Nutrients 79
Other Contaminants 79

Keithsburg Division 81
Cultural Resources – Archeology and History 81

Chapter 4: Management Direction 83
Refuge Management Considerations 83
Wetland Management 24 83
Forest Management 25 85
Cropland Management 28 87
Prescribed Fire Management 90
Invasive Species Management 91
Plants 93
Exotic Mussels 95
Exotic Fish 96
Other Invasive Species 96
Commercial Fishing 97
Trapping 98
Environmental Management Program (EMP) 98
Management of Lands Associated with Agriculture Department (USDA) 33 102
Conservation Easements 102
Private Land Assistance Through the Partners for Fish and Wildlife Program 103
Goals, Objectives and Strategies Discussion 103
Habitat Goals 103
Goal 1 Discussion: Wetlands and Aquatic Habitat 107
Open Water 108
Permanently Flooded Aquatic Plants 108
Semi-permanently Flooded Vegetation 108
Seasonally Flooded Emergents 109
Goal 2 Discussion. Forest Habitat 116
Fragmentation 117
Diversity 118
Spatial Distribution 120
Refuge Complex Forest Management 121
Goal 3 Discussion. Other Terrestrial Habitats 126
Grassland 126
Wet Meadow 127
Scrub-Shrub 128
Agriculture 128
Goal 4 Discussion. Sedimentation and Water Quality 134
Management Approaches 135
Goal 5 Discussion. Floodplain Management 140
Natural River Hydrologic Cycle 140
River Modifications and Modified Hydrology 140
Floodplain Management and the Flood of '93 142
Mark Twain Complex Floodplain Management 142
Connectivity and Sedimentation 143
Re-creation of natural wet/dry cycles 145
Reduction of farming and facilities in the floodplain 145
Partnerships and System-wide Floodplain Management 145
Other Considerations 146
Goal 6 Discussion. Public Use and Education 148
St. Louis Area Wildlife Education and Urban Outreach – Riverlands Demonstration Area 151
Goal 7 Discussion. Monitoring 163

Chapter 5: Refuge Boundary Expansion **170**
Land Acquisition Factors 170
Revenue Sharing 173

Chapter 6: Plan Implementation **175**
Funding 175
Personnel Needs 183
Step-down Management Plans 183
Partnerships 183

Appendices **185**
Appendix A: Refuge Maps 187
Appendix B: Species List 231
Appendix C: List of Abbreviations and Acronyms 261
Appendix D: Glossary 265
Appendix E: Cooperative Agreement 271
Appendix F: Compatibility Determinations 283
Appendix G: Mailing List 313
Appendix H: Environmental Assessment 319
Appendix I: Guiding Laws and Orders 429
Appendix J: Soil Associations 435
Appendix K: Bibliography 441
Appendix L: List of Preparers 453
Appendix M: Land Protection Plan 457

List of Figures:

Figure 1: Organizational Change 9
Figure 2: Mark Twain NWR Complex Staffing Chart 184

List of Tables:

Table 1: Changes in Organizational Structure 10
Table 2: Average Temperatures, Precipitation, Snowfall and Humidity in a Few Area of Ecological Concern Counties 47
Table 3: Waterfowl Species for which the Upper Mississippi River Valley is a Critical Migration Corridor 56
Table 4: INHS Aerial Duck Counts 57
Table 5: INHS Aerial Canada Goose Counts 57
Table 6: Peak Snow Goose Numbers Using UMRS 59
Table 7: Prescribed Burn Units 91
Table 8: Predicted Reliability of Pool Level Management in St. Louis District 101
Table 9: Refuge Complex Habitats and Prevalent Wildlife Associations 105
Table 10: Connectivity and Sedimentation 144
Table 11: Cover Types for CCP Habitat Management Strategies 165