



U.S. Fish & Wildlife Service

Great Thicket National Wildlife Refuge

*Final Land Protection Plan/
Environmental Assessment*

October 2016



Front cover:

Shrubland habitat, Sandwich, Massachusetts
USFWS

Clockwise from top right:

American woodcock
Carlos Guindon/USFWS

Blue-winged warbler
Steve Arena/USFWS

*Northern red-bellied cooter (on left), and
painted turtle*
Bill Byrne

New England cottontail
USFWS

Back cover:

Shrubland habitat, Sandwich, Massachusetts
USFWS



*This blue goose, designed by J.N.
“Ding” Darling, has become the
symbol of the National Wildlife
Refuge System.*

The *U.S. Fish and Wildlife Service* is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The Service manages the 150 million-acre National Wildlife Refuge System comprised of more than 565 national wildlife refuges, thousands of waterfowl production areas, and national monuments. It also operates 70 national fish hatcheries and 81 ecological services field stations. The agency enforces Federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the Federal Assistance Program which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to State wildlife agencies.

Executive Summary

Executive Summary	ES-1
-----------------------------	------

Chapters**Chapter 1 The Purpose of, and Need for, Action**

Introduction	1-1
Relationship to Service Policies and Landscape-Level Conservation Goals	1-1
Status of Shrubland-Dependent Wildlife	1-5
Threats to Resources	1-9
Purpose of this Proposal	1-10

Chapter 2 Alternatives

Introduction	2-1
Alternative A – No Action	2-1
Alternative B – The Service-Preferred Alternative	2-5
Alternatives or Actions Considered but Eliminated from Detailed Study	2-18

Chapter 3 Affected Environment

Introduction	3-1
Resources of the Area of Interest	
Cultural Resources and Historic Preservation	3-1
Physical Environment	3-2
Socio-Economic Environment	3-6
Biological Environment	3-11
Description of Sub-Regions Containing Refuge Acquisition Focus Areas	
Maine/New Hampshire Coast Sub-Region	3-22
Merrimack Valley-New Hampshire Sub-Region	3-31
Southeastern Massachusetts Sub-Region	3-35
Southeastern Connecticut/Rhode Island Coast Sub-Region	3-40
New York/Connecticut Border Sub-Region	3-46

Chapter 4 Environmental Consequences

Introduction	4-1
Impact Analysis and Relationship to Scale	4-2
Effects on Cultural Resources and Historic Preservation	4-3
Effects on the Physical Environment	4-4
Effects on the Socio-Economic Environment	4-9
Effects on the Biological Environment	4-14
Cumulative Impacts	4-27

Chapter 5 Coordination and Consultation

Partners	5-1
New England Cottontail Coordination	5-1
Refuge Acquisition Focus Areas	5-2
Public Involvement	5-3

Bibliography

Bibliography	Bibl-1
------------------------	--------

Chapters (cont.)

Acronyms

Acronyms Acro-1

Glossary

Glossary Glos-1

Appendixes

Appendix A Conceptual Management Plan

Introduction A-1
 Criteria and Target Acreages A-1
 Managing Habitat for Priority Shrubland Species A-3
 Creating Young Forest Habitat A-8
 Acquisition Decisions and Management Planning A-9
 Bibliography A-9

Appendix B FAQs about Refuge Land Acquisition

FAQs about Refuge Land Acquisition B-1

Appendix C Summary of Public Comments on Draft LPP/EA and the Service’s Responses to Them

Introduction C-1
 Summary of Comments Received C-1
 Service Responses to Comments by Subject C-3
 Table C1: List of Commenters with Identification Number C-42

Appendix D Finding of No Significant Impact

Finding of No Significant Impact (FONSI) D-1

List of Tables

Table 1 Refuge Acquisition Focus Areas 2-8
Table 2 Fee and Easement Costs by RAFA 2-15
Table 3 Counties Associated with Geographic Regions and Refuge
 Acquisition Focus Areas 3-6
Table 4 Populations of Affected Counties and States (2014). 3-7
Table 5 Population by Geographic Region (2014) 3-7
Table 6 Population Projections 3-7
Table 7 Occupation by Industry, 2009 to 2013 3-8
Table 8 Relative Occupation by Industry, 2009 to 2013 3-8

List of Tables (cont.)

Table 9	Changes in Occupations by Industry: 2005 to 2013	3-9
Table 10	Regional Conservation Plans and Priority Species for Shrublands and Young Forest Habitats	3-16
Table 11	Current Breeding Bird and Habitat Estimates for all RAFAs Combined	3-18
Table 12	Maine/New Hampshire Coast Sub-Region Conserved Lands	3-22
Table 13	Maine/New Hampshire Coast Sub-Region Land Cover Types	3-26
Table 14	Merrimack Valley North Conserved Lands	3-31
Table 15	Merrimack Valley North Land Cover Types	3-31
Table 16	Southeastern Massachusetts Sub-Region Conserved Lands	3-35
Table 17	Southeastern Massachusetts Sub-Region Land Cover Types	3-35
Table 18	Southeastern Connecticut/Rhode Island Coast Sub-Region Conserved Lands	3-41
Table 19	Southeastern Connecticut/Rhode Island Coast Sub-Region Land Cover Types	3-41
Table 20	New York/Connecticut Border Sub-Region Conserved Lands	3-46
Table 21	New York/Connecticut Border Sub-Region Land Cover Types	3-46
Table 22	Context for Impact Analysis	4-2
Table 23	Revenue-to-Expenditure Ratios by Land Use in New Hampshire Communities Studied	4-11
Table 24	Current and Proposed Breeding Bird and Habitat Estimates for all RAFAs Combined	4-16
Table 25	NEC Conservation Strategy-Recovery Goals	4-25
Table A1	Refuge Acquisition Focus Area Target Acres	A-2
Table C1	List of Commenters with Identification Number	C-42

List of Figures

Figure 1	Predicted Stopover Bird Densities Based on Radar Data	3-19
Figure A1	Conceptual Model for the Conservation of the New England Cottontail: An example configuration of habitat networks or metapopulations.	A-3

List of Maps

Map 1	Bird Conservation Regions	1-6
Map 2	Area of Interest	1-12
Map 3	Proposed Refuge Acquisition Focus Areas Overview	2-7
Map 4	Cape Elizabeth-Scarborough Refuge Acquisition Focus Area	3-23

List of Maps (cont.)

Map 5	Berwick-York and Rollinsford Refuge Acquisition Focus Areas	3-24
Map 6	Oyster-Dover-Bellamy Refuge Acquisition Focus Area	3-25
Map 7	Cape Elizabeth-Scarborough Refuge Acquisition Focus Area Land Cover Types	3-27
Map 8	Berwick-York and Rollinsford Refuge Acquisition Focus Areas Land Cover Types	3-28
Map 9	Oyster-Dover-Bellamy Refuge Acquisition Focus Area Land Cover Types	3-29
Map 10	Merrimack Valley North Refuge Acquisition Focus Area	3-32
Map 11	Merimack Valley North Refuge Acquisition Focus Area Land Cover Types	3-33
Map 12	Plymouth Refuge Acquisition Focus Area	3-36
Map 13	Mashpee Refuge Acquisition Focus Area	3-37
Map 14	Plymouth Refuge Acquisition Focus Area Land Cover Types	3-38
Map 15	Mashpee Refuge Acquisition Focus Area Land Cover Types	3-39
Map 16	Rhode Island East-West Refuge Acquisition Focus Area	3-42
Map 17	Pachaug-Ledyard Refuge Acquisition Focus Area	3-43
Map 18	Rhode Island East-West Refuge Acquisition Focus Area Land Cover Types	3-44
Map 19	Pachaug-Ledyard Refuge Acquisition Focus Area Land Cover Types . .	3-45
Map 20	Northern Housatonic Refuge Acquisition Focus Area	3-48
Map 21	Northern Housatonic Refuge Acquisition Focus Area Land Cover Types	3-49