

U.S. Fish & Wildlife Service



Eastern Massachusetts National Wildlife Refuge Complex

Hunting Plan



Credit: Ryan Hagerty

August 2020

Appendix A – Hunting Compatibility Determination

Appendix B – Environmental Assessment

Appendix C – Intra-Service Section 7 Evaluation

Estimated Lead Agency Total Costs
Associated with Developing and
Producing the EA (per ERM 10-12):
\$16,908

Appendix D – Summary of Public Comments
Appendix E – Finding of No Significant Impact

**Eastern Massachusetts National Wildlife Refuge Complex
Hunting Plan**

August 2020

U.S. Fish and Wildlife Service

**Assabet River National Wildlife Refuge
Great Meadows National Wildlife Refuge
Oxbow National Wildlife Refuge**

**Headquartered at
73 Weir Hill Road
Sudbury, MA 01776**

Submitted By:
Project Leader

Signature

Date

Concurrence:
Refuge Supervisor

Signature

Date

Approved:
Regional Chief
National Wildlife Refuge System

Signature

Date

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I. Introduction

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (Refuge System), the purposes of an individual refuge, U.S Fish and Wildlife Service (Service) policy, laws and international treaties. Relevant guidance includes the Refuge System Administration Act of 1966, as amended by the Refuge System Improvement Act of 1997, the Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations (CFR) and Service Manual. The Eastern Massachusetts National Wildlife Refuge Complex (NWRC, Complex) is made up of eight refuges, three of which are covered in this plan. Each national wildlife refuge is established under specific legislation. Similarly, each refuge has one or more specific legal purposes for which it was established. The establishing legislation and purposes for the three covered in this plan are given below.

Table 1. Refuge Purposes and Establishing Authorities

Refuge	Establishing Authorities	Refuge Purposes
Assabet River National Wildlife Refuge (NWR)	...was established September 28, 2000, under an Act Authorizing the Transfer of Certain Real Property for Wildlife, or Other Purposes. (16 U.S.C. 667b).	... purpose is its “...particular value in carrying out the national migratory bird management program.” (16 U.S.C. 667b-d, as amended)
Great Meadows NWR	...was established May 3,1944, under the authority of the Migratory Bird Conservation Act (16 U.S.C. § 715d) and Refuge Recreation Act (16 U.S.C. § 460k-1)	<p>... “...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d),</p> <p>“... suitable for – incidental fish and wildlife-oriented recreational development,” (16 U.S.C. § 460k-1),</p> <p>“the protection of natural resources,” (16 U.S.C. § 460k-1),</p> <p>“and the conservation of threatened or endangered species...” (16 U.S.C. § 460k-1)</p>
Oxbow NWR	...was established May 24, 1974, under an Act Authorizing the Transfer of Certain Real Property for Wildlife, or Other Purposes (16 U.S.C. 667b).	... is its “...particular value in carrying out the national migratory bird management program.” (16 U.S.C. 667b-d, as amended)

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These refuges are managed as part of the Refuge System whose mission, as outlined by the National Wildlife Refuge System Administration Act (NWRSA), and as amended by the Refuge System Improvement Act (16 U.S.C. 668dd et seq.) is “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (Refuge System Improvement Act of 1997).

The NWRSA mandates the Secretary of the Interior in administering the Refuge System to (16 U.S.C. 668dd(a)(4):

- Provide for the conservation of fish, wildlife, and plants, and their habitats within the Refuge System;
- Ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans;
- Ensure that the mission of the Refuge System described at 16 U.S.C. 668dd(a)(2) and the purposes of each refuge are carried out;
- Ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the States in which the units of the Refuge System are located;
- Assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the Refuge System and the purposes of each refuge;
- Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the Refuge System through which the American public can develop an appreciation for fish and wildlife;
- Ensure that opportunities are provided within the Refuge System for compatible wildlife-dependent recreational uses; and
- Monitor the status and trends of fish, wildlife, and plants in each refuge.

This plan sets forth guidance on the expansion and implementation of hunt programs at Assabet River, Great Meadows, and Oxbow NWR. All three refuges are currently opened for hunting.

Assabet River NWR, formerly referred to as the U.S. Army Fort Devens Sudbury Training Annex, is a 2,357-acre parcel of land located approximately 20 miles west of Boston and 4 miles west of the Complex headquarters. It is located in portions of the towns of Hudson, Maynard, Stow, and Sudbury and covers approximately 3.5 square miles. Assabet River NWR consists of two separate pieces of land. The larger northern section is just north of Hudson Road. The smaller southern section is located to the south of Hudson Road. The land, centered in a developed area, has been protected by the Army for the last 58 years. That protection has

allowed the maturation of extensive, structurally diverse wetland habitats, whose ecological integrity is enhanced by its surrounding upland forests and grasslands. The refuge provides important habitat for migrating and resident wildlife. The refuge supports a diverse mix of migratory birds including waterfowl, wading birds, raptors, passerines, as well as resident mammals, reptiles, amphibians, fish and invertebrates. There are extensive and regionally important wetlands occurring on and adjacent to the refuge, including their associated tributary drainages and headwaters. With the exception of occasional (most likely wintering) bald eagles, no federally listed threatened or endangered species are known to inhabit Assabet River NWR.

The refuge's geographic position, diverse biological resources, and accessibility to local and regional communities make it highly attractive for wildlife dependent recreational uses including environmental education, interpretation, hunting, and fishing. While many lands adjacent to the refuge are State, town, or private conservation lands, there are also many residential areas near the refuge. Additional development in the area is increasing the urban-wildland interface and can lead to management conflicts. Assabet River NWR is currently open for deer, turkey, and upland game (cottontail rabbit, gray squirrel, ruffed grouse, and woodcock) hunting.

Great Meadows NWR is a 3,874-acre collection of parcels of land located approximately 20 miles west of Boston, in the historic towns of Concord, Sudbury, Bedford, Billerica, Lincoln, Carlisle, and Wayland. It comprises two divisions: lands south of State Route 117 compose the Sudbury Division (2,321 acres) and lands north of State Route 117 compose the Concord Division (1,542 acres). Great Meadows NWR stretches 12 miles from State Route 4 in Billerica to the Framingham/Wayland town line along the Concord and Sudbury Rivers. The refuge provides habitat for a variety of species, including migrating waterfowl, shorebirds, wading and marsh birds. The upland areas support woodcock, songbirds, and many raptors. The marsh habitats are utilized by amphibians and reptiles. With the exception of occasional (most likely wintering) bald eagles, no federally listed threatened or endangered species are currently known to inhabit Great Meadows NWR. Great Meadows NWR is currently open for deer (archery-only) and waterfowl (duck and goose) hunting.

Oxbow NWR is a 1,697-acre collection of parcels of land located approximately 35 miles northwest of Boston, in the towns of Ayer and Shirley in Middlesex County and the towns of Harvard and Lancaster in Worcester County. The refuge consists of three sections; the northern end of the refuge abuts the former Fort Devens; Shirley Road/West Main Street in Ayer separates the northern and middle portions of the refuge; Massachusetts Route 2 bisects the middle and southern parcels with the refuge's southern boundary at Still River Depot Road in Harvard. Oxbow NWR was formed by three land transfers from the former U.S. Army, Fort Devens Military Installation and the purchase of private land. The refuge supports a diverse mix of migratory birds including waterfowl, wading birds, raptors, shorebirds, passerines, as well as resident mammals, reptiles, amphibians, fish and invertebrates. With the exception of occasional (most likely wintering) bald eagles, no federally listed threatened or endangered species are currently to inhabit Oxbow NWR. Oxbow NWR is currently open for deer, snipe, turkey, upland game (cottontail rabbit, gray squirrel, ruffed grouse, and woodcock), and waterfowl (duck and goose) hunting.

Assabet River, Great Meadows, and Oxbow NWRs are managed as part of the Complex, which also includes Mashpee, Massasoit, Monomoy, Nantucket, and Nomans Land Island NWRs. The refuges of the Complex, which is headquartered in Sudbury, Massachusetts, total 17,187 acres. Assabet River, Great Meadows, and Oxbow NWRs received approximately 919,980 recreational visitors in 2017. We estimate that hunting accounted for only 2,353 of those visits (USFWS 2017). The original hunt plans for Assabet River, Great Meadows, and Oxbow NWRs were completed in 2005. As the previous hunt plans are over 10 years old, the Service has created this new plan to address existing and expanded hunting opportunities. Opening hunt plans for Mashpee and Monomoy NWRs were completed in 2019 for the 2019-2020 hunt season.

II. Statement of Objectives

The objectives of the hunting programs at Assabet River, Great Meadows, and Oxbow NWRs are to:

1. Provide the public with a high-quality recreational experience on refuge lands/waters and increase opportunities and access for hunters;
2. Design a hunting program that is administratively efficient and manageable with existing staffing levels and in alignment with Massachusetts Division of Fisheries and Wildlife (MassWildlife) regulations when possible;
3. Implement a hunting program that is safe for all refuge users;
4. Provide hunting opportunities for youth, disabled, veteran, apprentice hunters, and other underrepresented groups; and
5. Design a hunting program that aligns with refuge habitat management objectives.

To help meet these objectives, we propose expanding existing hunting opportunities for deer, turkey, small game, and waterfowl, as well as opening new opportunities for bear, coyote, and fox on refuge lands. These efforts will maintain a historic, wildlife dependent public use and provide accessible hunting opportunities in cooperation with local accessibility experts and organizations. We will enhance public understanding of refuge hunting and fishing opportunities by providing quality maps, signs, and wording within outreach materials and on the refuge web pages. Finally, we will increase the visibility of refuge law enforcement and hunter adherence to Federal and State regulations to ensure high quality ethical hunting and safe hunting experience.

III. Description of Hunting Program

A. Areas to be Opened to Hunting

Assabet River NWR

The Assabet River NWR totals 2,357 acres (Figure 1). Under the new hunting plan an additional 123 acres will be open for the first time bringing the total area open to hunting to 2,273 acres.

Those areas include the North Unit A, North Unit B (for Archery Only), Unit C (archery only except waterfowl) and South Unit (archery only). The Safety Zone (80 acres) and the Closed Area (4 acres) will continue to be closed for hunting. See Table 2: Assabet River NWR Hunting Units for a list of specific hunt units, species, and acres. The parcels along the Assabet River in Unit C (123 acres) that were acquired in 2008 will be opened to hunting for the first time, providing new opportunities for waterfowl and archery only deer, turkey, bear, coyote, and fox hunting. New opportunities for bear, coyote and fox will be made available in North Units A and B as well as South Unit, with the exception of no rifles or handguns allowed across the refuge. Coyote and fox hunting will be allowed concurrent with deer season with the corresponding method of take allowed for deer. In addition, North Unit A will be opened for special waterfowl hunts for targeted user groups including, youth, women, veterans, and underserved groups on a limited basis. Portions of the refuge will be closed during the hunt to maintain a safe, quality hunt for targeted user groups. There are areas that are designated for “archery only” due to their proximity to densely populated residential areas, schools, or other areas of safety concern. These archery areas include North Unit B, Unit C (except for Waterfowl), and South Unit.

Table 2: Assabet River NWR Hunting Units

Hunt Unit	Acres	Bear ¹	Coyote ²	Deer	Fox ²	Grouse	Rabbit	Squirrel	Turkey	Waterfowl	Woodcock
North Unit A	1,332	X	X	C	X	C	C	C	C	S	C
North Unit B	520	X	X	C	X				C		
Unit C	123	X	X	X	X				X	X	
South Unit	298	X	X	C	X				C		
Total Acres	2,273	2,273	2,273	2,273	2,273	1,332	1,332	1,332	2,273	1,455	1,332

C = Currently Opened, X = New Opportunity, S = Special Hunts Only

1- Bear hunting is only open during 2nd and shotgun season only

2- Coyote and Fox is only open concurrent with deer season; not baiting, no night hunting

Great Meadows NWR

Great Meadows NWR totals 3,874 acres and is comprised of two divisions, the Concord Division (Figure 2) and the Sudbury Division (Figure 3), which span 14 miles across 7 towns along the Sudbury and Concord Rivers. Surrounding the refuge is suburban residential housing and mixed use development areas. Within the two divisions, there are 11 units that current allow archery-only deer hunting. Under the new hunting plan an additional 778 acres will be open, increasing the total hunting acreage to 3,401 acres.

Approximately 2,280 acres of the refuge are currently opened to archery deer hunting. Areas

open for white-tailed deer hunting in the Concord Division include all refuge lands in Bedford, Billerica, and Carlisle. Route 225 serves as the southern border of this hunt area, and the Concord River bisects the area. There is currently no deer hunting on refuge lands south of Route 225 in Bedford or anywhere in Concord. The majority of the land currently open for white-tailed deer hunting on the refuge is located in the Sudbury Division (total of 1,707 acres in Sudbury Division). This includes all refuge lands south of Sherman’s Bridge in Sudbury and Wayland, with the exception of lands south of Stonebridge Road in Wayland. We will be opening an additional 778 acres of lands in two units for archery deer hunting. These areas are located on refuge lands North of Sherman’s Bridge Road in Sudbury and South of Route 225 in Bedford and Concord. Additionally, Great Meadows NWR will open all deer hunting units to turkey and coyote using archery equipment only. The refuge will also be open to black bear hunting in all units except South of SR 225 and North of Sherman Bridge Rd using archery equipment only. See Table 3: Great Meadows NWR Hunting Units for a list of specific hunt units, species, and acres.

During fall migration and into the winter, waterfowl are found on the Sudbury and Concord Rivers and associated wetlands and in refuge impoundments. The refuge is currently open to waterfowl hunting in portions of four units along the Sudbury and Concord River. The total riverine and associated wetland acreage currently open to hunting is approximately 334 acres. The refuge’s Concord Impoundments will remain closed to hunting.

In the Concord Division, waterfowl hunting is permitted in the Concord River Waterfowl Unit, which is about 86 acres of land and water from Route 225 stretching north to the boundary of the “O’Rourke Farm” in Carlisle. In the Sudbury Division, waterfowl hunting is permitted in three areas. The first area is approximately 136 acres from south of Sherman’s Bridge Road along the Sudbury River to just south of the intersection of the Water Row and Plymouth Road. The second area is approximately 38 acres of Sudbury River and associated wetlands between Routes 27 and 20. The third area includes approximately 74 acres of wetlands along the southern portion of Heard Pond and along the Sudbury River south of Heard Pond. Under this expansion plan, we would open up an additional 670 acres to waterfowl hunting including 376 acres at Pelham Island and 294 riverine acres north of Sherman Bridge Road.

Table 3: Great Meadows NWR Hunting Units

Hunt Unit	Acres	Bear	Deer	Coyote	Turkey	Waterfowl*
CONCORD UNIT						
Bedford	279	X	C	X	X	
Carlisle	259	X	C	X	X	
Concord River Waterfowl	109	X	C	X	X	C
Kinnelly	53	X	C	X	X	

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South of SR 225	484		X	X	X	
SUDBURY UNIT						
North of Sherman Bridge Rd	294		X	X	X	X
Water Row	628	X	C	X	X	
Sudbury River Waterfowl	274	X	C	X	X	C
Wolbach Strand	237	X	C	X	X	
Pelham Island	376	X	C	X	X	X
Stone Bridge	303	X	C	X	X	
South of Heard Pond	105	X	C	X	X	C
Total Acres	3,401	2,623	3,401	3,401	3,401	1,004

C = Currently Opened, X = New Opportunity

* All hunting units are archery only except for waterfowl

* Acres open to waterfowl may only reflect a portion of the hunt unit to reflect riverine and wetland areas. See Figures 2 and 3 for specific waterfowl hunting areas.

Oxbow NWR

Oxbow NWR currently includes 1,695 acres along the Nashua River (Figure 4). Portions south of Route 2 have been open to hunting of turkey, gray squirrel, cottontail rabbit, ruffed grouse, snipe and American woodcock since 1976, under previous ownership. Hunting is currently allowed on 1,543 acres which includes all units except the Closed Area and Hospital Road North. Under the new hunting plan an additional 128 acres will be open, increasing the total hunting acreage to 1,671, with exception of no rifles or handguns allowed refuge wide.

In the north units, we are proposing to maintain hunting opportunities in the portion of the refuge located on the westerly side of the Nashua River north of Shirley Road/West Main Street (Walker Road, 158 acres) for deer, turkey, upland game (grouse, rabbit, squirrel) and woodcock. All legal methods of take in alignment with State and refuge regulations, would be allowed for deer, turkey, and woodcock. Only non-toxic shot is permitted for upland game. Opportunities for waterfowl and bear hunting will also be added to Walker Road Unit in alignment with State Regulations, with exception of no rifles or handguns allowed. The portion of the refuge on the easterly side of the Nashua River north of Shirley Road/West Main Street (Bishop Road area, 234 acres) is currently only open for archery deer and turkey hunting. Bishop Road area will be opened for new opportunities for upland game (grouse, rabbit, and squirrel), migratory birds (woodcock and waterfowl), turkey, and bear. The methods of take at Walker Road and Bishop Road areas for current and new species will come into alignment for method of take for deer, turkey, bear, grouse, rabbit, squirrel, woodcock, and waterfowl in these two units, with exception of no rifles or handguns allowed. Coyote and fox opportunities will be added only concurrent with deer season and the corresponding method of take allowed for deer season. Following these changes we will combine Walker Rd and Bishop Rd and rename it the North Unit. See Tables 4 and 5: Oxbow River NWR Hunting Units 1 and 2 for a list of specific hunt units, species, and acres.

The Central units at Oxbow NWR from the Route 2 underpass north to Hospital Road (Sheridan Road, 142 acres, and Hospital Road South Unit, 169 acres) are currently open for archery deer

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hunting and shotgun grouse, rabbit, squirrel, turkey and waterfowl. Woodcock hunting is also allowed on Sheridan Road. We will expand hunt opportunities to include bear, coyote, and fox as well as come into alignment for method of take, with the exception of no rifles or handguns allowed for current and newly proposed species in the Sheridan Road and Hospital Road South Units.

Hospital Road North Unit will be opened for the first time. Due to the proximity to sport fields, hunting opportunities for bear, coyote, deer, fox, and turkey will be by archery only following State regulations in addition to refuge-specific regulations.

The Route 2 South Unit at Oxbow NWR (248 acres) is currently open for white-tailed deer, turkey, woodcock, snipe, and upland game hunting. The Waterfowl area totals 466 acres and is open to hunt opportunities for the same species as the adjacent Route 2 South Unit which also includes waterfowl. We propose combining Route 2 South Unit and the Waterfowl Area and renaming it all Route 2 South, and offering the same hunting opportunities. We will expand waterfowl hunting opportunities to the adjacent Route 2 South Unit. With the newly combined Route 2 South Unit, coyote and fox opportunities will be added only concurrent with deer season and the corresponding method of take allowed for deer season. Bear hunting will also be added in alignment for state seasons and method of take, with the exception of no rifles or handguns allowed. The Still River Depot Area is currently open and will be maintained as an archery only hunting area for deer and turkey. Archery only bear opportunities will be added following refuge-specific regulations. Coyote and fox opportunities at Still River Depot will be added only concurrent with deer season for archery only.

The portions of Oxbow NWR from Hospital Road north to Shirley Road/West Main Street, and from Shirley Road/West Main Street to the north side of the railroad tracts crossing MacPherson Road will remain closed to hunting.

Table 4. Oxbow NWR Hunting Units 1

Hunt Unit	Acres	Bear	Deer	Turkey	Coyote	Fox
North Unit (Walker Rd & Bishop Rd combined)	392	X	C	C	X	X
Hospital Road North	128	X	X	X	X	X
Hospital Road South	169	X	C	C	X	X
Sheridan Road	142	X	C	C	X	X
Still River Depot Area	126	X	C	C	X	X
Route 2 South (Waterfowl Area and Route 2 South combined)	714	X	C	C	X	X
Total Acres	1,671	1,671	1,671	1,671	1,671	1,671

C = Currently Opened, X = New Opportunity

Table 5. Oxbow Hunting Units 2

Hunt Unit	Acres	Grouse	Rabbit	Snipe	Squirrel	Waterfowl	Woodcock
North Unit (Walker Rd & Bishop Rd combined)	392	X	X		X	X	X
Hospital Road North	128	X	X				
Hospital Road South	169				C	C	
Sheridan Road	142	C	C		C		C
Still River Depot Area	126						
Route 2 South (Waterfowl Area and Route 2 South combined)	714	C	C	C	C	C	C
Total Acres	1,671	1,417	1,417	714	1,417	1,275	1,248

C = Currently Opened, X = New Opportunity

B. Species to be Taken, Hunting Periods, Hunting Access

Table 6. Refuge Specific Regulations by Species

Species	Assabet River	Great Meadows	Oxbow
Deer	Archery only in North Unit B, Unit C, South Unit	Archery only	Archery only Hospital Road North and Still River Depot
Turkey	Archery only in North Unit B, Unit C, South Unit. Open fall and spring seasons	Archery only	Archery only Hospital Road North and Still River Depot
Bear	Archery only in North Unit B, Unit C, South Unit. Only open second season (no rifles) and shotgun season	Archery only	Archery only Hospital Road North and Still River Depot. All Refuge: No rifles or handguns.
Fox	Open concurrent with deer season and corresponding method of take. Recommend voluntary use of non-toxic ammunition	N/A	Open concurrent with deer season and corresponding method of take, except archery only at Hospital Road North and Still River Depot. Recommend voluntary use of non-toxic ammunition
Coyote	Open concurrent with deer season and corresponding method of take. Non-toxic ammunition only	Open concurrent with deer season and archery only	Open concurrent with deer season and corresponding method of take except archery

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Species	Assabet River	Great Meadows	Oxbow
			only at Hospital Road North and Still River Depot. Non-toxic ammunition only
Grouse, Rabbit, Squirrel	North Unit A: Open in alignment with State for seasons and method of take, except no rifles or handguns. Non-toxic ammunition only	N/A	Open in alignment with State for seasons and method of take, except no rifles or handguns. Non-toxic ammunition only
Waterfowl	Open in alignment with State for seasons and method of take in Unit C. Open North Unit A for special waterfowl hunt events only	Open in alignment with State for seasons and method of take	Open in alignment with State for seasons and method of take
Woodcock	North Unit A: Open in alignment with State for seasons and method of take.	N/A	Open in alignment with State for seasons and method of take.
Snipe	N/A	N/A	Open in alignment with State for seasons and method of take.

Big Game

Deer and Turkey

At Assabet River NWR, white-tailed deer and turkey hunting would be permitted at North Unit A, North Unit B, Unit C, and the South Unit. North Unit A will maintain opportunities for the archery, muzzleloader, and shotgun seasons established annually by the State. North Unit B and the South Unit would be maintained as archery only hunt areas. Unit C will open for archery only deer and turkey hunting for the first time.

At Great Meadows NWR, all areas opened to white-tailed deer and turkey hunting will be maintained as archery only following State regulations.

At Oxbow NWR, the Still River Depot Unit will remain open for archery only deer and turkey hunting. Route 2 South and Waterfowl Area will remain open for the archery, muzzleloader, and shotgun seasons established annually by the State. Oxbow NWR units of Bishop Road, Walker Road, Hospital Road South and Sheridan Road will be opened to all legal methods of take, with exception of rifles or handguns, for deer and turkey during the respective seasons. Hospital Road North will be opened for the first time to archery only deer and turkey hunting.

For all three refuges, archers may also hunt during the shotgun and muzzleloader seasons in accordance with State regulation. Turkey hunting is currently allowed in the spring only. All three refuges will open for the fall turkey season (following refuge restrictions in some areas) and in accordance with State regulations.

Black Bear

Assabet River, Great Meadows, and Oxbow NWRs will be open for black bear hunting for the

first time in designated units and in accordance with State regulations, with exception of no rifles or handguns allowed on all three refuges and subject to the following:

At Assabet River NWR, the North Unit B, Unit C, and South Unit will open to black bear hunting for archery only. North Unit A will open to all methods of take in alignment with State regulations, with exceptions of rifles or handguns, for bear hunting. For all units bear hunting will only be open during the second bear and shotgun seasons. This restriction will mitigate potential conflicts with other user groups and other youth environmental education programs that take place during first State bear seasons.

At Great Meadows NWR areas open to deer and turkey hunting (except North of Sherman Bridge Road and South of SR 225) will be open to bear hunting via archery only for all State seasons.

At Oxbow NWR, the Route 2 South, Waterfowl Area, Sheridan Road, Hospital Road South, Hospital Road North, Bishop Road and Walker Road units will open to black bear hunting in alignment with State regulations for method of take and seasons, with exception of no rifles or handguns. Hospital Road North Unit and Still River Depot will be open to bear hunting via archery only for all State seasons.

Upland Game

Coyote and Fox

Assabet River NWR will open 2,273 acres to coyote and fox hunting following refuge specific and State regulations, with the exception of no rifles or handguns allowed. These opportunities will open concurrent with the deer season to mitigate conflicts with other user groups and to conserve refuge resources. Hunting for coyote and fox in Unit B, Unit C, and the South Unit will be limited to archery only. Unit A will open concurrent with the deer season with the corresponding method of take.

Great Meadows NWR will open all deer and turkey units to coyote hunting for the first time via archery only, concurrent with the deer season.

Oxbow NWR will open 1,671 acres to coyote and fox hunting concurrent with the deer season with the corresponding method of take allowed, with the exception of no rifles or handguns allowed. The Route 2 South, Sheridan Road, Hospital Road South and North Unit (formerly Bishop Road and Walker Road) units will open concurrent with deer season with the corresponding method of take, with the exception of no rifles or handgun allowed. Hospital Road North and Still River Depot Units will open to archery hunting only.

Other Upland Game

At Assabet River NWR, hunt seasons for ruffed grouse, cottontail rabbit and gray squirrels in North Unit A will be maintained in alignment with State and refuge regulations including use of non-toxic ammunition only. No rifles or handguns would be allowed.

At Oxbow NWR, shotgun hunting for ruffed grouse, cottontail rabbit and gray squirrels is currently allowed on the portions of the refuge and will be expanded to include all legal methods of take in alignment with State and refuge regulations, with exception of rifles and handguns. Under this plan the Bishop Road Unit would also open to ruffed grouse, cottontail rabbit, and gray squirrel hunting for all legal methods of take in alignment with State and refuge regulations.

Migratory Game Bird

Waterfowl

Under the current management, the only migratory bird open to hunting on Assabet River NWR is the American woodcock. Assabet River NWR Unit C will be opened for waterfowl hunting for the first time since its acquisition in 2008. Wetlands in Hunt Unit A will also be opened to waterfowl hunting for special events to aid in recruitment, retention and reactivation of new hunters. Portions of the refuge will be closed to hold special hunts for youth, women, veterans and underserved groups on a limited basis to maintain a safe, quality hunt for specific targeted user groups.

At Great Meadows NWR, a total of 334 acres are currently opened for waterfowl hunting. New opportunities will be opened at Pelham Island (376 acres) and riverine and wetland portions North of Sherman Bridge Road (294 acres).

At Oxbow NWR, waterfowl hunting currently only occurs in the Waterfowl area (466 acres). The new opportunities at Oxbow NWR for hunting of migratory birds consist of opening Route 2 South, Bishop Road and Hospital Road South to waterfowl hunting, totaling 809 acres.

The waterfowl hunt program will be conducted in alignment with State regulations in units open to waterfowl. Hunting seasons will generally begin in early September with the early Canada goose season and extend through late-February with the late snow and blue goose season. Ducks are generally hunted mid-October to late November. Most of the hunter activity will occur during the duck and goose seasons.

Snipe and Woodcock

Snipe and American woodcock hunting is currently permitted on portions of Oxbow NWR as noted in Section B of the hunt plan. At Oxbow, Bishop Road Unit (234 acres) will be opened as a new opportunity for woodcock. Woodcock hunting generally occurs from mid-October to mid-November. No changes to snipe hunting are being proposed.

Hunter Access

The refuge will make a reasonable effort to allow hunters access to all portions of the hunt areas. The intention is to provide safe, quality hunting opportunities that consider the welfare of the refuge wildlife resources. Hunters must mark tree stands/blinds with refuge permit number. All access points including hunter parking lots and boat ramps will be delineated on refuge hunt maps and will be included in the hunt brochures.

C. Hunter Permit Requirements

All persons hunting on the refuge will be required to obtain the necessary State licenses, permits and stamps. In addition, all hunters on any of the three refuges (Great Meadows, Oxbow and Assabet River NWRs) will need to purchase and possess an annual refuge hunting permit. Individual hunting permits are required for each of the deer, migratory bird, turkey, and upland game hunting seasons and cover those species at Assabet River, Great Meadows, and Oxbow NWRs. Youth hunters (between the ages of 12 to 17) are required to obtain a single permit at no cost that covers all hunting seasons. Discounted permits are offered to active-duty members of the military, permanently disabled hunters, and senior citizens (at least 62 years of age).

To maintain a quality hunt, the number of permits made available for shotgun and muzzleloader deer season are limited and disbursed through a lottery system. Permits for all hunts are sold online through a 3rd-party vendor. Additional information will be available at each respective refuge website (https://www.fws.gov/refuge/assabet_river, https://www.fws.gov/refuge/great_meadows, and <https://www.fws.gov/refuge/oxbow>). Fees collected from permit sales are used to support the hunting program. Hunters are required to have their refuge-issued permits and state license with them at all times when hunting or scouting on the refuges and must provide those documents when requested.

D. Consultation and Coordination with the State

National wildlife refuges, including Assabet River, Great Meadows, and Oxbow NWR, conduct hunting programs within the framework of State and Federal regulations. The refuge has moved forward with developing this hunting plan based upon earlier formal coordination with the MassWildlife as well as the intervening informal discussions.

In developing this plan, the Complex reviewed the operations and regulations for neighboring State wildlife management areas to find consistency where possible. Refuge leadership met with Michael Huguenin (Assistant Director of Wildlife Research) and Johnathan Regosin (Deputy Director) in May 2019 to discuss proposed changes to the Complex's hunting plans. In September of 2019, MassWildlife provided a letter with formal comments to the proposed changes and these comments were considered in drafting the hunt plan expansions. A follow up correspondence summarizing areas of expansion was sent to MassWildlife in November 2019.

The Complex staff will continue to consult and coordinate with MassWildlife to maintain consistent regulations and programs, monitor populations of proposed hunt species, and set harvest goals. We will work together to ensure safe and enjoyable recreational hunting opportunities. The Environmental Assessment (EA) (appendix B) associated with this hunting plan was shared with MassWildlife.

E. Law Enforcement

Refuge law enforcement officers work closely with State Environmental Police Officers (EPOs), as well as other State and local Police Departments, to conduct patrols, safeguard hunters and

visitors, and protect both game and nongame species. .

Federal Wildlife Officers will patrol the refuge during hunting season. The frequency of patrols will be determined by hunter use, the level of compliance observed during patrols, information obtained from participants, and other sources. Refuge boundaries and hunt area boundaries will be clearly posted. As needed, the refuge will hold voluntary hunter meetings to answer questions from hunters and listen to feedback on the hunt program.

F. Funding and Staffing Requirements

Table 7. Initial Costs of New Hunting Programs at Eastern Massachusetts NWRC

Activity	Material Costs	Labor Costs	Total
Document Preparation	\$500	\$5,000	\$5,500
Posting/Signs	\$3,000	\$1,000	\$4,000
Administration	\$500	\$5,000	\$5,500
Outreach	\$500	\$2,000	\$2,500
Law Enforcement	\$1000	\$30,000	\$31,000
Totals	\$5,500	\$43,000	\$48,500

Table 8. Annual Costs of New Hunting Programs at Eastern Massachusetts NWRC

Activity	Material Costs	Labor Costs	Total
Document Preparation	\$500	\$1,800	\$2,300
Posting/Signs	\$500	\$1,500	\$2,000
Administration	\$1000	\$3,000	\$4,000
Outreach	\$500	\$1,800	\$2,300
Law Enforcement	\$1,000	\$30,000	\$31,000
Totals	\$3,500	\$38,100	\$41,600

There are sufficient funds within the annual operating budget of the Eastern Massachusetts NWRC to conduct the expanded refuge hunting program as proposed. There will be little difference in the amount of law enforcement needed under the previous hunting plan and this proposed expanded plan at Assabet River, Great Meadows, and Oxbow NWRs. During the hunt season, current law enforcement efforts are focused on compliance with State and refuge

regulations, reducing user conflicts in the refuge and ensuring a safe hunt. The refuge has successfully implemented hunting programs on all three refuges for over 10 years.

Not all hunters will hunt every day, and some hunters will receive refuge permits but hunt just a few days. Hunter pressure on most days is expected to be low.

IV. Conduct of the Hunting Program

A. Hunter Permit Application, Selection, and/or Registration Procedures

All refuge hunt permits are sold online through a 3rd-party vendor and information will be available at each respective Refuge's website. To purchase a permit and/or enter a hunt lottery, individuals must create an account on the 3rd-party vendor's website. Once an account has been created, individual hunting permits (archery deer, migratory birds, turkey, upland game, youth hunter) are available for purchase. Permits cover Assabet River, Great Meadows, and Oxbow for the specific season. To ensure a quality hunt, a lottery system is administered by the 3rd-party vendor for access to shotgun deer and muzzleloader deer permits. Youth hunter permits are available at no cost. Discounted permits are made available to active-duty members of the military, permanently disabled hunters, and senior citizens (at least 62 years of age). Permits may be printed after purchase or displayed on a smart phone or tablet to satisfy law enforcement officer requests. All hunters are also responsible for obtaining their State hunting license through the appropriate channels.

B. Refuge-Specific Hunting Regulations

Listed below are refuge-specific regulations that pertain to hunting on Assabet River, Great Meadows, and Oxbow NWR. These regulations may be modified as conditions change or if refuge expansion continues/occurs. To ensure compatibility with refuge purposes and the mission of the Refuge System, hunting must be conducted in accordance with State and Federal regulations, as supplemented by refuge-specific regulations (50 CFR,). Refuge-specific stipulations are also detailed in the hunting Compatibility Determination (appendix A).

- Refuge lands are closed to night hunting. Refuge hunting hours are half hour before sunrise to half hour after sunset, except for migratory waterfowl which is open to sunset.
- Hunters may enter the refuge 1.5 hours before legal hunting time and must leave the refuge within 1.5 hours after legal sunset.
- We allow the use of dogs consistent with State regulations when hunting migratory birds and upland game species.
- On Great Meadows NWR, only archery equipment may be used to hunt white-tailed deer, bear, turkey and coyote.

- Scouting can occur once the hunter has obtained a refuge permit. Scouting can begin no earlier than 4 weeks from the opening day of the hunt season from half hour before sunrise to half hour after sunset.

C. Relevant State Regulations

Hunters are responsible for knowing and complying with all Massachusetts regulations and hunter safety training requirements.

D. Other Refuge Rules and Regulations for Hunting

- Eastern Massachusetts NWRC only permits non-toxic ammunition for migratory bird and upland game hunting.
- Based on input we received during the public comment period, we adjusted the proposed alternative discussed in the draft plan and EA, primarily with changes regarding method of take by removing handguns and rifles on Oxbow and Assabet River NWRs.

V. Public Engagement

A. Outreach for Announcing and Publicizing the Hunting Program

The Complex will disperse information about the hunting program in a number of ways. Special announcements will be published in local newspapers, as well as on refuge websites and social media pages. Friends groups for the Complex manage mailing lists and mass emails can be sent through those channels. Hunt brochures containing information about the rules and regulations for hunters are available at kiosks across Assabet River, Great Meadows, and Oxbow NWRs, as well as at the Complex headquarters and online at the refuge webpages and on the permit webpage managed by the 3rd-party vendor. Public information meetings will be held as needed.

The plan has been thoroughly coordinated with all interested and/or affected parties, including MassWildlife. On March 16, 2020, we distributed a press release to news organizations and alerted the public about the availability of the hunting plan with postings on the respective refuge's websites. We also notified local town representatives and partners as well as emailed to members of the Friends of Assabet River NWR mailing lists. No public meetings were held due to bans on public gatherings due to COVID-19. The Refuge Manager did answer questions on the hunt plan during a Monthly River Stewardship Council Meeting of the Sudbury, Assabet, and Concord River Wild and Scenic Partnership, attended by representatives from seven towns and three partner groups. Upon request, the public comment period was extended from April 24, 2020 until May 22, 2020, for a total comment period of 68 days.

B. Anticipated Public Reaction to the Hunting Program

Hunting is a priority public use of the Refuge System, and it has been found compatible at

Assabet River, Great Meadows, and Oxbow NWRs. In developing each refuge's CCP, hunting surfaced as a key issue. At that time, members of the public in opposition were primarily against the idea of hunting in general. Those that were not against hunting, generally expressed support for archery-only deer hunting for specific proposed species, citing safety and user conflict concerns. Some form of hunting has now been an ongoing activity at each of these refuges for over 10 years, so the public is familiar with the presence of hunters on the refuge landscape during certain times of year.

During creation of individual hunt plans for each refuge (2005), it was identified that the greatest potential visitor use conflict is between hunters and non-consumptive refuge users. Information on kiosks and brochures remind all consumptive and non-consumptive users of the other activities that may be ongoing at the same time. Additionally, hunting is also not allowed in the State of Massachusetts on Sundays, thereby decreasing user conflicts. Some people are too uncomfortable to walk on the refuge during any hunt season. Others are or will become comfortable walking on the refuge during archery-only seasons. Because the majority of hunting occurs early in the morning and later in the afternoon, non-hunters might decide to restrict their visit to the refuge to mid-day. Non-hunters who have access to the refuge on a daily basis will have to accommodate hunters on certain days. There will be some resentment over this accommodation. It is possible that we will lose the support of some individuals, but we will gain support from the State and other individuals who will be pleased to have expanded opportunities to hunt on the refuge.

Since the initiation of the refuge hunt program in 2005, several of the neighboring towns and conservation groups have implemented deer hunting programs of their own in an effort to reduce local deer populations and their impacts to the environment. Therefore, we anticipate far less resistance from those groups who may have been opposed to our initial opening.

We anticipate the greatest level of controversy to stem from the opening up to hunting of black bear on all three refuges since neither of them have a current population and sightings of bear in these areas may still be considered a novelty to the public. Upon release of the draft hunt plan and associated documents, a total of 189 unique comments representing 501 individuals or entities were submitted to the refuge. Among these were two petitions: an online Care2.com petition with 262 signatures representing 40 people from Massachusetts, 55 people from other states, and 167 people living in other countries; and, a mailed petition representing 25 Massachusetts people. Appendix D of the hunting plan summarizes the substantive comments received on the proposal, and the Service's responses.

C. How Hunters Will Be Informed of Relevant Rules and Regulations

General information regarding hunting can be obtained at the Complex headquarters in Sudbury or from the hunt brochures available in refuge kiosks. Hunting information is also available on the refuge websites and on the permit webpage managed by the 3rd-party vendor. Information will also be sent to hunters on our emailing lists. Refuge staff also plan to host annual meetings to announce rule/regulations updates, orient new hunters, and solicit feedback from previous hunts. Dates, forms, hunting unit directions, maps, and permit requirements about the hunt will

be available on the station websites at:

https://www.fws.gov/refuge/assabet_river/
https://www.fws.gov/refuge/great_meadows/
<https://www.fws.gov/refuge/oxbow/>

VI. Compatibility Determination

Hunting and all associated program activities proposed in this plan are found compatible with the purposes of the refuge. Allowing hunting for the previously mentioned species on Assabet River, Great Meadows, and Oxbow NWR contributes to, and does not materially interfere with, or detract from, the mission of the Refuge System and the purposes for which the refuge was established. See appendix A for the complete compatibility determination for hunting on Assabet River, Great Meadows, and Oxbow NWR.

REFERENCES

- Horsley, S.B., S.L. Stout, and D.S. DeCalesta. 2003. White-tailed deer impact on the vegetation dynamics of a northern hardwood forest. *Ecol. Appl.* 13(1)98-118.
- Massachusetts Division of Fisheries and Wildlife. 2018. Annual Report. *MassWildlife*. 182 pp.
- U.S. Fish and Wildlife Service. 2017. *Banking on Nature: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation*. 32 pp.
- U.S. Fish and Wildlife Service. 2017. *Waterfowl: Population Status, 2017*. USFWS, Laurel, MD. 74pp.

Figure 1. Assabet River NWR

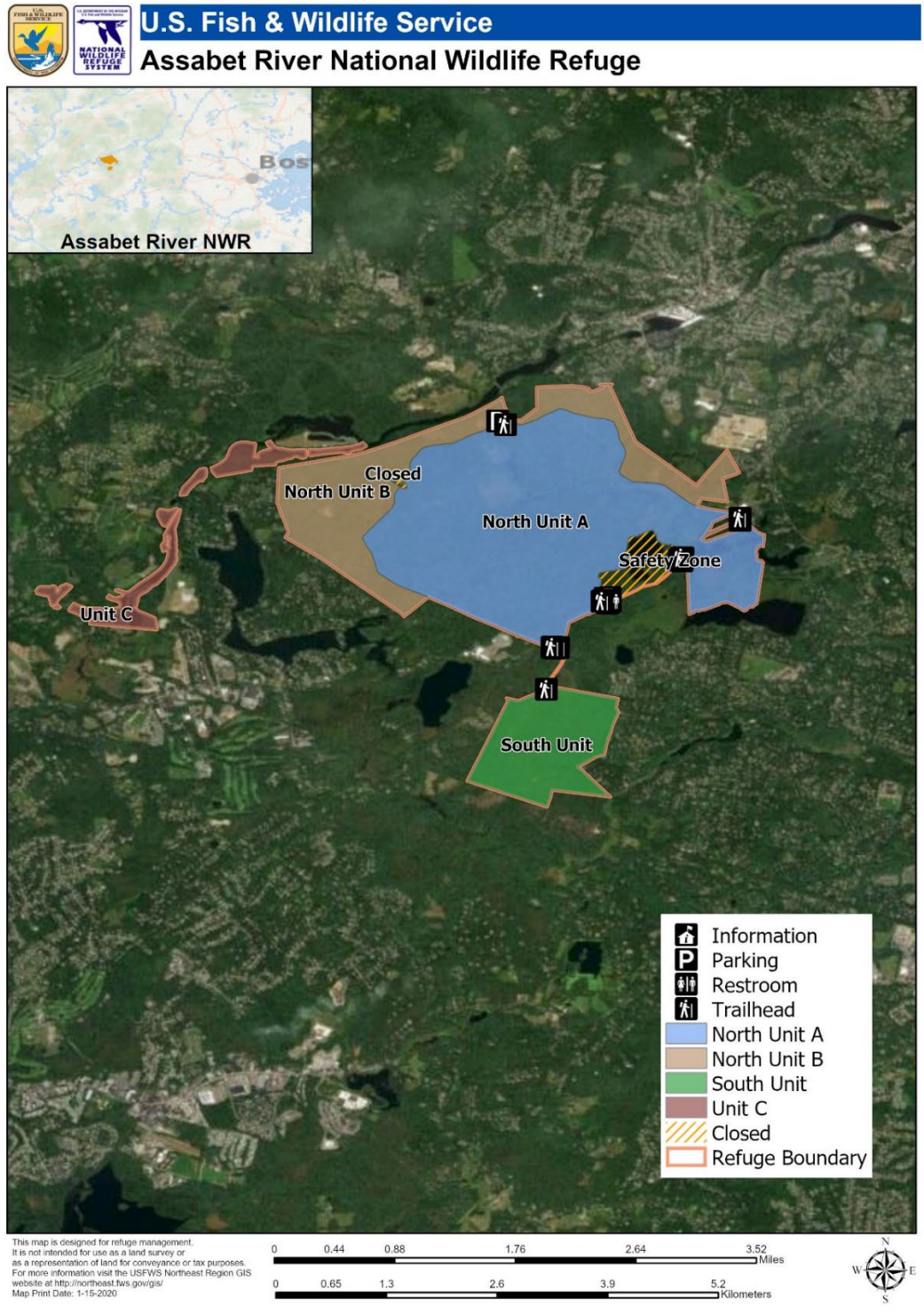


Figure 2. Great Meadows NWR, Concord Unit

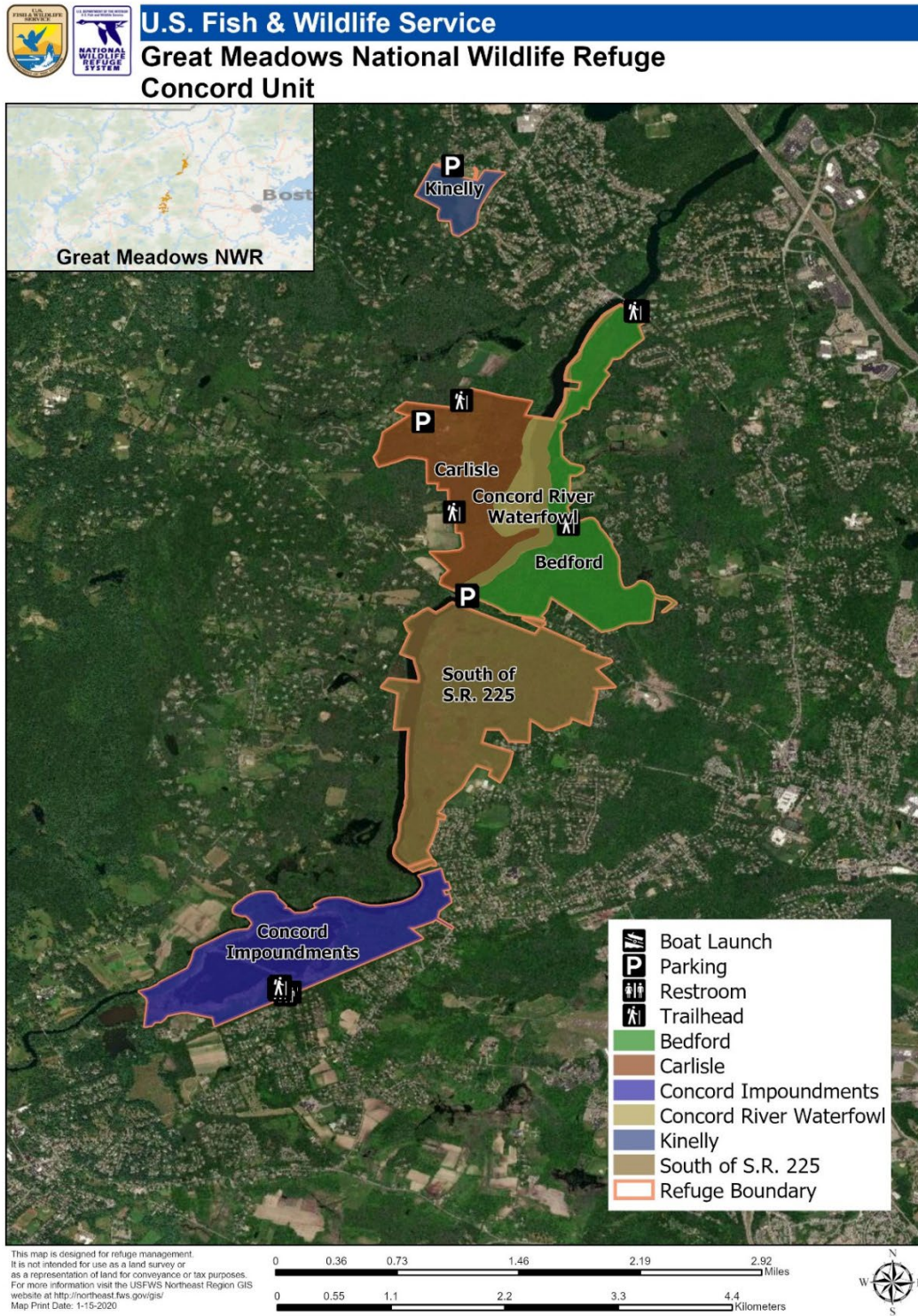


Figure 3. Great Meadows NWR, Sudbury Unit

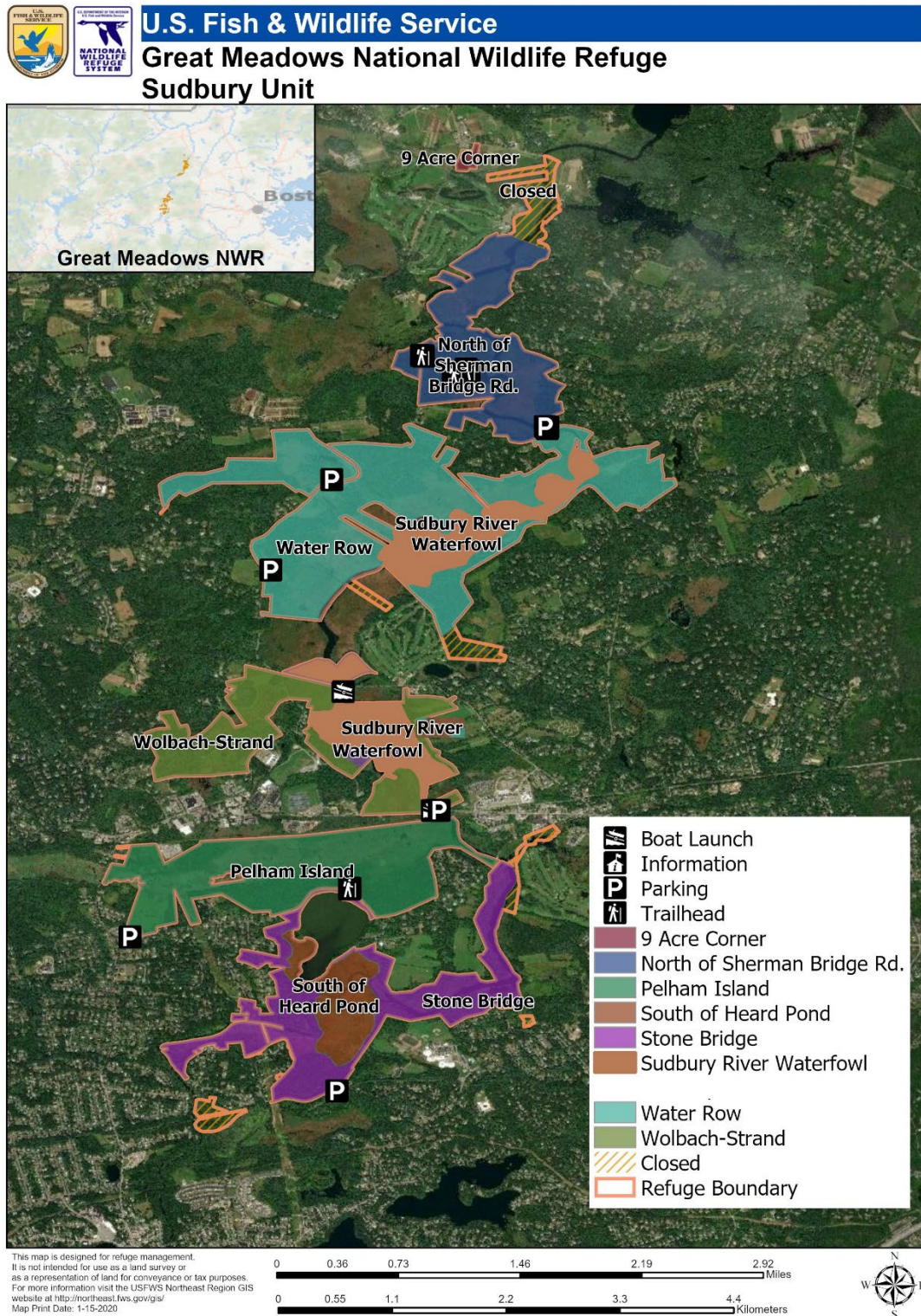
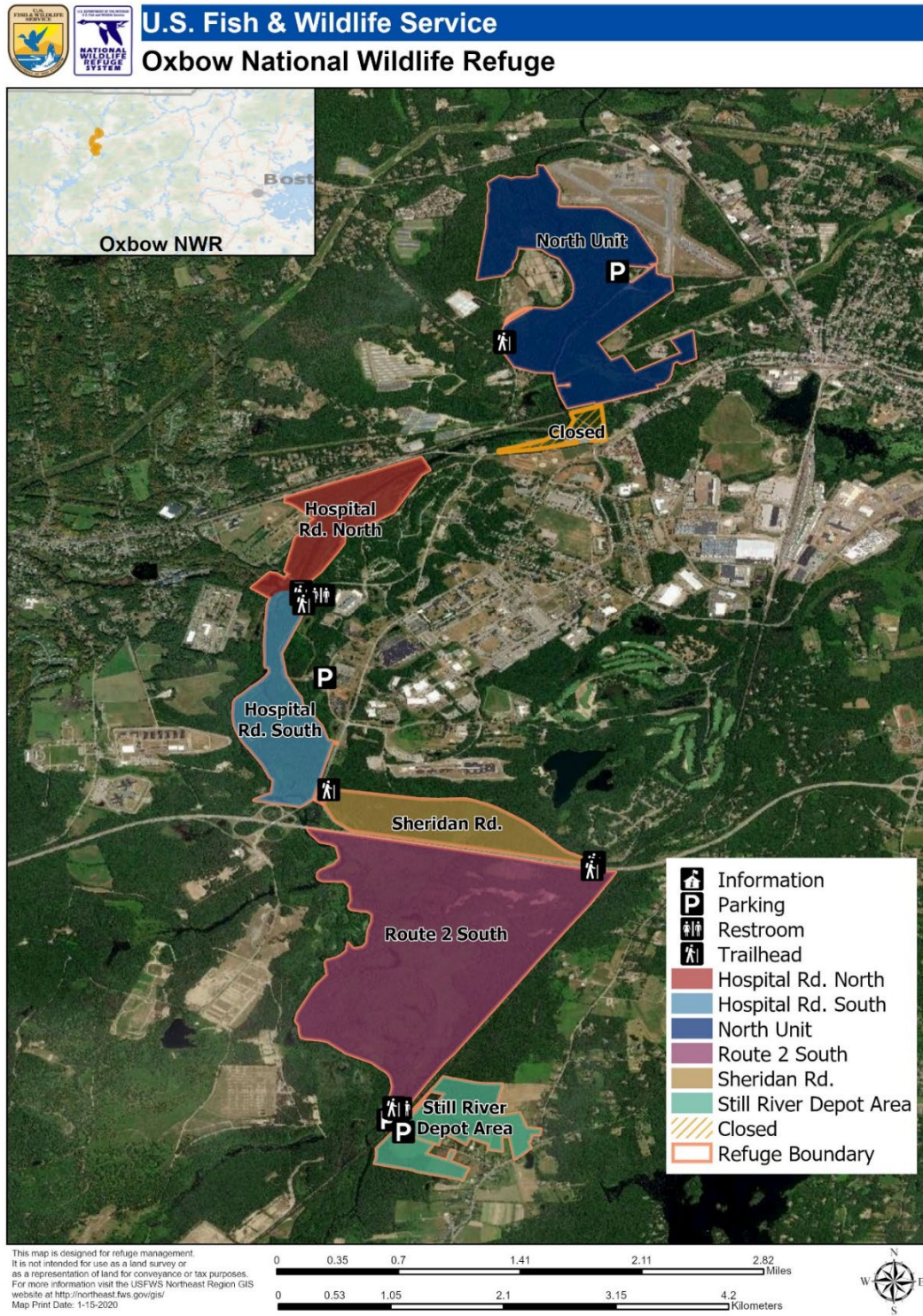


Figure 4. Oxbow NWR



Compatibility Determination

USE: Hunting

REFUGE NAME: Eastern Massachusetts National Wildlife Refuge Complex (NWRC, Complex). The Complex comprised of eight refuges in the State of Massachusetts. The refuges covered in this plan include:

- Assabet River National Wildlife Refuge (NWR)
- Great Meadows National Wildlife Refuge
- Oxbow National Wildlife Refuge

DATE ESTABLISHED:

- Assabet NWR, September 28, 2000
- Great Meadows NWR, May 3, 1944
- Oxbow NWR, May 24, 1974

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Assabet River National NWR was established under an Act Authorizing the Transfer of Certain Real Property for Wildlife, or Other Purposes. (16 U.S.C. 667b).

Great Meadows NWR was established under the authority of the Migratory Bird Conservation Act (16 U.S.C. § 715d) and Refuge Recreation Act (16 U.S.C. § 460k-1).

Oxbow NWR was established under an Act Authorizing the Transfer of Certain Real Property for Wildlife, or Other Purposes. (16 U.S.C. 667b).

REFUGE PURPOSE(S):

Assabet River NWR's purpose is its "...particular value in carrying out the national migratory bird management program." (16 U.S.C. 667b-d, as amended).

Great Meadows NWR's purpose is: "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. § 715d), "... suitable for – incidental fish and wildlife-oriented recreational development," (16 U.S.C. § 460k-1), "the protection of natural resources," (16 U.S.C. § 460k-1), "and the conservation of threatened or endangered species..." (16 U.S.C. § 460k-1).

Oxbow NWR's purpose is its "...particular value in carrying out the national migratory bird management program." (16 U.S.C. 667b-d, as amended).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION:

"The mission of the National Wildlife Refuge System (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" (Refuge System Improvement Act of 1997, Public Law 105-57).

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The use is public hunting of big game (deer, turkey, bear), coyote, fox, upland game (ruffed grouse, rabbit, and squirrel) and migratory game bird (waterfowl, woodcock, snipe) at Assabet River, Great Meadows, and/or Oxbow NWRs.

Under the proposed plan, Assabet River NWR would have 2,273 acres open to hunting (including 123 opened for the first time). Species open at Assabet would include black bear, white-tailed deer, turkey, coyote, fox, cottontail rabbit, squirrel, grouse, woodcock, and waterfowl.

Under the proposed plan, Great Meadows NWR would have 3,401 acres open to hunting, including 778 acres opened for the first time. Species open at Great Meadows would include black bear, white-tailed deer, turkey, coyote, and waterfowl.

Under the proposed plan, Oxbow NWR would have 1,671 acres open to hunting, including 128 acres opened for the first time. Species open at Oxbow would include black bear, white-tailed deer, turkey, coyote, fox, cottontail rabbit, squirrel, grouse, waterfowl, woodcock, and snipe.

Hunting was identified as one of six priority public uses of the Refuge System by the Refuge System Administration Act of 1966, as amended by the Refuge System Improvement Act of 1997 (Public Law 105-57), when found to be compatible.

(b) Where would the use be conducted?

Assabet River NWR

The Assabet River NWR totals 2,357 acres (Figure 1 in Hunt Plan). A total of 2,273 acres will be maintained or opened to hunting and those areas include the North Unit A, North Unit B (for Archery Only), Unit C (archery only except waterfowl) and South Unit (archery only). No rifles or handgun are allowed refuge wide. The Safety Zone (80 acres) and the Closed area (4 acres) will continue to be closed for hunting. See Table A-2: Assabet River NWR Hunting Units for a list of specific hunt units, species, and acres. The parcels along the Assabet River in Unit C (123 acres) that were acquired in 2008 will be opened to hunting for the first time, providing new opportunities for waterfowl, deer, turkey, bear, coyote, and fox hunting. New opportunities for

bear, coyote and fox will be made available in North Units A and B as well as South Unit. In addition, North Unit A will be opened for special waterfowl hunts for targeted user groups including, youth, women, veterans, and underserved groups on a limited basis. Portions of the refuge will be closed during the hunt to maintain a safe, quality hunt for targeted user groups. There are areas that are designated for “archery only” due to their proximity to densely populated residential areas, schools, or other areas of safety concern. These archery area include North Unit B, Unit C (except for Waterfowl), and South Unit.

Table A-2: Assabet River NWR Hunting Units

Hunt Unit	Acres	Bear ¹	Coyote ²	Deer	Fox ²	Grouse	Rabbit	Squirrel	Turkey	Waterfowl	Woodcock
North Unit A	1,332	X	X	C	X	C	C	C	C	S	C
North Unit B	520	X	X	C	X				C		
Unit C	123	X	X	X	X				X	X	
South Unit	298	X	X	C	X				C		
Total Acres	2,273	2,273	2,273	2,273	2,273	1,332	1,332	1,332	2,273	1,455	1,332

C = Currently Opened, X = New Opportunity, S = Special Hunts Only

S- Hunting of waterfowl in North Unit A is only during special refuge sponsored hunts.

1- Bear hunting is only open during 2nd and shotgun season only.

2- Coyote and fox hunting is only open concurrent with deer season; no baiting, no night hunting.

Great Meadows NWR

Great Meadows NWR totals 3,874 acres. The refuge is comprised of two divisions, the Concord Division and the Sudbury Division, that span 14 miles across 7 towns along the Sudbury and Concord Rivers. Surrounding the refuge is suburban residential housing and mixed use development areas. Within the two Division there are 11 units that current allow archery-only deer hunting.

Approximately 2,280 acres of the refuge are currently opened to archery deer hunting. We will be opening additional 778 acres of lands in two units for archery deer hunting. See Table A-3: Great Meadows NWR Hunting Units for a list of specific hunt units, species, and acres. These areas are located on refuge lands North of Sherman’s Bridge Road in Sudbury and South of route 225 in Bedford and Concord. Additionally, Great Meadows NWR will open all current deer hunting units to turkey and coyote using archery equipment only. The refuge will also be open to black bear hunting in all units except South of SR 225 and North of Sherman Bridge Rd using archery equipment only. The refuge is currently open to waterfowl hunting in portions of four units along the Sudbury and Concord River. The total riverine and associated wetland acreage included currently open to hunting is approximately 334 acres, which is less than 10 percent of the refuge acreage. The refuge’s Concord Impoundments will remain closed to hunting. Under

this expansion plan, we will open up an additional 670 acres to waterfowl hunting including 376 acres at Pelham Island and 294 riverine acres north of Sherman Bridge Road.

Table A-3: Great Meadows NWR Hunting Units

Hunt Unit	Acres	Bear	Deer	Coyote	Turkey	Waterfowl*
CONCORD UNIT						
Bedford	279	X	C	X	X	
Carlisle	259	X	C	X	X	
Concord River Waterfowl	109	X	C	X	X	C
Kinnelly	53	X	C	X	X	
South of SR 225	484		X	X	X	
SUDBURY UNIT						
North of Sherman Bridge Rd	294		X	X	X	X
Water Row	628	X	C	X	X	
Sudbury River Waterfowl	274	X	C	X	X	C
Wolbach Strand	237	X	C	X	X	
Pelham Island	376	X	C	X	X	X
Stone Bridge	303	X	C	X	X	
South of Heard Pond	105	X	C	X	X	C
Total Acres	3,401	2,623	3,401	3,401	3,401	1,004

C = Currently Opened, X = New Opportunity

* All hunting units are archery only except for waterfowl.

* Acres open to waterfowl may only reflect a portion of the Hunt Unit to reflect riverine and wetland areas. See Figures 2 and 3 in Hunt Plan for specific waterfowl hunting areas.

Oxbow NWR

Oxbow NWR currently includes 1,695 acres along the Nashua River. Portions of Oxbow NWR south of route 2 have been open to hunting of turkey, gray squirrel, cottontail rabbit, ruffed grouse, snipe and American woodcock since 1976 under previous ownership. Hunting is currently allowed on 1,543 acres which includes all units except the Closed Area and Hospital Road North. Under the new hunting plan an additional 128 acres will be open, increasing the total hunting acreage to 1,671. No rifles or handgun are allowed refuge wide. See Table A-4: Oxbow NWR Hunting Units (1) and (2) for a list of specific hunt units, species, and acres.

In the north units we are proposing to maintain hunting opportunities in the Walker Road unit (158 acres) for deer, turkey, upland game (grouse, rabbit, and squirrel) and woodcock. Opportunities for bear hunting will also be added to Walker Road Unit in alignment with State Regulations, with the exception of no rifles or handguns allowed. The Bishop Road Unit (234

*Eastern Massachusetts National Wildlife Refuge Complex
Appendix A - Compatibility Determination*

acres) is currently only open for archery deer and turkey hunting. Bishop Road area will be opened for new opportunities including upland game (grouse, rabbit, and squirrel), migratory birds (woodcock and waterfowl), turkey and bear, with the exception of no rifles or handguns allowed. Coyote and fox opportunities will be added following State regulations and only concurrently with deer season, and corresponding method of take for deer. Following these changes, Bishop Road and Walker Rod will be combined and renamed North Unit. The Sheridan Road Unit (142 acres) and Hospital Road South Unit (169 acres) are currently open for archery deer hunting and shotgun grouse, rabbit, squirrel, turkey and waterfowl. Woodcock hunting is also allowed on Sheridan Road. We will expand hunt opportunities to include bear, coyote, and fox as well as come into alignment for method of take for these species in these two units, with exception of no rifles or handguns allowed. The Hospital Road North Unit will be opened for the first time. Due to the proximity to sports fields, hunting opportunities for bear, coyote, deer, fox, and turkey will be by archery only following State regulations in addition to refuge-specific regulations.

The Route 2 South Unit at Oxbow NWR (248 acres) is currently open for white-tailed deer, turkey, woodcock, snipe, and upland game hunting. Coyote and fox opportunities will be added following State regulations and only concurrently with deer season, and corresponding method of take for deer. Bear will also be added following state seasons and method of take with the exception of no rifles or handguns allowed. . The Waterfowl area totals 466 acres and is open to hunt opportunities for the same species as the adjacent Route 2 South Unit and also includes waterfowl. We will expand waterfowl hunting opportunities to the adjacent Route 2 South Unit. Following these changes, Route 2 South and Waterfowl Area will be combined and collectively called Route 2 South. The Still River Depot Area is currently open and will be maintained as an archery only hunting area for deer and turkey. Archery only coyote, fox, and bear hunting opportunities will be added following refuge-specific regulations.

The portions of Oxbow NWR from Hospital Road north to Shirley Road/West Main Street, and from Shirley Road/West Main Street to the north side of the railroad tracts crossing MacPherson Road will remain closed to hunting.

Table A-4: Oxbow NWR Hunting Units (1)

Hunt Unit	Acres	Bear	Deer	Turkey	Coyote	Fox
North Unit	392	X	C	C	X	X
Hospital Road North	128	X	X	X	X	X
Hospital Road South	169	X	C	C	X	X
Sheridan Road	142	X	C	C	X	X
Still River Depot Area	126	X	C	C	X	X
Route 2 South	714	X	C	C	X	X
Total Acres	1,671	1,671	1,671	1,671	1,671	1,671

C = Currently Opened, X = New Opportunity

Table A-5: Oxbow NWR Hunting Units (2)

Hunt Unit	Acres	Grouse	Rabbit	Snipe	Squirrel	Waterfowl	Woodcock
North Unit	392	X	X		X	X	X
Hospital Road North	128	X	X				
Hospital Road South	169				C	C	
Sheridan Road	142	C	C		C		C
Still River Depot Area	126						
Route 2 South	714	C	C	C	C	C	C
Total Acres	1,671	1,417	1,417	714	1,417	1,275	1,248

C = Currently Opened, X = New Opportunity

(c) When would the use be conducted?

Hunt seasons for big game, upland game, and migratory game bird will be in accordance with State of Massachusetts hunting seasons except for bear, coyote, and fox. At Assabet River NWR, bear hunting will only be open during the second season and shotgun season following refuge-specific regulations in addition to Massachusetts State regulations. For coyote and fox, Assabet River, Great Meadows, and Oxbow NWR will only open concurrent with the deer season to mitigate conflicts with user groups such as Urban Education and other Youth Environmental Education programs that take place in the fall. The refuge also does not currently have the resources to administer such a long hunt season. Turkey hunting is currently allowed in the spring only. All three refuges will open for the fall turkey season (following refuge method of take restrictions in some areas) and in accordance with State regulations.

(d) How would the use be conducted?

All persons hunting on the refuge will be required to obtain the necessary State licenses, permits and stamps. A valid Massachusetts hunting license is required. Migratory game bird hunters will be required to have a Federal Migratory Bird Hunting and Conservation Stamp (“Duck Stamp”). In addition, all hunters on any of the three refuges in the northern part of the Complex (Great Meadows, Oxbow and Assabet River NWRs) will need to purchase and possess an annual hunting permit. Individual hunting permits are required for each of the deer, migratory bird, turkey, and upland game hunting seasons and cover those species at Assabet River, Great Meadows, and Oxbow NWRs. Youth hunters (between the ages of 12 to 17) are required to obtain a single permit at no cost that covers all hunting seasons. Discounted permits are offered to active-duty members of the military, permanently disabled hunters, and senior citizens (at least 62 years of age).

To maintain a quality hunt, the number of permits made available for shotgun and muzzleloader deer season are limited and disbursed through a lottery system. Permits for all hunts are sold online through a 3rd-party vendor.

The refuge will make a reasonable effort to allow hunters access to all portions of the hunt areas. The intention is to provide safe, quality hunting opportunities that consider the welfare of the refuge wildlife resources. Access to the refuge for all hunt seasons is through walking, snowshoeing, or via boat. All access points including hunter parking lots and boat ramps will be delineated on refuge hunt maps and will be included in the hunt brochures.

Cutting of vegetation is prohibited. Limited special hunts will be provided for Americans with Disabilities Act (ADA) hunters and other special user groups including. Selected roads on the refuge will remain open for restricted vehicle traffic. Some of these roads will allow us to provide ADA hunting opportunities. Hunters must mark tree stands/blinds with refuge permit number.

(e) Why is the use being proposed?

Hunting is a healthy, traditional recreational use of renewable natural resources deeply rooted in America's heritage, and it can be an important wildlife management tool. During the CCP process, each of these three refuges identified goals to provide opportunities for hunting and fishing where appropriate and compatible with refuge purposes. Assabet River NWR established specific goals to open the refuge to upland game, migratory birds, and big game species in their CCP. Both Great Meadows and Oxbow NWRs established goals to expand the hunting acreage for white-tailed deer and waterfowl.

Therefore, this proposed action will bring these refuges into compliance with objective set in their CCPs. Furthermore, Department of the Interior Secretarial Order 3356 directs the Service to enhance and expand public access to lands and waters on national wildlife refuges for hunting, fishing, recreational shooting, and other forms of outdoor recreation. The proposed action will promote one of the priority public uses of the Refuge System, and providing opportunities for visitors to hunt will promote stewardship of our natural resources and increase public appreciation and support for the refuge.

AVAILABILITY OF RESOURCES:

There are sufficient funds within the annual operating budget of the Eastern Massachusetts NWRC to conduct the expanded refuge hunting program as proposed. There will be little difference in the amount of law enforcement needed under the previous hunting plan and this proposed expanded plan at Assabet River, Great Meadows, and Oxbow NWRs. During the hunt season, current law enforcement efforts are focused on prohibiting poaching in the refuge and ensuring a safe hunt. The refuge has successfully implemented hunting programs on all three refuges for over 10 years.

Hunting on the refuge will be by annual permit and fees are collected for specific hunting season

including archery deer, muzzleloader deer, shotgun deer, turkey, upland game. One fee is valid for Assabet River, Great Meadows, and Oxbow NWRs only for the seasons that are allowed at each NWR. Fee money collected will help recover costs for funding the program.

Table A-6: Initial Costs of Hunting Programs at Eastern Massachusetts NWRC

Activity	Material Costs	Labor Costs	Total
Document Preparation	\$500	\$5,000	\$5,500
Posting/Signs	\$3,000	\$1,000	\$4,000
Administration	\$500	\$5,000	\$5,500
Outreach	\$500	\$2,000	\$2,500
Law Enforcement	\$1000	\$30,000	\$31,000
Totals	\$5,000	\$28,000	\$48,500

Table A-7. Annual Costs of New Hunting Programs at Eastern Massachusetts NWRC

Activity	Material Costs	Labor Costs	Total
Document Preparation	\$500	\$1,800	\$2,300
Posting/Signs	\$500	\$1,500	\$2,000
Administration	\$1000	\$3,000	\$4,000
Outreach	\$500	\$1,800	\$2,300
Law Enforcement	\$1,000	\$30,000	\$31,000
Totals	\$3,500	\$38,100	\$41,600

ANTICIPATED IMPACTS OF THE USE:

Hunting can result in positive or negative impacts to the wildlife resource. A positive effect of increasing access to the refuge will be the provision of additional wildlife-dependent recreational opportunities and a better appreciation and more complete understanding of the wildlife and habitats associated with Massachusetts ecosystems. This can translate into more widespread and stronger support for the refuges of the Complex, the Refuge System, and the Service.

Vegetation

The current number of hunters comprises a small fraction of the Complex’s total visitation. Hunting could negatively impact vegetation by trampling or creating foot paths. With the

opening of new hunt areas that trampling of vegetation may increase slightly, but the physical effects on refuge vegetation from hunting is expected to be minimal based on anticipated levels of use. Hunting could create a positive, indirect effect on vegetation through controlling the white-tailed deer population.

Negative cumulative impacts of recreational hunting include the temporary trampling of vegetation and light soil erosion. Most hunting activities occur during the fall, but impacts will be minimal. Some hunt seasons extend into winter when plants are dormant and the ground is frozen and/or covered in snow. Hunters would have minimal impacts on plants during this period. For these reasons, hunting is expected to have minimal adverse short-term, long-term, or cumulative impacts on vegetation.

Soils

It is anticipated that hunting on the Complex will have minor impacts to soils. The hunt program has the potential to cause some compaction and/or erosion because off-trail foot travel does occur. However, with a limited number of hunters dispersed across the refuge during the hunting season, impacts would be minimal. At the anticipated levels of use, hunting is expected to have minimal adverse short-term, long-term, or cumulative impacts on soils.

Hydrology (Water Resources and Wetlands)

Hydrology impacts from hunting would be minimal and only result from the use of roads and trails. Unsurfaced trails are susceptible to a variety of impacts including vegetation loss and compositional changes, soil compaction, erosion and muddiness, exposure of plant roots, trail widening, and the proliferation of visitor created side trails (Marion and Leung 2001). However, hunting is expected to have minimal adverse short-term, long-term, or cumulative effects as hunters are generally dispersed, which reduces repeated erosive actions on soils.

Other Wildlife

Hunting can have direct and indirect impacts on both target and non-target species. These impacts include: direct mortality of individuals, changes in wildlife behavior, changes in wildlife population structure, dynamics, and distribution patterns, and disturbance from noise and hunters walking on- and off-trail (Cole and Knight 1990, Cole 1990, Bell and Austin 1985). However, under the anticipated levels of use these impacts are expected to be minimal. Hunters tend not to disperse very far from parking areas and roads, which leaves large areas of refuge land undisturbed.

White-Tailed Deer

The white-tailed deer population in Massachusetts is estimated at over 100,000 deer in total (MassWildlife 2018). In some areas, deer density is as high as 25 to 30 deer per square mile. Oxbow NWR is located in Massachusetts' wildlife management zone (WMZ) 9. Assabet River and Great Meadows NWRs are located in WMZ 10. For WMZ 9, the State has set the target deer density at 12 to 18 deer per square mile of forest. In 2018, WMZ 9 was within that target range. For WMZ 10 the State has set the target deer density at 6 to 8 deer per square mile of forest. In 2018, WMZ 10 was well above that target range (MassWildlife 2018). With the deer populations on each refuge either within or above the carrying capacity for that area, white-tailed

deer hunting on the Complex is expected to have minimal adverse impacts to the State-wide population.

High deer densities have been shown to negatively affect plant and animal communities. Therefore, a hunting program would help to facilitate ecological diversity by mitigating the effects of high deer densities. Deer densities, if maintained through regulated hunting, will sustain the native vegetation and forest regeneration associated with the natural communities in those regions. Regulated deer hunting will also maintain a deer herd in good physical condition that staves off malnutrition and disease.

Wild Turkey

The State's turkey population is estimated to be between 30,000 and 35,000 individuals (MassWildlife 2018). Disturbance to turkeys in an area will occur during the hunting season, but the disturbance is considered negligible, as flocks are prone to move regularly over large areas. Expanding turkey hunting opportunities on the complex will not have any significant impacts to local or regional turkey populations.

Black Bear

State-wide black bear hunting has been permitted in Massachusetts since 2015. Black bear hunting on the complex will not have any significant impacts to the local or regional black bear populations. Disturbance to this species may occur during the hunting season, although the disturbance is considered negligible as the number of individuals encountered will be small.

Upland Game

Disturbance to these species in the area will occur during the hunting season, although the disturbance is considered negligible as the number of individuals encountered will be small. Potential impacts to target species include direct mortality or injury and indirect changes in behavior. To mitigate additional adverse impacts, the Eastern Massachusetts NWRC prohibits the use of toxic ammunition for upland game hunting.

Game Birds

Hunting would not have a significant impact on local, regional, or Atlantic Flyway waterfowl populations because the percentage taken on the Complex, though possibly additive to existing hunting take, would measure a fraction of a percent of the estimated migratory game birds populations. Potential impacts to target migratory species include direct mortality or injury and indirect changes in behavior. In addition to direct mortality, hunting could result in some short-term redistribution due to disturbance.

Other Visitors and Users

Under the proposed action the refuges of the Complex would be open to priority public uses including wildlife observation, environmental education, interpretation, photography, hunting, and fishing. With the addition of new hunt areas, a slight increase in the number of conflicts among user groups can be expected. During the hunting season, non-hunters may limit refuge visits to Sundays or they may avoid the refuge altogether. Public outreach, zoning, and restrictions in some locations have been proposed to reduce conflicts among the different user

groups. If conflicts arise among user groups, mitigation efforts can be implemented to ensure that the proposed action will not have significant impacts to other user groups.

Cumulative Impacts

Cumulative impacts on the environment result from incremental impacts of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. The refuge hunt program is designed to be sustainable through time, given relatively stable conditions, particularly because of close coordination with MassWildlife. The cumulative impacts of hunting on big game, upland game, and game bird populations at the Complex are negligible. The proportion of the refuge's harvest of these species is negligible when compared to local, regional, and State-wide populations and harvest.

Because of the regulatory process for harvest management in place within the Service, the setting of hunting seasons largely outside of the breeding seasons of resident and migratory wildlife, the ability of individual refuge hunt programs to adapt refuge-specific hunting regulations to changing local conditions, and the wide geographic separation of individual refuges, we anticipate no direct or indirect cumulative impacts on resident wildlife, migratory birds, and non-hunted wildlife of by use of hunting on the refuge.

Refuges, including those of the Complex, conduct hunting programs within the framework of State and Federal regulations. Hunting at the refuge is at least as restrictive as the Commonwealth of Massachusetts and in some cases more restrictive. Additionally, the refuge coordinates with the State as needed to maintain regulations and programs that are consistent with the State's management programs. Thus, we anticipate no direct or indirect cumulative effects on resident wildlife, migratory birds, or non-hunted wildlife by hunting at the Eastern Massachusetts NWRC.

PUBLIC REVIEW AND COMMENT:

This Compatibility Determination (CD) is part of the Eastern Massachusetts NWRC Hunting Plan and the accompanying EA. The plan has been thoroughly coordinated with all interested and/or affected parties, including MassWildlife. On March 16, 2020, we distributed a press release to news organizations and alerted the public about the availability of the hunting plan with postings on the respective refuge's websites. We also notified local town representatives and partners as well as emailed to members of the Friends of Assabet River NWR mailing lists. No public meetings were held due to bans on public gatherings due to COVID-19. The Refuge Manager did answer questions on the hunt plan during a Monthly River Stewardship Council Meeting of the Sudbury, Assabet, and Concord River Wild and Scenic Partnership, attended by representatives from seven towns and three partner groups. Upon request, the public comment period was extended from April 24, 2020 until May 22, 2020, for a total comment period of 68 days.

A total of 189 unique comments representing 501 individuals or entities were submitted to the refuge. Among these were two petitions: an online Care2.com petition with 262 signatures representing 40 people from Massachusetts, 55 people from other states, and 167 people living in

other countries; and, a mailed petition representing 25 Massachusetts people. Appendix D summarizes the substantive comments received on the proposal, and the Service's responses.

DETERMINATION (CHECK ONE BELOW):

Use is not compatible

Use is compatible, with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

The Complex will manage the hunt program in accordance with Federal and State regulations and review it annually to ensure wildlife and habitat goals are achieved and that the program is providing a safe, high quality hunting experience for participants. To ensure compatibility with refuge purposes and the mission of the Refuge System, hunting will occur on the Complex under the refuge-specific regulations highlighted in this document and the following stipulations:

- Eastern Massachusetts NWRC only permits non-toxic ammunition for migratory bird and upland game hunting.
- Refuge lands are closed to night hunting. Refuge hunting hours are half hour before sunrise to half hour after sunset, except for migratory waterfowl which is open to sunset.
- Hunters may enter the refuge 1.5 hours before legal hunting time and must leave the refuge within 1.5 hours after legal sunset.
- We allow the use of dogs consistent with State regulations when hunting migratory birds and upland game species.
- On Great Meadows NWR, only archery equipment may be used to hunt white-tailed deer, bear, turkey and coyote.
- On Assabet River and Oxbow NWR, no rifles or handguns are permitted for hunting of any species.
- Scouting can occur once the hunter has obtained a refuge permit. Scouting can begin no earlier than 4 weeks from the opening day of the hunt season from half hour before sunrise to half hour after sunset.

JUSTIFICATION:

The Refuge System Improvement Act of 1997 (P.L. 105-57) identifies six legitimate and appropriate uses of wildlife refuges: hunting, environmental education, interpretation, fishing, wildlife observation and wildlife photography. Hunting is a priority wildlife-dependent use for the Refuge System through which the public can develop an appreciation for fish and wildlife.

*Eastern Massachusetts National Wildlife Refuge Complex
Appendix A - Compatibility Determination*

Service policy is to provide expanded opportunities for wildlife-dependent uses when compatible and consistent with sound fish and wildlife management and ensure that they receive enhanced attention during planning and management.

Hunting satisfies a recreational need, but hunting on national wildlife refuges is also an important, proactive management action that can prevent overpopulation and the deterioration of habitat. Disturbance to other species will occur, but this disturbance is generally short-term. Suitable habitat exists on refuge lands to support hunting as proposed.

This activity will not conflict with any of the other priority public uses or adversely impact biological resources. Therefore, through this compatibility determination process, we have determined that hunting on the refuge, in accordance with the stipulations provided above, is a compatible use that will not materially interfere with, or detract from, the fulfillment of the Refuge System mission or the purpose(s) of the refuge.

SIGNATURE:

Refuge Manager

(Signature)

(Date)

CONCURRENCE:

Regional Chief

(Signature)

(Date)

MANDATORY 15 YEAR RE-EVALUATION DATE:

(Date)

LITERATURE CITED:

Cole, D.N. 1990. Ecological impacts of wilderness recreation and their management. In J.C. Hendee, G.H. Stankey, and R.C. Lucas (Eds.), *Wilderness Management* (pp. 425–466). Golden, CO: North American Press.

Cole, D.N. and Knight, R.L. 1990. Impacts of recreation on biodiversity in wilderness. *Natural Resources and Environmental Issues*, 0, 33-40.

Marion, J.L. and Leung, Y.-F. 2001 *Indicators and Protocols for Monitoring Impacts of Formal and Informal Trails in Protected Areas*. 217.

Massachusetts Division of Fisheries and Wildlife. 2018. *Annual Report. MassWildlife*. 182 pp.

Environmental Assessment for Hunting Eastern Massachusetts National Wildlife Refuge Complex

This Environmental Assessment (EA) is being prepared to evaluate the effects associated with this proposed action and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (43 CFR 46; 516 DM 8) and U.S. Fish and Wildlife Service (Service) (550 FW 3) regulations and policies. NEPA requires examination of the effects of proposed actions on the natural and human environment.

Proposed Action

The Service is proposing to open or expand recreational hunting opportunities in Massachusetts on the Eastern Massachusetts National Wildlife Refuge Complex (NWRC, Complex, refuge) in accordance with the refuge's Hunting Plan. The Complex will open opportunities for big game (white-tailed deer, bear, and/or wild turkey), upland game (fox, coyote, grouse, rabbit, and/or squirrel) and/or and migratory game birds (waterfowl, woodcock, and/or snipe). The Complex is proposing to open or expand hunting and fishing opportunities on refuge-owned lands when found to be compatible, and consistent with Federal, State, and refuge hunting and fishing regulations.

This proposed action is often iterative and evolves over time during the process as the agency refines its proposal and learns more from the public, Tribes, and other agencies. Therefore, the final proposed action may be different from the original. The final decision on the proposed action will be made at the conclusion of the public comment period for the EA.

Background

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (Refuge System), the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance includes the Refuge System Administration Act of 1966, as amended by the Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations (CFR) and Service Manual.

The Complex is made up of eight refuges, three of which are covered in this plan. Each national wildlife refuge is established under specific legislation. Similarly, each refuge has one or more specific legal purposes for which it was established. The establishing legislation and purposes for three of the refuges in the Complex are given below.

Table B-1: Refuge Purposes and Establishing Authorities

Refuge	Establishing Authorities	Refuge Purposes
Assabet River National NWR	...was established September 28, 2000 under an Act Authorizing the Transfer of Certain Real Property for Wildlife, or Other Purposes. (16 U.S.C. 667b).	... purpose is its“...particular value in carrying out the national migratory bird management program.” (16 U.S.C. 667b-d, as amended)
Great Meadows NWR	...was established May 3,1944 under authority of the Migratory Bird Conservation Act (16 U.S.C. § 715d) and Refuge Recreation Act (16 U.S.C. § 460k-1)	... “...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d), “... suitable for -- incidental fish and wildlife-oriented recreational development,” (16 U.S.C. § 460k-1), “the protection of natural resources,” (16 U.S.C. § 460k-1), “and the conservation of threatened or endangered species...” (16 U.S.C. § 460k-1)
Oxbow NWR	...was established May 24, 1974 under an Act Authorizing the Transfer of Certain Real Property for Wildlife, or Other Purposes. (16 U.S.C. 667b).	... is its “...particular value in carrying out the national migratory bird management program.” (16 U.S.C. 667b-d, as amended)

These refuges are managed as part of the Refuge System whose mission, as outlined by the National Wildlife Refuge System Administration Act (NWRSA), and as amended by the Refuge System Improvement Act (16 U.S.C. 668dd et seq.) is to:

“administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans”

The NWRSA mandates the Secretary of the Interior in administering the Refuge System to (16 U.S.C. 668dd(a)(4):

- Provide for the conservation of fish, wildlife, and plants, and their habitats within the Refuge System;

- Ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans;
- Ensure that the mission of the Refuge System described at 16 U.S.C. 668dd(a)(2) and the purposes of each refuge are carried out;
- Ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the States in which the units of the Refuge System are located;
- Assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the Refuge System and the purposes of each refuge;
- Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the Refuge System through which the American public can develop an appreciation for fish and wildlife;
- Ensure that opportunities are provided within the Refuge System for compatible wildlife-dependent recreational uses; and
- Monitor the status and trends of fish, wildlife, and plants in each refuge.

This plan sets forth guidance on the expansion and continued implementation of hunt programs at Assabet River, Great Meadows, and Oxbow NWR. All three refuges have been opened for hunting since at least 2005. Portions of Oxbow NWR south of Route 2 have been open to hunting of turkey, gray squirrel, cottontail rabbit, ruffed grouse, snipe and American woodcock since 1976 under previous ownership.

Purpose and Need for the Proposed Action

Hunting is a healthy, traditional recreational use of renewable natural resources deeply rooted in America's heritage, and it can be an important wildlife management tool. The Refuge System Administration Act of 1966, the Refuge System Improvement Act of 1997, and Service policy permit hunting on a national wildlife refuge as a priority wildlife-dependent recreational opportunity when it is compatible with the purposes for which the refuge was established and acquired.

The purpose of this proposed action is to expand opportunities for compatible hunting opportunities on Assabet River, Great Meadows, and Oxbow NWRs. Currently, there are five refuges in the Complex that conduct hunting programs within the framework of Federal and State regulations, including Assabet River, Great Meadows, Oxbow, Mashpee, and Monomoy NWRs. All authorized hunts are at least as restrictive as the State of Massachusetts. By maintaining hunting regulations that are as, or more, restrictive than the State, individual refuges ensure that they are maintaining seasons which are supportive of management on a local and

regional basis. Hunters on the refuge are expected to be ethical and respectful of other hunters, non-consumptive users, wildlife species, and the environment while on refuge lands.

The objectives of the hunting program on refuge lands are to:

- Provide the public with a high-quality recreational experience on refuge lands and increase opportunities and access for hunters;
- Implement a hunting program that is safe for all refuge users;
- Design a hunting program that is administratively efficient and manageable with existing staffing levels; and
- Design a hunting program that is in alignment with refuge habitat management objectives.

Department of the Interior Secretarial Order 3356 directs the Service to enhance and expand public access to lands and waters on national wildlife refuges for hunting, fishing, recreational shooting, and other forms of outdoor recreation. The proposed action will also promote one of the priority public uses of the Refuge System, and will promote stewardship of our natural resources and increase public appreciation and support for the refuge by providing opportunities for visitors to hunt. To address the needs stated above, the purpose of the proposed action will bring the refuge into compliance with management guidance detailed in the orders, policy, and Federal law to “recognize compatible wildlife-dependent recreational uses as the priority general uses of the Refuge System” and “ensure that opportunities are provided within the Refuge System for compatible wildlife-dependent recreational uses.” 16 U.S.C. 668dd(a)(4).

This EA serves as the NEPA document that analyzes the impacts on environmental, cultural, and historical resources of expanding hunting opportunities on the refuge.

Alternatives Considered

Alternative A: No Action Alternative

The No Action Alternative would continue the refuge’s current hunting program, which allows for hunting on specific areas of Assabet River, Great Meadows, and Oxbow NWRs as described in the 2007 refuge-specific EAs and Hunt Plans. Under this alternative, Assabet River NWR permits white-tailed deer, turkey, woodcock, grouse, rabbit, and squirrel hunting. Oxbow NWR permits white-tailed deer, turkey, woodcock, waterfowl, grouse, rabbit, and squirrel hunting. Great Meadows NWR permits white-tailed deer and waterfowl hunting. Hunting regulations for these refuge lands are consistent with State hunting regulations. Additional refuge-specific regulations also apply.

Alternative B: Proposed Action Alternative – Expand Hunting Opportunities at Assabet, Great Meadows, and Oxbow NWRs

The refuge Complex has prepared a hunt plan, which is presented in this document as the Proposed Action Alternative.

Under the Proposed Action Alternative, at Assabet River NWR, 2,273 acres (of 2,357 total) will be maintained or opened to hunting opportunities for new species or method of take, with exception of rifles or handguns, including 123 acres to be opened to hunting for the first time. New species added would include bear, coyote, fox, and waterfowl.

At Great Meadows NWR, 3,401 acres (of a total 3,874 acres) will be maintained or opened to hunting opportunities. Approximately 778 additional acres will be opened to archery-only deer hunting. Additionally, Great Meadows NWR will open all deer hunting units to turkey and coyote using archery equipment only. A total of 2,623 acres will be open to black bear hunting using archery equipment only for the first time. Currently 334 acres is open for waterfowl hunting and an additional 670 acres will be open to waterfowl hunting for a total of 1,004 acres.

At Oxbow NWR, 1,671 (of 1,695 acres total) will be maintained or opened to hunting opportunities, including 128 acres to be opened to hunting for the first time. New species added would include bear, coyote, and fox. New methods of take will be introduced in specific hunt units as outlined in the hunt plan.

Special Refuge-Specific Regulations

- Eastern Massachusetts NWRC only permits non-toxic ammunition for migratory bird and upland game hunting.
- Refuge lands are closed to night hunting. Refuge hunting hours are half hour before sunrise to half hour after sunset, except for migratory waterfowl which is open to sunset.
- Hunters may enter the refuge 1.5 hours before legal hunting time and must leave the refuge within 1.5 hours after legal sunset.
- We allow the use of dogs consistent with State regulations when hunting migratory birds and upland game species.
- On Great Meadows NWR, only archery equipment may be used to hunt white-tailed deer, bear, turkey and coyote.
- On Assabet River and Oxbow NWR, no rifles or handguns are permitted for hunting of any species.
- Scouting can occur once the hunter has obtained a refuge permit. Scouting can begin no earlier than 4 weeks from the opening day of the hunt season from half hour before sunrise to half hour after sunset.

The proposed action builds on an existing hunting program, and includes areas developed during the completion of each refuge’s respective CCP, which involved an extensive public review process; therefore, the Service does not need to consider additional alternatives (43 CFR 46.310).

Mitigation Measures to Avoid Conflicts

The refuge-specific regulations detailed in the plan (and in 50 CFR) are measures under the Proposed Action Alternative that will reduce or avoid impacts. Refuge and State law enforcement officers enforce hunting regulations. Providing hunting information through various forums will ensure the public is aware of applicable laws and policies.

To minimize conflict, refuge-specific hunt regulations and hunt unit maps (brochures) will be made available to hunters at kiosks, the refuge website and at the Refuge Complex Headquarters in Sudbury, Massachusetts. To help reduce interaction between hunters on the refuge and other user groups off the refuge, refuge boundaries and hunt area boundaries will be clearly posted. Further restrictions on season will be imposed at Assabet River NWR to accommodate youth environmental education visits. At Great Meadows NWR, only archery equipment may be used to hunt white-tailed deer, bear, turkey and coyote to mitigate concerns in a high density and fragmented urban area. Additionally, refuge lands are closed to night hunting. Refuge units may be closed to other public activities during special group hunts to increase overall safety and quality of the hunt.

This proposed alternative offers increased opportunities for public hunting and fishing and fulfills the Service’s mandate under the Refuge System Improvement Act of 1997. The Service has determined that the hunt and fish plan is compatible with the purposes of the Assabet River, Great Meadow, and Oxbow NWRs and the mission of the Refuge System.

Affected Environment

The Assabet River, Great Meadows, and Oxbow NWRs are located in the Boston Metrowest area. Assabet River NWR totals 2,357 acres. Great Meadows NWR totals 3,863 acres. Both are located in Middlesex County Massachusetts. Oxbow NWR totals 1,695 acres and is located in Middlesex and Worcester Counties. All three refuges are made up of a wide range of habitat types. Table B-2 provides a list of habitat types and descriptions of the dominant habitat types found on all three refuges.

Table B-2: Habitat Types and Descriptions

Habitat Type	Description
Grassland and Old Field	<i>Ruderal Grassland/Shrubland</i> is a community commonly referred to as “old field successional grassland.” This community develops in areas originally converted from forest to agriculture once agricultural practices are ended.

<p>Freshwater Wetland</p>	<p><i>Freshwater Marsh</i> is a wetland community occurring on flat-bottomed, shallow basins where the substrate consists of muck over mineral soil. <i>Phragmites australis</i> frequently invades emergent marsh communities.</p> <p><i>Forested Wetland (swamp)</i> is a forest where soils are saturated or flooded for at least a portion of the growing season, and vegetation, dominated by trees, is adapted to tolerate flooded conditions.</p> <p><i>Scrub- shrub Wetland</i> includes areas dominated by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. All water regimes except subtidal are included.</p> <p><i>Freshwater Pond</i> is an area filled with water, either natural or artificial, that is smaller than a lake which arises naturally in floodplains as part of a river system, or be a somewhat isolated depression (such as a kettle pond or vernal pool). It may contain shallow water with marsh and aquatic plants and animals.</p> <p><i>Vernal Pools</i> are small freshwater wetland communities occurring within forests. Vernal pools form in seasonally flooded basins that are too shallow to maintain water year-round. Vernal pools are important breeding areas for a number of amphibians because they do not support fish populations that would prey on eggs and larvae.</p>
<p>Open Water</p>	<p>Open water habitats include rivers, streams, and tidal estuaries and associated transitional habitats influenced by fluctuating water levels. Diadromous, anadromous and indigenous fish, freshwater mussels, mayflies, dragonflies, and amphibians rely on these communities for some stage of their life cycle. These habitats also provide foraging opportunities for other taxa including, waterfowl, herons, egrets, mink, and otter.</p>
<p>Oak-Pine Forest</p>	<p><i>Oak-pine forests</i>, known as transition hardwood forests, contain a combination of species typical in central and northern hardwood forest communities. Often, dominant species can be oak, sugar maple, yellow birch, American beech, red maple, black cherry, and sweet birch. It is also common to find eastern hemlock and white pine in this forest type. These forests are moderately vulnerable to climate change given the potential buffering effects of central hardwood species (red oak, black birch) on the loss of northern hardwood tree species (yellow birch) from these communities.</p>
<p>Shrubland</p>	<p><i>Scrub Oak Shrublands</i> are dense shrublands dominated by shrub oaks forming almost impenetrable thickets ranging from 2 to 3 feet (about 1m) to greater than 6 feet (2m) in height. They occur on sandplains, usually in</p>

	depressions where localized frosts keep out competing trees, and on ridge tops. Disturbances in both environments maintain mosaics in space and time of grassland and heathland openings.
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Environmental Consequences of the Action

This section analyzes the environmental consequences of the action on each affected resource, including direct and indirect effects. This EA focuses primarily on analyses of the environmental consequences on a resource when the impacts on that resource could be more than negligible and therefore considered an “affected resource.” Resources that will not be more than negligibly impacted by the action have been dismissed from further analyses.

Tables B-3 through B-7 provide: (1) a brief description of the affected resources in the proposed action area; and (2) anticipated impacts of the proposed action and any alternatives on those resources, including direct and indirect effects. Table B-8 provides a brief description of the cumulative impacts of the proposed action and any alternatives.

Impact Types

Direct effects are those which are caused by the action and occur at the same time and place. Effects can be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, social, or medical.

Indirect effects are those which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Effects can be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, social, or medical.

Negligible impacts result from management actions that cannot be reasonably expected to affect identified refuge resources or recreational opportunities at the identified scale.

Table B-3. Affected Natural Resources and Anticipated Impacts

NATURAL RESOURCES	
AFFECTED RESOURCE	ANTICIPATED IMPACTS
<p>Big Game (<i>White-tailed Deer, Wild Turkey, Black Bear</i>) Populations of these species have generally remained steady in Massachusetts. The State monitors the populations and will continue to adjust seasons, and limits to maintain healthy populations.</p>	<p>No Action Under this alternative, the current hunt program would be maintained.</p> <p><u>White-tailed deer:</u> White-tailed deer hunting would continue to be permitted in designated areas of Assabet River,</p>

White-tailed deer:

For white-tailed deer, each refuge is within a Wildlife Management Zone (WMZ) that is either within or above the target deer density for that area (MassWildlife 2018).

The white-tailed deer population in Massachusetts is estimated at over 100,000 deer in total (MassWildlife 2018). In some areas, deer density is as high as 25 to 30 deer per square mile. Oxbow NWR is located in Massachusetts' wildlife management zone (WMZ) 9. Assabet River and Great Meadows NWRs are located in WMZ 10. For WMZ 9, the State has set the target deer density at 12 to 18 deer per square mile of forest. In 2018, WMZ 9 was within that target range. For WMZ 10 the State has set the target deer density at 6 to 8 deer per square mile of forest. In 2018, WMZ 10 was well above that target range (MassWildlife 2018).

Wild turkey:

Wild turkeys are a resident wildlife species, whose population is managed by MassWildlife. Wild turkeys were reintroduced to Massachusetts in the 1970s and their populations have increased with the help of in-State transplants (ceased in 1996) and dispersal from adjacent states. The State population is estimated at greater than 30,000 to 35,000 birds with about 3,000 harvested statewide annually (MDFW 2018b). Wild turkey harvest is restricted to two bearded birds in the spring season and one bird in the fall season. This limit is set to maintain a healthy and stable population.

Black bear:

MassWildlife approved Statewide black bear hunting in 2014 to aid in population management. Black bear hunting has been permitted since 2015 and the number of

Oxbow, and Great Meadows NWRs. For the 2019 season, 555 permits for the various seasons (archery, muzzleloader, and shotgun) were issued for deer hunting on the Complex. During the 2019 season, we estimate that 18 deer were harvested from Assabet River NWR, 12 deer were harvested from Oxbow NWR, and 20 deer were harvested from Great Meadows NWR. Current levels of harvest would be expected under this action as no new opportunities would be provided.

Wild turkey:

Wild turkey hunting would continue to be permitted in designated areas of Assabet River and Oxbow NWRs. For the 2019 season, 52 permits were issued for turkey hunting on the Complex. During the 2019 season, 1 turkey was harvested from Assabet River NWR and 2 turkey were harvested from Oxbow NWR. Current levels of harvest would be expected under this action as no new opportunities would be provided.

Black bear:

Bear hunting would not be offered at Assabet River, Oxbow, and Great Meadows NWRs. There would continue to be no bears harvested on refuge property as no hunting opportunities would be provided.

Proposed Action

White-tailed deer:

Under this proposed action, white-tailed deer hunting opportunities will be expanded by 1,029 acres in total across the three refuges. It is unlikely that hunter numbers in this area will increase considerably, though some increase is expected. Under current level of use there is approximately 1 deer hunter for every 11 acres of land. If the current levels of use remain stable, the refuge can expect the additional 1,029 acres of open hunting land to support up to 93 new deer hunters in 2020. While the refuge can support the capacity of 93 additional

<p>permits granted have increased each year. There are currently only records of bears at Oxbow NWR, although there has been reports that the population is expanding east to more urban areas where human conflict will increase.</p> <p>There are an estimated 4,500+ black bears in Massachusetts and the population is estimated to be increasing by about 8 percent annually with hunters harvesting less than 6 percent of the population yearly. The estimated population of 45,000 to 50,000 occurs throughout New England.</p> <p>MassWildlife authorizes 3 statewide hunting seasons for black bear. During the three hunting seasons in 2018, a total of 204 bears were harvested statewide. This represents a drop from the 270 bears taken in 2017 and record of 283 bears taken in 2016. The breakdown by season for 2018 is as follows:</p> <p>First season (Sept. 4 – Sept. 22): 152 Second season (Nov. 5 – Nov. 24): 19 Shotgun season (Nov. 26 – Dec. 8): 33</p> <p>The September and November seasons were virtually identical in 2017 (151 and 26) and 2018. The big decrease in harvest in 2018 was during the Shotgun season. Bears were active very late in 2017, resulting in a high Shotgun season harvest, 93 bears taken. The lack of hard mast in 2018 saw bears enter their dens early, which resulted in a corresponding reduction in the Shotgun season harvest, with only 25 bear taken. Assabet River NWR and Great Meadows NWR are located in Middlesex County, and Oxbow NWR is in Middlesex and Worcester Counties.</p>	<p>deer hunters, we anticipate that 40 to 50 additional hunters is more likely. An increase in the hunting area would increase the number of deer harvested on the refuge and that is estimated to be an additional 10 to 12 deer harvested in the Complex. Disturbance to deer in the area will occur during the hunting season, but the disturbance is considered negligible, as deer are prone to move regularly over large areas. With the deer populations on each refuge either within or above the carrying capacity for that area, white-tailed deer hunting on the Complex is expected to have minimal adverse impacts to the State-wide population.</p> <p><u>Wild turkey:</u> 3,652 additional acres would be provided for turkey hunting on the Complex. Expanding opportunities for turkey hunting will have a minor impact the local turkey population. Under the current level of use, there is approximately 1 turkey hunter for every 71 acres of land. If the current levels of use remain stable, we can expect the additional 3,652 acres of open hunting land to support up to 51 new turkey hunters in 2020. As with deer hunting, while the refuge can support the capacity of 51 additional turkey hunters, we anticipate that 40 to 50 total additional hunters is more likely. The State generally does not change the number of permits issued for turkey hunting under refuge alternatives, so there no expected increase in harvested turkeys statewide. However, expanding turkey hunting opportunities may result in a minor increase in turkey harvest on the Complex that is estimated to be an additional 3 to 5 turkeys harvested. The harvest on the refuge would have a negligible impact on the overall population. Disturbance to turkeys in an area will occur during the hunting season, but the disturbance is considered negligible, as flocks are prone to move regularly over large areas.</p> <p><u>Black bear:</u></p>
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Black bear harvest by county, 2008-2018			
Year	State Total	Middlesex	Worcester
2018	204	3	13
2017	270	-	9
2016	283	1	12
2015	237	1	16
2014	240	4	8
2013	148	1	8
2012	185	1	6
2011	131	-	7
2010	144	-	3
2009	169	1	3
2008	100	-	3

Bear populations are expected to continue to expand eastward to more densely populated counties of Middlesex and Worcester County. As part of MassWildlife’s effort to radio collar black bears, three male bears were trapped at a site less than 2 miles from the Hospital South Unit at Oxbow NWR (Pers comm, MassWildlife) As of winter 2019/2020, there have been no confirmed reports of bears in or near Assabet River and Great Meadows NWR; however, there have been sightings of bears further east in Lexington, Bedford, and Arlington, MA.

The Complex will open 6,465 acres for black bear hunting for the first time. Disturbance to this species may occur during the hunting season, although it is considered negligible, as the number of individuals encountered will be small. In Massachusetts the use of dogs, night hunting, and baiting bear are all prohibited. This includes the use of lures, scents, or any other substance as a bear attractant.

Given the limited occurrence, the Complex does not anticipate a huge demand for bear permits, and estimates only issuing five to six bear hunting permits in 2020 under this proposed expansion. Given the state hunting restrictions and the very small number of bears reported within the Complex, we estimate only one bear to be harvested over a five to eight year period in the Complex.

At Assabet River NWR, the North Unit B, Unit C, and South Unit will open to black bear hunting for archery only. North Unit A will open to all methods of take in alignment with State regulations for bear hunting, with exceptions of no rifles or handguns. For all units bear hunting will only be open during the second bear and shotgun seasons. This restriction will mitigate potential conflicts with other user groups and other youth environmental education programs that take place during first State bear seasons.

At Great Meadows NWR areas open to deer and turkey hunting (except North of Sherman Bridge Road and South of SR 225) will be open to bear hunting via archery only for all State seasons.

At Oxbow NWR, the Route 2 South, Waterfowl Area, Sheridan Road, Hospital Road South, Hospital Road North, Bishop Road and Walker Road units will open to black bear hunting in alignment with State regulations for

	<p>method of take and seasons, with exception of no rifles or handguns. The Hospital Road North Unit and Still River Depot will be open to bear hunting via archery only for all State seasons.</p>
<p>Upland Game (<i>Coyote, Fox, Grouse, Rabbit, Squirrel</i>) The State will adjust seasons, and limits to maintain healthy populations.</p> <p><u>Coyote and fox:</u> For coyote and fox, there are currently no bag limits. MassWildlife estimates the statewide population of coyotes is between 9,500 and 11,500 animals. This number is not expected to increase significantly, as coyotes have exhausted all suitable habitat in the State. Studies shows that it would take about a 70 to 75 percent reduction in the population to permanently decrease the population of coyotes (MassWildlife 2019, Wade, 1981). Over the last 10 years, the annual harvest has been between 400 to 750 (which is less than 10 percent of the population).</p> <p>In 2018, 522 tagged coyotes were harvested in Massachusetts (MassWildlife 2018). On average, this number has increased over the previous four years, from 486 in 2017, 532 in 2016, 465 in 2015, and 420 in 2014 (MassWildlife 2017, 2016, 2015, 2014).</p> <p>Red and gray foxes are common and abundant species in Massachusetts. In 2018, 126 tagged foxes (red and gray) were harvested in Massachusetts (MassWildlife 2018). This number varied slightly over the previous four years, from 126 in 2017, 87 in 2016, 114, in 2015, and 130 in 2014.</p> <p><u>Rabbit and squirrel:</u> For rabbit and squirrel, the current bag limit is 5 per day with no annual limit. These species are common and abundant in the State of Massachusetts with high</p>	<p>No Action Under this alternative, the current hunt program would be maintained.</p> <p><u>Coyote and Fox:</u> Coyote and fox hunting would not be offered at Assabet River, Oxbow, or Great Meadows NWRs. There would continue to be no coyotes or foxes harvested on refuge property as no hunting opportunities would be provided.</p> <p><u>Rabbit and squirrel:</u> Rabbit, squirrel, and grouse hunting would continue in designated areas of Assabet River and Oxbow NWRs. Current levels of harvest would be expected under this action as no new opportunities would be provided. In 2019, 35 permits were issued for upland game and it is estimated that 40 squirrel and 50 rabbits were harvested in the 2,515 acres opened to rabbit and squirrel hunting.</p> <p><u>Ruffed Grouse:</u> Grouse hunting would continue on designated areas of Assabet River and Oxbow NWRs. Current or lower levels of harvest would be expected under this action as no new opportunities would be provided. In 2019, 35 permits were issued for upland game and it is estimated that less than 10 grouse were harvested in the Complex in the 2,515 acres opened to grouse hunting.</p> <p>Proposed Action <u>Coyote and fox:</u> Coyote and/or fox hunting would be opened for the first time at Assabet River, Oxbow, and Great Meadows NWRs. 7,345 new acres of hunting area would be provided for coyote hunting. A total of 3,944 new acres of hunting</p>

<p>reproductive success. Studies have suggested that Rabbits both compete with native animals for food and shelter and act as easy prey for abundant populations of mesopredators including fox and coyotes. By over-grazing vegetation and reducing habitat complexity, they support unsustainable populations of mesopredators (Lurgi, et al, 2018)</p> <p><u>Ruffed Grouse:</u> For grouse the current bag limit is 3 per day and 15 per season. Ruffed grouse populations are generally declining the the Eastern United States (Bomberg et. al. 2011) but bag limits are set to maintain viable populations.</p>	<p>area would be provided for fox hunting. Night hunting and baiting are not permitted on the refuge and the season would only be open concurrent with the deer season. Since the hunting season is limited and these species are typically less active during the daytime, we do not expect a large harvest to occur, and estimate harvests less than 10 coyotes and less than 10 fox. The Complex does not anticipate a high demand for coyote hunting, and estimates issuing approximately 25 additional permits to account for coyote and fox hunting in 2020. This harvest would have a negligible impact on the overall population. Disturbance to these species in the area will occur during the hunting season, although the disturbance is considered negligible compared to the Statewide populations. Hunting will end before the spring breeding season to prevent impacts of compensatory reproduction from hunting pressures resulting in the unintended increase in coyote and fox populations.</p> <p><u>Rabbit and squirrel:</u> Under the Proposed Action, 234 additional acres of Oxbow NWR would be opened for rabbit and squirrel hunting. Under the current level of use, there is approximately 1 small game hunter for every 71 acres of land. If the current levels of use remain stable, the refuge can expect the additional 234 acres of open hunting land to support approximately 3 new small game hunters in 2020. Therefore, disturbance to these species from the proposed action will be considered negligible.</p> <p><u>Ruffed Grouse:</u> Under the Proposed Action, 234 additional acres of Oxbow NWR would be opened for grouse hunting. Under the current level of use, there is approximately 1 small game hunter for every 71 acres of land. If the current levels of use remain stable, the refuge can expect the additional 234 acres of open hunting land to support approximately 3 new small game</p>
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	<p>hunters in 2020. We estimate an additional 2 to 3 grouse harvested as a result of the additional acres opened. Therefore, disturbance to these species from the proposed action will be considered negligible.</p>																																																															
<p>Migratory Game Bird <i>(Waterfowl, woodcock, snipe)</i> Harvest for these species is cooperatively regulated among an international consortium (Atlantic Flyway Council (AFC)) of wildlife managers and are based on surveys, harvest data, and habitat data.</p> <p>Estimates of waterfowl harvest and hunter activity (Raftovich, R.V., K.K. Fleming, S. C. Chandler, and C.M. Cain, 2019) in Massachusetts during the 2017 and 2018 hunting seasons include:</p> <table border="1" data-bbox="215 940 755 1543"> <thead> <tr> <th></th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr><td>Mallard</td><td>4,178</td><td>7,186</td></tr> <tr><td>Black Duck</td><td>2,289</td><td>3,721</td></tr> <tr><td>MallardBlackHybrid</td><td>94</td><td>0</td></tr> <tr><td>Wigeon</td><td>0</td><td>171</td></tr> <tr><td>Green-winged Teal</td><td>755</td><td>770</td></tr> <tr><td>Northern Pintail</td><td>24</td><td>0</td></tr> <tr><td>Wood Duck</td><td>3,115</td><td>5,004</td></tr> <tr><td>Greater Scaup</td><td>47</td><td>0</td></tr> <tr><td>Lesser Scaup</td><td>71</td><td>0</td></tr> <tr><td>Goldeneyes</td><td>189</td><td>128</td></tr> <tr><td>Bufflehead</td><td>1,487</td><td>1,198</td></tr> <tr><td>Long-tailed Duck</td><td>1,815</td><td>598</td></tr> <tr><td>Eiders</td><td>4,698</td><td>2,991</td></tr> <tr><td>Scoters</td><td>2,029</td><td>2,222</td></tr> <tr><td>Hooded Merganser</td><td>283</td><td>599</td></tr> <tr><td>Other Mergansers</td><td>354</td><td>813</td></tr> <tr><td>Total Duck Harvest</td><td>21,400</td><td>25,400</td></tr> <tr><td>Active Duck Hunters^a</td><td>2,900</td><td>3,400</td></tr> <tr><td>Hunter Days Afield^a</td><td>15,400</td><td>18,500</td></tr> <tr><td>Duck Harvest/Hunter^a</td><td>4.4</td><td>5.8</td></tr> </tbody> </table> <p>Refuge populations of these species have remained relatively stable.</p>		2017	2018	Mallard	4,178	7,186	Black Duck	2,289	3,721	MallardBlackHybrid	94	0	Wigeon	0	171	Green-winged Teal	755	770	Northern Pintail	24	0	Wood Duck	3,115	5,004	Greater Scaup	47	0	Lesser Scaup	71	0	Goldeneyes	189	128	Bufflehead	1,487	1,198	Long-tailed Duck	1,815	598	Eiders	4,698	2,991	Scoters	2,029	2,222	Hooded Merganser	283	599	Other Mergansers	354	813	Total Duck Harvest	21,400	25,400	Active Duck Hunters ^a	2,900	3,400	Hunter Days Afield ^a	15,400	18,500	Duck Harvest/Hunter ^a	4.4	5.8	<p>No Action Under this alternative, the current hunt program would be maintained. Current levels of migratory bird harvest would be expected under this action as no new opportunities would be provided. In 2019, the Complex issued 173 migratory bird permits for the refuge. Based on current levels, we estimate annual harvest totals at the 3 refuges is approximately:</p> <p>Assabet (currently closed): 0 ducks/0 geese Great Meadows: 48 ducks/24 geese Oxbow: 12 ducks/10 geese/6 woodcock</p> <p>Proposed Action This alternative would open new lands to migratory game bird hunting, including 2,686 acres for waterfowl and 234 acres for woodcock. This may result in a small increase in hunter numbers and harvest. Under current level of use, there is approximately 1 migratory bird hunter for every 17 acres of land. If the current levels of use remain stable, the refuge can expect the additional 2,920 acres of open hunting land to support up to 172 new migratory bird hunters in 2020. While the refuge can support the capacity of 173 additional waterfowl hunters, we anticipate that 40 to 50 additional hunters is more likely.</p> <p>With the proposed action, we anticipate that annual harvest totals at the 3 refuges would approximately be:</p> <p>Assabet River: 25 ducks/24 geese Great Meadows: 75 ducks/40 geese Oxbow: 22 ducks/18 geese/12 woodcock</p>
	2017	2018																																																														
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	<p>Massachusetts sets State season length and harvest limits (within the limits set for the Atlantic Flyway) for all species we propose to open to hunting at the refuge units. They have determined that populations are at levels acceptable to support a public hunt while maintaining healthy population levels that are commensurate with the carrying capacity of the habitat. The Massachusetts migratory bird season is currently open from September through February. Hunting would not have a significant impact on local, regional, or Atlantic Flyway waterfowl populations, because the percentage taken on the Complex, though possibly additive to existing hunting take (i.e., less than 125 ducks and 85 geese), would measure a fraction of a percent of the estimated migratory game birds populations. Potential impacts to target migratory species include direct mortality or injury and indirect changes in behavior. In addition to direct mortality, hunting could result in some short-term redistribution due to disturbance.</p> <p>It is not anticipated that the proposed action at the refuge would influence populations at the Flyway or Continental level.</p>
<p>Other Wildlife and Aquatic Species The refuge supports a diversity of wildlife species in Eastern Massachusetts including game and nongame species, reptiles, amphibians, and invertebrates, which are important contributors to the overall biodiversity on the refuge. Some songbirds and raptors breed at the refuge, whereas others utilize the refuge for wintering and during migration.</p>	<p>No Action Under this alternative, the current hunt program would be maintained with a total of 6,316 acres available in the Complex to some form of hunting. A total of 401 hunters (555 total permits issued for multiple hunt opportunities) is estimated Complex-wide, and results in an average density of one hunter per 15 acres. However, hunting pressure is spread over the duration of the hunting season for multiple species, thereby minimizing the impacts. This alternative currently results in some short-term, but negligible, negative impacts to small mammals, birds, and other wildlife due to</p>

	<p>disturbance in areas where human access for hunting activities occurs.</p> <p>Proposed Action Hunting can have direct and indirect impacts on both target and non-target species. These impacts include: direct mortality of individuals, changes in wildlife behavior, changes in wildlife population structure, dynamics, and distribution patterns, and disturbance from noise and hunters walking on- and off-trail (Cole and Knight 1990, Cole 1990, Bell and Austin 1985). However, under the anticipated levels of use these impacts are expected to be minimal. Hunters tend not to disperse very far from parking areas and roads, which leaves large areas of refuge land undisturbed. While resident and non-game wildlife in areas newly opened to hunters and hunting may be negatively impacted by disturbance, that impact is expected to be negligible. This proposed action will open an additional 1,029 acres, bringing the total acres to 7,345 total acres for multiple species over the duration of the hunting season. While the available hunt area would be able to support additional hunters as noted above, the total increase is estimated to be between 40 to 50 new hunters a year total due to this proposed action. This estimated number of hunters is low in proportion to the available hunt area, and as it has been observed that the current hunt program has only minor and temporary impacts on other wildlife; thus, this expansion is anticipated to have minor and temporary impacts, with the dispersed nature of hunting across wide areas, and that human disturbance is both uncommon and short-term.</p> <p>Deer and turkey hunt participants will be encouraged to voluntarily use non-toxic ammunition. Scavenging of unrecovered deer and deer gut piles resulting from the permit deer hunt will likely occur and may cause detrimental impacts caused by lead exposure.</p>
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<p>Threatened and Endangered Species and Other Special Status Species With the exception of occasional (most likely wintering) bald eagles, no federally listed threatened or endangered species currently inhabit Assabet River, Great Meadows, and Oxbow NWRs.</p> <p>State-listed species occurring on the refuges include Blanding’s turtle, blue-spotted salamander, and whip-poor-will, American bittern, and least bittern.</p>	<p>No Action Under this alternative the current hunt program would be maintained. No federally listed species occur regularly on the refuges and therefore there are no direct impacts to those trust resources.</p> <p>Proposed Action Under the proposed plan, there will be negligible impacts to State-listed species as the majority of the hunting season occurs outside of the breeding and active season of those species and any impacts are expected to be negligible due to low hunter numbers.</p>
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<p>Vegetation (including vegetation of special management concern) Vegetation varies throughout the refuges; however, hunt areas are generally forested wetlands and uplands, shrublands, and old fields.</p>	<p>No Action Under this alternative, the current hunt program would be maintained. The current number of hunters comprises a small fraction of the Complex’s total visitation, with a total of 6,316 acres open to in the Complex to some form of hunting. A total of 401 hunters results in an average density of one hunter per 15 acres. However, hunting pressure is spread over the duration of the hunting season for multiple species, thereby minimizing the impacts. Minor impacts on vegetation observed with the current hunting program include trampling or creation of foot paths.</p> <p>Proposed Action Trampling of vegetation on newly opened lands could increase slightly because of an increased number of users and increase in frequency of use. However, the proposed action will open an additional 1,029 acres, bringing the total acres to 7,345 total acres for multiple species over the duration of the hunting season. The refuge does not anticipate a high demand for the new opportunities, and estimates that the expected increase in number of hunters is low in proportion to available hunt area (estimate of 40 to 50 new hunters per year) and dispersed, and therefore adverse impacts to vegetation are not expected to increase.</p> <p>Most hunting activities occur during the fall, and some hunt seasons extend into winter when plants are dormant and the ground is frozen and/or covered in snow. Hunters would have minimal impacts on plants during this period. For these reasons, hunting is expected to have minimal adverse short-term, long-term, or cumulative impacts on vegetation.</p> <p>High deer and rabbit densities have been shown to negatively affect plant and animal communities. A hunting program would help to facilitate ecological diversity by mitigating the effects of overbrowsing. Deer and rabbit</p>
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	<p>densities, if maintained through regulated hunting, will sustain the native vegetation and forest regeneration associated with the natural communities in those regions. Regulated deer hunting will also maintain a deer herd in good physical condition that staves off malnutrition and disease.</p>
<p>Water Resources Assabet River, Great Meadows, and Oxbow NWRs contain rivers and streams. These habitats are located throughout the hunt area.</p>	<p>No Action Motorized boats used by migratory bird hunters can inadvertently leak polluting substances or introduce aquatic invasive species into water bodies near or on the refuge. Additionally, creek bank erosion caused by wake from fast-moving boats has been documented; therefore, the refuge enforces a 10-mph speed limit on all portions of the rivers owned by the Service. Given factors of the affected environment (e.g., the size of the river, the types of boats used, the areas available for waterfowl hunting, the number of waterfowl hunters expected, an duration of the season) and staff observations, we estimate that less than two small engine boats are in the waterway at any given time engaged in waterfowl hunting. The amount of any potential pollution leaked is low, and would have minimal impact when diluted in the water. The hunting season is typically in the fall to winter season when most aquatic invasive species are dormant, so impacts are likely minimal.</p> <p>Proposed Action New areas open to hunting could see an impact from increased activities and boats, but anticipated to stay in relative proportion to current levels of use. Disturbance is expected to remain minor, with estimated use between one to two boats in the waterway at any given time.</p>
<p>Wetlands Assabet River, Great Meadows, and Oxbow NWRs contain wetland habitats including freshwater marsh forested wetland (swamp),</p>	<p>No Action Hunters are permitted to walk on lands throughout designated hunting areas mostly without restriction. Waterfowl hunters have</p>

<p>freshwater pond, and vernal pools. These habitats are located throughout the hunt area and would be traveled by deer and migratory game bird hunters, in particular.</p>	<p>caused trampling and vegetation die-offs along frequently traveled paths. Although these impacts have been obvious, such paths are few in number and small in area, so overall impacts are considered minor. Migratory bird hunters are permitted to place blinds on refuge marshes, but must remove them daily. This minimizes impacts to vegetation. Access to wetlands can also pose a moderate risk of spreading disease and invasive species without proper disinfecting procedures.</p> <p>Proposed Action Opening new areas to hunting for additional species will slightly increase the number of hunters and lengthen the period of time hunters will be traversing the landscape, leading to an increase in vegetation trampling. The refuge does not anticipate a high demand for the new opportunities, and estimates that the expected increase in number of hunters is low in proportion to available hunt area (i.e., estimate of 40 to 50 new hunters per year) and spread over the duration of the hunt season.</p> <p>Most hunting will also take place during the dormant season when vegetation is least vulnerable. Some of the new areas will be accessed by foot, which may result in addition trampling of wetland vegetation. Access to wetlands also pose a moderate risk of spreading disease and invasive species without proper disinfecting procedures.</p>
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Table B-4. Affected Visitor Use and Experience and Anticipated Impacts

VISITOR USE AND EXPERIENCE	
AFFECTED RESOURCE	ANTICIPATED IMPACTS

<p>Assabet River, Oxbow, and Great Meadows NWRs are open to all six priority public uses (hunting, fishing, wildlife observation, photography, environmental education, and interpretation). Oxbow NWR is also open to canoeing and kayaking. In 2017, Assabet River, Oxbow, and Great Meadows NWRs received 919,980 total recreational visits. Of this total, only 2,353 visits were for hunting.</p>	<p>No Action</p> <p>Currently, Assabet River, Oxbow, and Great Meadows NWRs are open to all six priority public uses. In the past, refuge visitors have been concerned with personal safety during hunting seasons. In response, refuge staff ensure that all safety zones are communicated to hunters through maps and brochures. For the benefit of all visitors, hunting information is posted on kiosks, at headquarters, and on refuge websites. Orange safety vests are also made available to visitors at the Assabet River NWR visitor center.</p> <p>Proposed Action</p> <p>We expect between 40 to 50 new hunters due to the increased opportunities for hunting on the refuge; thus, we can expect to see a slight increase in the number of conflicts among user groups. Non-hunters will likely see hunters entering and exiting the refuge on the same trails that hiking is allowed on the refuges. Non-hunting users may feel uncomfortable seeing hunters on the trails. Information will be posted at the contact station and kiosk to alert non-hunters of hunting activity, and to recommend wearing blaze orange while walking the trails during hunting season.</p> <p>At Assabet River NWR, bear hunting will only be open during the second bear and shotgun seasons. This restriction will mitigate potential conflicts with user groups such as Urban Education and other youth environmental education programs that take place during first State bear seasons. We anticipate additional conflict to stem from the opening up to hunting of black bear on all three refuges, since neither of them have a current population and sightings of bear in these areas may still be considered a novelty to the public.</p>
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Table B-5. Affected Cultural Resources and Anticipated Impacts

CULTURAL RESOURCES	
AFFECTED RESOURCE	ANTICIPATED IMPACTS
<p>Native American occupation at the refuges began during the Paleoindian period (as early as 12,500 years Before Present (B.P.)) and continued through European Settlement.</p> <p>Five prehistoric sites have been identified at Assabet River NWR (Gallagher et. al. 1986). Assabet River NWR should be considered highly sensitive for such cultural resources. A few farmhouses from the period of European development remain at Assabet River NWR, although all are in a serious state of decay and will be removed at a future date.</p> <p>Oxbow NWR is considered moderately to highly sensitive for archaeological resources in areas not impacted by military ordnance. The refuge has potential to yield archaeological sites that will contribute to our understanding of prehistoric settlement in the region (MHC 1985). There are no known archaeological or historical sites at Oxbow NWR.</p> <p>Several known Native American sites occur within the boundary of Great Meadows NWR (Ritchie 1985). Several farm archaeological sites dating back to Early European settlement occur within the boundary (Gupta 2004, Donahue 2004). There are two federally recognized Indian tribes in the State of Massachusetts, the Mashpee Wampanoag Tribe and the Wampanoag Tribe of Gay Head (Aquinnah) of Massachusetts.</p>	<p>No Action No adverse impacts would occur under this alternative.</p> <p>Proposed Action Section 106 of the National Historic Preservation Act of 1966, as amended, requires the Service to evaluate the effects of any of its actions on cultural resources (historic, architectural and archeological properties) that are listed or eligible for listing in the National Register of Historic Places (NRHP). It is believed the proposed action would not likely affect any cultural resources found on the Complex.</p> <p>Hunting, regardless of method or species hunted, is a consumptive activity that does not pose any threat to prehistoric or historic properties on and/or near the refuge. No impacts to cultural resources are anticipated above what may be caused by any refuge visitor. Although hunters would be able to access parts of the refuge that are closed to non-hunters, this access alone is not expected to increase vandalism or disturbance to cultural resources by individuals while they are hunting, nor is it likely that hunters will be more likely to engage in vandalism or disturbance than any other refuge visitor.</p>

Table B-6. Affected Refuge Management and Operations

REFUGE MANAGEMENT & OPERATIONS	
AFFECTED RESOURCE	ANTICIPATED IMPACTS
<p>Eastern Massachusetts NWRC is headquartered at Great Meadows NWR. Great Meadows NWR currently maintains the headquarters building, roads, refuge trails, and an observation tower. Assabet River NWR maintains a Visitor Center, refuge trails, roads, and a fishing/wildlife observation pier. Oxbow NWR maintains a visitor contact station, boat launches, roads, and refuge trails.</p> <p>The eight Eastern Massachusetts NWRs are managed as a Complex, with centrally stationed staff at Great Meadows NWR taking on duties at multiple refuges. At Assabet River NWR there are no full-time staff members. At Oxbow NWR there are no full-time staff members.</p>	<p>No Action Current levels of use are manageable within the Complex’s infrastructure, staffing, and budget. The Refuge Manager coordinates the budget each year to ensure funds are available, and the estimated cost to run the current hunt program is between \$35,000 to \$41,000 annually.</p> <p>Proposed Action The proposed action would open additional refuge lands to hunting. Staff costs are expected to increase as the number of hunting opportunities increase. The estimated initial costs to implement the proposed hunt plan is \$48,500 and the annual costs is \$41,600, which could be offset in part by the permit fee collected. A detailed cost breakdown can be found in the Hunting Plan. There may be a slight increase to traffic on refuge roads, trails, and parking lots during the hunting season. The greatest impact will be to dirt hunter parking lots and boat launches increasing the need to perform more frequent maintenance of these facilities.</p>

Table B-7. Affected Socioeconomics and Anticipated Impacts

SOCIOECONOMICS	
AFFECTED ENVIRONMENT	ANTICIPATED IMPACTS
<p>From an economic perspective, Assabet River, Oxbow, and Great Meadows NWRs provide a variety of environmental and natural resource goods and services used by people either directly or indirectly. Spending in the local area of the refuge units generates and supports economic activity in the Boston MetroWest area.</p> <p>The total economic output of Assabet River, Oxbow, and Great Meadows NWRs in the local economy amounted to approximately \$16,311,000 in 2017 (USFWS 2017). At Assabet River and Great Meadows NWRs, hunting accounted for less than one percent of recreational expenditures on either refuge in 2017. At Oxbow NWR, hunting accounted for three percent of expenditures on recreational activities in 2017.</p>	<p>No Action The current hunting program generates and supports positive economic activity through the multiplier effect, as hunters spend money on hunting equipment, fuel for boats, and patronize local restaurants and business before and after hunting trips on the refuge. This spending cycles through the local economy and contributes to the total economic output as calculated using the IMPLAN analysis. In 2017, an estimated 919,980 users visited the Complex, but only 2,353 were for hunting. In general, hunters contribute more money proportionately than other user groups, with spending on equipment and permits. While not measurable, we assume there may be additional indirect beneficial economic impacts of maintaining the current hunt program by mitigating agricultural damage, reducing vehicle collision, and controlling tick population and Lyme disease.</p> <p>Proposed Action While hunting visitation is expected to increase due to increased opportunities, hunting only accounts for a small portion of local economic impacts generated by all refuge users. Expanding hunting opportunities on the refuge will result in a minor increase in hunter numbers resulting in a small increase in local sales of goods and services. However, direct economic impact is expected to be negligible under this proposed action.</p>

ENVIRONMENTAL JUSTICE	
<p>Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.</p>	<p>The Service has not identified any potential high and adverse environmental or human health impacts from this proposed action or any of the alternatives. The Service has identified no minority or low income communities within the impact area. Minority or low-income communities will not be disproportionately affected by any impacts from this proposed action or any of the alternatives.</p>

Cumulative Impact Analysis

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7).

For more information on the national cumulative impacts of the Service’s hunting and fishing program on the National Wildlife Refuge System, see *2020-2021 National Wildlife Refuge and National Fish Hatchery Proposed Hunting and Sport Fishing Openings* (2020).”

TABLE B-8. ANTICIPATED CUMULATIVE IMPACTS

Other Past, Present, and Reasonably Activity Foreseeable Impacting Affected Environment	Descriptions of Anticipated Cumulative Impacts
<p>Hunting Hunting occurs on public and private lands that are found adjacent to several units of the refuge. Other national wildlife refuges in Massachusetts that allow hunting include: Parker River NWR, Silvio O. Conte NFWR, Mashpee NWR, and Monomoy NWR. Great Bay NWR in New Hampshire is approximately 60 miles from Great Meadows NWR.</p>	<p>The Service considers hunting to be an important tool for wildlife management. Hunting gives resource managers an effective means to control populations of some species that might otherwise exceed the carrying capacity of their habitat and threaten the well-being of habitats (composition, structure, and function) and other wildlife species, and in some instances, threaten human health and safety.</p> <p>Assabet River, Oxbow, and Great Meadows NWRs conduct their hunting programs within</p>

	<p>the framework of State and Federal regulations. The proposed hunting programs have been reviewed by and are supported by MassWildlife. Additionally, the Complex will coordinate with MassWildlife annually to maintain consistent regulations and programs.</p> <p>Under the Proposed Action Alternative, the refuge would allow the harvest of four new species at Assabet River, three new species at Great Meadows, and three new species at Oxbow NWRs from approximately 40 to 50 new hunters. Even at the local level, the refuge only adds slightly to cumulative impacts on resident wildlife, and a negligible amount to regional and statewide populations. For example, during the 2018 hunt season, 1,458 deer were harvested from WMZ 9, and 2,651 deer from WMZ 10 (of the Statewide total of 14,516), while a total of 50 deer were harvested at the three refuges of the Complex.</p> <p>Annual waterfowl assessments are based upon the distribution, abundance, and flight corridors of migratory birds. An <i>Annual Waterfowl Population Status Report</i> is produced each year and includes the most current breeding population and production information available for waterfowl in North America (USFWS 2017a). An Annual Adaptive Harvest Management Report (AHM) provides the most current data, analyses, and decision-making protocols (USFWS 2017b). These reports are intended to aid the development of waterfowl harvest regulations in the United States for each hunting season.</p> <p>Hunting on the refuge will not add significantly to cumulative impacts of migratory waterfowl management on local, regional, or Atlantic Flyway waterfowl populations, as the percentage to be taken on the refuge, though additive to existing hunting takes, would be a small fraction of the estimated populations. Refuge estimates for annual harvest</p>
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	<p>of migratory game birds suggest that Assabet River NWR will have a take of 25 ducks and 24 geese, Great Meadows NWR will have a take of 75 ducks and 40 geese, and Oxbow NWR will have a take of 22 ducks, 18 geese, and 12 woodcock, total under this proposed expansion. This harvest is relatively small in comparison to the number of waterfowl taken in Massachusetts as a whole, which in 2018 included: 16,400 ducks, 8,900 geese, and 3,500 woodcock (Raftovich et al., 2019). In addition, overall populations will continue to be monitored and future harvests will be adjusted as needed under the existing processes.</p> <p>Management of wildlife populations is important to ensure the health of the ecosystem, and the refuge’s hunting program provides minor, additional beneficial impacts to the cumulative impacts of wildlife management in the State.</p>
<p>Development and Population Increase Assabet River, Oxbow, and Great Meadows NWRs are located in Middlesex and Worcester counties in Massachusetts. Middlesex County is the second-most densely populated in the State. Worcester County is the ninth most densely populated in the State. From April 2010 to July 2018 the population of Middlesex County is estimated to have increased by 7.4 percent. From April 2010 to July 2018 the population of Worcester County is estimated to have increased by 4.1 percent. The population of these counties are expected to continue growing at or above this rate for the next 15 years (Renski et. al 2015). In a study of GIS cover between 1990 and 2010, there was an average 14% change from natural ecosystems (forest, grassland, wetlands) to development in Middlesex County, MA (Tardie, 2010). This trend continues and impacts available</p>	<p>It is uncertain how projected population and development trends in Massachusetts will measurably influence species and hunting impacts. The refuges’ geographic position, diverse biological resources, and accessibility to local and regional communities make them attractive for wildlife dependent recreational uses including environmental education, interpretation, hunting, and fishing. While many lands adjacent to the refuges are State, town, or private conservation lands, there are also some residential areas near refuge properties. Additional development in the area is increasing the urban-wildland interface and can eventually lead to some management conflicts. The slow but steady urban expansion can decrease availability of habitat, and have increasing demands on water resources. However, the slight increases in the number of hunters and visitors from additional outreach and an increasing population can be expected to have a negligible impact. Impacts will in part be influenced by changing societal interests and</p>

<p>habitat for wildlife populations including game species.</p>	<p>other developments (e.g., transportation, equipment).</p> <p>Because the refuge uses an adaptive management approach for its hunt program, reviewing the hunt program annually and revising annually (if necessary), the Service’s hunting program can be adjusted to ensure that it does not contribute further to the cumulative impacts of population growth and development and potentially help mitigate impacts on non-game and game species.</p>
<p>Use of lead ammunition/tackle Lead ammunition is permitted in Massachusetts and on the Eastern Massachusetts NWRC for all hunts except migratory birds and upland game. Only non-toxic shot is permitted for migratory bird and upland game hunting.</p>	<p>With the expanded hunting plans, a small influx in refuge users is anticipated. Any increase in annual hunt visits would increase the addition of lead shot to the local landscape. The refuge only permits the use of lead shot for big game hunting.</p> <p>Under current levels of use, the refuge could expect up to 93 new deer hunters, 51 new turkey hunters, and up to 6 bear hunters in 2020. However, not all of these hunters will use lead ammunition. In 2019, only 33 percent of deer hunters on the Complex used shotguns or muzzleloaders, with the vast majority of hunters using archery equipment. Archery equipment is the only permitted method of take at Great Meadows NWR. If this level of use remains consistent, the refuge can expect up to 90 new big game hunters who may utilize lead shot.</p> <p>This increase in the use of lead ammunition, distributed across 3,401 acres open to firearm big game hunting at the Complex is not expected to result in lead poisoning.</p>
<p>Climate Change Warming, whether it results from anthropogenic or natural sources, is expected to affect a variety of natural processes and associated resources. Based on NOAA’s summary of potential climate</p>	<p>The Service adjusts management based on changing environmental conditions. Hunt programs and mitigation measures will adapt with changing conditions to continue to conserve natural resources and balance compatible recreational uses. The refuge would review the</p>

<p>change effects on Massachusetts (https://statesummaries.ncics.org/chapter/ma/; Runkle, Kunkel et al. 2017), the prediction is that Massachusetts will experience warmer winter and spring temperatures. Average annual temperatures have increased almost 3°F in Massachusetts over the past century. Under a higher emissions pathway, historically unprecedented warming is projected by the end of the 21st century, with associated increases in heat wave intensity and decreases in cold wave intensity. Precipitation has increased during the last century, with a record-setting number of extreme events occurring over the last decade. Winter and spring precipitation is projected to increase, as well as heavy precipitation events.</p> <p>Changing the climate threatens ecosystems by disrupting relationships between species. Wildflowers and woody perennials are blooming—and migratory birds are arriving—sooner in spring. Not all species adjust in the same way, however, so the food that one species needs may no longer be available when that species arrives on its migration. Warmer temperatures allow deer populations to increase, leading to a loss of forest underbrush, which makes some animals more vulnerable to predators. Rising temperatures also enable invasive species to move into areas that were previously too cold. (https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-ma.pdf).</p>	<p>hunt program annually and revise if necessary, and a refuge Inventory and Monitoring Plan (IMP) is in development.</p>
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Monitoring

Many game species populations are monitored by MassWildlife through field surveys and game harvest reports, which provide an additional means for monitoring populations. Refuge hunters will be required to submit a harvest report at the end of the hunting season. The State has determined that populations of game species are at levels acceptable to support hunting and these assessments are reviewed and adjusted periodically. The refuge will be adaptive towards harvest management under the hunt program to ensure species and habitat health. Refuge-specific hunting regulations may be altered to achieve species-specific harvest objectives in the future. The refuge is currently developing an Inventory and Monitoring Plan (IMP) which is expected to be completed in 2021.

Summary of Analysis

No Action Alternative: There would be no additional costs to the refuge under this alternative. There would be no change to the current public use and wildlife management programs on the refuge. The refuge would not increase its impact on the economy and would not provide new hunting and access opportunities. This alternative has the least direct impacts of physical and biological resources. In addition, this alternative would reduce not meet mandates under the Refuge System Administration Act and Secretarial Order 3356.

Proposed Action Alternative: This alternative is the Service's proposed action because it offers the best opportunity for public hunting that would result in a minimal impact on physical and biological resources, while meeting the Service's mandates under the Refuge System Administration Act and Secretarial Order 3356. The Service believes that hunting on the refuge will not have a significant impact on local or regional wildlife populations because the percentage likely to be harvested on the refuge, though possibly additive to existing hunting takes, would be a tiny fraction of the estimated populations. Additional hunting would not add more than slightly to the cumulative impacts to wildlife from hunting at the local or regional levels, and would only result in minor, negative impacts to wildlife populations.

List of Sources, Agencies and Persons Consulted

Massachusetts Division of Fisheries and Wildlife (MassWildlife)

Michael Huguenin – Assistant Director of Wildlife Research

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Noah Kahn – Hunting and Fishing Chief

Laura Howard – Visitor Services Assistant
Caleb Robitaille – Visitor Services Assistant

State Coordination

Coordination with MassWildlife regarding hunting began with the drafting of Assabet River, Oxbow, and Great Meadows previous hunting plans in 2004. MassWildlife was also involved in each refuge’s CCP process. In preparation for this plan, refuge leadership met with Michael Huguenin (Assistant Director of Wildlife Research) and Johnathan Regosin (Deputy Director) from MassWildlife in May 2019 to discuss proposed changes to the refuge hunting plans. In September 2019, MassWildlife provided a letter with formal comments to the proposed changes and these comments were considered in drafting the hunt plan expansions. A follow up correspondence summarizing areas of expansion was sent to MassWildlife in November 2019.

Tribal Consultation

Refuge staff will coordinate with federally recognized Tribal governments in areas of mutual interest, including hunting opportunities. The Federally recognized tribe that we will be coordinating with is the Mashpee Wampanoag Tribe. We will reach out to this Tribe prior to the release of the draft documents.

Public Outreach

The public will be notified of the availability of the Eastern Massachusetts National Wildlife Refuge Complex Hunting Plan, CD, and EA in April 2020 for a 30-day review and public comment period. We informed the public through local venues, the refuge website, and social media. The refuge will host at least one public meeting during the 30-day public review and comment period.

Determination

This section will be filled out upon completion of any public comment period and at the time of finalization of the Environmental Assessment.

- The Service’s action will not result in a significant impact on the quality of the human environment. See the attached “**Finding of No Significant Impact.**”

- The Service’s action **may significantly affect** the quality of the human environment and the Service will prepare an Environmental Impact Statement.

Preparer Signature: _____ Date: _____

Name/Title/Organization: _____

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Reviewer Signature: _____ Date: _____

Name/Title: _____

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OTHER APPLICABLE STATUTES, EXECUTIVE ORDERS & REGULATIONS

Cultural Resources

- American Indian Religious Freedom Act, as amended, 42 U.S.C. 1996 – 1996a; 43 CFR Part 7.
- Antiquities Act of 1906, 16 U.S.C. 431-433; 43 CFR Part 3.
- Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa – 470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7.
- National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810.
- Paleontological Resources Protection Act, 16 U.S.C. 470aaa – 470aaa-11.
- Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001-3013; 43 CFR Part 10.
- Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971).
- Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996).

Fish & Wildlife

- Bald and Golden Eagle Protection Act, as amended, 16 U.S.C. 668-668c, 50 CFR 22.
- Endangered Species Act of 1973, as amended, 16 U.S.C. 1531-1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450.
- Fish and Wildlife Act of 1956, 16 U.S.C. 742 a-m.
- Lacey Act, as amended, 16 U.S.C. 3371 et seq.; 15 CFR Parts 10, 11, 12, 14, 300, and 904.
- Migratory Bird Treaty Act, as amended, 16 U.S.C. 703-712; 50 CFR Parts 10, 12, 20, and

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- Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001).

Natural Resources

- Clean Air Act, as amended, 42 U.S.C. 7401-7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23.
- Wilderness Act, 16 U.S.C. 1131 et seq..
- Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq.
- Executive Order 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999).

Water Resources

- Coastal Zone Management Act of 1972, 16 U.S.C.1451 et seq.; 15 CFR Parts 923, 930, 933.
- Federal Water Pollution Control Act of 1972 (commonly referred to as Clean Water Act), 33 U.S.C. 1251 et seq.; 33 CFR Parts 320-330; 40 CFR Parts 110, 112, 116, 117, 230-232, 323, and 328.
- Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.; 33 CFR Parts 114, 115, 116, 321, 322, and 333.
- Safe Drinking Water Act of 1974, 42 U.S.C. 300f et seq.; 40 CFR Parts 141-148.
- Executive Order 11988 – Floodplain Management, 42 Fed. Reg. 26951 (1977).
- Executive Order 11990 – Protection of Wetlands, 42 Fed. Reg. 26961 (1977).