National Park Service
U.S. Department of the Interior

Cape Cod National Seashore
Massachusetts

Final Environmental Impact Statement
Cape Cod National Seashore
Hunting Program

July 2007







U.S. Department of the Interior National Park Service
Final Environmental Impact Statement for the Hunting Program at the
Cape Cod National Seashore, Barnstable County, Massachusetts
July 2007

Summary:

This Final Environmental Impact Statement (EIS) describes alternatives for management of the hunting program at Cape Cod National Seashore (CACO). It also describes potential adverse and beneficial effects to the following:

- natural resources (wildlife, special status species, natural communities, and vegetation);
- cultural heritage (customary hunting activities, berry picking, mushroom gathering);
- public use (land use and recreation; health and safety, and public use and experience);
- socioeconomic values (effects on local/regional economy);
- management and operations (consistency with CACO and National Park Service (NPS) goals, plans, policies, guidelines, mandates, changes to staffing levels and ranger duties, and costs to implement); and
- non-federal lands within CACO (private residential properties, private commercial properties, and municipal and state lands).

Three alternatives for the hunting program are presented, and the environmental consequences of each are analyzed. These include Alternative A – no action, Alternative B – a modified hunting program, and Alternative C – eliminating hunting. These three alternatives were generated from internal and external scoping meetings and agency and public correspondence. Each external scoping meeting was run by NPS staff and included an information session, a public comment period, and a question and response session. The primary purpose of these meetings was to gain public input and inform the public of the ensuing Environmental Impact Statement.

A thorough assessment of the adverse and beneficial effects of each alternative was completed, and a determination was made regarding which alternative would be the NPS preferred and the environmentally preferred alternative. Following the completion of the NEPA process and issuance of the Record of Decision (ROD), the NPS will implement the preferred alternative.

Following issuance of the Draft EIS in April 2006, comments were received on many elements of the analyses and alternatives during the 60-day comment period. A table summarizing the NPS response to each unique comment (Table 34) appears in Section 5.3. Copies of selected comment letters appear in Appendix D. In addition, all comments are part of the public record. The comments resulted in additional information-gathering, consideration, and changes which have been incorporated in this document. The FEIS has benefited from the suggestions, concerns, and information provided during the comment period, and the revised NPS preferred and environmentally preferred alternative reflects the value of the public review process.

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Executive Summary

The following Draft Environmental Impact Statement (EIS) has been prepared by the National Park Service (NPS) to provide the scope of the administrative decision-making process regarding the hunting program at the Cape Cod National Seashore (CACO) (NPS 2001a). The preparation of this EIS meets the intent of the court order issued during 2003, relating to providing compliance with the National Environmental Policy Act of 1969 (NEPA). The major directive arising from the court order is that the current hunting program, and particularly the pheasant hunting program at CACO, in place since the Park's inception, must be evaluated with respect to achieving NEPA compliance under today's standards. A revised hunting program that is acceptable in meeting these standards will result in a Record of Decision (ROD), and will then be implemented by the NPS. The goals of the proposed action are to:

- manage hunting to minimize effects to wildlife populations and ecosystems and to sustain natural processes;
- manage hunting to reduce or avoid wildlife and human conflicts;
- provide for the protection of natural and cultural resources, cultural heritage, and recreational values;
- provide opportunities for future generations to enjoy the natural and cultural resources, cultural heritage, and recreational values of CACO;
- provide diverse and high quality visitor experiences; and
- develop management solutions that address potential concerns related to the current hunting program.

This Final EIS presents and analyzes three alternatives for maintaining, eliminating, or altering the hunting program, and reviews NPS and CACO policies, the General Management Plan (GMP), and other relevant management plans to assess the consistency of the proposed actions with NPS guidance. It also analyzes the range of beneficial and adverse effects on the environment and has been prepared in accordance with the NEPA.

Three alternatives are presented. Alternative A is the No Action alternative required by NEPA, which analyzes the hunting program as it existed prior to the court's injunction. Alternatives B and C present proposals modifying or eliminating the existing hunting program. Various impact topics were analyzed to determine the level of potential beneficial and adverse effects that could result from each alternative. These topics included:

- natural resources (wildlife [game, non-game, rare species] and vegetation [plants, rare plants, natural communities]);
- cultural resources (cultural heritage [customary hunting activities, berry picking, mushroom gathering);
- public use (land use and recreation, health and safety, public use and experience, and socioeconomic values [effects on local/regional economy]); and
- management and operations (consistency with CACO and NPS goals, plans, policies, guidelines, and mandates**,** changes to staffing levels and ranger duties, and costs to implement).

Alternative A: The No Action alternative meets much of the basic project purpose as provided above and is also considered as a baseline for comparing the effects of the other alternatives. Under this alternative, hunting would remain as it has since CACO was formed and prior to a court injunction enjoining the pheasant hunt. However, this alternative does not address many of the issues established during the public scoping meetings, especially relating to modifying the hunting program and reducing potential hunting-related visitor conflicts. The continuation of the pheasant hunt would continue to raise the question of the appropriateness of introducing an exotic species with a limited, seasonal presence at

CACO, which is not strictly in compliance with NPS policies. This was the basis for the court injunction that stopped pheasant stocking at CACO.

Maintaining the current hunting program maintains cultural heritage factors that are part of the fabric of life on the Outer Cape (easterly six towns: Chatham, Orleans, Eastham, Wellfleet, Truro, Provincetown), provides recreational opportunities for local residents and individuals from the region, and maintains consistency with CACO goals and the reasons that CACO was established. This alternative does not improve safety, awareness of hunting and non-hunting areas, or recreational opportunities. Adverse effects are relatively minor and include the loss of individuals from game species populations. Adverse effects are negligible with respect to safety with no alterations to existing perceptions of safety for non-hunters.

Alternative B: Creating a modified hunting program (the NPS preferred alternative) meets the basic project purpose and addresses many of the concerns raised during the scoping process. This alternative involves retaining a majority of the existing hunting program, adds a spring turkey (*Meleagris gallopavo*) hunting season, and provides an adaptive management approach for phasing out the ring-necked pheasant (*Phasianus colchicus*) hunting program while progressively restoring acres of the CACO landscape to enhance the heathland and grassland plant communities. This restoration effort, while environmentally and culturally appropriate for CACO, will have the ancillary benefit of enhancing opportunities to hunt wild native upland game birds in a manner consistent with NPS policies.

Modifying the current hunting program would provide beneficial effects relating to maintaining and enhancing habitat quality for game and non-game species, maintaining cultural heritage factors that are part of the fabric of life on the Outer Cape, providing recreational opportunities for local residents and individuals from the region, and maintaining consistency with CACO goals as well as with the reasons that CACO was established.

This Alternative would clarify and simplify the areas open and closed to hunting, improve information for hunters and non-hunters, and develop improved communication with the Massachusetts Division of Fisheries and Wildlife in their wildlife monitoring efforts. The provisions to simplify and more clearly delineate hunting areas, together with improved information regarding hunting areas and safety measures, is expected to increase confidence that non-hunting uses can coexist with hunting activity. This is in keeping with the preferences expressed by both hunters and non-hunters in having separation between these activities.

Alternative C: This alternative considers eliminating all hunting activity at CACO. Terminating the hunting program has beneficial effects relating to eliminating the loss of individuals from game species' populations. Benefits to safety could occur, given the perception as expressed through some public comment that hunting is unsafe for non-hunters. Visits to CACO might increase by visitors sharing that perception who would otherwise not visit CACO during the hunting seasons. Terminating the hunting program would eliminate hunting as part of the cultural heritage, with an associated loss of recreational opportunities.

Preferred Alternative: The NPS considered three main factors when determining which option would be the preferred alternative. The first factor was ensuring that the chosen alternative would meet the project purpose while giving due consideration for minimizing effects to the environment, economics, public safety, cultural heritage, and public use. The second factor was determining which alternative was environmentally preferred and resulted in the least amount of adverse effects to natural and cultural resources. The environmental and cultural considerations included detailed assessments of the various impact topics. The third factor examined whether or not any of the alternatives would impair CACO resources. This impairment determination considered the holistic picture of the alternative and the

potential effects associated with it. After careful review and consideration of these factors, the NPS determined that Alternative B best meets the project purpose, provides the most benefits and the least adverse effects to environmental and cultural resources, and does not impair CACO resources.

1.0 INTRODUCTION: PURPOSE AND NEED

The development of this Final Environmental Impact Statement (EIS) reflects an opportunity to evaluate and consider potential modifications to the hunting program of the Cape Cod National Seashore (CACO) (Figure 1). Hunting has been a traditional recreational activity long before the establishment of CACO and is part of the cultural heritage of Outer Cape Cod. Due to its place in the history and culture of the Cape, the opportunity for the continuation of hunting was specifically included in the enabling legislation that was passed establishing CACO in 1961. CACO's establishment itself was unique and controversial; as it was the first time that a National Park was created from what was primarily privately-owned lands. The elements in the enabling legislation were the specific results of the extensive negotiations leading to creation of the National Park.

The National Park Service (NPS) completed ecological studies and an Environmental Assessment (EA), during 1996, regarding the stocking and hunting of ring-necked pheasants (*Phasianus colchicus*). In 2002, a legal challenge was filed claiming improper compliance with the National Environmental Policy Act of 1969 (NEPA) in regard to the hunting program in general and the pheasant hunting program specifically. After a trial, the court ruled in 2003 that an EA on the hunting program needed to be completed by the NPS. Furthermore, the court enjoined the pheasant stocking and hunting program until the EA was completed. The NPS concluded that while an EA would meet the letter of the court's decision, a more complete approach to NEPA compliance would be to meet the more rigorous assessments and broader review of an EIS. The following document provides that more thorough assessment in seeking to meet NEPA compliance.



Figure 1. The Outer Cape Cod Region, Most of which is within the Cape Cod National Seashore.

1.1 Purpose and Need for the Action

The NPS is reviewing the CACO hunting program, providing an opportunity to make policy and program modifications to it. The following purpose and need statements reflect NPS goals for the overall visitor program and how the program coalesces with the management objectives, regulations, enabling legislation, and policies of the NPS for CACO. The purpose and need also address problems that may need to be remedied or other actions that need to be implemented. The draft statements were prepared through internal NPS scoping meetings and a review of the CACO General Management Plan (GMP), NPS policies, and management documents. The purpose and need focus on answering the questions on both whether hunting is an appropriate activity at CACO, and whether modifications to the program can adequately address concerns that have been raised and can be considered in the NEPA process. The purpose of the proposed action is to:

1. balance diverse uses of the Park while minimizing effects to wildlife populations, ecosystems, and sustaining natural processes;
2. reduce or avoid conflicts during recreational uses of the Park;

3. protect natural and cultural resources, cultural heritage, and recreational values;
4. provide opportunities for future generations to enjoy the natural and cultural resources, cultural heritage, and recreation values of the CACO; and
5. develop management solutions that address concerns related to the current hunting program to ensure diverse and high quality public experiences.

This EIS evaluates the current hunting program at CACO and provides the NPS with the necessary information for making associated decisions related to the management of wildlife, vegetative resources, and other public uses, in the limited way in which they specifically relate to the hunting program.

The CACO hunting program has been the subject of regional and local debate for many years. There is strong support for the continuation of hunting at CACO from a variety of constituencies, as well as from the Massachusetts Division of Fisheries and Wildlife (MDFW). In addition, there is a strong regulatory and historical foundation for continuing to allow hunting at CACO, and hunting continues to be a part of the cultural heritage and fabric of life on Outer Cape Cod. The creation of the Park under President Kennedy specifically included the provision to continue hunting in the enabling legislation. Allowing the Secretary of the Interior to take steps to maintain the unique character and traditions of the Outer Cape, including hunting, was essential in helping to secure the necessary local and state support to create CACO in 1961.

In recent years, some members of the public have questioned the continuation of hunting in general, whether it is an appropriate activity within CACO, and whether it conflicts with other uses. Questions have included the appropriateness and the legality of an annual "put-and-take" pheasant-stocking program that has occurred in certain areas of CACO since prior to the establishment of the Park. In addition, some residents and visitors have expressed their concerns about the safety of hunting, particularly given the proximity of some hunting areas to residences and to parts of CACO with high levels of public use (i.e., trails and beaches).

This EIS summarizes several studies that were initiated to provide information on questions relating to hunting. A number of informational sources were also used to provide a background of the situation including pertinent information about hunting. In developing this EIS, the NPS initiated the following studies:

- a literature search of scientific studies on the effects that hunting has on wildlife;
- a visitor use and opinion survey, including summer visitors, fall visitors, residents, and hunters (Kuentzel 2006);
- an assessment of the presence of New England cottontail (*Sylvilagus transitionalis*) and eastern cottontail (*Sylvilagus floridanus*) (Boland *et al.* 2005);
- an assessment of the social and socioeconomic effects of hunting;
- a review of information relating to hunting safety, ballistics, and hunting related injuries;
- a review of other Department of the Interior (DOI) managed hunting programs (NPS 1995);
- a review of the history of hunting at CACO; and
- a summary of the goals, policies, and regulatory background of the CACO hunting program.

Preparation of this Final Draft EIS was guided by an interdisciplinary team that included biologists, social and economic researchers, genetic researchers, CACO staff, and MDFW staff. They have identified the specific issues and potential problems related to the current hunting program through an extensive scoping process, with input from the public, affected agencies, and CACO personnel. The scoping process also helped the team identify the goals and objectives of the action and to develop a list of alternatives to consider. With the completion of this EIS, the NPS has gained a clearer understanding of the environmental and social effects related to hunting at CACO, and used this knowledge to identify a

preferred alternative that will best meet CACO's overall mission, its goals, and its commitment to conserve and provide opportunities for the public enjoyment of CACO's many resources and values.

1.2 Project Background

1.2.1 General Features

The boundaries of Cape Cod coincide with those of Barnstable County, a peninsula approximately 50 miles southeast of Boston. The county is bounded by Cape Cod Bay to the north and Nantucket Sound to the south. Cape Cod's land area is approximately 396 square miles (mi^2), with a density of about 472 people per mi^2. The Cape Cod Canal (which was completed in the 1930s) separates the peninsula from the mainland. Two bridges, the Sagamore and the Bourne, link the Cape to the mainland. The county is composed of 15 communities. Barnstable is the county seat. For the purposes of this Final Draft EIS the Outer Cape is defined as the six towns associated with CACO: Chatham, Eastham, Orleans, Provincetown, Truro, and Wellfleet (Figure 1). The Outer Cape's land area is about 95.1 mi^2; the average population density is 284 people per mi^2. The highest population densities are found in Orleans (414 people per mi^2) and Chatham (401 people per mi^2). Truro has the lowest population density (75 people per mi^2). Population density on the Cape (562 people per mi^2) is relatively sparse compared to the rest of Massachusetts (810 people per mi^2).

The Outer Cape communities are directly affected by CACO's management policies. CACO has the highest visitation rate of all Cape Cod attractions and therefore has an immediate effect on the entire Barnstable County region. As one might expect, the effect on the whole county is not nearly as palpable as the relationship CACO has with its six immediate neighbors. For the purposes of this document, the whole of Barnstable County must be considered as the socioeconomic impact area, with special attention to the six Outer Cape communities.

1.2.2 History and Significance of CACO

The enabling legislation which formed the Cape Cod National Seashore and other policy documents which followed, including the 1998 General Management Plan, discuss "cultural" aspects of hunting on the Outer Cape, including within the boundary of the Seashore. The cultural practices referenced are those of the six towns on the Outer Cape and hunters of modern times. These writings are true observations of the traditions since European settlement, but do not include prior Native American practices as well. Nomadic Paleo-Indian people—hunters and gatherers—arrived on Cape Cod about 12,000 years ago. Succeeding populations developed more permanent occupation. By 1600 the Wampanoag Indians had established six villages along the creeks and bays from Chatham to Wellfleet, relying on a combination of hunting, fishing, and farming for sustenance. The cultural tradition of hunting, fishing and gathering has been documented to have gone on within the Seashore for thousands of years, including evidence at the Carns site near Coast Guard Beach in Eastham dated approximately 2100 to 1100 years before present. There were numerous Wampanoag villages during the 17th century located within what is now the Seashore at the time of European contact including: Mannamoyik in Chatham; Nauset in Wellfleet; and Pamet in Truro. Native American hunting and cultural practices and interaction with European settlers are an important part of the history of the Cape and should not be forgotten.

CACO is a unique unit of the National Park system that contains significant natural, cultural, historical, and recreational resources. It consists of 44,000 acres on the outer arm of the Cape Cod peninsula, including lands under the ownership and jurisdiction of the NPS as well as lands owned by the Commonwealth of Massachusetts, portions of Chatham, Orleans, Eastham, Wellfleet, Truro, Provincetown, and approximately 600 private owners. CACO is different from most National Parks in

that it was carved out of a relatively populous area, encompassing not only natural and cultural resources, but also vital communities with a rich history of political, economic, social, and recreational activities. CACO's founding marked the first time a National Park was created largely through acquisition of private lands, and significant ongoing non-federal ownership. The founding of the Park was, therefore, the subject of tremendous controversy and highly detailed negotiations, resulting in enabling legislation that was very carefully crafted and scrutinized.

Figure 2 shows the locations of areas open to hunting relative to the locations of private lands. The legislation that created CACO in 1961 acknowledged the need to protect the variety of Cape Cod's outstanding resources for the enjoyment of residents and visitors alike, while at the same time seeking to perpetuate many of the traditional values, pastimes, and ways of life that have helped shape the special ambiance of the Cape. Striking that balance was essential in creating the public and legislative support that enabled the creation of the Park. Maintaining that balance remains the challenge today. One of the customary activities at CACO, the hunting of upland game and waterfowl, is the focus of this Final EIS.

1.2.3 CACO Hunting Program

The following is a summary of the current hunting program at CACO; a summary of the history and background of the CACO hunting program is also included. The locations of areas open to hunting and corresponding acreages are presented in Figure 2. Hunting at CACO generally follows the species, season dates, bag limits, and regulations established by the MDFW (Tables 1 and 2) although there are some differences discussed below. The MDFW establishes these regulations for all species, although they incorporate the migratory bird hunting regulations based on the seasons and bag limits provided by the U.S. Fish and Wildlife Service (USFWS).



Hunting related signs, including regulations and restrictions.

The MDFW regulates safety, hunter education, prohibited activities and equipment, licenses and permits, and additional regulations for Wildlife Management Areas (WMA). The NPS has added some rules and made others more stringent as necessary to best meet park objectives and NPS policies, for example regarding hunting proximity to buildings and bicycle paths. In addition, NPS does not allow hunting from March 31 to August 31 and only allows hunting of waterfowl and upland game species. MDFW manages all aspects of the hunting program, but coordinates with the NPS for the pheasant stocking program and local deer check stations. CACO rangers are responsible for enforcement duties. This close coordination between the state and federal entities has several benefits, in particular consistency where possible between the state and federal hunting programs and policies allows for clear regulations and expectations for the hunting community, as well as economies between the governmental agencies.

The most popular aspects of the hunting program include the annual deer, waterfowl, pheasant, and rabbit hunting seasons, which represent the four most commonly hunted species. Brief summaries are provided below. Current seasons and bag limits are provided in Table 1, and a summary of general regulations is provided in Table 2. A complete list of the species hunted and applicable statewide regulations are included in Appendix A.

Figure 2: OVERVIEW - Hunting Areas and Non-Federal Land within Cape Cod National Seashore

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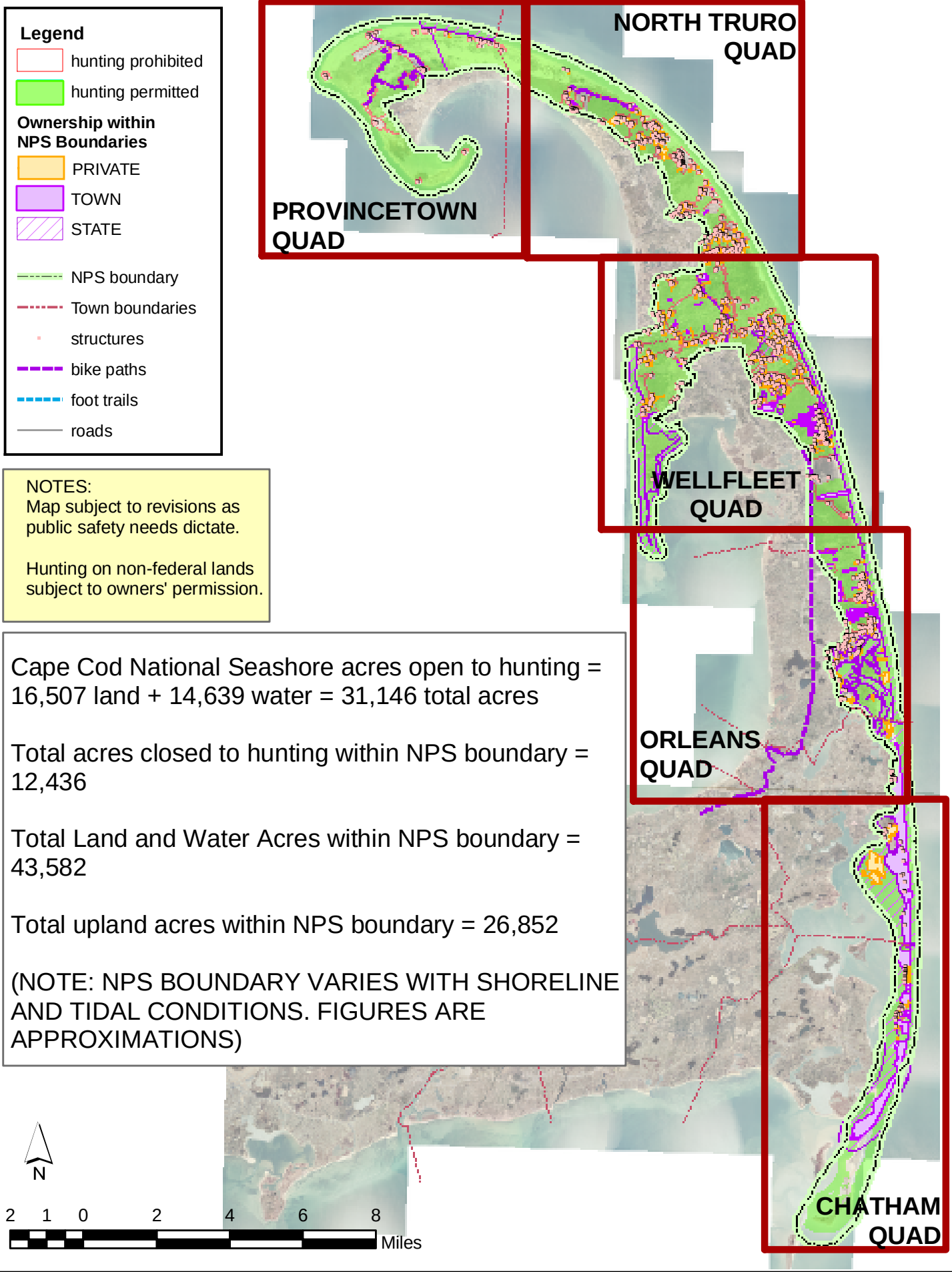


Figure 2a: Hunting Areas and Non-Federal Land within Cape Cod National Seashore

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NOTES:
Map subject to revisions as public safety needs dictate.

Hunting on non-federal lands subject to owners' permission.

Example of 500-foot buffer for scale

Example of 150-foot buffer for scale



Figure 2b: Hunting Areas and Non-Federal Land within Cape Cod National Seashore

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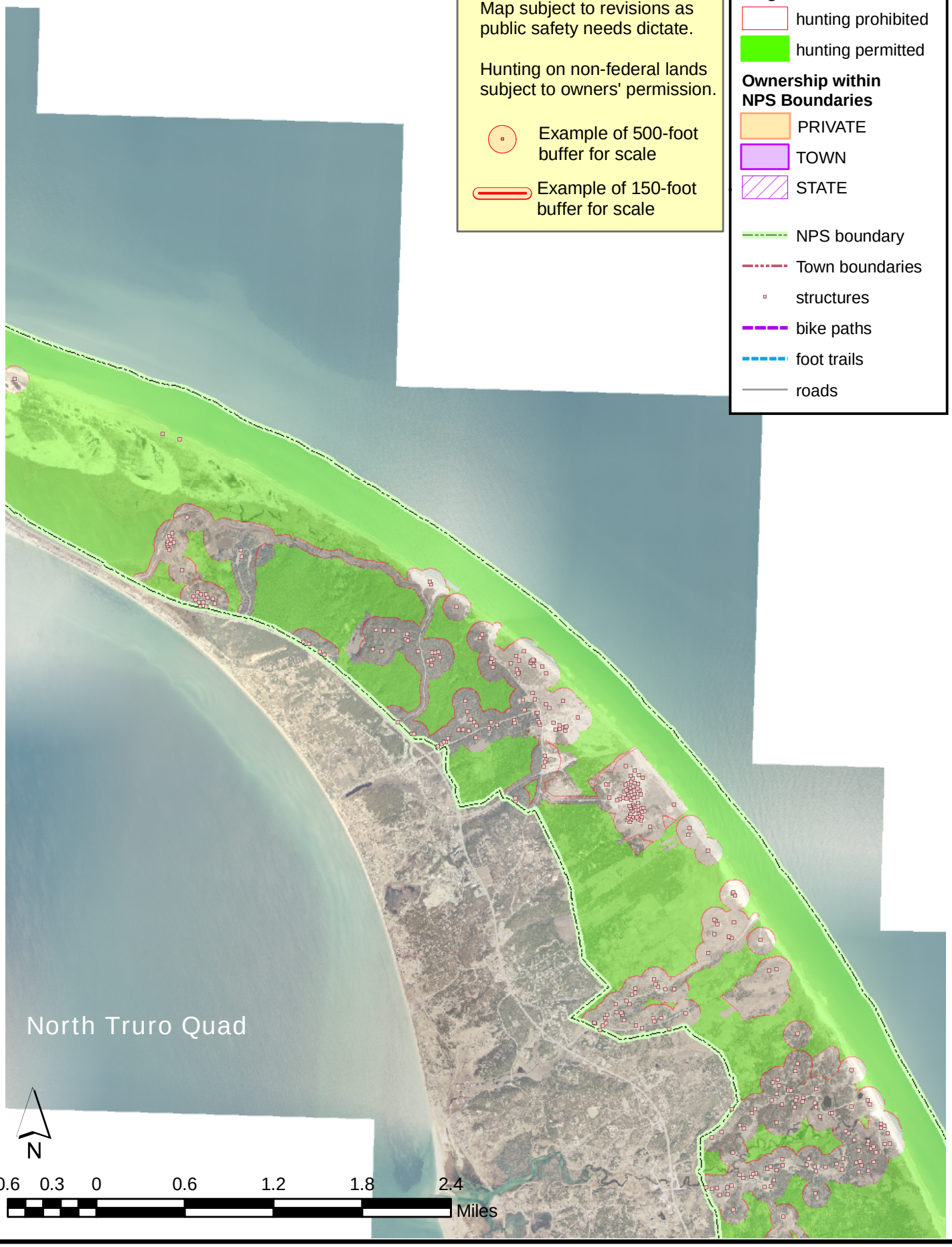


Figure 2c: Hunting Areas and Non-Federal Land within Cape Cod National Seashore

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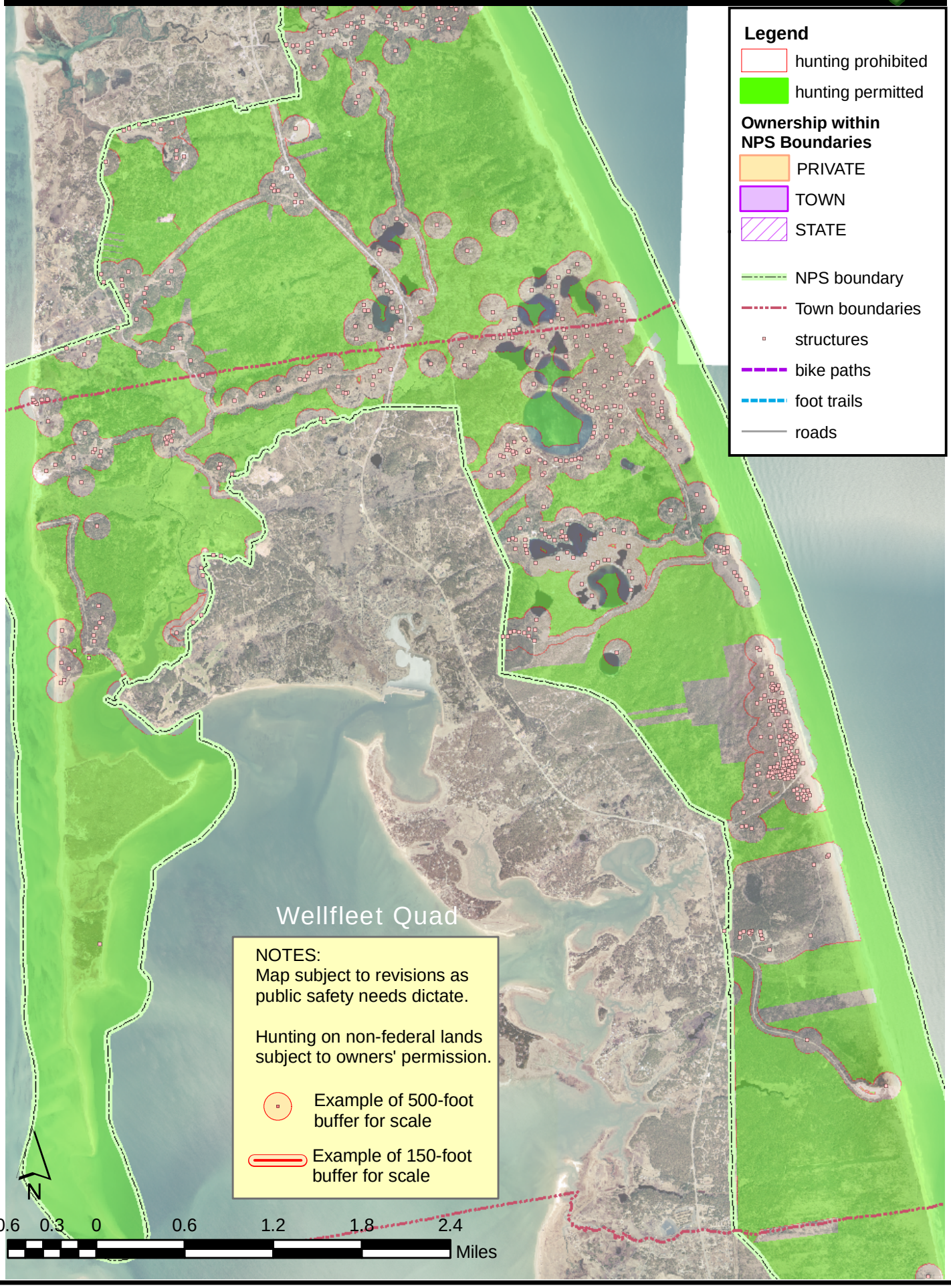


Figure 2d: Hunting Areas and Non-Federal Land within Cape Cod National Seashore

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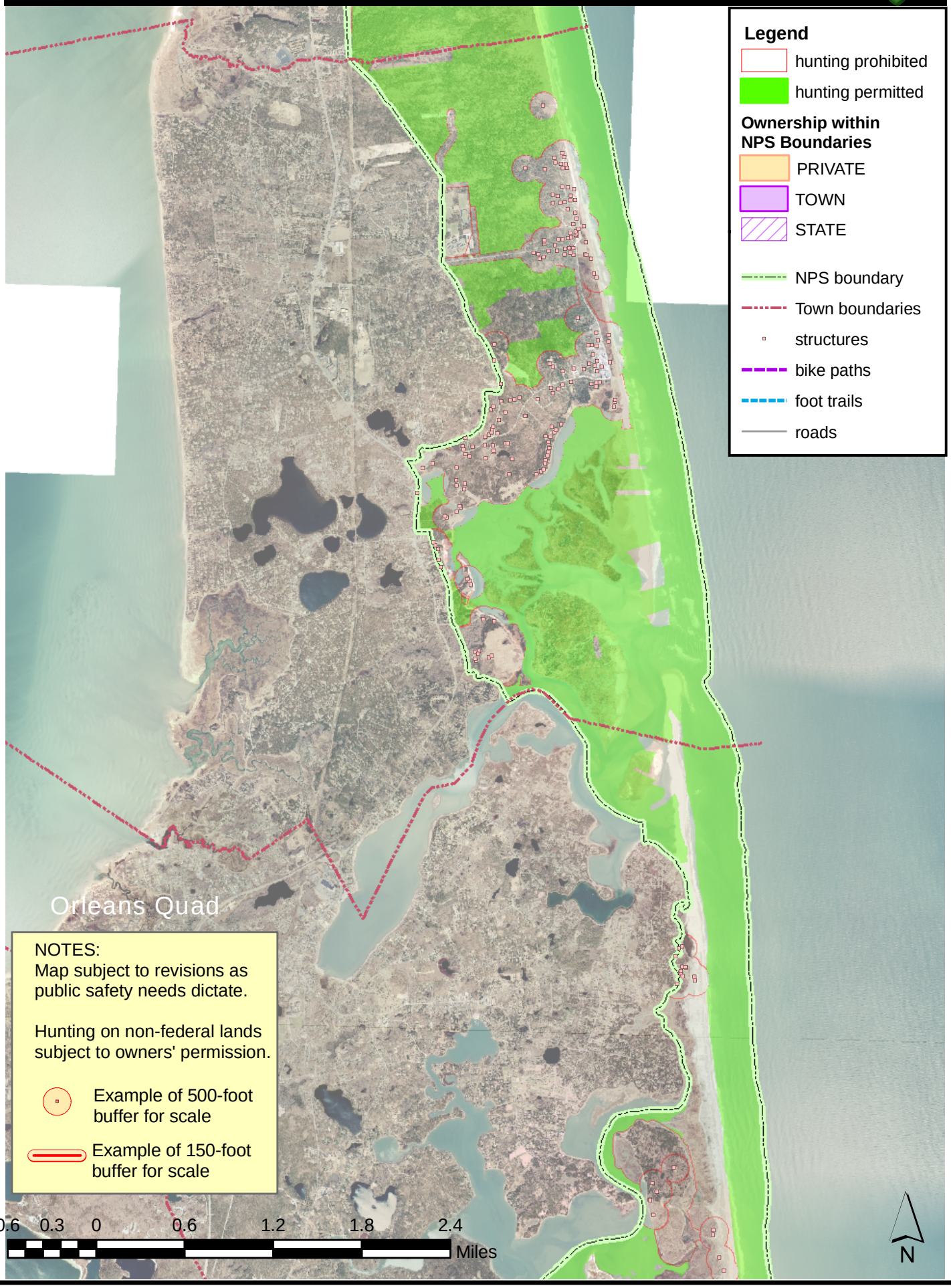
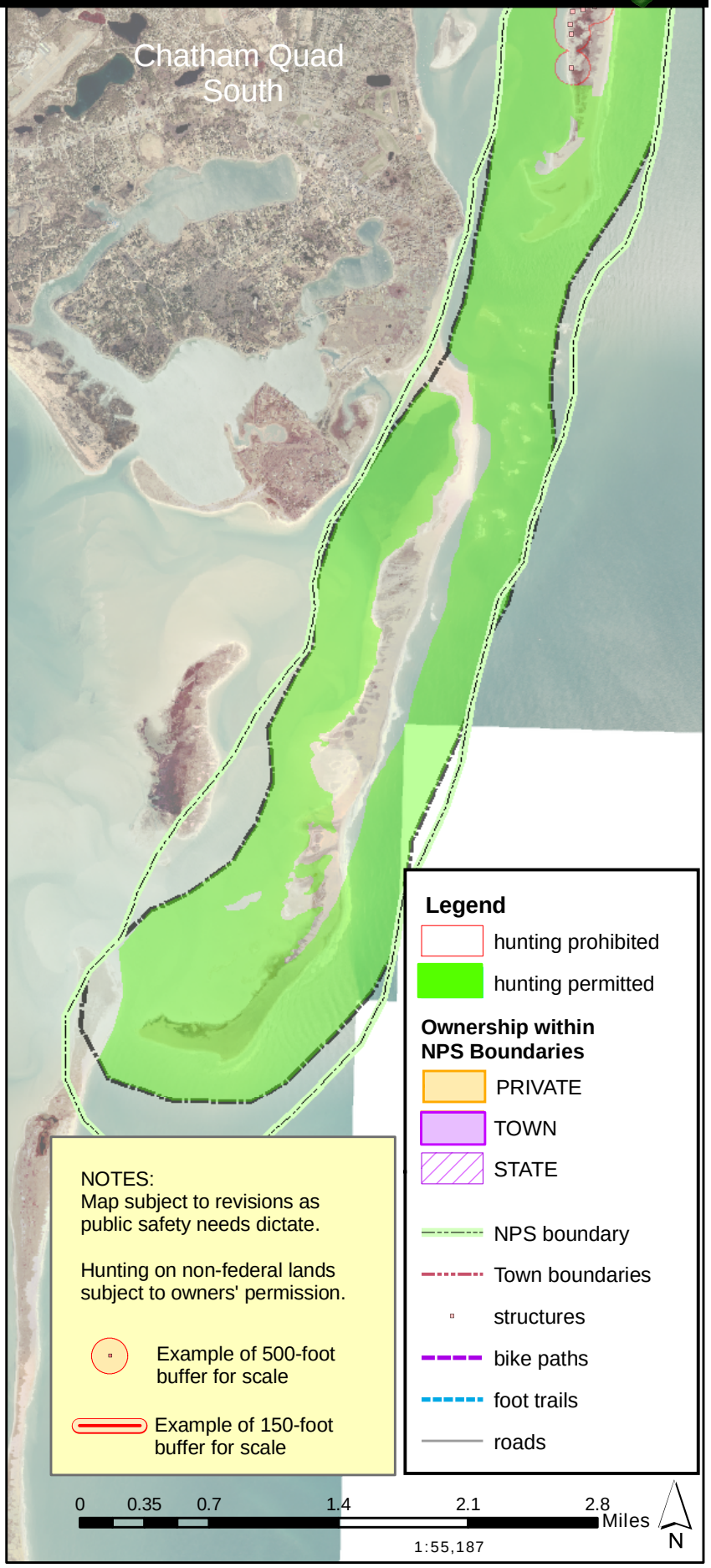


Figure 2e: Hunting Areas and Non-Federal Land within Cape Cod National Seashore

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Legend

- hunting prohibited
- hunting permitted

Ownership within NPS Boundaries

- PRIVATE
- TOWN
- STATE

- NPS boundary
- Town boundaries
- structures
- bike paths
- foot trails
- roads

NOTES:
Map subject to revisions as public safety needs dictate.

Hunting on non-federal lands subject to owners' permission.

Example of 500-foot buffer for scale

Example of 150-foot buffer for scale

0 0.35 0.7 1.4 2.1 2.8 Miles

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***Deer hunting*:** White-tailed deer (*Odocoileus virginianus*) are hunted throughout the areas open to hunting on CACO. Deer hunting is divided into three distinct seasons: archery, shotgun, and muzzleloader. The shotgun season is the most popular, with most hunters using 12-gauge shotguns loaded with either buckshot or slugs. All hunters who hunt during the shotgun and muzzleloader seasons must wear hunter orange for safety purposes. Deer may be hunted from temporary tree stands; permanent tree stands are not allowed. Stalking and still hunting are also used to locate deer. Deer drives are permitted, but hunters may not shoot across a paved road or bicycle trail. All deer must be checked-in at 1 of 3 official check stations located in the Outer Cape. Antlerless deer may be taken with a valid permit in addition to a valid hunting license. Approximately 20 to 30 deer are taken each year at CACO with some 75 to 100 hunters participating in the annual hunt. Deer hunting activity generally peaks during the mornings of the shotgun season. Deer are most active during dawn and dusk periods. Hunting pressure is most intense during "shotgun" hunting week for deer, which is the first full week following Thanksgiving (November 26 through December 2, 2006). This is a relatively slow time for general CACO visitation and with the majority (5 of 6 days) of the hunting occurring during the week (when most residents are either working or in school), the potential for accident and/or injury is very low.

Table 1. Summary of Wildlife Species Hunted at CACO, Seasons and Limits[1,2]

Species	Season	Bag Limits			Notes and Comments
		Daily	Possess	Season	
Crow	1/1 – 2/28/07 9/1 – 2/29/08	-	-	-	Not commonly hunted at CACO.
Pheasant	10/13 – 11/24/07	2	4	6	800 pheasants are stocked in three locations annually.
Quail	10/13 – 11/24/07	4	8	20	Not abundant enough to be hunted effectively.
Cottontail rabbit	1/1 – 2/28/07 10/13 – 2/29/08	5	10	-	A popular species often hunted using dogs.
Deer (archery)	10/15 – 11/24/07	Same as shotgun limits			Very few hunters.
Deer (shotgun)	11/26 – 12/1/07	2	2	2+	Very popular hunt.
Deer (muzzleloader)	12/10 – 12/31/07	Same as shotgun limits			Very few hunters.
Coyote	1/1 – 2/28/07 11/1 – 2/29/08	-	-	-	Very few hunters.
Fox	1/1 – 2/28/07 11/1 – 2/29/08	-	-	-	Very few hunters.
Gray squirrel	10/13 – 1/2/08	5	10	-	Very few hunters.
Opossum	1/1 – 1/31/07 10/1 – 1/31/08	-	-	-	Very few hunters.
Raccoon	1/1 – 1/31/07 10/1 – 1/31/08	3	-	-	Very few hunters.
Ducks, mergansers, and coots	10/13 – 10/28/06 11/23 – 1/17/07	6, 5, 15	12, 10, 30	-	Popular hunting season, specific bag limits are established for some species (Appendix A).
Sea ducks	10/5 – 1/20/07	7	14	-	Popular hunting season, specific bag limits are established for some species (Appendix A).
Canada goose	9/5 – 9/25/07	5	10	-	Popular hunting season.
Snow and blue geese	10/13 – 10/28/06 11/23 – 1/17/07	15	30	-	Few hunters as they are generally not common species.
Brant	11/23 – 12/27/07	3	6	-	Few hunters as they are generally not common species.

1. http://www.mass.gov/dfwele/dfw/regulations/abstracts/abstracts.htm
2. NPS 2004b

Table 2. Brief Synopsis of Hunting Regulations in Massachusetts and CACO

Species	Regulation	Purpose
All waterfowl	The use of non-toxic shot.	Preventing lead poisoning.
All species	Hunting is prohibited within 500 feet of all buildings.	Protects occupants and structures.
All species	Hunting is prohibited within 150 feet of all bicycle trails and hunters may not shoot across a paved road or bicycle trail.	Protects visitors using roads and bicycle trails.
All species	No hunting from March 1 through August 31.	Most hunting seasons are occurring during the fall and winter. This restriction improves summer visitor's safety.
Deer	All deer must be taken to a check station.	Allows biologists to collect data on the health of the deer herd and helps to regulate and track the harvest.
All waterfowl	Hunters must purchase a duck stamp.	Provides funding for waterfowl conservation.
Upland game birds, rabbits, deer, and others	Hunters must wear hunter orange.	Helps protect hunters from possible accidents.
Most species	Hunting is prohibited earlier than one-half hour before sunrise and later than one-half hour after sunset.	Protects hunters and non-hunters from accidents and minimizes disturbance to many species.
Rabbits, pheasants, and quail	Hunters are limited to 6 hunting dogs per group.	Minimizes disturbance to wildlife and visitors. Most upland bird hunters use only one or two dogs.
All species	No hunting on Sundays.	Allows non-hunters to recreate during hunting season without encountering hunters.

***Pheasant Stocking and Hunting*:** Pheasants are not a native species to the area and are introduced only for hunting purposes. The MDFW began stocking ring-necked pheasants (*Phasianus colchicus*) for hunting on Outer Cape Cod during the 1930s and 1940s, prior to the 1961 establishment of CACO. The area that became the Marconi WMA was used for stocking before 1961. Pheasant stocking and hunting within the boundaries of CACO have been permitted under a Memorandum of Understanding (MOU) (Appendix B) until enjoined by a court order in 2003. Under a 24-year old experimental designation, specified within the MOU, 1,500 acres in the Marconi Station area have been managed jointly by the MDFW and the NPS as a wildlife management area. CACO records show this experimental area was established in 1971 as an "experimental one with no time limit shown" (Arenberger 1971 as cited in NPS 1996). This 1,500-acre wildlife management area was still used for pheasant stocking by the MDFW as the main pheasant hunting area on Outer Cape Cod, until the 2003 court order enjoining the hunt. Other historically stocked areas were established prior to the creation of CACO and were used up until the court injunction, including the Bound Brook area in Wellfleet and Hatches Harbor area in Provincetown. Prior to the injunction, these were the only remaining stocking areas on Outer Cape Cod, as others have been shut down due to habitat loss, increased urbanization, and/or for public safety MDFW 1995 as cited in NPS 1996). MDFW continues to stock pheasant at seven other locations on Cape Cod.



Bound Brook Island area.

The pheasants released in the Marconi Station area are raised on a farm in a free-ranging environment, not in cages, and thus are able to

develop natural behaviors, including flying. The beaks are trimmed during the first two weeks of life to prevent injuries from pecking. The beak grows back and is functional for feeding and drinking. A small amount of antibiotic is put into the pheasant feed when the birds are chicks. The antibiotic is not long lasting, and its effects have worn off by the time the pheasants reach maturity. While the pheasants are farm-raised, they are not completely tame and retain much of their natural instincts for taking cover and running and flying away from predators (R. Deblinger MDFW presentation at the July 12, 2004, scoping meeting).

The pheasant hunting season is typically six weeks in length, beginning in mid-October. Most of the hunting activity occurs on holiday and Saturday mornings. Moderate to light hunting occurs on weekday mornings. Hunting is prohibited throughout the state on Sundays. On Saturday mornings, with good weather, as many as 150 to 200 pheasant hunters may be found in the vicinity of the release site. Ninety percent of the hunting activity happens within a two-hour period immediately following sunrise. Many hunters use one or more specially trained hunting dogs for locating and retrieving birds and consider their hunting activities to be enhanced by the use of their dogs.

Most of the hunting activity occurs near the release sites which are fairly isolated from buildings or nearby development. Hunting is prohibited within 500 feet of any building and within 150 feet of any paved roadway or bicycle trail. Hunting areas are accessed from adjacent parking lots and paved roadways and involve short to moderate walking distances, typically 0.1 to 1.0 miles. Other CACO visitors using the same areas at the same time include sightseers, walkers and hikers, cyclists, joggers, dog walkers, mushroom collectors, and cranberry pickers. Each year several complaints are received from non-hunters about the hunting activity in general, as well as from hunters toward the other users. There have been only two reported actual verbal or physical conflicts between hunters and non-hunters since the 1970s (B. Grant, personal communication, April 8, 2004).

Management of the Marconi WMA, including the stocking and hunting of pheasants, has remained fairly unchanged since 1971, with current fall releases of pheasants and associated hunting activity generally managed today as it was then. The area has changed dramatically from an ecological perspective, with pine and oak forests replacing heathland habitats. Stocking and hunting of pheasants in other locations inside CACO also continues. The largest numbers of birds stocked and hunted are in the Marconi area (Table 3). Hunting pressure was probably at its peak during the early 1970s (Table 4), and has likely decreased since that time (B. Grant, personal communication, April 8, 2004).

Pheasant hunters may use shotguns ranging in bore from 12 to 20 gauge and generally loaded with small game or birdshot (medium to light load) shotgun shells. Most pheasants that are taken are felled with one or two shots in the air. Some individuals hunt within small groups, often a pair or trio of hunters, which can aid in locating and flushing pheasants. Walking through areas stocked with pheasants is the most effective; still-hunting is much less effective. Hunters are permitted the use of specially trained dogs, and generally use only one dog. Hunters prefer to take pheasants on the wing. Pheasant hunters are required to wear hunter orange.

Table 3. Numbers of Ring-necked Pheasants Released within CACO by the MDFW[1]

Locations	1990	1991	1992	1993	1994
Marconi Area (Wellfleet and Eastham)	488	440	440	440	440
Bound Brook Island and Griffin Island Areas (Wellfleet)	216	224	224	224	224
Hatches Harbor Area (Provincetown)	160	160	160	160	160
Total	864	824	824	824	824

[1] Data provided by the MDFW

Table 4. Estimates of Pheasant Hunting Pressure During the Early 1970s

Year	Total Number of Hunters	Holiday and Saturday Hunters	Percentage of Total Hunters that Hunted on Holidays and Saturdays.
1971	1,380	830	60.1%
1972	1,500	920	61.3%
1973	1,800	850	47.2%
1974	1,960	1,150	58.7%
1975	-	900	-
1976	-	813	-

***Rabbit Hunting*:** The hunting of eastern cottontail rabbits is especially popular among local hunters and many hunting groups from the New Bedford area. This is often a family sport, with two or three generations of hunters present (M. Minnerath, personal communication, May 12, 2004). Rabbit hunters are permitted the use of up to six dogs, many of which are beagles or similar small, stocky, breeds. Most rabbit hunting groups use the maximum complement of six dogs, while others use only two to four dogs. Shot guns are used, with a bore ranging from 12 to 20 gauge, and small game shot with a medium to light load. Once a rabbit is located and jumped the dogs chase the rabbit and bring it into range of the hunter. The resulting shots are typically low to the ground in medium to thick vegetation. Most rabbits are taken with two to three shots. Slow stalking without the use of dogs is generally less effective for hunting rabbits and still hunting is virtually ineffective.

As part of the development of this EIS, the NPS has initiated an assessment of the presence of the New England cottontail and eastern cottontail. Upon completion of this study, CACO will coordinate with MDFW and USFW to determine if action is necessary to protect the New England cottontail at CACO. CACO maintains the ability to implement protection measures if indicated. This could include limiting rabbit hunting to areas outside of New England cottontail habitat or the discontinuation of rabbit hunting in the Park.

***Waterfowl Hunting*:** Coastal New England has a longstanding waterfowl hunting tradition. Waterfowl hunting on CACO almost exclusively occurs within aquatic habitats, primarily estuarine and intertidal areas for dabbling and diving sea ducks, mergansers, Canada geese (*Branta canadensis*), and brant (*B. bernicla*). Offshore hunting for sea ducks also occurs. Hunting techniques can take several forms, including pass shooting, stalking and flushing, and hunting from a blind. Often hunters use specially trained dogs to retrieve the downed birds. Pass shooting may occur on land, on a jetty, or from a boat, with the hunters generally attracting waterfowl with calls and decoys, and waiting for them to fly over. Stalking involves walking salt marsh areas, flushing waterfowl from small tidal creeks, and shooting on the wing. Temporary or portable blinds or camouflaged boats are used with decoys and calling to conceal the hunter and lure waterfowl within range. Shooting is on the wing and generally over water. Larger gauge shotguns are the most effective, and 12 gauge is the most popular with small game and waterfowl shot and heavy to medium load shotgun shells. Waterfowl hunters attempt to remain concealed and are not required to wear hunter orange.

The bag limit for ducks is contingent upon the year and species that are taken. For example, while hunters may take a total of six ducks per day, their daily bag may contain only one black duck (*Anas rubripes*), one hooded merganser (*Lophodytes cucullatus*), and two female mallards (*A. platyrhynchos*).

***Other Species Hunted*:** Several other species are hunted by a more limited number of hunters (Table 1). A small number of quail (i.e., northern bobwhite [*Colinus virginianus*]) are taken while hunters engage in other upland game hunting. The presence of mature pine and oak habitat is not conducive as quail

habitat. Gray squirrels (*Sciurus carolinensis*) are hunted on an irregular basis, more often while hunting other upland game. Gray squirrels are relatively abundant, but not hunted relative to their population. Other species, including common crow (*Corvus brachyrhynchos*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and red fox (*Vulpes vulpes*) are hunted on an irregular basis, more often while pursuing other game species. Coyote hunting has been increasing in the last 4 to5 years, largely due to the belief that coyotes are competing with deer hunters for that species. Hunting pressure on these species is low.

***Hunting Regulations*:** Table 1 lists those species that are commonly hunted on CACO, taking into consideration the actual presence and abundance of those species. A more complete summary of the hunting seasons is provided in Appendix A.

Currently, the NPS allows hunting in all areas except where specifically prohibited. There are two general categories of areas where hunting is prohibited: areas with high levels of public use, such as nature trails and cultural landmarks; and areas designated as safety zones, such as those within 500 feet of any building or within 150 feet of a bicycle trail (Table 2). Other restrictions and regulations are intended to keep hunting a safe sport and to regulate the take of various game species.

The overall acreages of areas open and closed to hunting by terrestrial and wetland type have been estimated by the NPS (Figure 2 and Table 5). Based on these figures, there are 16,507 acres of upland and wetland habitat open to hunting and 12,436 acres of upland and wetland habitat closed to hunting; therefore, approximately 43 percent of the upland and wetland (excluding submerged lands) areas are closed to hunting. Of the total CACO acreage (including submerged lands), approximately 29 percent is closed to hunting and 71 percent is open to hunting. Of the 16,507 upland and wetland acres open to hunting, 2,000 acres are stocked with pheasants. Areas closed to hunting are described in the CACO compendium and are depicted on the hunting information brochure. These areas are posted each year by sign.

Figure 3: OVERVIEW -- Areas Closed to Hunting Based on State / NPS Regulations - Cape Cod National Seashore

National Park Service
U.S. Department of the Interior

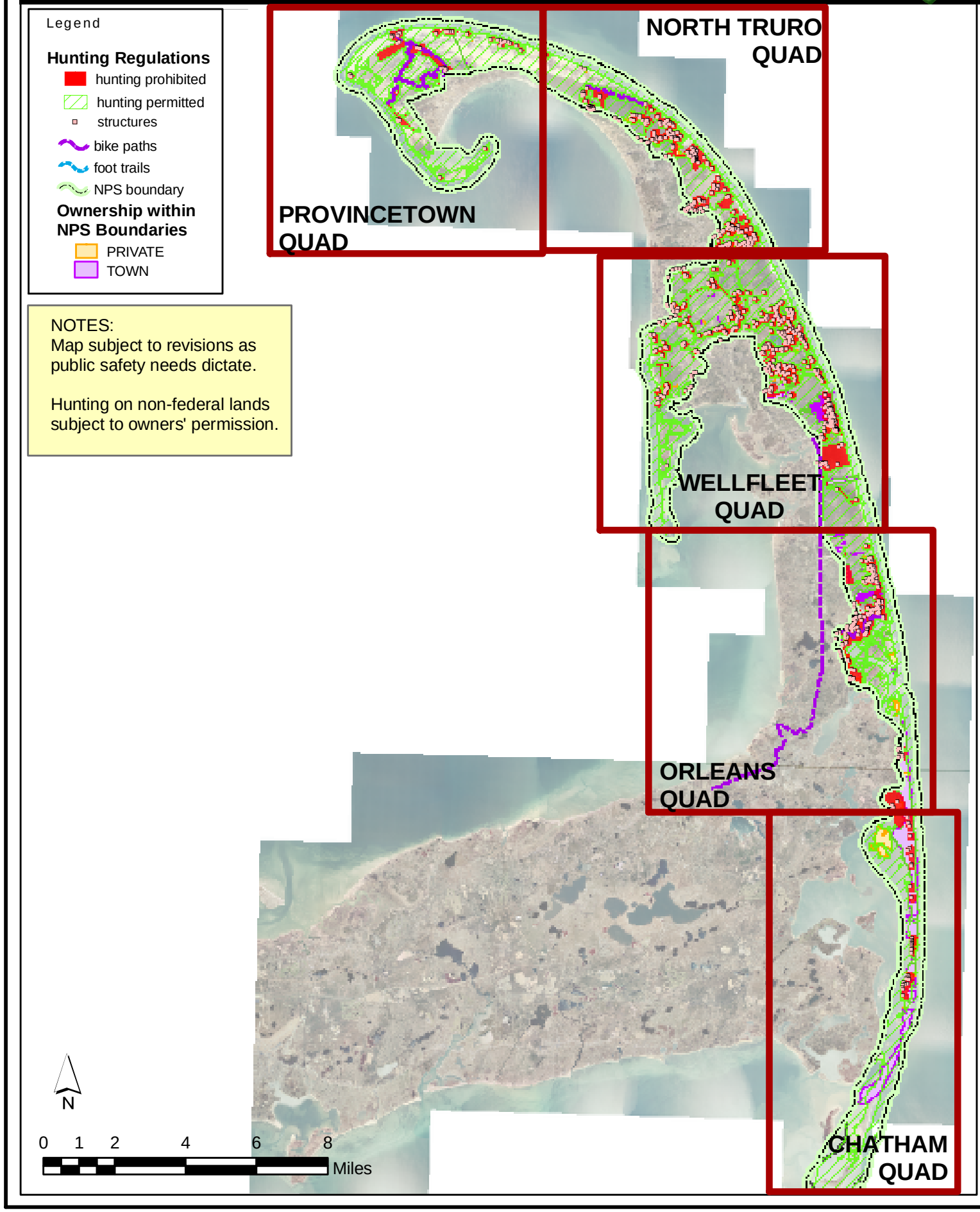


Figure 3a: Areas Closed to Hunting by State / NPS Regulations.
Cape Cod National Seashore

National Park Service
U.S. Department of the Interior



Figure 3b: Areas Closed to Hunting by State / NPS Regulations.
Cape Cod National Seashore

National Park Service
U.S. Department of the Interior

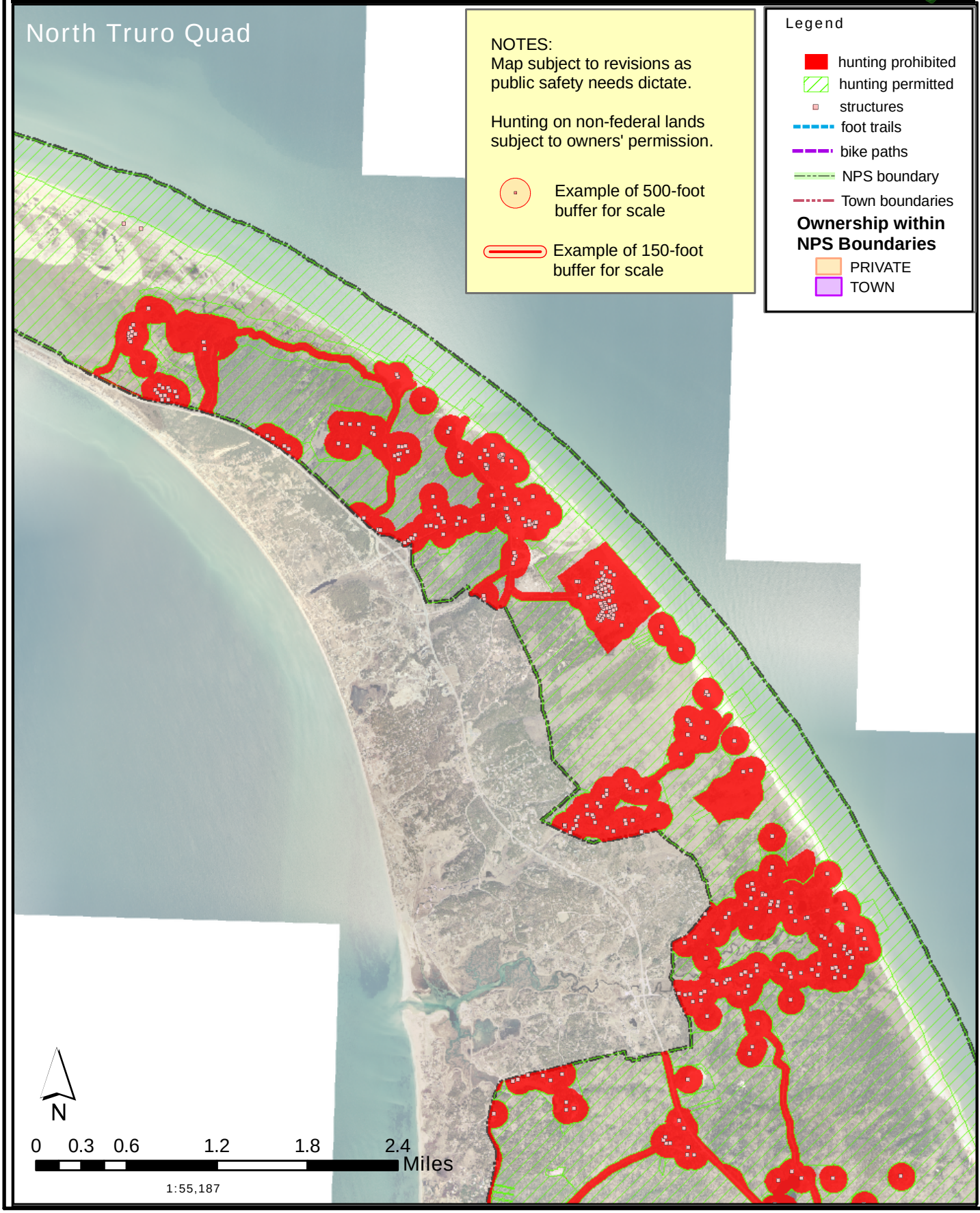


Figure 3c: Areas Closed to Hunting by State / NPS Regulations. Cape Cod National Seashore

National Park Service
U.S. Department of the Interior

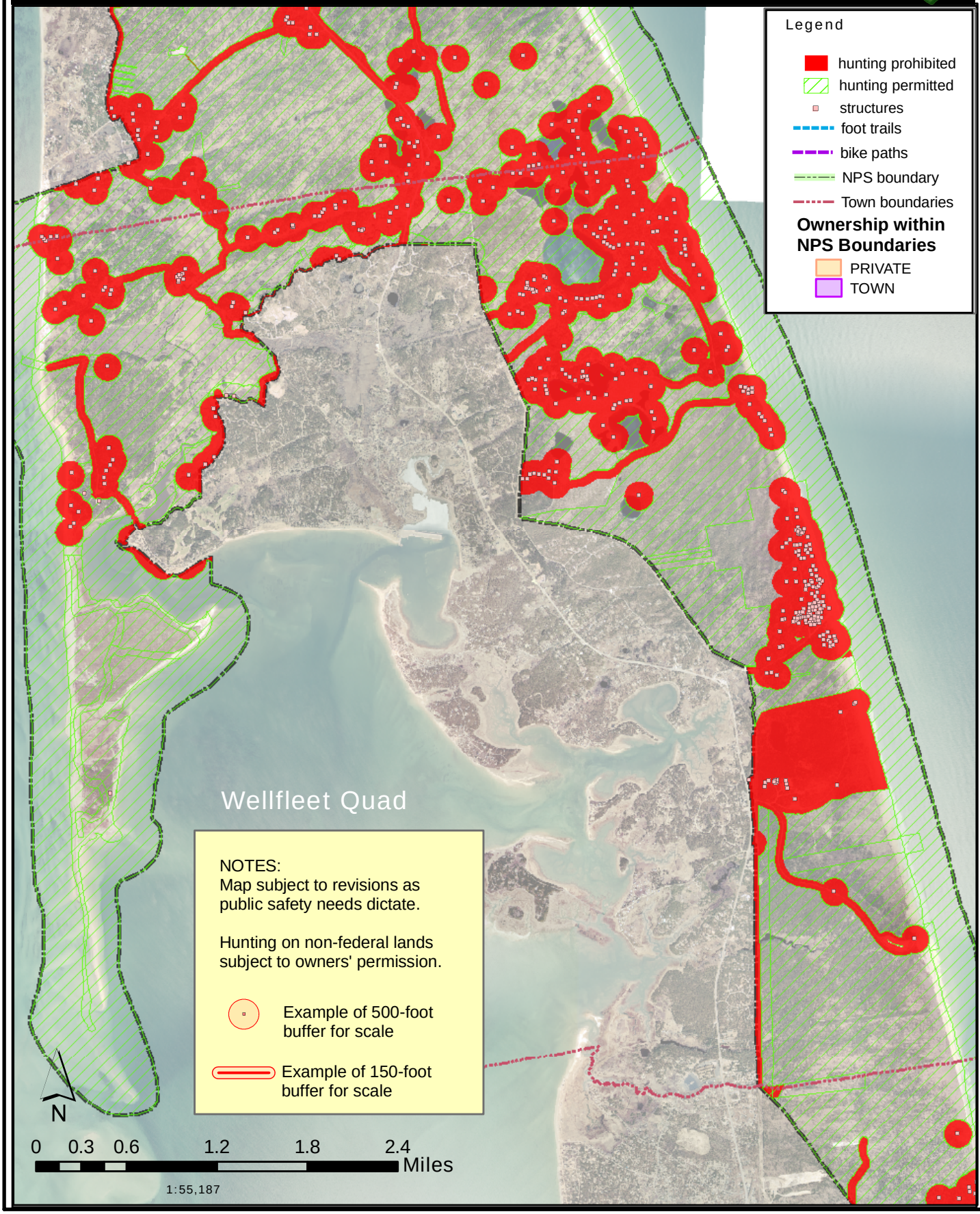


Figure 3d: Areas Closed to Hunting by State / NPS Regulations. Cape Cod National Seashore

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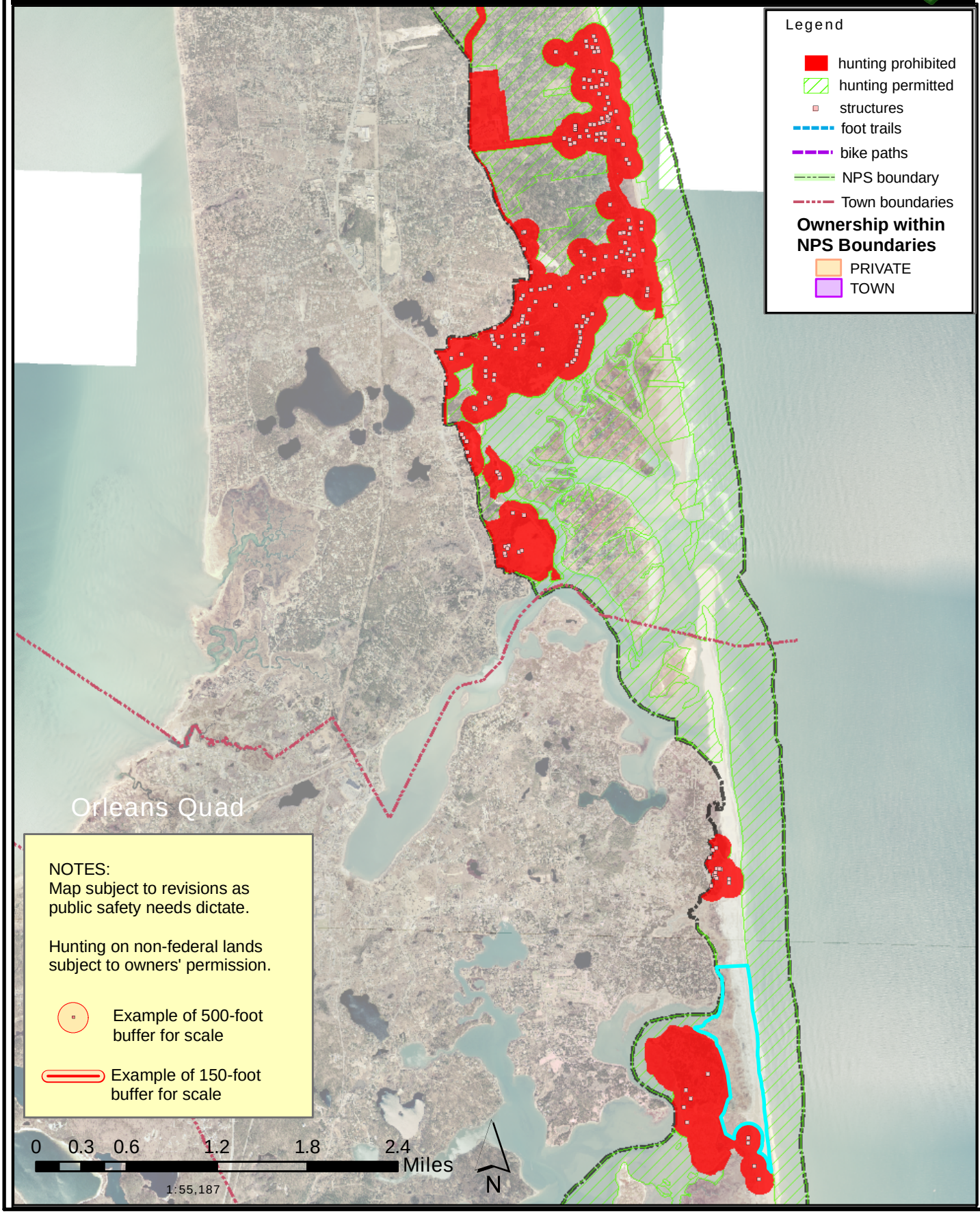
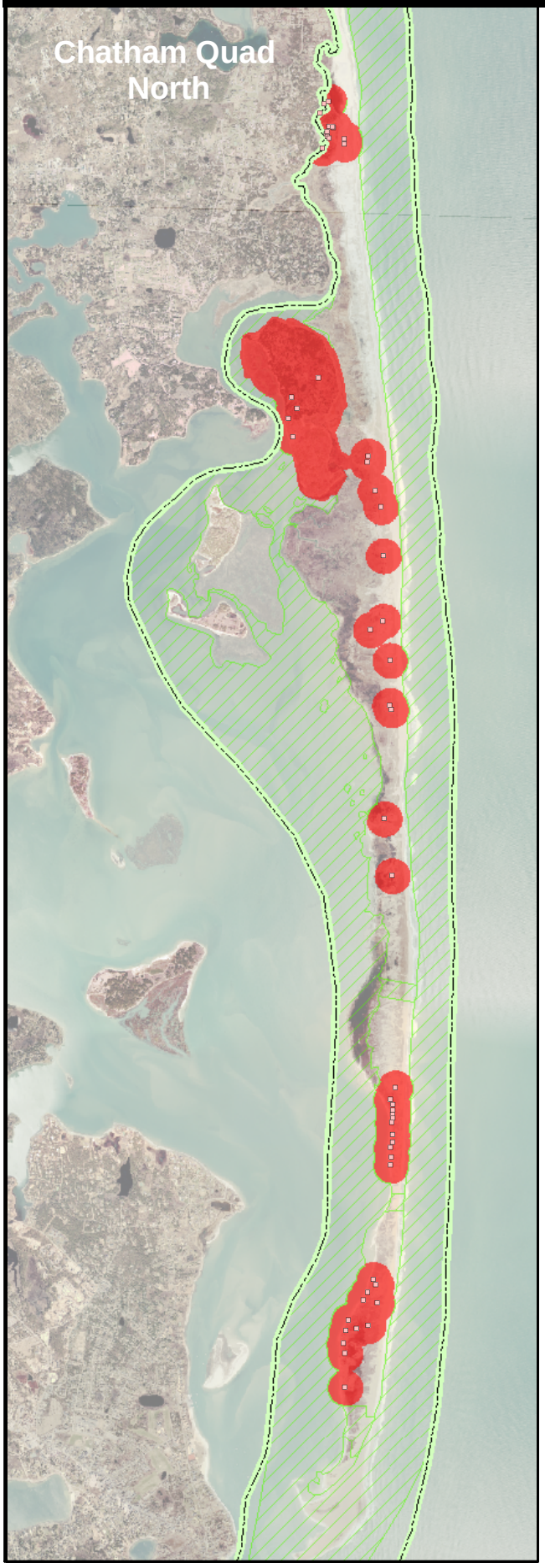
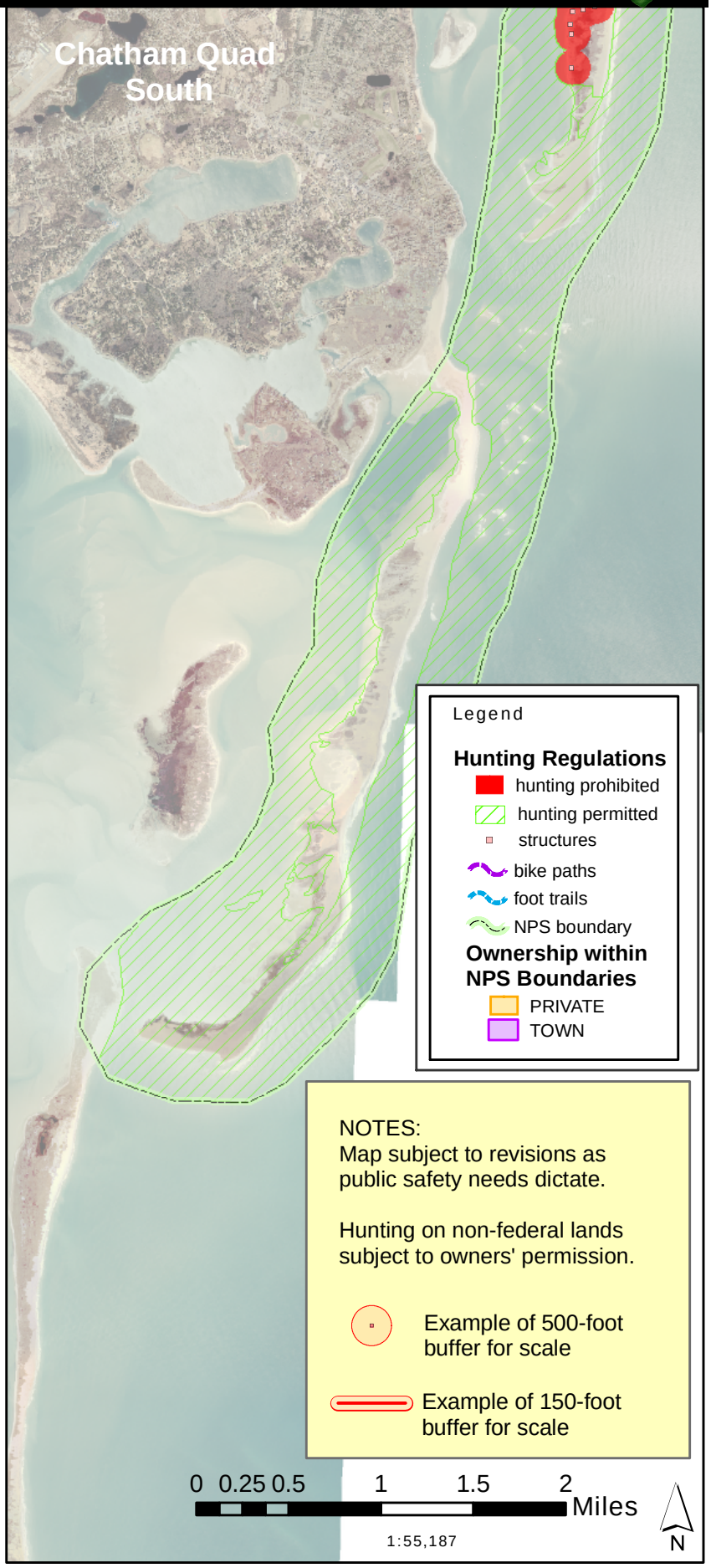


Figure 3e: Areas Closed to Hunting Based on State / NPS Regulations - Cape Cod National Seashore

National Park Service
U.S. Department of the Interior





Legend

Hunting Regulations
- hunting prohibited
- hunting permitted
- structures
- bike paths
- foot trails
- NPS boundary

Ownership within NPS Boundaries
- PRIVATE
- TOWN

NOTES:
Map subject to revisions as public safety needs dictate.

Hunting on non-federal lands subject to owners' permission.

Example of 500-foot buffer for scale

Example of 150-foot buffer for scale

0 0.25 0.5 1 1.5 2 Miles

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Table 5. Approximate Acreages of Areas Open and Closed to Hunting

Location or Type	Hunted or Not Hunted	Acres
Submerged Lands, below tidal zone	Hunted	14,639
Upland and wetland areas	Hunted	16,507
Subtotal Upland, Wetland, and Submerged Lands	**Hunted**	**31,146**
Upland and wetland areas specifically closed	Not Hunted	12,436
Total CACO	**All Areas**	**43,582**

***Enforcement*:** Enforcement of resource protection laws and state and federal hunting laws is conducted primarily by NPS rangers, with some limited assistance from state environmental police and local police officers. There has never been a serious hunting accident recorded at CACO. Over the last three years, rangers have documented multiple "close calls" that have occurred from birdshot overspray between two separate hunting parties, and there have typically been several incidents between hunters each year, sometimes leading to arguments and threatening behavior on the part of the individuals involved. There have never been any documented "close calls" involving hunters and non-hunters.

***Hunting Program Safety Information*:** In the past, protection efforts have focused on ensuring that both hunters and non-hunting visitors can co-exist safely, especially with the increasing numbers of non-hunting visitors and year-round residents on the Outer Cape in and around CACO. Efforts have been directed at education and information in the form of press releases, a hunting information brochure, and the posting of information on CACO's web site (www.nps.gov/caco) and at CACO visitor centers. Rangers also regularly speak to various groups and organizations throughout each year and emphasize, among other things, and the hunting program and hunter/visitor safety. These groups and organizations include the Barnstable League of Sportsmen, the Highland Fish and Game Club, the Nauset Rod and Gun Club, various town resident and non-resident citizen organizations, and Chambers of Commerce.

1.2.4 Areas Closed to Hunting

CACO hunting regulations specifically delineate areas that are designated closed to hunting (Figure 3). These areas are designated by two different means. First, there are large tracts that are posted in the field and expressly designated on CACO maps as closed to hunting. Many of these are popular visitor areas and are completely removed and isolated from hunting areas. Second, areas are designated as off-limits to hunting by regulation for specific safety reasons, such as areas within 500 feet of a building or within 150 feet of a bicycle trail. Overall, the areas currently closed to hunting account for 12,436 acres (Table 5) or about 43 percent of the terrestrial areas on CACO.



Scenic Photos of the Seashore, Including Nauset Lighthouse, Nauset Light Beach, and Great Island Beach (clockwise from left).

1.2.5 Summary of Enabling Legislation

CACO (Public Law 87-126) (Appendix C) was authorized by legislation signed into law on August 7, 1961, and applies to all areas within CACO boundaries. In summary:

- Section 1 of Public Law 87-126 defines CACO's boundary, including segments of the towns of Chatham, Orleans, Eastham, Wellfleet, Truro, and Provincetown. The boundary was changed slightly on November 10, 1978 (PL 95-625).

- Section 2 outlines NPS land acquisition authorities.

- Section 3 provides for the establishment of CACO once sufficient acreage was acquired; CACO was formally established on June 1, 1961.

- Sections 4, 5, and 6 provide for the acquisition of property by condemnation as well as suspension of such authority where "improved property" complies with applicable federal standards for approval of local zoning bylaws and for other statutorily authorized reasons. Regarding the use of public lands, Section 4 provides:

  > "(2) That the Secretary of the Interior may permit hunting and fishing, including shellfishing, on lands and waters under his jurisdiction within the Cape Cod National Seashore in such areas and under such regulations as he may prescribe during open seasons prescribed by applicable local, state and federal law; that said Secretary shall consult with officials of the Commonwealth and any political subdivision thereof who have jurisdiction of hunting and fishing, including shellfishing, prior to the issuance of any such regulations; that said Secretary is authorized to enter into cooperative arrangements with such officials regarding such hunting and fishing, including shellfishing, as he may deem desirable, except that he shall leave all aspects of the propagation and taking of shellfish to the towns referred to in Section One of Public Law 87-126; and that the fishing rights of the public shall be the same in the coastal waters within the CACO as prior to such conveyances."
  >
  > and,
  >
  > "(4) That if at any time the United States of America fails to use the lands so conveyed for the purposes in said Public Law 87-126, the title to such lands shall revert to and revest in the Commonwealth."

- Section 7 addresses the administration of CACO. Relative to the management and the conservation of CACO's resources and values, Section 7(b)(1) states:

  > "In order that the seashore shall be permanently preserved in its present state, no development or plan for the convenience of the public shall be undertaken therein which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing or with the preservation of such historic sites and structures as the Secretary [of the Interior] may designate: Provided, That the Secretary may provide for the public enjoyment and understanding of the unique natural, historic, and scientific features of Cape Cod within the seashore by establishing such trails, observation points, and exhibits and providing such services as he may deem desirable for such public enjoyment and understanding: Provided further, That the Secretary may develop for appropriate public uses such portions of the seashore as he deems especially adaptable for camping, swimming, boating, sailing, hunting, fishing,

> the appreciation of historic sites and structures and natural features of Cape Cod, and other activities of similar nature."

The NPS has interpreted the phrase "permanently preserved in its present state" as generally limiting property development to the level that existed at the time of the legislation's enactment, but not as restricting the restoration of cultural landscapes or natural conditions where disturbed, or precluding natural changes in the environment. Preservation would include a mixture of resources and activities that could change but must remain comparable in character and scale to that in existence in 1961.

An additional provision was added in response to concerns that visitors to CACO would violate the privacy and peace of local owners of improved property. Section 7(b)(2) specifies that:

> "The Secretary shall provide public use areas in such places and manner as he determines will not diminish for its owners or occupants the value or enjoyment of any improved property located within the Seashore."

Section 7(c) authorizes the Secretary of the Interior to permit hunting, fishing, and shellfishing within CACO and to prescribe regulations for such activities, subject to prior consultation with any governmental authority also having jurisdiction over such matters.

> "The Secretary may permit hunting and fishing, including shellfishing, on lands and waters under his jurisdiction within the Seashore in such areas and under such regulations as he may prescribe during open seasons prescribed by applicable local, state, and federal law."

Section 7(c) further authorizes the Secretary to enter into cooperative agreements regarding such activities, except that all aspects of the propagation and taking of shellfish are to be left to the towns.

- Section 8 establishes the CACO Advisory Commission (AC) to provide a means of ongoing consultation and liaison with private, local, and community interests that were expected to remain within CACO. The Advisory Commission is composed of 10 members: 1 member is appointed by each of the six towns, 1 by Barnstable County, 2 by the state, and 1 by the Secretary of the Interior. The life of the commission was originally for 10 years, but it has been extended 3 times.

  The purpose of the commission is to provide advice about matters relating to the development of CACO, land acquisition, and the issuance of regulations specifying standards for zoning bylaws (Section 8(f)). Furthermore, the Secretary must consider the advice of the commission before the issuance of any permit for commercial or industrial use of property located within CACO or any decision regarding the establishment of a public use area for recreational activity (Section 8(g)).

- Section 9 authorizes the appropriation of funds to carry out the act and set a limit on the amount that could be spent for the acquisition of land and waters. The original amount ($16 million) was subsequently increased to $33.5 million in 1970 and to $42.9 million in 1983. Subsequently there have been appropriations for the acquisition of land and waters in the sum of $496,000 in 1993, $825,000 in 1994, $500,000 in 2000, and $499,000 in 2001, all of which has been spent with a small remainder allocated to high priority purchases. A significant number of parcels remain to be acquired.

1.2.6 History of the Hunting Program at CACO

***Initial Hunting Regulations at CACO*:** Hunting and fishing were recreational activities that took place on Outer Cape Cod lands prior to the establishment of CACO, in accordance with existing local, state or federal laws. When Public Law 87-126 established CACO in 1961, its enabling legislation specifically authorized that hunting and fishing could continue in CACO, as discussed in Section 1.2.3 above. This and other specified elements of eventual Federal ownership of CACO are due to the circumstances that led to the creation of CACO as a National Park. This is because the properties that became CACO were held by the towns, the Commonwealth of Massachusetts, and private residential and commercial property owners, and the Park's creation was therefore very controversial. The language in the enabling legislation resulted from specific agreements that enabled passage of the statute founding the Park, and were the result of public hearings and negotiations on the Cape. These agreements assured the affected localities and residents of the Outer Cape that establishing a National Park would allow the Outer Cape, its residents and visitors, to maintain the unique traditions, character, and experience of Cape Cod. Hunting was and remains part of those traditions and character, and received specific attention in the enabling legislation as a result.

The first Master Plan for CACO, entitled *Preservation and Use of Cape Cod National Seashore*, was developed and approved in November 1962 (NPS 1962). Volume I, Chapter 4, Section D, part 5 describes the NPS plans for fish and wildlife protection and management. The Master Plan acknowledged the fact that the enabling legislation gave the Secretary of the Interior the authority to permit hunting under applicable local, state and federal laws. The plan further stated, "Hunting and all forms of fishing are recognized as legitimate, recreational activities in this area."

The Superintendent and staff at the time began the task of planning how to manage the diversity of natural and cultural resources and a wide variety of public use activities. Towards that end, special regulations for managing public use were drafted and published in the Federal Register (FR) on June 5, 1963 [28 FR 5523]. The proposed and final rule [28 FR 11540, October 30, 1963] codified the following regulations under 36 Code of Federal Regulations (CFR) 7.67 relating to hunting at CACO:

> "(a) Hunting.
>
> (1) The killing, wounding, frightening, capturing or attempting to kill, wound, frighten or capture of any wild bird or animal is prohibited in any portion of federally owned lands within CACO, except during the open hunting season prescribed by the state for protected species of waterfowl and upland game.
>
> (2) During the open season prescribed by the state, hunting of waterfowl and upland game is permitted on federally owned lands within CACO in accordance with all applicable federal, state and local laws for the protection of wildlife, except in developed and/or concentrated public use areas and areas of scientific or historic interest designated by the Superintendent which are marked on a map of CACO, which is available for inspection in the office of the Superintendent.
>
> (3) The carrying of loaded firearms of explosives is prohibited in developed and/or concentrated public use areas and areas of scientific or historic interest as marked on the ground and designated on a map of CACO, which is available for inspection in the office of the Superintendent. In all other areas, firearms and explosives shall not be used in a manner so as to endanger people or property."

***Designation of CACO as a "National Recreation Area"*:** In 1964, the NPS categorized all units of the National Park System as natural, historical, or recreational for management purposes. The NPS developed a series of administrative policies for each category that served as guidelines for NPS lands

management, and these were incorporated into general regulations. National Seashores were included in the National Recreation Area (NRA) category.

In March of 1965, the NPS issued a statement on wildlife management policy for recreation areas. National Seashores were, for management purposes, guided by the principles described in the recreation area category, which was different than natural or historical areas. The NPS statement included the following language:

> "Public hunting and fishing are resource uses which are desirable and compatible with fulfilling the mission of the national recreation areas administered by the NPS. This policy has its foundation not alone in the legislation affecting specific areas but also in the report of the Secretary of the Interior's Special Advisory Board on Wildlife Management in the National Parks, approved by the Secretary on May 2, 1963. It is the responsibility of the NPS to implement this policy through sound administration, management and use of the wildlife and fisheries resources in these recreation areas.
>
> Fish and wildlife management involves two principle management functions; i.e., (1) the management of the habitat - soils, water and vegetation; and (2) the management of harvesting fish and wildlife populations by the public.
>
> In national recreation areas administered by the NPS, this latter function is recognized as being within the regulatory authority of the individual states. The states should regulate the taking of fish and wildlife by the public, including such manners as season, bag limits, and licensing, and provide for the joint cooperative enforcement of such regulations.
>
> The first management function is recognized as the responsibility of the NPS. In carrying out this function, as well as its responsibility for the overall recreation program for the area, the NPS may designate zones where, and establish periods when, no hunting or fishing may be permitted for reasons of public safety, administration, or other public use and enjoyment of the area. Regulations prescribing such restrictions shall be issued after consultation with the states.
>
> The management of fish and wildlife in recreation areas must be a cooperative endeavor with the states. These cooperative endeavors will be affected through Memorandums of Understanding (MOU) with the respective states."

***NPS Regulation Changes, 1966 – 1970*:** In December of 1966, a rulemaking was published in the FR (31 FR 16651), which contained, among other things, the definition of the term "recreation area." Under Section 1.2(i), the term "recreation area" included all National Seashores. Part 2, Section 2.32(b)(1) and (2), contained regulations pertaining to hunting in recreation areas. Section 2.32(b)(1) states specifically:

> "Except as otherwise provided herein, hunting and trapping are permitted in accordance with all federal, state and local laws and regulations applicable to these areas or portions thereof. Portions of the area in which hunting and trapping are not permitted shall be designated on a map of the area which will be available for public inspection in the office of the Superintendent and at other convenient places within the area and may be posted on the ground."

The FR notice on the proposed rulemaking stated "...the purpose of these revisions, rearrangements and amendments is to clarify and bring up to date the regulations applicable to the areas administered by the

NPS, as well as to bring them into conformity with the basic policies of the DOI relating to administration and preservation of natural resources in areas of the National Park System."

The 1966 rulemaking apparently did not include provisions to repeal the special regulations relating to hunting at CACO, resulting in similar regulations regarding hunting appearing in two locations in 36 CFR.

In September 1968, a proposed rulemaking was published in the FR [33 FR 12914] with the part of the stated purpose being "...to revoke regulations or portions of regulations concerning hunting, fishing, swimming and water skiing, camping and fires, sanitation, litter, dogs, cats and other pets, horseback riding, and indecent exposure which are no longer needed in view of the provisions of Part 2 of Title 36." The proposed revision to the existing special regulation found at §7.67 regarding hunting was as follows:

> "(a) Hunting.
> The hunting of waterfowl, upland game or any other animal species is permitted: *Provided*, that a specific open season (less than year round) has been established for that waterfowl, game or other species by the Commonwealth of Massachusetts and that the hunting is in accordance with all applicable state, federal or local laws."

***1968 CACO Memorandum of Understanding*:** In December of 1968, the NPS and the MDFW signed the *MOU relating to Wildlife Management in Cape Cod National Seashore*. The MOU cites, as the authority for doing so, Section 7(c) of the enabling legislation (see above) and 1965 NPS Wildlife Management Policy – NRAs, for which CACO is included. This MOU has remained in effect from its inception, and has been renewed on several occasions. The current General Agreement (formerly MOU) was renewed in 2001 and has a five-year validation period (Appendix B). The purpose of this MOU is to establish the MDFW as the entity that manages the hunting program.

***NPS Regulation Changes, 1982 – 1983*:** In 1982, the NPS undertook a revision of regulations codified in 36 CFR parts 1-7 and 12. These rules provide guidance and controls for public use and recreational activities (i.e., camping, fishing, hunting, winter activities, boating) in areas administered by the NPS. The changes stressed consistency, clarity and increased public involvement in NPS management procedures. The proposed rule was published in the FR on March 17, 1982 (47 FR 11598), and the final rule was published on June 30, 1983 (48 FR 30252), stating, "This rulemaking document makes no substantive changes to long-standing regulations or policies."

The "*analysis of comment*" section in the final rules specifically addressed hunting under Section 2.2, Wildlife Protection. It states: "For certain Park areas, Congress has stated that the taking of wildlife through hunting or trapping is an acceptable activity. This authority is found most frequently in connection with national recreation areas, lakeshores, and seashores. In recognition of this explicit Congressional authorization, these activities are clearly permissible in these specified areas. If the legislation for a Park area authorizes hunting or trapping on a discretionary basis, special regulations for CACO will govern a hunting or trapping program."

The "*section-by-section analysis*" portion of the final rule also addresses hunting where authorized. It states: "If the legislation for a Park area authorized hunting or trapping on a discretionary basis, special regulations for CACO area will be required in order to implement a hunting or trapping program. The process of developing special regulations will require compliance with the NEPA and provide for public comment."

The regulation pertaining to hunting codified in 1983 at 36 CFR 2.2 (b)(2) states that "...hunting may be allowed in Park areas where such activity is specifically authorized as a discretionary activity under

Federal statutory law if the superintendent determines that such activity is consistent with public safety and enjoyment, and sound and noise resource management principles (NPS 2001c). Such hunting shall be allowed pursuant to special regulations." Section 2.2(a)(4) goes on to state "...where hunting or trapping or both are authorized, such activities shall be conducted in accordance with Federal laws and the laws of the State within whose exterior boundaries a Park area or a portion thereof is located. Non-conflicting state laws are adopted as a part of these regulations."

The EA prepared by NPS in 1981 on the proposed revisions of these regulations, and its accompanying Finding of No Significant Impact (FONSI) dated June 17, 1983, discusses hunting on pages 14 and 15, including the following language:

> "2.2 *Wildlife Protection*
> *Alternative A (Preferred Alternative)*:
> The principle change in this regulation is the elimination of the concept of using management categories to define what taking of wildlife will be permitted. Instead, the revised regulation bases the permissibility of hunting and trapping on each Park's enabling legislation.
>
> In cases where this legislation is silent on the issue, all taking of wildlife is prohibited. If the law permits hunting, on a discretionary basis, special regulations for that Park will be required in order to implement a hunting program. This will ensure that there is an opportunity for public comment in the process of decision-making in such cases.
>
> Another new feature of this regulation is the requirement for consultation with state agencies in most situations where hunting and trapping is permitted, but where the NPS has a need to restrict these activities in some manner. Most enabling legislation permitting these activities in Parks contains language requiring this consultation process.
>
> *Effects of Alternative A*:
> Elimination of the use of management categories will clarify that stature of hunting and trapping in a number of Parks and will ensure that the NPS management closely adheres to legislative intent for these Parks. In some instances, the issuance of special regulations will be required, where they were not necessary under the present regulations.
>
> Consultation with state agencies will provide better interagency cooperation and make possible better communication with members of the public who hunt on CACO lands. State concurrence in NPS management decisions is not required, so control over management of CACO wildlife will remain an NPS responsibility.
>
> Where hunting has been permitted, it has been conducted in accordance with applicable state laws, but there is no clear-cut adoption of these laws in the NPS regulations. This revision will provide clear authority for CACO personnel to control hunting on the basis of these state laws, taking enforcement action where appropriate."

A memorandum dated July 7, 1983, from the Director of the NPS to the Washington Office of the NPS Directorate, Regional Directors, and Park Superintendents accompanied the release of these new regulations to the field. Included in this memo was a stipulation emphasizing that beginning October 3, 1983, special regulations would be required to implement a hunting program where hunting is specifically authorized as a discretionary activity. The use of the term "implement" is somewhat misleading here, as

hunting was already legally taking place at CACO at the time these regulations were proposed and made final.

***CACO Special Regulations, 1983 – 1984*:** The Director of the NPS issued a subsequent memorandum on August 29, 1983, to Regional Directors and Park Superintendents, which restated the requirements for the development of special regulations to "... implement a hunting program where hunting is specifically authorized as a discretionary activity, that is, those Parks in which the Secretary may authorize hunting." Parks were also required to develop proposed rules and determination of effects, including quantifiable information on the economic impact of the special regulation on individuals and small businesses.

CACO staff drafted a proposed rule, including a statement of economic impact and submitted this to the Washington NPS office through the North Atlantic Regional Office on September 8, 1983. In the CACO proposed rule, it is important to note that they referred to the proposed rule as a "recodification of activities formerly allowed under 36 CFR 2.32 (b), wildlife, and hunting in the Recreational Area Management Category." It is also interesting to note that in the *background* information provided by CACO in the proposed rule, they state that they are complying with the requirement "under the final rules published on June 30, 1983, 36 CFR Part 2 Section 2.2(b)(2) requires that special regulations be promulgated under Section 7.67 in order to continue [emphasis added] a hunting program at CACO."
The proposed rule, including the provision to codify special regulations relating to hunting at CACO, was published in proposed form for public comment on December 27, 1983 [48 FR 56971], with the comment period extended until February 25, 1984 [49 FR 3492]. The NPS received 3,850 timely written comments regarding the proposed amendments, with the vast majority relating to NPS-wide regulations on trapping and loaded weapons.

The *analysis of comments* section under the Part 7, Special Regulations/Hunting heading cites only one comment received regarding the proposed regulation for CACO: One commenter requested assurances that the NPS would monitor hunting activities within CACO. The NPS responded that they intended to manage hunting within CACO to ensure public safety, public enjoyment, and resource protection. The rule specified that hunting be allowed, subject to applicable federal and state laws and any special restrictions that may be necessary to ensure public safety and protect resources. The NPS would also document any adverse effect hunting may have on wildlife populations.

The commenter further requested that the NPS extend the "no hunting" season from August 31 until October 15, to protect fall recreational uses of CACO. The NPS indicated that it would not be adopting this suggestion. The prohibition on hunting from March 1 through August 31 eliminates the problem of a year-round open season on certain species within Massachusetts, such as English sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), chipmunk (*Tamias striatus*), flying squirrel (*Glaucomys sabrinus*), red squirrel (*Tamiasciurus hudsonicus*), weasel (*Mustela erminea*), porcupine (*Erethizon dorsatum*), striped skunk, and woodchuck (*Marmota monax*). The NPS responded that it believes that opening the hunting season on September 1 coincides with the time of reduced visitation, and that conflicts among users would be minimal.

In the *section-by-section analysis* portion of the rule, under Part 7, Special Regulations/Hunting, there is the following statement:

> "This rule specifies that hunting be allowed, subject to applicable Federal and State laws and any special restrictions that may be necessary to ensure public safety and protect resources."

The *section-by-section* analysis with regards to the hunting special regulations goes on to say:

> "In all five of the Park areas covered by hunting regulations, hunting was practiced before the NPS assumed management responsibility. Planning documents for these areas have received extensive public review. The documents include hunting as an approved public activity. Hunting is managed jointly by the states and the NPS and has no known adverse resource effects. It is not anticipated that implementation of these regulations will result in any significant change in the manner in which hunting is conducted in these areas."

In the years since the special regulation re-codifying hunting as a special regulation was published, CACO has attempted to ensure the public safety and protection of resources through the use of CACO Compendium, which gives Superintendents the discretionary authority to designated closures and impose public use limits and restrictions as authorized by 36 CFR 1.5.

Lastly, with respect to this particular rule making, the following information is contained under the heading, *Compliance with Other Laws*:

> "As required by the NEPA (42 U.S.C. 4332, et seq.), the Service has prepared an EA on those portions of this rulemaking which are other than correcting or clarifying in nature and has made a FONSI. Copies of the EA and FONSI are available at the address noted at the beginning of this rule or at the individual Parks affected."[1]

The final rule establishing the special regulations pertaining to hunting at CACO was published in the FR on April 30, 1984. The regulations, found at 36 CFR 7.67(i) state the following:

(1) Hunting is allowed only at times and locations designated as open to hunting.
(2) Only deer, upland game, and migratory waterfowl may be hunted.
(3) Hunting is prohibited from March 1 though August 31 of each year.

There have been no changes to either the service-wide general regulations (Part 2) or CACO special regulations relating to hunting since 1984.

***Compendium Appendix B. 36 CFR Part 2, Resource Protection, Public Use and Recreation Determinations. Section 2.2 Wildlife Protection (NPS 2004b)*:** The following provides a summary of the CACO compendium relating to hunting regulations.

- Hunting is permitted in accordance with applicable state and federal hunting laws and regulations, except as further specified in this section or other federal laws or regulations.
- Hunting is prohibited from March 1 through August 31.
- Hunting or the possession of a loaded weapon is prohibited on or within 150 feet of established bicycle trails. Discharge of a weapon across any established bicycle trail is prohibited. These restrictions apply to the following bicycle trails: Nauset Bike Trail; Province Lands Bike Trail; Head of the Meadow Bike Trail; and Cape Cod Rail Trail.
- Hunting or the possession of a loaded weapon is prohibited within 500 feet of any building, except as authorized by the owner or occupant thereof.
- Hunting or the possession of a loaded weapon is prohibited in certain areas of CACO pursuant to 36 CFR 1.5 and 36 CFR 7.67(f). These areas include the following: Fort Hill Area (Eastham); Cedar Banks Area (Eastham); Beech Forest Area (Provincetown); Marconi Station/Cedar Swamp Area (Wellfleet); Former Ball Trust Land (Truro); and Pilgrim Heights Area (Truro).

[1] Despite an extensive search of Park files (on site and archived), as well as regional and Washington office compliance program files, CACO staff have not been able to locate a copy of the EA and FONSI mentioned above. It is important to note that this category of document is classified as available for disposal after 15 years in accordance with the NPS record disposition rule.

- The specific areas, which are closed, are designated on a map, which is available for review in the Chief Ranger's Office at CACO Headquarters. This map is included in the "Hunter's Information" brochure which may be obtained upon request from the Chief Ranger's Office, Visitor Centers, and Ranger Stations.
- Upland game as used in 36 CFR 7.67 includes the following species: crow; ruffed grouse (*Bonasa umbellus*); ring-necked pheasant; northern bobwhite; English sparrow; European starling (*Sturnus vulgaris*); cottontail rabbit; snowshoe hare (*Lepus americanus*); opossum; raccoon; red fox; gray fox; coyote; gray squirrel; chipmunk; weasel; striped skunk; woodchuck.
- The disposal/dumping of animal carcasses is prohibited.

***National Environmental Policy Act*:** The NEPA was passed in 1969. Council on Environmental Quality (CEQ) regulations were codified at 40 CFR Section 1500 to 1508 in November of 1978. The DOI published Part 516 of the Departmental Manual to further facilitate NEPA compliance. In January 1981, the Department published Appendix 7 to 516 DM, which contained NEPA procedures specific to the NPS. Later guidance on NEPA compliance within the NPS at that time could also be found in Director's Order 12 (NPS 1982). At the time NEPA was passed into law, hunting had been taking place, as provided for in both law and policy, for the previous eight years of CACO existence.

NEPA applies to "federal actions" that are defined as projects, activities, or programs funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency. However, activities must be both "major" and have a "significant effect" on the environment to require the preparation of an EIS. Actions that are neither major nor have a significant effect are either evaluated by an EA, followed with a FONSI or are categorically exempt and require no NEPA compliance. During the early 1980s, many people referred to the list of categorical exclusions without creating a memo stating that they had done so. The lack of any file documents would support a conclusion that the CACO managers believed that at the time NEPA became law and the implementation of regulations and guidelines were developed, the pre-existing activity of hunting at CACO met the specific provisions to be categorically excluded. Specifically, the program was not considered to have highly controversial environmental effects or have significant adverse effects on public health and safety. Furthermore, during the 1983-1984 period a programmatic EA was completed regarding the hunting program. The documentation and EA were likely destroyed as part of a routine purging of documents older than 15 years.

The earliest list of categorical exclusions regarding actions related to visitor use is found in 516 Departmental Manual, Appendix 7, dated January 19, 1981 (#2316). These categorical exclusions would have been in effect at the time of the proposed rulemaking resulting in the re-codification of the regulations regarding hunting at CACO in 1983-84. The following are listed as categorical exclusions under Parts D and E:

> D (2) Minor non-controversial changes in amounts and types of visitor use for the purpose of ensuring public safety or resource protection in accordance with existing regulations.
>
> D (4) Minor non-controversial changes in programs and regulations pertaining to visitor activities.
>
> E (5) Issuance of individual hunting and/or fishing licenses in accordance with state and federal regulations.

The NPS stated in the 1983 rulemaking that those Parks with discretionary authority wishing to implement a hunting program under a special regulation would need to comply with NEPA and provide

for public comment. CACO staff, through the special regulations rule making process, did comply with NEPA, including providing an opportunity for public comment. It is relevant, however, to provide additional information concerning what federal actions qualify for a categorical exclusion to the NEPA process. Director's Order 12 contains NPS and Department-wide policy with regard to NEPA (NPS 1982). The categorical exclusions for the NPS are found in 516 Departmental Manual 6, Appendix 7, Section 7.1D. *Actions Related to Visitor Use* includes sub-section (4): *Minor non-controversial changes in programs and regulations pertaining to visitor activities*. It is also apparent from information previously cited that the NPS did not feel the rulemaking was controversial in nature. Later revisions of the NPS list of categorical exclusions continued to exempt on-going public use programs, hunting activities conducted in accordance with state and federal regulations, and minor changes to existing programs. 516 Departmental Manual 6, Section 7.4 (2/28/85) lists the following categorical exclusions:

D (2) Minor changes in amounts or types of public use for purposes of ensuring public safety or resource protection in accordance with existing regulations.

D (4) Minor changes in programs and regulations pertaining to visitor activities.

E (5) Issuance of individual hunting and/or fishing licenses in accordance with state and federal regulations.

Therefore, the continued conduct of fall and winter season hunting within CACO has been in compliance with statutes, policies, NEPA compliance requirements, and the agency regulations since CACO was created in 1961 and the first special regulations were issued in 1963.

Two other NEPA documents, the Pheasant Study EA and the EIS for the GMP, have been conducted at CACO that review the hunting program in some fashion. Limited just to the question of evaluating the effects of the pheasant hunting program, a draft EA, final EA, and FONSI (NPS 1996) afforded an opportunity for the public to provide input to CACO on this particular program. The EA was announced to the public in the FR on August 27, 1996, and released for a 30-day public review on August 29, 1996. The EA analyzed potential effects from two alternatives related to the pheasant program: (1) the no-action alternative where the existing hunting program would be allowed to continue; and (2) a two-year assessment and research study to determine the effects of the program on natural resources (the NPS "preferred" alternative). During the comment period, numerous articles and announcements in three local papers were published briefly describing the EA and its proposals. Eight formal responses were received in writing during the comment period, with four supportive of the preferred proposal and four opposed or desiring that the alternative of ending stocking and hunting of pheasant be adopted or further analyzed. The preferred alternative was chosen and a FONSI was signed on October 18, 1996.

***Cape Cod National Seashore General Management Plan*:** Lastly, CACO completed the GMP process in July 1998. During the several years that were spent by CACO staff and others working towards completion of this effort, numerous public meetings, forums, and discussions were held in an attempt to obtain public input and comment on this document. An EIS on the GMP was prepared, as required by NEPA, and a Record of Decision (ROD) was issued in July 1998. The topic of hunting was discussed a great deal during this process. In fact, the Final EIS, published in February 1998, lists no less than 34 separate citations in the index where hunting is discussed, and a total of 7 letters (5 pro and 2 con) were received from individuals, organizations, or State officials. In one response to a writer regarding the hunting program, CACO stated:

> "Open hunting areas have remained stable in the seashore for many years, and no changes are planned. Regulating and monitoring hunting activity is an essential part of managing the seashore. Over the past three years, complaints from the public about hunting, complaints from hunters, and tickets and warnings issued to hunters have all dropped significantly. This is an indicator that hunting within the seashore is managed appropriately at this time."

***Waiver of Policy Regarding Pheasant Stocking/Hunting at CACO*:** The following provides background regarding the NPS policy on exotic species. The pheasant is an "exotic" species, which is defined in NPS-77 Natural Resource Management Guidelines (NPS 1991) as: "A species occurring in a given place as a result of direct or indirect, deliberate, or accidental actions by humans." The Guidelines go on to clarify: "Those (species) that invade with human intervention are considered to be exotic...In general, the NPS strives to protect and preserve all species of native flora and fauna within all management areas."

The Guidelines were published to be considered in tandem with the Park Service's Management Policies that were in effect at that time (NPS 1988). Regarding exotic species, NPS 1988 stated:

> "Non native plants and animals will not be introduced into natural zones except in rare cases where they are the nearest living relatives of extirpated native species, where they are improved varieties of native species that cannot survive current environmental conditions, where they may be used to control established exotic species, or when directed by law or legislative intent."

and,

> "In national recreation areas and preserves where the enhancement of fish and game species for hunting and fishing is authorized, preference will be given to enhancing native species. However, where stocking of exotic fish and same species has historically occurred, stocking for the same species may be continued unless it is known to be damaging native resources."
> (Note: CACO was defined for management purposes as a recreation area until 1984.)

A study completed by Bump and Field (1999) on the effects of the pheasant stocking and hunting program at CACO found no evidence that pheasants survive beyond the winter in numbers great enough to establish a breeding population and concluded that native resources are not put at risk by this program.

The NPS published an update to its Management Policies in 2001 (NPS 2001b). Another update to the Management Policies was published in 2006 (NPS 2006a). These policies serve as the basic service-wide policy document of the NPS.

> "The Service manages harvest to allow for self-sustaining populations of harvested species and does not engage in the stocking of plants or animals to increase harvest. In some special situations, the Service may stock native or exotic animals for recreational harvesting purposes, but only when such stocking will not unacceptably impact park natural resources or processes and when…the intent for stocking is a treaty right or expressed in statute, other applicable law, or a House or Senate report accompanying a statute."

Adherence to policy is mandatory unless specifically waived or modified by the Secretary of Interior, the Assistant Secretary, or the Director of the NPS. Furthermore, based on the above cited exotic species policy, a waiver of that policy was needed to continue the pheasant hunting program. CACO Superintendent Maria Burks prepared a memo requesting a waiver of the NPS exotic species management policy on October 7, 2002. The waiver was granted. The memo was based on scientific study and best professional judgment by CACO technical and enforcement staff. Issues addressed in this memo included the ecological issues relating to pheasant releases and potential effects to vegetation from hunters. The waiver request stated that, since it was recognized that the pheasant hunt represented an important traditional practice, CACO would phase the pheasant hunt out slowly, while encouraging management practices that would improve habitat for native upland game species.

1.2.7 CACO's Mission Statement, Management Philosophy, Objectives, and Goals

***Mission Statement*:** The *Strategic Plan for the Cape Cod National Seashore Fiscal Year 2001 - 2005* (NPS 2001b) indicates that the mission statement of the NPS grows from the CACO legislated mandate found in Public Law 87-126 and is a synthesis of the mandated purpose and of CACO's primary significance. It reads:

> "The Mission of CACO is to preserve the nationally significant and special natural and cultural features, distinctive patterns of human activity and ambiance that characterizes the Outer Cape, along with the associated scenic, cultural, historic, scientific and recreational values, and to provide opportunities for current and future generations to experience, enjoy and understand these features and values."

***Management Philosophy*:** As stated in the GMP (NPS 1998a), the management philosophy for CACO is the foundation for management actions and decision making. It identifies the fundamental principles for management and is the result of a thorough examination of CACO's legislation. It also reflects a growing understanding of what is required to manage this complex resource on a scientific basis and to be responsive to the concerns of neighbors, partners, and the public. The philosophy articulates the commitment of the NPS to the principles of sustainability and ecosystem management.

The Management Philosophy for CACO

Cape Cod is a dynamic place where human and natural forces have interwoven to create a distinctive regional character. Cape Cod National Seashore was established to preserve vital elements of the Cape's character, including flora and fauna, physiographic conditions, historic sites and structures, cultural heritage, and other unique natural and cultural features. This character also includes a certain ambience that is subtler and harder to define, but that provides both a sense of peace and relative isolation. A distinctive pattern of human activity has both shaped, and been shaped by, this special place. Management of the seashore is a delicate balance in which the human needs of today and tomorrow must be addressed within the context of both preservation and tradition.

The legislative record of the national seashore's establishment makes it clear that the preservation of nationally significant resources and these special values was the paramount objective of Congress. However, it is equally clear that Congress envisioned a Park unit that would be actively enjoyed by people. That task becomes particularly challenging when part of what is being preserved and made available to visitors is a relationship between humans and their surroundings that is still important to the daily existence of many Cape Codders.

Better science and access to information can continue to help to bring about a dramatic improvement in our understanding of public use and resource protection issues. On Cape Cod this new understanding must be applied in ways that are sensitive to the history and continuing daily lives and activities of the people here. It must also be applied in ways that help us keep the relationship between people and their environment healthy, so that natural, cultural, and economic systems do not become degraded over time.

Even though the national seashore was established with specific legal boundaries, the special resources that characterize the Outer Cape transcend those boundaries, as well as every other political boundary. The quality of life and the economic needs of nearby communities affect seashore resources, just as the management of resources within the national seashore has significant effects on the towns. For this reason a collaborative approach to stewardship among the six Outer Cape towns and all seashore partners is essential. Cape Cod National Seashore staff and managers assume that cooperation and teamwork begin, not end, at the seashore boundary.

***Management Objectives*:** The GMP (NPS 1998a) contains management objectives that were developed to provide a framework so CACO managers and planners can work toward fulfilling CACO's purpose. The stated objectives are:

- "In concert with local, regional, and state agencies, manage the natural and cultural resources of CACO to sustain the distinctive character of the Outer Cape Cod, a resource held in common among the six towns and the people of the United States.
- Seek to understand, foster, and maintain native biological and physiographic diversity to sustain thriving, dynamic natural communities and systems. Within these standards, protect water resources through a cooperative, balanced approach to water use management.
- Encourage a commitment to the stewardship of the buildings, places, activities, and artifacts of Cape Cod that best exemplify its traditional character, and conserve them to ensure their continuing contribution to the culture of Cape Cod, in collaboration with local communities.
- Allow natural processes to continue unimpeded in natural zones, including the action of wind and water, and neutralize the effects of human intervention where it has adversely affected natural systems, with consideration for public safety.
- Provide opportunities for a diverse range of quality experiences that are based on the resources and values of Cape Cod, with consideration for sustainable practices and traditional uses, and that are consistent with the purposes of CACO.
- Stimulate, and then satisfy, a public desire to understand the natural and cultural resources and the history and sociology of Cape Cod through the primary interpretive themes identified for CACO.
- Respect and cooperate with the residents of the Outer Cape, with an emphasis on collaborative decision making and problem solving to address common Outer Cape issues and to promote a stewardship ethic for CACO.
- Consult with a broad variety of interested parties, or stakeholders, to generate effective public participation and better-informed decisions."

The Government Performance and Results Act of 1993 requires a slightly different focus for management objectives, aimed at greater measurability of actual results. The NPS and other federal agencies are moving from the current operational mode toward performance management using strategic planning to accomplish the NPS mission. In 2000, CACO developed a Strategic Plan that sets forth planning goals based on the identified NPS service-wide mission goals, including:

- preserving CACO resources;
- providing for the public use and enjoyment and public experience of CACO;
- strengthening and preserving natural and cultural resources and enhance recreational opportunities managed by partners; and
- ensuring organizational effectiveness.

***Relevant Management Goals*:** The GMP lists specific goals and objectives for managing CACO's resources. In regard to wildlife and vegetative resources and the public uses and activities that could affect those resource, the stated goals and the strategies designed to help meet them include:

- *Management Goal*: Manage special uses affecting wildlife populations, such as hunting, to minimize ecosystem impacts and to sustain natural processes.

  Strategies - Stocking and reintroduction program: A consistent policy toward stocking programs for hunting and fishing will be developed in cooperation with the MDFW. The use of native species will be encouraged in such programs. Habitat will not be altered merely to support game animals, but may be managed for historical communities.

- *Management Goal*: Manage native natural communities by allowing natural processes to continue unimpeded except where appropriate to selectively manage for native biological diversity or rare, threatened, or endangered species or communities and reduce effects from human disturbance.

  Strategies - Vegetation and wildlife database: An assessment will be completed to determine the level of effects to vegetative communities by various user groups. In accordance with CACO's approved *Fire Management Plan,* the natural role of fire will be researched and then restored or simulated in fire-dependent ecosystems and in selected areas using prescribed burning techniques. Because heaths are caused by natural disturbances such as severe storms or fire, or from intense human activity, the locations of heathlands may change over time as existing areas naturally succeed to other communities and new disturbances create heaths in other areas. Vegetation management will include the planting of native species for erosion control, wildlife habitat, and the mitigation of effects from construction projects and public use.

- *Management Goal*: Maintain and allow public activities at CACO that are compatible with CACO's purpose and that enhance the cultural heritage of the region.

  Strategies – Public activities: Maintain and allow public activities at CACO that are compatible with CACO's purpose and enhance the cultural heritage of the region. As the needs arise, public activities at CACO will be evaluated in consultation with affected stakeholders to see if they meet the following criteria:

  - The use will be compatible with the purposes and management objectives of CACO.
  - User conflicts will be minimized.
  - The use will not result in resource degradation beyond what is reasonable in the relevant management zone.
  - The use will not impair the quality of the desired experience defined for the relevant management zone.
  - The scale of use will be in character with Cape Cod.
  - The use will not constitute a public health or safety hazard.

Some uses may be restricted to certain areas or to certain times, with the regulation and level of use varying from season to season or from place to place. NPS will continue to develop public use management strategies to minimize resource impacts and use conflicts (NPS 1998a).

***Relevant NPS Policies and Guidance Documents*:** The NPS Management Policies 2006 (NPS 2006a) provides management guidelines for the harvesting of plants and animals by the public and the management of exotic species. Specifically, guidance provides for public harvesting of designated species of animals in Park units when:

> "Hunting, trapping subsistence use, or other harvesting is specifically authorized by statute or regulation and not subsequently prohibited by regulation."

Where harvesting is allowed and subject to NPS control, the NPS will allow harvesting only when the monitoring requirement specified for management of native species and the criteria established for removal of native species have been met (NPS 2006a), and the NPS has determined that the harvesting will not unacceptably impact CACO resources or natural processes, including the natural distributions, densities, age-class distributions, and behavior of:

- harvested species;
- native species that the harvested species use for any purpose; or
- native species that use the harvested species for any purpose.

The NPS will manage harvesting programs, and any associated habitat management programs intended to restore and maintain habitats supporting harvested plant or animal populations, to conform with applicable federal and state regulations and in consultation and cooperation, as appropriate, with the Commonwealth of Massachusetts.

Habitat manipulation for harvested species may include the restoration of a disturbed area to its natural condition so it can become self-perpetuating, but will not include the artificial manipulation of habitat to increase the numbers of a harvested species above its natural range in population levels.

In some situations, the NPS may stock native or exotic animals for recreational harvesting purposes, but only when such stocking will not impair Park natural resources or processes and:

- such stocking is in an NRA or preserve that has historically been stocked (in these situations, stocking only of the same species may be continued); or
- Congressional intent for stocking is expressed in statute or a House or Senate report accompanying a statute.

Management of exotic species can include allowing that species to remain on NPS lands under specific conditions. In general, new exotic species will not be introduced into NPS lands. In rare situations, an exotic species may be introduced or maintained to meet specific, identified management needs when all feasible and prudent measures to minimize the risk of harm have been taken, and it is:

- a closely related race, subspecies, or hybrid of an extirpated native species; or
- an improved variety of a native species in situations in which the natural variety cannot survive current, human-altered conditions; or
- used to control another, already-established exotic species; or
- needed to meet the desired condition of a historic resource, but only where it is prevented from being invasive by such means as cultivating (for plants) or tethering, herding, or pasturing (for animals). In such cases, the exotic species used must be known to be historically significant, to have existed in the CACO during the period of historical significance, or to have been commonly used in the local area at that time; or
- necessary to provide for intensive public use in developed areas, and both of the following conditions exist:
    1. Available native species will not meet CACO management objectives.
    2. The exotic species is managed so it will not spread or become a pest on CACO or adjacent lands.

***Exotic Species of Animals*:** Exotic species of animals may be introduced into recreation areas as part of various management programs for purposes of public recreational use and enjoyment except that no species, particularly those new to the country or region, may be introduced unless there are reasonable assurances from the Bureau of Sport Fisheries and Wildlife and responsible State agencies that the species will not become a pest or disrupt desirable natural plant and animal communities and associations of particular scientific significance.

Control of exotic species will be undertaken only when they are undesirable in terms of public health, recreational uses, and enjoyment, or when their presence threatens significant scientific features or the existence of important native species.

***Resource Management Plans*:** The Resource Management Plan for CACO (NPS 1999) identifies a wide range of information and management needs based on issues and knowledge at the time. This Plan has been used to prioritize resource management activities and to compete for funding for research and

monitoring projects. The Resource Management Plan outlines a number of information needs for the hunting program. Most of these needs focus on obtaining population trend information and hunting effect assessments.

White-tailed deer: Other than evaluating the sex and general age characteristics of the deer harvest obtained through the deer check stations, no monitoring is conducted. Additional information and data about deer and deer hunting within CACO is needed to identify and evaluate changes to the population. Specifically, information addressing the effects of increasing residential development and visitation to the Outer Cape, and further evaluating the role hunting plays in regulating the CACO deer population, is required. The Resource Management Plan proposes to develop a long-term monitoring program, implemented by the MDFW[2], that would measure deer abundance (population index) and distribution, and to continue to monitor the harvest rates, sex, age, weight, and antler-beam diameter of yearling males, and female reproductive rates, to determine population trends and distribution patterns and whether the deer harvest rate is changing. The Resource Management Plan proposes monitoring that will address specific ecosystem level questions, including:

- What are the effects and impending ecological changes from increasing deer densities?
- Are plant species being eliminated as a result of browsing by deer?
- How will changes in landscape and vegetation influence deer population dynamics?
- Are deer adversely affecting forest-nesting birds?

To answer these questions, a multi-year study is needed to evaluate the ecological effects of hunting at CACO. As a first step, data on harvest levels and hunting effort by species must be acquired. Programs to monitor the population trends of hunted species should be established by the MDFW. The MDFW would collect data on harvest and could analyze that data for correlations with population monitoring data. If data indicate that hunting depresses populations of small game species, ecological studies of native predators would be undertaken to quantify their feeding habits and determine the extent to which hunting competes with these species for prey, and the extent to which the native predators may shift their foraging to other species. The MDFW could begin a monitoring program for those animals that are hunted to determine the levels of harvest that those species experience and to determine the population level or a population index. Based on such studies, future park managers may propose adaptations to ongoing approaches or may have more information to continue a program unchanged.

1.2.8 Decision Making Process

The NEPA process provides an opportunity to make management decisions based on the best available scientific information, common sense, policy and rules and staff, other agency, and public input. NEPA also provides a means to ensure that the environmental costs and benefits of NPS proposed actions are fully and openly evaluated during the decision making process. Two key steps in this process are scoping and public review of a Draft EIS.

***Scoping*:** To inform the public and receive input, and as a NEPA requirement, the NPS embarked on a series of public informational and scoping meetings, each run by NPS staff and the sponsoring organization within a public forum (Table 6). Parties that may be interested in the hunting program were contacted as part of scheduling the meetings. The issues generated through these meetings and from letters received during the scoping process are summarized in Sections 1.4 and 1.5, and the linear path from issues to impact topics is documented. Preliminary alternatives suggested by the NPS were also presented and public responses were incorporated into the impact analysis process.

[2] The MDFW is charged with managing the hunting program at CACO.

The NPS focused on a number of goals for the public scoping process:

- identify all interested parties;
- receive input in formulating alternatives;
- receive information regarding hunting and its effects;
- identify the diversity of views and concerns among CACO users;
- identify options and alternatives;
- identify informational gathering needs;
- open and extend the lines of communication;
- provide information for the interested parties; and
- establish the NEPA rules and procedures.

After considering public and agency input on potential options for the hunting program, the NPS developed three alternatives for managing hunting at CACO. Scoping input was also used to develop and refine the list of impact topics that would be used to evaluate the environmental impacts, both adverse and beneficial, of implementing each of the three alternatives. The process by which these alternatives were developed and the impact topics identified are discussed in the remainder of Chapter 1 and the first portion of Chapter 2 of this Final EIS.

Review of the Draft Environmental Impact Statement: In April of 2006, the NPS issued a Draft EIS that summarized the information used to analyze the three alternatives, summarized the adverse and beneficial impacts that would result from implementing each of the three alternatives, and identified the NPS preferred alternative. The Draft EIS was available for a 60-day public and agency review and comment period. Copies of the Draft EIS were distributed to interested agencies and organizations, local libraries, and park visitor centers. The Draft EIS was also available on the park's web site. Availability notices were sent to over 2030 individuals who had indicated their interest in hunting at CACO. This included those who provided mail or e-mail addresses at the informational and scoping meetings listed in Table 6 as well as those who had provided addresses at a public meeting held in 2002 regarding the pheasant hunt at CACO. Two public comment meetings were held to receive oral comment on the Draft EIS during the 60-day comment period. Over 200 comments were received. These comments were used to improve the clarity and accuracy of the document, refine impact analyses, and revise the preferred alternative, resulting in this Final EIS. Public involvement, consultation and coordination with other agencies, and the NPS response to comments are described in more detail in Chapter 5 of this Final EIS.

Table 6. Summary of Public Meetings and Documentation

Meeting	Date	Facilitator	Notes		Public Notice
			Flip Chart	Full Notes	
Informational Meetings					
Humane Society U.S. Wildlife Center, West Barnstable	5/5/04	Finley	NA	Yes	No
Nauset Regional Middle School, Orleans	5/11/04	Burks	Yes	Yes & filmed	Yes
Wellfleet Forum, Wellfleet Library, Wellfleet	5/27/04	Paul Connor Wellfleet Forum Chair/Murray	Yes	Yes	Yes
Conservation Commission, Wellfleet Senior Center, Wellfleet	6/16/04	Abby Franklin (Wellfleet ConCom)/Murray	Yes	Yes	Yes
Hunting Groups, Brewster Police Station, Brewster	7/14/04	Finley	NA	Yes	No
Scoping Meetings					
Orleans Town Hall, Orleans	6/30/04	Margaret Fulcher (Orleans Selectman)/Finley	Yes	Minutes & filmed	Yes
Regional Vocational School, Bourne	7/12/04	Lepore	Yes	Yes	Yes
Truro Central School, Truro	7/13/04	Truro Selectman	Yes	Yes	Yes
Eastham Forum, Eastham Police Station, Eastham	7/21/04	Phillips	NA	Yes	No
Provincetown Town Hall, Provincetown	7/22/04	Murray	Yes	Yes	Yes
Eastham Town Hall, Eastham	7/27/04	Murray	No	Yes	Yes
Draft EIS Public Comment Meetings					
Salt Pond Visitor Center, Eastham	6/8/06	Ron Kaufman (CCNS Advisory Committee)	Yes	Yes	Yes
Province Lands Visitor Center, Provincetown	6/10/06	Price	Yes	Yes	Yes

1.3 Public Experience Goals

The NPS has established several goals for public experience, which are consistent with the enabling legislation, NPS policies and management guidelines, the CACO mission statement, GMP, and resource management plans. These goals were also established to help focus the issues and impact topics specifically relating to the hunting program, allowing the NPS the opportunity to assess each alternative relative to meeting these goals or determining areas requiring remedies. The following goals were established for the public experience at CACO:

1. Providing recreational opportunities for a wide diversity of visitors.
2. Maintaining the distinctive cultural and social character and patterns of Outer Cape Cod.
3. Maintaining and managing wildlife populations and natural communities for ecological and recreational opportunities.
4. Providing safe conditions for visitors and staff.
5. Provide opportunities for future generations to enjoy the natural resources, cultural heritage, and recreational values of CACO.

1.4 Primary Issues Related to Hunting

During the spring and summer of 2004, CACO held multiple public scoping meetings that yielded important input on community concerns associated with hunting at the Park. The comments consistently fell into a series of categories that are summarized in Table 7.

Issues relating to wildlife and other natural resources:

- Providing appropriate management of wildlife resources;
- Assessing the effects of hunting on hunted and non-hunted wildlife, including rare or endangered wildlife species;
- Monitoring populations of hunted species and hunting related mortality;
- Maintaining sustainable populations of hunted species;
- Providing opportunities for hunting other species; and
- Maintaining and improving natural communities.

Issues relating to cultural and socioeconomic resources:

- Maintaining and providing opportunities for public uses that are part of the cultural heritage and way-of-life of Outer Cape Cod;
- Continuing the traditions that were in place when CACO was established;
- Providing opportunities and balancing demands for all appropriate public use;
- Providing hunting opportunities for future generations;
- Acknowledging the contributions of hunting to the local economy; and
- Providing enough land area for future hunting opportunities.

Issues relating to visitation and user conflicts:

- Reducing conflicts between the human populations and wildlife;
- Maintaining and improving safety;
- Addressing concerns about hunting violations and hunter ethics;
- Improving visitors' knowledge and awareness of hunting safety;
- Eliminating all hunting;
- Assessing the perception and potential that hunting compromises the safety of visitors and residents; and
- Acknowledging that the Cape Cod region is growing and becoming more densely populated;

Issues relating to NPS policy and administration:

- Providing an assessment on the stocking of non-native pheasants and possible conflicts with NPS policies;
- Resolving concerns that some visitors have over safety during the hunting season;
- Addressing the view that hunting is unethical; and
- Addressing concerns of hunting techniques, hunting equipment, and sportsmanship.

One issue raised during the public meetings was the ethics of hunting, with some individuals stating that they felt hunting was unethical, while others strongly disagreed. In general, approximately 20% of residents and visitors are strongly opposed to hunting, while another 16% are strongly in favor of hunting (Kuentzel, 2006). Attitudes about hunting have shifted somewhat since 1992, with less opposition to hunting in 2006 than expressed in the 1992 survey.

As documented throughout Section 1.2.6, the NPS, CACO, and the Commonwealth of Massachusetts recognize hunting as a legitimate recreational activity at CACO, and Congress determined in 1961 that hunting could be conducted at CACO. The NPS understands that questions about the legitimacy of hunting is central to the concerns of some individuals; however, opinions about this issue vary widely amongst CACO visitors. Aside from environmental and visitor experience concerns, the appropriate role of the NPS and MDFW is to provide laws, rules, and guidelines to make hunting as safe as possible for both hunters and non-hunters, and to balance the many user interests to provide opportunities for all visitors to enjoy the Park's resources.

1.5 Impact Topics

Impact topics were chosen for detailed evaluation based on the CEQ's NEPA regulations and *NPS Director's Order 12*: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2001a) by assessing the issues raised during project planning meetings, public meetings, and by careful considerations of the potentially affected resources at CACO. These issues were then used to establish potential impact topics based on the screening form provided in Director's Order 12 (DO-12) and directly from the discussion provided in DO-12. Issues raised during the public meetings were considered within the context of NEPA compliance and used to formulate the impact topics. Some issues raised are outside of NEPA impact topics, or may otherwise not be consistent with NEPA goals and objectives. The topics analyzed in this Final EIS include:

- Natural Resources: wildlife (game, non-game, rare species), vegetation (plants, rare plants, natural communities);
- Cultural Resources: Cultural Heritage (customary hunting activities, berry picking, mushroom gathering), Cultural Landscapes (NPS 1997);
- Public Use: Land Use And Recreation, Health and Safety, Public Use and Experience, Socioeconomic Values (effects on local/regional economy); and
- Management and Operations: Consistency with CACO and NPS goals, plans, policies, guidelines, mandates, changes to staffing levels, ranger duties, and implementation costs.

Several impact topics considered but dismissed from the detailed Final EIS analysis are outlined in Section 1.6.

Table 7. Summary of Hunting Related Issues and Corresponding Impact Topics

IMPACT TOPIC	ISSUE
	Natural Resources
Wildlife	Providing appropriate management and protection of wildlife resources.
	Assessing the effects of hunting on hunted and non-hunted wildlife, including rare or endangered wildlife species.
	Monitoring populations of hunted species and hunting related mortality.
	Maintaining sustainable populations of hunted species.
	Reducing conflicts between the human populations and wildlife.
	Providing an assessment on the stocking of a non-native species and possible conflicts with NPS policies.
	Providing opportunities for hunting other species.
	Eliminating all hunting.
	Crippled wildlife require assistance from local rehabilitation facilities.
Vegetation	Maintaining and improving natural communities.
	Cultural Resources
Cultural Heritage	Maintaining and providing opportunities for public uses that are part of the cultural heritage and way-of-life of Outer Cape Cod
	Continuing the traditions that were in place when CACO was established
	Providing hunting opportunities for future generations
	Providing enough land area for future hunting opportunities
	Providing opportunities for hunting other species.
Cultural Landscape	Maintaining and improving natural communities.
	Reducing conflicts between the human populations and wildlife.
	Public Use
Land Use and Recreation	Providing opportunities for public use.
	Providing hunting opportunities for future generations.
Health and Safety	Concerns that hunting compromises the safety of visitors and residents.
	Maintaining and improving safety.
	Addressing concerns about hunting violations.
	Improving visitors' knowledge and awareness of hunting safety.
	Resolving concerns that some visitors have over safety during the hunting season.
	The Cape Cod region is growing and is becoming densely populated.
Public Use and Experience	Addressing concerns about potential conflicts between hunters and non-hunters.
	Some individuals avoid using CACO during the fall and winter.
	Improving visitors' knowledge and awareness of hunting safety.
Socioeconomic Values	Hunting contributes to the local economy.
	The Cape Cod region is growing and demographics and attitudes have changed over 40-years.
	Management and Operations
Consistency with CACO and NPS goals, plans, policies, guidelines, and mandates	Resolving possible conflicts with NPS policies regarding the pheasant-stocking program.
	Hunting is inconsistent with NPS rules.
	Non-NEPA Impact Topics Issues
	Addressing the view that hunting is unethical.
	Addressing concerns of hunting techniques, hunting equipment, and sportsmanship.

1.6 Impact Topics Considered, But Dismissed From Further Analysis

The following impact topics were analyzed for potential effects resulting from any of the alternative actions. The relationships of these topics to hunting are summarized as part of the impacts analysis based on a careful review of potential effects that alternatives might have, or the lack thereof. The impact topics are discussed below, but are not carried forward into the detailed analysis in this Final EIS. There will not be any changes to these effect topics resulting from the retention or elimination of the hunting program or any other alternative proposed.

1.6.1 Natural Resources

***Air Resources*:** The Clean Air Act of 1973 (as amended) and associated NPS policies require the NPS to protect air quality in Parks and other holdings. The intent of this effect topic is to assess actions that may improve and protect air quality for human health and ecosystem benefits, or that may have an adverse effect. In general, this topic analyzes far reaching and local influences on air quality, many of which are out of the control of the NPS. For example, CACO is downwind from large urban and industrial areas in states to the south and west, and prevailing winds often carry potential pollutants that are deposited in the northeast. Acid precipitation could be a major influence on ponds and other freshwater habitats at CACO, and could cause excessive nutrient enrichment in estuaries, and affect sensitive vegetation. Conversely, because CACO is removed from the mainland and prevailing local winds come from the ocean, concentrations of air pollutants may not be as high at CACO as on the mainland.

Hunting does not generate any pollution that would adversely affect human health and environmental resources. A negligible amount of exhaust from automobiles and gases generated by the discharge of shotgun shells would be expected. Exhaust from the vehicles of hunters is likely far less than what would be expected from vehicles driven by summer visitors. Hunting does not have an effect, either beneficial or adverse, on air quality and will not be carried forward into the detailed analysis.

***Coastal Processes*:** Coastal processes are the ecological processes affecting the biotic and abiotic elements of the coastal ecosystem. Some wildlife populations are directly and indirectly involved in these ecosystems. For example, coastal waterfowl forage in and use the Cape Cod coastal ecosystems as non-breeding habitat. These species rely on the marine food chain, including small vertebrate and invertebrate prey, for their survival during this period. Conversely, most upland species such as white-tailed deer have very little if any effect on coastal processes, although some individuals forage in salt marshes.

Hunting has only indirect negligible effects on these processes as it may relate to estuarine and marine hunted species. The USFWS and MDFW regulate the legal taking of coastal waterfowl. Lead shot is prohibited for waterfowl hunting. Coastal waterfowl hunting only affects a negligible segment of the coastal communities and any indirect effects are considered negligible. Additionally, hunting does not disturb soil and vegetation, and does not harm natural communities. Therefore, coastal process, as an impact topic, will not be carried forward into the detailed analysis portion of this Final EIS.

***Water Resources*:** Water resources include freshwater, estuarine, and marine aquatic resources such as ponds, lakes, streams, and estuaries. This topic relates to maintaining good water quality, protecting areas from flooding, protecting aquatic ecosystems, and assessing activities that could have beneficial or adverse effects on water resources. One of the primary variables that can affect water resources is extensive development that can create either point source or non-point source pollution. Erosion from earthwork, discharge from septic systems, the creation of impervious surfaces, and discharges from other sources can have adverse effects on water quality and stormwater management. Fill placed in a flood prone area can contribute to flooding, while removal of fill can reduce flooding. The construction and

operation of marinas can create direct pollution into waterways from gasoline and oils spilling from watercraft.

Hunting can generate negligible pollution to coastal and inland water resources where motorized watercraft are used in pursuit of waterfowl. The number of boats and trips is minimal compared to the other recreational and commercial boating activities. Watercraft is not used for hunting within the interior of CACO and as such there would not be any impacts to freshwater communities. The use of lead shot for hunting waterfowl was discontinued. There are no floodplain alteration issues associated with hunting. Hunting does not require any physical alterations to water resources. Therefore, impacts to water resources are not expected from any of the alternatives and water resources are not carried forward into the detailed analysis of this Final EIS.

1.6.2 Cultural Resources

***Historic Structures and Architecture*:** A historic structure is defined as a "constructed work consciously created to serve some human activity that is listed or eligible for listing in the National Register of Historic Places." This can include ruins, roads, dikes, railbeds, and cellar holes, as well as the more familiar historic homes and lighthouses. Historic structures are an important part of the fabric of life on Outer Cape Cod and contribute to the image of CACO and surrounding areas. These structures include the Penniman House, several lighthouses, the Atwood-Higgins House, the Coast Guard Station, and the Old Harbor Life Saving Station. All receive significant visitation. CACO also has a number of historic sites, such as Fort Hill and the Marconi Station Site, and numerous hiking trails, natural sites, and interpretive sites. Effects on historic structures and sites would generally involve development and significant site-specific construction and rehabilitation. Potential effects from these sources are carefully reviewed when various projects are proposed.



Historic structures at CACO: the Coast Guard Station and the Atwood-Higgins House.

The various hunting related alternatives will not have any effects on historical structures and sites. Hunting is not allowed within 500 feet of any dwelling, whether occupied or not, and all sites of historic or natural significance are closed to hunting. Furthermore, hunting activities do not make use of buildings or structures, with the exception of portable deer stands and duck blinds. Other local closures near the Marconi Station Site include CACO headquarters and maintenance areas, residences, bicycle trails on the western edge of the WMA, the beach parking lots, and the Atlantic Cedar Swamp trail area. Closures in Wellfleet include the 500-foot safety zones around private homes. The hunting alternatives will not affect historic structures and therefore will not be carried into the detailed analysis of this Final EIS.

***Archaeological and Ethnographic Resources (Including Submerged Resources)*:** CACO contains numerous archeological resources, both on the land and submerged along the coast. There are hundreds of known prehistoric and historic sites, and perhaps hundreds or even thousands of unknown sites. These resources may extend back in time to the Early Archaic period (9,000 years ago) and may include artifacts related to multiple time periods, up to and including the recent past. Historic period artifacts can be numerous, relating to old homes and farms, roads, cart paths and walled pastures. Many of the sites are visible or just below the surface, such as shell middens or chipped-rock scatters of native peoples, or the shallow cellar holes and trash middens of early European settlers.

Hunting activity does not involve the use, excavation, or removal of archaeological resources, nor does it require construction of earthwork that could affect these resources. There is a remote possibility that

hunters could inadvertently affect archeological resources if artifacts occur on the ground surface and they are trampled. There have been a few cases of sites being disturbed by hunters and other users driving vehicles in remote areas and accelerating erosion in sensitive areas. Even with these few cases, however, effects to these resources will generally be negligible to nonexistent and not necessarily related to hunting activity per se. Therefore, the alternatives analyzed in this Final EIS will not affect archeological or ethnographic resources and will not be carried through into detailed analysis.

***Museum Collection*:** The museum collection at CACO includes archaeological, archival, historical, and natural history objects, including prehistoric artifacts, a scrimshaw collection, historic papers, and a large historical photographic collection. CACO is experiencing a lack of storage, display, and research spaces with the necessary environmental controls. While the lack of storage space and the catalog backlog of objects is a threat to the museum collection, hunting does not include collecting artifacts, or disturbing any objects that would be of value to the CACO museum collection. The museum collection impact topic will not be addressed in the detailed analysis.

1.6.3 Management and Operations

***Changes to staffing levels and ranger duties*:** NPS adds enforcement staff during the summer peak season for support in enforcing CACO regulations and other laws, and assisting and serving the public. Seasonal employees that are necessary for the enforcement of regulations and the safety of visitors during the summer are not needed during the hunting season (C. Thatcher, personal communication, May 14, 2004; B. Grant, personal communication, August 26, 2004). Workloads for the rangers are greatly reduced at this time (M. Minnerath, personal communication, May 12, 2004). Ranger duties stay within the normal and expected enforcement duties during the fall, and such changes to these duties are negligible. The proposed alternatives do not require any changes to staffing levels and ranger duties, and as such this topic was not carried forward into the detailed analysis.

Cost to Implement: The hunting program costs are generally limited to a portion of the year-round ranger salaries, which would be paid even if the program was terminated, costs to post "no hunting" areas, and the costs to print the hunting brochure. These latter costs are a minimal and insignificant portion of the CACO budget. The staff members implementing this program are permanent full-time employees and their salaries are not increased or decreased based on what form the hunting program takes. Therefore, cost to implement will not be carried forward into the detailed analysis.

1.6.4 Geology

CACO is host to a variety of outstanding geological features with unusual intrinsic value. Many of these geological features are regularly viewed and studied by a wide range of visitors, educators, and scientists and are considered a valuable natural resource. Hunting activities do not alter geologic features and resources at CACO. Therefore, geological resources will not be carried forward into the detailed analysis portion of this Final EIS.

1.6.5 Floodplains

Floodplain or flood-prone areas include those low-lying areas that are flooded during 100 year storm events. These areas are generally mapped by the Federal Emergency Management Agency and those maps are made available to the general public. Local and some state governments implement the federal floodplain protection regulations, which at a minimum regulate construction of dwellings and other structures in the floodplain. Massachusetts regulations also review fill placed in floodplains that could reduce floodplain capacity. Hunting activities do not involve the filling or alterations of floodplain areas,

and do not require the construction of any structures. Earthwork and construction activities that could adversely affect flood-prone areas are not part of any hunting activity. Given that the alternatives proposed will not affect floodplain values, this topic will not be carried forward into the detailed analysis.

1.6.6 Wild and Scenic Rivers

Wild and scenic rivers are designated by the federal mandate and are provided with advance protection at the federal, state, and local levels. Wild and scenic rivers have not been designated within CACO boundaries; therefore, this topic will not be carried forward into the detailed analysis.

1.6.7 Transportation

CACO does not have a public transportation system that operates during the hunting season, and the hunting program does not require or include any transportation services. Hunters utilize their own vehicles, and park in designated areas. The proposed alternatives will not affect transportation, and as such will not be carried forward into the detailed analysis.

1.6.8 Indian Trust Resources

Indian trust resources include those resources not on Native American owned property, but rather on DOI administered lands that are held in trust on behalf of Native American tribes. Secretarial Order 3175 requires that any anticipated impacts to Native American trust resources from a proposed project or action by DOI agencies be explicitly addressed in environmental documents. The federal Indian Trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to Native American and Alaska Native tribes.

CACO as a public holding is not considered a Native American trust resource and there are not any such designated resources on CACO. The hunting program and the proposed alternatives do not conflict with any American Indian interests. Therefore, this topic will not be carried forward into the detailed analysis.

1.6.9 Prime or Unique Farmland

The Natural Resource Conservation Service (1993) defines prime farmland as soil that produces general crops such as common foods, forage, fiber, and oil seed. Unique farmland is defined as soil that produces specialty crops such as fruits, vegetables, and nuts. The soil types in the Barnstable County area provide limited support for prime farmland and unique farmland based on these definitions. There are three prime farmland soil types found on CACO, in very limited quantity: Boxford silt loam (28 acres); Merrimac sandy loam (15 acres); and Nantucket sandy loam (36 acres). Areas of agricultural use on CACO do not exist and as such the proposed alternatives do not involve alterations to any land-use or soil. Therefore, prime or unique farmland will not be carried forward as an impact topic.

1.6.10 Lightscape

In accordance with NPS Management Policies (2001b), the NPS strives to preserve natural ambient lightscapes, which are resources and values that exist in the absence of human caused light. Any actions related to the hunting program at CACO would not be expected to result in any changes to the existing lightscape conditions. Therefore, this topic will not be carried forward into the detailed analysis.

1.6.11 Soundscape Management

In accordance with *NPS Management Policies, 2001* (2001b) and *NPS Director's Order 47*: *Sound Preservation and Noise Management* (2001c), an important part of the NPS mission is preservation of natural soundscapes associated with Parks. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in Park units, together with the physical capacity for transmitting natural sounds. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units, as well as potentially throughout each Park unit, are generally greater in developed areas and less in undeveloped areas.

The hunting program does create some limited and negligible noise from the use of firearms. These sounds would be considered irregular and intermittent and would be limited spatially to those areas open to hunting, and temporally during the hunting seasons, when hunters are actively pursuing game. Situations with the highest concentrations of hunters, such as a Saturday or holiday mornings during the pheasant-hunting season would create more firearm-related noise than other hunting seasons in which the taking of game is more evenly distributed over the season. The following two examples are provided to help gauge the number of shotgun blast that could result from pheasant and deer hunting. There is no data or information regarding the number of shots a hunter may take to harvest these game species. Therefore, some assumptions are made and it is acknowledged that shotgun blasts are not evenly distributed from Monday through Saturday, but are weighted towards Saturday. Additionally, shotgun blasts are spread out over 16,507 acres of upland and wetland habitat.

For example, approximately one-third (267) of the 800 stocked pheasants are taken (Bump and Field 1999), involving a minimum of 267 to 534 shot gun blasts (assumes one to two shots per bird taken) over a 6 week period, or an average of about 45 to 90 per 6-day week, or 7 to 14 per day. Furthermore, assuming that one-half of these shots occur on Saturdays, this would suggest 23 to 45 shots per Saturday. The number of shots would likely be weighted towards Saturdays, early and late in the season.

Conversely, deer hunting may involve taking approximately 26 deer during the shotgun season, resulting in a range of 26 to 52 blasts (assumes one to two shots per deer taken) during the one-week season, averaging 4 to 8 per day. If one-half of those shots occurred on the one Saturday of deer hunting, 13 to 26 shots might be expected. Additionally, the use of dogs during the rabbit-hunting season creates a nominal amount of noise from barking and shotgun blasts. Again, these noises are limited to the specific season, those areas hunted, and generally on Saturday and holiday mornings. Considered as a whole, the noises generated by hunting over the course of the year relative to the overall soundscape across CACO are negligible. Therefore, this topic will not be carried forward into the detailed analysis.

1.6.12 Environmental Justice

According to the United States Environmental Protection Agency (USEPA), environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the adverse environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

Presidential Executive Order 12898, "General 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 the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations

and communities. Any actions related to the hunting program would not be expected to have health or environmental effects on minorities or low-income populations or communities as defined in the USEPA Draft Environmental Justice Guidance (USEPA 1996). Therefore, this topic will not be carried forward into the detailed analysis.

1.6.13 Non-Federal Lands Within CACO – Private Residential and Commercial Properties and Municipal and State lands

Of the 43,570 acres within the CACO boundaries, the NPS owns approximately 27,000 acres of terrestrial and submerged land. More than 30 percent of the land within CACO boundaries is owned by other public entities, and nearly 4 percent is privately owned, but these still fall in the NPS jurisdiction. Although private properties are within the CACO boundary, the NPS has limited mechanisms to regulate their development and use, specifically the threat of condemnation. As a result, the NPS must rely on local zoning bylaws and health codes, state regulations, and cooperation on the part of local, town, state, and other federal property owners. The principal protection mechanism available to the NPS is the acquisition of development rights or full title to a given property within its boundary. The NPS also prohibits some activities on private lands that could harm CACO resources or visitors; these are addressed through law or regulations. For example, wildlife protection, commercial fishing, carrying a loaded weapon in proximity to a residence, fires, and boating or vehicle use contrary to CACO rules.

In some areas in and adjacent to CACO, developing areas are affecting sensitive resources. The NPS has the authority to protect sensitive areas within CACO's boundaries, but it has limited legal authority outside CACO boundaries.

The greatest issues regarding the sensitive lands on CACO involve development pressure. The juxtaposition of town, state, and NPS lands in various areas complicates this issue as developable land is very scarce. As such, hunting is not seen as an issue that affects landownership or development. Furthermore, the NPS provides a safety measure to private homeowners by prohibiting hunting within 500 feet of any occupied or unoccupied dwelling. The proposed alternatives will not hinder or alter in an adverse or beneficial way public and private access to any areas on CACO; therefore, this topic will not be advanced into the detailed analysis.

2.0 ALTERNATIVES

2.1 Introduction

The CEQ defines reasonable alternatives as those that are economically and technically feasible and that show evidence of common sense. Alternatives that cannot be implemented or that do not fulfill the stated purpose should be eliminated as unreasonable alternatives. The following alternatives have been considered based on what is feasible and could be implemented by the NPS. This EIS considers three alternatives for the hunting program:

- Alternative A – No Action (continue the hunting program as it was prior to the court enjoining the pheasant hunt)
- Alternative B – Provide a modified hunting program
- Alternative C – Eliminate the hunting program

The establishment of these alternatives was completed by members of the interdisciplinary team through the use of screening criteria and a filtering process.

The proposed alternatives were generated from four basic sources: public input; NEPA guidance documents; internal scoping and internal consideration to achieve a management based decision. Specific portions of the alternatives were taken directly from public meetings, while the No Action alternative is a NEPA requirement. The No Hunting alternative was taken from public input. Through internal scoping, the interdisciplinary team reviewed the public input and considered specific alternatives that would be consistent with the purpose and need of the project. The alternatives are a derivative of these sources, as are the alternatives that were considered but dismissed. Following public review and comment on the Draft EIS, the alternatives were reviewed and revised to reflect the NPS consideration of the suggestions and concerns raised in the public comment process. These revisions are reflected in the alternatives and in the discussion of options.

The following is a description of the filtering process used to develop the three alternatives selected for a more detailed impact assessment. The three alternatives selected for detailed analysis are described in sections 2.3, 2.4, and 2.5.

2.2 Screening of Options Consolidated from Public Scoping

A series of options were drafted as a result of the input received from the public scoping process. The input included suggestions for improving the hunting program in several key areas including modifications to the timing of hunting seasons, alterations to the species hunted, and changes to the locations where hunting is permitted. The suggestions that hunting should remain as it has in the past or that hunting should be discontinued entirely, were also put forth and will form stand-alone alternatives. The remaining options were reviewed to develop alternatives that are the most practical and appropriate to carry out through further analysis. The objective was to define the components of a modified hunting alternative for the detailed impact analysis. The following screening criteria were used to examine the various options:

- public health and safety;
- practical ability to implement;
- covered more effectively by other options;
- consistent with the project purpose and need;
- supports customary uses;

- supports diverse public attitudes and uses;
- minimizes conflicts among users;
- provides fairness;
- ecological effects; and
- consistency with NPS policy.

The range of options associated with a modified hunting program is summarized below. This list is directly derived from public input and is in no specific order. Each item is followed by a brief discussion and the outcome in terms of further consideration under the alternatives.

2.2.1 Modify Hunting – Options That Describe Alterations to Season Length

***I. Shorten all Hunting Seasons; Combine all hunting season to a one-week period*:**

As is the case throughout the state, hunting seasons at CACO are established and managed by the MDFW. This is in keeping with the cooperative agreement between the NPS and the MDFW. Where CACO management objectives or policies differ from MDFW, modifications to the state's hunting seasons or other regulations have been made. For example, modification to the MDFW hunting seasons occurs in CACO in recognition of the seasonally intense use of beaches by the public. In general, it is the intent of CACO to provide consistency where possible with the state's hunting regulations. This reduces the likelihood for confusion within both the hunting and non-hunting public. Unless there is a specific potential or actual problem with respect to accommodating multiple uses within CACO which cannot be managed by other means, or where NPS policies or objectives indicate the necessity for CACO-specific hunting modifications, hunting seasons and other regulations are consistent with those of the state. This relationship between the state and CACO with respect to the state's establishment of open seasons for hunting is clearly envisioned in the CACO enabling legislation. Given the absence of evidence of an actual user conflict with respect to hunting that cannot be managed by other available means, the overriding interest of CACO is to maintain consistency with state hunting regulations, maintain recreational uses that are part of the Outer Cape's cultural heritage, and accommodate appropriate uses through careful management of the resource. Other options consider ways to reduce the perception and further reduce any potential conflict between the hunting and non-hunting public, while maintaining the current recreational use of the Park.

Option outcome: This option was not considered further under the alternatives analysis.

***II. Establish a Longer Hunting Season for Coyotes and Other Predators*:** The intent of the option is clear in the title.

This is one area where CACO's special regulations differ from the hunting regulations of MDFW as a result of a specific potential user conflict. Due to the heavy increase in visitors to the beach areas at CACO, the hunting season for these species is truncated as compared to the state, and hunting is prohibited from March 1 to August 31 of each year. Changing this prohibition would provide only a negligible actual benefit in increasing the recreational hunting use of CACO, as there are very few coyote and predator hunters on CACO. Changing the prohibition would also be exceedingly complex, but more importantly would undermine the reason for the prohibition's intent, which is to minimize the potential for recreational user conflict.

Option outcome: This option was not considered further under the alternatives.

***III. Extend the Deer Hunting Season to Help Limit the Potential for Lyme Disease*:** This option would allow for taking of deer such that there would be a likely decrease of the potential for Lyme disease.

The deer hunt season at CACO is established by the state, and is regulated by MDFW and monitored such that that the numbers of deer taken on a year-to-year basis are generally consistent with the state's goals for the maintenance of the population. The deer population on CACO and the surrounding Outer Cape is generally maintained within the carrying capacity of the habitat from the established hunting season and additional hunting pressure would raise questions about unsustainable impacts to the deer population. With respect to the control of Lyme disease through management of the deer population, other reservoirs for Lyme disease exist in CACO, and although substantially reducing deer numbers has been shown to reduce Lyme disease occurrences in some instances, research indicates that drastic reductions in the deer population are required to have any meaningful impact, and that even significant reductions in deer populations do not necessarily result in reductions in disease. The success of deer reduction efforts alone in reducing Lyme disease is extremely variable, but the reductions in deer population required to potentially impact Lyme occurrence would likely place the sustainability of the annual deer hunt in question. At best, drastic deer population reductions could be only one part of an aggressive plan to reduce Lyme occurrence on the Cape, as deer do not provide the only reservoir of Lyme-carrying species.

Option outcome: This option was not considered further under the alternatives.

2.2.2 Modify Hunting – Options That Describe Alterations to the Management of People or Hunting Location

***IV. Limit the Number of Hunters*:** Limit the density of recreational hunting (i.e., set a cap on the number of hunters in CACO on any given day).

This objective would be inconsistent with existing MDFW regulations and CACO policies and objectives. CACO policies could be modified, but reducing recreation, in this case in the form of hunting, would have to be clearly necessitated in order to meet other CACO objectives. However, currently, the density of hunters is not exceeding the area available to them and other CACO visitors. Hunters are not crowding each other, and a review of experience over the past several years indicates that their numbers are not creating actual safety hazards to the non-hunting public. Therefore, pursuing the limitation of hunting by restricting the numbers of hunters runs contrary to CACO's goals of maintaining and enhancing actual recreational opportunities. Other options consider alternatives to address the perception and potential for user conflict while maintaining recreational use.

Option outcome: This option was not considered further under the alternatives.

***V. Hire Two Seasonal Rangers for Regulating Hunting*:** The NPS would increase enforcement staff by adding two seasonal part-time rangers, whose duties would include enforcement of hunting regulations. These rangers would work opening days, Saturdays, and mornings from the opening of the waterfowl season (October 14) through the end of the waterfowl season (January 10). These rangers would work full-time during the deer season.

Existing enforcement staff during the hunting season is primarily dedicated to hunting. Current experience with hunting and minimal report of hunter/non-hunter conflicts at CACO indicates that current staff levels are adequate to manage the existing hunting program. However, other measures that can be expected to further reduce the potential for hunter/non-hunter conflicts and the need for additional oversight are included in the alternatives analysis.

Option outcome: This specific option was not considered further under the alternatives, although other options to further reduce the potential for hunter/non-hunter user conflicts are considered.

VI. Establish a Hunting Permit System and Hunting Fees: Hunters would be required to obtain and sign a copy of the CACO hunting regulations, serving as a seasonal hunting permit.

Hunting currently is regulated by state regulations which require hunter education, firearm identification cards, and a license to carry a firearm. This option would make the requirements and cost to hunt higher than what is currently in effect. The purpose of introducing new requirements for participating in the hunting program is unclear given the absence of a widespread or persistent problem with the current hunting program and the adequacy of the existing regulations at CACO. Fees could also potentially impact the availability of hunting as a recreational opportunity for some.

Option outcome: This option was not considered further under the alternatives.

VII. Set Aside 10 Percent of CACO Land for Hunting and the Remainder for Non-Hunting Activities:
This alternative is intended to reduce potential conflict between hunters and non-hunters. The 10 percent corresponds to the estimated percentage of hunters as members of the total user group.

As a practical matter, the resulting 10 percent acreage for hunting would be too small to safely support hunting as a continuing recreational activity. As a policy direction, the precedent of supporting recreational activities based upon numbers of users would result in impractical management of CACO's resources. For example, summer beach recreation users are by far the most numerous. If the Park were to allocate acreage for use based upon the percentage of total users, many more public beach areas would need to be provided. This would impact and impair areas designated for natural resource conservation and wildlife observation. While percentages of visitors engaged in a particular form of recreation is one consideration the NPS management uses in making land use management decisions, the overarching objective is to balance recreational uses within the context of overall Park objectives and goals. This option would effectively end the hunting program while creating a policy precedent that would impede CACO's ability to provide a broad range of opportunities for visitors to enjoy park resources in a manner that protects those resources for future generations.

Option outcome: This option was not considered further under the alternatives.

VIII. Ban all Human Activity: This option should be clear from the title.

This alternative is contrary to the mission of the NPS and CACO and is inconsistent with the purpose of this project. Current CACO management of the Park does result in managing and limiting human activity as necessary when environmental conditions or balancing user interests warrants it. For example, hunting is banned as an activity during the Park's summer beach season. Limiting or banning human activity selectively or in limited portions of the Park, and as warranted by conditions, Park goals, and objectives will continue to be used as a management tool. Other options included in this analysis do consider banning elements of certain activities in some areas of the Park.

Option outcome: This option was not considered further under the alternatives.

IX. Provide Properly Trained Personnel to Provide Oversight of Hunting:
The objective is already met through the presence of CACO rangers and the rules and regulations that apply to hunters for education, firearm identification cards, and the requirement of a license to carry a firearm. In addition, a review of experience with hunting to date does not support a determination that hunting is currently receiving inadequate oversight, or that the current personnel implementing the hunting program are inadequately trained.

Option outcome: This option was not considered further under the alternatives.

***X. Prohibit Non-hunters from Using the Areas Where Hunting is Allowed*:** Providing this type of regulation would address the perceived issue of safety, although actual experience indicates that hunting and non-hunting uses currently coexist without sacrificing safety. This option would have the consequence of reducing non-hunter recreational use of CACO without an added benefit in terms of expected safety gain. Other measures to further reduce the potential for hunter/non-hunter conflicts are included in the alternatives analysis.

Option outcome: This option was not considered further under the alternatives.

***XI. Enact Legislation Declaring CACO a Recreation Wildlife Refuge in Order to Eliminate Hunting*:** The NPS does not have a designation of "Recreation Wildlife Refuge". Wildlife refuges are part of the National Wildlife Refuge system operated by the USFWS and generally allow hunting. Some Refuges operated by the NPS also allow hunting, and such a designation would therefore not necessarily change the status of hunting at CACO, since hunting is permissible per the enabling legislation. Alternative C considers the elimination of hunting; therefore, analysis of Alternative C meets the intent of this suggestion.

Option outcome: The intent of this option is analyzed under Alternative C.

***XII. Require Advanced Hunter Education*:** Require hunters to take an advanced hunter education class.

Hunters are already required to take a hunter education and safety class and obtain a firearms permit. Hunter awareness of safety concerns and the rules of sportsmanship do not appear to be issues. Other safety concerns are addressed through other aspects of Alternative B.

Option outcome: This option was not considered further under the alternatives.

***XIII. Hunting Program Geographic Alterations*:** Several geographic alterations were suggested during public scoping meetings: In areas with heavier residential use or visitation pressure, establish "safety zones" to add an additional buffer area adjacent to the hunting areas; extend all hunting area boundaries to one mile from all roads, trails, bike paths, runways, buildings, etc.; and prohibit hunting west of Race Point Road in Provincetown.

Increasing the hunting setbacks to a mile would eliminate many parcels and acreage from the hunting-allowed areas, in fact making many large tracts unsuitable for hunting. More hunters would be concentrated into very small hunting areas in the field. This would likely increase the potential of accidents among hunters. Some areas west of Race Point Road are already closed to hunting. Eliminating hunting from the remaining areas west of Race Road would eliminate a sizable tract from the allowed hunting areas and would not improve safety. Elements of geographic alterations are considered in the alternatives analysis, with the intent shared with this option to reduce potential and perceived hunter and non-hunter safety.

Option outcome: Elements of this option were not considered further under the alternatives, although a reduction in hunting areas and increased setbacks along areas used by non-hunters are carried forward as part of Alternative B.

***XIV. Clearly Delineate Existing Areas that are Closed to Hunting*:** Accurately designate areas in the field where hunting is prohibited for safety and regulatory reasons (i.e., 500-foot setbacks), along with areas off-limits to hunting.

Option outcome: This option is assessed under Alternative B.

***XV. Clearly Designate Areas Where Hunting is Permitted*:**

Geographic Information System data would be used for identifying large tracts of open land where hunting is currently permitted, and a limited number of these tracts would be selected for hunting, being cognizant of the types of habitat that support valued hunted species. Areas that have small tracts and slivers of hunting-permitted zones would be removed. Essentially this approach would reshape and simplify the scope of areas open to hunting and designated hunting permitted areas, versus the current policy, which allows hunting at CACO in all areas that are not prohibited**.**

Option outcome: This option is assessed under Alternative B.

***XVI. Improve Information About the Hunting Program for All Users*:**

Improve information about hunting at CACO, hunting regulations, safety procedures, and non-hunting areas for all autumn and winter CACO users

Option outcome: This option is considered in Alternative B.

2.2.3 Modify Hunting – Options that Describe Alterations to Hunting Techniques

***XVII. Eliminate the Use of Deer Drives*:** Eliminate the process of driving white-tailed deer for hunting.

Deer drives are a legal and customary technique for hunting deer in Massachusetts and are an effective method for hunting low-density deer populations. Unless otherwise indicated by environmental or other CACO-specific considerations, NPS policies or goals, the hunting that occurs at CACO is consistent with state law.

Option outcome: This option was not considered further under the alternatives.

***XVIII. Eliminate/Limit the Use of Hunting Dogs*:** Reduce the number of hunting dogs allowed per hunting group from six to four, or eliminate their use altogether.

The use of hunting dogs currently operates under some limitations. The regulation of hunting is consistent with state law unless otherwise indicated by CACO or National Park Service policies or goals. The use of hunting dogs is consistent with state law and is part of the tradition of hunting that occurred on the Cape prior to the creation of CACO/

Option outcome: This option was not considered further under the alternatives.

2.2.4 Modify Hunting – Alternatives That Describe Alterations to Species Hunted or Species Specific Changes

***XIX. Eliminate Pheasant Hunting*:** Pheasant hunting would be permanently discontinued, effective immediately.

Option outcome: This option is considered under both Alternative B, with a phase out, and Alternative C.

***XX. Eliminate Pheasant Stocking at the Marconi Area and Establish a New Stocking Area*:** Discontinue pheasant stocking and hunting at the Marconi WMA and designate a new pheasant stocking and hunting area elsewhere on CACO.

While is it possible to discontinue stocking in one or more areas, opportunities to create new areas are limited by size, configuration, and location of other tracts of land. Another tract of suitable size and quality would be difficult to locate and likely would not provide any benefits that would resolve the questions raised under the court action. While finding an area outside of CACO to continue pheasant stocking might not trigger the issues raised by stocking a non-native species within a National Park, such action would be under the jurisdiction of MDFW and local towns, and assessment of this option is not part of this project.

Option outcome: This option was not considered further under the alternatives.

***XXI. Create Habitat for Sustaining a Local Pheasant Population*:** Convert woodlands to herbaceous and shrub communities for pheasant nesting, foraging, cover, and over-wintering.

This form of habitat management would encourage a non-native species and is specifically inconsistent with NPS policy.

Option outcome: This option was not considered further under the alternatives.

***XXII. Eliminate Agricultural Pest Species Hunting*:**

Agricultural pest species hunting is consistent with state regulations, which are applicable to CACO as part of the NPS relationship with the State of Massachusetts. The CACO program has special regulations (numbers of dogs, shortened season) specifically to accommodate the needs, goals and policies of the National Park. Evidence of a problem for CACO resources related to any element of the hunting program could result in consideration of CACO-specific modifications from the state hunting program at CACO. Overall, maintaining consistency with state hunting regulations provides the ability for hunters and non-hunters alike to more readily comply with overall hunting regulations. Agricultural pest species hunting is not associated with any known problem; therefore the goal of consistency with the state program unless modifications are warranted due to substantiated concerns is maintained.

Option outcome: This option was not considered further under the alternatives.

***XXIII. Reproduction Intervention for Deer in lieu of the deer hunting season*:**

Hunting within the park is a recreational activity, not a management activity. At this time, there is no reason to believe that reproductive intervention for deer management is necessary in the park. The use of reproduction intervention has been employed in other Parks for control of deer populations on an experimental basis (NPS 1995). The deer hunt at CACO occurs as part of the cultural heritage and recreational activities supported at CACO, not to manage population size for deer.

Option outcome: This option was not considered further under the alternatives.

***XXIV. Establish a "Put and Take" Quail Hunt*:** This alternative would replace the existing pheasant "put and take" (stocking) program with a similar program with the native quail without necessarily any passive habitat restoration to enhance the native quail population

Option outcome: This was proposed as a possible alternative in the Draft EIS. However, after weighing public response to this option, it is no longer being considered for inclusion in the preferred alternative (Alternative B). Specifically, one commenter pointed out that stocking quail could dilute, and possibly extinguish, the gene pool of the native quail population currently present in CACO and on the Outer Cape. Additionally, in meetings to discuss the Draft EIS, MDFW indicated they did not support the proposal to stock quail at CACO.

***XXV. Modify the Pheasant Hunting Program*:** The pheasant hunting program would be managed as it was prior to the court ordered suspension of the program, with minor modifications that address public concern.

Option outcome: This option is carried forward under the alternatives analysis.

***XXVI. Apply Adaptive Management to Phase-out the Pheasant Hunting Program*:** Retain all stocked areas, but only stock the number of pheasants based on hunter demand according to MDFW recommendations and in coordination with Park management objectives.

The MDFW would monitor the take and stocking effort, ensuring that the two are equal. CACO staff in coordination with MDFW would develop a phase-out schedule that would be specific to location, the numbers of birds stocked, and timing. At the same time, other native hunting opportunities would be enhanced.

Option outcome: This option was included in the DEIS preferred alternative. However, following public comment, this option was revised and it is described in detail in the preferred alternative and environmental consequences.

***XXVII. Reduce the Number of Species that are Hunted*:** Remove some species that are not hunted regularly on CACO from the hunted list, including sparrows, crows, and woodchucks.

Hunting occurs consistent with state regulations. In the absence of a problem or other policy objectives at CACO associated with the hunting of a particular species, this consistency remains one goal of the hunting program.

Option outcome: This option was not considered further under the alternatives.

***XXVIII. Establish Turkey Hunting Consistent with MDFW Regulations*:** Include a new hunting season for eastern wild turkeys in the spring consistent with the regulations of the MDFW.

This would be a controlled hunt limited to turkey requiring a permit, limiting the number of hunters, and designating specific areas open to hunting. It would also require a modification to an existing federal regulation, which would entail rulemaking to add the spring hunting season and would also require consultation with the CACO Advisory Commission. Fall hunting would be initiated only if the MDFW established such a season in their southeast region. This option would not expand CACO's hunting season for any other species.

Option outcome: This option is discussed in detail in the preferred alternative.

***XXIX. Monitor Wildlife and Hunting*:** Evaluate and integrate MDFW annual wildlife-monitoring results into CACO management decisions to insure sound wildlife management focusing on deer, eastern cottontail rabbits, eastern wild turkey, and northern bobwhite quail.

Data would be used to develop population or harvest indices for evaluating population trends, over a long-term timeframe (i.e., five years or more). The population and harvest data collected by the MDFW and provided to CACO would help document the population trends of CACO game species and help to monitor the effects of hunting, if any, on local populations. Surveys conducted by MDFW may include turkey brood counts, quail covey counts, deer abundance indicators, rabbit abundance indicators, various hunter bag checks, monitoring pheasant releases, and evaluating specific harvest data for deer, pheasants, and turkey.

A scientific study of New England cottontail and eastern cottontail hunting and ecology has been initiated to assess hunting pressure on cottontail populations, distribution and habitat preferences of each species. The data collected will be provided to MDFW and USFWS for their use in managing these two species. Eastern cottontails are abundant throughout Massachusetts. The New England cottontail is uncommon or rare in much of the state and is a candidate for Federal listing as a threatened or endangered species. CACO would reserve the prerogative to implement protection measures if needed.

Option outcome: Elements of this option were included in the preferred alternative in the Draft EIS. The option was subsequently revised based on comments from MDFW and is evaluated as part of Alternative B in this Final EIS.

***XXX. Eliminate Hunting*:** Hunting would be phased out according to an implementation plan created by CACO staff in consultation with MDFW.

Option outcome: This option is considered under Alternative C.

2.2.5 Screening the Range of Options

The interdisciplinary team reviewed each of the 30 options generated through the public input process and selected those that would weigh positively relative to the screening criteria. At the opposite ends of the spectrum, it was a given that the "No-action" (Alternative A) and "Discontinue Hunting" (Alternative C) alternatives would be analyzed and each evaluated relative to potential effects on the scoping issues. The screening of the 30 options created a third alternative (Alternative B) that addresses issues of concern and could be implemented by the NPS if it were determined to be the preferred alternative. As a result of the input and screening of the range of options, several options for improving hunting came to the forefront. These include:

- Element XIV: Clearly Delineate Existing Areas that are Closed to Hunting;
- Element XV: Clearly Designate Areas Where Hunting is Permitted;
- Element XVI: Improve Information About Hunting for All Park Users;
- Element XXV: Apply Adaptive Management to Phase-out the Pheasant Hunting Program;
- Element XXVIII: Establish Turkey Hunting Consistent with MDFW Regulations; and
- Element XXIX: Monitor Wildlife and Hunting.

Alternative B has been proposed to improve and modify the hunting program, incorporating the above-referenced six modifications. These modifications are intended to address and resolve as many of the issues raised during the scoping process as possible.

Option XIX: Eliminate Pheasant Hunting Program is a variation of an Eliminate Hunting alternative, and will be addressed in the analysis of see Alternative C – Eliminate Hunting.

2.3 Alternative A – No Action

The No Action alternative serves two functions: first, it provides a baseline upon which to compare the effects of the other alternatives; and second, it is an alternative action under evaluation for implementation. The hunting program at CACO is described in Section 1.2. The No Action alternative sets a baseline of existing effects continued into the future against which to compare effects of the other alternatives. The No Action alternative considers retaining hunting at CACO as it was prior to the court's decision to enjoin the pheasant stocking and hunting program. Thus, under this alternative, the pheasant program would be reestablished and managed as it had been prior to the injunction.

2.4 Alternative B – Develop a Modified Hunting Program – Preferred and Environmentally Preferred Alternative

The hunting program at CACO would be modified as described below. The modifications presented in the DEIS were derived from input received during public scoping. They have been revised and reorganized in response to comments on the Draft EIS. Collectively, these changes are designed to address NPS policies regarding non-native species, hunting opportunities for native upland game bird species, public safety, and the enjoyment of both hunting and non-hunting park visitors. Additionally, these measures are feasible and fiscally sustainable given current and projected funding.

As described Sections 1.25 and 1.26, CACO's hunting program generally follows the Commonwealth of Massachusetts' program administered by the MDFW, with additional specific provisions or restrictions as necessary to meet park objectives and NPS policies. CACO has adopted many of the State's regulations without additional restrictions. Although the ultimate responsibility for developing and managing an appropriate hunting program for CACO rests with the NPS, CACO regards MDFW as a key expert agency, with the state- and region-wide perspective important for determining hunting seasons, bag limits, and other elements of a sound hunting program. As a result, management of hunting at CACO is best accomplished through close coordination between CACO and MDFW. This coordination is reflected in several of elements of the preferred alternative.

2.4.1 Element 1: Increase hunting opportunities for native upland game bird species.

Eastern wild turkeys and northern bobwhite quail are native species that were traditionally hunted on Cape Cod. Both turkeys and quail were extirpated from Cape Cod and other parts of New England in the past, but populations have now been restored to the point where hunting has been allowed by MDFW for some time (see Section 3.3.2 for more information). However, opportunities to hunt these species at CACO are limited by CACO's current hunting regulations and habitat conditions. The following measures would restore opportunities to hunt turkeys through modifications of CACO's hunting season, and would increase the opportunity to hunt quail as an ancillary benefit of cultural landscape restoration focusing on heathland and grassland plant communities. This element does not purport to replace the pheasant hunting experience - pheasant hunting involves pursuit of a farm raised and stocked non-native species, and hunting wild native upland game birds cannot replace that experience. Rather, the objective of this element is to enhance opportunities to hunt wild native upland game birds to improve the overall range of hunting experiences at CACO in a manner consistent with NPS policies.

Element 1A – Establish turkey hunting consistent with MDFW regulations:
A new hunting season for eastern wild turkeys consistent with MDFW regulations would be established. Currently, MDFW only allows spring turkey hunting in the southeast region of the state. Therefore, a turkey hunt would likely be held for two weeks in late April and early May. A change to CACO's special hunting regulations would be required to add the spring hunting season. Fall turkey hunting would be

initiated if MDFW established such a season in their southeast region. This element would not expand the hunting season for any other species.

Given that CACO currently supports about 6,000 acres of turkey habitat, and considering that each hunter would need about 100 to 200 acres in order to avoid disturbances from other hunters and ensure hunter safety, the number of turkey hunters would be limited. As a result, this would be a controlled hunt requiring a permit, limiting the number of hunters, and likely managed through a lottery system. Specific areas would be designated as open to turkey hunting. Continuation of this program would be based on monitoring of the annual hunt by MDFW, and responsive management to ensure NPS goals regarding natural resource protection, visitor experience, and safety are met.

Element 1B – Ancillary improvement of upland game bird habitat:

As outlined in CACO's GMP, CACO has established goals for restoration and management of cultural landscapes, management of heathland and coastal grassland habitat, and fire management. Toward this end, CACO has developed a Cultural Landscape Restoration Plan that addresses these goals, and is consistent with the Fire Management Plan and its Environmental Assessment and Finding of No Significant Impact (NPS 2005c,d; NPS 2007). An ancillary benefit of this restoration will be to improve habitat conditions for northern bobwhite quail. CACO anticipates restoring and maintaining heathland and grassland habitat on 270 acres over a 15-year period using an adaptive management approach. Most of the restoration effort will occur in the Marconi area. This will represent a significant increase in the acreage of habitat suitable for quail in the Marconi area specifically, and in the park in general. All restoration activities will be implemented as presented in the Cultural Landscape Restoration Plan and the Fire Management Plan contingent on the continued availability of federal appropriated funding.

2.4.2 Element 2: Apply adaptive management to phase out the pheasant stocking and hunting program.

An adaptive management approach would be used to phase out pheasant stocking as opportunities to hunt native upland game birds increase. The success of the heathland and grassland habitat management, called for by the cultural landscape restoration plan, will be used as an indicator of native species hunting opportunity. The number of pheasants stocked during the first year the program is resumed will be determined in coordination with MDFW, but will not exceed 800 - the number of pheasants released during the years preceding the court injunction that stopped the pheasant hunt. In each subsequent year, the number of pheasants stocked would be reduced as the number of restored heathland and grassland acres increases. This element would result in the end of pheasant stocking and hunting at CACO within 14 to 17 years. In no case will pheasant stocking continue beyond 17 years.

If the overall goal of phasing out the pheasant hunt can be achieved in a manner that is also sensitive to hunter interest and that reflects quail density, those considerations could be incorporated into the annual determination of the number of pheasants to be released. CACO would work with MDFW to determine if feasible measures of hunter interest and quail numbers can be developed, and to evaluate ways of integrating those considerations into this adaptive management approach.

In the years that pheasant hunting is being phased out, the program would also be managed to minimize the potential for impacts to natural resources and other park users. In addition to the adaptive management considerations above, the number of pheasants stocked within each year would be adjusted to reflect the number harvested from the park during the preceding season in order to ensure the number stocked is approximately equal to the take. The goal is to ensure that the number of pheasants released does not exceed hunter interest, and to minimize take by predators. In addition, pheasant release locations would be re-assessed at least every five years to determine if they are still suitable for pheasant stocking.

This assessment would consider hunter success, visitor and resident complaints, and other recreational uses in the vicinity. The goal would be to eliminate release locations that few hunters use, and those that conflict with other visitor and resident uses. MDFW will be encouraged to monitor the take of pheasants at each release location within the park to assist in implementing this element. If the State is unable to conduct this monitoring, CACO will develop methods to estimate the numbers of pheasants taken. CACO will require that MDFW ensure that medications will be withdrawn from pheasants prior to release according to the drugs' prescribed withdrawal period, and that written documentation be provided certifying the health of the pheasants released in the park.

After reviewing cultural landscape restoration monitoring data, numbers or estimates of pheasant taken the preceding season, and the other considerations described above, CACO will inform the State each spring how many pheasants can be released within the park in the coming hunting season.

2.4.3 Element 3: Simplify and clearly delineate hunting areas

This element would simplify the scope of hunting areas and would designate hunting-permitted areas versus the current policy that allows hunting in all areas except where specifically prohibited.

When examining the areas where hunting has been permitted, CACO staff found large cohesive blocks of habitat, such as the Marconi Area, Nauset Marsh, and the Province Lands, and thin slivers that are more than 500 feet from a hard-surfaced road, buildings, or bike path, but that contain relatively little land area for hunting. These small patches are of only minimal value for hunting and in fact may not be regularly used by hunters. These slivers would be closed to hunting under this alternative. In addition, the no-hunting buffer adjacent to bike paths would be increased from 150 feet to 500 feet. Through these two changes, 1,546 acres would be closed to hunting under Alternative B that would ordinarily remain open under Alternative A (Table 8). Since most of the acres removed cannot be practicably hunted, this would not materially affect hunting opportunities. These changes are depicted in the maps in Figure 4. Minor adjustments to these maps may be made if errors are found in the underlying data regarding locations of structures or other facilities and ownership. Hunting areas may be further revised if necessary to meet public safety needs. Any changes to these maps will be made through the Superintendent's Compendium. Maps of the hunting-permitted areas, along with CACO and MDFW regulations, will be made readily available at various locations within CACO, and will be integrated into the outreach materials and objectives described in Element 4 below.

Table 8. Proposed Acreages of Hunting Areas Based on Expanded Buffers and an Evaluation of Areas that are Impractical to Hunt

Location or Type	Current Acres	Proposed Acres
Open to Hunting	31,146	29,581
Closed to Hunting	12,436	14,000
Net Reduction in Hunting Acres		-1,564

This element would provide an added safety precaution protective of visitors using the bike paths; should result in more predictable areas where hunting is likely to be encountered and where it will not; would provide consistent buffers for hunting set-backs from roads, buildings, and bike paths; would facilitate more efficient monitoring by law enforcement staff; and would result in little reduction in hunting opportunities.

2.4.4 Element 4: Expand hunting-related outreach to hunting and non-hunting users

CACO would develop and implement an expanded outreach plan aimed at hunting and non-hunting visitors. Outreach to non-hunting visitors would focus on where and when hunting occurs in the park,

where visitors can go to avoid hunting, safety precautions when in or adjacent to hunting areas (such as wearing orange), how to report any unlawful behavior or safety concerns, and the importance of courteous and respectful behavior to all users. Outreach to hunters would also focus on where and when hunting is permitted in the park, hunting regulations, the importance of courteous and respectful behavior to other users, and how to report any unlawful behavior or safety concerns. The outreach program would use the park's existing communication venues, such as the website and visitor centers, and would coordinate with MDFW, hunting organizations, and other entities as appropriate and as opportunities arise.

2.4.5 Element 5: Cooperative monitoring and management

CACO would invite MDFW to cooperate in integrated and expanded game species monitoring to support sound wildlife management with a focus on deer, eastern cottontail rabbits, eastern wild turkey, and northern bobwhite quail. Emphasis would be placed on monitoring abundance and harvest of these species on the outer Cape to better inform coordinated wildlife management decisions by both CACO and MDFW.

Currently, MDFW monitoring is very limited, and CACO's monitoring programs are focused on ecosystem processes and biological communities rather than single species. Implementation of this element would depend on funding to support expanded MDFW monitoring efforts. CACO would also invite MDFW to collaboratively locate and secure additional funding for related studies as needed.

Regardless of funding, discussions regarding protection of New England cottontail rabbits will be a first priority. A study of New England cottontail and eastern cottontail rabbit hunting and ecology was initiated in 2004 (see Section 3.3.4 for a summary of preliminary results). Upon completion of this study, CACO will coordinate with MDFW and USFWS to review the results, and determine if action is necessary to protect the New England cottontail within CACO. CACO would preserve the prerogative to implement protection measures if indicated. This could include limiting rabbit hunting to areas outside of New England cottontail habitat, or discontinuation of rabbit hunting in the park.

Figure 4: OVERVIEW -- Proposed Hunting Areas Under Alternative B (Preferred Alternative)

Cape Cod National Seashore
National Park Service
U.S. Department of the Interior

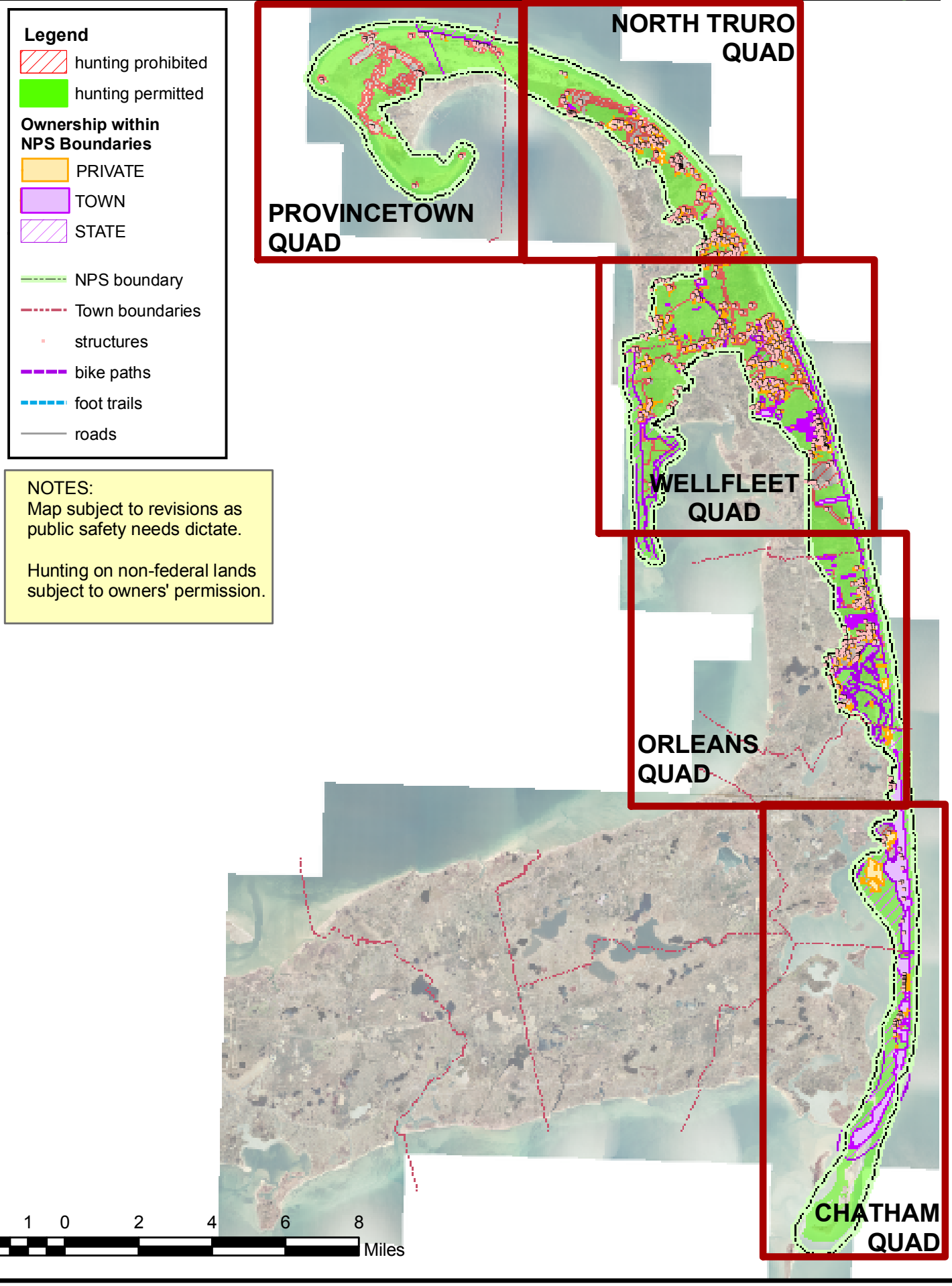


Figure 4a: Proposed Hunting Areas Under Alternative B (Preferred Alternative)

Cape Cod National Seashore
National Park Service
U.S. Department of the Interior



Figure 4b: Proposed Hunting Areas Under Alternative B (Preferred Alternative)

Cape Cod National Seashore
National Park Service
U.S. Department of the Interior

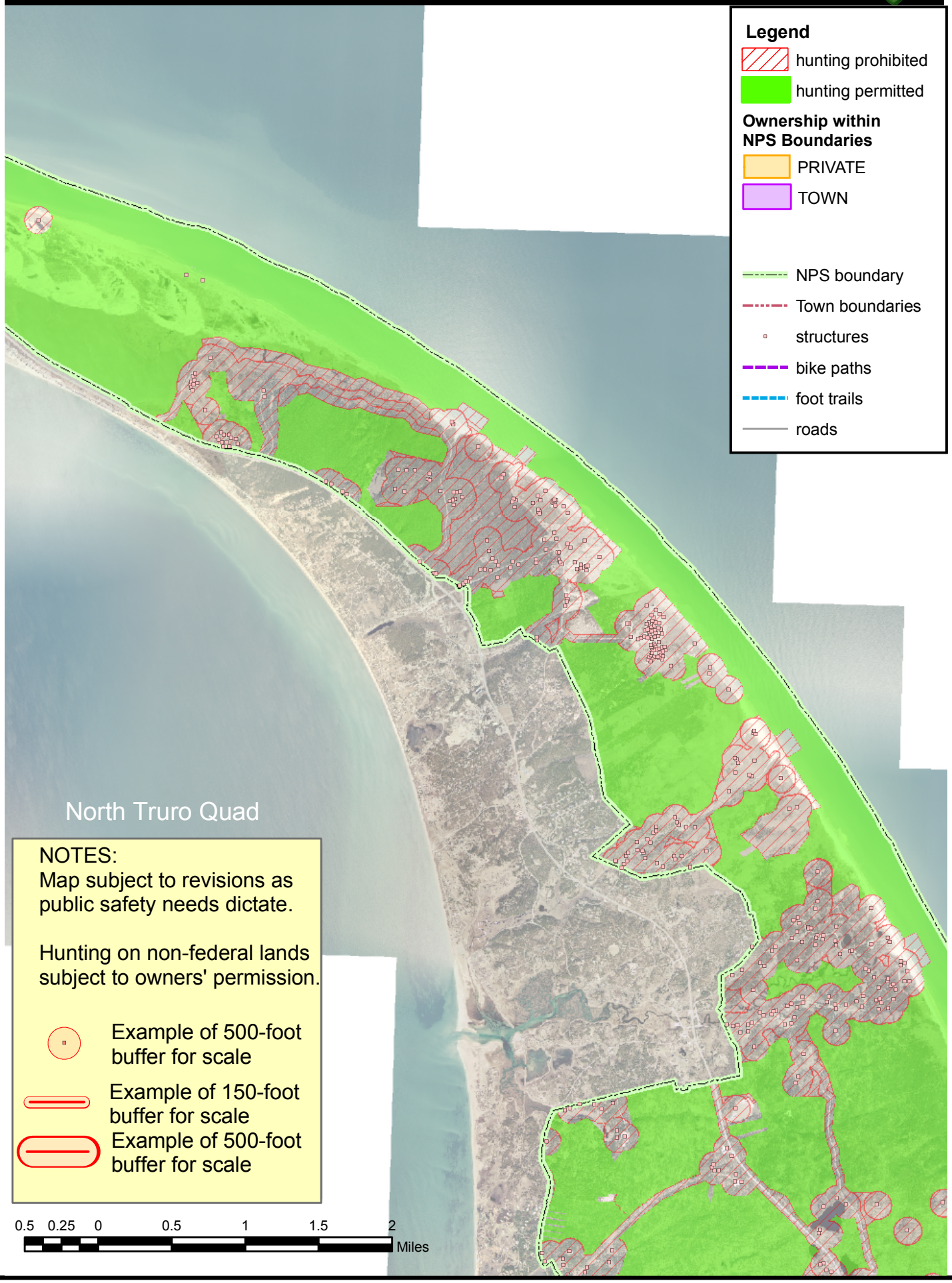


Figure 4c: Proposed Hunting Areas Under Alternative B (Preferred Alternative)

Cape Cod National Seashore
National Park Service
U.S. Department of the Interior

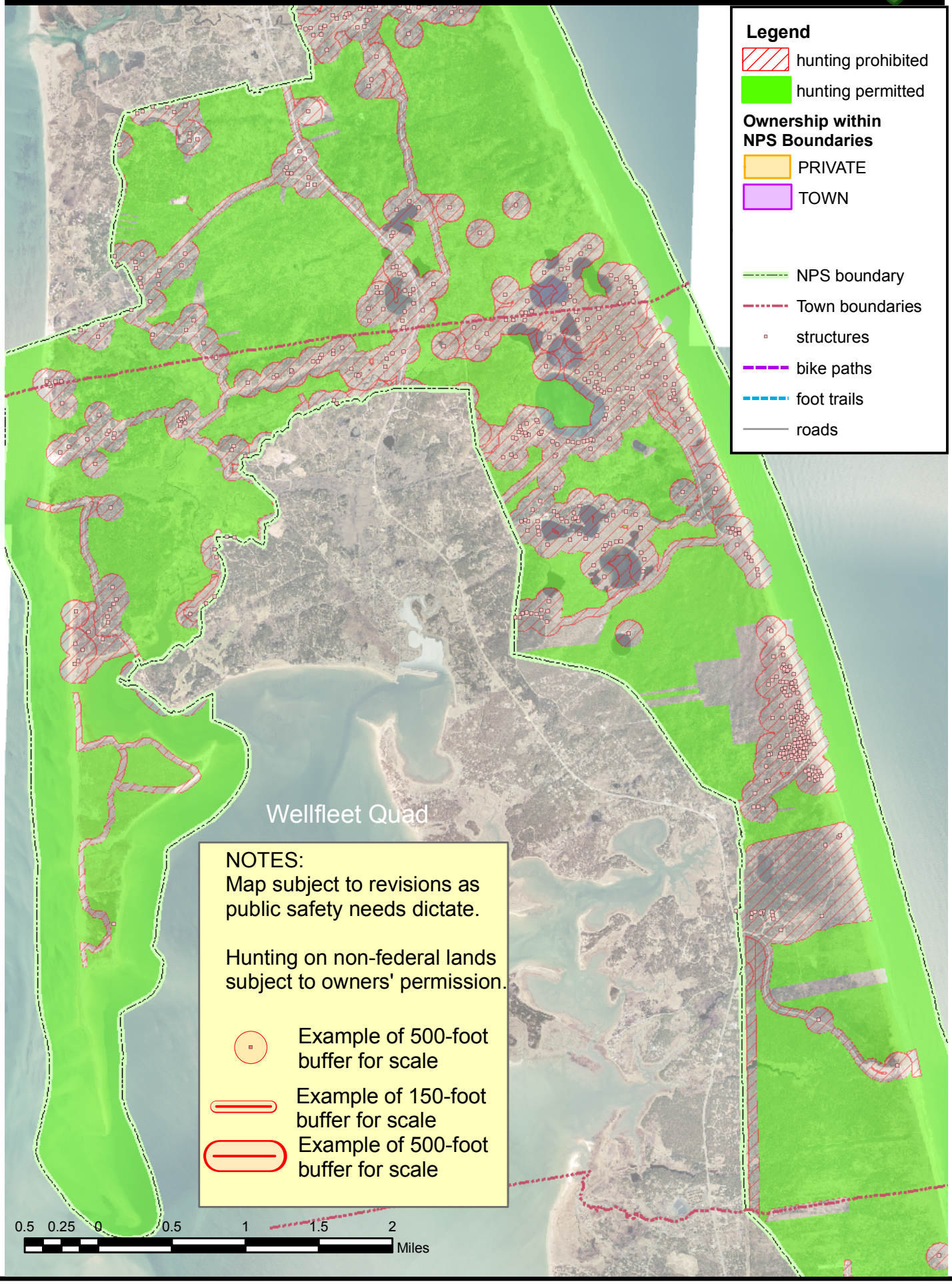


Figure 4d: Proposed Hunting Areas Under Alternative B (Preferred Alternative)

Cape Cod National Seashore
National Park Service
U.S. Department of the Interior

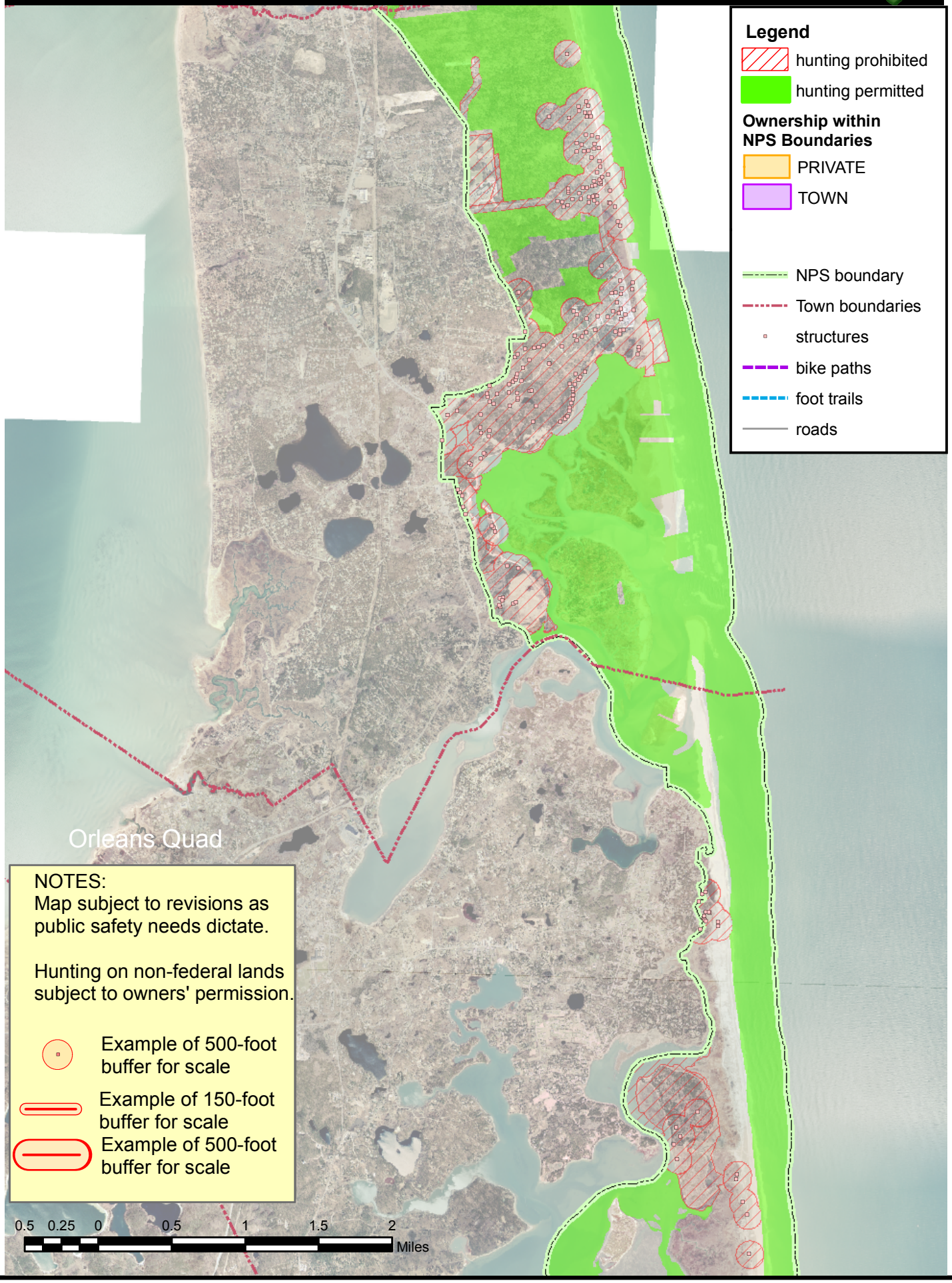
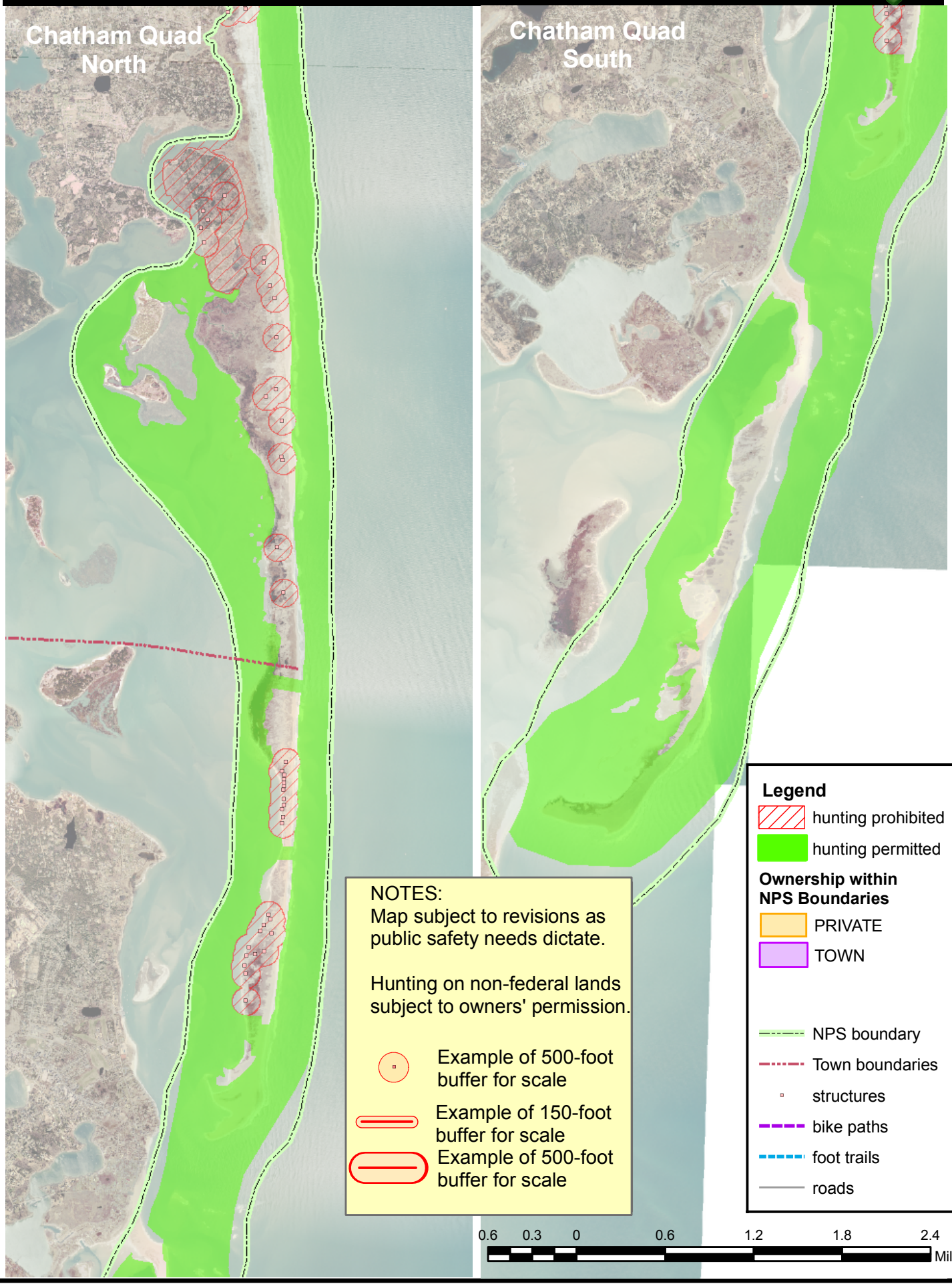


Figure 4e: Proposed Hunting Areas Under Alternative B (Preferred Alternative)

Cape Cod National Seashore
National Park Service
U.S. Department of the Interior



2.5 Alternative C – Eliminate Hunting

Alternative C considers the complete elimination of the hunting program. Hunting would be phased-out according to an implementation plan created by CACO staff.

***Option 1 – Eliminate Pheasant Hunting*:** The pheasant hunt would be eliminated. Given that the pheasant hunt has been enjoined by a court injunction since 2003, a phase out of the hunt would not be necessary. CACO would coordinate methods to communicate the elimination of the hunt with MDFW and the hunting community.

***Option 2 – Eliminate All Hunting*:** Develop and implement a plan to phase out all hunting within CACO. The plan would lay out a timeframe in coordination with MDFW that would not exceed five years to phase out the existing hunting programs. CACO would retain the management prerogative to implement proactive measures earlier should conditions indicate the need for a more immediate action.

2.6 NPS Preferred Alternative

Table 9 summarizes the three alternatives relative to the NPS goals and objectives identified in the Purpose and Need section (Section 1.1).

Alternative B, creating a modified hunting program, involves altering the current hunting program to provide the following:

- increase hunting opportunities for native upland game bird species
- apply adaptive management to phase out the pheasant stocking and hunting program
- simplify and more clearly define hunting areas
- expand hunting-related outreach to hunting and non-hunting users, and
- cooperative monitoring and management.

These modifications are designed to address many of the issues raised during the scoping process and in comments on the Final Draft EIS. These modifications to the hunting program provide a fair compromise relative to the other two alternatives and should appeal to a broad range of users. Implementing Alternative B reflects the appropriateness of continuing hunting at CACO, would improve visitors' experiences, provide management of hunting, provide a range of opportunities to enjoy park resources in a manner that will preserve them for future generations, and is consistent with NPS goals and policies. Therefore, Alternative B is the NPS preferred alternative as it meets the project purpose, while avoiding and minimizing adverse effects to the human environment.

Table 9. Summary of Alternatives

Goals and Issues	Alternative A No Action	Alternative B Modified Hunting Program	Alternative C Eliminate Hunting
Goal 1. Balance diverse uses of the Park while minimizing effects to wildlife populations, ecosystems and sustaining natural processes			
Monitor populations of hunted species.	Additional monitoring would not be implemented.	Provides for some additional monitoring.	Additional monitoring would not be implemented.
Eliminate introduction of a non-native species into natural ecosystems.	Would continue introduction of the non-native pheasant into CACO's natural systems.	Would gradually eliminate stocking non-native pheasants over a 14 to 17 year period.	Would immediately eliminate the stocking of non-native pheasants.
Goal 2 Reduce or avoid conflicts during recreational uses of the Park			
Reduce potential conflicts between hunters and non-hunters.	Does not change current conditions.	Improves the delineation of areas opened and closed to hunting. Improves the availability of information regarding areas and times hunting may be encountered.	Would eliminate conflicts between hunters and non-hunters.
Goal 3. Protect natural and cultural resources, cultural heritage, and recreational values			
Maintain and protect natural resources.	Does not interfere with NPS efforts to maintain and protect natural resources.	Does not interfere with NPS efforts to maintain and protect natural resources.	Does not interfere with NPS efforts to maintain and protect natural resources, but may lead to unnaturally high deer populations that could damage these resources
Maintain cultural resources.	Does not affect practices that manage cultural resources.	Develops a cultural landscape, which in turn would improve quail habitat.	Does not affect practices that manage cultural resources.
Continue the customary activities that were in place when CACO was established.	Continues hunting as a customary activity.	Continues hunting as a customary activity, but eventually phases out the pheasant stocking. Provides increased opportunities to hunt native quail and turkey.	Eliminates hunting as a customary activity. Other uses remain the same.

(*continued*)

Goals (in bold) and Issues	Alternative A No Action	Alternative B Modified Hunting Program	Alternative C Eliminate Hunting
Goal 4. Provide opportunities for future generations to enjoy the natural and cultural resources, cultural heritage, and recreation values of the CACO			
Provide uses that balance divergent contemporary interests while maintaining recreational opportunities for future generations.	Continues hunting as a recreational activity. Does not provide better delineation to aid in the separation of non-hunting and hunting recreational opportunities.	Continues all existing recreational activities. Provides for some enhanced hunting opportunities. Outreach efforts may further promote non-hunting uses.	Eliminates hunting as a recreational activity, thus does not maintain this type of recreational opportunity for future generations.
Provide enough land area to maintain existing recreational opportunities.	No change in land area for existing uses.	Provides ample hunting areas, better defines and slightly reduces those areas to enhance non-hunting uses.	Does not provide hunting areas.
Goal 5. Develop management solutions that address concerns related to the current hunting program to ensure diverse and high quality public experiences			
Maintain and improve safety.	Does not address potential safety issues.	Addresses potential safety issues by better defining areas open and closed to hunting, and by increasing no-hunting buffers along bike paths.	Eliminates possible safety issues by eliminating hunting.
Improve visitors' perception of hunting safety.	Does not address this perception.	Addresses this perception through improved information.	Does not address this perception as hunting would be eliminated.
Improve visitors' knowledge and awareness of hunting safety.	No attempts would be made to improve knowledge and awareness of hunting.	Expands outreach to all visitors regarding hunting regulations, safety, and areas open and closed to hunting.	Does not attempt to improve these aspects as hunting would be eliminated.
Resolve possible conflicts with NPS policies regarding the pheasant stocking program.	These conflicts would likely need to be addressed through an administrative waiver.	Eliminates these conflicts.	Eliminates these conflicts.

2.7 Environmentally Preferred Alternative

The Environmentally Preferred Alternative is defined by the CEQ as "the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act [Section 101(b)]." This section states that the Environmentally Preferred Alternative should:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.

- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

In accordance with the analysis of effects of each alternative, Alternative B has been identified as the Environmentally Preferred Alternative.

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter describes the existing conditions within CACO and the immediate vicinity and summarizes available information and current research relating to the impact topics. The CEQ requires that NEPA documents focus on issues that are truly significant to the action in question. With NEPA as guidance, the determination of which resources could reasonably be expected to be affected by any proposed actions related to the hunting program has been based on a combination of best available information, professional judgment, and common sense. The current conditions, relating to these resources and impact topics, are discussed below. An assessment of effects that may result from each alternative is presented in Chapter 4.

3.2 Hunting Theory and Background

When hunting substitutes for other forms of mortality, it is said to be "compensatory." In contrast, when hunting as another form of mortality adds to total mortality, it is said to be "additive." Early theories and research have shown that hunting is often compensatory in game species. The relationships among hunting regulations, hunting mortality, and population size are still not well understood, despite major research efforts spanning some 30 years (Baldassarre and Bolen 1994).

The MDFW deer management objective is to maintain the white-tailed deer population at levels compatible with human activity and habitat conditions. The target density goal is eight deer per mi^2 for the deer management zone (DMZ) encompassing CACO (DMZ 12) (MDFW 2003). The deer population is managed by predicting the adult male harvest level (from harvest trends) and then setting the appropriate harvest sex ratio (females to be harvested per 100 adult males harvested) that will increase/decrease the deer population towards the desired goal. This is accomplished by adjusting the number of antlerless deer permits.

CACO's objective is not to manage wildlife populations through hunting, but to manage hunting in a manner that is compatible with other park uses and that does not compromise natural and cultural resource conservation objectives. CACO regards MDFW as a key expert agency with the state- and region-wide perspective needed to manage hunting in a manner that maintains healthy and sustainable wildlife populations. In turn, MDFW relies on harvest theory to determine what species can be hunted and to establish seasons and bag limits for those species.

3.3 Wildlife Resources[3]

3.3.1 Species Present – Overview

Diverse and abundant vegetation within CACO supports a wide variety of fish and wildlife. A broad range of habitats is provided by the various community types, as well as by the diversity of successional stages.

At least 30 species of terrestrial mammals occur throughout the forested uplands and heathlands of CACO, including deer, rabbits, foxes, coyotes, raccoon, striped skunk, weasels (*Mustela* spp.), meadow voles (*Microtus pennsylvanicus*), bats (*Myotis* spp.), woodchucks, shrews, muskrats (*Ondatra zibethicus*),

[3] The works of Veit and Peterson, 1993, Whitaker and Hamilton, 1998, and DeGraaf and Yamasaki, 2001, were extensively consulted in compiling the information for Section 3.3.

eastern chipmunks, squirrels, mice (*Peromyscus* spp.), other rodents and small mammals, and river otter (*Lontra canadensis*).

A variety of marine mammals occur in the Cape Cod waters. The Marine Mammal Protection Act prohibits activities that cause the death or serious injury of marine mammals. Marine mammals and sea turtles are regularly stranded within CACO. CACO staff cooperates with a wide range of regional and local specialists in the recovery and rehabilitation of stranded marine mammals.

At least 368 species of migratory and resident birds have been identified within CACO, including a wide variety of waterfowl, gulls, shorebirds, wading birds, and songbirds (Griffin 2006). Many neotropical migrants use Cape Cod as a breeding site. Cape Cod is along the Atlantic Flyway, a major route for migrating birds, and many transient species appear during spring and autumn. Areas close to the beach are especially important as feeding sites for shorebirds during migration.

Due to the insular nature of Outer Cape Cod, and its glaciated past, CACO has a unique assemblage of amphibians and reptiles. There are at least 18 reptilian species and at least 13 amphibian species within CACO, including snakes, turtles, salamanders, newts, frogs, and toads.

Cape Cod is home to a number of freshwater macroinvertebrate animals, including sponges, flatworms, mollusks, insects, and crustaceans. Marine benthic macroinvertebrates such as shrimps, crabs, oligochaete and annelid, worms, mollusks, and echinoderms provide a food source for many fish, and some are fished recreationally and commercially. In addition, numerous species of dragonflies, damselflies, butterflies, moths, diptera (flies and their allies), and beetles inhabit CACO.

Inventories have been conducted for several animal species, including white-tailed deer, *Lepidoptera* (butterflies and moths), dragonflies, and tiger beetles. Monitoring of beach-nesting terns and piping plovers (*Charadrius melodus*) is conducted on an annual basis. CACO also monitors pond-breeding amphibians and estuarine nekton as part of its long-term ecosystem monitoring program. Studies have been completed that assess appropriate methods for long-term monitoring of small mammals, aquatic turtles, freshwater fish, shorebirds, and migratory waterfowl. However, such monitoring is not currently feasible given management priorities and available resources. Similar studies are underway for landbirds, snakes, and fresh and marine invertebrate assemblages. During hunting season, MDFW evaluates the sex and general age characteristics of harvested deer.

3.3.2 Natural History – Game Species-Birds

Ring-necked Pheasant

The ring-necked pheasant is one of the most successful and well-known introduced game birds in North America. This species is exceptionally popular as an upland game bird throughout much of its range. Populations are established on most mid-latitude agricultural lands throughout its range in North America. Breeding does occur in the wild; however, widespread annual releases obscure status and delineation of resident breeding populations in North America.

Range: In New England, pheasants are primarily a stocked game bird. There are low numbers of over-wintering and breeding populations along the New Hampshire coast, eastern Massachusetts, southern Connecticut, and around Narragansett Bay, Rhode Island (DeGraaf and Yamasaki 2001).

Habitat: Pheasants typically breed in open fields cultivated for grass or grain, fallow fields, brushy pastures, hedgerows by roadsides, cut-over land and open ungrazed woodlots. Agricultural land, however, provides the most suitable habitat. They are not present in mountainous regions or in forested

areas. During the winter season they inhabit areas that have dense cover, such as cat-tail swamps interspersed with thickets (DeGraaf and Yamasaki 2001). Pheasants thrive best in agricultural and early successional areas, which are limited at CACO. They require dense herbaceous cover for nesting.

Food Habits: Their staple food sources are cultivated grains and weed seeds. They also feed on soft parts of herbaceous vegetation, fleshy fruits, and insects. They typically feed in grain and weed fields bordered by hedgerows, which offer cover protection (Allen 1956).

Conservation: A study conducted by Bump (1999) found that the Cape Cod region offered only marginal habitat. Only 1.1 percent of the population survived through mid winter. Therefore, pheasants released in this area are mainly a put and take resource and have not formed any significant breeding population. Also, since they are raised in captivity, they feed very little between the time they are released and when they are harvested. As they are not present in the ecosystem for very long, pheasants are thought to have a negligible effect on the CACO ecosystem.

Abundance: Bump (1999) reviewed the history of pheasant releases on Cape Cod. Pheasants have been released on Outer Cape Cod for several decades, well before the establishment of CACO in 1961. In 1971, the NPS and MDFW began cooperative management of the pheasant release program on CACO. The MDFW stocks birds within CACO while the NPS monitors hunter numbers and activities. Pheasants are typically released at three locations on CACO: Marconi Beach WMA, Wellfleet/Truro, and Provincetown. Numbers of birds released on the Outer Cape each year between 1970 and 1997 varied between 330 and 1,166. Typically, about 800 birds have been released each year since the mid 1980s (Bump and Field 1999).

Recent Breeding Bird Survey (BBS) analyses indicate that pheasants decreased 5.4 percent per year from 1980 to 2004 statewide for Massachusetts (Sauer *et al.* 2005). While no pheasants were recorded on the BBS (47901) route within CACO (1989 to 1999), pheasants counted on the Wellfleet BBS route (47004) from 1970 to 1998 averaged 0.56 birds/count (range: 06 birds, [Sauer *et al.* 2005]). However, all pheasants on Cape Cod are assumed to be stocked birds.

Take: Kennedy (1988) reported Massachusetts statewide harvests of 70,605 and 51,468 pheasants in 1985 and 1986 hunting seasons by 43,121 and 37,613 hunters, respectively. Based on a two-season study, Bump (1999) estimated that 574 and 466 pheasant hunters used the Marconi Beach WMA in the 1996 and 1997 hunting seasons, respectively. This was lower than reported in the early 1970s, when hunter numbers ranged from 813 in 1976 to 1,150 in 1974. Of 1,595 pheasants released on CACO during 1996 and 1997, 33 percent were harvested.

Harvest management strategy: On Cape Cod, pheasants are stocked annually by the MDFW, and Bump (1999) found no evidence that released pheasants on CACO can survive through the fall and winter to establish a viable breeding population. Thus, the pheasant harvest on CACO is considered a "put and take" harvest in which all released animals are either harvested or die of natural causes. Either sex may be harvested throughout Cape Cod. Hunting constitutes a significant proportion of annual mortality for male pheasants (i.e., in most regions with self-sustaining populations, only male birds may be harvested). However, few studies have demonstrated that hunting limits population levels (Giudice and Ratti 2001).

Pheasant chicks receive a starter mash that contains the anti-biotic Amprolium during the first six-weeks of life. After six-weeks, the pheasants are fed an adult feed that does not contain antibiotics and are kept in enclosures that are large enough for the birds to fly. By the time the pheasants are released at 15 to 20 weeks old, there are only trace amounts of antibiotics in their bloodstream. The USDA and the MDFW inspect both the farms that raise and sell the pheasants and the pheasants themselves to determine that they are disease free (letter from Robert Deblinger of MDFW to Maria Burks of NPS, October 7, 2002).

Bump (1999) reported that harvest mortality in 1996-1997 on CACO accounted for a 33 percent loss, and radio-tagged pheasants experienced extreme predation from a variety of predators, including avian predators, foxes, and coyotes. All but 1 of the 53 collared birds were dead within 92 days of release.

The ecological effects of discontinuing the pheasant hunt at CACO are unknown. However, Bump (1999) concluded that the proportion of the released pheasant population not harvested (~67%) would not provide fox and coyote populations on CACO a sustained food source. Thus, the effects would probably be minimal at best.

Effects on predator/prey interactions and competition with other species: On CACO, avian predators (red-tailed hawk [*Buteo jamaicensis*] and great horned owl [*Bubo virginianus*]) accounted for 30 to 40 percent of the non-harvest mortality, followed by fox (14 – 16%), coyote (7 – 8%), and an unknown mammal (12 – 14%) (Bump and Field 1999). Furthermore, Bump and Field concluded that non-harvested pheasants provide an easy food source for predators for only a short period of time in fall each year, and the effect on the populations is short-term. There is no evidence of competitive interactions of pheasants with other species on CACO (Bump and Field 1999). Finally, the Bump and Field work concluded that released pheasants on CACO are not feeding after release; consequently they are unlikely to be numerous enough to deplete any native food source.

Northern Bobwhite Quail

Range: In New England, quail occur in southeast Massachusetts, including Cape Cod, Martha's Vineyard and Nantucket; eastern and southern Connecticut; and Rhode Island.

Habitat: Quail breed in fields, early successional habitats and open woodlands adjacent to pastures, meadows, agricultural fields with abundant weedy growth (Brennan 1999), and open pitch pines and barrens (on Cape Cod and the islands). Bobwhites avoid deep woods (DeGraaf and Yamasaki 2001).

Food Habits: Quail feed on soft parts of herbaceous vegetation, buds, seeds and fruits. The young are almost totally insectivorous. They commonly feed in agricultural fields and open areas near protective brushy cover (Brennan 1999).

Abundance: Cardoza (1993) reviewed the status of bobwhites in Massachusetts. As in DeGraff and Yamasaki (2001) bobwhites are native to Massachusetts and were common throughout southern New England. Periods of severe loss and local extirpation were reported after severe winter storms in the 1850s and 1870s. A storm in 1898 wiped out virtually all quail between Cape Cod and New Hampshire. The large, pale native New England bobwhite was extirpated by 1872. By 1952, bobwhites were restricted to five southeastern counties and the southern portion of Norfolk County. Beginning in the early 1900s, bobwhites were propagated from southern stock for release in Massachusetts. As recently as 1993, about 3,500 bobwhites were obtained from commercial sources for release on WMAs in Barnstable and Plymouth Counties (Cardoza 1993).

From 1952 to 1956, call count indices in Barnstable County ranged from 2.37 to 2.74 (quail heard/stop on route multiplied by a weighting factor) (Ripley 1958). Since 1958, biennial call counts have been conducted by MDFW. Cardoza (1993) reported an index of 1.71 for 1991 within Barnstable County. He concluded that indices in the early 1990s were less than those recorded historically. The mean index in 1999 and 2001 were 13.00 and 11.50, respectively, for Barnstable County (Cardoza 2002), up substantially from the early 1990s.

Recent BBS data indicate that bobwhites decreased 13.6 percent per year from 1980 to 2004 statewide for Massachusetts (Sauer *et al.* 2005). Similarly, bobwhites decreased 18.7 percent from 1989 to 1999 on the

BBS (47901) route within CACO and 10.2 percent from 1970 to 1998 on the Wellfleet BBS route (47004) (Sauer *et al.* 2005).

Take: There is no current information on numbers of bobwhite hunters and harvests on CACO. Kennedy (1988) reported statewide harvests of 19,100 and 9,699 bobwhites during 1985 and 1986 hunting seasons, respectively.

Harvest management strategy: Most bobwhite management focuses on habitat management via frequent vegetation disturbance (every 1 – 5 years) from prescribed fire and/or mechanical disturbances (Stoddard 1931; Landers and Mueller 1986). Hunting pressure on public lands continues to increase in some areas, despite declining populations (Brennan and Jacobson 1992). Hunting records from shooting-plantation game books from the southeastern United States show evidence that relatively stable and abundant populations can be maintained for multiple decades if proper habitat is maintained through management (Brennan *et al.* 1995b). Management of hunting pressure is also essential for effective population management (Roseberry and Klimstra 1984). However, bobwhite hunting management decisions and resultant pressure vary widely across properties, states, and regions.

Bobwhite population dynamics and susceptibility to hunting pressures: Roseberry and Klimstra (1984) reported evidence of density-dependent processes (i.e., greater reproductive success at low densities and greater mortality at high densities) and cyclic variation at 10-year intervals in southern Illinois. They suggested that pre-breeding and breeding social interactions such as intraspecific competition (for space and food resources) may also contribute to density-dependent reproduction and that over-winter survival may be related to spacing behavior among winter coveys, as well as to weather.

Two types of intrinsic factors appear to influence bobwhite populations: "one tending to promote fluctuations through momentum and the other tending to dampen fluctuations through compensatory adjustments of reproduction and mortality" (Roseberry and Klimstra 1984:166). Extrinsic factors are also potentially significant for regulating bobwhite populations. Effects of weather (both lack of rainfall and excessive rainfall, as well as winter weather severity) often overwhelm effects of management and land use (Stoddard 1931; Roseberry and Kilmstra 1989; Giuliano and Lutz 1993).

Roseberry and Klimstra (1984) observed strong evidence for synchrony between bobwhite population abundance and the nodal lunar cycle. Bobwhites show evidence of cyclic population changes (on 10-year interval) from a southern location in Illinois (38°N) that is typically characteristic of wild animals, including bobwhites (Kabat and Thompson 1963, Sinn 1978) at more northern latitudes.

Ruffed Grouse

Range: Ruffed grouse are a common species of inland New England, although less abundant along the southern coast and absent from Nantucket, Massachusetts and Block Island, Rhode Island (Veit and Petersen 1993).

Habitat: Ruffed grouse inhabit brushy, mixed-aged woodlands and early successional to mature hardwood and mixed forest, commonly with birch or aspen present. Hens and broods prefer areas with a dense understory and fairly open herbaceous ground cover. Early successional habitats (regenerating clear-cuts or old burns) are ideal. More mature woodlands, especially coniferous forests, are used in winter for cover and roosting. Birds roost in snow when it is soft and deep, or they roost on the ground or in trees (DeGraaf and Yamasaki 2001).

Food Habits: The diet of the ruffed grouse consists of seeds, insects, fruit, and leaves. During the fall and winter the buds of birch, aspen, hazel, hop hornbeam and cherry are staples (Bump *et al.* 1996). During the winter, aspen stands are favorite feeding spots (Svoboda and Gullion 1972).

Abundance and Take: There is no information on ruffed grouse abundance in CACO; however, they appear to be of numbers too small to support an abundance of hunting activity and are apparently not specifically pursued in the region. The ecological effects of hunting or not hunting ruffed grouse on CACO are unknown. Cape Cod is very poor habitat for ruffed grouse and it is likely that the number of grouse harvested in Barnstable County is very low.

American Crow

Range: The American crow is a common resident of New England and can be found throughout the region (DeGraaf and Yamasaki 2001). Northern populations are migratory, but they winter within North America (DeGraaf and Yamasaki 2001).

Habitat: Crows require open areas for foraging and are found in semi open fields and woodlands containing deciduous, coniferous and mixed forests. They also inhabit open wooded river bottoms, orchards, woodlands adjacent to agricultural fields and other open land, and parks and suburban neighborhoods. In the winter, individuals often move to lower elevations off the coast (DeGraaf and Yamasaki 2001).

Food Habits: Crows are omnivorous. Three-fourths of their diet consists of plant products such as cultivated grains, seeds, and wild and cultivated fruits and nuts. They also supplement their diet with small mammals, carrion, insects, eggs, young birds, millipedes, spiders, small crustaceans, frogs, and reptiles (DeGraaf and Yamasaki 2001).

Abundance: BBS data show significant increases in crow numbers from 1966 to 1996 in 24 of 51 states and provinces, and in 23 of 52 physiographic regions. Conversely, recent BBS data indicate that crows decreased 1.69 percent per year from 1989 to 2004 statewide for Massachusetts (Sauer *et al.* 2005). Similarly, crows decreased 4.88 percent from 1989 to 1999 on the BBS (47901) route within CACO, but increased 2.36 percent from 1970 to 1998 on the Wellfleet BBS route (47004) (Sauer *et al.* 2005).

Take: There is no current information on numbers of crow hunters and harvests on CACO or in Massachusetts.

Harvest management strategy: Although crows in the United States have been protected by the Migratory Bird Treaty Act since 1971, hunting is allowed and individual states set hunting seasons (not to exceed 124 days) that exclude the nesting season (Clapp and Banks 1993). Recreational hunting accounts for the single largest cause of death continent-wide: 1,248 crows shot among 1,831 band returns of banded crows from 1917 to 1999 (data from Bird Banding Office, Hull, Québec in Verbeek and Caffrey 2002).

Crow population dynamics and susceptibility to hunting pressures: There is no information on the effects of hunting on the population dynamics of crows. However, the effects of a variety of other control measures (lethal and non-lethal) were reported by Verbeek and Caffrey (2002). These methods included dynamiting of roosts (Kalmbach 1939, Good 1952), but this has had no noticeable effect on crow population levels or agricultural damage (Hanson 1946). Neither removal of a "traditional" roost, nor dispersal of crows from a number of roosts causes crows to leave urban areas; they instead move to other established roosts or form new ones (Gorenzel and Salmon 1993). Therefore, it appears that even

extensive population control methods have not adversely affected crow populations. As such, recreational hunting probably does not effect crow populations.

Wild Turkey

Range: Turkeys are a common resident in New England. They reside in most of Massachusetts, except for some areas to the east. Their northern limit seems to be determined by condition, depth, and duration of snow cover (Markley 1967).

Habitat: During summer months, turkeys prefer open, mature, hardwood forests containing mast-bearing trees and scattered openings such as forest clearings and agricultural land. In winter they favor mature forests with south-facing slopes, mast-bearing trees, and abundant springs and seeps. In areas to the north where snow can be deep and fluffy, turkeys use silage and waste grain as primary feeding sites (Healy 1992a).

Home Range: Size is highly variable as a result of flock segregation by sex and annual food supply. Hens with broods range over an area of 100 to 200 ha during the summer, but use smaller centers of activity within the larger range depending on habitat quality (Healy 1992a). Large movements tend to occur mostly during early spring, late summer, and fall (Healy 1992b). Pough (1951) found that in ideal conditions an average of 15 to 20 birds per mi^2 were represented.

Food Habits: The staple food of turkeys consists of acorn and beechnuts, but they also feed on fruits and seeds of trees, shrubs, and herbaceous vegetation, tubers, roots and insects (Korschgen 1967). They generally feed in mast-producing woodlands during fall and winter, and fields, pastures and woodlands with rich herbaceous ground cover during the summer (DeGraaf and Yamasaki 2001).

Conservation: The turkey population, which had been extirpated in Massachusetts and other parts of New England, rebounded as a result of the reintroduction of wild trapped birds from New York during the 1970s (DeGraaf and Yamasaki 2001). Massachusetts began transplanting wild birds into Berkshire County in 1972. From 1995 to 2003, two wild turkey transplants were made from Berkshire County to Barnstable County by MDFW. Eighteen birds were released at Camp Edwards in 1989, and 28 birds were released in 1995-1996 in the vicinity of CACO in Wellfleet (J. Cardoza, MDFW, unpubl. data).

Abundance: There is no information on wild turkey numbers specifically within CACO, but crude estimates are available at a variety of spatial scales. Populations dropped drastically during the 19th and early 20th centuries because of hunting and habitat loss. The overall population of eastern wild turkey and Florida wild turkey increased from 129,373 in the late 1940s to almost 300,000 in 1956 (Mosby 1959). By 1970, the United States population was estimated at 1,250,000 (Mosby 1973) and the species had spread beyond its ancestral range in 7 western states. It was also reestablished in two states west of the Mississippi River plus six eastern states. The United States population estimate was 5.46 million in 1999. Recent BBS analyses indicate that wild turkeys increased 11.3 percent per year survey-wide from 1980 to 2004 (Sauer *et al.* 2005). The estimated state-wide wild turkey population is 18,000 birds (MDFW unpubl. data).

Take: There is currently no wild turkey hunting season within CACO. However, estimates of annual harvests are available for Barnstable County from MDFW. The first hunting season occurred in Barnstable County in 1999, and only spring hunting seasons are permitted on Cape Cod. For the 7-year period (1999 – 2005), a total of 51 turkeys were harvested in Barnstable County, averaging 7 birds per year (range 0 – 15) (Table 10).

Table 10. Reported Spring Wild Turkey Harvest by Town in Barnstable County, 1999 – 2005[1]

Town	1999	2000	2001	2002	2003	2004	2005
Bourne	2	11	4	3	1	8	3
Chatham	0	0	1	0	0	0	0
Eastham	0	1	1	0	1	0	2
Falmouth	0	1	0	1	1	0	0
Sandwich	0	2	2	1	0	1	0
Truro	0	0	0	0	2	1	1
Total:	**2**	**15**	**8**	**5**	**5**	**10**	**6**

1. MDFW unpublished data

Harvest management strategy: In Massachusetts, restoration efforts produced a huntable population by 1980. The hunt is by permit only in order to manage hunter density. With 11 counties open for spring hunts, virtually all hunters who apply obtain a turkey hunting permit. Typically, the spring hunting season is timed to coincide with the period when the protected hens are already on their nests; thus only gobblers can be taken. During the fall, there is a limited either-sex hunting season in some areas of the state, though not on Cape Cod (MDFW 2005a).

Wild turkey population dynamics and susceptibility to hunting pressures: Wild turkeys have been studied extensively throughout their range. Roberts *et al.* (1995) suggested that annual fluctuations of northern populations of wild turkeys in mixed agricultural and forested environments rarely result from variability of annual survival, but rather from changes in annual nest success and poult survival. However, Rolley *et al.* (1998) indicated that variability of annual survival can also be important, especially regarding long-term changes in populations. Eaton (1992) summarized the limiting factors for various turkey subspecies. He reported that the main limiting factors for the eastern wild turkey are poult mortality during the first 6 weeks, loss of habitat, and hunter harvest. Factors identified as limiting turkey populations elsewhere included poult losses during the first two weeks, predators, hunting, disease, accessible surface water, land management, and fall and spring rains, which are important in recharging soil moisture for abundance of vegetation and insects.

Waterfowl Population Indices and Harvest Estimates

The following tables (Tables 11, 12, and 13) provide a summary of national waterfowl population indices, harvest estimates in Barnstable County, and a comparison of Atlantic Flyway harvests and those from Barnstable County. These summaries are further referenced within many of the species accounts that follow. Generally this information suggests that harvests from Barnstable County are relatively low and represent a very small portion of the flyway harvest.

Table 11. Waterfowl Estimated Population Indices from 1999 – 2005

Species	Estimated Population Indices by Year						
	1999	2000	2001	2002	2003	2004	2005
Brant	171,600	157,200	145,300	181,600	164,500	129,600	123,200
Black duck	1,018,000	885,009	864,009	1,174,000	976,002	1,093,000	826,500
Bufflehead	70,500	49,300	95,000	83,600	66,300	43,800	Unknown
Goldeneye	821,100	778,700	1,118,000	970,300	968,400	747,800	714,700
Canada goose breeding	77,500	93,200	146,700	164,800	156,900	174,800	162,400
Canada goose resident	999,500	1,024,500	1,017,200	966,000	1,083,200	980,400	1,064,700
Canvasback	716,000	706,800	579,800	486,600	557,600	617,200	520,600
Ring-necked	905,300	1,342,000	838,600	834,900	1,012,000	1,257,000	883,100
Gadwall	3,235,500	3,158,400	2,679,200	2,235,400	2,549,000	2,589,600	2,179,100
Pintail	3,057,900	2,907,600	3,296,000	1,789,700	2,558,200	2,184,600	2,560,500
Green-winged teal	627,600	347,900	265,900	588,800	521,100	775,700	422,900
Wigeon	2,920,100	2,733,100	2,493,500	2,334,400	2,551,400	1,981,300	2,225,100
Mallard	554,100	443,800	465,000	517,500	648,100	645,500	411,700
Lesser scaup and Greater scaup	4,411,700	4,026,300	3,694,000	3,524,100	3,734,400	3,807,200	3,386,900
Snow goose	803,400	813,900	837,400	639,300	678,000	957,600	814,600

Table 12. Waterfowl Harvested in Barnstable County 1993 – 2003

Species	Barnstable County Harvest by Year											
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**Total**
Coot	Unk	Unk	Unk	Unk	Unk	Unk	0	0	180	40	40	270
Atlantic brant	530	140	330	0	220	160	0	220	270	510	270	2,650
Black duck	1420	1730	1360	850	900	3610	1750	3140	1440	1050	520	17,770
Bufflehead	320	230	500	100	30	2380	2140	4630	2730	350	360	13770
Goldeneye	0	30	50	0	0	310	70	0	0	0	40	500
Canada goose	1140	990	70	590	450	270	580	300	150	40	260	4,840
Canvasback	0	0	0	0	0	0	140	0	0	0	0	140
Ring-necked pheasant	0	0	0	0	0	80	0	0	220	90	0	390
Eider	840	6410	11590	5290	2100	3930	2770	0	0	0	0	32,930
Gadwall	0	0	80	0	0	80	350	0	110	0	0	620
Pintail	0	0	0	0	0	0	140	0	0	40	0	180
Green-winged teal	0	120	110	0	80	540	760	0	660	180	400	2,850
Wigeon	0	0	110	0	0	80	0	0	160	0	40	390
Long-tailed duck	0	460	150	0	0	0	140	0	0	0	0	750
Mallard	820	450	1090	910	940	460	1590	990	980	750	120	9,100
Common merganser	50	0	0	0	0	80	70	0	0	0	0	200
Red-breasted merganser	940	620	730	400	1940	2930	1310	0	230	180	40	9,320
Hooded merganser	0	0	0	0	80	230	210	0	110	90	160	880
Ruddy duck	0	0	0	0	80	0	0	0	0	0	0	80
Lesser scaup	0	60	0	0	0	230	0	0	0	310	0	600
Greater scaup	50	0	0	0	0	0	0	0	0	180	40	270
Black scoter	0	0	220	0	0	0	0	0	0	0	0	220
Surf scoter	210	0	370	0	0	0	140	0	0	0	0	720
White-winged scoter	310	190	220	0	0	0	0	0	0	0	0	720
Snow goose	0	0	0	0	80	0	0	0	0	0	0	80
Wood duck	90	60	130	0	0	150	620	170	0	0	0	1,220
Total:												

Table 13. Barnstable County Waterfowl Harvest Relative to State and Flyway Harvests

Species	Barnstable County Harvest 2003	Mass Harvest 2003	Mass Harvest 2004	Flyway Harvest 2003	Flyway Harvest 2004	2003 Harvest Barnstable County Flyway %
Coot	<50	<50	100	12,800	13,100	<0.4
Atlantic brant	270	1,600	300	44,925	18293	0.6
Black duck	520	2,711	1,809	95,108	74920	0.5
Bufflehead	360	837	2,210	54,571	52,265	0.7
Goldeneye	40	239	452	13,439	13,036	0.3
Canada goose	260	12,874	15,200	657,910	633,289	0.04
Canvasback	0	0	0	4,738	9,772	0.0
Ring-neck.	0	199	301	112,806	74,349	0.0
Eider	0	3,097	5,717	34,638	21,582	0.0
Gadwall	0	80	0	38,479	24,269	0.0
Pintail	0	40	0	18,134	10,254	0.0
Green-winged teal	400	2,033	1,156	137,155	114,969	0.3
Wigeon	40	319	50	39,598	19,374	0.1
Long-tailed duck	0	127	539	17,627	20,909	0.0
Mallard	120	7,375	9,245	427,301	422,091	0.03
Common and Red-breasted merganser	40	399	1,558	22,824	19,729	0.2
Hooded merganser	160	598	352	29,181	25,692	0.5
Ruddy duck	0	0	0	2,474	4,307	0.0
Greater scaup	40	80	0	17,344	16,837	0.2
Lesser scaup	0	0	0	60,939	54,891	0.0
All scoters	0	3,776	3,344	63,174	48,303	0.0
Snow goose	0	26	0	36,105	31,548	0.0
Wood duck	0	2,711	3,165	338,004	265,560	0.0
Totals	2300	39171	45498	2,279,274	1,989,339	0.1

Waterfowl—Dabbling Ducks:

American Black Duck

Range: The breeding range for the black duck extends from northeastern Saskatchewan to northern Labrador and Newfoundland, south to northern South Dakota, northern Illinois, and central West Virginia and on the Atlantic Coast to North Carolina. The winter range extends from southeastern Minnesota and central Wisconsin to New Brunswick and Nova Scotia, south to southern Texas, the Gulf Coast, and south-central Florida (DeGraaf and Yamasaki 2001). They winter as far north as open water and food are available. In New England they are a widespread breeder and common migrant but a declining winter resident.

Habitat: The breeding habitat of the black duck consists of a wide variety of coastal and freshwater habitats, including brackish marshes and estuaries and edges of rivers, lakes, and ponds. They also inhabit forested swamps, beaver ponds, emergent wetlands, and open boreal and mixed hardwood forests (DeGraaf and Yamasaki, 2001). Populations in Vermont have been found to occur in glacial kettle ponds surrounded by bog mats (Laughlin and Kibbe 1985). During the winter months, they are found mainly in brackish marshes bordering bays, estuaries, and agricultural marshes (DeGraaf and Yamasaki 2001).

Food Habits: The black duck diet varies greatly with habitat; in marine habitats they feed mainly on mollusks, whereas in fresh and brackish environments their diet consists mainly of plant material. They also consume seeds, acorns, berries, crustaceans, amphibians, earthworms, and small fish (DeGraaf and Yamasaki 2001). In late fall and winter, birds may leave their rest areas early in the day and just before sunset to fly to waste cornfields up to 25 miles away (Bellrose 1976).

Abundance: The longest time-series of data available to assess the status of the black duck is provided by the Midwinter Waterfowl Inventory (MWI) conducted in January in states of the Atlantic and Mississippi Flyways. The 2005 midwinter counts of black ducks (203,900 in both flyways combined) was 10 percent lower than the 2004 index (226,700), and 25 percent lower than the 10-year mean (272,600). In the Atlantic Flyway, the midwinter index of 184,100 decreased 11 percent from 206,400 in 2004, and was 18 percent below the most recent 10-year mean (225,000) (USFWS, 2004a, 2005a).

Estimates of the black duck breeding population size in the eastern survey area have varied from 826,500 to 1.174 million since 1999 (Table 11). The population estimate for 2005 was 18 percent below the 1999-2004 average (USFWS 2004a, 2005a).

Take: Estimates of annual harvests are available for Barnstable County from the USFWS Harvest Inventory Program (HIP) program. For the 1993 – 2003 11-year period, 17,770 black ducks were harvested in Barnstable County, averaging 1,615 birds per year (range 520 – 3,610) (Table 12).

In 2003 and 2004 hunting seasons, 2,711 and 1,809 black ducks were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 95,108 and 74,920 black ducks were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The average annual black duck harvest for all of Barnstable County is 1.0 percent of the black duck population in the eastern United States. Similarly, the level of harvest of black ducks in Barnstable County is insignificant compared to harvest levels in the Atlantic Flyway (0.5%) (Table 13).

The USFWS reports the numbers of mallard x black duck hybrids harvested. For the 11-year period, 1,080 mallard x black duck hybrids were harvested in Barnstable County, averaging 98 birds per year (range 0 – 210). For the Atlantic Flyway, 7,000 and 8,719 hybrids were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b).

Harvest management strategy: Black ducks have been heavily exploited in most states and provinces of eastern North America (Wright 1947). Following a 25-year decline in the abundance of black ducks as measured by the MWI, the USFWS placed restrictions on the sport harvests of black ducks in 1983, reducing the daily bag limit to one black duck in the Mississippi Flyway, and a variety of regulatory options in the Atlantic Flyway designed to reduce the harvest by 25 percent. By 1994, a 47 percent reduction in flyway harvest had been achieved. With the implementation of Annual Harvest Management (AHM) for general duck seasons in 1995, most states in the Atlantic Flyway gradually returned to the maximum season length allowable under framework regulations, although a daily bag limit of one black duck has been maintained through federal regulations. Since 1994, harvests have remained at comparable levels. Black duck harvest in Canada has declined at an average rate of 3 percent per year since keeping records began in 1968, in part due to regulatory restrictions, but probably more as a result of their dramatic long-term decline in hunter numbers (Johnson and Conroy 2005).

Johnson and Conroy (2005) developed an assessment framework for black duck harvest management in the United States. This framework is intended to help the USFWS assess the biological implications of any proposed changes to hunting regulations, as well as to complement the ongoing effort to develop an AHM program for black ducks.

Black duck population dynamics and susceptibility to hunting pressures: Conroy *et al.* (2002) reviewed the variety of factors proposed to explain the black duck decline, including reduction in quantity and quality of: (1) breeding habitat; (2) wintering habitat; (3) effects of harvest; and (4) interactions with mallards. They concluded that there is circumstantial evidence linking all of these factors with the black duck decline. However, several studies suggested that the long-term population decline in black ducks was related mostly to excessive hunting (Blandin 1982, Grandy 1983, Francis *et al.* 1998), and not to interactions with mallards (Ankney *et al.* 1987, Longcore *et al.* 1998, McAuley *et al.* 1998; Longcore *et al.* 2000). Further, with the harvest restrictions implemented since 1983, there have been increasing numbers of black ducks recorded on the MWI (Longcore *et al.* 1998) and in Canada (Boyd 1988). The numbers of breeding black duck pairs has also increased in eastern Canada since the 1990s (Longcore *et al.* 2000).

The ecological effects of discontinuing the black duck hunt are unknown. However, mean survival rates, based on recoveries of banded ducks, increased when hunting was reduced (Francis *et al.* 1998). Survival rates were higher in areas where mean numbers of direct band recoveries (i.e., within same year banded) were lower. At four study sites in Québec, Nova Scotia, and Vermont during 1990-1991, survival of black ducks in the fall was ≥ 80 percent when losses from hunting were excluded (Longcore *et al.* 2000).

Gadwall (*Anas strepera*), ***Northern Pintail*** (*A. acuta*), ***Green-winged Teal*** (*A. crecca*), and ***American Wigeon*** (*A. americana*)

Range: The winter range of the gadwall, pintail, green-winged teal, and wigeon in New England includes sections of Massachusetts (eastern coast, Plum Island, Salem, Plymouth and Berkshire counties), south along the coast to Rhode Island and Connecticut (Veit and Petersen 1993). All four are uncommon in winter and during the breeding season in New England (DeGraaf and Yamasaki 2001).

Habitat: During the winter, gadwalls reside in coastal bays and freshwater marshes that remain free of ice, but they can be found in most bodies of open water (DeGraaf and Yamasaki 2001). Pintail winter habitat includes shallow inland fresh and brackish wetlands, flooded agricultural fields, tidal wetlands, mudflats along rivers, and sounds and bays (DeGraaf and Yamasaki 2001). During the winter green-winged teal remain on fresh and brackish marshes, lakes, ponds, shallow streams, sloughs, forested wetlands, brackish estuaries, and flooded agricultural fields. They will also use mud banks. During winter wigeons use shallow, fresh and brackish ponds; wet meadows; coastal marshes; and bays (DeGraaf and Yamasaki 2001).

Food Habits: Gadwalls feed mainly on submerged aquatic plants (seeds or soft parts), pondweeds, naiads, wigeon grass, eelgrass, filamentous algae, etc. in shallow water (DeGraaf and Yamasaki 2001).

The pintail mainly feeds on seeds, especially those of pond weeds, sedges, grasses, smartweeds and cultivated grains. They will also consume aquatic insects, crustaceans and snails (Austin and Miller, 1995). Their preferred feeding habitat is shallow waters of marshes, ponds, meadows, and grain fields (DeGraaf and Yamasaki 2001).

Seeds of wetland plants comprise the staple of the green-winged teal diet, especially millets, smartweed, and nutgrasses. They also feed on insects, crustaceans, and mollusks. Teals generally forage in flooded or dry grain fields and woodlands in the spring and fall, but their preferred feeding habitat is mudflats (Johnson 1995).

The wigeon is almost wholly vegetarian, eating leaves, stems and buds of pondweed, wigeon grass, and wild celery. It also eats tender shoots of grasses and occasionally snails, beetle, and crickets (DeGraaf and Yamasaki 2001).

Abundance: There is no information on gadwall numbers specifically within CACO. Estimates of the gadwall breeding population size in the traditional North American survey area have varied from 2.179 to 3.235 million since 1999 (Table 11) and are 30 percent above the 1955 – 2004 long-term average (USFWS 2005a).

There is no information on pintail numbers specifically within CACO. Estimates of the pintail breeding population size in the traditional North American survey area have varied from 1.79 to 3.3 million since 1999 (Table 11) and are 38 percent below the 1955 – 2004 long-term average (USFWS 2005a).

There is no information on green-winged teal numbers specifically within CACO. Estimates of the green-winged teal breeding population size in the eastern survey area (survey strata 51-72) have varied from 422,900 to 775,700 since 1999 (Table 11). The population estimate for 2005 was 19 percent below the 1999 – 2004 average (USFWS 2005a). Estimates of the green-winged teal breeding population size in the traditional North American survey area have varied from 2.16 to 3.19 million since 1999, and are 16 percent above the 1955 – 2004 long-term average (USFWS 2005a).

There is no information on wigeon numbers specifically within CACO. Estimates of the wigeon breeding population size in the traditional North American survey area have varied from 1.98 to 2.92 million since 1999 (Table 11), and are 15 percent below the 1955 – 2004 long-term average (USFWS 2005a).

Take: There is no information on numbers of these four species harvested specifically within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program.

For the 11-year period (1993 – 2003), 620 gadwalls were harvested in Barnstable County, averaging 56 birds per year (range 0 – 350); 180 pintails were harvested, averaging 16 birds per year (range 0 – 140) 2,850 green-winged teals were harvested, averaging 259 birds/year (range 0 – 760); and 390 wigeons were harvested in Barnstable County, averaging 35 birds/year (range 0 – 110) (Table 12).

In 2003 and 2004 hunting seasons, 80 and 0 gadwalls were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 38,479 and 24,269 gadwalls were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 2003 harvest of gadwalls for Barnstable County accounts for <0.1 percent of the flyway harvest (Table 13).

In 2003 and 2004 hunting seasons, 40 and 0 pintails were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 18,134 and 10,254 pintails were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 2003 Barnstable County harvest represents <0.1percent of the flyway harvest (Table 13).

In 2003 and 2004 hunting seasons, 2,033 and 1,156 green-winged teals were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 137,155 and 114,969 green-winged teals were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 2003 harvest of green-winged teal for Barnstable County accounts for about 0.3 percent of the flyway harvest (Table 13).

In 2003 and 2004 hunting seasons, 319 and 50 wigeons were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 39,598 and 19,374 wigeons were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 2003 wigeon harvest in Barnstable County represents approximately 0.1 percent of the flyway harvest (Table 13).

Harvest management strategy: Gadwalls are the third most harvested waterfowl species in the United States; however, less than 4 percent of the total United States harvest comes from the Atlantic Flyway (LeSchack *et al.* 1997). There is no specific AHM protocol developed for the gadwall. Thus, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for gadwalls in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for gadwalls in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway gadwalls since 1996.

Pintails have shown a substantial population decline in the past 30 years, presumably due to anthropogenic changes to the landscape on the breeding grounds (Miller and Duncan 1999). Prior to this decline, pintails were an important component of the United States harvest. In recognition of the poor status of pintails, the USFWS developed a special harvest strategy in 1997 (referred to as the "Interim Pintail Harvest Strategy") that remains in effect. In the 2002 and 2003 hunting seasons, the USFWS set pintail regulations that deviated from the provisions of the interim strategy, referred to as "season-within-a-season" regulations. For the 2004 hunting season, the USFWS formally incorporated seasons-within-a-season as a component of the pintail strategy. Runge and Boomer (2005) provided a draft interim report reviewing pintail demographic and harvest information and suggesting technical modifications to the pintail harvest strategy.

There is no specific AHM protocol developed for the pintail. However, since 1997 the USFWS has depended on their "Interim Pintail Harvest Strategy" instead of exclusively using the status of eastern mallards for setting the harvest level for pintails in the Atlantic Flyway. Under this interim strategy, the USFWS has generally based their harvest regulations on the estimated breeding population size for pintail in the traditional survey area and their projected fall flight.

Typically, green-winged teals are the second most hunted duck species in the United States after mallards; however, on average <10 percent of the total United States green-winged teal harvest comes from the Atlantic Flyway (USFWS 2005b). Although there is no early hunting season for green-winged teals in Massachusetts, six states in the Atlantic Flyway had special teal seasons in September 2003 and 2004 with total harvests of 3,186 and 2,331, respectively (USFWS 2005b). There is no specific AHM protocol developed for the green-winged teal. Thus, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for green-winged teals in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for green-winged teals in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway green-winged teals since 1996.

Less than 4 percent of the total United States wigeon harvest comes from the Atlantic Flyway (Mowbray 1999). There is no specific AHM protocol developed for the wigeon. Thus, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for wigeons in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for wigeons in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway wigeons since 1997.

Population dynamics and susceptibility to hunting pressures: From 1986 to 1996, gadwalls had the largest population increase of any other waterfowl species (LeSchack *et al.* 1997). There are several factors contributing to this increase. First, gadwalls typically nest later than other dabbling ducks, and this decreases nest-site competition and predation. Second, gadwalls prefer to nest on island habitat, which further reduces mammalian predation. Finally, increases in their breeding numbers are also

attributed to increased nesting habitat due to unusually wet conditions since 1996 (Caithamer and Dubovsky 1996).

Information is very limited on the effects of hunting on gadwalls. However, the species is the third most harvested waterfowl species in the United States. Although the gadwall populations were at record highs in the mid 1990s (Dubovsky *et al.* 1995), population numbers have declined since then (Wilkins *et al.* 2005). However, hunting pressure and associated human activity affect this bird's ability to accumulate lipid reserves (Fredrickson and Drobney 1979, Gaston 1991). This is probably a result of reduced feeding time and increased energy requirements.

The ecological effects of discontinuing the gadwall hunt on CACO are unknown; however, the harvest is typically so small or completely absent in Barnstable County that no ecological effects would be expected.

Overall, the continental pintail population has been declining since the mid 1950s when surveys were first initiated. In 2005, populations were 38 percent below their 1955—2004 long-term average (USFWS 2005a). The continental population is influenced by variations in recruitment rates, annual and winter survival rates, and harvest rates (Austin and Miller 1995). High populations are associated with abundant shallow wetlands in the Prairie Pothole Region during wet periods. Low populations are associated with prairie drought (Bellrose 1980). Consequently, sustaining a large continental population seems dependent on prairie production. However, regions of Alaska, northern Canada, and the intermountain western United States also support the population base. Continued wetland drainage and cultivation of preferred upland nest sites in grassland (Krapu 1977), intense predation on nesting hens (Sargeant *et al.* 1984), agricultural operations that destroy nests in stubble fields (Krapu 1977, Klett *et al.* 1988, Greenwood *et al.* 1995), and other agricultural effects on wetlands and upland nest sites (Turner *et al.* 1987) result in poor nest success (Greenwood *et al.* 1995) and recruitment in prairies. Runge and Boomer (2005) report that the pintail population is settling, on average, about 2.4° of latitude farther north now than it did prior to 1975. They believe that this more northern distribution has resulted in lower reproduction, a 30 to 45 percent decrease in carrying capacity and a 40 to 65 percent decrease in sustainable harvest potential.

Information on the effects of hunting on pintails is very limited. Based upon band recoveries, Runge and Boomer (2005) reported that annual survival rates from 1960 to 2002 were highly dynamic across all pintail sex and age classes. In contrast, the recovery rate estimates suggested a common pattern of decreasing recovery rates from the 1970s through the 1990s with large increases in recovery rates throughout the period of liberalization associated with the AHM program. Further, there was a consistent reduction during the restrictive seasons in 2002 and 2003.
The ecological effects of discontinuing the pintail hunt at CACO are unknown; however, the harvest is typically so small in Barnstable County that no ecological effects would be expected.

Although green-winged teal populations have been declining since the late 1990s, populations are 16 percent above the 1955—2004 long-term average (USFWS 2005a). These higher population numbers may result from a lack of breeding habitat disturbance, because most individuals breed north of major agricultural areas (Bellrose 1980; Johnson 1995). Factors that regulate green-winged teal populations are unknown. Potential factors (i.e., those factors important in other species) include predation, wetland habitat availability, weather, hunting, and food availability (Johnson *et al.* 2002).

Information on the effects of hunting on green-winged teals is very limited. On protected reserves in Louisiana, numbers of individuals on the reserve were not correlated with hunting season (Tamisier 1976). Thus, it did not appear that green-winged teal were moving to areas free of hunting pressure.

The ecological effects of discontinuing the green-winged teal hunt at CACO are unknown; however, the harvest is typically so small in Barnstable County that no ecological effects would be expected.

Wigeon populations have been declining since the late 1990s and are below the 1955—2004 long-term average (Wilkins *et al.* 2005). Weather and land use patterns and their effects on nest site availability are the major factors affecting wigeon populations (Mowbray 1999). Additionally, long-term climate change and associated wetlands loss in the Canadian Prairie-Parklands also have significant effects on duck abundance (Bethke and Nudds 1995).

Information on the effects of hunting on wigeons is very limited. Hunting pressure and associated human activities affect wigeon feeding patterns during fall migration and winters. During fall hunting season, birds feed largely at night and leave the fields and marshes at daybreak for sheltered areas on larger bodies of water. In southwestern British Columbia during fall and winter hunting seasons, wigeons feeding during the day prefer large open agricultural fields with standing water to smaller fields with adjacent vegetative cover (Hirst and Easthope 1981).

The ecological effects of discontinuing the wigeon hunt at CACO are unknown; however the harvest is typically so small or completely absent in Barnstable County that no ecological effects would be expected.

Mallard

Range: Mallards are the most widely dispersed duck in the northern hemisphere. In New England the mallard is a common resident and migrant. They are found throughout the region during the breeding season and primarily in Massachusetts, Rhode Island, Connecticut, southern Vermont, southern New Hampshire, and southern of Maine during the winter months (DeGraaf and Yamasaki 2001).

Habitat: During the winter months, mallards are found mainly inland on ponds and rivers with open water and less commonly in coastal marshes (DeGraaf and Yamasaki 2001).

Food Habits: Mallards feed primarily on the seeds of sedges, grasses and smartweed, but they will also eat leaves, stems, and seeds of other marsh plants; waste grain; snails; insects; tadpoles; fishes; and fish eggs (DeGraaf and Yamasaki 2001).

Conservation: The mallard is the most common and widely distributed duck in North America and is ubiquitous throughout southern New England. The introduction of feral mallards has resulted in much hybridization with black ducks and various domestic waterfowl, particularly Muscovy (*Cairina moschata*) and Peking (*Anas platyrhynchos*) ducks (Veit and Petersen 1993).

Abundance: There is no information on mallard numbers specifically within CACO. However, mallards in Massachusetts are considered part of the eastern mallard population that is defined as those breeding in southern Ontario and Québec and in the northeastern United States Estimates of the eastern mallard population size in the eastern survey area (survey strata 51-72) have varied from 411,700 to 648,100 since 1999, with the majority of the population accounted for in the northeastern United States (Table 11). The population estimate for 2005 was 25 percent below the 1999 – 2004 average (USFWS 2005a). Estimates of the mallard breeding population size in the traditional North American survey area have varied from 6.75 to 10.81 million since 1999, and are 10 percent below the 1955 – 2004 long-term average (USFWS 2005a).

Take: There is no information on numbers of mallard harvested specifically within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the

11-year period (1993 – 2003), 9,100 mallards were harvested in Barnstable County, averaging 827 birds/year (range 120 – 1,590) (Table 12).

During the 2003 and 2004 hunting seasons, 7,375 and 9,245 mallards were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 427,301 and 422,091 mallards were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 2003 take in Barnstable County represents 0.03 percent of the flyway harvest for that year.

Harvest management strategy: The biology of eastern mallards appears to differ from that of mid-continent mallards (Johnson *et al.* 2002). The eastern breeding population, although much smaller than the mid-continent population, appears to be more productive and has been growing since the mid-1960s. Because of these differences and the high degree of spatial separation of the mid-continent and eastern mallard populations during the hunting season, the USFWS implemented separate AHM protocols for the Atlantic Flyway regulations for mallards beginning in 2000-2001.

For purposes of AHM, the estimates of eastern mallard population size differ from those reported in the USFWS annual waterfowl trend and status reports (USFWS 2005a). This is because the annual survey includes composite estimates based on more fixed-wing strata in eastern Canada and helicopter surveys conducted by the Canadian Wildlife Service (CWS). For the AHM, the eastern mallard population has varied from 856,000 to 1.1 million since 1990.

Based largely upon these estimated population sizes as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for mallards in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway mallards since 1996. Between 1996 and 2004, the estimated harvest rate ranged from 0.13 to 0.16 (USFWS 2005c).

Mallard population dynamics and susceptibility to hunting pressures: Mallards are highly adaptable, migratory ducks with a high reproductive potential. Females breed at one year of age and lay 9 to 12 eggs. This species is the most heavily hunted waterfowl species in North America. The effects of harvest on mallards have been studied in detail since the 1960s. Early work by several researchers (Geis 1963, 1972a, 1972b; Martinson *et al.* 1968; Geis and Crissey 1969) suggested that hunting represented additive[4] mortality to waterfowl. In contrast, an analysis of nearly 700,000 band recoveries from mallards by Anderson and Burnham (1976) concluded that hunting mortality was compensatory at least up to a threshold. Rogers *et al.* (1979) also concluded that hunting represented compensatory mortality from examining mallard survival rates. Nichols *et al.* (1984) summarized several other studies and concluded that the bulk of evidence for mallards supported the compensatory hypothesis, especially for males. In contrast, Caswell *et al.* (1985) determined that the survival rates of adult mallards increased during years of restrictive harvests compared to liberal harvests. Additional studies (Nichols and Hines 1983, Burham and Anderson 1984, Trost 1987) have not produced consistent results on the effects of hunting. Smith and Reynolds (1992) thoroughly rejected the influence of compensatory mortality in mallard populations. Thus, many questions remain about the effects of hunting on annual survival rates of mallards. In the 1995-1996 hunting season, the AHM framework was implemented by the USFWS for setting the waterfowl harvests levels. This approach has provided managers with a structural testing process for developing a quantitative link between waterfowl population data and hunting regulations. By 2001, the AHM process has consistently selected the model for additive mortality and strong density dependence, thereby suggesting that hunting mortality is additive to natural (non-hunting) mortality (USFWS 2005c).

[4] Hunting mortality is considered to be additive when natural mortality is not reduced in assication with hunting mortality. Essentially the two types of mortality are additive for total mortality of that species.

The ecological effects of discontinuing the mallard hunt at CACO are unknown. If hunting mortality is additive, this suggests that more restrictive hunting would result in larger mallard populations. However, many factors affect annual mortality, especially habitat conditions. The effects of population size on non-hunting mortality are unknown. If it is density dependent, the mortality rate may increase with population size. Mallard populations may also experience density-dependent natality. Kaminski and Gluesing (1987) reported that the mallard recruitment rate was correlated negatively with the population size in May. Recruitment rate was also correlated positively to mean numbers of May and July ponds, suggesting that the habitat conditions in breeding areas were more important to mallard recruitment than winter habitat conditions. Baldassarre and Bolen (1994) conclude that hunting does not appear to have reduced populations of mallards "most of the time, for most places, and with most populations." However, they believe hunting may have reduced mallard populations "at some times, and in some places and with some populations." They conclude that more research is needed and that the question is so complex that biologists may never be able to arrive at a highly refined answer to the effects of hunting.

Wood Duck

Range: The breeding range of the wood duck in eastern North America encompasses east-central Saskatchewan, east to Prince Edward Island and Nova Scotia, and south to central and southeast Texas and the Gulf Coast. Wood ducks winter primarily in the southern part of their breeding range. They are fairly common and are a widespread breeder and migrant in the New England region (DeGraaf and Yamasaki 2001).

Habitat: The wood duck inhabits woodlands near shallow, quiet inland lakes, ponds, streams, marshes, beaver impoundments, forested wetlands, and river bottomlands where nest sites are available and there is an abundant plant and invertebrate food sources. They also use scrub-shrub wetlands with woody shrubs (buttonbush, willow, alder) and an overhead cover of downed trees (Hepp and Hair 1977). Stable water levels are important for successful brood rearing; stream channels may provide travel lanes for ducklings moving among wetlands (Hepp and Bellrose 1995). Wood ducks are probably not abundant on CACO during the waterfowl hunting season due to the lack of suitable habitat in areas open to hunting. Wood ducks generally do not use estuarine habitats and would likely be restricted to freshwater streams and small ponds.

Food Habits: Wood ducks feed primarily on aquatic and terrestrial insects, fleshy fruits, acorns, hickory nuts, and waste grains. Often, lack of wetland foods will drive wood ducks into uplands, groves, orchards, or fields, where they seek acorns, nuts and grains (Bellrose and Holm 1994).

Abundance: Wood duck populations are not monitored using aerial surveys, and there are few estimates of wood duck populations (Heusmann and Sauer 2000). Trends in wood duck populations are monitored by the North American BBS (USFWS 2005a). Wood ducks are encountered with low frequency along BBS routes, limiting the amount and quality of available information for analysis (Sauer and Droege 1990). However, the BBS provides the only long-term indices of this species' regional populations. Trend analysis suggests that wood duck numbers in the Atlantic Flyway increased 4.8 percent annually over the long-term, with a 2.4 percent annual increase over the intermediate-term (1985 – 2004).

Take: Because wood ducks are not abundant on CACO, they are not specifically pursued and those taken would likely be incidental to other hunting efforts. Estimates of annual harvests for Barnstable County from the USFWS HIP program indicate a total of 1,220 wood ducks were harvested in Barnstable County, averaging 111 birds per year (range 0 – 620) for the 11-year period (1993 – 2003) (Table 12).

In the 2003 and 2004 hunting seasons, 2,711 and 3,165 wood ducks were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway,

338,004 and 265,560 wood ducks were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The average take in Barnstable County represents about 4 percent of the statewide harvest and only 0.04 percent of the flyway harvest.

Harvest management strategy: After mallards, wood ducks are the second most hunted duck species in the Atlantic Flyway. Approximately 25 percent of the total United States wood duck harvest comes from the Atlantic Flyway (USFWS 2005b). There is no specific AHM protocol developed for the wood duck. Thus, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for wood ducks in the Atlantic Flyway (Heusmann and McDonald 2002). Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for wood ducks in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway wood ducks since 1997.

*Wood duck population dynamics and susceptibility to hunting pressur*es: Hunting was the most important factor limiting wood duck populations from the late 1890s up to 1918, and recovery took almost 70 years (Bellrose and Holm 1994). Low availability of nest sites may limit production and population growth (Nichols and Johnson 1990, Soulliere 1990). Several studies indicated that wood duck numbers are higher after addition of nest boxes (Nichols and Johnson 1990). Where food resources are good and nest sites inadequate, nest boxes might be used to increase local populations. Predation may limit production locally (Bellrose 1976). Further, increased productivity from increased nest success in predator-resistant nest boxes often results in increased population density leading to intraspecific competition that intermittently reduces local populations (Bellrose and Holm 1994).

Populations seem to be responsive to changes in hunting mortality. Increased harvest rates resulted in lower estimated annual survival (Sauer *et al.* 1990, Trost 1990, and Johnson *et al.* 1986). Heusmann and McDonald (2002) analyzed wood duck population and harvest data from the Atlantic and Mississippi flyways. They concluded that total wood duck harvests increased in both flyways during the liberal 60-day hunting seasons. Further, they evaluated the BBS and other breeding surveys and concluded that the long-term (1966 – 2000) and short-term (1980 – 2000) data indicated maintenance or growth of wood duck populations in Atlantic and Pacific flyways. However, they suggested the liberal seasons from 1997-2002 may have resulted in "population leveling" or even a reversal of the population trend.

The ecological effects of discontinuing the wood duck hunt at CACO are unknown; however, the harvest is typically so small in Barnstable County relative to state-wide harvest totals that no ecological effects would be expected.

Waterfowl—Diving Ducks and Coots

***American Coot** (Fulica Americana)*

Range: In New England, coots breed along the southern Maine coast, the northern Champlain Lowlands in Vermont (Kibbe 1985), and in northeastern Massachusetts (Veit and Petersen 1993). Coots are considered a rare and local breeder in New England and occasionally an abundant fall migrant and uncommon winter resident in southern New England (DeGraaf and Rappole 1995).

Habitat: Coots inhabit marshes, ponds, lakes, reservoirs, sewage lagoons, sloughs, wet meadows and marshy borders of creeks and rivers. They typically require shallow, freshwater wetlands with water about 3-feet deep and emergent vegetation interspersed with areas of open water (Fredrickson *et al.* 1977).

Food Habits: Underwater plants are staples for coots as well as algae, grass shoots, grains, and aquatic insects, but they will also take fish, tadpoles, worms, and crustaceans in shallow water (DeGraaf and Yamasaki 2001).

Abundance: Continental numbers (1999) are estimated at around 3 million individuals in the major breeding strata of the United States and Canada, based on aerial surveys (Brisbin *et al.* 2002). This estimate is similar to that projected by the 1999 BBS with estimates of just fewer than 3 million for all areas included in the BBS (Sauer *et al.* 1997). MWIs for the United States and Mexico, which tend to underestimate numbers by at least 1.6 percent (Boyd *et al.* 1982), indicate about 2.5 to 3.0 million wintering coots. States where annual winter densities average >100,000 coots include California, Florida, Louisiana, and Texas, as well as Sonora, Mexico (Arnold 1994).

BBS data indicate significant increases in the Midwest between 1966 and 1999 (7 – 13%), and in the entire United States (6.6%). Populations for the survey-wide area of the United States and Canada increased slightly (1.2%), but not significantly (Sauer *et al.* 1997).

Take: Estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 5-year period (1999 – 2003), a total of 270 coots were harvested in Barnstable County, averaging 54 birds per year (range 0 – 180) (Table 12).

In the 2003 and 2004 hunting seasons, <50 and 100 coots were harvested statewide in Massachusetts by 100 and <50 hunters, respectively (USFWS 2005a). For the Atlantic Flyway, 12,800 and 13,100 coots were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005a). Generally the harvest in Barnstable County, based on the above figures, only accounts for <0.4 percent of the flyway harvest.

Harvest management strategy: Annual coot harvests in the United States vary greatly (e.g., 88,000 in 2003 and 181,300 in 2004). During these 2 years, 7 to 14 percent of the United States harvest came from the Atlantic Flyway (USFWS 2005a). There is no specific AHM protocol developed for the coot.

Coot population dynamics and susceptibility to hunting pressures: There is little information on the population dynamics of coots (Brisbin *et al.* 2002). The major factor limiting coot populations appears to be availability of habitat as demonstrated by declines in reproductive output and abundance during drought conditions. In wet years, increased availability of wetlands, coupled with stable water levels through brood-rearing, results in increased breeding densities, improved breeding success, and greater numbers of coots. There is no information on the susceptibility of coots to modern recreational hunting.

Bufflehead (*Bucephala albeola*) ***and Common Goldeneye*** (*B. clangula*)

Range: During the winter months bufflehead and goldeneye are abundant migrants and common residents in eastern Massachusetts, Rhode Island, and southern Connecticut and also along the coasts of Maine and New Hampshire (DeGraaf and Yamasaki 2001).

Habitat: Both species inhabit saltwater habitats consisting of sheltered coves, harbors, bays, and estuaries. Their inland habitat encompasses rivers, ponds, lakes and reservoirs (Gauthier 1993).

Food Habits: Aquatic invertebrates such as crustaceans and mollusks account for 90 percent of the bufflehead and goldeneye diet. This is supplemented with fish and seeds of pond weeds, widgeon grass, and bulrush. Both species prefer feeding in shallow (4 to 15 feet deep) water over tidal flats and in large open bodies of water (DeGraaf and Yamasaki 2001).

Conservation: The winter populations of the bufflehead have increased greatly over the past 50 years (Veit and Petersen 1993). It is one of the few species of ducks whose numbers have increased markedly since the 1950s (Gauthier 1993).

Abundance: There is no information on bufflehead numbers specifically within CACO. However, estimates of bufflehead numbers for the eastern survey area (survey strata 51-72 as discussed in USFWS 2005a) varied from 43,800 to 95,000 between 1999 to 2004 (Table 11) and were 27 percent below the 1996 – 2003 long-term average (USFWS 2004).

There is no information on goldeneye numbers specifically within CACO. Estimates of the goldeneye (Barrow's [*Bucephala islandica*] and common) breeding population size in the eastern survey area (survey strata 51-72) have varied from 714,700 to 1.12 million since 1999 (Table 11), and are 21 percent below the 1955 – 2004 long-term average (USFWS 2005a).

Take: There is no information on the numbers of buffleheads harvested specifically within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 13,770 buffleheads were harvested in Barnstable County, averaging 1,252 birds/year (Table 12).

In 2003 and 2004 hunting seasons, 837 and 2,210 buffleheads were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 54,571 and 52,265 buffleheads were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 2003 harvest in Barnstable County represents 0.7 percent of the flyway harvest (Table 13).

There is no information on the numbers of goldeneyes harvested specifically within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 500 goldeneyes were harvested in Barnstable County, averaging 45 birds/year (range 0 – 310) (Table 12).

In 2003 and 2004 hunting seasons, 239 and 452 goldeneyes were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 13,439 and 13,036 goldeneyes were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 2003 harvest in Barnstable County represents 0.3 percent of the flyway harvest (Table 13).

Harvest management strategy: Typically, about 30 percent of the total United States bufflehead harvest and about 15 percent of the total United States goldeneye harvest comes from the Atlantic Flyway (USFWS 2005b). There is no specific AHM protocol developed for buffleheads and goldeneyes. Thus, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for each species in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for buffleheads and goldeneyes in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway buffleheads and goldeneyes since 1996.

Bufflehead and goldeneye population dynamics and susceptibility to hunting pressures: Erskine (1972) suggested that nest sites (either because of the absence of trees or lack of suitable cavities) may limit bufflehead distribution and probably density in many parts of the species' range. Eadie *et al.* (1995) reported that the most important factor limiting goldeneye populations is probably nest-cavity availability, particularly in recently or historically logged regions.

The role of hunting in population regulation of both species is unknown, largely due to poor population estimates. Eadie *et al.* (1995) concluded that the relatively stable goldeneye population numbers from the 1950s to the early 1990s, in combination with the decline in numbers harvested over that same period, indicated that the effect of hunting on goldeneyes may be small. A comparable scenario may apply to buffleheads.

The ecological effects of discontinuing the goldeneye hunt on CACO are unknown; however, the average annual harvest is typically so small (x = 45), or completely absent in many years, in Barnstable County that no ecological effects would be expected. For buffleheads, the annual harvest is only 0.7 percent of the flyway harvest and as such discontinuing the hunt would have no ecological effects.

Canvasback (*Aythya valisineria*) and ***Ring-necked duck*** (*A. collaris*)

Range: The canvasback winter range encompasses the Pacific Coast from the central Aleutians and southern coastal Alaska, south to Baja California, from Arizona and New Mexico to the Great Lakes, and on the Atlantic Coast from New England south to the Gulf Coast and into Mexico (DeGraaf and Yamasaki 2001). In New England, they are present during the winter months in Massachusetts along Cape Cod, the Islands, and Cambridge (Veit and Petersen 1993).

In New England, the ring-necked duck breeds throughout Maine, western to northern and central New Hampshire, and the Northeast Highlands in Vermont. It winters along the coast of Connecticut, Rhode Island, and mid Cape Cod and the islands (DeGraaf and Yamasaki 2001).

Habitat: In the winter months canvasbacks prefer estuaries, sheltered bays, and inland lakes that contain wild celery and pondweeds and that are free from ice. They also require stretches of open water for taking off and landing (DeGraaf and Yamasaki 2001). Ring-necked duck use similar habitats, such as fresh or brackish marshes, lakes, rivers, and estuaries; they seldom use strictly saline water (DeGraaf and Yamasaki 2001).

Food Habits: The canvasback and ring-necked duck diets consists of seeds, vegetative parts of aquatic plants such as wild celery and pondweeds, aquatic invertebrates, small fishes, and some small mollusks (Noyes and Jarvis 1985, Bellrose 1980).

Conservation: Overall, canvasback populations have declined in the United States, possibly due to loss of breeding habitat as a result of drainage and drought (Hohman *et al.* 1990). However, in Massachusetts, the population has varied greatly over the years. Although they were scarce before the 1900s, the canvasback population on Cape Cod and surrounding islands rebounded somewhat between 1910 and 1950 (Veit and Petersen 1993).

Abundance: Estimates of the canvasback breeding population size in the traditional North American survey area have varied from 486,600 to 716,000 since 1999 (Table 11) and are 8 percent below the 1955-2004 long-term average (USFWS 2005a).

Estimates of the ring-necked duck breeding population size in the eastern survey area (survey strata 51-72) have varied from 834,900 to 1.34 million since 1999 (Table 11) and are 14 percent below the 1955 – 2004 long-term average (USFWS 2005a).

Take: Estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), a total of 140 canvasbacks were harvested in Barnstable County; however, all of these canvasbacks were harvested in one year (1999) (Table 12).

In 2003 and 2004 hunting seasons, no canvasbacks were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 4,738 and 9,772 canvasbacks were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b).

There is no information on numbers of ring-necked ducks harvested specifically within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 390 ring-necked ducks were harvested in Barnstable County, averaging 35 birds/year (range 0 – 220) (Table 12).

During the 2003 and 2004 hunting seasons, 199 and 301 ring-necked ducks were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 112,806 and 74,349 ring-necked ducks were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b).

Harvest management strategy: Since 1955, there has been considerable fluctuation in continental breeding populations of canvasbacks. Much of this variation is attributed to changes in moisture levels and perhaps hunting regulations (Mowbray 2002). In response to fluctuations in population size, harvest limits have varied considerably during the past three decades, with total annual harvest in the United States ranging from a high of 219,242 (1966) to a low of 1,003 (1988), with complete bans on hunting during some years in some regions. In 2003 and 2004, 14 percent and 22 percent, respectively, of the total United States canvasback harvest came from the Atlantic Flyway (USFWS 2005b).

Typically, ring-necked ducks are the most hunted diving duck species in the United States; up to 25 percent of the total United States ring-necked duck harvest comes from the Atlantic Flyway (USFWS 2005b).

There is no specific AHM protocol developed for either species. Thus, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for canvasback and ring-necked ducks in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for canvasback and ring-necked ducks in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway for both species since 1997.

Canvasback and ring-necked ducks population dynamics and susceptibility to hunting pressures: On a continental basis, land-use patterns and weather are key factors regulating canvasback populations. Nest-site availability may also limit breeding opportunities in some areas (Mowbray 2002). Increased availability of wetlands results in increased breeding densities, improved nest success, and a greater number of canvasbacks is noted during wet years (Leitch and Kaminski 1985; Anderson *et al.* 2001). Patterson (1999) suggested that canvasback populations are density dependent; thus, they are less productive when their numbers are high. Stoudt (1971) reported a decline in number of clutches/pairs with higher canvasback density in Saskatchewan. In contrast, studies at Manitoba reported that density-dependent factors do not affect the size of canvasback populations (Serie *et al.* 1992; Arnold *et al.* 1995; Leonard *et al.* 1996; Anderson *et al.* 1997, 2001). Temporal fluctuations in Minnedosa populations appeared to result from differences in natality and/or mortality.

Hunting is a major mortality factor for canvasbacks (Mowbray 2002). Canvasbacks have lower survival during years of liberal harvest, suggesting harvest is additive or that kill exceeds the threshold for compensation (Anderson *et al.* 1997, 2001). Illegal hunting was a major source of mortality during fall migration on the upper Mississippi River (Korschgen *et al.* 1996) and the single largest source of mortality in hatch-year females.

The ecological effects of discontinuing the canvasback hunt on CACO are unknown; however, the harvest is typically absent or so small in Barnstable County that no ecological effects would be expected.

There is little information on ring-necked duck population dynamics, but Hohman and Eberhardt (1998) suggested that human-related activities may be the primary sources of population regulation in the United States. Further, the relationship between hunting and non-hunting mortality is poorly understood because of limited banding information and low reporting rates. Survival rates of adult male and female ring-necked ducks banded in the southern Mississippi Flyway were negatively correlated with recovery rates of birds banded in north-central North America, but there was no correlation between survival rates and recovery rates of banded birds in other regions (Conroy and Eberhardt 1983). Prevalence of embedded shot in spring-migrating diving ducks killed by oil pollution in southeast Minnesota in March through April of 1963 was 2 to 3 times greater in ring-necked ducks than in lesser scaup (*Aythya affinis*) (Jessen *et al.* 1968). Harvest rates estimated on basis of prevalence of embedded shot were 30 to 35 percent for immature females and 60 to 70 percent for immature males (Jessen *et al.* 1968). In spring 1985 and 1986 5 of 16 fluoroscoped ring-necked ducks had embedded shot at Keokuk Pool, Mississippi River, (Havera *et al.*, 1992). Spring trapping of muskrats was also an important source of mortality for ring-necked ducks in Maine (Mendall 1958), presumably due to capture in traps.

The ecological effects of discontinuing the ring-necked duck hunt at CACO are unknown; however, the average annual harvest is typically so small (x = 24), or completely absent in many years, in Barnstable County that no ecological effects would be expected.

Ruddy Duck (*Oxyura jamaicensis*)

Range: The winter range of the ruddy duck encompasses North America from British Columbia along the west coast, and to a limited extent inland through the western United States and south to Mexico and Central America. They are present along the Atlantic Coast from Massachusetts to Florida, the West Indies, and the Gulf Coast (Johnsgard 1975).

Habitat: The wintering grounds of the ruddy duck are primarily brackish to slightly brackish estuaries or coastal lagoons of shallow depth. They often contain an abundance of submerged plants, small mollusks and crustaceans (Johnsgard 1975).

Food Habits: A majority of the diet of these birds consists of plant material, with pondweeds and sedges being the most common. A variety of insects are also consumed, such as the larvae of midges and horseflies (Johnsgard 1975). For a diving duck mollusks comprise an unusually small portion of their diet. Although they regularly dive for food in water 2 to 10 feet in depth, they will also feed on the surface or submerge their heads to reach plants slightly below the surface. This species more commonly feeds in smaller bodies of water than scaups or canvasbacks typically use (Bellrose 1980).

Abundance: There is no information on ruddy duck numbers specifically within CACO, and estimates of the breeding population size in the traditional survey area are not reported in the 2005 Waterfowl Population Status report (USFWS 2005a). Brua (2001) reports that an estimate of continental and prairie-pothole-region breeding populations appear to be stable to increasing, although highly variable between years. The majority (87%) of breeding population is located within the Prairie Pothole Region of North America (Batt *et al.* 1989), with roughly a 50/50 split between Canadian and United States prairies. Long-term (1955 – 2000) population average estimated from May breeding waterfowl population surveys is 409,783, with a high of 947,872 in 1982 and a low of 170,712 in 1958 (USFWS and Canada Wildlife Service unpublished in Brua 2001). From 1955 to 1979, the population of ruddy ducks wintering in Chesapeake Bay declined significantly, with a long-term average of 29,552 birds. There is little information about wintering populations.

Take: There is no information on the numbers of ruddy ducks harvested specifically within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 80 ruddy ducks were harvested in Barnstable County, averaging 7 birds per year (range 0 – 80) (Table 12).

In 2003 and 2004 hunting seasons, no ruddy ducks were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 2,474 and 4,307 ruddy ducks were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b).

Harvest management strategy: Typically, 12 to 24 percent of the total United States ruddy duck harvest comes from the Atlantic Flyway (USFWS, 2005b). The ruddy duck is generally not considered to be a desirable game bird by many hunters. There is no specific AHM protocol developed for the ruddy duck. Thus, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for ruddy ducks in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for ruddy ducks in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway ruddy ducks since 1997.

Ruddy duck population dynamics and susceptibility to hunting pressures: There is little information on ruddy duck population dynamics. The size of breeding population correlates positively with wetland abundance on breeding grounds (Batt *et al.* 1989). Current hunting pressure is low relative to other waterfowl. The role of hunting in population regulation is unknown. Further, the ecological effects of discontinuing the ruddy duck hunt on CACO are unknown.

Lesser Scaup and Greater Scaup (*Aythya marila*)

Range: The lesser scaup winters along the west coast from British Columbia into Mexico and Central America, along the southern United States and the Gulf Coast, into the Prairie Pothole Region and along the Atlantic Coast to southeastern Massachusetts (Austin *et al.* 1998). In Massachusetts, it is a common to abundant migrant and winter resident (Veit and Petersen 1993). Greater scaup winter on the Great Lakes, the Finger Lakes in New York, and the St. Lawrence River during mild winters and where heated water discharge occurs, as well as along the Atlantic Coast from southern Newfoundland and Nova Scotia south to northern Florida (Kessel *et al.* 2002).

Habitat: During the winter, both species are found along shores of lakes reservoirs and fresh to brackish coastal bays and estuaries (Chasbreck *et al.* 1989). During severe winters, they may move to more saline waters often close to freshwater sources. Wintering greater scaup are found almost exclusively in marine habitats, usually on extensive, shallow, salt-water bays and brackish river inlets that provide protection from cold winds. Large freshwater lakes that remain ice-free are used by wintering greater scaup in the eastern United States.

Food Habits: Both scaup species are expert divers and can swim rapidly underwater. They feed mainly in depths of 5 to 6 feet. Their diet is almost equally divided between plant and animal matter. They feed on the seeds of pondweeds, widgeon grass, wild rice, sedges, and bulrushes. They also consume snails and other mollusks, small shrimp like crustaceans, and aquatic insects. They feed along the coast and in the open-water zone of shallow wetlands and lakes (Terres 1980).

Abundance: Lesser scaup are the most abundant diving duck in North America. This species cannot be distinguished from greater scaups from aerial surveys, thus the two species are combined in the May

Breeding Waterfowl Population Survey (USFWS 2005a) and flyway midwinter waterfowl estimates (USFWS 2005b).

Estimates of the scaup breeding population size in the traditional North American survey area have varied from 4.0 to 4.4 million since 1999 (Table 11), and are 35 percent below the 1955-2004 long-term average (USFWS 2005a).

Take: Estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 600 lesser scaups were harvested in Barnstable County, averaging 54 birds per year (range 0 – 310) (Table 12). Unlike population estimates of breeding and wintering birds, species-specific harvest estimates are derived from hunter-reported kills and from wings analyzed from the Waterfowl Parts Survey (USFWS 2005b) (Table 13).

In the 2003 and 2004 hunting seasons, no lesser scaups were harvested in Barnstable County or statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 60,939 and 54,891 lesser scaups were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b).

In 2003 and 2004 hunting seasons, 80 and 0 greater scaup were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 17,344 and 16,837 greater scaup were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b) (Table 13). The 2003 harvest represents 0.2 percent of the Atlantic Flyway 2003 harvest (Table 13).

Harvest management strategy: Lesser scaup are the second most harvested diving duck species in the United States, and about 20 percent of the total United States harvest comes from the Atlantic Flyway (USFWS 2005b). Annual United States greater scaup harvests declined significantly from 1961 through 1997 (Allen *et al.* 1999). The largest harvests generally occurred during special scaup seasons (1966 – 1988), with a high of 132,475 birds in 1977. In 2003 and 2004, 36 percent and 24 percent of harvested greater scaups came from the Atlantic Flyway (USFWS 2005b), down from 51 percent from the 1961-1989 period.

With the continental decline of scaup populations since the mid 1980s, the USFWS implemented restrictive hunting seasons for scaups between 1988 and 1994 (Austin *et al.* 1998). Boomer and Johnson (2005) reported that the productive capacity and the harvest potential of the scaup population decreased since the historical high scaup population levels observed prior to the mid 1980s. Further, this decline has coincided with a period of harvest liberalization associated with the AHM program. In the absence of an AHM protocol for scaup, Boomer and Johnson (2005) concluded that there are no objective criteria that prescribe when scaup regulations should be modified in response to changes in population status or harvest potential. They recommend that a continental-wide scaup harvest strategy be developed that accounts for system changes and key sources of uncertainty relative to scaup population dynamics and responses to exploitation.

Considering there is no specific AHM protocol developed for scaup, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for scaup in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards, as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for scaup in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway scaup since 1997.

Scaup population dynamics and susceptibility to hunting pressures: Information is very limited on the effects of hunting on scaups. However, the species is typically the second most harvested diving duck

species in the United States. Boomer and Johnson (2005) reported that the productive capacity and the harvest potential of the scaup population decreased since the historical high scaup population levels observed prior to the mid 1980s. Additionally, their analyses indicated that the harvest levels in 1997 and 1998 may not have been sustainable, and that contemporary scaup harvest levels may be approaching values close to the maximum sustained yield; yet, the breeding population estimate continues to decrease. Further, they suggest that the harvest of scaup has increased post AHM with increasing levels of hunter effort.

However, the harvest is typically so small or completely absent in Barnstable County; no ecological effects of discontinuing the scaup hunt would be expected.

Waterfowl—Sea Ducks

Common Eider (*Somateria mollissima*)

Range: Eiders winter in coastal areas of the Pacific from Alaska south to Washington and along the Atlantic coast from Newfoundland south to the Mid-Atlantic States, with casual occurrences inland (Johnsgard 1975). In Massachusetts they are very abundant migrants and winter residents off Cape Cod and the Islands. They are also common to abundant along the rest of the New England Coast (Veit and Petersen 1993).

Habitat: Common eiders are mainly marine birds, remaining well off shore during the winter season (Johnsgard 1975).

Food habits: Most of the diet of the eider consists of animal matter, such as bivalves (blue mussels [*Mytilus edulis*], clams), gastropods (whelks), starfish, sea urchins, and crustaceans. However, the blue mussel, which grows in dense beds on rocky or pebbly substrates, is their staple food source. They prefer feeding in fairly shallow waters around submerged ledges and reefs of rocky shores (Terres 1980). They are expert divers and can go down to depths of 35 to 60 feet (Bent 1925).

Abundance: Bourget *et al.* (1986) assembled the best available information from Newfoundland southward to estimate wintering populations of approximately 155,000 eiders in the Gulf of St. Lawrence, 157,000 in Newfoundland and the Maritime Provinces, and 181,000 from Maine to Massachusetts. The total winter population of common eiders for North America is probably 600,000 to 750,000 individuals, of which approximately 500,000 to 600,000 are breeding adults.

Take: Estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 32,930 common eiders were harvested in Barnstable County, averaging 2,994 birds/ per year (range 0 – 11,590) (Table 12).

In the 2003 and 2004 hunting seasons, 3,097 and 5,717 common eiders were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 34,638 and 21,585 common eiders were harvested during the 2003 and 2004 hunting seasons.

Harvest management strategy: Typically, the total United States common eider harvest comes from the Atlantic Flyway (USFWS 2005b). The species is important subsistence game for humans in northern regions, especially in the spring (Litvinenko 1993). The effect of this harvest of adults in spring may be increasingly significant in some areas with the advent of better mobility and firearms (Cooch 1986). In North America, interest in the sport hunting of sea ducks has increased dramatically, perhaps due to declining opportunities for other "sport" ducks and the promotion of sea ducks as an abundant waterfowl group with liberal hunting regulations (Gillelan 1988). Harvests of common eiders have been increasing

dramatically in eastern North America in recent years, and may exceed sustainable levels (Goudie *et al.* 1994, Bédard 1995). Newfoundland and Labrador support a traditional hunt that has extended from late fall to March 10, with high bag limits and little enforcement.

There is no specific AHM protocol developed for common eiders. Thus, the USFWS depends exclusively on the status of eastern mallards to set the harvest level for common eiders in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for common eiders in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway common eiders since 1997.

Common eider population dynamics and susceptibility to hunting pressures: Hunting is an important source of mortality. Eiders are a key component of native subsistence hunts in the north and coastal sport hunting farther south. In the past, some populations were almost totally extirpated due to over-hunting by humans (Townsend 1914, Doughty 1979, Goudie *et al.* 1994). Goudie (1989) and Goudie *et al.* (1994) concluded that traditional harvests in Newfoundland and Labrador are excessive, based on available population information. Krementz *et al.* (1996) reported high survival rates for eiders in eastern North America using recovery data from 1930 to 1994. Commercial netting in littoral zone for species such as lumpfish (*Cyclopterus lumpus*; coastal Newfoundland) can overlap considerably with near-shore haunts of eiders; large numbers are caught and drowned (Palmer 1976b). The ecological effects of discontinuing the common eider duck hunt on CACO are unknown.

Long-tailed Duck (*Clangula hyemalis*)

Range: Long-tailed ducks in New England are abundant migrants, especially off Nantucket Island, and are winter residents, although rarely inland. Populations are scarce during the summer months, mostly occurring in Massachusetts, on Cape Cod, and the Islands (Veit and Petersen 1993).

Habitat: During the winter, long-tailed ducks inhabit open water, coastal bays, salt estuarine bays and some brackish estuarine bays (Johnsgard 1975). They also occupy the Great Lakes in greater numbers than any other sea duck (Bellrose 1980).

Food Habits: The diet of the long-tailed duck consists of amphipods, shrimps, crabs, and other crustaceans. They can dive depths up to 200 feet below the surface, but tend to dive in water of moderate depths to retrieve blue mussels and other mollusks (Terres 1980).

Abundance: Robertson and Savard (2002) reviewed the breeding population status of the species. Various population estimates in Alaska and the Canadian northwest combine for a 1.4 percent overall annual increase for the 1996-2000 period (CWS Waterfowl Committee 2000). Midwinter inventories on the east coast of the United States indicate a 1.15 percent decline/year during 1976-1997.

Take: Estimates of annual harvest are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 750 long-tailed ducks were harvested in Barnstable County, averaging 68 birds per year (range 0 – 460) (Table 12).

In the 2003 and 2004 hunting seasons, 127 and 539 long-tailed ducks were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 17,627 and 20,909 long-tailed ducks were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The harvest levels in Massachusetts are a very small portion of the Flyway harvest, 0.7 to 2.6 percent (Table 13).

Harvest management strategy: Typically, 80 percent of the total United States long-tailed duck harvest comes from the Atlantic Flyway (USFWS 2005b). However, this species is not a large component of the waterfowl harvest in North America (Robertson and Savard 2002). The long-tailed duck is not considered a desirable game bird by many hunters. There is no specific AHM protocol developed for the long-tailed duck, therefore the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for long-tailed ducks in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for long-tailed ducks in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway long-tailed ducks since 1997.

Long-tailed duck population dynamics and susceptibility to hunting pressures: As with all sea ducks, population growth rates are most sensitive to changes in adult survival (Goudie *et al.* 1994); factors such as hunting or fishing by-catch that decrease adult survival probably have the greatest effect on populations. Historically, by-catch in fishing nets has been large. It is estimated that in the winter of 1951-1952, 15,539 were killed; in 1952-1953, 19,562 were killed in Lake Michigan alone (Ellarson 1956). This is possibly still an important source of mortality on some coastal wintering areas, but no data are available.

Like most sea ducks, long-tailed ducks have a limited capacity to compensate for hunting mortality, and it is likely this mortality is completely additive (Caithamer *et al.* 2000). On the east coast of North America, special seasons were established for sea ducks; while restrictions were put in place for scoters (bag of 4 ducks/day) in 1993. This was not done for long-tailed ducks, which remained at 7 ducks per day. Harvest increased under liberal regulations and stabilized under restrictive ones, indicating that changes in regulations could be an effective tool (Caithamer *et al.* 2000) in controlling harvest. The ecological effects of discontinuing the long-tailed duck hunt at CACO are unknown.

Black Scoter (*Melanitta nigra*), ***Surf Scoter*** (*M. perspicillata*), ***and White-winged Scoter*** (*M. fusca deglandi*)

Range: The wintering range of the three scoter species extends from Newfoundland along the Atlantic Coast to South Carolina and the Great Lakes (Johnsgard 1975). These three species are abundant migrants and uncommon to fairly common winter residents in New England (Veit and Petersen 1993). Their major wintering areas on the east coast are Maine, Massachusetts, and Rhode Island (Bordage and Savard 1995).

Habitat: Stewart (1962) found that scoters often inhabit the littoral zone of the ocean, usually within a mile of the shore, and occasionally in coastal bays or their salt and brackish estuaries. They also are common in areas where water depths do not exceed 25 feet and large quantities of mussels can be found (Cottam 1939, Goudie *et al.* 1994, and Grosz and Yocom 1972).

Food Habits: The majority of food (90%) consumed by scoters is animal matter, and mollusks are the main food source, with blue mussels the most common (Bellrose 1980), followed by short razor clams (*Tagelus californianus*). Plant material such as muskgrass and other algae, pondweeds, and widgeon grass comprised the remaining 10 percent (Cottam 1939).

Abundance: There is no information on black scoter numbers specifically within CACO, and estimates of the black scoter breeding population size in the traditional survey area are not reported in the 2005 Waterfowl Population Status report (USFWS 2005a). Bordage and Savard (1995) reviewed the population status of the species; however, they noted that surveys in Alaska combine all 3 scoter species (Conant and Groves 1992), as do most wintering-ground surveys (Serie 1993; Bartonek 1994). USFWS

Midwinter Surveys (1973 – 1992) provided no evidence for trends in wintering populations of scoters in the United States portions of the Atlantic Flyway. At Manomet Point, Massachusetts (west Cape Cod Bay), October counts of migrants flying along the coast showed no discernible trend from 1967 to 1976: 10,915 in 1967; 2,112 in 1968; 8,900 in 1975; and 2,524 in 1976 (Veit and Petersen 1993). Winter counts in southeast Massachusetts, however, dropped from 100,000 to 15,000 from 1960 to mid-1970s (Veit and Petersen 1993).

Take: There is no information on numbers of scoters harvested within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 220 black scoters, 720 surf scoters, and 720 white-winged scoters were harvested in Barnstable County, all in 1995 (Table 12).

In the 2003 and 2004 hunting seasons, 3,776 and 3,344 scoters (all species combined) were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 63,174 and 48,303 scoters were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b) (Table 13).

Harvest management strategy: Typically, over 80 percent of the total scoter harvest comes from the Atlantic Flyway (USFWS 2005b). Harvest numbers have increased greatly since 1961 to 1993 when approximately 18,000 were killed annually in the United States (Bartonek 1994). There is no specific AHM protocol developed for black scoters. Thus, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for black scoters in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for black scoters in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway black scoters since 1997.

Scoter population dynamics and susceptibility to hunting pressures: Population dynamics of scoter populations are poorly known. Scoters are long-lived and have low reproductive output (Goudie *et al.* 1994, Krementz *et al.* 1997). Reproductive success is highly variable, but generally low (Savard and Lamothe 1991; Morrier *et al.* 1997). Populations are highly sensitive to adult mortality, so hunting and accidental deaths due to fishing nets or oiling can have a significant effect on the population. Further, there is a large non-breeding segment in the population because this species does not breed until 2 or 3 years of age.

Common Merganser (*Mergus merganser*), ***Red-breasted Merganser*** (*M. serrator*), ***and Hooded Merganser***

Range: During the winter, the range of the common and red-breasted mergansers encompasses the Aleutian Islands and south-coastal Alaska, east across to southern Canada to Newfoundland and south to southern California, and the Gulf Coast to Central Florida (DeGraaf and Yamasaki 2001). They are found throughout southern New England and along the coast of Maine and New Hampshire (DeGraaf and Yamasaki 2001). In New England, the hooded merganser breeding range encompasses Maine, New Hampshire, Vermont, and most of Massachusetts, but they are absent from Cape Cod and the Islands (Veit and Petersen 1993). During the winter, their range includes Massachusetts, with regular presence on Cape Cod and the Islands, but they are uncommon throughout the rest of the state (Veit and Petersen 1993). Hooded mergansers also occasionally inhabit parts of New Hampshire and areas of open water in Vermont (Laughlin and Kibbe 1985).

Habitat: During the winter, common and red-breasted merganser species prefer fresh and brackish waters of lakes, rivers, ponds, and estuaries (DeGraaf and Yamasaki 2001). Hooded merganser breeding habitat

consists of freshwater forested wetlands, forested margins of rivers, streams, small lakes, ponds, reservoirs, and emergent marshes. They prefer clear freshwater habitats, especially those with sandy, gravelly, or cobbled bottoms and abundant small fish (DeGraaf and Yamasaki 2001). They tend to avoid areas of human activity and roost on exposed rocks, and logs and unvegetated sandbars (Beard 1964).

Food Habits: For each merganser species, fish is the staple of their diet, but they also supplement it with the roots and stems of aquatic plants, leeches, frogs, aquatic salamanders, worms, and aquatic insects (Johnsgard 1975, Palmer 1976b, and DeGraaf and Yamasaki 2001). During the winter they will often consume mollusks (Timken and Anderson 1969). Their preferred feeding habitat is calm shallow water (Johnsgard 1975).

Abundance: There is no information on merganser species specifically within CACO. Continental population size for common mergansers has been estimated at 641,000 birds by Bellrose (1980). Data from the USFWS and the Canadian Waterfowl Survey May Aerial Waterfowl Population Surveys during 1970-1979 suggested a combined population of roughly 1.5 million for all three merganser species found in North America; using the Audubon Christmas bird census proportion of mergansers that are common mergansers (73%, Bellrose 1980), this gives an estimate of 10.9 million birds. Winter population is estimated at 165,000 birds (USFWS 1998), which is undoubtedly an underestimate, as single concentrations of 35,000 birds have been seen in Minnesota (Janssen 1987).

In the 1970s, Bellrose (1980) recorded wintering populations for red-breasted mergansers of 38,000 in the Atlantic Flyway, 14,000 in the Mississippi Flyway, 1,100 in the Central Flyway, and 6,000 in the Pacific Flyway. From 1966 to 1989, BBS data show 4.6 percent decline in the continental population. For Canada alone, the trend is similar: overall, a 7 percent decline estimated from 1966 to 1994, with a 6.6 percent decline in the Boreal Shield, which comprises boreal regions of Newfoundland, Québec, Ontario, Manitoba, and Saskatchewan (Downes and Collins 1996). Christmas Bird Counts compared between 1959 and 1988 indicate local decreases of wintering populations in Maryland, North Carolina, and Oregon and increases in Colorado, Georgia, Indiana, Maine, Massachusetts, Nova Scotia, Ontario, Ohio, Pennsylvania, Texas, and Wisconsin.

There is no information on hooded merganser numbers specifically within CACO. Further, estimates of the hooded merganser breeding population size in the traditional survey area are not reported in the 2005 Waterfowl Population Status report (USFWS 2005a). Further, estimating population sizes is difficult because of the secretive behavior of hooded mergansers and their preference for wooded habitats (Dugger *et al.* 1994). Additionally, the May and mid-winter surveys conducted by USFWS and CWS group all merganser species together. Dugger *et al.* (1994) reviewed the population status of the species. Bellrose (1980) estimated continental populations at 76,000 individuals, but this estimate is much too low given that hunters harvest 70,000 to 100,000 birds each year (U.S. Dept. Interior 1988). Little is known about long-term population trends nationwide. In central Ontario, however, populations increased significantly from 1985 to 1989 (Dugger *et al.* 1994), and populations in Minnesota and locally in south east Missouri and western Tennessee also seem to be increasing (Dugger *et al.* 1994). These observations, plus the increased hunter harvest throughout the continent from 1961 to 1988 (USDOI 1988), suggest populations are currently stable and possibly increasing over much of the range.

Take: There is no information on numbers of common mergansers harvested specifically within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program (Table 12). Unlike population estimates of breeding and wintering birds, species-specific harvest estimates are derived from hunter reported kills and from wings analyzed from the Waterfowl Parts Survey (USFWS 2005b).

In 2003 and 2004 hunting seasons, 399 and 1,558 mergansers (excluding hooded mergansers) were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 22,824 and 19,729 mergansers were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 1998 combined harvest of common and red-breasted mergansers represents 15.2 percent of the flyway harvest.

There is no information on numbers of hooded mergansers harvested specifically within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 880 hooded mergansers were harvested in Barnstable County, averaging 80 birds per year (range 0 – 230) (Table 12).

In 2003 and 2004 hunting seasons, 598 and 352 hooded mergansers were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 29,181 and 25,692 mergansers were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 2003 Barnstable County harvest represents 0.5 percent of the flyway harvest (Table 13).

The combined harvest of the three merganser species in Barnstable County during 2003 represents 0.2 percent of the flyway harvest.

Harvest management strategy: Common and red-breasted mergansers are not considered a prized game species (Mallory and Metz 1999) and are often shot by mistake or shot but not retrieved (Wick and Jeffrey 1966). Nonetheless, around 40,000 mergansers (excluding hooded) are shot annually in the United States and about 13,000 in Canada (USFWS 2005b). In 2003 and 2004, about 50 percent of harvested mergansers came from the Atlantic Flyway (USFWS 2005b).

Although over-hunting was common at the turn of this century (Phillips 1926), hooded mergansers are also not considered a prized game species (Dugger *et al.* 1994). Nonetheless, 80,000 to 90,000 hooded mergansers are shot annually in the United States and about 8,000 in Canada (USFWS 2005b). In 2003 and 2004, about 31 percent of harvested hooded mergansers came from the Atlantic Flyway (USFWS 2005b).

Considering there is no specific AHM protocol developed for hooded mergansers, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for mergansers in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for hooded mergansers in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway hooded mergansers since 1997.

Merganser population dynamics and susceptibility to hunting pressures: The most important factor limiting common merganser populations is probably nest cavity availability, particularly in recently or historically logged regions. The role of hunting in common and red-breasted merganser population regulation appears to be small, although the exact effect is unknown because of poor population estimates. Most data indicate that populations vary regionally, but overall are presently stable or increasing (Mallory and Metz 1999).

In many areas, lack of nest cavities due to logging probably limits hooded merganser breeding in once suitable areas. Increasing local populations associated with nest box programs in Missouri, Maine, Iowa, and Oregon support this conclusion (Morse *et al.* 1969, Allen *et al.* 1990). Non-human related factors limiting populations remain largely unknown, but probably vary across the species range. Cavity densities probably play a role in population regulation, but understanding of this resource is limited.

More localized factors may include nest site competition with common goldeneyes in the north and wood ducks in the south. Inter-specifically territorial goldeneyes may also exclude mergansers from suitable habitat in some areas. Competition with fish for invertebrate resources also may play a role in more oligotrophic habitats. In the south, annual variation in river floodplain hydrology creates apparent high variability among years in habitat availability and food abundance, which may regulate densities in these systems. The current effect of hunting on populations of this species is unknown (Dugger *et al.* 1994).

The ecological effects of discontinuing hunting of the three merganser species on CACO are unknown; however, the harvest is relatively small or completely absent in Barnstable County and no ecological effects would be expected.

Waterfowl— Atlantic Brant, Canada Goose, and Snow Goose

Atlantic Brant (Branta bernicla hrota)

Range: During the winter months, brant (referring to the Atlantic flyway population) migrate to wintering grounds along the Atlantic Coast from Massachusetts to South Carolina. They are most abundant along the coast of New York and New Jersey (Bellrose 1980). In New England, they are locally abundant migrants and winter residents (Veit and Petersen 1993).

Habitat: Brant inhabit intertidal mudflats during the winter, in well-protected, shallow marine waters behind barrier beaches or sheltered estuaries, where eelgrass or other green algae are abundant. This type of habitat is prevalent along the coasts of Long Island and New Jersey, where extensive cordgrass marshes in upper intertidal areas and beds of eelgrass and sea lettuce occur (Reed, Ward *et al.* 1998).

Food Habits: Sea lettuce is the staple food source of this bird, followed by eelgrass, green algae and salt marsh grasses (Bellrose 1980). In its artic habitat the brant will also graze on algae, mosses and artic plants (Terres 1980).

Abundance: Estimates of the brant populations are made from the MWI, typically conducted in January of each year. Brant have been assessed annually during midwinter (January) aerial and ground surveys for over 50 years. However, these inventories lack precision because they are usually single counts and do not account for variations in weather or seasonal phenology (Kirby and Obrecht 1982; Sedinger *et al.* 1994).

The 2005 MWI conducted by the USFWS estimated 123, 200 brants in the Atlantic Flyway, which was 5 percent lower than the 2004 estimate (Table 11) (USFWS 2005a). However, these estimates have increased an average of 1 percent per year for the most recent 11-year period. The 2005 MWI estimate of brants in the Pacific Flyway and Mexico was 101,400, 15 percent fewer than in 2004. These estimates have decreased an average of 3 percent per year during 1996 to 2005 (USFWS 2005a).

Take: Estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 2,650 brants were harvested in Barnstable County, averaging 241 birds per year (range 0 – 530) (USFWS, 2005b) (Table 12).

In 2003 and 2004 hunting seasons, 1,600 and 300 brants were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 44,925 and 18,293 brants were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). Based on the 2003 estimates, the brant harvest in Barnstable County is approximately 0.6 percent of the Atlantic flyway harvest (Table 13).

Harvest management strategy: In North America, most brant deaths are caused by hunting, except for Eastern High-Arctic brants, which benefit from closed seasons on staging areas in Iceland and wintering areas in Ireland (Reed, Ward *et al.* 1998). Hunting mortality of brants occurs in 2 main areas: (1) along the United States Atlantic Coast from Massachusetts to North Carolina; and (2) in eastern James Bay (Québec), by Cree subsistence hunters. Brant hunting seasons were closed along the Atlantic Coast in 1972/1973-1974/1975 and 1976/1977-1980/1981. Typically, 3 states—New Jersey, New York, and Virginia—accounted for >85 percent of birds shot during 1973-1979, when comparable estimates of recreational and subsistence harvest were available. United States recreational hunters were calculated to have taken 73 percent, Québec Cree 22 percent, and other Canadians (recreational hunters and other native groups) the remaining 5 percent of the harvest (Reed 1991). Because brants overfly the populated southern portion of eastern Canada in the fall, only small numbers are shot by Canadian sport hunters.

Considering there is no specific AHM protocol developed for brant, the USFWS depends exclusively on the status of eastern mallards for setting the harvest level for brants in the Atlantic Flyway. Based largely upon the estimated population size for eastern mallards as well as the objective to maximize long-term cumulative harvests, the USFWS determined that the liberal harvest option was the optimal regulatory strategy for brants in the Atlantic Flyway in 2005 (USFWS 2005c). This has been the management option selected for Atlantic Flyway brants since 1997.

Brant population dynamics and susceptibility to hunting pressures: Hunting has been one of the most important factors regulating population size (Reed, Ward *et al.* 1998). Reductions in the brant population in the 1970s were caused in part by overshooting on the United States Atlantic Coast (Kirby *et al.* 1985). Although harvest levels have been relatively low (<12% of total winter population size) on Atlantic and black brant (*Branta bernicla nigricans*) since 1985, hunting may have greater effect on breeding population than in other waterfowl because adults generally constitute greater proportion of the bag than juveniles (Kirby *et al.* 1985; Subcommittee on Pacific Brant 1992) and spring subsistence harvest differentially takes breeding pairs (Sedinger *et al.* 1994).

The ecological effects of discontinuing the brant hunt on CACO are unknown; however, the harvest is typically so small relative to the Atlantic Flyway harvest that no ecological effects would be expected.

***Canada Goose* (*Branta canadensis*)**

Range: The winter range of the Canada goose extends from the southern coast of Alaska through British Columbia, southern Alberta to the Atlantic Coast of Newfoundland, and south to Mexico, the Gulf Coast and Florida (Bellrose 1980). They are a common resident throughout the New England Region and sometimes cause damage to golf courses and small ponds (DeGraaf and Yamasaki 2001).

Habitat: During the winter, Canada geese remain on coastal marshes, inland ice-free lakes and rivers, agricultural land, and flooded fields (DeGraaf and Yamasaki 2001).

Food Habits: Canada geese graze on tender shoots of grass, sedges and other marsh plants, submerged vegetation, and agricultural crops. Also, they consume small quantities of insects; larvae; seeds; mollusks; and small crustaceans in mud flats, agricultural fields, flooded meadows, salt marshes, and shallow water with submergent vegetation (DeGraaf and Yamasaki 2001).

Abundance: Flyway and continental population estimates for geese are derived from a variety of surveys, including the MWI, conducted each January in wintering areas, the Waterfowl Breeding Population and Habitat Survey (WBPHS), surveys specifically designed for various populations, and others. These estimates are reported in the Waterfowl Status Report each year (USFWS 2005a).

In the Atlantic Flyway, a mixture of *B. c. canadensis* from boreal areas of Atlantic Canada, *B. c. interior* from arctic and boreal Québec and Greenland, and resident Canada geese, *B. c. maxima*, declined from 775,200 to 569,200 between 1970 and 1993 (Rusch *et al.* 1995), prompting studies of the status of contributing subspecies to overall numbers of Canada geese in the flyway (Trost and Malecki 1985; Hindman and Ferrigno 1990). Subsequently, it was determined that resident Canada geese increased from 400,000 in 1989 to >1 million in 2001. This increase, coupled with the overall decline in the Atlantic Flyway, created uncertainty about the status of migrant stocks (*B. c. canadensis* and *B. c. interior*). Harvest restrictions were imposed, and subsequent surveys of populations on the breeding grounds indicated that the decline was of the *B. c. interior* population of northern Québec, which recovered, increasing from <50,000 pairs in 1994 to 147,000 pairs in 2001 (Harvey and Rodrigue 2001).

Three Canada goose populations comprise most of the geese that occur in the Atlantic Flyway. The Atlantic Population (AP) of Canada geese nest throughout much of Québec, especially along Ungava Bay, the eastern shore of Hudson Bay, and on the Ungava Peninsula. The AP winters from New England to South Carolina, but the largest concentrations occur on the Delmarva Peninsula. Spring surveys in 2005 yielded an estimate of 162,400 breeding pairs (+/- 24,700), 7 percent fewer than in 2004. Breeding pair estimates have increased an average of 17 percent per year during 1996-2005. The estimated total spring population of 1.14 million geese in 2005 was 12 percent higher than that of last year.

The Atlantic Flyway Resident Population (AFRP) inhabits southern Québec, the southern Maritime Provinces, and all states of the Atlantic Flyway. Surveys during spring 2005 estimated 1.06 million AFRP Canada geese in this population (+/- 189,000), about 9 percent more than in 2004. These estimates have increased an average of 1 percent per year over the last 10 years.

The North Atlantic Population (NAP) of Canada geese principally nest in Newfoundland and Labrador. They generally commingle during winter with other Atlantic Flyway Canada geese, although NAP geese have a more coastal distribution than other populations. During the 2005 WBPHS, biologists estimated 51,300 (+/- 23,100) indicated pairs (singles plus pairs) within NAP range (strata 66 and 67), 24 percent fewer than in 2004. Indicated pair estimates have declined an average of 4 percent per year since surveys were initiated in 1996. The 2005 estimate of 129,900 (+/- 62,800) total Canada geese was 34 percent lower than last year's estimate. Total goose estimates have declined an average of 3 percent per year from 1996 to 2005.

Take: Estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), 4,840 Canada geese were harvested in Barnstable County, averaging 440 birds/year (range 40 – 1,140) (USFWS, 2005b) (Table 12).

In 2003 and 2004 hunting seasons, 12,874 and 15,200 Canada geese were harvested statewide in Massachusetts by 3,300 and 3,100 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 657,910 and 633,289 Canada geese were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The 2003 harvest in Barnstable County represents only 0.04 percent of the Atlantic Flyway harvest (Table 13).

Harvest management strategy: Mowbray *et al.* (2002) reviewed the harvest strategy for Canada geese in North America. Currently, about 2 million Canada geese are harvested annually in the United States, and approximately 600,000 in Canada (Trost and Drut 2001; Peterson 2001). Annual harvest has been increasing steadily since the 1970s, making this goose one of the top two or three species of waterfowl harvested in North America (exceeded only by mallards and in some years green-winged teal). Thus, harvest constitutes an important recreational and economic influence on all aspects of Canada goose management. Harvest regulations vary widely in different geographic areas of the United States, with

different management programs attempting to target specific recognized populations. A similar approach is used in Canada, and efforts are made to coordinate harvest management between the two countries.

Subsistence hunters in Alaska and northern Canada also take a number of Canada geese each year (Klein 1966; Bromley 1996). Although exact numbers are not known, harvest by aboriginal people in Canada estimated to be about 200,000 per year, or 25 percent of 600,000 sport harvest (Mowbray *et al.* 2002) and less of regulated harvest in Alaska. Thus, subsistence harvest overall is not a major factor for most recognized Canada goose populations (e.g., Bromley 1996), but for some it has been identified as a local concern (e.g., *B. c. minima* on Yukon-Kuskokwim Delta, AK; Raveling 1984).

The USFWS is striving to apply the principles and tools of AHM to improve decision-making for the AP of Canada geese whose numbers declined significantly in the 1980s and early 1990s (USFWS 2005a). Sport-hunting seasons for this population were closed in the United States from the fall of 1995 to the winter of 1999. Hunting seasons have been reinstated, but are currently at restrictive to moderate levels in the United States. Continuation of sport harvest for Canada geese and maintenance of the population within desired bounds is contingent upon effective harvest management and monitoring programs. Effective management will need to incorporate multiple objectives and must be accomplished with incomplete knowledge of the system and in the presence of various types of uncertainty, including environmental variation, partial system control, model uncertainty, and partial system observability.

Canada geese population dynamics and their susceptibility to hunting pressures: Hunting has been one of the most important factors regulating population size for many Canada goose populations. Canada goose populations have significant age structure as a result of relatively high survival rates and age-dependent productivity. Previous studies have shown that optimal harvest management of age-structured populations is conditional on the age-structure of the population and on age-specific differences in vulnerability of harvest (USFWS 2005c). The prototype AHM strategy for the AP recognizes that the critical components governing the dynamics of the population, unlike those governing ducks, are generally density-independent over the range of population sizes that likely characterize management objectives. Thus, harvest represents an imposed regulatory mechanism on the dynamics of the population. This requires specification of a desired range for the population size. At one end of the population spectrum is the maximum tolerable population size that is linked with what the various stakeholders are willing to accept, given the potential for negative effects of overabundant goose populations. Similarly, the minimum tolerable population size is that population below which the hunting season would be closed considering stakeholder concerns. Thus, the management objective is to maintain the population in the range between the maximum and minimum values, while simultaneously maximizing opportunity for sport harvest (USFWS 2005c).

The ecological effects of discontinuing the Canada geese hunt on CACO are unknown. However, special Canada goose hunting seasons have occurred in Massachusetts and many other states, with the first in 1988 in Massachusetts. One of the major objectives of special Canada goose hunting seasons is to reduce the numbers of resident Canada geese. Heusmann (1997) reported on the various problems associated with over-abundant resident goose populations in Massachusetts, including complaints received about fecal deposition/contamination on golf courses, gardens, shellfish beds, lawns, cranberry bogs, alfalfa fields, beaches and reservoirs. Without the harvest of these increasing numbers of resident geese, the frequency of these complaints from the public would be expected to increase (Heusmann 1997). Yet, relatively low numbers of geese are harvested from Barnstable County each year.

Snow Goose (Anser caerulescens)

Range: In winter, the eastern snow goose population is dispersed along Atlantic Coast from Massachusetts (Veit and Petersen 1993, CBC data) to South Carolina, with main concentrations in New

Jersey, southeast Pennsylvania, Delaware, Maryland and Virginia, and North Carolina. Highest concentrations are found along the shore of Delaware Bay (Reed, Giroux *et al.* 1998).

Habitat: In winter in coastal areas, snow geese inhabit estuarine marshes, marine inlets and bays, shallow tidal waters and coastal freshwater and brackish marshes. Inland, they inhabit wet grasslands, freshwater marshes, coastal prairies, and cultivated fields (Palmer 1976b). Along the Atlantic Coast, snow geese frequent saltwater-cordgrass tidal marshes, freshwater ponds, and agricultural fields.

Food Habits: In winter and during migration, the snow goose diet is comprised of seeds, stems, leaves, rhizomes, stolons, tubers, and roots of grasses, sedges, rushes, and other aquatic plants; grains and young leafy stems of various agricultural crops; stems of horsetails (*Equisetum* spp.); and a variety of berries (Palmer 1976b, Bellrose 1980). During the breeding season, they eat the leafy parts of grasses, sedges, rushes, willows, and other aquatic plants, along with rhizomes, tubers, and roots of grasses, rushes, sedges, forbs, and tundra shrubs. Brooding goslings may also feed on fruits and flowers, the shoots of horsetails, and Chironomid (Diptera) larvae (Palmer 1976b, Bellrose 1980).

Abundance: There is no information on snow geese numbers specifically within CACO. Flyway and continental population estimates for geese are derived from a variety of surveys, including the MWI, the WBPHS, surveys specifically designed for various populations, and others. These estimates are reported in the Waterfowl Status Report each year (USFWS 2005a). Most snow goose populations are currently increasing and causing considerable management concern. In most parts of their range, the population is expanding, and any current estimate of size is soon likely to be superseded and thus of limited use. Aerial photo inventories in 1997 put the total number of breeding snow geese at around 5 million individuals; adding 30 percent for nonbreeding adults (1- and 2-year-olds), the total becomes 6.7 million (Cooke *et al.* 2000).

Midwinter inventories and counts of Mississippi and Central Flyways made by USFWS personnel provide an annual index from which trends can be calculated. These counts underestimate numbers by at least a factor of 1.6 (Boyd *et al.* 1982), increasingly so as the population has risen (Cooke *et al.* 2000). Current midwinter counts by this method, including immature birds (Sharp and Moser 1998), indicate about 3 million birds, clearly well below values derived from the breeding ground estimates.

Take: There is no information on numbers of snow geese harvested specifically within CACO. However, estimates of annual harvests are available for Barnstable County from the USFWS HIP program. For the 11-year period (1993 – 2003), a total of 80 snow geese were harvested in Barnstable County, and all of these geese were taken in 1997 (USFWS 2005b) (Table 12).

In the 2003 and 2004 hunting seasons, 26 and 0 snow geese were harvested statewide in Massachusetts by 2,400 and 2,400 hunters, respectively (USFWS 2005b). For the Atlantic Flyway, 36,105 and 31,548 snow geese were harvested during the 2003 and 2004 hunting seasons, respectively (USFWS 2005b). The harvest of snow geese during 2003 in Barnstable County represents <0.01 percent of the flyway harvest (Table 13).

Harvest management strategy: Mowbray *et al.* (2000) reviewed the harvest strategy for snow geese in North America. Harvest estimates for the mid-continent population from 1975 (first year when data were available from Central and Mississippi Flyways of United States and Canada) to 1992 declined gradually from 597,000 to 258,000. Declines in the United States sector of flyways were evident for an even longer period (Abraham and Jefferies 1997). This decline occurred despite large increases in the goose population and increases in the bag limit/hunter, suggesting that the number of hunters of snow geese declined during this period. Between 1992 and 1997, the harvest increased to 721,000, and perhaps to >1 million in 1999 (Cooke *et al.* 2000). This increase may have been due to increased publicity associated

with concerns about overpopulation (Batt 1998). Even with these increases in harvest, there is no evidence that the population growth of the species has declined.

Snow geese population dynamics and susceptibility to hunting pressures: It appears that hunting mortality is additive to natural mortality for snow geese (Francis *et al.* 1992), but hunting mortality, despite liberal bag limits, has to date failed to curtail the 5 percent or more annual population growth rate of most populations. Mortality due to hunting will decline as snow goose populations increase, unless there is a corresponding increase in hunting pressure. Indeed, Francis *et al.* (1992) and Kerbes *et al.* (1999) showed declines in hunting and total adult mortality during the period 1970-1987, as total population numbers increased. As adult survival increased from 78 to 88 percent, recovery rates (a measure of hunting mortality) decreased 2 to 3 fold at 3 major colonies. Whereas hunting accounted for 66 percent of total adult mortality in 1970, it accounted for <50 percent in 1997 (Cooke *et al.* 2000).

The ecological effects of discontinuing the hunting of snow geese on CACO are unknown; however, relatively few snow geese are harvested from Barnstable County each year.

3.3.3 Natural History – Game Species-Mammals

White-tailed Deer

Range: White-tailed deer are widespread throughout New England. Their range extends across southern Canada to central British Columbia and throughout the United States into South America (Hesselton and Hesselton 1982).

Habitat: Deer utilize forest edges, swamp boarders, areas interspersed with fields, and woodland openings. During the winter they require dense cover for shelter and adequate browse. When snow depths exceed 16 inches, they will yard in conifer stands creating a central resting area with trails (DeGraaf and Yamasaki 2001). Deer are mostly active in the early evening and early morning and seasonally browse on a variety of deciduous and coniferous growth. This consists of twigs, bark, dried red maple (*Acer rubrum*) leaves, and twig litter from hemlock (*Tsuga canadensis*) and white cedar (Crawford 1982). Spring and summer food consists of forbs, ferns, leaves, grasses and sedges. During the fall they supplement this with gilled mushrooms, beechnuts, and acorns (Pruss and Perkins 1992).

For non-migratory deer, home ranges can vary from 146 to 1,285 acres (i.e., densities of 0.2 – 2.0 deer/ mi^2). Areas used seasonally tend to not exceed a one-mile radius (Marchinton and Hirth 1984). In agricultural woodland and suburban areas, densities can reach 30 deer/mi^2. For densely forested areas, density can range up to 15 deer/mi^2 (Baker 1984).

Deer Abundance in Massachusetts: A survey of deer on CACO was completed during November 2003 using nocturnal spotlight surveys. This effort resulted in estimates of 0.80 and 0.56 deer/kilomter^2 (2.08 and 1.45 deer/mi^2) depending on the calculation method (Underwood, H. B. 2004 unpublished data). While these results are consistent with reported values in the literature, they are substantially lower than the MDFW estimates for deer densities in DMZ 12, which comprises the 15 towns of Cape Cod and therefore includes CACO within its boundaries. In recent years, deer densities for DMZ 12 have been estimated at 15 to 17 deer/mi^2. Although this is higher than the density goal set by MDFW (8 deer/mi^2), agency managers consider both the deer densities and hunter densities to be stable and satisfactory.

Porter *et al.* (1994) conducted research at CACO beginning in 1988. This study described the age distribution, physical condition, reproductive performance, and mortality rates of deer on CACO; evaluated principal factors contributing to the limitation of deer abundance on Cape Cod; and recommended methods for long-term monitoring of the deer populations at CACO. This study concluded

that: (1) deer populations on CACO appear to be in good physical condition; (2) deer populations appear to be stable or increasing slowly and are well below the ecological carrying capacity; and (3) that the limit to deer population abundance is probably set by annual harvest rather than habitat or weather.

Harvest: Each harvested deer in Massachusetts is required to be checked at a deer check station. Data collected at these check stations include date of kill, location of kill by DMZ, and sex of deer. Prior to 2003, MDFW did not record numbers of deer harvested specifically within CACO. CACO-specific data for deer harvest were collected in 2003, but have not yet been processed by MDFW. Therefore, estimates of total deer harvest within CACO must be derived from the harvest totals for the five towns encompassing CACO (Provincetown, Truro, Eastham, Wellfleet, and Orleans).

There are no specific counts of the deer harvest at CACO as deer can be checked in at any deer checking station. Therefore, some deer taken at CACO may be checked at stations other than those in the immediate area. Harvest counts are available by town for those towns that provide deer hunting opportunities that fall within the CACO boundaries. For the period between 1999 and 2004 harvest counts ranged from 42 to 74, with an average of 53 deer (data supplied by MDFW). Furthermore deer population estimates are not made at CACO but, in general, population densities are estimated in southeast Massachusetts. The MDFW estimates that the region has 10 to 20 deer per mi^2.

In the late 1980s, a 4-year deer study was conducted at CACO (Seybold 1994). This work suggested that CACO deer population trends, age structure data and physical condition indices were not limited by nutrition or weather. Anthropogenic data indicated that habitat loss probably was not limiting deer population sizes. The deer demographic analyses identified population characteristics typical of heavily exploited herds, and the study concluded that deer populations on CACO may be smaller and less problematic than in other eastern National Parks because they are hunted and subject to intense human disturbance.

Deer population dynamics and their susceptibility to hunting pressures: Deer populations have the potential for rapid growth. Under normal circumstances, yearling does produce single fawns and does two years or older produce twins annually. In very good habitat conditions, adult does can produce triplets. Thus, in the absence of predation or hunting, a deer herd can nearly double in size in one year. The deer population in George Reserve in southern Michigan grew from 10 deer in 1975 to 212 in 1980 (McCullough 1984). This is an average growth rate exceeding 80 percent per year.

However, there are natural limits to the number of deer that a given area can support. The high potential rates of increase of deer populations are limited by reproductive rates and fawn survival (McCullough 1984, Fuller 1990), which in turn is affected by the quantity and quality of deer forage and/or the availability of good winter habitat. If deer populations grow beyond the capacity of an area's vegetation to support them, deer starvation rates increase and vegetative destruction caused by deer feeding becomes problematic (Behrend *et al.* 1970, Deblinger *et al.* 1993). Deer densities greater than $20/mi^2$ have typically reduced forest regeneration and plant species diversity (MacDonald *et al.* 1998).

Most studies of white-tailed deer survival have concluded that hunting is the major source of mortality in exploited populations (Nelson and Mech 1986, Fuller 1990, Patterson and Power 2002, Patterson *et al.* 2002). In the Northeast, in several areas where deer densities had reached high levels, controlled hunts were used to reduce the densities to within biological carrying capacity (e.g., Deblinger *et al.* 1993, Decker *et al.* 2004, Winchcombe 1993, and MacDonald *et al.* 1998).

For example, at the 6,000-acre (9.4 mi^2) Great Swamp National Wildlife Refuge in New Jersey, deer densities in the mid 1970s reached 60 to 70 deer/mi^2. Starting in 1974, controlled hunts were used to reduce the herd and to stabilize population numbers. As a result of the hunt, MacDonald *et al.* (1998)

reported that no winter starvation mortalities were recorded after 1974, deer body condition improved and parasite loads in deer stomachs were reduced (an indicator of herd health).

Management of the deer population at Gettysburg National Military Park and Eisenhower National Historic Site consists of direct reduction (authorized personnel shooting deer in the Parks) and cooperative management (increasing public hunting outside the Parks by cooperative efforts of private landowners, the Pennsylvania Game Commission, and the NPS) (NPS 1995). These methods are used annually to maintain the deer population at a predetermined density.

At the Crane Wildlife Refuge in coastal Massachusetts, deer densities estimated at 100 deer/mi^2 were reduced by setting a harvest quota of 40 percent of the pre-hunting season population (1985 – 1990). Beginning in 1991, the harvest rate was set at 25 percent, maintaining the population at or below its biological carrying capacity (Moen 1984, Deblinger *et al.* 1993). Over the period of the study, body condition improved, winter starvation was eliminated, and vegetative overgrazing was reduced. In addition, researchers noted a decrease in the abundance of ticks that cause Lyme disease.

Effects on predator/prey interactions and competition with other species: Predation can be a major source of mortality for deer, especially along the northern extent of their geographic range (Nelson and Mech 1986). However, Patterson (1999) reported in Nova Scotia that the proportion of deer removed by coyotes decreased with increasing deer densities; thus coyote predation is likely to destabilize rather than regulate deer densities.

Eastern cottontail and New England cottontail

Range: Eastern cottontails can be found in the United States east of the Rocky Mountains and in southern Canada, eastern Mexico, and parts of Central America (Chapman *et al.* 1980). They were introduced into New England in the early twentieth century and have now extended their range to include Vermont, southern Hew Hampshire, and southern New England (Probert and Litvaitis 1996).

New England Cottontails were historically found throughout southern and central New England, eastern Pennsylvania, New Jersey, and along the southern Appalachian Mountains to Alabama (Chapman 1975). Their range has been greatly reduced in New England as a result of suburbanization and forest maturation. New England cottontails have not been documented on outermost Cape Cod since the mid-1900s and were only recently detected in Orleans (Boland and Litvaitis 2007). They now inhabit isolated patches of early successional habitat in Maine, New Hampshire, Massachusetts, and Rhode Island (Litvaitis and Litvaitis 1996). In many areas they are vulnerable to regional extirpation and are considered a species of special concern in New Hampshire, Maine, Vermont, and Rhode Island (DeGraaf and Yamasaki 2001). This species is a candidate for federal listing as a threatened or endangered species.

Habitat: Eastern cottontail habitat consists of farmland, pastures, barren farmland, open woodland, forest edges, marshes and suburban areas. They require stone walls, piles of brush, dens, or burrows (e.g., abandoned woodchuck [*Marmota monax*] holes) for protection from cold weather or storms. They avoid dense cover, but must have occasional pockets of shrubby or herbaceous cover (Allen 1984).

New England cottontails inhabit brushy areas, open woodlands, swamps, and mountains (Fay and Chandler 1955). They are also found in patches of clear-cut forest, shrublands, or grasslands but also require closely spaced patches of dense cover and coniferous shrubs seedlings and saplings (Chapman *et al.* 1982). They occur more frequently in suitable habitats $\geq$25 acres (Litvaitis and Litvaitis 1996).

The home range of the Eastern cottontail is from 0.5 to 40 acres (larger for males, especially during spring and summer, than females) and 0.5 to 1.8 acres for New England cottontail (Godin 1977). In favorable

habitat, the population density of Eastern cottontail can be up to three rabbits/acre (over 2,000 rabbits/mi^2) (Kurta 1995). The densities for New England cottontail average 5.7 females per acre and 1.2 males per acre (Dalke 1942).

Both cottontail species are active mostly during the early evening and early morning. They are primarily nocturnal feeders with summer food consisting of grasses and herbs; winter food is comprised of seedlings, bark, twigs, and buds, especially from maples and oaks (DeGraaf and Yamasaki 2001).

There are many predators, including coyote, fox, bobcats (*Lynx rufus*), hawks, owls and domestic dogs and cats (Chapman *et al.* 1980). Foxes are thought to have some influence over rabbit populations (Banks 2000, Banks *et al.* 1998). Because of dark pelage, predation can be high where snow cover is persistent and escape cover is insufficient (Keith and Bloomer, 1993).

Loss of early successional habitat (reduction in understory cover) is believed to be a major problem for New England cottontail, thereby increasing predation rates by coyote and fox. Further, New England cottontails require patches of greater than 10 hectares to sustain viable populations (Litvaitis and Villafuerte 1996).

Abundance: There is little information on the abundance of cottontail species on CACO. While Eastern cottontails are known to occur throughout Cape Cod, the extent of New England cottontail distribution on Cape Cod is not fully known. In 2004, CACO initiated studies to investigate the presence and distribution of both species and the effects that hunting may have on them. These studies involved collection of fecal pellets for DNA analysis at 161 locations across the Outer Cape over a three year period, with the majority of the collections taken from CACO. Cottontails were also trapped at five locations within CACO in 2005, and at six locations in 2006. The only New England cottontails detected were from a single site in the northwest portion of Orleans (Boland and Litvaitis 2007). Prior to that time, New England cottontails had not been documented on outermost Cape Cod (Orleans to Provincetown) since the mid-1900s (as summarized in Boland *et al.* 2005).

Harvest: Eastern cottontail is a common game species that is often hunted with hounds. Incidental take of New England cottontail can occur as a result of eastern cottontail harvest when the two species are found in the same area. Both species can withstand high hunting pressure due to high reproductive rates.

In Montana, Raucher (1999) surveyed 1,408 hunters and found that only 6 percent (85 individuals) hunted or harvested rabbits. Most stated they were hunting other game in combination with rabbit hunting (51%). while 41 percent were hunting specifically for rabbits. Successful hunters generally harvested less than three rabbits (61%).

However, Kennedy (1988) found that statewide in Massachusetts in 1985/6 and 1986/7, cottontail was the fourth most popular species (as measured by total hunter-days). His estimated statewide harvest (with a large standard of error, since it was computed from a 1% sample of hunters) was 20,096 cottontails for 1985/86 and 19,163 for 1986/87. Given the methods used in this study, there is no reliable way to estimate what proportion of this take occurs at a county or town level.

Species susceptibility to hunting pressures: According to Lord (1963), harvest of eastern cottontail was once greater than for any other game species in the United States. Nonetheless a minimal amount of research is available regarding hunting pressure on cottontails. In Mississippi, Bond (1999) reported that in areas of the wildlife refuge that were not hunted during the late season (i.e., to the end of February), the number of cottontails harvested tripled the following year relative to the harvested areas. Hence, eliminating late season hunting increased harvest the following year.

In Virginia, Payne (1964) reported that intense fall hunting of cottontail (with dense cover conditions) was not a depressing factor to cottontail populations. Removal of different percentages of cottontail populations indicated that with a 75 percent reduction of the fall population, a breeding population was able to produce comparable numbers the following year. Both of these studies suggest that the timing of the hunt is an important factor in determining whether hunting effects are additive or compensatory.

Murphy *et al.* (1996) examined the effect of beagle chasing (training beagles to chase cottontails) on a cottontail population in an enclosure that excluded most predators. There were concerns that chasing activity may lead to increased nest destruction, inhibit rabbit reproduction, and limit fall rabbit abundance. The study concluded that even with intensive beagle chasing activity (more than 200 days per year), cottontail densities in the enclosed area were high and that the almost daily chasing by dogs did not preclude rabbit abundance within the enclosure.

To assess the effects of hunting on cottontail population dynamics at CACO, Boland and Litvaitis (2007) compared cause-specific mortality rates of radio-collared cottontails in hunted and non-hunted areas of CACO. In period 1 (December 2004 through April 2005), 78 rabbits were radio-collared from two hunting and two non-hunting areas, and in period 2 (December 2005 through April 2006), 98 rabbits were radio-collared in six hunting and three non-hunting areas. The fates of 16 and 14 collared rabbits, respectively, were undetermined. Of the 52 cottontail deaths recorded during period 1, 2 were from hunting, 42 were killed by predators, and 8 died of non-hunting anthropogenic or unknown causes. This period was marked by an unusually severe winter with large snowfall for Cape Cod. Of the 46 rabbit deaths recorded in period 2, 8 were from hunting, 28 were killed by predators, and 10 died of non-hunting anthropogenic or unknown causes. The investigators found a lower overall survival rate at the hunted sites compared to the non-hunted sites during period 1; however, during period 2, no overall differences in survival was noted for hunting and non-hunting sites, although hunting represented 17 percent of mortality for that period. The authors concluded that higher mortality rates associated with the harsh winter during period 1 may have reduced cottontail populations below the capacity of their environment, and that under such conditions, hunting mortality may have been additive. Under the more normal winter conditions of period 2, the authors believe hunting is likely operating as a form of compensatory mortality.

Gray Squirrel

Range: Gray squirrels range over the eastern United States to just west of the Mississippi River and north to Canada. Introductions have occurred in many of the western states. They are found throughout New England and are very common in Massachusetts.

Habitat: Mast-bearing hardwood trees (acorns, beechnuts, and hickory nuts) are the most important element of squirrel habitat. Other important tree and shrub species provide flowers, buds, fruit, cones and samaras (fruit of maple trees) in season. Den trees are essential to squirrels for winter shelter, escape cover, and rearing of young. Natural den cavities begin to appear in 40 to 50 year old stands. Although leaf nests are also used, the survival rate of young is 40 percent lower in leaf nests compared to cavities. Frequently, squirrels will claim two or three dens at the same time. Moderate to dense ground cover near den trees is preferred for cover and concealment. Optimal habitat has 2 to 3 suitable cavities per acre (Flyger and Gates 1982).

The home range of gray squirrels varies from 1.5 to 8 acres and is usually smaller where populations are high. Populations develop social hierarchies or "pecking orders" influenced by age and sex of the animals. Dominant animals usually have larger home ranges.

Gray squirrels normally feed twice a day, usually feeding on one or two types of food at a time. They will also bury nuts and acorns in the fall and then dig them up and eat them in the winter and spring. Important food sources include hickory, oak, beech, maple, fungi, animal matter, and corn.

Abundance: There are no squirrel abundance data specific to Cape Cod or to CACO.

Harvest: There is no information on the number of hunters pursuing squirrels or the total squirrel harvest within CACO. Studies that have examined the harvest of squirrel populations in other places vary widely in hunting pressure: In Mississippi, Bowman *et al.* (1999) found a density of hunters averaging 1 hunter per 54 acres on an 8.9 mi^2 WMA; in Ohio, Nixon *et al.* (1974) documented harvest density on a fox squirrel (*Sciurus niger*) population in a 1.9 mi^2 area, with 1 hunter per 3.4 to 13.5 acres.

Reported squirrel harvests from public forests have varied from lows of 13 percent to 15 percent of the population (Uhlig 1955; Kidd and Soileau 1965) to highs of 45 percent (Nixon and McClean 1969), 46 percent (Chapman 1941), and 58 percent (Peterle and Fouch 1959; Nixon *et al.* 1974 as referenced in Nixon *et al.* 1975, p1).

In the 1980s, gray squirrels were consistently the fifth or sixth most hunted species statewide in Massachusetts and in the top three in terms of statewide harvest (Kennedy 1988). Statewide, this study estimated that 10,800 and 14,100 hunters sought gray squirrels statewide in Massachusetts in the 1985/6 and 1986/7 hunting seasons, respectively. Further, Kennedy reported an average season total harvest of 4.6 to 5.1 squirrels per hunter per season. To place Kennedy's findings about number of squirrel hunters in perspective, Nixon *et al.* (1975) reported a low success rate for squirrel hunters in an Ohio study: over a 10 year period, nearly 63 percent of 3,466 hunters killed no squirrels, 23 percent shot only 1 squirrel, and 14 percent shot 2 or more. Only 82 hunters out of the 3,466 shot the bag limit of 4 squirrels.

Using the data from this study (Kennedy 1988), an approximate estimate of the squirrel harvest in CACO can be calculated[5]. There are several assumptions that must be considered. First, it is assumed that hunting pressure is not evenly distributed across the state since hunting on Cape Cod represents only 2 percent of the hunters in the state; whereas the Cape represents 5.1 percent of the state's surface area (Cape Cod represents 400 mi^2 of the 7,840 mi^2 of the state). This estimate is assumed based on discussion with CACO rangers who have indicated that squirrel hunting is limited on CACO and that gray squirrel habitat is better in other areas of the state. It is likely that squirrel hunting is much more popular in the central and western portions of the state. Secondly, it is assumed that 75 percent of all squirrel hunting on Cape Cod takes place within CACO. Based on these assumptions, the acreage available for squirrel hunting, and the data in Kennedy (1988), it is estimated that a total of 162 people hunt squirrels each year in CACO. The average squirrel harvest per hunter per year is likely one-half of the statewide average harvest (4.6 to 5.1 squirrels/hunter) or 2.5 squirrels per hunter per year. This estimate yields harvest of perhaps 405 squirrels per year on CACO.

There are approximately 12,188 acres of forested upland and wetlands available for squirrel hunting. This would amount to a hunter density of approximately 1 hunter per 57 acres. This calculated hunter density for CACO is considerably lower than the 1 hunter per 54 acres reported by Bowman *et al.* (1999) in Mississippi. Furthermore, this represents a take of 1 squirrel per 22 acres. Assuming an average density of 0.3 squirrels per acre (one-half of the density reported by Nixon *et al.* 1975), or 3,657 squirrels in the hunted woodlands, a typical harvest is an estimated 14.5 percent of the population.

[5] Hunter and harvest estimates were calculated by Woodlot Alternatives, Inc. based on data from Kennedy (1988) as follows: 10,800 hunters statewide * 2% of the hunters hunt on Cape Cod * 75% of the Cape Cod hunters hunt on CACO yields 162 hunters that may hunt squirrels on CACO.

Species susceptibility to hunting pressures: Early research suggested that harvest was not detrimental to gray squirrel populations, even at harvest levels of 50 to 60 percent of the fall populations (Uhlig, 1955; Madson 1964, quoted in Bowman *et al.* 1999). Squirrel populations, however, have been shown to be sensitive to food availability. Allen (1942) reported that squirrel populations were affected more by mast availability than by harvest, except in bottomland forests. Nixon *et al.* (1975) documented that the combination of poor mast crop years and harvest adversely affected squirrel populations in an upland area of Ohio. In contrast, Mosby (1969) reported "little or no measurable effect" of poor mast crop on gray squirrel populations.

Mosby (1969) demonstrated experimentally that 37 percent of the fall gray squirrel population could be harvested without affecting the average annual mortality rate compared with the rate on an adjacent un-hunted area. Additionally, Mosby *et al.* (1977) described a "law of diminishing returns" for hunters, since they found that hunter effort could be positively correlated to squirrel densities. This means that as population densities drop, squirrels are correspondingly more difficult to find and to hunt. Thus, they believed that hunters would cease harvest before populations were impacted negatively.

Shugars (1986) reported a 7 to 9 percent annual mortality attributed to harvest in Maryland with a total annual mortality rate of 48 to 54 percent. Similar mortality rates were documented in an unexploited gray squirrel population in North Carolina (Barkalow *et al.* 1970).

Bowman *et al.* (1999) documented the effect of hunting in two study areas following an 11-year period in which one of the study areas had not been hunted. They found that gray squirrel harvest per hunter day decreased in the first two years of the study, but then stabilized for the remaining five years of the study. There were no changes in age ratio, sex ratio, or color following exploitation. Similarly, Mosby (1969) documented no difference in sex ratio between exploited and unexploited populations.

Harvest is often considered compensatory for small mammals like squirrels (Caughley 1985). Bowman *et al.* (1999) reported reproductive compensation for exploitation in fox squirrel, but not in gray squirrel. They hypothesized that partial compensation in gray squirrel population occurred in natural mortality, but their data were not sufficient to demonstrate this effect. Although they had no data on gray squirrel abundance in their study area, the harvest per unit effort stabilized after two or three years following the beginning of harvest, suggesting that exploitation was sustainable at that harvest pressure of 1 hunter per 54 acres.

Nixon *et al.* (1975) observed that the size of the adult kill in one fall hunting season appeared to influence the population density the following year (but not the size of the sub adult kill). However, when both harvest and seed crop were combined in a correlation analysis, the density of squirrels was significantly influenced only by the size of the seed crop the previous fall. In other words, effects of food availability substantially outweighed the effect of harvest on the fluctuating population numbers.

Mosby *et al.* (1977) reviewed several hunting studies and concluded that a harvest rate of 30 percent of pre-season fall population can occur without detrimental effects to the population. They generalized their results to say that squirrel populations in extensively forested areas can usually withstand "much greater utilization than [they] are currently receiving."

Coyote

Range: Coyotes, which first appeared in Maine in the 1930s, are now present throughout New England. Their range also includes North and Central America south of the tundra region (Parker 1995). Their distribution can be limited by certain factors, including snow depth, prey size, and competition with larger predators such as the wolf or the mountain lion (Voigt and Berg 1987).

Habitat: Coyotes are primarily found in a variety of forest and field habitats. They use edge habitat, especially second-growth forests, bare agricultural land, forest openings, exposed scrub-brush fields and many urbanized areas (Voigt and Berg 1987). They tend to remain in low-lying areas, which contain substantial populations of deer and snowshoe hare, especially during the winter (Ozoga and Harger 1966). They also require areas that contain well-drained and secluded den sites, which are generally abandoned by foxes and porcupines. These include rocky caves, hollow logs, or excavated burrows (Parker 1995).

Northeast ranges are generally larger due to limited food availability and distribution (Harrison 1992). In Maine, they average 12,800 acres for males and 11,800 acres for females (Caturano 1983). Seasonal range changes do occur often during breeding, pregnancy, nursing and winter foraging (Major and Sherburne 1987). Young will disperse at 1 to 1.5 years of age, traveling an average distance of 70 miles (males) and 58 miles (females) (Harrison 1992). Some coyotes form packs and develop well-defined territories, whereas those traveling in pairs or solitary do not (Bekoff 1980).

Coyotes are often considered a keystone predator, one with much influence on the local ecosystems. Because of this, they frequently shape the faunal community around them; this is more evident in the western states (Henke and Bryant 1999). They are an opportunistic species and prey on a variety of small to medium-sized mammals. Their most common prey species are snowshoe hare, deer fawns, beaver, muskrat, and small mammals such as mice and voles (Parker 1995). The availability of food is often a major influence in the type of social system (pack vs. pair) (Harrison 1992).

The diet and food habits of coyotes in Ohio's Cuyahoga Valley National Park were analyzed by Cepek (2004). Cuyahoga Valley National Park is surrounded by residential communities, located between Cleveland and Akron, Ohio, and is experiencing pressures of increased urbanization. The coyote is the top predator at Cuyahoga. Meadow vole (*Microtus pennsylvanicus*) was the predominant food item found, followed by eastern cottontail, white-tailed deer, and raccoon. A variety of insects, small birds, and plant materials comprised the remainder of the diet. It is important to note that though white-tailed deer occurred frequently in coyote diet, further investigation indicates that they are mainly scavenged as carrion.

Under natural circumstances, coyote abundance is controlled greatly by resource availability and competition with other predators, such as wolves (Bekoff and Gese 2003).

Human-caused mortality also occurs. Studies indicate that coyote populations are able to maintain themselves under considerable human-induced mortality through behavioral adaptations and biological compensatory mechanisms such as increased rates of reproduction, survival, and immigration (Knowlton 1972). Coyote population densities that have been reduced result in increased resource availability and less competition. Lower densities also reduce the transmission of disease. Pregnancy rates tend to increase while natural mortality tends to decrease. Connolly and Longhurst (1975) estimated that coyotes can withstand 70 percent annual control level and that 3 coyotes would need to be killed for every animal present at breeding time to hold the density below 50 percent of the pre-control level. In most areas, coyote population numbers are controlled by competition for limited resources such as food and by social stress, disease, and parasites.

Effects of control, sport hunting, and trapping are not well known. However, there have been some observations that suggest that coyotes may be adapting to exploitation through learning or heredity (e.g., trap aversion) (Andelt 1987).

Interspecific competition: Coyotes may not tolerate the presence of red foxes in their range unless there is an abundant food supply (Gese, Ruff, and Crabtree. 1996). They will often kill small canids such as gray fox if food supplies and territory areas overlap. In many areas, coyotes control the abundance and

distribution of smaller predators. For example, Crooks and Soulé (1999) reported that in southern California areas where coyote are absent, the population density of smaller predators (i.e., foxes and feral cats) increases. This can also have detrimental effects on the avifaunal community (Soulé *et al.* 1988).

It has also been found that coyote predation has little effect on deer population. When coyotes are absent, deer populations increase, causing less resource availability, which results in a decrease in population. They have the largest effect on rabbit populations when those populations are already in decline because of other factors (Andelt 1987).

Hunting data/information - Abundance: Coyotes are relatively 'new' to Cape Cod, documented first in the late 1970s (Way *et al.* 2002a). Way (2001) and Way *et al.* (2002b) documented that Cape Cod coyotes are territorial, with average territory sizes of 11 mi^2 and with average pack sizes of 3 resident animals per territory. A crude estimate of population size for coyote in CACO's 69 mi^2 area is therefore around 20 resident animals. Coyotes are highly efficient dispersers (Way *et al.* 2004) and have litter sizes of approximately five pups. This suggests that there could be as many transient animals as residents (i.e., 20) and thus perhaps as many as 40 individuals in total within CACO at a given time.

Harvest: MDFW maintains a database of all sealed pelts from 1981/82 to the present. Prior to the ban on trapping in 1996, the database lists eleven coyotes harvested in 7 Cape Cod towns[6] (all in the 4-year period from 1989 – 1993). In the eight years following the banning of traps, only two coyotes were reported harvested on Cape Cod, both in the town of Chatham.

The statewide harvest estimate prepared by Kennedy (1988) is considerably higher than the number of sealed pelts in the full statewide MDFW database. Using the low-end estimate of the statewide harvest (Kennedy 1988), the total coyote harvest is still approximately five times the number of sealed pelts. This data would suggest that the actual Cape Cod harvest may be several times higher than the pelt data show, but probably not more than 5 to 10 coyote a year from within CACO. Anecdotal information suggests the number may be higher than this; possibly up to 20 per year (Way *et al.* 2004). However, because coyote disperse rapidly into vacant territories and because of the large number of transient coyote on Cape Cod, the harvest is unlikely to have a major ecological impact on this species.

Coyote susceptibility to hunting pressures: In addition to the territory size data from Way *et al.* (2004), other studies have reported densities ranging from ~0.12 coyote/247 acres (Henke and Bryant 1999, mixed grassland and shrubland habitat, western Texas) to more than 2 coyotes/247 acres (Knowlton 1972, also in Texas).

The major factor regulating coyote populations is food abundance, especially in winter (Gese, Stotts, and Grothe 1996.), but human activities (hunting, trapping, and vehicle collisions) can cause a high proportion of coyote deaths (Tzilkowski 1980, Windberg *et al.* 1985, Windberg 1995).

Exploitation of coyote was shown to affect the demographic structure of populations. (Knowlton *et al.* 1999). Unexploited populations have older age structures, high adult survival rates, low reproductive rates (especially among yearlings), and low recruitment into the adult population. These populations may have larger packs or social units depending on available food. Heavily exploited populations have younger age structures, lower adult survival rates, increased percentages of yearlings reproducing, increased litter size, and relatively smaller packs.

[6] Provincetown, Truro, Orleans, Harwich (all with zero harvest from 1981-2003), Wellfleet (1 coyote in 89/90), Eastham (2 in 1990/91, 3 in 1991/92, and 5 in 1992/93, i.e., all prior to the trap ban), and Chatham (1 in 1998/99 and 1 in 2001/02, i.e., after the trap ban).

Much of the literature on coyote is related to managing their populations because of livestock depredation, which is not relevant to CACO. Knowlton *et al.* (1999) provides a good overview of this topic.

Effects on predator/prey interactions and competition with other species: Coyotes have been suggested as being keystone predators in a variety of ecosystems, including chaparral (Soule *et al.* 1988), grassland (Vickery *et al.* 1992), wetland (Sovada *et al.* 1995), and shortgrass prairie (Henke and Bryant 1999, Crooks and Soule 1999).

Henke and Bryant (1999) showed that reducing coyote density had little effect on desert cottontail rabbit population, but did have a regulatory effect on black-tailed jackrabbit (*Lepus californicus*). Similarly, Wagner and Stoddard (1972) also showed a strong cross-linkage in the food web between jackrabbit and coyote in Utah. Wagner (1988) speculated that a sustained reduction of coyote numbers would result in a jackrabbit increase, which in turn could lead to overuse of vegetation and greater competition with livestock for available forage. Lingle (2000) reported on coyote predation of mule deer (*Odocoileus hemionus*) and white-tailed deer (open prairie and mixed grassland habitat in Alberta, Canada) and found that between 47 and 85 percent of the mortality on fawns was caused by coyotes (n=19).

Interspecific killing seems to be common in carnivore communities (Peterson 1995). Coyotes may not tolerate red foxes in some areas (Sargeant *et al.* 1987) and can apparently control the abundance and distribution of smaller predators like feral cats (Crooks and Soule 1999).

Red Fox and Gray Fox

Range: The red fox occurs over most of North America from Baffin Island, Canada, and Alaska to the southern United States, except for coastal western Canada, Oregon and California, the Great Plains, the southwestern desert and the extreme southeastern United States. Kamler and Ballard (2002) point out that red fox occurs both as native and non-native species in North America. They refer to the introduction of red fox by colonists in the mid 1700s and show how the non-native red foxes expanded westward. Since native red foxes are generally found at high elevations, it seems possible (although uncertain) that red fox at CACO may be an introduced species that has become naturalized.

The gray fox occurs from extreme southern Canada throughout the United States, except in Montana, Idaho, Wyoming, and most of Washington. It ranges into Mexico and Central America.

Habitat: Home range size varies considerably for both red and gray foxes (Cypher 2003). In Maine, Harrison *et al.* (1989) and Major and Sherburne (1987) reported mean home range sizes for red fox of 5.8 to 7.7 mi^2. In Minnesota, Sargeant (1972) observed home range size of 2.7 mi^2. Griffin *et al.* (1989) documented fox home range sizes at CACO for three radio-tagged foxes over an eight month period (June – January). Monthly home range size averaged 0.3 mi^2 for the two tagged females and 0.4 mi^2 for the tagged male. The three tagged foxes spent 70 percent of their time in upland habitats (fields and woods) and 30 percent of their time in beach habitats.

Foxes are important predators of prolific prey species like mice and rabbits. Griffin *et al.* (1989) reported that foxes were a significant predator of piping plover and roseate tern (*Sterna dougallii*) eggs.

Abundance: There are no fox abundance data specific to Cape Cod or to CACO. In Scotland, England, Hewson (1986) found average densities of red fox dens ranging from 3.8 mi^2 per den (in agricultural land) to 12.4 mi^2/den (in forested land). Lindstrom (1982) reported higher densities of dens in Sweden (2.7 mi^2/den). Hewson (1986) estimated that red fox densities in an area with high control of fox numbers through culling were less than 0.3 fox per 0.39 mi^2, whereas other studies in areas with no control had fox

densities ranging from 1 to 3 foxes per 0.39 mi^2. If these figures are extrapolated to CACO, they suggest a red fox population of between 35 and 300. However, since red fox typically avoid coyote territories (Gosselink 1999 and Harrison *et al.* 1989), it seems likely that the fox numbers are at low end of this range.

Harvest: The MDFW maintains a database for all sealed fox pelts that extends back to the 1989/90 hunting season. In the period prior to 1996 when leg-hold traps were banned, the database lists only one red fox harvested in all of the seven Cape Cod towns[7] (from Orleans in 2000/01), and no reported gray fox harvest from 1989-2003.

A statewide estimate of fox harvest prepared by Kennedy (1988) is considerably higher than the number of sealed fox pelts in the full statewide MDFW database. Following the methodology established for coyote pelts (see above), even if a crude estimate of take on the low end of Kennedy's range, the total fox harvest appears to be more than five times the number of sealed pelts. This suggests that the actual Cape Cod harvest may be four or five foxes per year from within CACO.

Fox susceptibility to hunting pressures: Allen and Sargeant. (1993) suggested that annual harvests in localized areas for one or more years would likely have little effect on population size in subsequent years, because red fox are efficient dispersers. Weston and Brisbin (2003) compared age structure, sex ratio, and reproductive output for unharvested and harvested populations of gray fox with the same parameters for harvested populations. They found significant differences in age structure, although this may have been partly attributable to habitat and not only to hunting. Further, there was a high percentage of foxes older than 34 months, and the authors concluded that the lack of harvest pressure on this population led to more individuals surviving to 3+ years of age. The sex ratio of unharvested gray fox showed higher proportions of females (1.27:1 f:m) than is generally found in exploited populations (typically 1:1).

Effects on predator/prey interactions and competition with other species: Foxes and coyotes have extensive dietary overlap, given that they are generalist carnivores-omnivores occupying the same habitat. Lavin *et al.* (2003) reported in a range of urban and rural landscapes of Illinois that coyotes inhibit fox foraging, possibly by spatial displacement or by direct scramble competition. Foxes typically avoid coyote territories (Gosselink 1999 and Harrison *et al.* 1989).

Raccoon (Procyon lotor)

Range: Raccoons are found throughout most of southern Canada and the United States. They are not present in the deserts of the Southwest or high elevations in the Rocky Mountains (Sanderson 1987). They are very common throughout New England.

Habitat: Raccoons are commonly found in wooded areas containing fields and wetland habitat, especially near human habitation. They tend to avoid upland areas and dense forest (Kaufman 1982). Raccoons will also make use of edge habitat and agricultural landscapes, traveling along the periphery (Pedlar *et al.* 1997). Den sites consist of abandoned woodchuck burrows and hollow trees; culverts are used when tree dens aren't available (Leham 1984). Sites are generally located 10 feet above ground in trees that are near water (Sanderson 1987).

[7] Chatham, Harwich, Provincetown, Truro and Wellfleet all have zero reported harvest for both red and gray fox from 1981-2003. In 2000/2001, there is one red fox in the dataset (i.e., after the trap ban of 1996).

Most raccoons reach sexual maturity by their first fall. Breeding season is late February to June, peaking in February (Fritzell 1978). Gestation is approximately 63 days and the young are born in late April to early May. They have only 1 litter per year, with litter sizes ranging from 2 to 7 cubs (Sanderson 1987).

The size of raccoon home ranges varies greatly, from less than 12 acres (reported in an Ohio suburb) to nearly 12,355 acres (reported in North Dakota), and is affected by weather and by food availability. Typical home range size is between 99 acres and 247 acres (Sanderson 1987). Juvenile dispersal generally occurs in fall or early winter following birth (Lotze and Anderson 1979).

Raccoons are omnivorous and opportunistic. In the spring and early summer, their diet consists mainly of animal matter such as crayfish, worms, insects, carrion, mollusks, turtle and bird eggs (significant predation), and garbage. In the summer, fall, and winter, fruits, grains, nuts, seeds, buds and shoots comprise most of their diet (Sanderson 1987). Winter dormancy lasts from late November to March, during this time they live off fat accumulated during late summer (Godin 1977).

Their primary source of mortality is a result of human activities such as harvest, vehicle collisions, and nuisance control (Lotze and Anderson 1979). Another major source of mortality is disease, such as canine distemper and rabies. Major predators include coyotes, red fox, bobcats, and owls (Kaufman 1982).

Historically, raccoons have been an economically important mammal in North America (Sanderson 1987). However, during the late 1980s and early 1990s their economic importance shifted to economic costliness as carriers of disease and damage in residential areas (Bluett 2000). There is little or no evidence that harvesting raccoons has had any lasting detrimental effect on raccoon populations.

Abundance: There is no information on raccoon population levels within CACO. Studies in rural areas of Ontario, Minnesota, Wisconsin, and Tennessee report densities averaging 2 to 10 raccoons per $0.39mi^2$. In urban areas in Ohio and Toronto, population densities exceed 50 raccoons per $0.39mi^2$ (see Table 1 in Rosatte 1998 for specific references). Assuming population densities typical of rural areas, this would suggest a raccoon population at CACO of between 350 and 1,750 animals.

Harvest: Because raccoon pelts do not need to be sealed in Massachusetts, no specific information exists on harvest levels within CACO. Of the nine species assessed in Kennedy (1988), raccoon hunting had the lowest hunter demand and was one of the least harvested species statewide (although estimates of raccoon harvest did fluctuate considerably for the years reported in this study).

Raccoon susceptibility to hunting pressures: Two studies in Iowa (Glueck *et al.* 1988) and Mississippi (Chamberlain *et al.* 1999) both cite human activity (hunting and trapping, vehicle collisions) as a substantial cause of raccoon mortality. Peak exploitation of raccoon populations usually occurs during fall-winter trapping and hunting seasons (Clark *et al.* 1989). In Washington D.C., road-kills accounted for 46 percent of the raccoon mortalities (Hadidian and Riley 1990), and in Toronto Rosatte and MacInnes (1989) reported road-kill mortality of raccoons to be 17 percent.

Raccoons are capable of withstanding substantial hunting pressures (Rosatte 1998). Sanderson (1987) claims that there is no evidence that harvesting raccoons has any lasting detrimental effect on their populations; even if the local population declines, the overall effect is negligible. Hasbrouck *et al.* (1992) suggests that harvest be considered an additive mortality factor only when more than 40 percent of the population is harvested; in other cases it is probably compensatory. Similarly, Clark (1990) reported that increasing raccoon harvest beyond 40 percent of the fall population level appears to have an additive effect, but that harvest levels between 20 percent and 40 percent permitted compensation.

It has been suggested that hunting might alter movement patterns of raccoon and increase their energy expenditure, particularly for a summer hunting season. Roseberry (1980) and Hodges *et al.* (2000) showed that summer hunting had a minimal effect on movement and home range size (and therefore on energetics and population dynamics). In a direct study of summer hunting, Chamberlain *et al.* (1999) found that hunting with reasonably conservative bag limits (three raccoons) did not affect annual survival of raccoon. In CACO there is no summer hunting season.

Opossum

Range: Opossums, which were not present in New England before 1900, can now be found throughout the region. They have extended their range to southern Maine, through central New Hampshire, and up to northwestern Vermont (DeGraff and Yamasaki 2001). Their northern distribution is probably limited by lack of foraging as a result of subfreezing temperatures. Over the years, their range has expanded due to warming trends and their reliance on human activity to provide food and shelter (Gardner and Sunquest 2003).

Habitat: Opossums are found in dry to wet wooded areas, often near rivers and swamps; they require access to a water source. They are not commonly found in uplands or cultivated areas, yet are becoming increasingly common near more residential areas as they are being attracted by the availability of human food waste (DeGraff and Yamasaki 2001). Since opossums do not dig their own burrows, they must rely on dens provided by other animals such as woodchucks, raccoons, and cottontail rabbits. These dens are then often reused by other animals such as red fox, skunk, woodchuck, raccoon, and cottontail rabbits (Gardner and Sunquest 2003).

Maturity is reached at 8 to 12 months and breeding occurs in late June to early July. The young are born from February to July, after a 13-day gestation period. Opossums give birth to young in an underdeveloped stage, after which the offspring spend the next 60 days in the mother's pouch. They are typically weaned 96 to 106 days later. In the northern United States, they tend to have 1 litter per year with an average of 8 young (DeGraff and Yamasaki 2001).

Two telemetry studies on opossum movements (Allen *et al.* 1985, Hossler *et al.* 1994) indicated that opossums, especially females, regularly use areas for food gathering and caring for young. Allen *et al.* (1985) reported home range sizes for seven radio-tagged animals, and Hossler *et al.* (1994) reported high den fidelity, especially during weaning periods. Male ranges average 270 acres and often encompass home ranges of several females, which tend to be smaller (127 acres). When the young reach 80 to 100 days, they begin to gradually extend their range away from the den. Males will make gradual shifts in their ranges as opposed to females who will often demonstrate sudden dispersal movements (DeGraff and Yamasaki 2001).

Opossums are omnivorous and are extensive scavengers; they will eat the food source that is most abundant. This includes most vegetable or animal food, insects, invertebrates, fruit, and mushrooms from beneath the snow. They are not thought to be a serious predator (Gardner and Sunquest 2003).

In the past, hunting and trapping of opossum was extensive, but has recently been decreasing (Gardner and Sunquest 2003). Urbanization, which results in habitat reduction and increased motor vehicle collisions, is thought to be the major source of mortality (DeGraff and Yamasaki 2001). Other factors include winter severity and resource availability. Natural predators such as dogs, coyotes, foxes, raccoons, and raptors seem to have little effect on the population (Gardner and Sunquest 2003).

Management: Population trends are often difficult to predict. They vary greatly with changing environmental conditions. These fluctuations result in a change in carrying capacity for a given area.

This change affects the number of young produced. Since there is little time lag between the change in animal numbers and the change in environmental conditions affecting carrying capacity, estimating current and future populations is very difficult. For this reason, harvest data are a good indicator of survivorship and environmental conditions for the reproductive season preceding harvest, but not a good prediction of future trends. The most effective management option is to restrict harvest until after the breeding season and to protect areas providing favorable environmental conditions, especially during environmental extremes (Seidensticker *et al.* 1987).

Abundance: There is no information on the abundance of opossum in CACO, and no literature was found for this species on which estimates could be made based on typical population densities.

Harvest: There is no information on the size of opossum harvest in Massachusetts or within CACO. Similarly, no references were found in the scientific or management literature related to the effects of hunting on opossum.

3.3.4 Non-native Species

Non-native or exotic species are defined as species that occupy or could occupy Park lands directly or indirectly as a result of deliberate or accidental human activities. Because an exotic species did not evolve in concert with the species native to the place, the exotic species is not a natural component of the natural ecosystem (NPS 2006a). Highest priority is given to the control of exotic species that have a potential to have a substantial impact on Park resources and that can reasonably be expected to be successfully controlled. Lower priority is given to the control of exotic species that have almost no impact on Park resources or that probably cannot be successfully controlled.

Since European settlement, numerous non-native wildlife species have been introduced to the Outer Cape, including brown-tailed moths (*Euproctis chrysorrola*) and gypsy moths (*Lymantria dispar*). Many brown-tailed moth surveys and control efforts have been conducted within CACO over the last 30 years. However, very little quantitative data exist to indicate trends in their distribution or abundance on the Outer Cape. Some gypsy moth monitoring has also been conducted.

Ring-necked pheasants are a non-native species introduced within CACO by MDFW specifically for a stocked hunt. The annual release of ring-necked pheasants has not resulted in an established population and this species does not appear to cause any adverse effects towards other wildlife species (Bump and Field 1999). Pheasants appear to represent what are termed innocuous species and by definition are exotic species that do not significantly harm Park resources and do not require management efforts (NPS 1991).

3.3.5 Wildlife Species That Are Endangered, Threatened, or of Special Concern

USFWS and National Marine Fisheries Service list 15 species found within CACO as threatened or endangered. Eleven of these species are marine mammals or marine turtles. The Massachusetts Natural Heritage Endangered Species Program lists 42 species occurring in CACO as threatened, endangered, or of special concern. Nine species found within CACO are also protected by the Marine Mammal Protection Act. Migratory birds are protected under the Migratory Bird Treaty Act.

CACO implements an intensive monitoring and management program for the state and federally listed threatened piping plover (*Charadrius melodus*). State listed terns are also monitored and protected as part of this program. CACO implements periodic road closures to protect state threatened Eastern spadefoot toads (*Scaphiopus holbrookii*), and is conducting research to better understand toad movements and inform management to reduce road mortality. CACO does not actively manage other state or federally

listed species. However, these species receive varying levels of monitoring, and all park activities and projects are managed to avoid impacts.

3.4 Hunting Activity at CACO

A detailed discussion examining the economic aspects of hunting is presented in Section 3.8.4, while this section provides a brief synopsis of the level of hunting activity at CACO. Much of the discussion is based on the recently completed CACO Hunting Survey (Kuentzel 2006).

Responses from hunters using CACO provide the basis for documenting hunting activity on CACO. Hunters using CACO most commonly target deer, waterfowl, pheasant, and rabbit. Over 70 percent of hunters consider deer to be their preferred species (Kuentzel 2006), which is consistent with hunter preferences on a statewide and nationwide basis (USFWS 2004). The most heavily hunted areas of CACO include the Marconi and the Collins Road/kettle pond area. However, hunting occurs in all areas of CACO that are open to hunting. In general, CACO is used by a limited set of local hunters who hunt extensively. On average, they hunt at CACO 32 days out of the year. This exceeds the average hunting days for Massachusetts hunters of 17.5 days per year by a large margin (USFWS 2002). Most CACO hunters are Massachusetts residents: 70.2 percent Cape Cod residents; 24.4 percent Massachusetts "off Cape Cod" residents; and 3.3 percent from out-of-state (NPS 2005b). Approximately 43 percent of the hunters licensed in Barnstable County hunted within the previous 12 months and 24 percent have hunted at CACO (Kuentzel 2006). Hunting activity peaks in October, with pheasant (prior to when the pheasant stocking was enjoined), rabbit, and waterfowl hunting seasons opening (Table 14). Hunting activity remains relatively steady through December, with deer, waterfowl, and rabbit hunting seasons all occurring within this month. There are some notable differences between a visitor and resident survey conducted in the early 1990s (Manning 1994) and the Kuentzel (2006) study (Table 14). While the earlier study shows a peak in hunting activity during September and October, the more recent study shows hunting activity more focused on deer and to a lesser extent waterfowl and rabbits. DLW

Table 14. Estimate of CACO Hunting Days

	Sept	Oct	Nov	Dec	Jan	Feb	TOTAL
Estimated Hunting Days (1993-1994 season) (Manning 1994)	2,273 23.4%	3,456 35.6%	1,533 15.8%	1,131 11.7%	641 6.6%	661 6.8%	9,694 100%
Kuentzel (2006)	3.5%	19.8%	28.6%	27.4%	12.7%	8.0%	100%

3.5 Hunting Violations of Regulations, Safety

3.5.1 Hunting Related Violations

***Hunting Program*:** The legislation establishing CACO allows hunting under the jurisdiction of the MDFW and the NPS. White-tailed deer hunting is a popular hunting activity; waterfowl and small upland game are also harvested. The state sets harvest quotas and hunting season dates. The state stocks ring-necked pheasants in three locations in CACO (the Marconi Area, the area near Bound Brook Island, and in the Province Lands) for a six-week sport-hunting season. Refer to Section 1.2.1 of this Final EIS for a more detailed summary of the hunting program at CACO.



Hunting Related Violations and Warnings[8]**:** The following provides a summary of hunting regulation enforcement. The full staff of CACO rangers enforces hunting regulations. There is no seasonal or extra assistance needed by the NPS for enforcement duties. According to information from the NPS, there have not been any hunting related fatalities or injuries since CACO was established. Violations and warnings issued by CACO rangers are relatively few, particularly in comparison to other activities at CACO (Tables 15 and 16). During 2001, 11 of the 16 violations were specific to waterfowl hunting enforcement in the Nauset Marsh/Nauset Beach area. From 1997 to 2001, based upon the type of warning and/or the location of the violation and/or the date, none were related specifically to pheasant hunting. During 2001, no hunting related warnings were issued. There have been no hunting related injuries or fatalities to hunters or non-hunters at CACO since its inception.

Over the last 10 years, annual visitation to CACO has remained steady at an average of just under 5 million with the last few years showing some decline to a low of 4.1 million in 2004. According to statistics compiled by the Cape Cod Commission (Cape Cod Commission 2000), the year-round population for the lower six Cape Cod towns (Provincetown, Truro, Wellfleet, Eastham, Orleans, and Chatham) has increased by an average of 23 percent between 1990 and 2000. Similarly, the Commission reports that the average summer population has increased by almost 10 percent for the same period. In spite of this significant increase in the numbers of people living and recreating in and around CACO, there have been no injuries or fatalities to hunters or non-hunters at CACO since its inception. Each year, a few violation notices and warnings are issued to hunters (primarily rabbit) for being within 500 feet of a building with a loaded weapon. Most of the contacts come as a result of ranger-initiated patrols rather than complaints since the majority of the buildings (cottages) are unoccupied during this time of year. On occasion, a resident inside CACO will phone in a complaint concerning hunters walking through their property with weapons (loaded or unloaded) and a ranger will respond. More often than not, the hunter is no longer in the area when the ranger arrives. During the public scoping process, individuals related situations of near misses or shot flying over visitors. However, none of these incidents were reported to CACO rangers at the time.

Non-hunting-related violations (Table 17) exceed hunting related ones (Tables 15 and 16) by a factor of some 35 to 265 times for violations and 56 to 107 times for warnings, with some years having no hunting related warnings. In comparing the numbers of hunting-related violations and warnings to non-hunting-related violations and warnings each year, it should be noted that hunters represent a small percentage of annual users overall and may receive violations and warnings at a higher per capita frequency than other user groups. The difference in the ratio of Resource and Visitor Protection Rangers to the number of participants in various user groups may also influence violation and warning rates. A summary of the types of violations is provided in Table 17. Injuries relating to non-hunting activities occur annually at CACO, averaging 30 accident-related injuries per year from 1998 to 2005 (Unpublished CACO data). Approximately one-half of these injuries are from bicycle accidents. Non-hunting accident-related fatalities at CACO are rare, with only one bicycle fatality occurring between 2001 and 2004.

[8] Data was provided by CACO.

Table 15. Hunting-Related Violation Notices, 1997 – 2004

Violation	1997	1998	1999	2000	2001	2002	2003	2004
Possible loaded weapon within 500' of building	6	1	7	2	2	4	6	13
Permanent tree stand	0	0	0	0	0	2	0	0
Loaded weapon on bike trail	1	4	0	0	0	0	0	0
Hunting with more than six dogs	3	0	0	0	2	0	0	1
Hunting on posted land	0	0	1	0	0	0	0	0
Taking waterfowl out of season	0	0	0	0	2	0	0	0
Unplugged shotgun	0	0	0	0	5	0	0	0
Invalid license	0	0	0	0	1	0	0	0
Hunting waterfowl without stamp	0	0	0	0	3	2	0	0
Closure	1				1	0	0	1
Failure to tag deer	0	0	0	0	0	0	0	1
Total Hunting Violations	**11**	**5**	**8**	**2**	**16**	**8**	**6**	**16**
Total Violations for all Activities	382	433	383	531	628	831	754	688

Table 16. Hunting Related Warning Notices, 1997 – 2004

Violation	1997	1998	1999	2000	2001	2002	2003	2004
Possible loaded weapon within 500' of building	1	4	1	0	0	0	0	2
Hunting hours	2	0	0	0	0	0	0	0
Failure to display	0	0	1	0	0	0	0	0
Hunting with more than six dogs	3	0	3	0	0	0	0	0
No orange hat	3	1	0	0	0	0	0	0
Orange hat in wildlife area	2	0	0	0	0	0	0	0
Duplicate license	1	0	0	0	0	0	0	0
No FID in possession	0	1	0	0	0	0	0	0
Illegal taking of wildlife	0	1	0	0	0	0	0	1
Closed season	0	0	1	1	0	0	0	1
Total Hunting Warnings	**12**	**7**	**6**	**1**	**0**	**0**	**0**	**4**
Total Warnings for the Year for all Activities	668	393	251	107	100	202	121	389

Table 17. CACO Non-Hunting Related Violation Notices, 2001 – 2004

Violation	2001	2002	2003	2004
Motor vehicle related (parking, speed, off route, registration, etc.)	359	328	401	301
Alcohol/controlled substance related	86	123	84	108
Nudity/disorderly conduct/lewd/interfering with agency function	41	148	97	92
Pets off-leash/prohibited area	9	15	27	35
Illegal activities (fire, camping, metal detector, sanitation, aircraft, etc.)	33	84	73	81
B&E/vandalism/theft	1	2	6	3
Trespass/closed area	27	47	39	19
Permit violations	54	65	12	25
Fishing violations	1	7	8	2
Preservation/destruction natural resources	1	4	1	6
Hunting violations	16	8	6	16
Total Violations for the Year for all Activities	628	831	754	688

3.5.2 Hunting Related Injuries

Hunting Injuries in Massachusetts[9]: There were no fatal hunting accidents in Massachusetts from 1995 through 2005. The last hunting related fatality occurred in 1992. Twenty-nine hunting-related accidents occurred from 1995 to 2005, of which 25 involved 2 parties and 4 were self-inflicted. All accidents occurred among shooters and victims that were hunters. There were no accidents involving non-hunters.

Hunting Injuries and Injuries to Non-participants in a Nationwide Context: Virtually all hunting-related accidents occur between the victim and a member of his or her party. The most common type of hunting accident is associated with the victim not being seen by the shooter. Vision or hunter judgment related accidents comprise about 55 percent of hunting-related injuries and fatalities, based on 10 years of data from the National Safety Council. Generally, these type of injuries fall into four categories:

- the victim moved into the shooter's line of fire;
- the victim was covered by the shooter who was swinging on game;
- the victim was out of sight of the shooter; or
- the victim was mistaken for game.

Skill and aptitude deficiencies or errors comprise about 54 percent of the hunting related injuries and fatalities and fall into categories such as:

- getting the trigger caught while loading/unloading the gun;
- careless handling of a firearm, such as dropping it; or
- falling from a tree stand.

Self-inflicted injuries are typically caused by improperly handling a loaded firearm. Almost 34 percent of all hunting accidents are self-inflicted.

Based on data from the United States National Safety Council, hunting ranks very low for the number of injuries requiring hospital emergency room treatment per 100,000 participants when compared to several other recreations[10] (Table 18). Furthermore the mortality rate for hunters involved in a hunting-related accident is very low (Table 19) relative to all other types of accidents and outdoor recreational activities (Table 20). For example, activities such as bowling, golf, and fishing have higher injury rates than in hunting. Statistics indicate that only 1 non-hunting person in 100 million could die from a hunting-related accident. On average, a hunter injures only 1 non-hunter for every 12 million recreation days of hunting. Essentially, a non-hunter has a higher probability of dying from a lightning strike (40 times more likely) or an insect bite (20 times more likely) than from a hunting related incident (Table 19). Hunting has become a very safe sport relative to other common outdoor activities. The probability of being killed or injured in a hunting accident is lower than many other activities, including those within the home. Compared to other activities, hunting has one of the lowest accident rates per 100,000 people. Firearms are involved in approximately 0.8 percent of all accidental fatalities in the United States.

[9] Information provided by the MDFW

[10] The National Safety Council stopped recording accidents by activity after 2001; therefore, this data is the most current available. Fatality data from the 1990s is also the most current available.

Table 18. Annual Rates of Recreation-Related Injuries Requiring Hospital Emergency Room Treatment in the United States[1]

Recreation	Injuries per 100,000 participants
Football	2,369.2
Basketball	2,326.2
Wrestling	1,536.9
Bicycle Riding	1,400.6
Soccer	1,262.4
Baseball	1,167.4
Skateboarding	1,088.0
Softball	963.4
Ice Hockey	766.1
Boxing	676.8
Volleyball	482.7
Horseback Riding[2]	464.6
Martial Arts	461.9
Roller Skating	441.1
Weight Lifting	352.2
Ice Skating[2]	334.9
Snowmobiling	333.3
Swimming	319.0
Racquetball	130.4
Mountain Climbing	256.6
Tennis	228.3
Fishing	178.8
Golf	173.3
Archery	86.0
Bowling	56.9
Hunting	4.2

[1] U.S. National Safety Council Data 2001
[2] U.S. National Safety Council Data 1991

Table 19. Annual Rates of Accidental Deaths in the United States[1]

Accident Cause	Mortality Rate per 100,000 People
Automobiles	18.6
Home Accidents	8.6
Falls	5.0
Poisoning	2.6
Fires	1.7
Suffocation	1.3
Hunting Among Participants	0.85
Lightning	0.04
Insect Stings	0.02
Hunting Among Non-participants	0.001

[1] U.S. National Safety Council Data 1991

Table 20. Fatalities Resulting from Various Outdoors Type Activities during 1995[1]

Outdoor Activity	Deaths
Swimming	1,700
Boating	836
SCUBA Diving	97
Hunting	87
Personal Watercraft	79
Hang Gliding	28
Sky Diving	28
Football	4

[1] National Safety Council 1995

***Hunting Related Injuries in Other States*:** Based on statistics from the State of Georgia, there has been an average of 73 hunting accidents and an average of 8 fatalities each year since 1979. Tree stand and self-inflicted accidents account for 72 percent, and shooter/victim accidents account for 28 percent of the total accidents. None of these accidents have involved a person not participating in the hunting activity. Furthermore, statistics from Georgia indicate that only 4 percent of hunters are cited for some type of hunting related violation. The top five violations were hunting without wearing hunter orange, hunting big game over bait, hunting without permission from landowners, possession of illegally taken wildlife, and hunting without a license.

In North Carolina, hunting firearm related injuries were categorized based on the distance of the gun muzzle to the victim (North Carolina Wildlife Resources Commission Division of Enforcement 2003). In 12 of the 26 non-fatal accidents, the distance from the shooter to the victim was 0 to 30 feet (46%) and in 7 instances it was 33 to 150 feet (27%). Together, these close range accidents accounted for 19 of the 26 (73%) accidents; therefore, the vast majority of hunting accidents occur at close range. Accidents with a shooting distance of 153 feet or more accounted for 6 incidents (23%).

In Texas, most hunting accidents between 1996 and 2002 occurred at close range with most injuries resulting from shots within 30 feet. Some accidents occurred from 30 to 150 feet, and very few occurred over 150 feet.

***Hunting Related Injuries Based on Shotgun Ballistics*[11]:** The following provides a brief synopsis of shotgun ballistics and injury potential, illustrating that potential non-hunter victims would have to be very close to a hunter and take a direct shot without any obstruction in between for a fatality to occur. Much of the hunting on CACO is for small game such as pheasants, rabbits, and waterfowl, typically using either 12, 16, or 20 gauge shotguns. Shotgun loads for these types of hunting would be either medium (#6 and #7) or small (#8 or #9), both of which have a shorter trajectory and a lower potential for injury to non-participants. In addition, deer hunting loads, including buckshot and slugs, carry only very modest trajectories. Furthermore, required safety distances, those distances from dwellings, paved roads, and bike trails that hunters cannot hunt within, generally prevents hunters from getting close enough to non-hunters, thus preventing possible severe injuries. The distance from the shooter to the victim for a potential injury decreases with smaller (i.e., 20 gauge) shotgun gauges, shot sizes, diameter of the choke, skill of the hunter, and obstructions (line-of-sight). For example, waterfowl hunters generally use 12 gauge shotguns with heavier loads of number 2 and 4 shot, but the trajectory is pointed up, the line-of-sight open, and generally away for human activities, hence unlikely to create injury to non-hunters. The trajectory of shots aimed at squirrels and pheasants are generally pointed up, so the further away a non-

[11] Information contained in this section is based on numerous sources and general information on firearms.

hunter is the less chance of an injury. The severity of potential injuries decreases as the distance increases between the shooter and potential victim and of course considering the variable listed above. The following excerpts illustrate this fact:

> "Damage suffered from a hunting related injury from a 12-guage, birdshot shotgun wound, would largely depend on how far away the victim was from the shooter. If a potential victim was 50 or more feet away, the shot would likely embed in his skin and muscles. If he were 100 feet away or more, the shot would likely only enter the skin. In these situations, the shot would be removed in the operating room or perhaps the emergency room. He would likely be admitted to the hospital for a couple of days, given antibiotics, then would rest at home for a few days and be none the worse for wear. If the shot were from close range, well less than 50-feet, and directed at his arm or shoulder, it could severely damage the arm or shoulder joint and possibly the blood vessels in that area. Damage could also occur to the heart or lungs. This injury might require orthopedic or vascular surgery and a prolonged recovery period and physical therapy." http://www.dplylemd.com The Writer's Medical and Forensic Lab. Copyright D. P. Lyle, MD 2001).

The following discussion focuses on the number of buckshot pellets (the shot used for deer hunting) that could hit a human under "testing" conditions, not actual field conditions. A 12 gauge shotgun (the gauge used for deer hunting), fired with a load of #4, #1, or #00 buckshot could provide several marginal hits on a full length human target out to about 75 yards when directed by good set of sights and no obstructions. For example, considering the type of shot used in deer hunting, #00/9 pellet (the number of pellets per shotgun shell), buckshot has 3 hits (the number of pellets that hit the target) at 50 yards and 1 hit at 75 yards. Considering a smaller buckshot load, #00/12 pellet buckshot has 4 hits at 50 yards and 2 hits at 75 yards. A smaller load, #000/8 pellet buckshot, has 1 hit at 50 yards and 0 hits at 75 yards. Generally the energy level of these larger loads diminishes significantly between 75 and 100 yards and has a lowered penetration value. In addition, the number of hits would be reduced if obstructions were between the shooter and other individual.

Shotgun slugs are effective against deer sized game out to 75 to 100 yards. Penetration and effectiveness drop off drastically beyond 125 yards due to velocity loss and soft lead construction. The effectiveness is reduced by obstructions such as trees.

***Hunting Related Injuries in Dogs*:** Although there have been no reports of hunting related injuries to dogs, there is some potential for risk. The following provides a discussion of circumstances where a canine could be injured or killed in a hunting-related situation. Many hunters use dogs for hunting pheasants, waterfowl, and rabbits; therefore, there is some potential for injuries to hunting dogs. For dogs that are pets of non-hunting visitors, CACO rules require that the dogs be leashed limiting the potential for an accident. In general, the most serious shotgun wounds to a dog would be the ones occurring at close range because that is where the pellet energy will be the highest. In addition, at close range more pellets will affect a given area and cause more tissue destruction. Close range shots to the chest, skull, abdomen, or other vital area are obviously the most serious. Close range shots to the thick skin and muscles of the neck are far less serious. If a dog is not shot at close range, the injury will probably be minor. In general most shotgun pellets penetrate only the skin and immediate subcutaneous tissues (Shotgun Injuries in the Hunting Dog at www.ThePetCenter.com).

Summary of Safety Statistics and Ballistics: Generally, the likelihood of a fatality to a non-hunter is extremely low based both on the statistical data and the range of shotgun ammunition. The mortality rate for non-hunters is substantially less than for lightning strikes and insect stings. The effectiveness of small game shot to inflict serious injury or mortality is generally less than 100 feet. Minor injuries can occur

from 100 to 150 feet and possibly longer distances. The effectiveness of buckshot and shotgun slugs is somewhat higher up to 300 feet with a direct shot. These effectiveness distances can be greatly reduced given the presence of obstructions and the trajectory of the shot.

Setback distances of 500 feet from dwellings and 150 feet from bike trails, with the requirement that the hunter is shooting away from the bike trail, should be very effective for protecting non-hunters. Expanding the setback for bike trails to 500 feet would increase the margin of safety.

3.6 Vegetation Resources

3.6.1 Plant Communities and Succession

Cape Cod is one of the first areas colonized by Europeans in North America and has one of the longest histories of alteration. Early English colonists described Wood End, near present-day Provincetown, as "all wooded with oaks, pines, sassafras, juniper, birch, holly, vines, some ash, walnut" (Frederick 1858). They also found woodland tracts, freshwater ponds and streams, salt marshes, and areas of fertile soils.



Upland Scrub Oak, Oak and Pitch Pine, and Pitch Pine Habitat (from left to right).

As the population grew, forest was cleared for farming, and large numbers of cattle and sheep ranged the open pastures. Cedar and maple swamps were transformed into cranberry bogs. By the mid-19th century, 30 percent of the county was used for agriculture, and farming reached its peak. These changes were not without environmental costs. By the time Thoreau visited Cape Cod in the 1850s, many resources had been depleted, and he wrote the following:

> "The old houses are built of the timber of the Cape; but instead of the forests in the midst of which they originally stood, barren heaths, with poverty grass for heather now stretch away on every side.[12]"

Wood End, where the Pilgrims stood, no longer supports forest cover. Old stumps and soil outcrops in the sand plains and dunes around Provincetown indicate how much more extensive the forests once were. Throughout the early 20th century human activities such as livestock grazing, agriculture, and accidental fires, continued to suppress tree growth. However, late in the century these activities were substantially decreased. Grazing and other forms of agriculture are no longer practiced on the Outer Cape, and natural and human-caused fires have been suppressed. These changes have resulted in an increased tree cover; pitch pine (*Pinus rigida*) and scrub oak (*Quercus ilicifolia*) have prospered, and the amount of heathland has decreased (Carlson *et al.* 1992).

[12] Thoreau, H.D. 1988 [1865]. *Cape Cod.* Joseph J. Moldenhauer, ed. Princeton Univ. Press, Princeton, NJ.

At least 800 species of plants occur within CACO in a wide variety of community types, including heathlands, freshwater and saltwater wetlands, upland forests, beaches, dunes, and grasslands. A 1991 vegetation study revealed 24 vegetation cover types within CACO (NPS 1991). This information is being updated through an ongoing mapping project, using aerial photography taken during 2000. Figure 5 provides the locations of these mapped vegetative communities and habitat, based on this ongoing mapping effort. These cover types and approximate acreages are shown in Table 21.



Tidal stream, low shrub, and herbaceous vegetation.

The vegetation in CACO is constantly changing in response to both natural and human-induced factors (including storms, sea level rise, fire, and human use). Recognizing changes in species composition and vegetation structure, and determining what factors contribute to these changes, are essential for effective management.

CACO staff initiated a revegetation program in 1985 to stabilize more than 900 acres of barren dunes in the Province Lands. To date, 110 acres of dunes have been planted with beach grass. This work was based on the assumption that human disturbance (such as deforestation and livestock grazing) had initiated dune migration (Leatherman *et al.* 1981). More recent information indicates that the Little Ice Age, with its correspondingly cooler temperatures and drier winds, may have contributed more to dune migration than human disturbance (Winkler 1990).

See 3.0 Affected Environment – Figure 5 (6 pages)

Table 21. Vegetative Community Cover Types for CACO

Cover Type	Description	Acreage	Notes
Forest	Generally a mix of mature pitch pine and mixed aged oaks	2,897	Primary habitat for deer and squirrels. Some rabbits, quail, and stocked pheasants may be found in these areas.
Woodland	A mix of various sized hardwoods and pines with no species dominance	12,931	Primary habitat for deer and squirrels. Some rabbits, quail, and stocked pheasants may be found in these areas.
Shrub	Along the leeward side of the dunes	3,456	Habitat for rabbits, stocked pheasants, and quail.
Dwarf Shrub	Along the leeward side of the dunes	364	Habitat for rabbits, stocked pheasants, and quail.
Grassland	Various annual and perennial grasses	46	Habitat for rabbits, stocked pheasants, and quail.
Open Dunes	Adjacent to the beaches	3,693	Very limited hunting opportunities here.
Beach	Natural beaches on the Atlantic and Bay sides	1,967	Very limited hunting opportunities here.
Wetland	Salt marshes	4,348	Large expansive emergent areas, generally open to waterfowl hunting.
Water	Freshwater ponds and lakes	1,035	Many of these areas are too close to buildings and are probably not hunted.
Developed	Residential, municipal, and commercial	7,999	Closed to hunting.
Disturbed	Human impacted areas	410	May provide some habitat for generalist species.

Heathland communities support a wide diversity of plants and animals, including many endemic species that are becoming increasingly rare. Protected heathlands are very rare in North America and uncommon globally. Approximately 670 acres of heathlands are found in 9 major areas in CACO. Some of these heathlands are becoming forested because of natural succession (tree growth). An ecological survey of heathlands (which includes management recommendations) was completed in 1992 (Carlson *et al.* 1992).

3.6.2 Plant Species That Are Endangered, Threatened, or of Special Concern

Between 1984 and 1987, the distribution of rare plants in CACO was mapped. Of all habitats surveyed, pond shores support the most threatened and rare plant species in CACO (NPS 1989). Massachusetts has listed 20 plant species within CACO that have been classified as threatened, endangered, or of special concern (Griffin 2006). Of these, four species have been recorded historically but have not been confirmed in recent years. There are no federally listed plant species known to occur in CACO.

3.6.3 Non-native Plant Species

Non-native species of plants have been introduced to CACO ecosystem and potentially compete with and displace native species. Data on the distribution, abundance, and impacts of non-native species on native biota and physical processes are currently limited to specific areas, including pond shores, salt marshes, and areas around some CACO facilities.

3.7 Cultural Resources – Cultural Heritage

Maintaining the cultural heritage of the Outer Cape Cod is an important aspect of the CACO mission statement,

> "CACO was established to preserve vital elements of the Cape's character, including flora and fauna, physiographic conditions, historic sites and structures, cultural heritage, and other unique natural and cultural features. This character also includes a certain ambience that is subtler and harder to define, but that provides both a sense of peace and relative isolation. A distinctive pattern of human activity has both shaped, and been shaped by, this special place. Management of the Seashore is a delicate balance in which the human needs of today and tomorrow must be addressed within the context of both preservation and tradition."

CACO was created in part to help preserve and maintain cultural heritage. This heritage is about people whose ways of life are traditionally associated with sites, structures, other material features, and natural resources in CACO. Several Cape Cod cultural communities have been identified as having traditional associations with the resources here, including Native Americans, Portuguese and Portuguese Americans, Cape Verdeans, and contemporary neighbors.

Cape Cod families who have hunted within CACO for generations could also be considered cultural heritage resources, as could the places they hunt and the game they have traditionally hunted. Numerous hunting families who have hunted for generations for the same game in the same areas of CACO were identified in the public meetings and through other forums. The vibrancy of traditional uses and ways of life on the Outer Cape is represented by these people. At one meeting, three generations of hunters from the same family were present. Preserving this cultural heritage should be compelling. The GMP calls for encouragement of customary activities and for collaboration with local entities to preserve and conserve the intangible elements of their cultural heritage, such as arts, skills, folk life, and folkways.

3.8 Public Use of CACO

3.8.1 Access

U.S. Route 6 is the primary access route for CACO. Roads and trails provide public access to CACO resources, and the access largely determines the range of public activities and experiences. There is increasing demand for access to ocean beaches, kettle ponds, historic sites, and other public use attractions, all with limited on-site parking. CACO managers must protect sensitive resources while providing an appropriate level of access to a variety of settings.

Access to some environmentally sensitive areas such as shoreline cliffs, kettle ponds, and dunes is often limited in order to protect these resources or out of concern for public safety. The presence of town-owned and privately owned property within CACO also leads to some access restrictions. Sand roads are a traditional means of access that link many features in CACO, yet ownership and access rights along these corridors are often complex, and the mixture of ownerships can confuse visitors. In developed areas of CACO and in town commercial areas, access is limited by the capacity of local access roads and the availability of on-site parking.

As access and parking facilities are lost to coastal erosion, CACO and surrounding towns are exploring cooperative solutions to public access and transportation problems. CACO staff are working with local,

county, and state agencies to identify transportation alternatives, particularly for the peak summer months, and are contributing to the Cape Cod Commission's *Long Range Transportation Plan.*

3.8.2 Facilities and Services

***Available Facilities*:** CACO provides a variety of facilities to support public use. Most facilities were built by the NPS or inherited from the state during the first decade after CACO was established. All the original facilities built in the 1960s are still in service. The towns own most of the Orleans and Chatham areas of CACO, and most management of these areas has been almost totally assumed by these towns. Except for the developed Nauset Town Beach, public facilities and services are lacking in the southern part of CACO.

Public facilities managed by CACO consist of six ocean beaches with bathhouses, two visitor centers, headquarters, and two environmental education centers. Smaller developments include 3 picnic areas with comfort stations, more than 10 historic sites and buildings, 8 interpretive trails, 3 bike trails, and 3 interpretive shelters. Most roads in CACO are owned and maintained by towns. Federally owned roads maintained by CACO include Doane Road and Cable Road in Eastham, Marconi Area roads in Wellfleet, and Race Point and Province Lands roads in Provincetown. Ownership of the sand (i.e., unsurfaced) roads is a mixture of municipal, federal, and private entities. CACO operates and maintains the following public use facilities:

Roads, trails, and parking - 25 pedestrian trails (24.5 miles), 3 bicycle trails (10.8 miles), 39 roads (22.5 miles), 3 horse trails (10.7 miles), 23 parking lots (2,600 spaces at beaches, 450 at visitor centers, 310 at picnic areas and trailheads, 73 at historic sites), 60 fire roads (35 miles), and 1 auto bridge.

Buildings and developed areas - 12 comfort stations/showers, 2 visitor centers with amphitheaters, 4 major picnic areas, 2 environmental education centers, 1 oversand station, 1 golf clubhouse and golf course, 1 snack bar, and 10 historic structures with public access.

***Capacity of Facilities*:** Nearly all public use opportunities within CACO are easily accessible. Parking lots are close to attractions, and most hikes are short and easy. Most visitors recreate together at the developed sites regardless of their level of ability, available time, or desire for challenge. In the summer, destinations are often crowded and sometimes suffer from overuse. Visitation meets or exceeds capacity at existing public use facilities at times, particularly at parking lots at certain beaches, visitor centers, trails, and scenic viewing areas.

The daily capacity of CACO was projected in the 1970 *Master Plan* as 48,000 people. This number was based on the maximum use of existing and proposed parking spaces at all locally, federally, or privately owned facilities within the boundaries of CACO. In 1995, the NPS managed more than 20 public use facilities, including onsite parking for approximately 3,400 vehicles. Towns and private operators provided recreation facilities with more than 5,000 additional onsite vehicle parking spaces. Use levels and access throughout CACO have been managed by the capacity and convenience of connecting roads and the size of onsite parking lots. There has been little coordinated federal, state, and local policy in regard to use levels. Visitors' perceptions of crowding or overuse indicate that they are willing to tolerate many other people at individual sites as long as they do not have to search for parking.

***Facility Use Survey*:** A 1994 study (Manning 1994) indicated that the most heavily used facilities and services in and around CACO are restrooms, restaurants, parking areas, self-guided nature trails, bookstores, and orientation films at visitor centers. The Audubon Sanctuary, gift and antique shops, roadside exhibits, and hotels, motels, and inns outside CACO are also heavily used. Visitor and resident

satisfaction with facilities and services was quite high, according to the survey. However, visitors expressed some dissatisfaction with CACO restrooms, parking (in general), Herring Cove Snack Bar, and facilities at Spectacle Pond. The most frequently mentioned public concerns were the presence of litter, the number of people, traffic, noise, and the adequacy and cleanliness of facilities (Manning 1994).

3.8.3 Profile of Visitation and Visitors

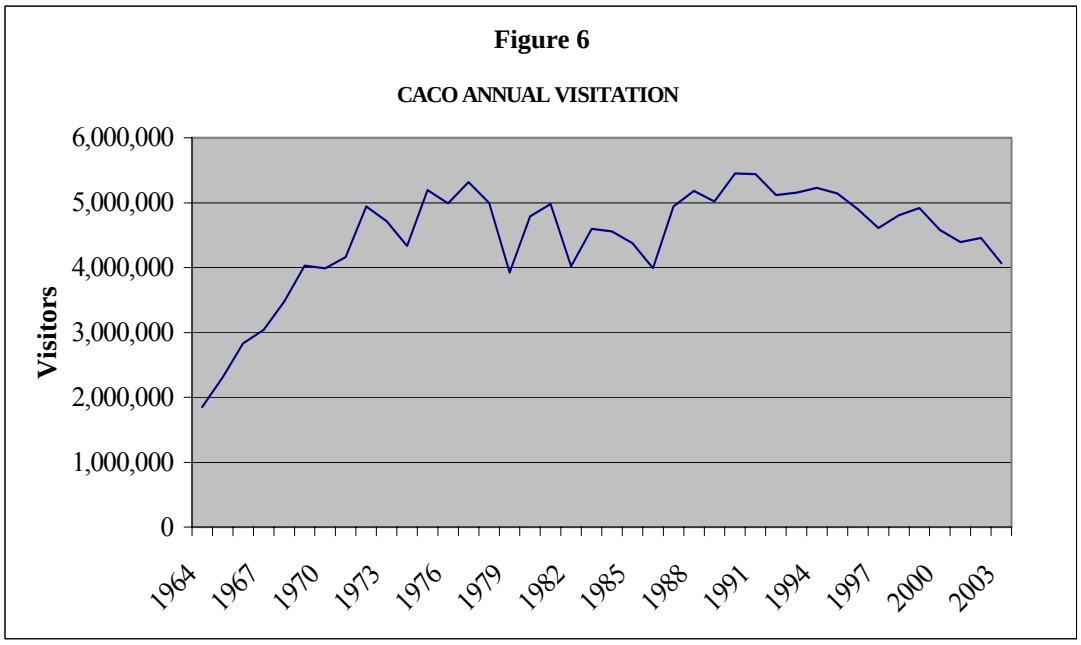
***Overview of Visitation*:** Two studies were completed with the purpose of documenting visitor profiles and uses of CACO. The first was conducted in 1992 by Manning (1994) and primarily focused on visitor profiles and uses. More recently during a study by Kuentzel (2006) CACO visitors were contacted during 2004 and a follow-up questionnaire was provided during 2005. This study covered the same general purpose, but also provided more detailed data on attitudes towards hunting and potential conflicts between hunters and other visitors.

In 2003, tourists made about 4.1 million visits to CACO, ranking it as the 11th most visited area in the National Park System.[13] The promotion of Cape Cod as a resort and tourist destination began almost a century ago, and it was firmly established in 1961 when CACO was authorized. In 1964, 1.8 million visits were counted, and by 1969 that visitation had more than doubled to over 4 million. Visitation reached over 5 million in the 1970s, and it has generally fluctuated between 4 million and 5 million in the years since (Figure 6).

In the most recent decade, visitation has decreased from a high of 5.3 million in 1994 to roughly 4 million in 2003 (Figure 6). The reasons for this decrease are not entirely clear. It may be part of the natural variation experienced since CACO was established. Changes in the Cape Cod region may also be a contributing factor. Most notably, the more than doubling of year-round and seasonal residents has had a dramatic effect, contributing to traffic congestion, site-specific use pressures, and resource degradation. Many visitors have said that they visit less frequently or in alternate seasons as a result of the increased traffic and congestion.

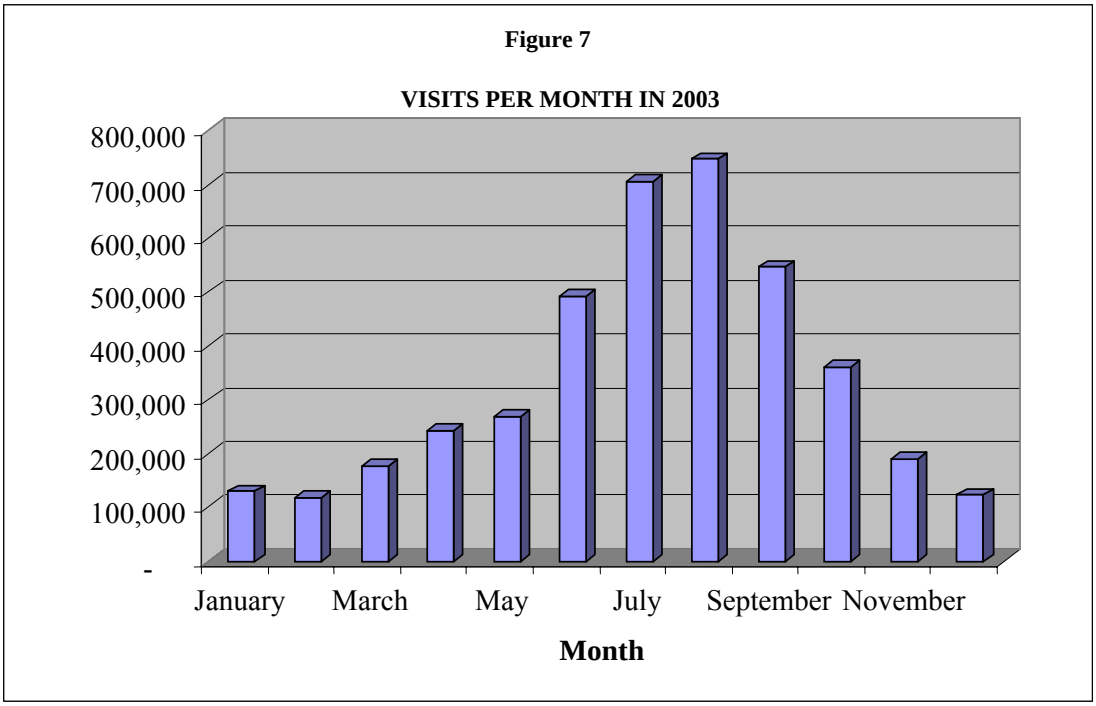
[13] These statistics include repeat visits and visits by one person to more than one area of CACO on a single day.

Figure 6



The majority of visits to CACO occur in the summer months. As demonstrated in Figure 7, nearly two-thirds of all visits in 2003 occurred from June through September. However, visitation in the "shoulder" months of early spring and late fall has grown, partly as a result of marketing and promotional efforts made by planners and businesses owners. A great deal of this growth may also be attributed to the dramatic increase in the number of vacation homes that are owned by visitors (approximately 7% in 1992 to about 34% in 2005).

Figure 7



The park is used mainly during the day; however, evening programs have been popular, and requests often exceed the programs available. Frequent visitors generally have a consistent pattern of use, usually engaging in particular activities at favorite sites in CACO during the day and leaving in the afternoon or evening to seek overnight accommodations in the local and regional area. The most popular destinations in the Outer Cape Cod region are beaches managed by the NPS, visitor centers, headquarters, the Marconi Station site, lighthouses, Nauset Beach, Fort Hill and trails, and the Atlantic white cedar swamp. According to the survey, most visitors do not consider CACO their primary destination on Cape Cod. Of summer visitors surveyed in 1992, approximately 18 percent indicated that CACO in particular was the primary reason for the trip to Cape Cod; this compares with approximately 16 percent of fall visitors, 22 percent of winter visitors, and 13 percent of spring visitors (Manning 1994).

***Profile of Park Users*:** A survey of visitors and local residents conducted in 2004 indicated that most CACO visitors (76.4%) come from the northeastern United States (New England states, New York, and Pennsylvania) although a total of 46 states were represented (Kuentzel 2006). Over one-third of the visitors were from Massachusetts. The mean size of groups visiting CACO is three (2.67 in 2004) in the summer, two in the fall (1.98), and two in the winter and spring. In general, visitors tend to be frequent, repeat visitors, and more than 85 percent of Cape Cod residents reported frequent visits to CACO.

CACO visitors often were families with children. In 2004, 37 percent of the people questioned had children with them during the summer, but only 7.8 percent during the fall. Consistent with the characteristics of Cape Cod residents, CACO visitors are typically in their mid-forties during 1992 and the average was 55 during 2004. The average age of fall visitors was 49 in 1992 and 55 in 2004, showing a dramatic increase. The number of visitors having college degrees increased from 1992 to 2004, going from 75 to 81 percent during the summer and 60 percent to 73 percent in the fall. Many visitors reported annual household incomes of $50,000 or greater. The percentage of visitors from 1992 to 2004 that were retirees also increased, going from 9 to 12 percent during the summer and 21 to 31 percent during the fall. The majority of visitors, 93 percent in summer and 100 percent in winter, travel to CACO by car, truck, or motorcycle. A small percentage of visitors travel by recreational vehicle, boat, or plane during the summer.

In the summer season, many visitors stay in rented homes, while spring and fall visitors primarily stay in hotels or motels. Winter visitors stay in their own privately-owned houses, as found during 1992. A total of 7 percent of CACO visitors stayed in their own vacation homes during 1992. In 2004, 36 percent of the summer visitors stayed in their own vacation homes. This increase was related to a decline in the proportion of people who stay in hotels and the proportion of people who rent houses/cabins at the Cape.

Expenditures by CACO visitors totaled $333 million in 1992, approximately half of which was spent in the summer season. The greatest percentage of these expenditures was for lodging, followed by food and beverages and retail shopping. During their visits, more than half of summer, spring, and fall visitors patronized Cape Cod restaurants, and approximately one-third of these visitors shopped area gift and antique stores.

***Recreational Uses*:** The vast majority of CACO visitors (over 99%) use CACO for recreational purposes (with the remainder including uses such as research). NPS provides and maintains a wide variety of recreational resources for Park users, including hiking and cycling trails, educational presentations and exhibits, ranger-guided nature walks, picnic and camping areas, and access for boating and fishing in designated areas. According to the Manning (1994) CACO user survey, the principle activities taking place in CACO were viewing scenery, sunbathing, swimming, beachcombing, hiking, and taking scenic drives. The level of participation in these activities was dependent upon the season (Manning 1994).

Summer visitation, roughly from Memorial Day to Labor Day, consists of regional, national, and occasionally international visitors. These visitors are attracted by outdoor activities, principally swimming, sunbathing, and beachcombing. Other outdoor activities such as nature study, photography, picnicking, and camping (at private or state campgrounds) are also quite popular. More than half of all visitors participate in some road- and trail-related activities, including driving on scenic roads, hiking, and bicycling. More than a third of the summer visitors take advantage of educational displays, ranger-guided programs, and other services offered through the visitor centers. These centers receive about half of their annual visitation during this 10-week period. The wider configuration of the Outer Beach and the presence of sport fish make summer the peak season for surf fishing and off-road vehicle (ORV) beach driving.

Winter visitation (November through March) consists primarily of local and regional visitors. Despite frequently harsh weather, winter visitors continue to be attracted to the beaches to walk, beachcomb, and watch nor'easter storms. Most visitors favor scenic driving and hiking, but when the weather permits, cross-country skiing and bicycling are also popular. Off-season visitors take advantage of exhibits and services at the visitor centers and historic structures, although these facilities often are closed or run at reduced schedules.

Tables 22 and 23 highlight the relative importance of recreational activities occurring within CACO, during 1992 (Manning 1994) and 2004 (Kuentzel 2006), respectively. As noted, swimming, sunbathing, beachcombing, driving, and hiking are major attractions. Somewhat less popular activities include bicycling, viewing visitor center exhibits, picnicking, nature study, photography, and visiting historic sites. Activities such as freshwater fishing, shellfishing, horseback riding, ORV driving, surfing, SCUBA diving, boating, windsurfing, ranger-guided activities, hunting, and cross-country skiing were less popular among survey respondents, with fewer than 10 percent of surveyed visitors participating in any given season. Hunting was among the least common activities occurring within CACO, with less than one percent of visitors engaging in the activity in each season.

In general, residents of Cape Cod engage in similar recreational activities to those of out-of-town visitors. The most common activities among residents are viewing scenery, swimming, scenic drives, beachcombing, and sunbathing. The least common activities of residents are SCUBA diving, tour bus rides, cross-country skiing, and hunting. It is noteworthy, however, that approximately 3.8 percent of surveyed residents hunt within CACO, a figure that is significantly higher than for visitors in general. Shoulder seasons (April – May and September – October) are the most popular periods for many local and regional visitors because of the combination of moderate weather and smaller crowds.

Table 22. Relative Levels of Participation in Recreational Activities at CACO (1992)

Activity	Seasonal Level of Participation			
	Summer	Fall	Winter	Spring
Ocean swimming	60.9%	15.5%	11.5%	15.6%
Pond swimming	15.1%	2.8%	1.0%	4.5%
Sunbathing	64.2%	13.6%	22.1%	32.6%
Beachcombing	54.6%	50.0%	54.8%	62.6%
Saltwater fishing	11.6%	8.9%	7.7%	6.8%
Freshwater fishing	1.9%	1.9%	1.0%	2.3%
Shellfishing	4.7%	3.8%	1.9%	2.3%
Hiking	46.4%	50.6%	49.0%	48.7%
Cycling	31.5%	22.5%	14.4%	25.5%
Scenic drives	53.9%	62.0%	53.8%	60.9%
Horseback riding	0.6%	0.9%	2.9%	1.7%
Off-road vehicle use	7.1%	4.4%	1.0%	2.5%
Surfing	2.9%	1.6%	3.8%	1.7%
SCUBA diving	1.3%	0.3%	1.0%	0.0%
Boating	9.3%	4.7%	5.8%	4.0%
Windsurfing	1.8%	0.3%	1.0%	1.4%
Viewing scenery	71.5%	78.5%	76.9%	80.5%
Camping	11.3%	5.1%	3.8%	7.4%
Picnicking	31.1%	21.8%	15.4%	27.5%
Nature study	25.3%	24.1%	28.8%	28.2%
Photography	29.1%	35.8%	32.7%	31.2%
Ranger-guided activities	8.3%	6.0%	7.7%	6.5%
Visiting historic sites	29.5%	32.3%	17.3%	28.6%
Tour bus rides	0.9%	0.3%	0.0%	0.0%
Cross-country skiing	0.6%	0.3%	0.0%	1.1%
Hunting	0.4%	0.9%	0.0%	0.6%
Viewing visitor center exhibits	39.1%	48.1%	40.4%	45.3%
Other	8.5%	6.3%	2.9%	8.5%

Source: Manning 1994.

Table 23. Relative Levels of Participation in Recreational Activities at CACO (2004)

Activity	Summer Visitors	Fall Visitors
Ocean swimming	86.2%	50.9%
Pond swimming	29.1%	10.1%
Sunbathing	80.2%	51.5%
Beachcombing	67.6%	66.1%
Saltwater fishing	21.3%	18.5%
Freshwater fishing	04.2%	2.2%
Shellfishing	5.7%	4.5%
Hiking	50.2%	52.9%
Cycling	52.6%	35.1%
Scenic drives	64.0%	72.0%
Horseback riding	1.5%	1.6%
Off-road vehicle use	11.1%	11.2%
Surfing	6.6%	3.6%
SCUBA diving	0.3%	0.8%
Boating	20.7%	14.6%
Windsurfing	0.9%	0.8%
Viewing scenery	75.1%	84.4%
Camping	15.3%	9.5%
Picnicking	47.1%	35.3%
Nature study	26.7%	31.6%
Photography	44.7%	46.9%
Ranger-guided activities	10.5%	10.1%
Visiting historic sites	29.1%	39.3%
Tour bus rides	0.9%	2.0%
Hunting	0.3%	0.4%
Cross-country skiing	0.3%	1.0%
Viewing visitor center exhibits	40.8%	50.9%
Other	8.1%	7.7%

Source Kuentzel 2006

***Quality of Recreational Experience*:** In the Manning (1994) user survey, greater than 95 percent of CACO users rated their experience at CACO as "good" or "excellent." Visitors expressed general levels of satisfaction with the management of particular recreational activities within CACO. Participants communicated high levels of satisfaction with beach experiences, self- and ranger-guided trail walks, and boating, fishing, and cycling. They expressed a nominal level of interest in increasing the number of hiking/walking and bicycle trails and providing more rustic camping opportunities for backpackers. The majority of visitors and residents said that CACO employees were friendly and helpful.

The public concerns mentioned most frequently in surveys were the presence of litter, the number of people, traffic, noise, and the adequacy and cleanliness of facilities. Most visitors and almost half of the residents surveyed said that crowding at CACO was not a problem, and a majority did not support the idea of placing overall limits on the numbers of visitors at a given time.

The majority of surveyed CACO users, both visitors and residents, emphasized the importance of maintaining balanced management of the natural resource and public use dimensions of CACO and valued preservation of natural resources over public use of the area.

***Regulations and Safety*:** All public use activities at CACO are managed to preserve and protect resources, promote public safety and enjoyment, and minimize conflicts between users and others. All activities are subject to the regulations found in the CFR on Parks, forests, and public property, as well as various titles of the *United States Code*.

While there have been no hunting related injuries, some individuals do not visit CACO during the fall and winter based on concerns related to safety. Some individuals (31.9%) report avoiding areas where hunters are present or on days when hunting occurs, but there is no evidence that areas where hunting is prohibited are also avoided due to hunting taking place elsewhere in CACO.





Examples of regulations that apply to all visitors.

DLW In addition to nationwide regulations, special regulations have been added for CACO. These regulations pertain to activities that require special rules or codes to protect public safety or resources or to control ORV use (routes, access periods, equipment, permits), camping (limited to self-contained ORVs on beaches), aircraft use (permitted landing area), motor boating (permitted areas), shellfishing (town regulation), and hunting (based on state regulations). Public nude sunbathing at CACO is prohibited by regulation.

The CACO superintendent has discretionary authority to impose additional regulations regarding designations, closures, and limits of certain permitted activities, including hours of operation, campfires, fee collection, pets, hunting and fishing, surfing, personal watercraft use, horseback riding, skating, smoking, consumption of alcoholic beverages, public assembly, special events, speed limits, and bicycle use.

Some customary activities like hunting and fishing predate the establishment of CACO and are identified in its enabling legislation. Those activities are allowed under the discretionary authority of the superintendent.

CACO maintains cooperative agreements with local police and fire departments. These agreements are critical to managing public uses and protecting resources. In 1995, CACO protection rangers recorded 734 incident reports, 376 courtesy tags (warnings), and 983 violation notices issued. The largest number of offenses was for traffic violations, vandalism, natural resource violations (poaching, dumping, etc.), theft, burglary, nudity, drug possession, and drunk and disorderly conduct. There were 170 emergency incidents in 1995, which mostly involved lost children; swimming-related incidents; and bicycle, boating, and motor vehicle accidents. Rangers typically arrest 10 to 15 people annually; usually they are drug, alcohol, or assault cases. There have not been any arrests related to hunting activity.

3.8.4 Hunting Activity

Section 7(c) of the legislation authorizing CACO (Public Law 87-126, August 7, 1961) authorizes the Secretary of the Interior, cooperatively with the Commonwealth of Massachusetts, to permit and regulate hunting and fishing within CACO. Hunting is currently allowed on approximately 37,641 acres of Federal land within CACO. Table 2 reviews the hunting seasons and additional CACO-specific regulations.

To assess effects of the management alternatives, it is important to examine the level of hunting activity at CACO. The recently completed CACO Hunting Survey (Kuentzel 2006) provides key information. This survey, conducted in 2004 and 2005, presented hunters with questions concerning their hunting habits, preference for hunting at CACO versus substitute locations, and other considerations. The survey was administered to three separate respondent groups: (1) hunters intercepted at CACO; (2) a random sample of licensed hunters in Barnstable County; and (3) a set of self-selected hunters from Outer Cape hunting organizations. Kuentzel (2006) provided a current assessment of visitor characteristics and use of CACO.

Survey responses from hunters using CACO suggest the following characteristics:

- Hunters using CACO most commonly target deer, waterfowl, pheasant, and rabbit. Over 70 percent of hunters intercepted at CACO listed deer as their preferred species.
- Based on the survey of hunters in the field, the most heavily hunted areas of CACO include the Marconi WMA and the Collins Road/kettle pond area. However, hunting occurs in many areas of CACO (Figure 2).
- In general, CACO is used by a limited set of local hunters who hunt extensively. Hunters intercepted at CACO indicated that they hunt at CACO 32 days out of the year on average. This exceeds the average hunting days for Massachusetts hunters (17.5 days per year) by a large margin (USFWS 2001). Inspection of license plates in parking areas suggests that CACO hunters are Massachusetts residents, primarily from Cape Cod (NPS 2003 and 2004a).

To develop a bounded estimate of baseline hunting activity, the following analysis incorporates data from the recent CACO Hunting Survey (Kuentzel 2006). The survey indicates 43 percent of licensed Barnstable County hunters have hunted at CACO in the past 12 months. Approximately 84.4 percent of the Barnstable hunters had hunted at CACO at some time in the past. Of those, 68.6 percent (or 57.9% of all people in the license sample) said they hunted "most" years or "every" year. This figure can be multiplied by the total number of licensed Barnstable County hunters to derive a rough estimate of the total number of hunters using CACO each year.[14] Next, the analysis considers the average number of days that each individual hunts. Survey responses from licensed hunters indicate that those who use CACO regularly hunt there an average of 20.1 days per year. Hence, the estimated total CACO hunting days is 25,151 days per year, cumulatively (Table 24).

Table 24. Estimate of CACO Hunting Days as a Percent of Licensed Hunters

Number of Licensed Barnstable County Hunters	2,910
Percent of Licensed Hunters Who Use CACO	43.0%
Average Annual Number of Days Per Hunter	20.1
Estimated Hunting Days	25,151

Sources: CACO Hunting Survey (Kuentzel 2006).

[14] The Massachusetts Department of Fish and Game maintains hunting license data in paper form only and, therefore, was unable to provide specific data on the number of hunting licenses issued in Barnstable County. The figure used here (2,241) is derived by multiplying the Massachusetts hunting rate by the population of Barnstable County. Specifically 0.98 percent of Massachusetts residents hunt (USFWS 2002); multiplying by the county population (228,683) yields the estimate of 2,241 hunters in Barnstable County. Massachusetts has a very low hunting rate compared to other states; to the extent that Cape residents are more avid hunters than Massachusetts residents overall, the analysis may understate CACO hunting activity.

3.8.5 Use/Resource Conflicts and Attitudes Towards Hunting

The scoping process for this EIS revealed some tension between different interest groups involved in the issue of hunting at CACO. This tension divides hunters, whose views on hunting appear to be strongly held and rooted in values and personal history, from non-hunters, whose values may be reflected in their choice of other recreational activities. This issue is also stratified by traditional residents of Cape Cod and newcomers, who have taken up summer or year-round residence relatively recently.

This impact analysis does not attempt to present a comprehensive assessment of all the views either for or against hunting. The objective is to frame the positive and negative social effects that different groups would potentially experience under the various regulatory alternatives, and look for ways not to reconcile the different opinions, but to find opportunities to balance the uses and share the resources at CACO if possible, to meet the divergent interests in the Park while acknowledging the reality of those differing values and views.

The scoping process involved public outreach meetings with towns, animal rights advocates, and hunting organizations, as well as acceptance of letters (conventional and e-mail) from interested parties. Meeting notes and written correspondence help identify key affected groups, characterize their views on hunting in CACO, and understand how they would be affected by changes to the hunting program. Additional information is taken from a 1992 survey of CACO visitors and Outer Cape residents (Manning 1994). Data gathered in a similar survey of CACO visitors and Cape Cod residents provides a more detailed understanding of the social effects associated with the CACO hunting program (Kuentzel 2006).

***Hunter Attitudes Towards Hunting*:** Many hunters feel that a sense of tradition surrounds hunting. The cultural heritage of hunting was highlighted by many individuals offering comments in the public scoping meetings (NPS 2004a). Likewise, in the hunting survey (Kuentzel 2006), 23 percent of hunters identified "tradition" as their primary motivation for hunting at CACO. Finally, 98 percent of hunters surveyed agreed with the statement that "hunting on Cape Cod is an important tradition."

Similarly, hunting is frequently a practice shared by family members and passed on from one generation to another. Maintaining this sense of continuity is often important to hunters. Hunters often hunt in groups, so that hunting may provide a chance to bond with family and friends. Hunting trips may be the basis of additional social interaction.

While it is unlikely that outright subsistence hunting exists on the Outer Cape, hunting may supplement the food budgets of some families. In the scoping process, some hunters indicated that they combined food from hunting with food obtained in other sporting and recreational pursuits (e.g., lobster, fish). In the hunting survey (Kuentzel 2006), 16 percent of hunters identified "food/subsistence" as their primary motivation for hunting at CACO. Likewise, nearly 78 percent of hunters agreed with the statement that hunting is important because it provides a supplemental source of food.

The CACO hunting survey (Kuentzel 2006) included two questions that examine how respondents perceive the substitute hunting sites that they would use in the event of a CACO hunting ban. First, respondents were asked to rate the quality of hunting at the substitute site, relative to hunting at CACO, on a scale of 1 to 10, with 1 being not as good as CACO, 5 being the same as CACO, and 10 being better than CACO. Of the hunters who said they would choose a substitute site, the average rating was 4, indicating that hunting at the substitute sites would be roughly the same quality as CACO. A second question asked the respondent to rate the convenience (e.g., travel distance, access) of the substitute site, with a low rating indicating a site less convenient than CACO. On average, the hunters rated the alternative sites at about 3, indicating the sites would be somewhat less convenient than CACO.

***CACO Non-hunting User Attitudes Towards Hunting*:** Residents and visitors were somewhat unaware about the presence of hunting at CACO. Almost 30 percent of residents and 80 percent of non-residents did not know that hunting was allowed at CACO. Overall results from the attitude research shows that residents and visitors are almost evenly split across the spectrum of opposition and support for hunting. Approximately 20 percent of those surveyed strongly oppose hunting, and there is a slightly smaller group (16%) of residents and visitors who are strongly supportive of hunting. About one-quarter of the residents and visitors generally do not have an opinion either for or against hunting. An additional one-third are either somewhat for or somewhat against. Thus, the majority of visitors and residents surveyed (approximately two-thirds) do not have strong feelings about hunting. Residents and visitors are typically not concerned with the ethics of hunting, and respondents to the survey generally *disagreed* that hunting was wrong or unethical. Overall, respondents report less opposition to hunting as a recreational activity in 2006 than in 1992.

Opinion about whether hunting is appropriate *at CACO* shows a greater number of resident and visitors are uncomfortable, with between 40 and 50 percent of residents and visitors opposed to hunting at CACO and 30 to 40 percent in favor of hunting at CACO. Summer visitors were the most opposed to hunting at CACO, and visitors overall were more likely to oppose hunting at CACO than residents. Visitors were also more likely than residents to be concerned about safety issues related to hunting at the Seashore. However, almost no visitors, either in the fall or summer, reported situations where they felt unsafe because of hunters or hunting activity (~10%).

Survey responses indicate that, when conflicts have been reported, non-hunters were the antagonists. The surveys (Kuentzel 2006) provided evidence that some non-hunters (approximately 1/3) feel hunting is in conflict with other activities and the CACO general purpose, and of this group, a smaller number is opposed to hunting under any circumstances. Essentially, this study documents some conflict for a minority of users due to differing philosophies of activities that are appropriate uses of CACO.

Data collected by an NPS intern suggested that common winter activities such as hiking and dog walking decrease during the week-long shotgun hunting season, suggesting that this week-long hunting event deters other types of recreation (NPS 2005a). During the scoping process, several non-hunting individuals provided personal accounts of conflicts with hunting and hunters. Notwithstanding these accounts, none have been documented through formal complaints. Likewise, anecdotal evidence was offered through an unofficial survey of CACO visitors, suggesting that negative interactions may occur between hunters and non-hunters (NPS 2005b). Some Park users believe that the sight of hunters and sound of gunshots can undermine their enjoyment of CACO. In the recent survey (Kuentzel 2006), visitors and residents expressed low tolerance for sharing the same space with hunters or experiencing hunting activity. However, fewer than 10% of visitors reported situations in which they felt unsafe because of hunters or hunting activity.

In the hunter survey (Kuentzel 2006), 46 percent of CACO hunters reported being harassed by people who were not hunting. In contrast, non-hunters reported very few incidents where they were harassed by hunters; for instance, less than one percent indicated that they had argued with hunters. The relative lack of conflict may be partially attributable to visitors avoiding areas frequented by hunters as well as of hunters avoiding areas most frequented by non-hunters. It is important to note that on-site conflict between hunters and non-hunters has actually not resulted in serious altercation or continuing problems. Generally, users move away from one another and continue with their individual pursuits. This is consistent with other findings of the survey, which showed that visitors generally wish to stay on and around amenities at the Seashore that are readily accessible by road. Hunters report a desire to avoid developed amenities, and express little interest in the beaches or picnic areas at the Park. These groups are generally looking for different experiences and different areas of the Park. This provides some opportunity for considering ways to balance these uses at CACO. Fall hikers and other non-hunting users

seeking solitude may be an exception since these types of users seek conditions similar to those desired by hunters.

***Resident Attitudes Towards Hunting*:** Attitudes of residents living near CACO are similar to those of non-hunting CACO visitors. Residents use CACO during the periods outside of high tourist season; therefore, they likely represent a significant share of CACO users during the fall and winter months.[15] Although perceptions of hunting are somewhat more positive in 2005 than in 1992, nearby residents have concerns about hunting related to noise and safety. For example, some participants at scoping meetings pointed to hunting as a source of anxiety over personal safety and enjoyment of their property. In the recent survey of residents, 51 percent felt that there are too many year-round residents for hunting at CACO to be safe (Kuentzel 2006). Some residents also expressed concern over their property rights, citing instances when hunters may have trespassed, although actual violation notices suggest otherwise. Some residents object to hunting under any circumstances. Over 55 percent of residents disagree with the statement that hunting for sport is an appropriate activity at CACO, while 32 percent agreed with that statement. When those same questions were asked regarding "hunting for food," 43 percent disagreed and 39 percent agreed (Kuentzel 2006).

***General Public Attitudes Towards Hunting*:** Hunters were, as expected, strong proponents of their sport and of the value of hunting as part of their culture.

Also as expected, resident and visitor attitudes toward hunting were less positive towards hunting than hunters, with comparable numbers of respondents for and against hunting. The majority had relatively neutral attitudes, with no specific preference towards or against hunting. Approximately half of both residents and visitors agreed that hunting is an effective wildlife management tool, and more residents and visitors disagreed that hunting was wrong or unethical. Nevertheless, for the remaining anti-hunting/pro-hunting items, slightly more respondents in these two samples expressed attitudes opposed to hunting. Similarly, slightly more residents and visitors were opposed to hunting (40% to 50%) at CACO than were in favor of hunting (30% to 40%). In addition, visitors were more likely than residents to oppose hunting at CACO. Visitors were significantly more likely than residents to be concerned about safety issues, and more likely to favor more limited access for hunters at CACO. Additionally, summer visitors were most opposed to hunting in general, and more opposed to hunting at CACO than were fall visitors.

***Conflicting Attitudes Regarding Hunting*:** Conflict over hunting practices at CACO was documented by Kuentzel (2006). Nearly half the hunters (47%) report some degree of harassment by non-hunters and had their hunting experience disrupted in some way (Kuentzel 2006). This harassment is in part motivated by non-hunter safety concerns and anti-hunting sentiments. However, there also appears to be an effort by some anti-hunters to disrupt hunting activity at CACO (Kuentzel 2006). Most of the harassment reported by hunters, however, may not be very serious as few hunters said that they left CACO, but they did tend to avoid areas used by non-hunters (Kuentzel 2006). Few hunters reported the incidents to NPS officials.

A large portion of residents (47%) avoided certain areas where hunting was likely to be taking place. Residents were also more likely than visitors to report situations where they felt unsafe because of hunters or hunting activity. Approximately 27% percent of residents avoided visiting CACO on days when hunting was likely and 24.1% percent felt they were unable to participate in activities at CACO. There was a measurable concern among some residents about hunting in the vicinity of their homes.

[15] Kuentzel (2006) reported that 85% of Cape Cod residents use CACO in the fall months and 50% use CACO in the winter months.

A small portion of visitors (11%), either in the summer or the fall, reported situations where they felt unsafe (10.5%) because of hunters or hunting activity. Approximately 21 percent avoided certain areas and 10 percent avoided visiting CACO on certain days. A small portion, 9 percent, felt they were unable to participate in activities at CACO due to hunting activities.

There was evidence that residents and visitors who are spending time at CACO, do not want to share the same space with hunters. Resident and visitor tolerance for hunter encounters and shots heard was uniformly low for any level of encounter. Conversely, the data provided evidence that hunters do not care to hunt in areas where there are a lot of non-hunters. In particular, hunters do not appear happy about sharing space with bicyclists.

Where there is inter-group conflict at CACO, the main trouble spots are at the Marconi WMA just south of the CACO headquarters, the Eastham waterfowl hunting areas, and bicycle paths and walking trails.

Finally, most people do not characterize various user groups with extreme stereotypes, and the majority is disinclined to do so. Overall, civility currently appears to dominate over open conflict about hunting at CACO.

3.9 Socioeconomic Environment

3.9.1 Demographic Features

Consistent with its largely rural, tourist reputation, the population of Cape Cod is relatively sparse and the area is divided into small municipalities. As shown in Table 25, the overall population of the Cape is about 222,000, with the 6 Outer Cape towns accounting for only about 12 percent of this population. However, the population of the Cape is growing rapidly as a result of growth in the retiree and commuter populations and the rising cost of housing in the metro Boston area. As shown, the population of the Cape grew by 19 percent between 1990 and 2000, far surpassing the 6 percent population growth experienced in Massachusetts overall. Growth in the Outer Cape is somewhat less; although towns such as Truro and Eastham have seen their populations grow rapidly in the last decade. The overall Outer Cape population growth rate is more apparent when considered over the long-term. Since 1950, the Outer Cape population has grown approximately 219 percent, 6 times the population growth rate in Massachusetts statewide (University of Massachusetts 2004).

Table 25. Population Trends for Socioeconomic Impact Area

Area	1990 Population	2000 Population	Percent Change
Cape Cod (Barnstable Co.)	186,605	222,230	19.1%
Outer Cape			
Chatham	6,579	6,625	0.7%
Eastham	4,462	5,453	22.2%
Orleans	5,838	6,341	8.6%
Wellfleet	2,493	2,749	10.3%
Truro	1,573	2,087	32.7%
Provincetown	3,561	3,431	-3.7%
Outer Cape Total	24,506	26,686	8.9%

Source: Cape Cod Commission, "Cape and Islands Population, 1930-2000," based on U.S. Census of Population.

The census has identified places in Chatham, Eastham, Orleans, and Provincetown that are densely settled population centers without legally defined corporate limits. Many of these village centers are at or near central business districts. Their population densities are high, and development is intensive. By far the most densely populated of these is an area in Provincetown where there are 1,874 people per mi^2.

In each of the Outer Cape communities, there is a small but growing minority population. Provincetown has the largest minority community, comprising 4 percent of the town's population. Overall, the Outer Cape population is 98 percent Caucasian.

The influence of retirement living on Cape Cod is evident in population statistics. The percent of the Cape population 65 years of age or greater is 23.1, nearly double the national figure of 12.4 percent. The median age of Cape Cod residents is 44.6 years, significantly greater than the national median of 35.3 years. Likewise, the influence of tourism and seasonal visitation on Cape Cod is evident in population and housing statistics. The summer population is roughly triple the year-round population presented above. Table 26 illustrates the prevalence of vacation unit housing on the Cape. The percent of all housing units that are vacation units on the Cape is nearly 10 times than that for Massachusetts as a whole. This pattern is especially true for Outer Cape communities, where vacant vacation units often constitute more than half of all housing.

Table 26. Vacant Vacation Units as a Percent of all Housing Units

Area	Vacant Vacation Units as a Percent of All Housing Units
Massachusetts	3.6%
Cape Cod	32.0%
Outer Cape Communities	
Chatham	46.7%
Eastham	52.3%
Orleans	34.6%
Wellfleet	64.2%
Truro	60.8%
Provincetown	47.0%

Source: Cape Cod Times, "Cape & Islands Vacant Units: 1990-2000," obtained on-line at http://www.capecodonline.com/special/census/.

As reflected in Table 27, Cape Cod communities are generally wealthier than their counterparts nationwide, with slightly higher median incomes. Wealth is also reflected in median home values on the Cape, which greatly surpass national values. Outer Cape communities exhibit this pattern even more strongly, with median home values inflated by large summer residences and a generally strong demand for real estate in the region. The percent of families living below the poverty level further reflects the relative wealth of the Outer Cape region; except for Provincetown, poverty levels are well below the national average, as well as below the average for Massachusetts.

Table 27. Income and Wealth Indicators for Socioeconomic Impact Area

Area	2000 Median Income	2000 Median House Value	2000 Percent of Families Below Poverty Level
United States	$41,994	$119,600	9.2%
Massachusetts	$50,502	$185,700	6.7%
Cape Cod (Barnstable Co.)	$45,933	$178,800	4.6%
Outer Cape			
Chatham	$45,519	$273,900	1.9%
Eastham	$42,618	$192,300	4.5%
Orleans	$42,594	$300,700	2.7%
Wellfleet	$43,558	$242,700	5.7%
Truro	$42,981	$286,500	4.8%
Provincetown	$32,716	$323,600	8.5%

Sources: Cape Cod Times, "Cape & Islands Vacant Units: 1990-2000," obtained on-line at http://www.capecodonline.com/special/census/. U.S. Census Bureau, American FactFinder data base.

3.9.2 Local Economy

Into the 20th century, the economy of Cape Cod centered on whaling, fishing, and related industries such as shipbuilding and fish processing. The demise of whaling coincided with the Cape's rise to prominence as a summer destination for wealthy industrialists and intellectuals. After the Second World War, the Cape established its enduring reputation as a summer vacation center for families from New England and the Middle Atlantic states. In recent decades, the Cape economy has diversified, although tourism remains the cornerstone of the regional economy (Barnstable County 2003).

Table 28 examines economic census data for Barnstable County, providing insight into key sectors of the Cape Cod economy. Based on the value of output (in terms of sales or revenue), the largest sector is retail trade, with sales of over $2 billion. Within this sector, food and beverage stores are most prominent, accounting for over $600 million in sales. The second largest sector is accommodation and food services, with sales of over $600 million, most of which is associated with restaurants, bars, hotels, and motels. Other major sectors include wholesale trade as well as health care and social assistance.

A similar profile of the region can be seen when the distribution of employment across all sectors is considered. Table 28 shows this distribution, incorporating the manufacturing, service, and public administration portions of the Barnstable County economy. Consistent with the preceding discussion, the retail and service sectors account for much of the region's employment. The public sector (including Federal, state, and local employees) is the next largest sector, accounting for 15 percent of employment. While the fishing industry is a visible and valued component of the regional economy, it accounts for very little employment in Barnstable County. Job growth on the Cape has been strong in recent years. The region has experienced job growth for 11 straight years, even during periods of statewide job loss (Cape Cod Commission 2003)

Table 28. Barnstable County Economic Sectors

NAICS Industry Code	Industry Description	Number of Establishments	Number of Employees	Annual Payroll ($1,000)	Shipments/ Sales/Receipts ($1,000)
11	**Forestry, fishing, agriculture**	**1,025**	**NA**	**NA**	**30,950**
23	**Construction**	**4,107**	**NA**	**NA**	**251,191**
31-33	**Manufacturing**	**226**	**2,561**	**82,427**	**349,442**
334	Computer and electronic product mfg	24	d	a	a
42	**Wholesale trade**	**259**	**1,361**	**45,462**	**462,848**
421	Wholesale trade, durable goods	135	698	24,222	240,080
422	Wholesale trade, nondurable goods	124	663	21,240	222,768
44-45	**Retail trade**	**1,592**	**13,675**	**256,460**	**2,518,765**
441	Motor vehicle & parts dealers	105	1,430	44,369	549,705
442	Furniture & home furnishings stores	94	757	12,623	114,270
443	Electronics & appliance stores	47	302	7,078	51,635
444	Building material & garden equipment & supplies dealers	129	1,141	32,443	266,973
445	Food & beverage stores	258	3,954	62,173	614,978
446	Health & personal care stores	91	906	15,382	149,704
447	Gasoline stations	130	820	11,392	171,248
448	Clothing & clothing accessories stores	256	1,509	24,774	210,899
451	Sporting goods, hobby, book, & music stores	136	531	8,215	73,047
452	General merchandise stores	28	1,150	15,983	159,250
453	Miscellaneous store retailers	260	805	12,618	93,819
454	Nonstore retailers	58	370	9,410	63,237
512	Motion picture & sound recording industries	22	176	2,820	16,089
513	Broadcasting & telecommunications	40	620	28,462	94,823
53	**Real estate & rental & leasing**	**286**	**917**	**21,356**	**138,106**
531	Real estate	220	700	17,442	118,475
532	Rental & leasing services	64	c	a	a
54	**Professional, scientific, & technical services**	**571**	**1,919**	**63,918**	**173,744**
541	Professional, scientific, & technical services	571	1,919	63,918	173,744
56	**Administrative & support & waste management & remediation services**	**262**	**1,830**	**32,602**	**99,055**
561	Administrative & support services	241	1,707	28,788	81,430
562	Waste management & remediation services	21	123	3,814	17,625
61	**Educational services**	**30**	**91**	**1,586**	**6,027**
611	Educational services	30	91	1,586	6,027
62	**Health care & social assistance**	**482**	**5,989**	**163,772**	**336,525**
621	Ambulatory health care services	413	3,617	116,908	238,441
623	Nursing & residential care facilities	24	2,089	42,898	90,620
624	Social assistance	45	283	3,966	7,464
71	**Arts, entertainment, & recreation**	**142**	**1,455**	**23,696**	**96,962**
711	Performing arts, spectator sports, & related industries	25	b	a	a
713	Amusement, gambling, & recreation industries	115	1,375	20,704	88,191
72	**Accommodation & foodservices**	**1,144**	**11,852**	**177,312**	**624,340**
721	Accommodation	347	3,015	59,440	212,506
722	Food services & drinking places	797	8,837	117,872	411,834
81	**Other services (except public administration)**	**439**	**1,819**	**36,020**	**124,634**
811	Repair & maintenance	233	833	19,970	82,774
812	Personal & laundry services	206	986	16,050	41,860

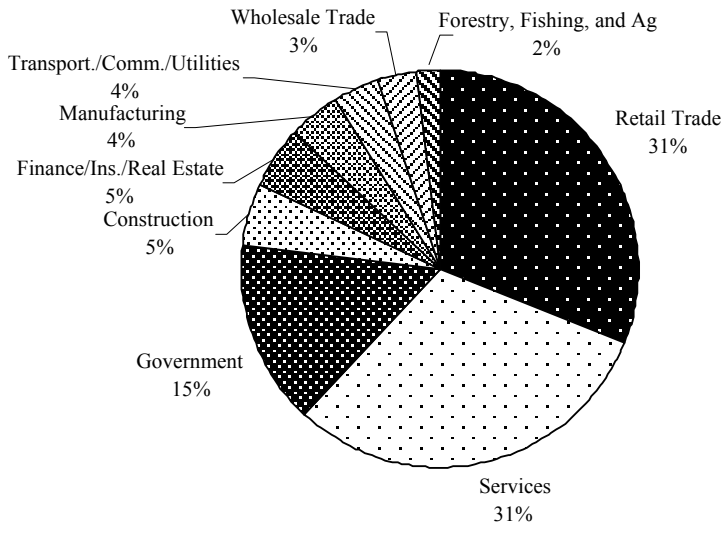
The vast majority of the existing commercial establishments on the Cape are small businesses. Data suggest that roughly 95 percent of all businesses on the Cape and Islands have fewer than 20 employees. Furthermore, over 19 percent of all workers in the Cape/Islands region are self-employed in unincorporated businesses; this is significant when compared to the statewide figure of 6.4 percent (Barnstable County 2003).

Economic census data for the Cape clearly indicate the importance of tourism-related industries. Roughly six million tourists visit Cape Cod and the Islands every year, with two-thirds of the activity occurring in summer and early fall. It is estimated that these tourists spend approximately $1 billion annually. The "hospitality" industry that serves tourist needs accounts for an estimated 23 percent of employment in the Cape and Islands region. The industry includes eating and drinking establishments, hotels and other lodging, souvenir shops, and other businesses.

The hospitality sector has several disadvantages that present a challenge to the economy of Cape Cod. First, the sector generally is composed of lower-wage jobs (Figure 8). Hospitality services are included within the general services category above. The average hospitality wage is 37 percent lower than the average wage for all industries in the region. Second, the hospitality sector is highly seasonal and is subject to unpredictable factors such as weather and the economic health of the New England and Mid-Atlantic regions from which most visitors come. Recent marketing campaigns have focused on expanding the Cape tourist period to include the "shoulder" seasons of early spring and late fall (Barnstable County 2003).

Figure 8

DISTRIBUTION OF CAPE COD EMPLOYMENT ACROSS ECONOMIC SECTORS



Economic development planning interests such as the Cape Cod Commission are targeting diversification of the Cape's economy in coming years. These efforts are designed to promote key industries while preserving the natural resource base on which the tourist economy relies. Therefore, planners are emphasizing development of light/clean industries (e.g., high technology, professional services) that provide higher wages but have limited environmental implications relative to manufacturing.

3.9.3 Economic Effects of Hunting at CACO

The economic effects of hunting activity in CACO can be characterized in two distinct ways (USFWS 2002, 2003). First, decision-makers and citizens are frequently interested in how outdoor recreations such as hunting influence the local economy. The local economic effects can be assessed by examining the expenditures that hunters make to support their hunting activity and by identifying the portion of these expenditures that are made locally (i.e., in Barnstable County).

Second, economists typically frame economic impacts in terms of changes in economic welfare. In the case of hunting, economic welfare is measured based on consumer surplus. The concept of consumer surplus focuses on the principle that some consumers benefit at current prices because they are able to purchase goods or services at a price that is less than their total willingness to pay for the good. In the current context, a hunter may be willing to pay $50 for a day of hunting, but may only incur $20 in costs (for transportation, ammunition, etc.). This individual would therefore realize a consumer surplus of $30 ($50 minus $20) for each day of hunting. To measure consumer surplus, economists apply a variety of methodological approaches, including revealed preference studies (such as travel cost models) and stated preference approaches (in which survey methods are used to estimate willingness to pay for hunting or a change in hunting quality).

Because original research methods are time and resource intensive, economists frequently employ information from existing studies of comparable resources to estimate the economic value of recreational services associated with a particular public resource.[16] To calculate hunters' consumer surplus, we multiply existing estimates of per-trip consumer surplus (see below) with the estimated number of hunting trips discussed above. This analysis offers a rough estimate of the annual economic value of hunting in CACO in the baseline, as well as the potential economic welfare changes associated the management alternatives.[17] These economic losses must then be weighed against qualitative benefits related to the curtailment of hunting (e.g., improved recreation for non-hunters).

***Hunter Expenditures*:** To estimate baseline expenditures associated with CACO hunting activity, current hunting days are multiplied by typical hunter expenditures. Hunter expenditures may include money spent on food, lodging, shells, gasoline, and other expenses. The typical expenditure profile varies depending on the geographic area under consideration, the species sought, and other factors. This analysis incorporates findings from the USFWS 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (USFWS 2002). The survey estimates that hunters hunting in Massachusetts spent an average of $9 per hunting day on trip-related expenditures.[18] This figure is low compared to per-trip expenditures found for other hunting studies in the economics literature.[19] However, the $9 figure is consistent with the fact that CACO hunters are predominantly local and therefore spend relatively little

[16] This practice, commonly referred to as the benefit transfer approach, is one of the methods designated for use in DOI guidance on recreational benefits evaluation (U.S. DOI 1983). It also is used in assessing compensable losses under DOI and National Oceanic and Atmospheric Administration rules for damage assessment [43 CFR 11.83 (c)(2)(vi) and 15 CFR 990.78 (c)].

[17] For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich (1990) and USEPA (2000).

[18] All expenditures examined here are trip-related, i.e., they vary with the number of hunting trips made. Equipment expenditures (e.g., rifles, clothing) associated with hunting may also be significant; however, we assume that hunters will either make these expenditures regardless of the changes in hunting regulations in CACO, or that the purchases are made outside the region. All figures converted to 2004 dollars using the Gross Domestic Product implicit price deflator.

[19] For instance, Hotvedt and Luzar (1989) estimated expenditures of $57 (1989) per deer-hunting trip in Louisiana. Nationally, trip-related expenditures per hunting trip are $90 (USFWS 2002).

accessing the hunting grounds. Likewise, the figure is reasonably consistent with available studies of *annual* expenditures per deer hunter in other New England states.[20]

A portion of these expenditures are made locally. The CACO hunting survey (Kuentzel 2006) asked hunters whether they typically spend money at Outer Cape businesses when hunting at CACO. Table 29 summarizes the responses given by hunters in the field sample. The responses are generally consistent with the characterization of CACO hunters as Cape residents who spend the majority of their trip-related dollars locally. The percent of hunters indicating local expenditures on lodging is low, but this is likely because few hunters seek overnight accommodations on the Outer Cape. While a limited number of respondents listed "other" expenses, these were generally equipment purchases, rather than trip-related expenses. To simplify, we therefore assume that all trip-related expenditures go to Outer Cape businesses.

Table 29. Extent of Hunting Related Expenditures Made at Outer Cape Businesses

Expenditure Category	Percent CACO Hunters Indicating that They Spend Money Locally
Food	90%
Lodging	18%
Gas	94%
Ammunition	74%
Other	18%

Source: CACO Hunting Survey (Kuentzel 2006)

Multiplying baseline hunting days (lower and upper) by the estimated per-day expenditures at Outer Cape establishments yields estimated expenditures of between $89,000 and $256,000. These expenditures are a minor component of total regional economic activity on the Cape, representing a very small portion of the roughly $2 billion in retail sales in Barnstable County. However, while not large relative to the overall regional economy, these expenditures may be significant to a small number of local businesses.

Note that a more comprehensive analysis would consider the secondary effects of hunting expenditures in the regional economy. Specifically, expenditures in food and retail establishments may be amplified as they influence related sectors. For example, spending at restaurants may increase activity in this sector, leading restaurants to increase purchases from food wholesalers, thereby affecting output and employment in the wholesale sector. However, NPS believes that the potential multiplier effects associated with Outer Cape hunting expenditures are too minor to warrant comprehensive regional economic modeling.

***Economic Welfare*:** Characterizing the economic welfare associated with baseline hunting activity involves multiplying the number of hunting days by measures of consumer surplus per hunting day. Consumer surplus estimates will vary depending on numerous factors, including the species hunted, the hunting location, the cost of accessing the hunting site, and the overall quality of the hunting experience (e.g., bag rates). Table 30 summarizes several studies that provide relevant consumer surplus values. Based on the available estimates, a range of $35 to $50 per day was used to value hunting at CACO.

[20] See Boyle, *et al.* (1990). This study estimated annual expenditures of about $140 (2004) per resident deer hunter in Maine. The study does not report the average number of hunting trips on which this figure is based. However, the CACO survey data indicate that the days per hunter average roughly 20 during the October through December months (deer season). Multiplying 20 days by $9 per day implies about $189 in expenditures per deer hunting season, a figure reasonably consistent with the figure for Maine deer hunters.

Multiplying by the estimated range of baseline hunting days yields a consumer surplus estimate of $339,000 to $1.4 million.

Table 30. Consumer Surplus Values Per Day of Hunting

Study	Location	Species	Consumer Surplus Estimate ($2004)
FWS 2003	Massachusetts	Deer	$51*
FWS 2003	New England (average of 5 states)	Deer	$48
Boyle and Roach 1998	New England	Deer	$33
Hay 1988	Massachusetts	Waterfowl	$37
Walsh, *et al.* 1992	U.S. (median of 17 studies)	Waterfowl	$37

* Value based on small sample size, between 10 and 29.

3.10 Management and Operations

3.10.1 Consistency with CACO and NPS Goals, Plans, Policies, Guidelines, and Mandates

The current hunting program is generally consistent with NPS guidelines, policies, and mandates, with the exception of the pheasant program. The basic day-to-day hunting activity is consistent with the goals, plans, guidelines, and mandates of the NPS, and is consistent with the enabling legislation for CACO. The Director has specifically issued a waiver from the exotic species management policies for the CACO pheasant hunting/stocking program (October 7, 2002), while the Park examines options for phasing it out. Continuing the pheasant stocking program in absence of a phase out would require a new waiver.

Exceptions to management policies are available, and specific provisions may be (1) waived or modified by the Secretary, the Assistant Secretary, or the Director; or (2) superseded by "higher authorities", including public laws, regulations, and specific directives. It is specified that, "policy must be consistent with these higher authorities." In this case, higher authorities include the 1961 Seashore Act.

In 2001, the NPS established management policies which are subject to higher authorities such as statutes and regulations. These policies were revised and reissued in 2006 (NPS 2006a). The policies do not permit stocking new exotic species in most circumstances; however, pheasants are not a new exotic species and have been stocked throughout Cape Cod since at least 1906. Additionally, these policies incorporate some flexibility into the sections regarding the management of exotic species, which do authorize recreational harvesting in some circumstances where the practice is historical or Congressional intent for stocking is expressed in statute or a House or Senate report accompanying a statute.

Pheasants have not become a pest species at CACO (Bump and Field 1999). The October 2002 waiver allows for the continuation of the stocking program while CACO initiates procedures to improve upland game habitat as part of a larger cultural landscape restoration program. The waiver further describes that the pheasant hunt would eventually be phased out as upland game hunting opportunities improved, and probably discontinued after 15-years.

3.10.2 Changes to Staffing Levels and Ranger Duties

The current hunting program does not require any additional staff or create any additional ranger duties that go beyond what is expected from Resource and Visitor Protection rangers. The protection division is divided into two districts at CACO, namely the north and south districts. A total of 13 rangers are part of the permanent force and work year-round. During the summer, 12 seasonal rangers are hired to support the permanent, full-time rangers. These rangers are not needed for enforcement duties during the hunting

season due to the low number of hunting violations and complaint calls and due to the lower numbers of visitors. Enforcement duties directly related to hunting include hunter checks. Other staffing indirectly related to the hunting program includes having temporary or seasonal help to collect data and information on the presence and abundance of wildlife species.

3.10.3 Cost to Implement

The hunting program costs a very nominal amount to implement and manage. Annual costs that are unique to the hunting program include the production of hunting brochures and posting lands.

4.0 Environmental Consequences

4.1 Introduction

Consequences, including adverse and beneficial direct and indirect effects, were assessed by impact topic for each of the three alternatives for the hunting program at CACO and cumulatively in the region. The impact topics include:

- Natural Resources: Wildlife (game, non-game, rare species), Vegetation (plants, rare plants, natural communities);
- Cultural Resources: Cultural Heritage (customary hunting activities, berry picking, mushroom gathering), Cultural Landscapes;
- Public Use: Land Use and Recreation, Health and Safety, Public Use and Experience, Socioeconomic Values (effects on local/regional economy); and
- Management and Operations: Consistency with CACO and NPS goals, plans, policies, guidelines, and mandates. Potential changes to staff duties and responsibilities relative to hunting and the costs to implement the hunting program.

Effects were divided into three categories: direct; indirect; and cumulative. Direct and indirect effects were assessed for each impact topic within the boundaries of CACO. Using the definitions below, cumulative effects were assessed based on the combined effects of the hunting program and other related projects in the entire Cape Cod region. The goal of this assessment is to document potential effects that can assist in the decision-making process and to determine if implementing any of the alternatives would impair CACO resources.

4.2 Impairment of CACO Resources

The NPS Management Policies 2006 (NPS 2006a) require analysis of potential effects to determine whether or not actions would impair CACO resources. The fundamental purpose of the NPS, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely effecting resources and values. However, the laws do give the NPS the management discretion to allow effects to CACO resources and values when necessary and appropriate to fulfill the goals and purposes, as long as the effect does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within CACO, that discretion is limited by the statutory requirement that the NPS must leave resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is defined as, "an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of Park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values." An impact would be more likely to constitute impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of CACO;
- key to the natural or cultural integrity of CACO or to opportunities for enjoyment of CACO; or
- identified in CACO's GMP or other relevant NPS planning documents as being significant.

A determination on impairment is made in section 4.6 for natural resources (wildlife and vegetation) and cultural resources (cultural heritage) for the preferred alternative. An assessment of impairment is not made for public use, management and operations, and non-federal lands within CACO.

4.3 Methodology for Assessing Impacts

4.3.1 Definitions

***Type of Effect*:** Effects are categorized in two different and contrasting types: adverse and beneficial. Adverse effects are considered contrary to the goals, objectives, management policies, and practices of the NPS and the public interest or welfare. These effects are of a kind likely to be damaging, harmful, or unfavorable to one or more of the various impact topics. Beneficial effects are believed to promote favorable conditions for the impact topics.

***Levels of Intensity*:** Levels of intensity refers to severity of the effect, whether it is negligible or major, or somewhere in between. The gradient of this grading system can be general or very detailed, but ultimately the assumptions and subjectivity of the system affect its sensitivity. A simple and subjective rating system is used in this Final EIS, which includes a rating scale of "no effect, negligible, minor, moderate, and major effects." The authors of this Final EIS based the rating system score on studies completed, data and information obtained from scientific and administrative sources, discussions with relevant individuals, subject matter experts, public comments, common sense, and professional opinion.

The definition of "no effect" would be the same for each of the general impact topics. No effect would mean that no measurable effects could be recorded or surmised. Each of these gradient levels is further defined below.

- For natural resource effects, including wildlife and vegetation, the gradients are defined to be:
  - *Negligible*: Effects would be barely detectable, measurable, or observable.
  - *Minor*: Adverse effects would be detectable, but not expected to have an overall effect on a species and/or any natural community. Impacts generally affect less than one-half acre of vegetation or would not be expected to influence the population of any wildlife species, or may influence a small number of individuals of a species. Beneficial effects would enhance the ecology for a small number of individuals.
  - *Moderate*: Effects would be clearly detectable, but could have short-term appreciable effects on a species and/or any natural community. Impacts may affect up to one acre of vegetation, but would not threaten the continued existence of any natural community. Impacts would have short-term effects. Beneficial effects would enhance the population of any wildlife species on CACO.
  - *Major*: Long-term or permanent, highly noticeable effects on the population of a species and/or any natural community. Impacts may affect over one acre of vegetation or may affect the continued existence of any natural community or wildlife species within CACO. Beneficial effects would enhance the population of more than one species over the long-term.

In reviewing the assessments of effects to hunted species, it should be understood that hunting at the Park occurs within a broader context, and:

1. Analyses concerning the impacts to species hunted at CACO are generally not CACO-specific (work being completed concerning the status of the New England cottontail at CACO is one exception);
2. In some cases, species-specific data-gathering is conducted annually and results in regulations and limitations on hunted species in Massachusetts which also affect CACO (waterfowl, for example); and,

3. Hunting at CACO does not occur in order to manage species, but in order to provide a full suite of recreational opportunities, some of which are part of maintaining the cultural heritage on the Outer Cape, without jeopardizing the ability of the Park to maintain the integrity of the natural resources at CACO.

Therefore, rather than assessing the value or absence thereof in the incidental management of species at CACO through hunting, this FEIS focuses the analysis of impacts on whether hunting affects either the short or long-term presence and overall health of the species hunted at CACO. This reflects the fact that hunting occurs at CACO as part of the preservation of CACO's cultural heritage, and not to manage the population of any given species at CACO.

- For cultural resource effects, including cultural heritage and cultural landscapes, the gradients are defined to be:
  - *Negligible*: Effects would be barely perceptible and not measurable and confined to a very small local area.
  - *Minor*: Adverse effects would not affect a character-defining pattern, behaviors of individuals, and features of the local heritage. Furthermore, these effects would not affect the defining characteristics of cultural landscapes either natural or man-made elements. Beneficial effects would include maintaining and making slight improvements, having a positive influence on the use and behavior patterns of visitors on a small-scale, local level. Beneficial effects on cultural landscapes would augment the important features of those areas.
  - *Moderate*: Adverse effects would alter a character-defining pattern or features of the local heritage and cultural landscapes, but would not diminish the integrity of either. Beneficial effects would include improving the character and features of the local heritage and cultural landscapes.
  - *Major*: Adverse effects would alter a character-defining pattern or features of the local heritage and cultural landscapes and diminish the integrity of either. Beneficial effects would include improving the character-defining patterns and features of the local heritage and cultural landscapes by including an increase in the number of people involved with heritage defining patterns and create significant improvements to the cultural landscapes.

- For land use and recreation—health and safety effects—the gradients are defined to be:
  - *Negligible*: Effects would be barely detectable, measurable, or perceptible.
  - *Minor*: Adverse effects would be limited to a small number of visitors and could be avoided or minimized through enforcement, public education, signage, and brochures. Beneficial effects would enhance law enforcement efforts, improve hunting season safety, improve education for hunters and non-hunters.
  - *Moderate*: Compromised safety conditions, resulting in permanently increased accident rates, would occur despite implementing all minimization and mitigation efforts. Beneficial effects would include notable improvements in safety of both hunters and non-hunters.
  - *Major*: Significant compromised safety conditions that would warrant the closing of the facilities and possibly portions of the entire site for a long-term period or permanently. Beneficial effects would include significant increases in safety.

- For land use and recreation—public use and experience effects—the gradients are defined to be:
  - *Negligible*: Effects would be barely detectable, hence visitors would not be aware of any effects or changes to the hunting program. There would be no noticeable change in public use and experience or in any indicators of visitor satisfaction or behavior.
  - *Minor*: For adverse effects, visitors would be aware of the effects, but this would not appreciably limit critical characteristics of a majority of the visitors. For beneficial effects, public satisfaction would be enhanced for a small number of visitors.

  - *Moderate*: Adverse effects would result in a change of a few critical characteristics of the desired public experience and/or the number of participants engaging in an activity would decrease. Public satisfaction would begin to decline as a result of the effect. Beneficial effects would improve a few critical characteristics of the public experience and/or the number of visitors would increase.
  - *Major*: Multiple critical characteristics of the desired public experience would change and/or the number of participants engaging in an activity would be greatly reduced or increased. The public would be aware of the effects associated with implementing the alternative and public satisfaction would markedly decline or increase. Beneficial effects would improve multiple characteristics of the public experience and/or the number of visitors would increase, substantially.

- For land use and recreation—socioeconomic effects—the gradients are defined to be:
  - *Negligible*: Effects on local businesses and communities would be barely perceptible, not measurable, and confined to a very small area.
  - *Minor*: Limited adverse and beneficial effects on local businesses and communities would be temporary and restricted to hunting related businesses in the immediate area.
  - *Moderate*: Local businesses, including those not directly related to hunting, would loose or gain visitor or hunter related business in the immediate area and other portions of Cape Cod.
  - *Major*: Significant losses or gains of visitor or hunter generated business in the immediate area and throughout Cape Cod.

- Management operations—consistency with CACO and NPS legislative mandates, goals, plans, policies, and guidelines—the gradients are defined to be:
  - *Negligible*: Effects would be barely detectable, any alterations or conflicts with legislative mandates, goals, and policies could be alleviated through a brief administrative process. Beneficial effects would include the termination of one policy waiver.
  - *Minor*: A waiver or other administrative process for two management policies would be required or the NPS would deviate from two policies or guidelines. Beneficial effects would include the termination of two policy waivers.
  - *Moderate*: A waiver from more than two management policies would be required or the NPS would deviate from one or two policies and guidelines. The NPS would deviate from any legislative mandate. Beneficial effects would include the elimination or two or more policy waivers or the elimination of one deviation from a legislative mandate.
  - *Major*: Adverse effects include deviation from NPS policies and/or guidelines would require extensive administrative change. Beneficial effects would eliminate all deviations from policies and guidelines.

***Duration*:** Duration describes how long an effect would be expected to last. In this Final EIS, effects are described as either being short-term or long-term. Short-term is an effect that would last no more than two years. Long-term would be an effect that would last for more than two years.

***Context*:** Context is the setting within which an effect is analyzed, such as the affected region or locality and the affected interests. In this Final EIS, the intensity of effects is evaluated within a local context, primarily considering effects on Outer Cape Cod. The intensity of effects on cumulative effects is evaluated in a regional context, and considers effects further in time and effects from other projects. The context of these effects would extend to upper Cape Cod and southeastern Massachusetts.

***Direct and Indirect Effects*:** Direct effects include effects on the resource actually caused by the proposed action, generally at the immediate site of the action and at the time of the action. Direct effects can extend into the future and are often permanent, but can be temporary. A direct effect is an effect that

is caused by an action and occurs at the same time and place. An example of a direct effect would be the filling of a portion of a stream, which immediately causes habitat loss at that location.

Indirect effects generally occur as a result of a "side-effect" of a direct effect, but occur later in time or further in distance than the action. An indirect effect could result from silt flowing downstream, creating turbid conditions, and adversely affecting water quality.

***Cumulative Effects*:** The CEQ regulations, which implement the NEPA (42 USC 4321 *et seq*.), require assessment of cumulative impacts in the decision-making process for federal projects. 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). Cumulative effects are considered for all alternatives and focus on a regional area well beyond the CACO boundary.

Cumulative effects were determined by combining the effects of each alternative with other past, present, and reasonably foreseeable future actions within CACO and the vicinity. These effects are assessed on a regional basis. These projects include development within the Cape Cod region, long-term population trends, as well as cultural and social changes.

4.3.2 Impact Matrix Comparisons

Comparisons of potential adverse and beneficial effects are made between Alternatives A, B, and C to help determine which alternative is the most environmentally preferable and which should be the preferred alternative. This type of comparison is important to the decision making process.

4.4 Impact Assessment

4.4.1 Alternative A – No Action

The short-term and long-term impacts of retaining the hunting program, the "No Action" alternative, at CACO are discussed for each species is followed by a summary of effects on wildlife and other natural resources. A discussion of impacts to the remaining impact topics follows. Effects on public use are divided into three categories: land use and recreation; health and safety; and experience. The experience topic focuses on public visitation and experiences at CACO. Therefore, this topic is analyzed by the types of visitors expected at CACO: hunters; winter (non-hunter) visitors; summer visitors.

Effects of the No Action Alternative on Birds
There is no established population of ring-necked pheasants on CACO. The impacts of continuing the pheasant stocking and hunting program would be to those individuals raised expressly for this purpose.

Ruffed grouse do not have an established population on Cape Cod and are not specifically pursued by hunters on CACO. The lack of suitable early successional habitat underlies the low grouse population on Cape Cod. Therefore, there are no beneficial or adverse effects expected from any incidental hunting mortality. A small quail population exists on CACO. The quail population is not sufficient to support or generate any consistent hunting pressure or interest by local hunters. Quail are taken incidentally while pursuing other game species. Given the small amount of hunting pressure, beneficial and adverse effects are likely to be negligible.

Hunting pressure for agricultural pest species such as common crows, starlings, and English sparrows is very limited on CACO. All are common and very abundant and the hunting pressure likely does not

effect the local and regional populations of these species. Continuing the hunting program should have no effect on these species.

The hunting of waterfowl, including dabbling ducks, diving ducks, mergansers, and geese, is a popular hunting program at CACO and is largely restricted to estuarine, marine, and tidal marsh areas. Hunting limitations for these species is determined by data gathered throughout their range, resulting in regulations by USFWS. Limitations are established based upon field surveys to ensure that regional management for the continued health of these species occurs consistently throughout the states. Generally, hunting mortality is considered compensatory for waterfowl populations. As such, continued hunting at CACO is not expected to adversely effect waterfowl populations.

Effects of the No Action Alternative on Mammals

Although detailed monitoring and analyses have not been performed with respect to the effects of hunting on deer populations at CACO, deer hunting at its present level at CACO may help prevent deer populations from increasing to densities that are damaging to native plant communities.

Hunting mortality is thought compensatory for Eastern cottontail rabbits elsewhere. A two-year study of Eastern cottontails at CACO indicates that hunting mortality is likely compensatory for cottontails at CACO as well (Boland and Litvaitis 2007). However, this study also indicates that under some conditions, such as the heavy snowfall experienced in the winter of 2005, hunting mortality may be additive for cottontails at CACO. Nonetheless, adverse effects to the eastern cottontail are not expected as Payne (1964) found that even a 75 percent harvest level was not sufficient to depress the population the following fall. Hunting mortality is likely less than 50 percent of the population on CACO. The highest hunting mortality documented at CACO was 6 of the 84 rabbits whose fate was determined, or less than 10 percent (Boland and Litvaitis 2007). New England cottontails have not been found at CACO, and therefore adverse impacts to this species are not anticipated. The methods and results of the recent study of New England cottontail distribution on the Outer Cape (Boland and Litvaitis 2007) will be shared with MDFW and USFWS. If recommendations or new information arises indicating that New England cottontails are put at risk from Eastern cottontail hunting at CACO, the park may alter or discontinue the Eastern cottontail hunt.

The effects of hunting on gray squirrels would not be considered either beneficial or adverse. Harvest mortality is compensatory and likely does not adversely effect the population in the short-term or long-term. Hunting probably does not effect squirrel populations as high population levels do not adversely affect the habitat.

Red and gray foxes, coyotes, and raccoons are predators on tern and plover nests and, in other areas, targeted removal of individual predators has been undertaken to increase tern and plover survival and recruitment. The effects of recreational predator hunting on beach-nesting birds are unknown, but benefits are possible if individual predators that prey on nesting birds are removed. Local hunters' observations (Personal Communication by local hunters with NPS staff) suggests that hunting pressure for coyotes is relatively higher than expected; however, since coyote populations tend to compensate for hunting mortality through increases in litter sizes, reproduction in yearlings, and juvenile survival, it is unlikely that hunting at CACO controls the coyote population. The potential for reduced predation on nesting shorebirds is determined to be negligible and long-term as long as hunting continues. The presence of pheasants is a negligible food source (Bump and Field 1999).

Studies of raccoon hunting mortality indicate that harvest levels below 40 percent are compensatory and do not adversely effect the population (Clark 1990, Hasbrouck *et al.* 1992). This assessment is based on the assumption that Kennedy's (1988) findings regarding low hunter demand for raccoon are still valid and the expectation that raccoon harvest in CACO is, therefore, well below the 40-percent threshold.

Retaining the pheasant program would continue the mortality resulting from predation and scavenging. This situation would reduce a potential negligible food source, as described above, and ultimately would have a negligible effect on the populations of predator species or any indirect effects on other species.

Effects of the No Action Alternative on Natural Resources: ***Wildlife (Game, Non-Game, Rare Species)***
Direct Adverse Effects: There are minor direct, long-term, and local adverse effects due to the wildlife mortality that results from hunting. This loss of taken individuals is a short-term and local situation. Hunting mortality is generally considered compensatory and should not reduce local populations of hunted species over the long-term. Experience with the hunting program at CACO indicates that this is the case, and that experience is expected to continue. The following direct adverse effects would be expected from the No Action alternative:

- Loss of some individuals from a population would be considered a temporary effect;
- Considered to be an ongoing effect to hunted species; and
- Generally only affects the immediate local populations of hunted species, but can extend to adjacent areas.

Adverse effects are restricted to CACO and the immediate area, as the upland hunted species do not migrate to areas outside of the Outer Cape. One exception is the hunting of waterfowl for which effects may extend beyond the Outer Cape, but the harvest of waterfowl here represents a negligible fraction of the international harvest, and is regulated within the context of international species data analysis with hunting limits established consistent with the goal of protecting waterfowl populations.

Federally listed threatened and endangered wildlife that occur in CACO either do not use the areas of the park where hunting occurs (i.e., marine species) or are not present during hunting season (i.e., piping plovers), and therefore would not be affected by the No Action Alternative. Some state listed wildlife species occur in the same areas and at the same time as hunting. Minor adverse impacts are possible to these state listed species if they are mistakenly shot or are disturbed by hunters

Direct Beneficial Effects: Short-term reductions in population due to hunting during the winter likely benefit the remaining individuals, improving winter survival. Furthermore, the long-term effects of hunting are observed in the current populations of game species. The level of game species appears to be healthy and as abundant as the habitats can support, despite the fact that hunting has been practiced at CACO since before CACO was established. Hunting may remove individual predators, such as coyotes, that can adversely affect endangered species, such as piping plovers. Beneficial effects are also seasonal or annual, but do occur over the long-term as long as hunting continues. Retaining the pheasant program would probably not effect predator populations.

The following beneficial effects would be expected:

- The loss of individuals is often considered compensatory mortality;
- Beneficial effects would be ongoing without timeframe limitations; and
- Generally only affects local populations, but can extend to adjacent areas.

Indirect Beneficial Effects: Minor beneficial effects result from hunting and incidentally result from management. The following effects would be expected:

- Beneficial effects would be ongoing without timeframe limitations; and
- Generally only affects the local area, but can benefit habitat and landscape vegetation adjacent to CACO.

Cumulative Beneficial Effects: Negligible beneficial effects can result from hunting when taken in consideration with other hunting activity within the Outer Cape region. The benefits of hunting can be further enhanced as human populations encroach on habitat and adverse interactions become more likely. The following effects would be expected:

- Hunting on other public and private lands in conjunction with deer hunting on CACO provides the indirect benefits described above;
- Benefits extend to areas on and around lands that are hunted; and
- This is an ongoing benefit in the region.

Effects of the No Action Alternative on Natural Resources*: *Vegetation (Plants, Rare Plants, Natural Communities)

Direct Adverse Effects: No adverse effects are expected to state listed or rare plants, or to plant communities. Clearing vegetation is not necessary for hunting. Small social trails may be created by hunters and other visitors, but the contribution to the creation of these trails by hunters is negligible and not measurable. The number of hunters spread across CACO for short periods during the fall and early winter does not likely create social trails, although their activity may use and/or contribute to them. The following effects would be expected:

- Hunting does not involve clearing or removing vegetation; and
- Hunters likely only contribute a negligible amount to the development of social trails.

Direct Beneficial Effects: Beneficial direct effects are not expected as hunting does not directl benefit vegetation.

Effects of the No Action Alternative on Cultural Resources*: *Cultural Heritage

Direct Beneficial Effects: Moderate direct long-term, local beneficial effects result from the opportunities for hunting that exist within CACO. Since hunting is an important part of the way of life on the Outer Cape for a number of individuals, it contributes to the local culture and retaining the local heritage for future generations. The following direct benefits would be expected:

- Hunting has been part of the cultural heritage of the Outer Cape for generations;
- Many individuals have grown up with a hunting tradition that is still fostered by many;
- Benefits are primarily related to local hunters and those from nearby communities; and
- These are ongoing benefits.

Direct Adverse Effects: Some individuals use CACO for berry picking and mushroom gathering during hunting season. These individuals may choose to more selectively use CACO during the hunting seasons (Sundays rather than Saturdays, for example, or non-hunting areas only), which would be considered a negligible effect.

Indirect Beneficial Effects: Negligible beneficial effects occur by maintaining hunting as part of the cultural heritage. There are many aspects of the local cultural heritage: fishing, shellfishing, berry picking, and other outdoor activities, including hunting. The following effects would be expected:

- Hunting is one aspect of many that make up the cultural heritage;
- This benefit is both local and regional; and
- This is an ongoing benefit.

Cumulative Beneficial Effects: Minor beneficial effects occur to the cultural heritage from hunting on CACO and on other public and private lands on Cape Cod. The benefits that hunting contributes to the

culture of the region are additive with all other hunting activities on the cape. Hunting is part of the cultural heritage throughout Cape Cod. Hunting contributes to the cultural heritage within the communities that extends beyond the five towns around CACO. The following cumulative benefits would be expected:

- Cultural heritage benefits from continuing hunting are additive with hunting in other communities and in the region; and
- This is an ongoing benefit.

Effects of the No Action Alternative on Cultural Resources: Cultural Landscapes
Direct Adverse and Beneficial Effects: Hunting activity does not take place at or within the immediate vicinity of the many cultural landscape features found on CACO. Therefore, no adverse effects to these features would be expected. Hunting does not contribute direct benefits to the cultural landscape as it does not take place in the immediate vicinity of these features and it does not alter or improve these areas.

Effects of the No Action Alternative on Public Use: Land-use and Recreation
Direct Adverse Effects: The hunting seasons occur when most summer residents and summer visitors have left and use of CACO is reduced to the annual lowest population levels. However, some negligible adverse effects are expected to fall hikers and other non-hunters seeking to get away from roads, developed sites, and other centers of human activity. Also, some visitors and residents report avoiding portions of CACO during the hunting season. Potential conflicts between hunting and other recreational and residential activities are minimized by prohibiting hunting in specific areas, and the prohibition on hunting on Sundays.

Direct Beneficial Effects: Moderate direct, long-term, local beneficial effects to recreational activities occur as hunting is a long established recreation activity on CACO and part of the culture of the region. Beneficial effects are not expected to land-use activities, as discussed above.

Indirect Beneficial Effects: The recreational benefits of hunting on CACO extend to areas outside CACO. Many hunters come from areas outside the Outer Cape to participate in the hunting opportunities provided on CACO. These benefits would be considered minor. Effects on land-use are not expected.

Indirect Adverse Effects: Hunting creates some minor indirect adverse effects among the perceptions of the non-hunting users. Individuals may avoid visiting CACO due to perceptions of unsafe conditions due to hunting.

Cumulative Beneficial Effects: Moderate beneficial effects to recreational uses are expected when considering the benefits of hunting on CACO and within other areas on Cape Cod. No effects are expected to land-use components of the region.

Effects of the No Action Alternative on Public Use: Health and Safety
Direct Adverse Effects: Negligible direct, long-term, local adverse effects occur due to the annual hunting seasons. Hunting, based on its history at CACO and general facts relating to hunting safety, does not jeopardize safety on CACO, as discussed in Section 3.5. Hunters and non-hunters are not substantially jeopardized by customary hunting activity, although there is always a small potential for risk of an accident. The discussion provided in the affected environment section of this Final EIS describes hunting safety, accidents, and shotgun ballistics. There is the potential, albeit negligible, for an increase in risk to non-hunters for the reasons discussed above.

Direct Beneficial Effects: Hunting does not create a substantially safer or less safe environment.

Indirect Effects: The continuation of hunting does not create any adverse indirect effects as the safety concerns of hunting probably do not extend beyond the CACO boundaries and do not extend further in time than each individual hunting season.

Cumulative Adverse Effects: Hunting could have a negligible cumulative adverse effect on safety if shoulder and off-season visitor use increases the potential for accidents and conflicts. Given the potential for the numbers of hunters to decrease and the positive safety history, such cumulative effects seem unlikely.

Effects of the No Action Alternative on Public Use: Visitor Experience

Hunters: Maintaining the hunting program would have moderate benefits to hunters, as it would allow them to continue their long-standing hunting traditions on CACO. Hunting activities would not be interrupted, and pheasant hunting would be reinstated. Adverse effects would not be expected as maintaining a hunting program is a favorable situation to hunters. Indirect beneficial effects would be minor, with benefits to hunters in other areas who could continue to travel and hunt at CACO and would not have to seek other areas to hunt. Hunting would continue to add to the overall diversity of recreational activities and would have a minor cumulative benefit.

Year-round residents and winter visitors (non-hunters): Minor adverse effects could occur to residents and visitors who hike during hunting season or seek to get away from roads, developed sites, and other centers of human activity. Minor indirect adverse effects may occur if individuals avoid traveling to CACO during the hunting season. Cumulative effects to use and experience at CACO by winter users would not be expected.

Summer visitors: Given that summer visitors or residents are not present on CACO during the hunting season, no effects either adverse or beneficial would be expected.

Effects of the No Action Alternative on Public Use: Socioeconomic Values (Effects on Local/Regional Economy)

Direct Beneficial Effects: Maintaining the hunting program would continue the economic benefits as discussed above. The level of these monetary benefits to the Outer Cape is relatively small and these direct beneficial effects would be minor.

Indirect and Cumulative Beneficial Effects: Indirect and cumulative benefits would be negligible to the regional economy when considered as part of the overall contribution made by CACO to the local and regional economy.

Effects of the No Action Alternative on Management and Operations: Consistency with CACO and NPS Goals, Plans, Policies, Guidelines, and Mandates

Direct Beneficial Effects: Retaining the current hunting program would not have any direct beneficial effects on management and operations. Hunting does not create any new or additional duties for CACO rangers. The hunting program does not create any additional costs other than production of hunting related brochures.

Direct Adverse Effects: Retaining the pheasant stocking and hunting program will require a policy waiver; as such, there would be a negligible adverse effect.

Indirect Adverse and Beneficial Effects: There are no indirect adverse or beneficial effects relating to management and operations.

Cumulative Adverse and Beneficial Effects: There are no cumulative adverse or beneficial effects expected when considering hunting and other operational consistency issues.

4.4.2 Alternative B – Create a Modified Hunting Program

The short-term and long-term beneficial effects of modifying the hunting program at CACO are determined to be minor, and adverse effects are determined to be negligible, although some species are affected differently than others. For this reason, a brief discussion of any beneficial and adverse effects for each species is provided, although many of the effects are the same as for Alternative A. This assessment is followed by a summary of effects on wildlife and other natural resources and the remaining impact topics.

As stated in Section 2.6, Alternative B would alter the current hunting program to provide the following modifications:

- increase hunting opportunities for native upland game bird species;
- apply adaptive management to phase out the pheasant stocking and hunting program;
- simplify and more clearly define hunting areas;
- expand hunting-related outreach to hunting and non-hunting users; and
- provide cooperative monitoring and management.

Effects of a Modified Hunting Program on Birds
There are three differences regarding bird species hunted proposed in Alternative B that deviate from Alternative A: establishing a hunting season for eastern wild turkey; ancillary enhancement of upland habitat with one expected side effect being an increase in quail numbers and potential hunting yield; and applying adaptive management to phase out the pheasant stocking and hunting program. A summary of the proposed modified program from Section 2.4 follows, and brief discussions are provided for each. The effects to all other avian game species from Alternative B would be the same as for Alternative A.

Turkey: A new hunting season for eastern wild turkeys consistent with MDFW regulations would be established. A turkey hunt would likely be held for two weeks in late April and early May. A change to CACO's special hunting regulations would be required to add the spring hunting season. Fall turkey hunting would be initiated if MDFW established such a season in their southeast region. This element would not expand the hunting season for any other species. This would be a controlled hunt requiring a permit, limiting the number of hunters, and likely managed through a lottery system. Specific areas would be designated as open to turkey hunting.

Effects on turkey: Mortality from hunting turkeys during a spring season has only negligible impacts, as a nominal harvest of male turkeys will not cause the population to decline. Spring turkey hunting is limited to juvenile and adult males and does not include nesting females. There is a minimal amount of disruption to the breeding cycle, since dominant male turkeys mate with a disproportionate number of females and the start of hunting season is timed to begin after the main mating period. In addition, turkeys are traditionally hunted from a stationary point and all harvested birds must be brought to an official check station, therefore the potential for disturbance to nesting females is low and check station experience indicates that illegal take of nesting females is very unlikely.

Quail: Instituting a cultural landscape restoration focusing on heathland and grassland will result in the likelihood for a higher population of quail, and a resulting increase in numbers hunted and taken. For all heathland and grassland communities and species, there is an expected potential major beneficial effect for quail and other species native to CACO that have been marginalized over time as heathland and coastal grassland have dwindled in the landscape.

Effects on quail: The expected effect of any increase in hunting pressure would be related to an increase in the population, and the effects of the modified hunting program would be negligible to minor.

Pheasant: An adaptive management approach would be used to phase out pheasant stocking as opportunities to hunt native upland game birds increase. The number of pheasants stocked during the first year the program is resumed will be determined in coordination with MDFW, but will not exceed 800. In each subsequent year, the number of pheasants stocked would be reduced as the number of restored heathland and grassland acres increases. This element would result in the end of pheasant stocking and hunting at CACO within 14 to 17 years. In no case will pheasant stocking continue beyond 17 years. Additionally, CACO will require that MDFW ensure that medications will be withdrawn from pheasants according to the drug's prescribed withdrawal period and MDFW contract specifications and MDFW will provide CACO with written documentation certifying the health of the birds released. This procedure will reduce any impacts associated with release of birds with antibiotics in their system and avoid the potential for introducing disease into the natural environment.

Effects on pheasant: Altering the pheasant program would not affect this species at CACO, as pheasants do not have an established population. Given that the predation and scavenging of pheasants by predators has no effect to negligible effects, phasing out the program should not adversely affect predators. Application of an adaptive strategy for phasing out the pheasant hunting program will result in fewer birds released to the CACO reflective of the general hunter numbers over time as discussed in Section 2.4.1.

Effects of Creating a Modified Hunting Program on Mammals

There are no changes proposed to the hunting program relating to mammals. Therefore, direct effects on particular species are the same for Alternative B as those previously discussed for Alternative A. Indirect effects could occur to mammalian predators as the numbers of pheasants stocked is reduced. Given that pheasants are a negligible food source for foxes and coyotes, systematically reducing the stocking numbers would likely have no effect or a negligible effect.

Effects of Creating a Modified Hunting Program on Natural Resources: Wildlife (Game, Non-Game, Rare Species)

Direct Beneficial Effects: The beneficial effects on wildlife resources from Alternative B would be the same as for Alternative A, with one notable exception: the cultural landscape restoration initiatives will likely result in some net enhancement of quail habitat and thus likely an increase in hunting yield over time. This would improve wildlife diversity, since heathlands on Cape Cod have been largely lost to plant community succession; therefore, habitat would be created for birds and mammals that use herbaceous and shrub habitat. Beneficial effects would be expected as follows:

- Activities associated with Alternative B would increase the population of native quail;
- Habitat diversity would contribute to increased wildlife diversity;
- An exotic species would eventually not be stocked at CACO;
- The loss of individuals is often considered compensatory mortality;
- Beneficial effects would be ongoing without timeframe limitations; and
- Generally only affects local populations, but can extend to adjacent areas.

Direct Adverse Effects: The adverse effects from Alternative B, as with Alternative A, would be largely limited to the loss of individuals from hunting mortality as follows:

- Loss of some individuals from a population would be considered a temporary population effect;
- Considered to be an ongoing effect to hunted species; and

- Generally only affects the immediate local populations of hunted species, but can extend to adjacent areas.

Most Federally listed threatened and endangered wildlife that occur in CACO do not use the areas of the park where hunting occurs. The proposed spring turkey hunting season would overlap with the piping plover nesting season, but turkey hunting would not occur in or near piping plover habitat. As a result, federal threatened and endangered wildlife would not be affected by the Alternative B. Some state listed wildlife species occur in the same areas and at the same time as hunting. Minor adverse impacts are possible to these state listed species if they are mistakenly shot or are disturbed by hunters.

Indirect Beneficial Effects: The beneficial effects from Alternative B would be the same as for Alternative A. The following benefits would be expected:

- Beneficial effects would be ongoing without timeframe limitations; and
- Generally only affects the local area, but can benefit habitat and landscape vegetation adjacent to CACO.

Indirect Adverse Effects: Applying an adaptive management approach to the pheasant-stocking program would reduce and ultimately eliminate the availability of this species to predators. This adverse effect is considered to be negligible based on the assessment that pheasant stocking has very little effect on predator species (Bump and Field 1999). This potential adverse effect would be less than what would be expected from continuing the full pheasant program. The following effects would be expected:

- Pheasants not taken by hunters provide a negligible food source for mammalian predators and have the unlikely potential to enhance the population of these predators.

Cumulative Beneficial Effects: The benefits from Alternative B would be the same as for Alternative A:

- Hunting on other public and private lands in conjunction with deer hunting on CACO provides the indirect benefits described above that extend beyond CACO boundaries;
- Benefits extend to areas on and around lands that are hunted; and
- This is an ongoing benefit in the region.

Effects of Creating a Modified Hunting Program on Natural Resources: Vegetation (Plants, Rare Plants, Natural Communities)

Direct Beneficial Effects: Implementing the elements of Alternative B, especially the landscape restoration activities, would improve conditions for the state listed broom crowberry (*Corema conradii*). Expanding heath and grassland habitat would create diversity of vegetative communities and may also help control some invasive plant species. These beneficial effects would be expected to be moderate in intensity, of long-term duration, and generally of a local nature. Adverse direct, indirect, and cumulative effects would not be expected.

Direct adverse effects, indirect effects, and cumulative effects would be the same as for Alterntive A.

Effects of Creating a Modified Hunting Program on Cultural Resources: Cultural Heritage

Direct Beneficial Effects: All the benefits described for Alternative A would also be realized here, plus those described below. Minor to moderate beneficial long-term, local effects would result from potentially improved quail populations and hunting opportunities and the initiation of a spring wild turkey hunting season. There would be minor to moderate long-term benefit from the cultural landscape restoration initiatives resulting in enhanced cultural landscapes as well as the potentially improved opportunity to hunt a native species (i.e., quail). The following effects would be expected:

- Hunting has been part of the cultural heritage of the Outer Cape for generations and would continue under this alternative;
- As the number of hunters declines, the benefits to the local heritage may become less apparent;
- Benefits are primarily related to local hunters and those from nearby communities;
- Initiating an adaptive management approach to the pheasant stocking and hunting program would retain the cultural aspects of this hunting activity for as long as the program remains in effect; and
- Adding a spring wild turkey hunting season would restore a portion of the hunting heritage of the Outer Cape;
- Improving native upland game species (i.e., quail) numbers through cultural landscape restoration provides the potential to improve the cultural heritage aspects for hunting a native species; and
- These are ongoing benefits.

Direct Adverse Effects: Some individuals use CACO for berry picking and mushroom gathering. These individuals may avoid using CACO on hunting days during the hunting seasons, which would be considered a negligible adverse effect. These effects are the same as Alternative A.

Indirect and Cumulative Effects: Indirect and cumulative effects would be the same as for Alternative A, with cultural heritage benefits extending to the local vicinity and region. Indirect beneficial effects that would be expected include:

- Hunting is one aspect of many that make up the cultural heritage;
- This benefit is both local and regional; and
- These are ongoing benefits.

Beneficial cumulative effects would be similar to those for Alternative A, including the following:

- Cultural heritage benefits from continuing hunting are additive with hunting in other communities and in the region; and
- This is an ongoing benefit.

Effects of Creating a Modified Hunting Program on Cultural Resources: Cultural Landscapes

Direct Beneficial Effects: Moderate to major beneficial effects would result with the restoration of the cultural landscape and historic heath habitat in many areas of CACO. This community has declined significantly as a result of vegetative community succession and elimination of grazing and other cultural practices that maintained heathlands. Much of CACO was likely heath habitat, especially during the mid 19th century, and increasing this habitat helps to provide a view of what the Outer Cape was like during those times. The landscape view would likely change from forested and shrub habitat to an open view that would extend the view towards the ocean and bays.

- Landscape restoration would likely improve quail habitat and subsequently their population;
- Portions of CACO would be restored to native heath habitat consistent with the mid 19th century and more consistent with the historical buildings and other historical features of CACO;
- The cultural viewscape would be improved; and
- These would be ongoing benefits at CACO and in the immediate areas.

Indirect and Cumulative Effects: The benefits of the landscape restoration efforts would probably not extend beyond CACO to the local area and the Outer Cape region.

Effects of Creating a Modified Hunting Program on Public Use: Land Use and Recreation

Direct, Indirect, and Cumulative Beneficial Effects: Direct, indirect, and cumulative effects would be the same as for Alternative A, except that Alternative B would apply an adaptive management approach to the pheasant program, resulting in the phase out of the pheasant hunt. At the same time, opportunities for native species hunts for turkeys and potentially an increase in quail will be instituted. This effort will create short-term adverse effects for local hunters who participated in the pheasant hunt once it is phased out. In the long-term, the cultural landscape restoration would have some long-term minor to perhaps moderate benefits as the native quail population increases and hunting potentially alters as a result. Benefits of the landscape restoration would extend to hunters as well as visitors and residents in the local and regional areas and as such would provide some indirect and cumulative effects.

The proposed modifications to the areas open to hunting and those closed may encourage more visitations during the hunting season, resulting in beneficial effects.

The following beneficial effects would be expected:

- Increased opportunities for hunting native game birds;
- Opportunity to experience wildlife associated with an important and otherwise diminishing landscape; and,
- Improving the designation of hunting areas and increasing the setback from bike trails may encourage more visitors during the hunting seasons.

Direct, Indirect, and Cumulative Adverse Effects: As noted above, phasing out the pheasant hunt would be an adverse impact to pheasant hunters as this form of recreation will be eliminated. This should be mitigated somewhat by the enhancement of native upland game bird hunting opportunities, but the loss will not be completely offset since the pheasant hunting experience is distinct from turkey and quail hunting experiences. Some CACO visitors, such as hikers or other seeking solitude, modify or reduce their outdoor activities at CACO during the hunting seasons, hence reducing some recreational opportunities. These effects are largely negligible and may be offset by improving the hunting designations and increased setback along bike trails. Information about these new designations should help clarify how to avoid areas that may be hunted, as well as heighten awareness of the opportunity to access all of CACO's publicly-available resources on Sundays. This should aid users in planning their outdoor activities to maximize their use of the Park.

Effects of Creating a Modified Hunting Program on Public Use: Health and Safety

Direct, Indirect, and Cumulative Effects: Direct, indirect, and cumulative effects would be similar for Alternative B as for Alternative A, with two exceptions: one exception is that the initiation of a turkey hunting program could adversely affect hunter safety. The effect would likely be negligible; turkey hunting can be as safe as any other hunting activity with the proper safety precautions and standards, as indicated by experience elsewhere. In the long-term, potential safety hazards would largely apply only to hunters and it is unlikely that non-hunters would be affected.

The second exception, which is beneficial at a minor intensity, is that any potential for "close calls" would be further reduced or eliminated with the creation of detailed maps of areas open and areas closed to hunting and by increasing the setback from bike trails. Eliminating small areas from the acreage open to hunting, especially those areas near dwellings and other public use areas, and preparing maps of these revised areas would contribute to reducing the risk of an accident. As summarized in Table 8 and depicted in Figure 4, 1,564 acres would be removed from the hunting program. While this area is not significant relative to those areas open to hunting, it is their location, often near dwellings and areas of non-hunting activities that provides safety benefits. Incorporating the modifications to the hunting areas, preparing the corresponding maps, and increasing the setback from the bike trails should reduce any risk of an accident, although that risk is already relatively low based on the information provided in Section

3.3. Additionally, the perception of the risk of a hunting-related accident for non-hunters could be reduced. This effect is a minor benefit with long-term implications that are restricted to CACO.

The following effects would be expected:

- Turkey hunting could create additional safety concerns that should be managed and minimized as a controlled hunt;
- Creating new maps of areas open and closed to hunting and simplifying the configuration of these areas would reduce confusion and potential hunting regulation violations;
- A total of 1,564 acres would be removed from the hunting program, with most of these areas near dwellings and areas of non-hunting activities;
- Extending the setback from 150 feet to 500 feet from bike trails could further reduce the already low risk of accidents;
- There would be a slight, negligible, reduction in the risk of an accident to non-hunters with the creation of the new maps, hence a negligible benefit may result: and
- The perception that visiting CACO during the hunting season is unsafe may be reduced, resulting in a potential increase in non-hunter visits.

Indirect and cumulative effects would be the same as for Alternative A.

Effects of Creating a Modified Hunting Program on Public Use: Visitor Experience

Hunters: Several of these modifications would have little or no adverse effect on hunting activity, including area designation, monitoring, and improved information. Maintaining the hunting program with these improvements would provide similar moderate benefits to hunters as would the No-Action alternative. The net reduction in acres through redefining the areas open to hunting will be 1,564 more acres closed to hunting under Alternative B than under Alternative A (Figure 4). Redefining the areas open and closed to hunting should result in more predictable areas where hunting is likely to be encountered and more predictable areas where it will not; as will consistent buffers for hunting set-backs from roads, residences, and bike paths. These changes will result in little reduction in hunting opportunities. These modifications may even improve the hunting experience by reducing the potential for hunting violations as well as the likelihood for possible conflicts with other CACO visitors.

Establishing a turkey hunting season is the only proposed modification to the hunting seasons, which would further diversify the recreational uses of CACO. The introduction of turkey hunting would create additional hunting days. Several factors suggest that a CACO turkey hunt would be popular. First, turkey hunting grounds are scarce in the region. Otis Air Force Base represents the nearest public turkey hunting location.[21] Likewise, turkey harvest data collected at check-in stations indicates that few turkeys are bagged in Barnstable County relative to the rest of the state. In the spring of 2005, only 6 turkeys were harvested in Barnstable County, a tiny fraction of the nearly 2,300 turkeys harvested statewide (MDFW 2005b). Barnstable County hunters appear to have a strong interest in turkey hunting, and many have stated that they would participate if given the opportunity. Of the hunters intercepted in the field, 91 percent said they would hunt turkey if a program were established at CACO (Kuentzel 2006). Likewise, 74 percent of the respondents from the survey of Barnstable County license holders indicated they would participate in turkey hunting at CACO.

The restoration of cultural landscapes with the secondary benefit of increasing upland game habitat will likely benefit the hunters and other visitors interested in viewing wildlife. The enhancement of the cultural landscape also benefits the visitor by providing viewscapes more in line with those expected while visiting Cape Cod.

[21] R. Kennedy, personal communication, September 13, 2004.

The indirect and cumulative effects would likely be the same as for the No Action alternative, with some benefits to hunters in the region, some improvement in visual landscape for the visiting public, and the potential to expand recreational opportunities.

Year-round residents and winter visitors (non-hunters): The expansion of hunting activity could increase the potential for conflict between hunters and non-hunters (both CACO users and local residents). Conversely, phasing out the pheasant hunt may reduce some conflicts. In particular, the addition of a spring turkey hunt could introduce a new set of interactions between non-hunters and hunters. CACO visitation data show that, while visitation clearly peaks in summer months, April and May have a distinct increase relative to the winter months; hence, there is some potential for interaction. Turkey hunters generally go unnoticed, as their activity requires a very stealthy approach, minimal firearms action and they usually only hunt in the morning hours, which may offset the potential for adverse interactions that could result as visitation increases during the spring.

Adverse effects would be similar to those in the No Action alternative due to potential conflicts with hunters and "close calls." The improved maps and designation of hunting areas may also help some visitors become more comfortable with safety issues and encourage their use of CACO more during the fall and winter. Improved outreach will also help make more visitors aware that hunting does not occur on Sundays. The improvement of information regarding open versus closed areas could alleviate some concerns regarding safety and potential conflicts, especially those that involve individuals hunting too close to dwellings. Indirect and cumulative effects would likely be the same as with the No-Action alternative. There is potential that the benefits resulting from these modifications could be far reaching and might indirectly encourage more visitors to CACO during the winter. If so, these indirect benefits would likely be negligible.

Summer visitors: Given that summer visitors or residents are not present on CACO during the hunting season, no effects either adverse or beneficial would be expected. Exceptions to this are discussed above regarding spring turkey hunting.

Effects of Creating a Modified Hunting Program on Public Use: Socioeconomic Values (Effects on Local/Regional Economy)

Direct, Indirect, and Cumulative Beneficial Effects: The economic benefits to local communities would be greater than the No Action alternative. The addition of a turkey hunting season and the enhancement of upland game hunting opportunities would likely increase CACO hunting activity. The analysis of hunting activity estimates a net addition of between 90 and 300 hunting days per year. Multiplying this range by the average expenditures per hunting day ($9) yields increased expenditures of about $800 to $2,700 at Outer Cape establishments. Because turkey hunting grounds are not widely available on the Cape, the addition of a CACO turkey hunt would likely increase overall hunting activity. Assuming that the hunting activity is newly created, the change in consumer surplus would equal the number of turkey hunting days multiplied by the average consumer surplus per hunting day. The resulting estimate is between $3,000 and $15,000 per year.[22] However, any negligible increase in consumer surplus would be expected to be offset by the loss of economic resources generated by the eventual phase-out of the pheasant hunt, and so the overall effect is a no net effect

[22] A literature search yielded no studies that explicitly estimated consumer surplus per day of turkey hunting; therefore, general hunting consumer surplus figures are used. Studies of small game and waterfowl typically yield consumer surplus estimates that are lower than those for deer hunting. Hence, the analysis may overstate the increase in economic welfare associated with the CACO turkey hunt.

The indirect and cumulative effects would also be similar with negligible benefits in the region and when combined with the overall economic benefits of CACO. These are relatively small when considered in the larger context of the region.

Effects of Creating a Modified Hunting Program on Management and Operations: Consistency with CACO and NPS Goals, Plans, Policies, Guidelines, and Mandates

Direct Adverse Effects: Creating a modified hunting program would have four negligible, long-term, local adverse effects. If the current pheasant hunting policy waiver is not sufficient to meet CACO policies, a revised policy waiver would be required to retain some form of the pheasant program for the period that it remains in place. Once the phase out is complete, the waiver would not be required. Initiating a spring turkey hunt would require an administrative type of modification to the CACO hunting regulations to extend hunting into the spring. Rangers would incur minor additional duties to manage and control the turkey hunting season. Furthermore, CACO staff would need to coordinate and manage the prescribed burn program for restoring the heath habitat. There would not be any direct beneficial effects. The following effects would be expected:

- Rangers would need to enforce and manage the turkey hunting season;
- A policy waiver to update the decision to phase out the pheasant hunt in the manner described may be needed;
- A modification to the CACO hunting regulations would be needed to extend the hunting season into the spring; and
- Natural and Cultural Resources and fire management staff would need to implement the cultural landscape practices if prescribed fire is to be used.

Direct Beneficial Effects: There would be two direct beneficial effects resulting from the termination of the pheasant hunt. As discussed above, once the phase-out is completed a policy waiver would not be needed. Furthermore, eliminating the use of an exotic species for hunting at CACO would provide consistency with the NPS Natural Resource Guidelines.

Indirect and cumulative effects would be the same for Alternative B as for Alternative A.

4.4.3 Alternative C – Eliminate Hunting

The short-term and long-term adverse effects of terminating hunting at CACO are determined to be minor, although there are potential adverse effects for some species. For this reason, a brief discussion of any beneficial and adverse effects for each species is provided. This assessment is followed by a summary of effects on wildlife and other natural resources and the remaining impact topics.

Although the role of hunting at CACO is recreational rather than to actively manage any particular species, where information and the best professional judgment of Park managers and other experts can offer information about likely changes to species and natural resources, this information is provided. Hunting certainly is a factor in population alteration for some species, particularly deer, and experience at other National Parks and in other managed environments is taken into account to inform the assessment of Alternative C as for both previous alternatives.

Effects of Eliminating Hunting on Birds

Ring-necked pheasants do not have an established breeding population on Cape Cod. Eliminating the stocking and hunting program would not have any beneficial or adverse effects on pheasants and predators.

Hunting pressure is very limited for the agricultural pest species. Eliminating hunting would likely not have any beneficial or adverse effects on local or regional populations of these species since the hunting mortality is very low.

There are very limited populations of quail on Outer Cape Cod. Some quail are harvested incidentally relative to other hunting activities; eliminating the hunting opportunities would likely not benefit or adversely effect the quail population. Ruffed grouse do not have a firmly established population on Outer Cape Cod and eliminating hunting will have no effect on this species.

Eliminating hunting for waterfowl would likely not have any measurable effects on these species. Hunting for these species is regulated at the national level and conditions affecting populations occur regionally and internationally. Changes in hunting at CACO would not alter the populations of these species.

Effects of Eliminating Hunting on Mammals

Terminating deer hunting would result in minor adverse effects to the deer population at CACO. While on first impression, elimination of take on an individual might seem to be positive, if over the long-term, food supply becomes a limiting factor, population reduction could occur through starvation and over-winter mortality. Based on scientific literature concerning the effects of hunting and non-hunting on deer, the density of the CACO deer population could increase and potentially result in long-term adverse effects on vegetation. Reducing vegetative cover would adversely affect deer by reducing forage, especially during the winter and could adversely affect other wildlife that would otherwise use the affected vegetation. Monitoring would be necessary to determine if these types of population changes result.

If cottontail rabbit hunting were terminated there are unlikely to be any beneficial effects on the rabbit population. Hunting mortality is likely compensatory in most years, although it may be an additive form of mortality during extreme winters. In most years, the proportion of the population not taken by hunting would likely succumb to other mortality factors and/or reproduction levels would be reduced in response to an elevated population. As has been stated previously, the effects of hunting on New England cottontails are under review, and modifications to the rabbit hunt may be considered following consultation with USFWS and MDFW.

If hunting were eliminated, squirrel populations would probably increase slightly within one to two years, depending on food availability in the actual year of the closure. Based on the harvest estimate (405 squirrels) provided in Section 3.3.3, a portion of the population would die during the winter without any hunting related mortality. Nonetheless, this harvest level represents 0.03 squirrels per acre of forested habitat. This suggests that the duration of the effects is short-term.

Raccoon populations are known to respond favorably in urban environments where there is no control and human related food sources are available. In that situation, there could be adverse effects of terminating the raccoon hunt.

The short-term and long-term effects of eliminating the fox and coyote hunt at CACO would be negligible to minor. The current annual fox harvest is low (based on MDFW pelt data); therefore, eliminating hunting would have only a minor effect on the current fox population. Although actual coyote harvest levels are not known, an approximate estimate (10 – 20 coyotes per year) suggests that less than 40 percent of the CACO population is harvested each year within CACO. This is well below the 70 percent level that Connolly and Longhurst (1975) suggest would lead to a large effect on overall coyote numbers. Coyote populations tend to be highly dynamic and resilient to hunting for severely decreasing their numbers (Knowlton *et al.* 1999).

Given the lack of interest by hunters in harvesting opossums, it is unlikely that terminating hunting would have any beneficial or adverse effects.

Effects of Eliminating Hunting on Natural Resources*: *Wildlife (Game, Non-game, Rare Species)
Direct Adverse Effects: There are no direct adverse effects that would be expected to result from the termination of hunting. There would be no effects to federally listed threatened and endangered species if hunting were eliminated.

Direct Beneficial Effects: Beneficial effects would include the short-term loss of mortality to the game species, which would be relatively negligible. Increased population numbers of game species could result, but this is not necessarily a benefit, as discussed above. The duration would reflect short-term seasonal and annual cycles. Beneficial effects are restricted to CACO and the immediate area, as the upland hunted species do not migrate to areas outside of the Outer Cape. The following effects would be expected:

- Increased wildlife populations could result;
- Beneficial effects for some species such as waterfowl would not be expected, as CACO is a very small portion of the relevant environment for these species;
- Effects would occur on a local basis; and
- Effects would be long-term as long as the hunting program is terminated.

Indirect Adverse Effects: Eliminating hunting could result in increased numbers of deer, which could lead to indirect effects such as increased browsing. If browsing increased to such an extent that habitat became degraded, this could adversely affect deer and other wildlife that depend on native plant communities. These effects could occur on a seasonal or annual basis and would also occur as long as the hunting program was discontinued. The following effects would be expected:

- If cessation of hunting lead to a damaging level of deer browsing, habitat could become degraded;
- These adverse effects would be largely restricted to the CACO area and immediate local areas; and
- Effects would be long-term.

Cumulative Adverse Effects: Negligible adverse effects could result from an increasing Outer Cape deer population. These effects would not apply to more localized species such as cottontails and far ranging species such as waterfowl. The same adverse effects described for the indirect effects could result, but when considered with the loss of private lands for hunting purposes, adverse effects could be more widespread. The following effects would be expected:

- With the loss of other hunting lands, the adverse effects of habitat degradation would extend to other parts of Cape Cod; and
- Effects would be long-term.

If only the pheasant hunt was eliminated, then the above beneficial and adverse effects would not be expected. In fact, eliminating the pheasant hunt would not affect wildlife resources.

Effects of Eliminating Hunting on Natural Resources*: *Vegetation (Plants, Rare Plants, Natural Communities)
Direct Effects: Terminating the hunting program would remove any contribution hunters make to the formation and maintenance of social trails. This effect is expected to be negligible.

Indirect Adverse Effects: Minor adverse effects are expected locally and over the long-term. It is possible that the deer population may increase, which could result in more browsing of vegetation. These adverse effects on vegetation could adversely affect deer in the long-term by reducing valuable forage. The following effects would be expected:

- These adverse effects would be similar to those described above for wildlife habitat damage relating to indirect effects; and
- Effects would be local, possibly regional, and long-term.

Cumulative Adverse Effects: When evaluating the adverse effects of vegetation loss on CACO with the continued development of the Outer Cape, adverse cumulative effects would likely occur. These would be minor in scope, but would extend over a long period of time. The following effects would be expected:

- These adverse effects would be similar to those described above for wildlife habitat damage relating to cumulative effects; and
- Effects would be regional and long-term.

If only the pheasant hunt was eliminated, then the above beneficial and adverse effects would not be expected. In fact, eliminating the pheasant hunt would not affect vegetation resources.

Effects of Eliminating Hunting on Cultural Resources*: *Cultural Heritage

Direct Beneficial Effects: There would be direct, minor beneficial effects to berry pickers and mushroom gatherers as they would not need to modify their use of CACO if they wish to avoid hunters.

Direct Adverse Effects: The loss of hunting opportunities on CACO would result in moderate, long-term, local and possibly regional adverse effects. CACO is the only public area open to hunting in the Outer Cape and has been a popular hunting area prior to the creation of CACO. Hunting in general, and especially on CACO, has been part of the cultural heritage for many generations. The loss of part of the cultural heritage would affect many local hunters and some from outside the region who travel to enjoy the hunting opportunities afforded by CACO. The following effects would be expected:

- Terminating the hunting program would end the cultural aspects of hunting on the Outer Cape, except for private lands open to hunting;
- Terminating hunting would have a major adverse effect on the hunters' cultural heritage;
- Terminating the hunting program would be contrary to the some of the purposes for creating CACO, which include maintaining the way of life and cultural aspects of the Outer Cape;
- Hunting pressure would be expected to increase on other public and private lands outside CACO;
- Effects would be local and regional; and
- Effects would be long-term.

Indirect Adverse Effects: Minor adverse effects could occur outside of CACO as the adverse effects of the loss of hunting could extend beyond the immediate area. Hunters that otherwise would hunt at CACO would have to use other public or private lands, thereby affecting the cultural heritage of the region. The following effects would be expected:

- Eliminating hunting would cause the loss of one aspect of the local and regional cultural heritage and would indirectly affect other cultural aspects of the Outer Cape.

Cumulative Adverse Effects: The loss of hunting on CACO together with ongoing development pressure in the region could change the cultural heritage of the region to reflect values and practices more typical

of a suburban culture versus the historical, more rural values that CACO was established to protect. These changes would result in minor cumulative adverse effects to the cultural heritage of the region. The following effects would be expected:

- Encroaching development pressure and the loss of private lands for hunting extends the adverse effects to the loss of this aspect of the cultural heritage;
- Adverse effects would be regional;
- Effects would be long-term.

If only the pheasant hunt was eliminated, then the above beneficial or adverse effects would not be expected, except those effects relating to pheasant hunting. Eliminating the pheasant hunt would adversely affect the cultural heritage issues relating to the loss of an established and locally popular hunting program.

Effects of Eliminating Hunting on Cultural Resources: Cultural Landscapes
Direct Effects: The loss of the hunting program at CACO would not create any adverse or beneficial direct effects on cultural landscape features. These areas are generally closed to hunting.

Indirect Adverse Effects: The loss of hunting opportunities could result in increased deer population and potential increased browse of native and landscaped vegetation. Negligible indirect adverse effects could result.

- Effects would be local and long-term.

Cumulative Effects: No adverse or beneficial cumulative effects would be expected.

If only the pheasant hunt was eliminated, no effects on cultural landscapes would be expected.

Effects of Eliminating Hunting on Public Use: Land Use and Recreation
Direct Beneficial Effects: There would be direct, minor beneficial effects to hikers and others seeking solitude as they would not need to modify their use of CACO if they wish to avoid hunters.

Direct Adverse Effects: Moderate, long-term, local adverse effects would result to hunters from the Outer Cape region and from nearby areas. Most hunters that participate in hunting at CACO live locally or travel from nearby communities in southeastern Massachusetts. This aspect of the recreational values provided by CACO would be eliminated and local hunters would be deprived of this recreational opportunity. The following effects would be expected:

- Eliminating hunting would eliminate a form of recreation available at CACO;
- Effects would largely be local, but hunters do travel from other communities and the effects could extend to other areas; and
- Effects would be long-term.

The perceptions of some visitors or residents may improve, but tangible benefits are not expected.

Indirect Adverse Effects: The loss of public hunting areas could push local hunters to public hunting areas in other parts of the state. This shift in hunter use of other areas could adversely affect the quality of hunting opportunities in other areas and as such negligible adverse effects would result.

Cumulative Adverse Effects: Cumulatively the loss of public hunting lands and private areas open to hunting would create moderate adverse effects to local hunters and those that in the nearby communities. As areas open to hunting diminish, the opportunities for hunters to participate in this activity are removed

from Cape Cod, forcing hunters to travel further from their homes and increasing the crowding at other public hunting areas. The following effects would be expected:

- The general trend of the loss of private lands for hunting and the potential to lose other public lands extends and intensifies these adverse effects; and
- Cumulative effects would be long-term.

If only the pheasant hunt was eliminated, then adverse effects relating to the recreational aspect of pheasant hunting would be eliminated. The full measure of the above beneficial and adverse effects would not be expected.

Effects of Eliminating Hunting on Public Use: Health and Safety
Direct Adverse Effects: Adverse effects are not expected.

Direct Beneficial Effects: Negligible beneficial effects are expected to result from the elimination of hunting at CACO in regard to the possibility of a hunting-related accident involving either a hunter or non-hunter. The record suggests that hunting has a very safe track record at CACO. Nonetheless, there is a small potential for such an injury to occur and eliminating hunting would eliminate this potential. The following effects would be expected:

- Despite the low probability of a hunting related accident, there is some potential for improved safety conditions; and
- Benefits would be long-term and restricted to CACO.

Indirect Adverse Effects: No indirect adverse effects would be expected.

Cumulative Adverse Effects: The cumulative effects would include moving the interest in hunting away from CACO lands, thereby increasing the hunting pressure and density of hunting activity in a smaller area of remaining lands open to hunting.

- Hunters would seek other public lands, thereby negligibly increasing the potential for accidents at these locations; and
- Effects would be long-term.

Eliminating only the pheasant hunt could enhance safety at a negligible level. Other beneficial and adverse effects discussed above would not be expected.

Effects of Eliminating Hunting on Public Use: Visitor Experience
Hunters: Terminating the hunting program would have adverse effects on hunters by ending their recreational activity at CACO. Adverse effects would be moderate and long-term. Some hunters indicated that they could find substitute sites of similar quality, but new sites would be less convenient. Alternative C would reduce the diversity of recreational activities at CACO. Terminating hunting could have minor adverse effects on hunters in nearby regions as hunters using CACO would likely seek other public areas for hunting. Cumulatively adverse effects could occur as residential development growth and pressure on other hunting lands could cause hunters to seek other areas outside the region. There would be no beneficial effects for the hunting public. Eliminating only the pheasant hunt would create adverse effects for those hunters that participate in that hunt. The full measure of the adverse effects to hunters would not be expected.

Year-round residents and winter visitors (non-hunters): Adverse effects would not be expected to residents and winter visitors. Minor beneficial effects would be expected as some individuals would

begin using CACO during the hunting seasons. Any potential for "close calls" and conflicts between hunters and non-hunters would be eliminated. Some individuals may visit CACO that would not have with the hunting program in place. Indirect minor beneficial effects would occur if individuals from other areas begin traveling to CACO that would not have otherwise. Cumulative effects would not be expected.

Summer visitors: No beneficial or adverse effects would be expected, as summer visitors are not present during the hunting season.

Effects of Eliminating Hunting on Public Use: ***Socioeconomic Values (Effects on Local/Regional Economy)***

Direct Adverse Effects: This analysis assumes that a CACO hunting ban would eliminate trip-related hunting expenditures in the Outer Cape region. This would be the case regardless of whether hunters choose substitute sites or cease hunting entirely.[23] As noted, CACO hunters spend approximately $89,000 to $256,000 per year at Outer Cape establishments; these expenditures and the benefits they bring to the local economy would be eliminated under Alternative C. Overall, the relocated hunting effort would likely deliver slightly less economic benefit relative to the same amount of hunting activity at CACO. However, survey responses suggest the difference is minimal, and it is difficult to specify the consumer surplus loss associated with the slight change in quality and convenience. The loss of revenue would result in minor effects to the local economy. While not large relative to the overall regional economy, these expenditures may be significant if concentrated in a small number of local businesses.

Indirect and Cumulative Effects: Indirect and cumulative negligible adverse effects would occur in the region due to the loss of locally generated expenditures, but may be offset if off-season visitation increases. Survey responses suggest that if hunting were banned at CACO, a subset of hunters would cease hunting altogether. Society would lose the economic benefit (consumer surplus) associated with the lost hunting days. A separate subset of hunters would redirect effort to substitute sites. Presumably, these substitute sites offer a different hunting experience than CACO. Therefore, the effect of Alternative C on the overall economic welfare depends on a variety of factors that affect the utility that hunters derive from substitute sites relative to CACO and, as stated previously, would be negligible.

If only the pheasant hunt was eliminated, then the above beneficial and adverse effects would not be expected. Eliminating the pheasant hunt would have an adverse effect on socioeconomic values.

Table 31 summarizes the economic effects of the alternatives, including the estimated change in commercial expenditures as well as the estimated change in consumer surplus.

Table 31. Summary of Economic Effects Under Management Alternatives

Type of Economic Effect Assessed		Alternative A	Alternative B	Alternative C
		No-Action Alternative	Modified Hunting Program	Elimination of Hunting
Estimated Hunting-Related Expenditures in Barnstable County	Low	$88,843	$825 increase	$88,843 decrease
	High	$256,102	$2,749 increase	$256,102 decrease
Estimated Consumer Surplus	Low	$339,301	$3,150 increase	$230,725 decrease
	High	$1,397,264	$15,000 increase	$950,139 decrease

[23] Depending on the location of substitute hunting sites, some hunters may still make trip-related purchases at Outer Cape businesses. Hence, the estimated loss of expenditures may be biased upward.

Effects of Eliminating Hunting on Management and Operations*: *Consistency with CACO and NPS Goals, Plans, Policies, Guidelines, and Mandates

Direct Adverse Effects: Terminating hunting would be contrary to CACO goals and the purpose for establishing CACO. Hunting was clearly designated as an acceptable activity and during public hearings positive input was expressed by the public regarding maintaining hunting as a part of the fabric of life on the Outer Cape. Given these facts, terminating hunting would have moderate adverse effects of a long-term nature at CACO on management and operations. The following effects would be expected:

- Hunting is consistent with CACO goals;
- Hunting was positively considered during the process of establishing CACO;
- Adverse effects would be restricted to CACO;
- Adverse effects would be long-term.

Direct Beneficial Effects: Terminating hunting would have negligible, long-term, and local beneficial effects to management and operations at CACO. A policy waiver for pheasant stocking and hunting would not be required. Furthermore, eliminating the use of an exotic species for hunting at CACO would provide consistency with NPS 2006 Management Policies (NPS 2006a). The responsibilities of the CACO rangers relating to hunting would not be required. Benefits in this regard would be negligible. The following effects would be expected:

- A policy waiver would not be required for the pheasant program;
- Ranger duties during the hunting season would be reduced;
- Benefits would only apply to CACO ;
- Benefits would be long-term.

Indirect Effects: No adverse or beneficial indirect effects to management and operations are expected.

Cumulative Effects: No adverse or beneficial cumulative effects to management and operations are expected.

If the pheasant hunt alone was eliminated, the above beneficial effects would be expected relating to the lack of a need for a policy waiver.

4.5 Impact Summary

A summary of effects to all issues and alternatives is provided in Table 32.

4.5.1 Alternative A – No Action

Maintaining the current hunting program provides numerous beneficial effects relating to maintaining habitat quality for game and non-game species, maintaining cultural heritage factors that are part of the fabric of life on the Outer Cape, providing recreational opportunities for local residents and individuals from the region, and maintaining consistency with CACO goals and reasons that CACO was established. This alternative does not address improving safety and awareness of hunting and non-hunting areas and improving recreational opportunities. Adverse effects are relatively minor with regard as to the loss of individuals from the game species populations and negligible relating to safety. Overall the game species populations would be expected to remain stable. The perception by many non-hunters that hunting creates safety risks for them is not addressed specifically. The beneficial effects outweigh the adverse effects.

Table 32. Effect Summary Matrix for the CACO Hunting Program Alternatives

Effect Category	Alternative A – No Action Effect intensity rating	Alternative B – Modified Hunting Program Effect intensity rating	Alternative C – Eliminate Hunting Effect intensity rating
Natural Resources			
Wildlife	Adverse: Minor Beneficial: Minor Indirect: Minor beneficial Cumulative: Negligible beneficial **Net negligible beneficial effects**	Adverse: Minor Beneficial: Minor Indirect: Minor beneficial Cumulative: Negligible beneficial **Net negligible beneficial effects**	Adverse: None Beneficial: Negligible Indirect: Negligible adverse Cumulative: Negligible adverse **Net negligible adverse effects**
Vegetation Natural Communities	Adverse: Negligible Beneficial: None Indirect: None Cumulative: None **Net negligible adverse effects**	Adverse: Negligible Beneficial: Moderate Indirect:None Cumulative: None **Net minor beneficial effects**	Adverse: None Beneficial: Negligible Indirect: Minor adverse Cumulative: Minor adverse **Net minor adverse effects**
Cultural Resources			
Cultural Heritage	Adverse: Negligible Beneficial: Moderate Indirect: Negligible beneficial Cumulative: Minor beneficial **Net minor beneficial effects**	Adverse: Negligible Beneficial: Moderate Indirect: Negligible beneficial Cumulative: Minor beneficial **Net minor beneficial effects**	Adverse: Moderate Beneficial: Minor Indirect: Minor adverse Cumulative: Minor adverse **Net moderate adverse effects**
Cultural Landscape	Adverse: None Beneficial: None Indirect: None Cumulative: None **No effects**	Adverse: None Beneficial: Moderate to major Indirect: None Cumulative: None **Net moderate to major beneficial effects**	Adverse: None Beneficial: None Indirect: Negligible adverse effects Cumulative: None **Net negligible adverse effects**

(*continued*)

Effect Category	Alternative A – No Action Effect, duration, intensity rating, and context	Alternative B – Modified Hunting Program Effect, duration, intensity rating, and context	Alternative C – E liminate Hunting Effect, duration, intensity rating, and context
Public Use			
Public Use: Land Use and Recreation	Adverse: Negligible, long-term, local Beneficial: Moderate, long-term, local Indirect: Minor beneficial Cumulative: Moderate beneficial **Net moderate beneficial effects**	Adverse: Negligible, long-term, local Beneficial: Moderate, long-term, local Indirect: Minor beneficial Cumulative: Moderate beneficial **Net moderate beneficial effects**	Adverse: Moderate, long-term, local Beneficial: Minor effects Indirect: Negligible adverse Cumulative: Moderate adverse **Net moderate adverse effects**
Public Use: Health and Safety	Adverse: Negligible, long-term, local Beneficial: Negligible, long-term, local Indirect: None Cumulative: Negligible beneficial **Net negligible beneficial effects**	Adverse: Negligible, long-term, local Beneficial: Minor, long-term, local Indirect: None Cumulative: Negligible beneficial **Net minor beneficial effects**	Adverse: None Beneficial: Negligible effects, long term, local Indirect: Negligible adverse Cumulative: Negligible adverse **Net neutral effects**
Public Use and Experience: Year-round residents and winter visitors	Adverse: Minor, long-term, local Beneficial: None Indirect: Minor adverse Cumulative: None **Net minor adverse effects**	Adverse: Minor, long-term, local Beneficial: Minor, long-term, local Indirect: Minor beneficial Cumulative: None **Net minor beneficial effects**	Adverse: None Beneficial: Minor, long-term, local Indirect: Minor beneficial Cumulative: None **Net minor beneficial effects**
Public Use and Experience: Summer visitors	Adverse: None Beneficial: None Indirect: None Cumulative: None **No adverse or beneficial effects**	Adverse: None Beneficial: None Indirect: None Cumulative: None **No adverse or beneficial effects**	Adverse: None Beneficial: None Indirect: None Cumulative: None **No adverse or beneficial effects**
Socioeconomic Values: Economics	Adverse: No effects Beneficial: Minor, long-term, local Indirect: Negligible beneficial Cumulative: Negligible beneficial **Net minor beneficial effects**	Adverse: No effects Beneficial: Minor, long-term, local Indirect: Negligible beneficial Cumulative: Negligible beneficial **Net minor beneficial effects**	Adverse: Minor, long-term, local Beneficial: No effects Indirect: Negligible adverse Cumulative: Negligible adverse **Net minor adverse effects**
Socioeconomic Values: Social	Adverse: Minor, long-term local Beneficial: Minor, long-term, local Indirect: Negligible beneficial Cumulative: No effects **Net negligible beneficial effects**	Adverse: Minor, long-term local Beneficial: Moderate, long-term, local Indirect: Negligible beneficial Cumulative: No effects **Net minor beneficial effects**	Adverse: Minor, long-term, local Beneficial: Minor, long-term, local Indirect: Negligible beneficial Cumulative: No effects **Net negligible beneficial effects**

(*continued*)

Effect Category	Alternative A – No Action Effect, duration, intensity rating, and context	Alternative B – Modified Hunting Program Effect, duration, intensity rating, and context	Alternative C – Eliminate Hunting Effect, duration, intensity rating, and context
Management and Operations			
Consistency with NPS goals, plans, and policies	Adverse: Negligible effects Beneficial: Negligible, long-term, local Indirect: No effects Cumulative: No effects **Net neutral effects**	Adverse: Negligible, long-term, local Beneficial: Negligible, long-term, local Indirect: No effects Cumulative: No effects **Net Negligible beneficial effects**	Adverse: Moderate, long-term, local Beneficial: Negligible, long-term, local Indirect: No effects Cumulative: No effects **Net minor adverse effects**
Net Effects	**Minor beneficial**	**Minor beneficial**	**Minor adverse**

4.5.2 Alternative B – Modified Hunting Program

Modifying the current hunting program addresses many of the concerns that were raised during the scoping process and provides numerous beneficial effects. The elements of Alternative B would maintain habitat quality for game and non-game species. While there would be a short-term loss of upland game bird hunting involving a non-native species, there would be long-term increases for upland game bird hunting focusing on native species. The proposed modifications to the hunting program would maintain cultural heritage factors that are part of the fabric of life on the Outer Cape, continue to provide hunting opportunities, and expand native game bird hunting opportunities. The modified approach to designating open and closed hunting areas should ease the safety concerns of fall and winter visitors, thus encouraging more recreational use by local residents and individuals from the region. Alternative B maintains consistency with CACO goals and with the reasons that CACO was established. Furthermore, this alternative addresses improving the cultural landscape, which would have moderate to major lasting benefits to visitors, scenic vistas, and for hunting opportunities. Modifying the hunting program would maintain the socioeconomic vales that hunting provides. It may increase some recreational opportunities, providing small economic benefits. Adverse effects are relatively minor concerning the loss of individuals from game species populations. Overall wildlife populations may benefit slightly from hunting. The beneficial effects outweigh the adverse effects.

4.5.3 Alternative C – Eliminate Hunting

Terminating the hunting program has beneficial effects as it relates to eliminating the loss of individuals from game species' populations. Negligible benefits to safety could occur, although hunting at CACO has a safe track record. The perception by many non-hunters that hunting creates safety risks for them is addressed, and any such perceptions would cease. Terminating the hunting program would have adverse effects relating to infringement on hunting as part of the cultural heritage and the loss of recreational opportunities. The effects to deer populations, and potential indirect effects to plant communities, are unknown and would need to be monitored. The adverse effects that would result from terminating hunting outweigh the beneficial effects that would result.

4.6 Determination of Impairment to CACO Resources

The following provides a determination on impairment for natural resources (wildlife and vegetation) and cultural resources (cultural heritage and cultural landscapes) as focused on implementation of Alternative B – Create a Modified Hunting Program. An assessment of impairment is not made for public use, management and operations, and non-federal lands within CACO. The preferred alternative, Alternative B "Improving the Hunting Program," would provide numerous beneficial effects and some adverse effects. Analysis of all available information suggests that although there may be some negligible to minor adverse effects, overall they are outweighed by the beneficial effects. Implementing Alternative B would provide the following benefits to CACO resources:

- Improve and retain cultural heritage aspects relating to hunting as part of the fabric of life of the Outer Cape;
- Expand and improve the rare heath vegetative community, which improves the cultural landscape;
- Improve populations of native quail;
- Provide expanded upland game bird hunting opportunities for native turkey and quail;
- Eventually phase-out the pheasant hunting program;
- Achieve compliance with NPS Management Policies and eventually eliminate the need for a policy waiver by phasing out pheasant stocking;

- Clarify and simplify the areas open and closed to hunting and increase the setback from bike trails;
- Provide modest improvements for reducing the potential risk of hunting related accidents;
- Encourage visitors to use CACO during the hunting season; and
- Retain and expand the socioeconomic benefits of hunting.

Adverse effects that would be expected include:

- The ongoing loss of individuals from game populations; and
- The eventual loss of pheasant hunting will eliminate this particular recreational activity. This should be mitigated somewhat by increased native upland game bird hunting.

Cape Cod National Seashore determined the implementation of Alternative B, the Preferred Alternative, will not constitute an impairment of the seashore's resources and values. This project is an alteration to a longstanding activity and park use, and does not meet any threshold to be viewed as impairment to the resources and values of the seashore. This conclusion is based on a thorough analysis of the impacts described in this Final EIS, agency and public comments, and the professional judgement of the decision-maker in accordance with the *NPS Management Policies 2006* (NPS 2006a). Implementation will not result in major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Cape Cod National Seashore; (2) key to the natural or cultural integrity of the seashore or to opportunities for enjoyment of the seashore; or (3) identified in the seashore's general management plan or other relevant NPS planning documents as being of significance. Based on the assessment of effects on CACO resources, implementing the preferred Alternative B will not impair CACO resources.

5.0 Consultation and Coordination

5.1 Public and Agency Involvement

In order to fully and openly evaluate the environmental costs and benefits of the alternatives presented in this Final EIS, CACO sought input from tribes, federal and state agencies, local town, the public, and interested groups. Agency and public consultation and coordination occurred mostly during the scoping phase of EIS development, and again through broad public review of the Draft EIS. Consultation and coordination with MDFW occurred throughout development of the EIS as they manage the hunting program.

Scoping was initiated with a Notice of Intent to prepare an EIS published in the Federal Register on June 21, 2004. A subsequent notice was published in the Federal Register on July 16, 2004, announcing the beginning and end dates of public scoping, and alerting the public to watch for information about upcoming public meetings. Groups with an interest in the hunting program at CACO were contacted, and eleven meetings were held during the summer of 2004 to share information and to solicit input. These meetings are listed in Table 6 in Section 1.2.8. All public meetings were announced through press releases sent to local newspapers and radio stations. Press releases were also sent to the newspapers of record for New Bedford and Fall River, Massachusetts, the home of many rabbit hunters who frequent CACO. The Cape Codder, the Provincetown Banner, and the Cape Cod Times each published at least one story notifying readers of upcoming public meetings. Letters were also sent to the six Outer Cape towns to notify them of CACO's intent to prepare an EIS and to solicit input during the scoping phase. As described in section 1.2.8, agency and public input from scoping was used to identify impact topics, formulate alternative approaches for managing hunting, and fill information gaps about hunting and its effects.

In April of 2006, CACO issued a Draft EIS for agency and public review and comment. The comment period opened on April 21, 2006, with the EPA's publication of a Notice of Availability (NOA) in the Federal Register, and closed on June 19, 2006, 60 days later. Two public meetings were held during the 60-day review period to receive oral comment (see Table 6 in Section 1.2.8). Copies of the Draft EIS were available for public review at the Salt Pond Visitor Center, the Province Lands Visitor Center, the libraries of the six Outer Cape towns, the park's Headquarters Building, and via the park's web site. The availability of the Draft EIS and the dates and times of the public meetings were also publicized through a second NOA published by the NPS in the FR on May 10, 2006, and through press releases sent to local papers and radio stations. Again, the Cape Codder, the Provincetown Banner, and the Cape Cod Times newspapers all published at least one story notifying readers of the availability of the Draft EIS and the public meetings.

Copies of the Draft EIS were sent directly to a number of interested agencies and organizations accompanied by a letter noting the dates of the comment period, instructions on where to send comments, and notice of the two public meetings. Agencies and organizations sent a copy of the Draft EIS are listed in Table 33. The three individuals who joined the animal rights groups in bringing suit against CACO's hunting program were also sent copies of the Draft EIS. In addition, over 2030 individuals were sent letters or e-mails notifying them of the availability of the Draft EIS and inviting their review and comment. This included all individuals who had provided mail or e-mail addresses at the informational and scoping meetings, had submitted written comments during the scoping process, and who had provided addresses at a public meeting held in 2002 regarding the pheasant hunt at CACO.

Over 200 comments were received from the review of the Draft EIS. These comments were used to improve the clarity and accuracy of the document, to refine impact analyses, and to revise the preferred alternative. The NPS response to comments is described in detail in Section 5.3 and Table 34.

Table 33. Agencies and Organizations Receiving the Draft EIS for the Cape Cod National Seashore Hunting Program

Wampanoag Tribe of Gay Head – Aquinnah	Mashpee Wampanoag Tribal Council
US Environmental Protection Agency	US Fish and Wildlife Service, New England Field Office
US Department of Interior, Regional Environmental Officer	Massachusetts Division of Fisheries and Wildlife
Massachusetts Historical Commission - State Historic Preservation Office	Tribal Historic Preservation Officer , Wampanoag Tribe of Gay Head - Aquinnah
Congressman William Delahunt	Senator Edward M. Kennedy
Senator John F. Kerry	State Representative Shirley Gomes
State Senator Robert O'Leary	Town of Truro
Town of Provincetown	Town of Eastham
Town of Wellfleet	Town of Chatham
Town of Orleans	Friends of Cape Cod National Seashore
Members of the Cape Cod National Seashore Advisory Commission	Barnstable County League of Sportsmen's Clubs, Inc
Highland Fish and Game Club	Fund for Animals
Massachusetts Sportsman's Council, Inc	Massachusetts Society for the Prevention of Cruelty to Animals
Humane Society of the United States	

5.2 Compliance

5.2.1 Federal Regulations

National Environmental Policy Act of 1969: The Draft EIS was on public review from April 21 through June 19, 2006. This Final EIS responds to or incorporates the public comments on the draft document. After a 30-day no-action period, a record of decision will be prepared to document the selected alternative and set forth any stipulations for implementation of the selected alternative.

Analysis of Impacts on Prime and Unique Agricultural Lands in Implementing the National Environmental Policy Act (45 FR 59189): Federal agencies are required to analyze the impacts of federal actions on agricultural lands, in accordance with the NEPA. This policy was developed to minimize the effect of federal programs in converting prime, unique, or locally important farmland to nonagricultural uses. There are both prime and unique farmlands within CACO; however, the hunting program does not affect these lands nor will it convert these lands to nonagricultural uses.

Clean Air Act, as amended (42 USC 7401 et seq.): CACO is designated a Class II clean air area. Maximum allowable increases of sulfur dioxide, particulate matter, and nitrogen oxides beyond baseline concentrations established for Class II areas cannot be exceeded. Class II increments allow modest industrial activities in the vicinity of a park. Section 118 of the act requires all federal facilities to comply with existing federal, state, and local air pollution control laws and regulations. The hunting program does not produce air pollution and as such will not impact air resources.

Coastal Zone Management Act (1972) and Coastal Barrier Resources Act (1982) both as amended in 1990: All of Cape Cod, except federal land, lies within the Massachusetts coastal zone; however, all federal activities related to marine resources must be consistent with Massachusetts Coastal Zone Management policies. These policies recognize the ecological significance of coastal waters and strive to protect both the water quality and the integrity of significant resource areas. A consistency determination will be completed to ensure management of the hunting program will be consistent with these policies.

Endangered Species Act of 1973, as amended (16 USC 1531 et seq.):
Section 7 of the Endangered Species Act directs all federal agencies to further the purposes of the act, which are to conserve threatened and endangered species and the ecosystems on which they depend. Federal agencies are required to consult with the USFWS to ensure that any action authorized, funded, or carried out by the agency that may affect listed species does not jeopardize the continued existence of those species or their critical habitats. CACO has determined that the alternatives evaluated in this FEIS will not affect any federally listed species.

Executive Order 11988, "Floodplain Management": All federal agencies are required to avoid construction within the 100-year flood-plain unless no other practical alternative exists. The hunting program does not propose any construction and as such there will be no impacts to the 100-year floodplain.

Executive Order 11990, "Protection of Wetlands": This order requires that all federal agencies must avoid, where possible, impacts on wetlands. The hunting program does not involve any impacts to wetlands.

Executive Order 11987, "Exotic Organisms": This executive order requires federal agencies to restrict the introduction of exotic species into natural ecosystems on lands and waters that they own, lease, or hold for purposes of administration and into any natural ecosystem of the United States and to encourage the states, local governments, and private citizens to prevent the introduction of exotics into natural ecosystems of the United States. The preferred Alternative in this document conforms to the intent of the executive order by phasing out and eventually eliminating pheasant stocking on CACO lands.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations": Under this executive order, the NPS must consider the impacts of its actions on minority and low-income populations and communities, as well as the equity of the distribution of benefits and risks of those decisions. For all alternatives in the document, based on the equity of benefit and risk distribution, there are no impacts on minority or low-income populations.

Federal Water Pollution Control Act, as amended, Clean Water Act of 1977, and Water Quality Act of 1987 (33 USC 1251–1376): Hunting does not affect water quality. Lead shot has been eliminated for hunting waterfowl. Proposed actions would have little if any adverse effect on water quality.

National Historic and Preservation Act and Other Related Laws: The NPS is mandated to preserve and protect its resources through the establishing legislation of August 25, 1916 (USC title 16). Cultural resources within CACO will be managed in accordance with that act and the Antiquities Act of 1906 (16 USC 431); the National Historic Preservation Act of 1966, as amended (16 USC 470); the NEPA of 1969, as amended (42 USC 4321, 4331, 4332); the Archeological Resources Protection Act of 1979 (16 USC 470); and the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001). In addition, cultural resource management is guided by chapter 5 of the NPS *Management Policies* (NPS 2006a), the *Cultural Resources Management Guidelines* (NPS 2006b), and other relevant policy directives. The Preferred Alternative (Alternative B) will benefit cultural heritage and cultural landscapes. On May 23, 2006, the Massachusetts State Historical Preservation Officer concurred with

CACO's determination of no adverse effect pursuant to section 106 of the National Historic Preservation Act of 1966.

Americans with Disabilities Act: The Americans with Disabilities Act establishes federal guidelines that define requirements for disabled access to parking facilities, pathways, and buildings. The act does not apply to the implementation of these alternatives.

Coastal Barrier Resources Act: This law encourages the conservation of hurricane prone, biologically rich coastal barriers by restricting Federal expenditures that encourage development, such as Federal flood insurance through the National Flood Insurance Program. The hunting program does not entail federal expenditures of financial assistance that would adversely affect ecologically sensitive coastal barrier resources.

Fish and Wildlife Coordination Act: This act provides the basic authority for the USFWS's involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. The hunting program does not entail water-related construction, and there will be no modifications to waterways or bodies of water protected by this act.

Magnuson-Stevens Fishery Conservation and Management Act: This Act requires federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA) regarding proposed actions that could damage Essential Fish Habitat (EFH) as identified by NOAA Fisheries and the appropriate fishery management council. Hunting activity will not affect EFH; therefore, consultation on the proposed modification to CACO's hunting program is not required.

Migratory Bird Treaty Act, and other laws and treaties that protect migratory birds: There are a number of laws and treaties designed to protect migratory birds such as the Migratory Bird Treaty Act, the Lacey Act, the Weeks-McLean Law, and the Waterfowl Depredations Prevention Act. MDFW's hunting regulations are consistent with these federal laws and treaties. The Preferred Alternative in this Final EIS adopts MDFW regulations with little modification, and those modifications will make hunting at CACO slightly more protective of migratory birds and other sensitive resources. As such, implementation of the Preferred Alternative will be consistent with the laws and treaties protecting migratory birds.

5.2.2 State Regulations

Massachusetts Endangered Species Act: The Massachusetts Endangered Species Act (MESA) is administered by the Massachusetts Natural Heritage and Endangered Species Program – a branch of the MDFW. The Preferred Alternative (Alternative B) adopts MDFW hunting regulations with few modifications. None of the modifications reduce protective measures for State-listed threatened and endangered species. As a result, implementation of the Preferred Alternative will be in compliance with MESA.

5.2.3 Local Regulations

The hunting program is regulated through the MDFW and the NPS regulations. There are no local regulations that specifically address hunting.

5.3 Comments and Responses on the Draft EIS

Over 200 comments were received on the Draft EIS, including letters and e-mails from agencies, organizations, and individuals, and the comments recorded at the public input meetings. Many commenters shared their opinions about hunting, and voiced their support or opposition to hunting at CACO, but did not provide input on the information, analysis, or conclusions presented in the Draft EIS. Every statement of opinion has been noted, but only substantive comments, corrections, or questions are given a textual response. While public opinion is a key component to NPS decision-making, popularity or organized interest group opinion efforts do not determine the outcome of the decision process. Therefore, we are not tabulating the numbers of comments received voicing opinions supporting or opposing certain alternatives. The opinions expressed by multiple commenters included:

- opposition to all hunting at CACO;
- opposition to pheasant stocking and hunting at CACO;
- concerns about safety and animal welfare;
- support for hunting at CACO;
- opposition to phasing out pheasant hunting and stocking at CACO;
- support for adding a turkey hunt at CACO; and
- support for ancillary habitat improvement for native quail.

Many groups and individuals provided specific input on the substance of the Draft EIS. This input was reviewed starting with the comment letters from agencies and interested organizations, then letters and e-mails from individuals were reviewed, then the notes from the two public meetings were evaluated. Each new comment was identified for response in the Final EIS. Appendix D provides copies of all the comment letters received from agencies and organizations with each comment delineated by an alpha-numeric identifier noted in the margin. This allows the comments to be seen in their original form, and in the overall context of the comment letter in which they appeared. Collectively, nine of these letters capture the majority of comments on the Draft EIS. Most of the comments in the other letters, the e-mails, and from the public meetings repeated the points raised by these commenters. Table 34 provides a summary of how the NPS responded to each unique comment identified. Unique comments from agency and organization letters are identified by their alpha-numeric code and can be viewed in Appendix D. Unique comments from individuals and from the public meetings are summarized within the table. In many cases, the NPS response to the comments resulted in revision to the EIS to correct errors, improve clarity, or improve the analysis of effects. In other cases, the NPS did not concur with the analysis or conclusions of the commenter and declined to revise the EIS.

Table 34: Summary of Comments and Responses to the Draft EIS

Comment Source:
A = Massachusetts Division of Fisheries & Wildlife
B = Humane Society of the United States
C = Wildlife Management Institute
D = National Wild Turkey Federation
E = Safari Club International
F = U.S. Sportsmen's Alliance
G = Mashpee Wampanoag Indian Tribal Council, Inc.
H = National Rifle Association
I = U.S. Fish and Wildlife Service

Please refer to Appendix D for the text of each comment, and to see comments from other organizations.

Comment	Response
A1	Although the preferred alternative will eventually result in the loss of the pheasant hunt, implementing a new hunt for turkey and increasing the potential for quail hunting will enable game bird hunting to continue.
A2	As described in Section 1.2.6 of the Final EIS, continued introduction of an exotic species is inconsistent with NPS Management Policies. The preferred alternative would achieve consistency with NPS policies while providing opportunities to hunt native game birds.
A3	Please see Response A2.
A4	As noted in the comment, the waiver allows pheasant stocking to continue while the NPS examines options for phasing it out. The preferred alternative, which will phase out pheasant stocking, is consistent with the waiver.
A5	Please see Response A2. The commenter's preference for Alternative A is noted.
A6	After considering comments on the Draft EIS, the NPS concluded that it would be infeasible to provide native wild upland game bird hunting opportunities commensurate to a stocked pheasant hunt. The conclusion in the Draft EIS that native game bird hunting opportunities could be increased by establishing a turkey hunt and ancillary habitat enhancement for quail remained intact. The preferred alternative, including the adaptive management element, and the assessment of impacts to recreation have been revised accordingly; please see Sections 2.4.1, 2.4.2, and 4.4.2.
A7	Please see Response A6. The commenter's support for cultural landscape management is noted.
A8	The preferred alternative has been revised accordingly; please see Section 2.4.2.
A9	The expanded buffer along bike paths will further reduce the already minimal risk of accident, and may allow more visitors to feel confident that non-hunting use is safe during hunting season.
A10	The commenter's support of a turkey hunt is noted.
A11	Please note that the monitoring element of the preferred alternative has been revised to emphasize cooperative NPS/MDFW monitoring. Please see Section 2.4.5.
A12	The commenter's support of education and outreach is noted.
A13	The commenter's opposition to Alternative C is noted.
B1	The text of the Final EIS has been revised to better reflect the balance and objectivity that was applied during the NEPA process.
B2	The Court directed the NPS to prepare an Environmental Assessment. However, the NPS chose the more in-depth analysis of an Environmental Impact Statement to broadly and fully consider management alternatives and effects to the human environment. The Final EIS addresses the issues raised during scoping and uses the best scientific information and professional judgment available.
(*continued*)	

Comment	Response
B3	The Final EIS does not attempt to present a comprehensive assessment of all views either for or against hunting. The objective is to assess the positive and negative effects that different user groups would potentially experience under the alternatives evaluated, and to provide a range of opportunities to enjoy the park's resources while acknowledging the range of views visitors hold regarding hunting and animal welfare. Impacts to hunted species are evaluated in the Final EIS.
B4	The NPS mission and CACO's enabling legislation provide that hunting can be an appropriate activity at CACO. The NPS has determined that implementation of the preferred alternative will not constitute an impairment of CACO's resources and values. Please see Section 4.6.
B5	Please see Response B4.
B6	Ecological impacts / effects to hunted species: Please see Response B41 NPS Policies: Please see Response B4. Hunting as cultural heritage: Please see Response B32.
B7	The purpose and need for the action has been revised to more accurately describe CACO's objectives for this NEPA process, and to better reflect the broad scope of alternatives considered to achieve those objectives. Please see Section 1.1.
B8	Please see Response B7.
B9	Please see Response B7.
B10	A rigorous scoping process was used in the development of the alternatives in the Final EIS. These alternatives range from elimination of hunting to continuing hunting without alteration.
B11	The Final EIS was developed to guide the future of hunting at CACO, and includes analysis of the effects of hunting on other park uses. Please also see Response B1.
B12	All comments received during the scoping process were given thorough and equal consideration.
B13	The Final EIS has been revised to include beneficial impacts to non-hunting users of limiting or eliminating hunting. Please see Sections 4.4.2 and 4.4.3; please also see Response B1.
B14	The Final EIS has been revised to better describe why this option was not considered under the alternatives analysis. Please see Section 2.2.1, Option I.
B15	Please see Response B14.
B16	The Final EIS has been revised to more accurately describe the potential effects of coyote hunting on beach-nesting birds. Please see Section 2.2.1, Option II.
B17	The Final EIS has been revised to better describe why this option was not considered under the alternatives analysis. Please see Section 2.2.2, Option IV.
B18	Please see Response B17. The Final EIS has been revised to better describe why these options were not considered under the alternatives analysis. Please see Section 2.2.2, Options V and VI.
B19	Please see Response B18. The Final EIS has been revised to better describe why this option was not considered under the alternatives analysis. Please see Section 2.2.2, Option VII.
B19a	The social science study (Kuentzel 2006) does not indicate that hunting is highly unpopular or excludes other uses.
B20	The Final EIS has been revised to clarify that an estimated 10% of CACO users hunt, not 10% of the population of Massachusetts. Please see Section 2.2.2, Option VII.
B21	Section 2.2.2, Option VIII proposes to ban all human activity. Alternative C would entail the elimination of hunting, not all human activity. Alternative C is described in Section 2.5 and the impacts are analyzed in Section 4.4.3.
(*continued*)	

Comment	Response
B22	CACO is among a minority of parks where hunting is allowed under each park's enabling legislation. Please also see Response B4.
B23	The Final EIS has been revised to better describe why this option was not considered under the alternatives analysis. Please see Section 2.2.3, Option XVII.
B24	The Final EIS has been revised throughout to better reflect that hunting at CACO is a recreational activity and not a population management tool.
B25	Please see Response B24.
B26	The Final EIS has been revised to better describe why this option was not considered under the alternatives analysis. Please see Section 2.2.3, Option XVIII. Please also note that CACO Resource and Visitor Protection staff estimate that about 3 hunting dogs per year are lost in the park compared to about 10 dogs per year lost during non-hunting activities, and that most canine fecal matter in the park is generated by the dogs of non-hunting visitors.
B27	The Final EIS has been revised to better describe why this option was not considered under the alternatives analysis. Please see Section 2.2.4, Option XXII. Please also see Response B3.
B28	Please see Response B24. Additionally, this section has been revised to better describe why this option was not considered under the alternatives analysis. Please see Section 2.2.4, Option XXIII.
B29	After considering comments on the Draft EIS, the NPS concluded that it would be inappropriate to establish a "put and take" quail hunt. The Final EIS has been revised to describe why this option was not considered further. Please see Section 2.2.4, Option XXIV. Please also see response B3.
B29a	Please see response B29.
B30	Please see response A2, B3, and B29.
B31	The language of CACO's enabling legislation regarding shellfishing differs from the language regarding hunting. We agree that the NPS has more flexibility to manage hunting than shellfishing. However, close coordination with MDFW is still required. We do not agree that the preferred alternative is contrary to Congressional intent.
B32	As defined by the NPS, “traditional” pertains to recognizable but not necessarily identical cultural patterns transmitted by a group across at least two successive generations. The traditional uses CACO seeks to protect, when consistent with park objectives and NPS policies, are those practiced at the time the park was established.
B32a	The Final EIS has been revised to include assessment of impacts to those engaging in berry picking, mushroom gathering, hikers, and users seeking solitude, which would include those engaging in wildlife viewing. Please see Sections 4.4.1, 4.4.2, and 4.4.3.
B33	Please see Response B32.
B34	We believe hunting is an appropriate recreational activity at CACO that can be managed in a manner that provides a range of opportunities to enjoy the park's resources, including opportunities for visitors to enjoy peace and solitude, hiking, cycling, wildlife viewing, berry picking, and mushroom gathering. Many elements of the preferred alternative are designed to accomplish this. Please see Sections 2.4.3 and 2.4.4.
B35	Please see Response B26. Similarly, CACO staff estimate that only a small portion of litter in the park is left by hunters. CACO has not received complaints of visitors encountering animals killed or wounded by hunting.
B36	Please see Responses B13 and B34.
B37	Please see response to B20 and B34.
B38	Please see response B34.
B39	All species that can be hunted within CACO have been covered in the EIS.
(*continued*)	

Comment	Response
B40	The relationship between CACO and MDFW, with respect to hunting, is described in Sections 1.25, 1.26, throughout Section 2.2, and in Section 2.4. Please also see Response B1.
B41	The Final EIS is based on the best available scientific information, including the literature reviews listed in Section 1.1. In addition, two studies were undertaken to address the highest priority information gaps: the status of New England and Eastern cottontail rabbits at CACO, and potential changes in visitor use and attitudes toward hunting. Where information is limited or not available, such as research into the response of ecological communities to hunting, best professional judgment was used to assess impacts. Please also see Response B1 and B24.
B42	Please see Response B41.
B43	Please see response B39.
B44	Additional information regarding the distribution of New England cottontails became available following the publication of the Draft EIS. The appropriate sections of the Final EIS have been updated to reflect this new information, including Sections 3.3.4, 4.4.1, and 4.4.2. In addition, the preferred alternative has been revised to more clearly state CACO's commitment to managing hunting in a manner that protects New England cottontails; please see Section 2.4.5.
B45	Please see Response B24. Please also refer to Section 3.3.4 for a summary of the preliminary results from the study examining the effects of hunting on cottontail rabbits at CACO.
B46	The Final EIS has been revised to eliminate the habitat-based estimate of deer density at CACO. Please see Section 3.3.4.
B47	Please see Response B24.
B48	The preferred alternative calls for CACO and MDFW to collaborate on deer and other wildlife monitoring. Please see Section 2.4.5.
B49	Please see Response B24. Please also note that the preferred alternative calls for cooperative wildlife monitoring and management. Please see Section 2.4.5.
B50	After considering comments on the Draft EIS and further review of current research, the contention that reducing deer populations would reduce the potential for Lyme disease has been removed from the Final EIS. Please see Sections 2.2.1, Option III, 3.3.5, and 4.4.
B51	The FEIS has been revised to better reflect that any potential for increased deer/automobile collisions with the elimination of hunting is only speculative.
B52	Please see Response B24.
B53	Please see Response B41 and A6.
B54	Accidental or illegal take of or disturbance to nesting females is unlikely as turkeys are traditionally hunted from a stationary point and MDFW regulations require that harvested birds be brought to an official check station.
B55	The harvest regulation allows the taking of only bearded (male) birds.
B56	Please see Response B55 and Section 2.4.5.
B57	Please see Response B41.
B58	Please note that quail hunting is currently allowed at CACO. The preferred alternative would result in ancillary habitat enhancement that could lead to increases in quail populations and increased hunting opportunities. Please also see Response B41.
B59	Please see Response B41.
(*continued*)	

Comment	Response
B60	Conservation and management of black ducks and other migratory waterfowl is most meaningful at the flyway level. CACO relies on the expertise of the US Fish and Wildlife Service, the expert-agency for waterfowl management, to assess the effects of hunting and establish regulations and management recommendations accordingly. It is our understanding that USFWS, US Geological Survey, and the Canadian Wildlife Service are developing a black duck management framework based on recent breeding-population surveys. CACO will implement any resulting management recommendations that are applicable at the local level.
B61	Conservation and management of Northern pintails and other migratory waterfowl is most meaningful at the flyway level. CACO relies on the expertise of the US Fish and Wildlife Service, the expert-agency for waterfowl management, to assess the effects of hunting and establish regulations and management recommendations accordingly. MDFW's waterfowl hunting regulations are consistent with USFWS flyway management recommendations, and CACO will continue to implement any management recommendations that are applicable at the local level.
B62	Please see Response B61.
B63	Please see Response B61.
B64	Please see Response B61. Crippling loss is considered in formulating USFWS flyway management recommendations.
B65	There are no federal or state listed threatened or endangered waterfowl species at CACO. Please also see Response B61. Identification error is considered in formulating USFWS flyway management recommendations.
B65a	Field identification of threatened and endangered waterfowl is a prerequisite for receipt of a Federal Duck Stamp. We believe current levels of Resource and Visitor Protection monitoring, enforcement, and interaction with hunters in the field are adequate to enforce waterfowl hunting regulations at CACO.
B66	Please see Response B24 and B41.
B67	The reference to discrete opossum home ranges has been removed and more specific information from the literature has been added. Please see Section 3.3.4.
B68	Marshbird hunting (including sora rails and king rails) is not allowed at CACO per the Superintendent's Compendium.
B68a	American coots are addressed in the waterfowl Sections of 3.3.2 and 4.4.
B69	Please see Response B41.
B70	The scope of Section 3.2 has been narrowed to focus on MDFW's use of hunting theory to establish hunting regulations, and to clarify the relationship between CACO and MDFW in managing hunting at CACO. Please also see Response B3.
B71	Please see Response B3.
B72	Please see Response B3 and B24.
B73	Please see Response B3.
B74	Please see Response A2 and B1.
B75	Please see Response A2.
B76	Please see Response A2 and B3.
B77	Please see Response B3.
B78	Please see Response A2 and B3.
B79	The issues raised are addressed in the Final EIS and the preferred alternative.
B80	Please see Response B41. Please also note that the preferred alternative addresses the use of antibiotics - please see Section 2.4.2.
B81	The general pathway for phasing out pheasant stocking has been revised in the preferred alternative. As noted by the commenter, the actual take of pheasants will influence the rate at which pheasant stocking is decreased. Please also see Response A4.
B82	Please see Response B3.
(*continued*)	

Comment	Response
B83	The summary of the results of the visitor and resident survey (Kuentzel 2006) have been revised to more clearly reflect that about one third of respondents feel hunting conflicts with other with other uses; please see Section 3.8.5. The effects of hunting on other park uses are evaluated in Sections 4.4.1 and 4.4.2. Please also see Response B34.
B84	Please see Response B83.
B85	The visitor and resident survey did not assess crowding as a result of displacement. The team developing the Final EIS concluded this was an unlikely occurrence based on their collective experience at CACO and professional judgment.
B86	The effects of hunting on safety are evaluated in Sections 4.4.1, 4.4.2, and 4.4.3. The preferred alternative includes an element to improve outreach to park visitors regarding hunting-related safety. Please see Section 2.4.4.
B87	We have not conducted a detailed analysis of warning and violation rates for park user groups, but we agree with the commenter's assessment of the data presented. The Final EIS has been revised to reflect the possibility that hunters may have a higher warning and violation rate than some other user groups. Please see Section 3.5.1.
B88	We do not believe the level of detail recommended by the commenter would contribute to the assessment of impacts in the Final EIS.
B89	References to specific organizations have been removed from this section. Please see Section 1.0.
B90	We refer the commenter to the comment letters from organizations that support hunting - please see Appendix X. Comments in support of hunting were also received from a number of other local and national organizations, as well as from individuals.
B91	Please see Response B4 and B22.
B92	The dates in Table 1 have been corrected.
B93	Effects to resources are analyzed in Sections 4.4.1, 4.4.2, and 4.4.3.
B94	We concur that the referenced statement was an over-simplification and have removed it from the Final EIS. Please see Section 1.6.1. Please also see Response B61.
B95	Pollution from two-stroke engines is addressed in 1.6.1.
B96	We believe operational costs are adequately addressed in the Final EIS.
B97	The preferred alternative has been re-characterized as a modified hunting program rather than an improved hunting program.
B98	Table 9 states that under Alternatives A and C, *additional* monitoring would not occur, contrasting these alternatives from the preferred alternative which calls for cooperative monitoring with MDFW.
B99	This reference has been removed from Table 9.
B100	Please see Response B3, B24, and B70.
B101	The citation has been clarified in the Final EIS. Please see Section 3.3.4.
B102 (a)	The Final EIS has been revised to clarify the potential benefits to nesting terns and plovers, and the reference to rabid raccoons has been removed. Please see Section 4.4.1.
B102	The direct, indirect, and cumulative beneficial and adverse effects identified during analysis of the alternatives are presented in the Final EIS. Please note that in some cases, the assessments of impact have been revised in response to comments. Please also see Response B24 and 41.
B103	This reference has been removed from the Final EIS.
B104	The adverse effects of retaining pheasant stocking under Alternative A are addressed at the conclusion of Section 4.4.1.

(*continued*)

Comment	Response
B105	The Final EIS has been revised to better convey the nature of the beneficial effect and to eliminate redundant statement of fact. Please see Section 4.4.2.
B106	The assessment of the effects of Alternative C on raccoons has been revised. Please see Section 4.4.3. Please also see Response B41.
B107	The Final EIS has been revised to clarify the expected effects of eliminating hunting, as well as the effects of continued hunting, on coyote populations. Please see Sections 4.4.1 and 4.4.3.
B108	The effects of eliminating pheasant stocking are evaluated in Section 4.4.2.
B109	The Final EIS has been revised to include this effect. Please see Section 4.4.3.
B110	We believe this paragraph accurately represents the significance of CACO lands for hunting on the outer Cape.
B111	The Final EIS has been revised to include the beneficial effects of Alternative C to berry pickers, mushroom gatherers, hikers, those seeking solitude, and similar types of users. Please see Section 4.4.3.
B112	The text of the Final EIS has been revised to better describe the social effects of each of the three alternatives, and Table 32 has been removed. Please also see Responses B1, B3, and B4.
B113	The bibliography in the Final EIS has been updated and edited.
B114	Please see Response B1 and B41.
B115	Please see Response B1 and B41.
B116	Please see Response B3 and B41.
B117	Please see Response A4 and B29.
B118	The commenter's opposition to hunting in National Parks is noted. Please also see Response B22.
C1	The commenter's agreement is noted.
C2	The commenter's agreement is noted.
C3	Please see Response A2 and A4.
C4	Commenter's agreement is noted, but please also see Response A2.
C5	The referenced text has been revised; however, it should be noted that this section reports the range of opinions expressed and is not the result of quantitative sampling. Please also see Response B3.
C6	Please see Response A6 and B41.
C7	Please see Response A6.
C7a	Please see Response A6.
C8	Please see Response A6.
C9	Please see Response B29.
C9a	Please see Response B29.
C10	The commenter's support for Alternative A is noted.
C11	The commenter's potential support for more intensive quail management and opposition to a quail put and take hunt is noted. Please also see Response B29.
D1	The commenter's support for a turkey hunt is noted.
D2	Please see Response A9.
D3	Please see Response A6.
D4	The assessment of effects for Alternative C has been revised slightly; we believe the impacts are estimated correctly. Please see Section 4.4.3.
E1	Please see Response A6.
E2	Please see Response A2 and A4.
E3	Please see Response A2 and A4.
E4	Please see Response A2 and A4.
E5	Please see Response A2 and A4.
E6	Please see Response A2 and A4.
(*continued*)	

Comment	Response
E7	We concur that the Final EIS meets the requirements of NEPA and satisfies the court order. The analysis in the Final EIS supports implementation of the preferred alternative.
E8	Please see Response A2 and A4. The commenter's support for continuing pheasant stocking is noted.
F1	Please see Response A2 and A4. Section 1.2.3 has been revised to note that pheasants are still stocked at seven other locations on Cape Cod.
F2	Please see Response A4.
F3	Please see Response A6 and A8..
F4	Please note that these elements of the preferred alternative have been revised slightly. Please see Sections 2.4.3, 2.4.4, and 2.4.5. The commenter's support for these elements, as they appeared in the Draft EIS, is noted.
F5	The commenter's opposition to Alternative C is noted.
G1	The Tribe's support of the preferred alternative is noted. Section 1.2.2 has been revised to reflect the significant contribution of the Mashpee Wampanoag to the cultural heritage of CACO. Note: In a meeting with the Superintendent, the Mashpee Wampanoag Tribal Council requested an acknowledgement of aboriginal hunting and fishing rights within the National Park boundary with respect to the Cape Cod National Seashore Hunting EIS. Response: The Department of the Interior (Department) recently issued a final determination acknowledging the Mashpee Wampanoag Tribal Council, Inc. (Mashpee) petitioner exists as an Indian tribe within the meaning of federal law. The Department's decision to acknowledge the Mashpee Tribe will be final and effective on May 23, 2007. As of the drafting of this document, the Mashpee acknowledgement decision is not yet final and effective. Thus, any comments on possible Mashpee rights to park related resources were considered premature. The National Park Service, therefore, will defer commenting on any possible rights until the decision acknowledging Mashpee tribal status is final and effective and it has had adequate time to discuss such matters with the Mashpee tribe. In January 2001, the Mashpee Tribe initiated a lawsuit against the Department alleging the agency unreasonably delayed its petition to be acknowledged as an Indian tribe. Following years of litigation, the Department and Mashpee Tribe reached a negotiated settlement for the procedural claims. The settlement resolved all issues of liability and relief by providing a timeline for considering the Mashpee Tribe's acknowledgement petition under the Department's regulations at 25 C.F.R. Part 83. On July 25, 2005, the court accepted the settlement, stayed the proceedings, and retained jurisdiction to enforce the agreement. The basic terms of the agreement called for the Department to issue a proposed finding on the Mashpee petition by March 31, 2006, and complete a final determination by March 30, 2007. Once these deadlines were met, the case would be dismissed with prejudice.

(*continued*)

Comment	Response
G1 (continued)	On March 31, 2006, the Department issued a positive proposed finding on the Mashpee petition. On February 15, 2007, the Department issued a final determination acknowledging the Mashpee petitioner exists as an Indian tribe. The Department determined that the Mashpee petitioner met all seven of the mandatory criteria for tribal acknowledgement pursuant to the agency's regulations at 25 C.F.R. Part 83. On February 22, 2007, the Department published notice of its final determination in the *Federal Register.* 72 Fed. Reg. 8,007. Per the Department's regulations, the decision to acknowledge the Mashpee petitioner is final and effective 90 days after publication of its notice in the *Federal Register,* unless any interested party requests reconsideration with the Interior Board of Indian Appeals. The 90-day time period closes on May 23, 2007.
H1	The commenter's opposition to Alternative C, support for Alternative A, and support for specific elements of the preferred alternative as in the Draft EIS are noted.
H2	The decline in early successional upland habitat that likely supported larger numbers of quail in the past is due to natural plant community succession. NPS Management Policies prohibit artificial manipulation of habitat to increase the numbers of a harvested species above its natural range in population numbers. Active management with the primary objective of increasing quail habitat and numbers would be inconsistent with these NPS policies. Since the cultural landscape management objectives described in the preferred alternative will, as an ancillary benefit, create better habitat conditions for quail than currently exists, we expect quail hunting opportunities to improve.
H3	This element of the preferred alternative has been revised to reflect importance of courteous and respectful behavior from and toward all users. Please see Section 2.4.4.
H4	Please see Response A2, A4, and A6.
H5	Please see Response A6.
H6	Please see Response B29.
H7	Please see Response A9.
N1	The Final EIS has been corrected to indicate that 16 federally listed species have been recorded at CACO. In addition to the species listed by the commenter, our records indicate that the following species have also been recorded from the park: • green turtle (NMFS record) • hawksbill turtle • bald eagle (transient) • Eskimo curlew (historic record of a migrant)
I2	The Final EIS has been revised accordingly. Please see Section 3.3.6.
I3	An analysis of effects to federally listed species to Sections 4.4.1 and 4.4.2. The NPS determined that the alternatives evaluated in this Final EIS will not adversely affect listed species.
(*continued*)	

Comment	Response
Comment from an individual	Comment: Hunting safety and the changing conditions of the Cape are not adequately addressed. Response: Please see Response B41.
Comment from an individual	Comment: The EIS should clarify if the 500 foot setback around buildings applies to the seasonal cottages on the Orleans/Chatham North Beach. Response: CACO's Superintendent's Compendium states that hunting within 500 feet of a building is prohibited without the authorization of the owner or occupant. This applies to all buildings including seasonal cottages and dune shacks. The Superintendent's Compendium can be viewed at: http://www.nps.gov/caco/parkmgmt/upload/SUPTCompendium.pdf
Comment from public meeting notes	Comment: The deer shotgun season on the Cape should be two weeks, rather than one, to match the rest of the state: Response: MDFW has set the 6-day limit for the deer shotgun season on the Cape. CACO concurs with MDFW's determination that a shorter season is appropriate for the outer Cape.
Comment from public meeting notes	Comment: CACO should provide more parking for hunters. Response: We believe existing parking is adequate.
Comment from numerous sources	Comment: There were numerous spelling errors in the Draft EIS. Response: We have tried to find and correct all spelling errors.

5.4 Acronyms, Bibliography, and List of Preparers

5.4.1 Acronyms

AC	Advisory Commission
AFRP	Atlantic Flyway Resident Population
AHM	Annual Harvest Management
AP	Atlantic Population
BBS	Breeding Bird Survey
CACO	Cape Cod National Seashore
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWS	Canadian Wildlife Service
DMZ	Deer Management Zone
DO-12	Director's Order 12
DOI	Department of the Interior
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
FONSI	Finding of No Significant Impact
FR	Federal Register
GMP	General Management Plan, Cape Cod National Seashore
HIP	Harvest Inventory Program
MDFW	Massachusetts Division of Fisheries and Wildlife
MESA	Massachusetts Endangered Species Act
mi^2	square mile(s)
MOU	Memorandum of Understanding
MWI	Midwinter Waterfowl Inventory
NAP	North Atlantic Population
NEPA	National Environmental Policy Act of 1969
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRA	National Recreation Area
ORV	Off-Road Vehicle
ROD	Record of Decision
SCUBA	Self Contained Underwater Breathing Apparatus
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WBPHS	Waterfowl Breeding Population and Habitat Survey
WMA	Wildlife Management Area

5.4.2 Bibliography

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national Parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

July 2007

United States Department of the Interior - National Park Service

Appendix A

Abstracts of the 2006 Massachusetts Fish & Wildlife Laws, Massachusetts Migratory Bird Regulations for 2005-2006 Season
CACO Hunting Regulations
Waiver of Policy Regarding Pheasant Stocking/Hunting at CACO



Photos by Bill Byrne

ABSTRACTS
of the 2006 Massachusetts Fish & Wildlife Laws

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Wayne F. MacCallum, *Director*

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From the Director

The emergence of Chronic Wasting Disease (CWD) in North American cervids (members of the deer family) poses a major threat to the health of our wild deer herds. CWD was first documented during the late 1960s in Colorado. Deer with this illness suffer tremors, excessive salivation, extreme behavior changes and extreme weight loss to the point that they become severely emaciated (skinny) and eventually die. In 1978, researchers identified this mysterious malady as a "transmissible spongiform encephalopathy," a contagious neurological disease that attacks the brain tissue of infected animals.

The illness is caused by a strange agent called a prion. The prion is basically an ordinary protein found in the central nervous system and lymph tissues of its host, but for unknown reasons is folded in an abnormal way that changes it and provides it with immunity to the enzymes that would normally break it down. When a prion comes in contact with the normal form of the protein, it changes that protein, causing it to become another prion. Each prion then goes on to repeat the process, causing a chain reaction. Since the body is unable to destroy or eliminate prions, the result is an accumulation in the brain cells that ultimately destroys the normal cells and kills the host.

The disease, which occurs only in cervids, is thought to be passed from one animal to the next through contact with the saliva and/or urine of infected animals. It is particularly communicable in farm or artificial feeding situations, which isn't surprising given the high degree of contact and crowding that is typically present under such unnatural conditions.

CWD was first observed in captive deer in Colorado in 1967. By 1981 CWD had been found in free ranging wild deer and elk living in Colorado, Wyoming and Nebraska, and in captive deer and elk in South Dakota, Oklahoma, Kansas, Montana, Alberta, Saskatchewan and South Korea. In 2001 the disease was detected in wild deer in Wisconsin near a captive deer and elk farm. State deer biologists across the nation responded, sampling brain tissue and testing for CWD in an effort to determine where else the disease might show up. This testing found the disease in captive animals in Minnesota, and east of the Mississippi in wild deer in Illinois.

The likelihood of CWD being found in Massachusetts seemed remote because the Fisheries & Wildlife Board had established regulations in 1995 prohibiting the farming of white-tailed deer and elk due to concerns that such animals had the potential to introduce diseases to our wild deer populations. The spread of CWD has instigated similar protective actions by other states. In fact, Massachusetts and its neighboring states have closed their borders to the importation of farmed deer and elk. Such importation bans further reduce the risk of this disease entering the Commonwealth.

Since 2002, 684 deer have been tested in Massachusetts through samples taken at deer check stations and from meat processing facilities or road-kills. We are pleased to report that CWD has **not** been detected in Massachusetts.

In 2005 CWD was reported from a deer in New York and another from West Virginia. Given the likelihood that the disease has spread because of the transport of captive deer and elk, and because of the possibility that the disease could spread through neurological tissue of animals taken from a CWD positive area to a "clean" area, the Fisheries & Wildlife Board voted to make it illegal to import, process or possess whole carcasses or parts of deer or elk (wild or captive) from states and Canadian provinces where CWD has been detected.

The only exceptions to the regulations are de-boned meat, cleaned skull caps, hides, upper canine teeth (buglers, whistlers and ivories) and taxidermy mounts. Restricting importation to these specific deer parts prevents the importation of neurological tissue — which is where the disease-causing prions are located — yet sportsmen and women hunting in "infected" states can still safely use any deer they harvest. Vermont, New Hampshire and Rhode Island have similar regulations in place and are consistent with regulations set or proposed to be set.



There is no indication that CWD poses any risk to humans. People have eaten deer and elk from infected areas of Colorado, Wyoming and Nebraska for more than 20 years. Epidemiologists with the Federal Centers for Disease Control and Prevention and the World Health Organization have studied the disease intensively and have found no sign of a human health link. Meanwhile we have chosen to manage for the health and safety of the Massachusetts deer herd, so if you hunt deer or elk in a state or province in which CWD has been detected, check with their state fish and wildlife agency for any specific recommendations or regulations pertaining to CWD.

For more information on CWD or other wildlife topics, visit our website at www/masswildlife.org. Remember that your purchases of hunting and fishing licenses and stamps underwrite the research and management programs which conserve the wildlife of Massachusetts. Thank you for your continuing support!

Wayne F. MacCallum, *Director*

MITT ROMNEY, *Governor*
Commonwealth of Massachusetts
STEPHEN R. PRITCHARD, *Secretary*
Executive Office of Environmental Affairs
DAVID M. PETERS, *Commissioner*
Department of Fish and Game
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New This Year

New regulations prohibit the importation of any live cervid (member of the deer family) or any cervid carcass. Meat brought into Massachusetts from CWD-positive states or provinces must be de-boned and packaged.

Black Bear season has been extended and now runs from Sept. 5 - 23 and from Nov. 6 - 25. The bear hunting permit application is now attached to your hunting license.

These Abstracts contain a summary of the laws and regulations in place as of September 1, 2005. Any changes in law or regulation enacted after September 1 are distributed through our regular press releases to the news media, town clerk offices, all license sales outlets and on our website. These are not the complete laws (MGL Ch.131 and 321 CMR) and are subject to change.

To obtain a License to Carry or a Firearms Identification card, contact your local police department. For a nonresident License to Carry , a permit to own or possess firearms by aliens, or for more information on the gun laws, contact the Department of Public Safety, Firearms Record Bureau, 200 Arlington St. Suite 2200, Chelsea, MA 02150, tel. (617) 660-4780. License sales outlets may sell a hunting or sporting license only after seeing proof of a previous year's hunting license, a certificate of completion of a hunter education course, or a valid FID or License to Carry.

Please see page 11 for Massachusetts Gun Laws.

A hunting, fishing or trapping license is not a permit to trespass on private land, posted or not. Remember, your privilege to enter on private land is a courtesy extended to you by the owner. Practice courtesy yourself if you want to continue hunting or fishing.

Hunting, fishing, sporting, and trapping licenses do not have to be displayed in a visible manner, but they must be shown on demand to any officer empowered to enforce these laws, and to landowners or lessees while on their property.

FISHING

	ALL DATES INCLUSIVE	Daily Creel	Length[1]
TROUT[2]			
lakes, ponds, major rivers [3]	Jan.1 - Dec. 31	3	—
all other rivers and brooks [4]	April 1 - Sept. 10	8	—
	Sept. 11 - March 31	3	—
South Pond, Brookfield [5]	Jan. 1 - Dec. 31	3	15"
LAKE TROUT			
Wachusett Reservoir [6]	"	3	—
Quabbin [6,7]	"	4	less than 20"
		1	greater than 23"
SALMON (landlocked)	"	2	15"
SALMON (broodstock) [8]	"	2	15"
AMERICAN SHAD	"	6	—
CHAIN PICKEREL	"	5	15"
BLACK BASS (Largemouth *and* Smallmouth, singly *or* combined):	"	5	12"
NORTHERN PIKE	"	1	28"
TIGER MUSKIE	"	1	28"
WALLEYE	"	5	14"
SMELT [9]	Jan. 1 - Feb. 28	—	—
	May 16 - Dec. 31	—	—
ALL OTHER FRESHWATER SPECIES	Jan. 1 - Dec. 31	—	—

STRIPED BASS and HERRING: For current regulations call the Division of Marine Fisheries at (617) 626-1520, or visit their website at www.mass.gov/marinefisheries.

POSSESSION OF: Sturgeon (all species), American Brook Lamprey, Bridle Shiner, Burbot, Eastern Silvery Minnow, Lake Chub, Longnose Sucker, and Northern Redbelly Dace IS ILLEGAL! If caught RELEASE IMMEDIATELY.

[1]Minimum length is measured as the straight line (not curved over the body) from the tip of the snout to the tip of the tail. Forked tails may be squeezed together for the final measurement.

[2]Trout applies to Brook, Brown, Rainbow and Tiger (a cross between a female brown and a male brook trout). From April 1 to September 10, no more than eight trout as defined may be taken daily, and only three of those trout may be from lakes, ponds, or major rivers. From Sept. 11 to Mar. 31, no more than three trout as defined, may be taken daily.

[3]Major Rivers: Childs, Coonamessett, Deerfield, Farmington, Green (Colrain), Green (Great Barrington), Ipswich, Jones, Mashpee, Millers, Nissitissit, North (Colrain), North (West Branch), Parker, Quaboag, Quinapoxet, Quinebaug, Seven Mile, Santuit, Scorton Creek, Shawsheen, Squannacook, Stillwater (Sterling, Princeton), Swift (East Branch), Swift (Winsor Dam to Ware River, except as posted), Tully (East and West Branches) Ware, Ware (East Branch), Westfield (All Branches).

[4]Mainstem Housatonic River from the confluence of the East and West Branches to the MA/CT line, exclusive of catch and release areas, limit one trout, minimum length 20 inches.

[5]Special brown trout water: Total daily creel is 3 trout but **only 1** may be a brown trout and it must be at least 15 inches.

[6]Opening and closing dates are set by the Department of Conservation and Recreation. For Quabbin Reservoir call 413-323-7221, for Wachusett / Sudbury Reservoirs call 508-835-4816 or 978-365-3800. The use of lead fishing sinkers including, but not limited to, split shot, bullet weights, egg sinkers, slip sinkers, bell sinkers, pinch sinkers, rubber grip sinkers, bank sinkers, pyramid sinkers, or twist, strap or wraparound sinkers for the taking of fish in Quabbin and Wachusett Reservoirs is prohibited. Lead fishing sinkers DO NOT include other lead fishing-related items such as artificial lures, jigs, lead-core line, down-rigger weights, keel sinkers, torpedo casting and trolling sinkers, or weighted flies.

[7]Lake trout at Quabbin measuring 20"-23" (inclusive) are protected. NO HARVEST!

[8]The harvest of broodstock salmon (Atlantic salmon) is lawful in all inland waters of Massachusetts except in: 1) the Connecticut River and all its tributaries, and 2) the Merrimack River downstream of the Essex Dam in Lawrence, MA and all its tributaries downstream of the Essex Dam in Lawrence, MA. The possession of an Atlantic salmon (including broodstock salmon) while fishing in the Connecticut River and all its tributaries and in the Merrimack River downstream of the Essex Dam in Lawrence, MA and all its tributaries downstream of the Essex Dam in Lawrence, MA is prohibited.

[9]Smelt may be taken by hook and line only.

Bait: Permit required to take baitfish for purpose of sale. Frogs (except leopard frogs) 2-1/2" or less snout to vent may be used as bait; 10 daily, 10 in possession. May not be sold. Baitfish may be taken by licensed anglers at any time (except for purposes of sale) with a rectangular net not exceeding 36 square feet of net area or by a hoop or circular net not exceeding 6 feet in diameter or with a fish trap with openings not exceeding one inch. The following species may be taken for personal use as bait by licensed anglers:

American eel	Banded killifish	Bluntnose minnow
Creek chubsucker	Emerald shiner	Fallfish
Fathead minnow	Golden shiner	Mummichog
Pumpkinseed	Rainbow smelt[‡]	Yellow perch
Spottail shiner	White sucker	

[‡] Hook and line only. Possession or use of smelt as bait in inland waters other than during the smelt season is prohibited.

Herring — for current regulations on the use and taking of herring contact the Division of Marine Fisheries, 617-626-1520 or www.mass.gov/marinefisheries.

Catch and Release Areas:

Artificial lures only. No bait in possession.

Housatonic River - From the Route 20 bridge in Lee downstream to Willow Mill Dam AND from Glendale Dam downstream to the R.R. bridge. No Fishing from June 15 - August 31 inclusive within 100 feet from the mouths of posted tributaries. Posted tributaries are: Beartown Brook, Goose Pond Brook, Hop Brook and Mohawk Brook.

Red Brook - From the outlet of White Island Pond to the inlet of Buttermilk Bay.

Nissitissit River - From the New Hampshire border to the Prescott St. Bridge. **FLY FISHING ONLY**.

Swift River - Winsor Dam to Rte. 9, catch & release **FLY FISHING ONLY** (year around); Rte. 9 to Cady Lane, catch & release July 1 - Dec. 31 (Artificials only).

Deerfield River - Fife Brook Dam to Hoosac Tunnel, and the section extending from Pelham Brook to the Mohawk Campground.

Westfield River, East Branch - Immediately below the Chesterfield Gorge parking lot in Chesterfield to the gate north of the Corps of Engineers parking lot at Knightville in Huntington.

Millers River - Templeton/Athol railroad bridge to dam in Athol and from Wendell Rd. bridge in Orange to breached dam in Erving center.

Quashnet River - From the outlet of John's Pond to the sign 0.1 Mile below Route 28.

Fish Consumption Advisories: The MA Dept. of Public Health (MDPH), has issued a statewide advisory for pregnant women not to consume fish caught in fresh water due to elevated levels of mercury in fish. MDPH has also issued fish consumption advisories for the general public on selected bodies of water primarily due to PCB and mercury contamination. For more information or for a list of waters with fish consumption advisories, write or call the MDPH at 250 Washington Street, 7th Floor, Boston, MA 02108-4619; (617) 624-5757.

Interstate Ponds: Wallum Lake, Douglas: fishing permitted by persons duly licensed in Massachusetts or Rhode Island. Rhode Island regulations apply.

Lake Monomonac and Robbins Pond, Winchendon; Long Pond, Tyngsboro and Dracut; Bent Pond, Warwick; Tuxbury Pond, Amesbury: fishing permitted by persons duly licensed in Massachusetts or New Hampshire. New Hampshire regulations apply.

Colebrook Reservoir, Tolland; Perry Pond, Dudley; Muddy Pond, Southbridge; Breakneck Pond, Sturbridge; Congamond Lake, Southwick; Hamilton Reservoir, Holland: fishing permitted by persons duly licensed in Massachusetts or Connecticut. Connecticut regulations apply to Colebrook Reservoir, Breakneck Pond, Perry Pond and Muddy Pond. Massachusetts regulations apply to Congamond Lake and Hamilton Reservoir.

Sherman Reservoir, Rowe: MA regulations apply and MA license required in MA. Vermont regulations apply and VT license required in VT.

FREE FISHING WEEKEND

June 3 & 4, 2006 — ***No license needed***

Spears, Bow and Arrows - May be used to take suckers, carp and eels only. Fishing license required.

PROHIBITED:

Explosives

Poisons

Rubbish in inland waters

Releasing fish or spawn into inland waters, except by permit.

Jug, toggle or trot line fishing.

More than two hooks for fishing or more than five hooks when ice fishing. A hook is defined as an angling device which is attached to a fishing line and which is designed to take one fish at a time, including, but not limited to, devices commonly called spinners, spoons, bait harnesses, lead head jigs or plugs, the purpose of which is to capture the fish by enticing it to take the device into its mouth.

Sale of freshwater fish without a permit.

Snagging

Transporting live fish (except bait) without a permit.

Avoid Aquatic Hitch Hikers!

INVASIVE PLANT AND ANIMAL SPECIES ARE A MAJOR ENVIRONMENTAL PROBLEM
ALWAYS WASH BOATS, MOTORS and TRAILERS, and ALWAYS EMPTY BAIT BUCKETS and LIVE WELLS
***BEFORE* MOVING from ONE BODY of WATER to ANOTHER.**
DON'T BE RESPONSIBLE FOR CONTAMINATING NEW WATERS with INVASIVE SPECIES!

SPORTFISHING AWARDS

Awards for freshwater fish are offered in 22 categories. Each qualified entry receives a bronze pin. Largest fish in each category each year receives a "gold" pin and plaque. Fish must meet minimum weight requirements as listed below, and must be weighed on a certified scale at an official weighing station. Please check our website or send request with self-addressed stamped envelope to Field Headquarters for a list of weighing stations and more detailed regulations.

Largemouth Bass	7 lbs. 8 ozs.	Channel Catfish*	6 lbs. 0 ozs.
Smallmouth Bass	4 lbs. 8 ozs.	White Catfish*	4 lbs. 0 ozs.
Northern Pike	15 lbs. 0 ozs.	Bullhead*	1 lb. 12 ozs.
Tiger Muskie	10 lbs. 0 ozs.	Sunfish**	1 lb. 0 ozs.
Chain Pickerel	4 lbs. 8 ozs.	Walleye	5 lbs. 0 ozs.
Rainbow Trout	4 lbs. 0 ozs.	Crappie/Calico	2 lbs. 0 ozs.
Brown Trout	6 lbs. 0 ozs.	White Perch	1 lb. 8 ozs.
Brook Trout	2 lbs. 0 ozs.	Yellow Perch	1 lb. 8 ozs.
Lake Trout	7 lbs. 0 ozs.	Carp	20 lbs. 0 ozs.
Shad	5 lbs. 0 ozs.	Landlocked Salmon***	5 lbs. 0 ozs.
Brood Salmon	10 lbs. 0 ozs.	Tiger Trout	3 lbs. 0 ozs.

** Sunfish category includes bluegills, pumpkinseeds and rock bass.

*** Landlocked Salmon are recognized only from Quabbin & Wachusett Reservoirs

HUNTING

OPEN SEASON (All Dates Inclusive)
NO HUNTING ON SUNDAY

Species	Open season	Daily Bag Limit	Possession Limit	Season Limit
Birds:				
Crow[1]	Jan. 2 - Apr. 10 Jul. 1 - Apr. 10, 2007	-	-	-
Pheasant[2]	Oct. 14 - Nov. 25	2	4	6
Quail[3]	Oct. 14 - Nov. 25	4	8	20
Ruffed Grouse[4]	Oct. 14 - Nov. 25	3	6	15
Turkey[5] Spring:				
Zones 1 - 10; 13:	Apr. 24 - May 20			
Zones 11 & 12:	Apr. 24 - May 6	} See Note # 5		
Fall:				
Zones 1 - 9; 13:	Oct. 30 - Nov. 4			
Waterfowl / migratory birds (including woodcock) see Migratory Bird Abstracts.				
Mammals:				
Black Bear[6]	Sep. 5 - Sep. 23 Nov. 6 - Nov. 25	See Note # 6		
Bobcat[7]	Jan. 2 - Mar. 8 Dec. 20 - Mar. 8, 2007	See Note # 7		
Cottontail Rabbit:				
Zones 1 - 12:	Jan. 2 - Feb. 28 Oct. 14 - Feb. 28, 2007	5	10	-
Zones 13 & 14:	Jan. 2 - Feb. 28 Nov. 15 - Feb. 28, 2007	5	10	-
Coyote[8]	Jan. 2 - Feb. 28 Nov. 1 - Feb. 28, 2007	-	-	-
Deer (archery)[9]	Oct. 16 - Nov. 25			
Deer (shotgun)[9]				
Zones 1 - 11; 14:	Nov. 27 - Dec. 9			
Zones 12 & 13:	Nov. 27 - Dec. 2	} See Note # 9		
Deer (muzzleloader)[9]				
	Dec. 11 - Dec. 30			
Fox (red or gray)	Jan. 2 - Feb. 28 Nov. 1 - Feb. 28, 2007	-	-	-
Gray Squirrel[10]				
Zones 1 - 9:	Sep. 11 - Jan. 2 , 2007	5	10	-
Zones 10 - 14:	Oct. 14 - Jan. 2 , 2007	5	10	-
Jackrabbit[11]	Nov. 15 - Dec. 30	1	2	-
Opossum[12]	Jan. 2 - Jan. 31 Oct. 2 - Jan. 31, 2007	-	-	-
Raccoon[12]	Jan. 2 - Jan. 31 Oct. 2 - Jan. 31, 2007	3	-	-
Snowshoe Hare				
Zones 1 - 4:	Jan. 2 - Feb. 28 Oct. 14 - Feb. 28, 2007	2	4	-
Zones 5 - 12:	Jan. 2 - Feb. 4 Oct. 14 - Feb. 5, 2007	2	4	-
Zones 13 & 14:	Jan.2 - Feb. 4 Nov. 15 - Feb. 5 , 2007	2	4	-
Reptiles and Amphibians:				
Bullfrog & Green frog[13]	Jul. 16 - Sep. 30	12	24	-
Snapping Turtle[13]	Jan. 1 - Dec. 31	-	-	-

ALL HUNTING SEASONS except waterfowl ARE CLOSED during shotgun deer season from Nov. 27 to Dec. 9 in Zones 1 - 11 & 14 and from Nov. 27 to Dec. 2 in Zones 12-13.

The following species may be taken by licensed hunters with no daily or seasonal bag limit: English sparrow, starling, chipmunk, flying squirrel, red squirrel, weasel, porcupine, skunk, woodchuck.

Closed season throughout the year on all birds and mammals not mentioned herein or in Massachusetts migratory bird regulations.

Hunter harassment is against state law. Report violations to the Office of Law Enforcement 1-800-632-8075 or state or local police and prepare to provide a description of violators.

Hunting hours are from 1/2 hour before sunrise to 1/2 hour after sunset on each day of open season **except** for: **(A)** spring turkey, raccoon and opossum (see footnotes 5 & 12) and **(B)** WMA REG #10 (pg. 12) which states that no person shall hunt before sunrise or after sunset on any WMA where pheasant or quail are stocked during the pheasant or quail season (Oct.14 to Nov. 25) except for the hunting of raccoons and opossums between 9P.M. and 3A.M. **(C)** Hunting for rabbit, hare, fox and coyote which closes at midnight.

FURBEARER CHECK STATIONS: Check stations are located at all Wildlife District Headquarters, Bitzer and Sunderland State Fish Hatcheries, Newbury WMA Headquarters, and Westboro Field Headquarters (Monday - Friday excluding holidays). **Call check station prior to bringing pelts for sealing.**

[1]**Crow** - May be hunted only on Friday, Saturday and Monday during the open season. Hunting hours close 1/2 hr. after sunset except as noted in WMA Reg #10 (See hunting hours above).

[2]**Pheasants** - Zone from the New Hampshire border south on I-95 to I-495 south to I-95, north on I-95 to I-93/128, east on I-93/128 to Route 3, south on Route 3 to Route 228, north on 228 to the Hull town line. Cocks and hens west of zone line and on all Wildlife Management Areas. Cocks only east of zone line including Hull and in Dukes and Nantucket counties. See WMA Reg. #10 under hunting hours above.

[3]**Quail** - Season limited to Zones 11 - 14. See WMA Reg #10 under hunting hours above.

[4]**Ruffed Grouse** - see WMA Reg. #10 under hunting hours above.

[5]**Turkey** - Permit required. **Official safety sticker must be adhered to firearm in such a manner as to be visible when hunter is sighting down the barrel.** Send self addressed stamped envelope to MassWildlife's Field Headquarters office (See p. 13) if new or replacement sticker is needed. **Spring hunting hours**: 1/2 hour before sunrise to 12:00 noon. **Fall hunting hours**: 1/2 hour before sunrise to 1/2 hr. after sunset except as noted in WMA Reg #10 (See hunting hours above). **Bag limit:** (A) 2 bearded birds in spring season (1 per day) with NO fall bird allowed, **OR** (B) 1 bearded bird in spring season, and 1 bird of either sex in fall season. Hunting only with shotguns no larger than 10 gauge and restricted to shot sizes #4 - #6, or with bows 40 lbs. pull or greater. Electronic calls, dogs, bait, driving prohibited. Successful hunters must tag bird immediately (with tag attached to permit) and bring bird to an official checking station within 48 hours.

[6]**Bear** - Permit required - submit application attached to license to Westboro Field Headquarters prior to season opening. Zones 1 - 9 ONLY. Hunting only with rifle .23 caliber or larger, muzzleloader .44 - .775 caliber, bows with 40 lb. pull or greater, or revolvers .357 Magnum or .40 caliber or larger. Handguns permitted in September season only - SHOTGUNS PROHIBITED. Dogs prohibited for hunting and training **(See**: **Hunting Dogs**, page 10). Hunting hours close 1/2 hr. after sunset except as noted in WMA Reg #10 (See hunting hours above). Successful hunters must tag bear immediately (with tag attached to permit) and bring bear to an official checking station within 48 hours. **Limit 1 bear per year.**

[7]**Bobcat** - Hunting hours close 1/2 hour after sunset. Hunting limited to Zones 1 - 8. All bobcats taken must be checked within four working days of date of harvest. The Director will close the season when the total harvest reaches 50 animals.

[8]**Coyote & Fox** - Hunting hours end at midnight. Pelts must be tagged within four working days of the end of the season. **Rifles** chambered to take larger than .22 caliber long rifle rimfire ammunition, pistols and revolvers larger than .38 caliber between the hours of 1/2 hour after sunset and 1/2 hour before sunrise **are prohibited**. Weapons other than shotguns and bows and arrows are prohibited on WMAs stocked with pheasant or quail during the pheasant and quail season. Possession or use of any rifle chambered larger than .22 long rifle in any place where birds or mammals may be found in Barnstable, Bristol, Dukes, Plymouth, and Nantucket counties is prohibited, November 1 - March 31.

[9]**Deer- Hunting hours** begin 1/2 hour before sunrise and close 1/2 hr. after sunset except as noted in WMA Reg. #10 (See hunting hours pg.6).



Antlered deer- any deer with at least one antler 3 inches long measured on a straight line from the center of the anterior (front) base of the antler burr to the tip.

Antlerless deer- a permit is required to harvest antlerless deer during any season in all zones. Only one application per person. Applications must be postmarked no later than **July 16th**. Incomplete or late applications will not be accepted. Additional permits may be available in certain zones (see page 11 for details). Permits are accompanied by a zone specific tag and are valid in any season.
Note: Each 2006 antlerless deer permit will have a tag attached, valid for one antlerless deer, increasing the seasonal bag limit for anyone possessing an antlerless deer permit. If you hunt the archery, shotgun, or muzzleloader seasons, you must have an antlerless permit to take an antlerless deer. The number of deer a hunter may harvest statewide depends on the number of antlerless deer permits they purchase. A hunter may possess antlerless deer permits for more than one Zone. For example, if a hunter applies for a permit for Zone 5 through the drawing, and is selected for that permit, that hunter may purchase additional permits for a Zone that has permits available (such as Zone 10 or Zone 14). Permit availability depends on permit allocation and the number of applicants.

Tagging requirements- Immediately upon killing a deer and prior to moving it (during any deer season), the tag portion must be separated from the license or antlerless deer permit, filled out, and attached to the deer in a conspicuous manner. The deer must be taken to an official checking station by the person who killed it within 48 hours after killing it for validation by a Division of Fisheries and Wildlife representative. At that time the paper tag will be collected and a metal tag affixed. This constitutes the official report of kill as required by law. Deer taken on Nantucket, Martha's Vineyard or Cuttyhunk must be tagged on the island where shot. Deer must not be possessed, transported, or under a person's control unless the deer, or a part of the deer, is open to view. However, after the deer has been tagged with an official metal seal, the deer may be concealed.

After killing 2 deer (except for persons with unused valid deer tags) a person shall not hunt for any bird or mammal other than deer, during the remainder of the shotgun deer season. This does not apply to hunting waterfowl on coastal waters.

Daily bag: the daily bag limit is determined by the number of valid tags a hunter possesses. Hunters possessing one deer may take an additional deer before presenting the first deer at an official check station. However, all deer must be taken to a check station within 48 hours of being killed.

Yearly bag: 2 antlered deer, and as many antlerless deer as the hunter has valid permits for, **PROVIDED**:
(A) Hunters may purchase additional antlerless deer permits for **available zones** subject to an overall quota in each zone.
(See p. 11 for antlerless deer permit regulations.)
(B) Hunters may take a maximum of two (2) deer in the **Quabbin** Reservation, both of which may be antlerless, provided the hunter obtains a second antlerless deer permit after checking their first antlerless deer at a Quabbin check station. **Antlerless** deer taken in the Quabbin are not considered part of the statewide bag limit. **Antlered** deer taken in the Quabbin are part of the statewide bag limit.

No person shall kill an antlerless deer unless he or she possesses on his or her person a permit from the director to do so.

During shotgun season hunters may use shotguns not larger than 10 gauge, bows and arrows, or muzzleloaders, including modern muzzleloaders, muzzleloaders with telescopic sights, and sabot rounds in muzzleloaders, including hinge action muzzleloaders.

During shotgun and muzzleloader seasons all deer hunters must wear a minimum of 500 square inches of "hunter orange" on their head, chest, and back. This includes archers hunting during either season (see page 10).

The possession of rifles, handguns, or **dogs** in any woodland or field, on any highway, or use of same on any game, is **prohibited** during the shotgun deer season except that the use of dogs is lawful for hunting waterfowl on coastal waters.

Driving deer is lawful.

Quabbin Controlled Hunt: Contact Dept. of Conservation & Recreation (413-323-7221) in June for information. Must apply by August 15.

Muzzleloader Season - Limited to shoulder-fired muzzleloaders .44 to .775 caliber; barrel length 18" or more with only one barrel operative. In-line ignition systems permitted providing rifle loads from muzzle. Hinge action muzzleloaders are not legal. Single projectile only (no buckshot). Sabot rounds, 209 primers and scopes are legal. Powder limited to black powder or approved substitutes. Firearm is considered unloaded when cap or pan powder is removed. Stamp required. **An antlerless deer permit is required by muzzleloader hunters in order to take an antlerless deer.** Archers may hunt during the muzzleloader firearms season but must purchase a primitive firearms stamp and wear at least 500 square inches of hunter orange on head, back and chest.

Paraplegic Season: There is a special deer hunt for paraplegic sportsmen. Contact Field Headquarters for information (508)792-7270.

[10]**Gray Squirrel** - Rifles and handguns permitted in Zones 1 - 9; prohibited in Zones 10 - 14. No person shall hunt before sunrise or after sunset on any WMA where pheasant or quail are stocked during the open season on pheasant or quail (Oct.14 to Nov. 25) except for the hunting of raccoons between 9PM and 3AM (WMA Reg #10, pg. 12). No person shall hunt by any means other than shotgun or bow and arrow during the pheasant and quail season on areas stocked with pheasant or quail except for hunting raccoons or opossums between 9PM and 3AM (WMA Reg. #9, pg.12).

[11]**Jackrabbit** - Season limited to Nantucket County — Zone 14.

[12]**Raccoon & Opossum** - Limit of 3 raccoon from sunset of one day to sunset of following day by one person; 6 by two or more persons hunting in same group. No limit on opossum. Night hunting on Wildlife Management Areas (except Delaney and Flint Pond WMAs) is permitted from sunset to sunrise excepting from Oct.14 to Nov. 25 on areas stocked with pheasant or quail, when raccoon and opossum may be hunted only from 9PM to 3AM.

[13]**Bullfrog, Green frog, Snapping Turtle** - No license required. Minimum size for frogs 3" snout to vent.

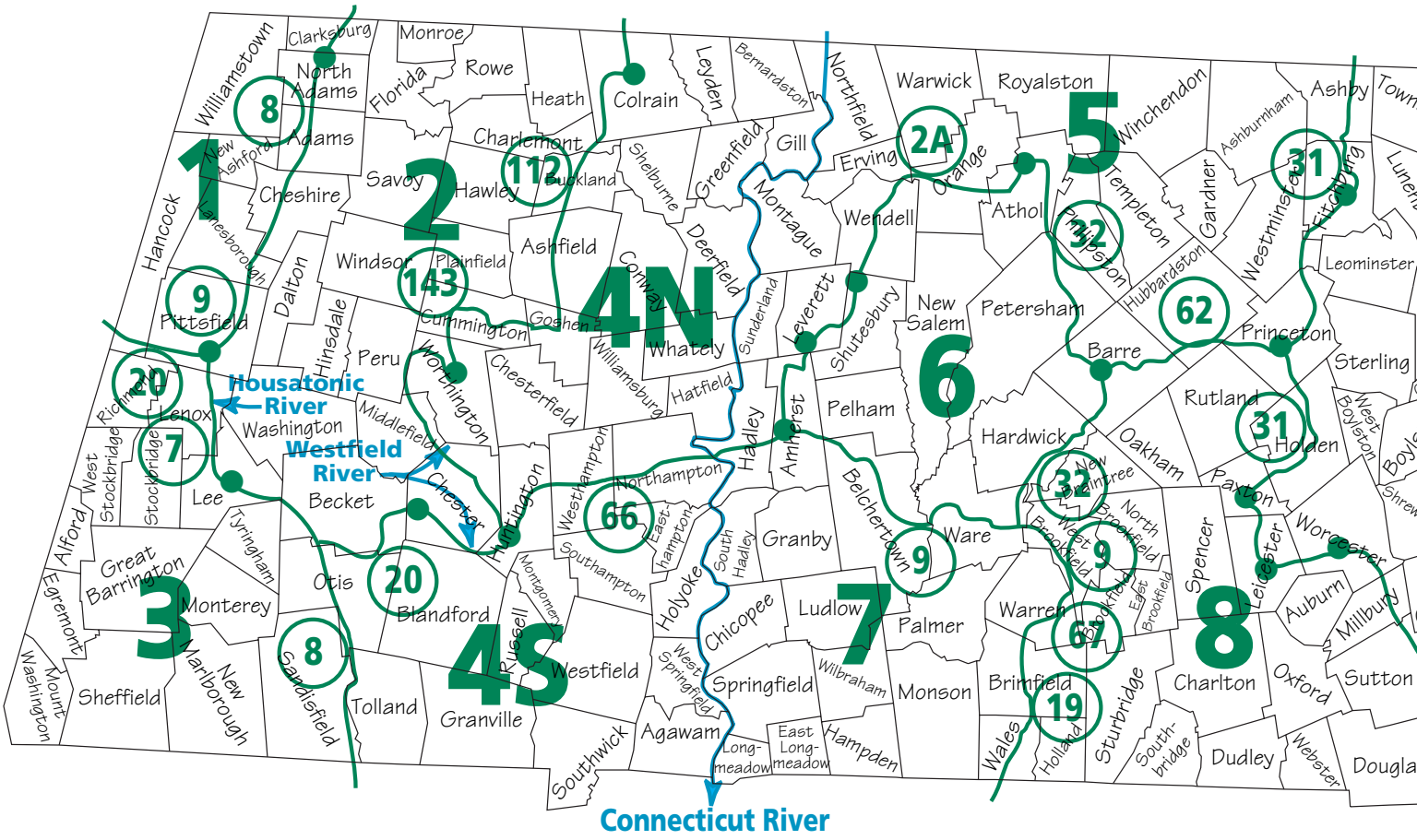
HUNTING REGULATIONS

Accidents - All hunting injuries or deaths MUST be reported to state, local police, and/or environmental police.

Archery - Poisoned arrows, or explosive tips or bows drawn by mechanical means are prohibited. Mechanical releases permitted.

(**Continued**, Page 10)

Wildlife Management



Zone 01 - Northerly by the Vermont border; westerly by the New York border; southerly by a line running along Rte. 20 to the junction with Rte. 7 in Pittsfield; north on Rte. 7 to Rte. 9 and east on Rte. 9 to the junction of Rte 8.; and easterly by a line running from the Vermont border south along Rte. 8 to Rte. 9 in Pittsfield.

Zone 02 - Northerly by Vermont border; westerly by zones 01 and 03; southerly by the Mass. Turnpike (I-90) from the intersection with the Housatonic River in Lee, east to the intersection (dead end) with Bonny Rigg Hill Road in Becket; and easterly by a line running from the Vermont border south along Rte. 112 to Rte. 143 in Worthington, along Rte. 143 west to the intersection with the middle branch of the Westfield River, then south along the middle branch of the Westfield River to the intersection with the East branch of the Westfield River, south along the East branch of the Westfield River to Rte. 20 in Huntington, west along Rte. 20 to Bonny Rigg Hill Road in Becket, south on Bonny Rigg Hill Road to the intersection with the Mass. Turnpike.

Zone 03 - Northerly by zones 01; westerly by the New York border; southerly by the New York and Connecticut borders; and easterly by a line running south along the Housatonic River from the junction with Rte. 9 in Pittsfield to the junction with Rte. 20 in Lee, east along Rte. 20 to the junction with Rte. 8 in West Becket, and south on Rte. 8 to the Connecticut border.

Zone 04 North - Northerly by the Vermont border; westerly by zone 02; southerly by a line running north from the intersection of Rte. 20 and the East branch of the Westfield River in Huntington along the East branch of the Westfield River to the intersection with Rte. 66, along Rte. 66 to the intersection with Rte. 9 in Northampton, to the intersection with the Connecticut River at the Northampton/Hadley town line; and easterly by the Connecticut River.

Zone 04 South - Northerly by zones 02 and 04N; westerly by zone 03; southerly by the Connecticut Border; and easterly by the Connecticut River.

Zone 05 - Northerly by the New Hampshire border; westerly by the Connecticut River; southerly by a line running from the intersection of the Connecticut River and Rte. 9 at the Northampton/Hadley line east along Rte. 9 to Rte. 116 in Hadley, north along Rte. 116 to Rte. 63 in North Amherst, east along Rte. 63 and Pine Street to State Street, northeast along State Street and East Leverett Road to Cushman Road, along Cushman Road to Shutesbury Road in East Leverett, east on Shutesbury Road and Leverett Road to Wendell Road in Shutesbury Center, north along Wendell Road to Locks Pond Road, north on Locks Pond Road to Lake View Road, northeast on Lake View Road to Locks Village Road, north along Locks Village Road to Depot Road in Wendell, north on Depot Road to Rte. 2A in Wendell Depot, east on Rte. 2A to Rte. 32 in Athol, south on Rte. 32 to Rte. 62 in Barre, and east on Rte. 62 to the intersection with Rte. 31 in Princeton.

Zone 06 - Northerly by zone 05; westerly by zone 05; southerly by a line running from the intersection of Rte. 9 and Rt. 116 in Hadley, east along Rte. 9 to the intersection with Rte. 32 in Ware; and easterly by a line running from the intersection of Rte. 32 and Rte. 62 in Barre, south along Rte. 32 to the intersection with Rte. 9 in Ware.

Zone 07 - Northerly by zones 05 and 06; southerly by the Connecticut border; easterly by a line running from the intersection of Rte. 9 and Rte. 32 in Ware, east along Rte. 9 to the intersection with Rte. 67, southwest along Rte. 67 to the intersection with Rte. 19 in Warren, and south along Rte. 19 to the Connecticut border.

Zone 08 - Northerly by zone 05; southerly by the Connecticut and Rhode Island borders; easterly by the following: Rte. 31 in Princeton south to Rte. 56 in Paxton, Rte. 56 south to Rte. 9 in Leicester, Rte. 9 east to Cambridge Street in Worcester, Cambridge Street east to Rte. 146, Rte. 146 southeast to the Rhode Island border, westerly by zones 06 and 07.

Zone 09 - Northerly by the New Hampshire border; southerly by the Rhode Island border; easterly by the following: Rte. 3 from New Hampshire southeast to Rte. I-495 south to Rte. 121 in Wrentham, 121 southwest to the Rhode Island border; westerly by zones 05 and 08.

Zone 10 - Northerly by the New Hampshire border; southerly by the following: Rte. 1A northeast from Walpole to Rte. 128, Rte. 128 east to Rte. 228, Rte. 228 north to the Atlantic Ocean; easterly by the Atlantic Ocean; westerly by zone 09.

Zone 11 - Northerly by zones 09 and 10; southerly by Buzzard's Bay and the Cape Cod Canal; easterly by the Atlantic Ocean ; westerly by the Rhode Island border.

Zone 12 - Northerly, southerly and easterly by the Atlantic Ocean; westerly by zone 11.

Zone 13 - Dukes County.

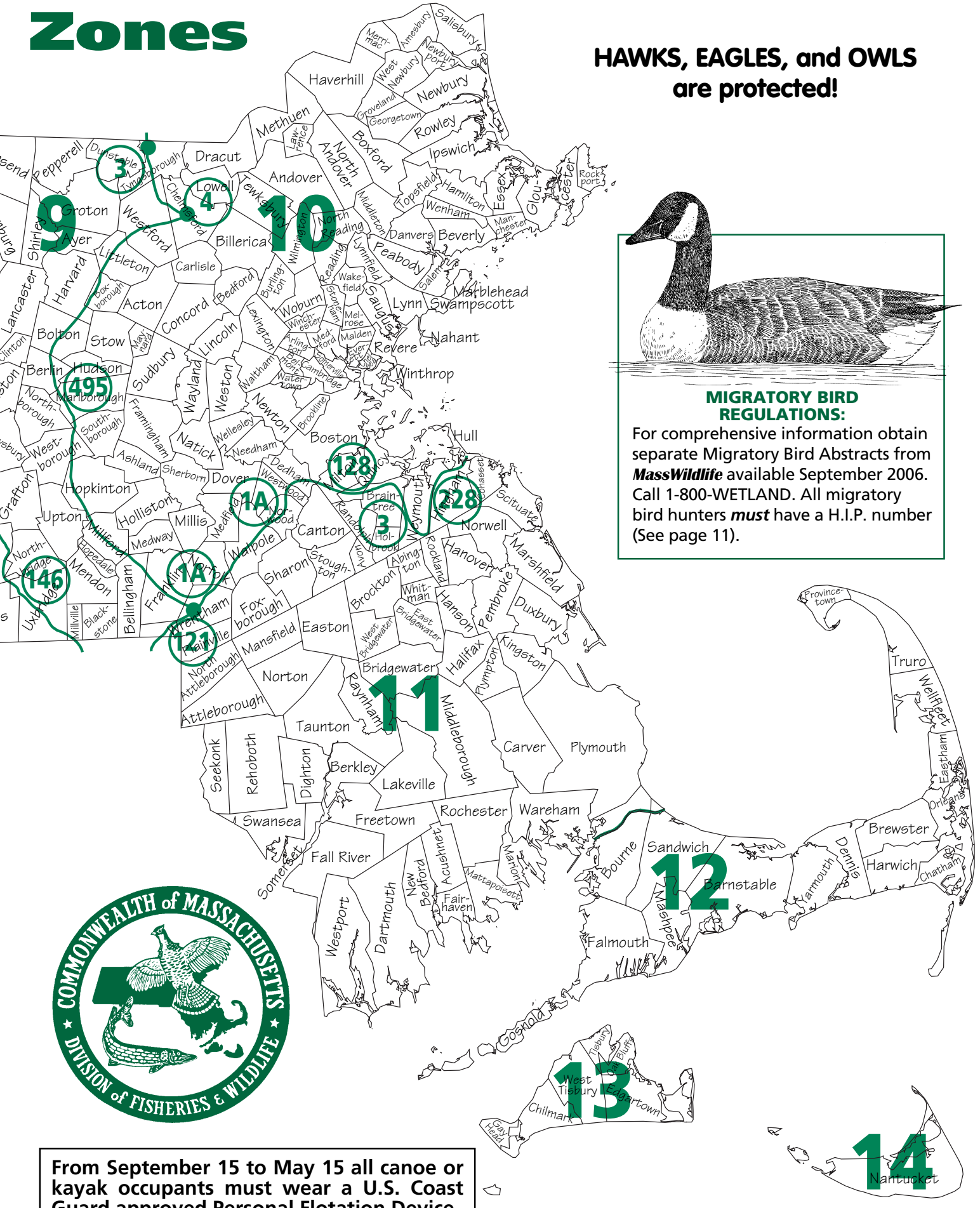
Zone 14 - Nantucket.

Zones

HAWKS, EAGLES, and OWLS are protected!

MIGRATORY BIRD REGULATIONS:

For comprehensive information obtain separate Migratory Bird Abstracts from ***MassWildlife*** available September 2006. Call 1-800-WETLAND. All migratory bird hunters ***must*** have a H.I.P. number (See page 11).



From September 15 to May 15 all canoe or kayak occupants must wear a U.S. Coast Guard approved Personal Flotation Device.

(**Continued** from Page 7)

Arrows used on deer, bear or turkey must have well-sharpened steel broadhead blades not less than 7/8 of an inch in width. Recurve or long bows for deer, bear or turkey hunting must have at least 40 lbs. pull at 28" or at peak draw weight for compound bows. No arrows may be released within 150 feet of, or across, any state or hard-surfaced highway and hunting is prohibited within 500 feet of any dwelling or building in use, unless authorized by owner or occupant thereof.

Antlerless deer permit required to take antlerless deer in any zone during archery deer season (Oct. 16 - Nov. 25), in addition to a hunting or sporting license. Archers, while hunting deer, shall not possess firearms on their person or use dogs. (See deer regulations this page for daily and seasonal bag limits, and antlerless deer permit regulations on page 11.) Archers may hunt with a bow and arrow during the shotgun season and muzzleloader season but must comply with the shotgun or muzzleloader season regulations. **Crossbows** may be used **by certain permanently handicapped persons by permit only**. For regulations and an application, visit our website or contact MassWildlife at (508) 792-7270.

Hunter Orange - No person shall hunt during the pheasant or quail season on public shooting grounds or Wildlife Management Areas where pheasant or quail are stocked without wearing a "hunter orange" cap or hat except while night-hunting for raccoons or while hunting waterfowl from a blind or boat.

During the period when it is legal to hunt deer with a shotgun, all hunters, except waterfowl hunters hunting within a blind or from a boat, must wear, in a conspicuous manner on chest, back, and head, a minimum of 500 square inches of "hunter orange" clothing or material. During the muzzleloader season deer hunters only must comply with the hunter orange requirement.

Hunting Dogs - May be trained at any time (except during the shotgun season on deer) provided no firearms other than pistol or revolver and blank cartridges are used or possessed. No sporting or hunting license necessary. During the shotgun season on deer, dogs may be used for waterfowl hunting on coastal waters only. Hunting bear or bobcat with dogs, or training dogs on those species, is prohibited.

Reptiles and Amphibians - No open season on 25 species: hunting, taking, possessing alive prohibited. Regulations available from MassWildlife. Possession limit of 2 on all others except bullfrog, green frog, or snapping turtle. (See p. 6).

Tree Stands - Must have written permission of landowner to construct **or use** any tree stand held in place with nails, bolts, etc., or in place for more than 30 days.

PROHIBITED

Artificial Lights for hunting any bird or mammal except raccoon and opossum.

Baiting wild birds, bear or deer.

Careless or negligent use of firearms.

Choke Traps, Leghold Traps or Nets for taking any bird or mammal.

Decoys for hunting deer.

Discharge of any Firearm or release of any arrow upon or across any state or hard-surfaced highway, or within 150 feet of any such highway, or possession of a loaded firearm, discharge of a firearm or hunting on the land of another within 500 feet of any dwelling or building in use, except as authorized by the owner or occupant thereof.

Electronic Calls for hunting migratory game birds, wild turkey, or deer.

Ferreting, possession of non-vaccinated / unneutered ferrets / fitches without permit. It is unlawful to hunt with a ferret.

Hunting on Posted Land without permission.

Hunting on Sunday.

Importation, transportation, liberation or possession of any live vertebrate protected under Chapter 131 of the General Laws except under permit from the Director.

Intoxication and Drugs - No person under the influence of intoxicating liquor or drugs shall hunt, target shoot, carry a firearm, bow and arrow or other weapon.

Loaded Shotgun or rifle in or on any motor vehicle, recreational vehicle (including snowmobiles), aircraft or motor boat, except as stated in the Migratory Bird Hunting Abstracts.

Machine Guns, fully-automatic firearms, any crossbow, any tracer or incendiary ammunition for hunting. Crossbows allowed for certain handicapped persons only (see Archery).

Motor Vehicles, Recreational Vehicles (including Snowmobiles), Aircraft for hunting any bird or mammal.

Possession of any protected wildlife and/or wild plants, dead or alive, taken from the wild, except by permit.

Power or Sailboats for hunting birds except when beached or tied to blind or for retrieving injured birds.

Removal of any mammal from walls, holes in trees, ground or logs.

Rifles chambered to take larger than .22 caliber long rifle rimfire ammunition, pistols and revolvers larger than .38 caliber between the hours of 1/2 hour after sunset and 1/2 hour before sunrise. Weapons other than shotguns and bows and arrows are prohibited on WMAs stocked with pheasant or quail during the pheasant and quail season. Possession or use of any rifle chambered larger than .22 long rifle in any place where birds or mammals may be found in Barnstable, Bristol, Dukes, Plymouth, and Nantucket counties November 1 - March 31, except during daylight hours on target ranges and except for the use of rifled caplocks or flintlocks during muzzleloader deer season, or rifled barrel shotguns during the shotgun deer season.

Sale of all species of mammals and birds or parts thereof, except heads, hides and hooves of deer.

Shotgun Ammunition - Except during the prescribed open season when deer may be hunted lawfully with a shotgun, a person shall not have in his possession a shotgun shell loaded with a rifled slug, single ball, buckshot of any size, BB shot or air rifle shot in any place where birds or mammals may be found except on a skeet, trap or target range between sunrise and sunset, or **except** as specified in Migratory Bird Hunting Abstracts.

Swivel or Pivot Guns for hunting any bird.

Taking Nests, destroying or disturbing eggs or nests of birds protected by law.

Target Shooting on Sunday except on one's own property or on a recognized range.

Traps for taking birds except under permit. All traps except cage or box traps and common mouse or rat traps are unlawful for the taking of fur-bearing mammals.

Vandalism or damage to property or livestock.

LICENSES & PERMITS

Licenses, stamps, permits, and boat registration renewals are now available online at mass.gov/massoutdoors. Anyone holding an electronic license may subsequently purchase stamps, permits or boat registration renewals over the Internet. Persons holding traditional licenses must purchase permits, stamps and licenses at license sales outlets in the traditional way.

Licenses are valid from Jan. 1 through Dec. 31 (except for limited term licenses).

Licenses are issued by: most city and town clerks, all MassWildlife offices and selected other outlets. Application may be made in person or by mail, or by agent of applicant. NOTE: City and town clerks MUST add an additional One Dollar ($1.00) and other sales agents MAY add up to an additional One Dollar and Fifty Cent ($1.50) service fee to the price of each license sold. NO SERVICE FEE is added to the price of licenses at MassWildlife offices.

Licenses are required for all persons 15 years of age and over for fishing (inland waters) and hunting (any bird or mammal). Trapping license 12

years and over. License must be shown on demand to any officer empowered to enforce these laws and to landowners, or lessees while on their property. No F.I.D. card needed if 12 to 14 years of age, or for bowhunting. Face of license must not be obscured. **NOTE:** No adult may buy a hunting or sporting license unless he shows the issuing agent a previous year's hunting or sporting license (from any state), a certificate of competency issued by MassWildlife's Hunter Education Program, a License to Carry, or a F.I.D. card. Licenses for minors see page 11.

Migratory Bird Harvest Information Program (H.I.P.) provides the U.S. Fish & Wildlife Service with migratory game bird harvest estimates for ducks, geese and other migratory game birds. Hunter cooperation is a critical part of gathering this information and managing game bird populations. Woodcock, rail, coot, snipe and waterfowl hunters **must** have a Harvest Information Permit (H.I.P.) number. This number can be obtained annually by calling **1-800-WETLAND**, and completing a seven question survey. There is no charge for the permit.

Waterfowl Consumption Advisory: The MA Department of Public Health has issued a waterfowl consumption advisory for the Housatonic River due to PCBs. For more information call the MDPH at (617) 624-5757.

Bear Permit - Bear permit applications are attached to hunting/sporting licenses. $5.00 fee **MUST** accompany each completed application. Current holders of electronic licenses may purchase permits on-line. Submit application by July 15 to ensure timely processing.

Wild Turkey Permit - Application is on the duplicate slip of hunting / sporting license. Current holders of electronic licenses may purchase permits on-line. Apply by March 15 for spring season & Sept. 15 for fall season to ensure entry in the permit system. $5.00 fee MUST accompany application. One fee covers both seasons.

Antlerless Deer Permit is required to take antlerless deer during shotgun, archery and muzzleloader seasons in all zones. (Application is on hunting / sporting license.) **DO NOT send fee with application**. Selection is by random drawing. Applications must be submitted by **July 16**. Successful applicants will be notified and assessed a $5.00 fee. Additional permits, if available after drawing, will be issued at all District Offices and Westboro (in person only) until the overall quota for each zone is reached. Applicants must have original hunting license and $5.00 fee for each permit requested. Permits for zone 13 and 14 may also be requested by mail from the Westboro office or at check stations on each island. **NOTE:** A fifteen dollar ($15) fee will be charged for all returned checks.

For a listing of Turkey, Bear and Deer check stations, visit our website or send a Self-addressed Stamped Envelope to Field Headquarters, Westboro.

STAMPS

Archery Stamp ($5.10), required to hunt deer with a bow from Oct. 16 - Nov. 25. Stamp must be signed across the face in ink and attached to the rear of the license.

Primitive Firearms Stamp ($5.10 each), required to hunt deer with a muzzleloader or with archery equipment Dec.11 - 30. Stamp must be signed across the face in ink and attached to the rear of the license.

Mass. Waterfowl Stamp - required in addition to Federal Stamp. Stamps shall be signed across the face in ink and in possession while hunting waterfowl. (Not needed for Woodcock, Snipe, or Rails)...$5.00

Residency Requirement - To obtain a resident license applicant must reside in Mass. for 6 consecutive months immediately prior to purchase. **Nonresidents** - A big-game license is required to hunt deer, bear and turkey. **Aliens** must obtain a permit from the Dept. of Public Safety for possession of firearms prior to obtaining a hunting license.

Minors 15 through 17 years of age are required to be licensed and to have required stamps and permits. To obtain a license a minor must have a Hunter Education Certificate, an FID card, or a letter signed by a parent affirming that the minor will be accompanied by an adult while hunting. Minors between 12 and 14 inclusive may hunt when accompanied by a duly licensed adult, provided that a single bag limit shall be observed and only one firearm/bow is possessed by the two. Only one minor per adult is permitted.

Special Licenses or Permits are necessary for possession or release of certain wildlife and for dealers, propagators, wildlife rehabilitators, taxidermists and/or fur buyers. Apply to the MassWildlife Boston office, Permit Section, 617-626-1575. Contact Field Headquarters in Westboro, 508-792-7270, for permits for falconry, problem animal control or shooting preserves.

No license is required by any legal resident of the Commonwealth or member of his immediate family for hunting, fishing or trapping on land owned or leased by him which is used principally for agriculture, if he is or they are actually domiciled thereon.

Penalties - License revoked for one year in addition to other penalties and fines and restitutions of up to $1,000 and/or 1 year in jail. Careless and negligent use of firearms - fines of up to $500 and/or 6 months imprisonment and loss of license for 5 years.



MASSACHUSETTS GUN LAW:

Possession: No License to Carry (LTC) or Firearms Identification (FID) Card is needed by bow hunters, nor by minors 12-14 years old hunting with a duly licensed adult, nor for the possession of primitive rifles or shotguns as defined in Chapter 140, Section 121, or their ammunition. However, an LTC or FID is required to purchase all ammunition, including black powder and Pyrodex. For hunting, resident citizens ages 15 and over must have an FID Card to possess a non-large capacity rifle or shotgun. An LTC is needed to possess large capacity rifles and shotguns and **all** handguns. Non-residents with a valid Massachusetts non- resident hunting license do not need an LTC or FID to possess or carry a rifle or shotgun, but must carry their firearms unloaded and in a case while traveling in their vehicles. Non-residents **may not** purchase guns or ammunition in Massachusetts.

Caution: Massachusetts public safety laws define primitive arms differently from the laws and regulations of ***MassWildlife*.**

Travel: Rifles, shotguns, and muzzleloaders may not be carried in or on motor vehicles, nor may they be carried on public ways, unless they are unloaded and in an enclosed case, or the person is lawfully engaged in hunting. A large capacity rifle or shotgun must be carried unloaded, and contained within a locked trunk or in a locked case or other secure container.

Storage: State law requires that whenever a gun is not under your direct control, it must be kept in a locked container or equipped with a tamper resistant mechanical lock. Muzzleloaders are exempt from this requirement.

TRAPPING: For comprehensive trapping information obtain separate Trapping Abstract from MassWildlife available October 2006.



WILDLIFE MANAGEMENT AREA REGULATIONS

MassWildlife holds 116 Wildlife Management Areas (WMAs) and 13 wildlife sanctuaries. Maps are available from Field Headquarters, Westboro.

1. No person shall possess any alcoholic beverage except under permit or dump or discard any can, bottle or rubbish.
2. No person shall remove vegetation, soil or stones from any WMA except under permit.
3. No person shall use excessive speed in driving a vehicle.
4. No person, unless under permit, shall drive or possess any vehicle except on roads or trails maintained for public traffic.
5. No person shall deface or tamper with any sign, building or equipment.
6. No person shall build or maintain a fire without written permission from the Director of *MassWildlife* or his designee.
7. No person shall camp within any WMA without written permission from the Director or his designee.
8. No person shall engage in target practicing without written permission from the Director or his designee.
9. No person shall use any means other than shotgun or bow and arrow during the pheasant and quail season on areas stocked with pheasant or quail except for hunting raccoons between 9PM and 3AM.
10. No person shall hunt before sunrise or after sunset on any WMA where pheasant or quail are stocked during the open season on pheasant or quail, Oct. 14 to Nov. 25, except for the hunting of raccoons between 9PM and 3AM.
11. No person shall hunt during the pheasant or quail season on wildlife management areas where pheasant or quail are stocked without wearing a "hunter orange" cap or hat except while night hunting for raccoons or while hunting from a blind or boat.
12. No person, except under permit, shall dig or disturb any artifact or archaeological remains.
13. The Director may make special regulations to handle special situations peculiar to any WMA. Controlled hunts are in effect at certain times on Burns, Delaney and Ludlow WMAs. Contact District Supervisor for details.

Any landowner permitting use of his property for recreation without charging a fee **is not liable** for injuries to recreational users or their property except in cases of willful, wanton or reckless conduct by the owner.
(Chapter 21, Section 17C MGL)

The Massachusetts Wildlife Viewing Guide & The Critters of Massachusetts

The ***Massachusetts Viewing Guide*** is 96 pages of wonderful trips to see wildlife and their habitats, from the summit of Mt. Greylock to the depths of Stellwagen Bank. $8.95 at any ***MassWildlife*** office, or send $8.95 plus $2.00 for postage and handling to the Westboro Field Headquarters, One Rabbit Hill Rd. Westboro, Ma. 01581. ***The Critters of Massachusetts*** is for kids. Basic info on mammals, birds and reptiles. Available at any ***MassWildlife*** office or send $5.00 plus $1.50 p&h to above address.

HAVE A QUESTION? VISIT OUR WEBSITE mass.gov/masswildlife

For questions regarding conflicts with wildlife, stocking of fish or gamebirds, or other **regional** issues contact your nearest District Wildlife Supervisor. For the district locations and phone numbers please see page 13.

For questions regarding the following programs please call the listed numbers:

Art Contest, Stamps	(508) 792-7270
Aquatic Resource Education	(508) 792-7270
Becoming an Outdoorswoman	(508) 792-7270
Hunter Education	(617) 727-3623 or (508) 792-7434
Mass. Jr. Conservation Camp	(508) 792-7270
Project WILD	(508) 792-7270
Mass. Wildlife Magazine	(508) 792-7270
Natural Heritage & Endangered Species Program	(508) 792-7270
Publications	(508) 792-7270
Fishing/Hunting Information	(508) 792-7270
Licenses	(617) 626-1590 or (508) 792-7270
Sportfishing Awards	(508) 792-7270
Trapping	(508) 792-7270
Waterfowl	(508) 792-7270
Wildlife Lands	(617) 626-1574

PERMITS:

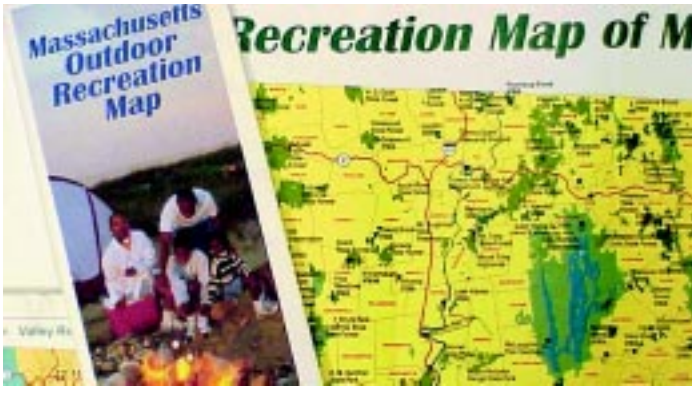
(Non-hunting): Permit Section	(617) 626-1575
Bear / Turkey / Antlerless Deer Permits	(508) 792-7270

TAGGED ANIMALS

Some bear, deer, moose, coyote or other animals have ear tags or radio collars. Contact MassWildlife's WestboroughField Headquarters (508) 792 -7270 immediately after taking or finding these animals in order to determine their source and status.

Do you want to know where to go fishing or boating? ***Public Access to the Waters of Massachusetts*** is now available. This 146 page map booklet will show and tell you information about current public sites. Send $8.00, payable by check to:

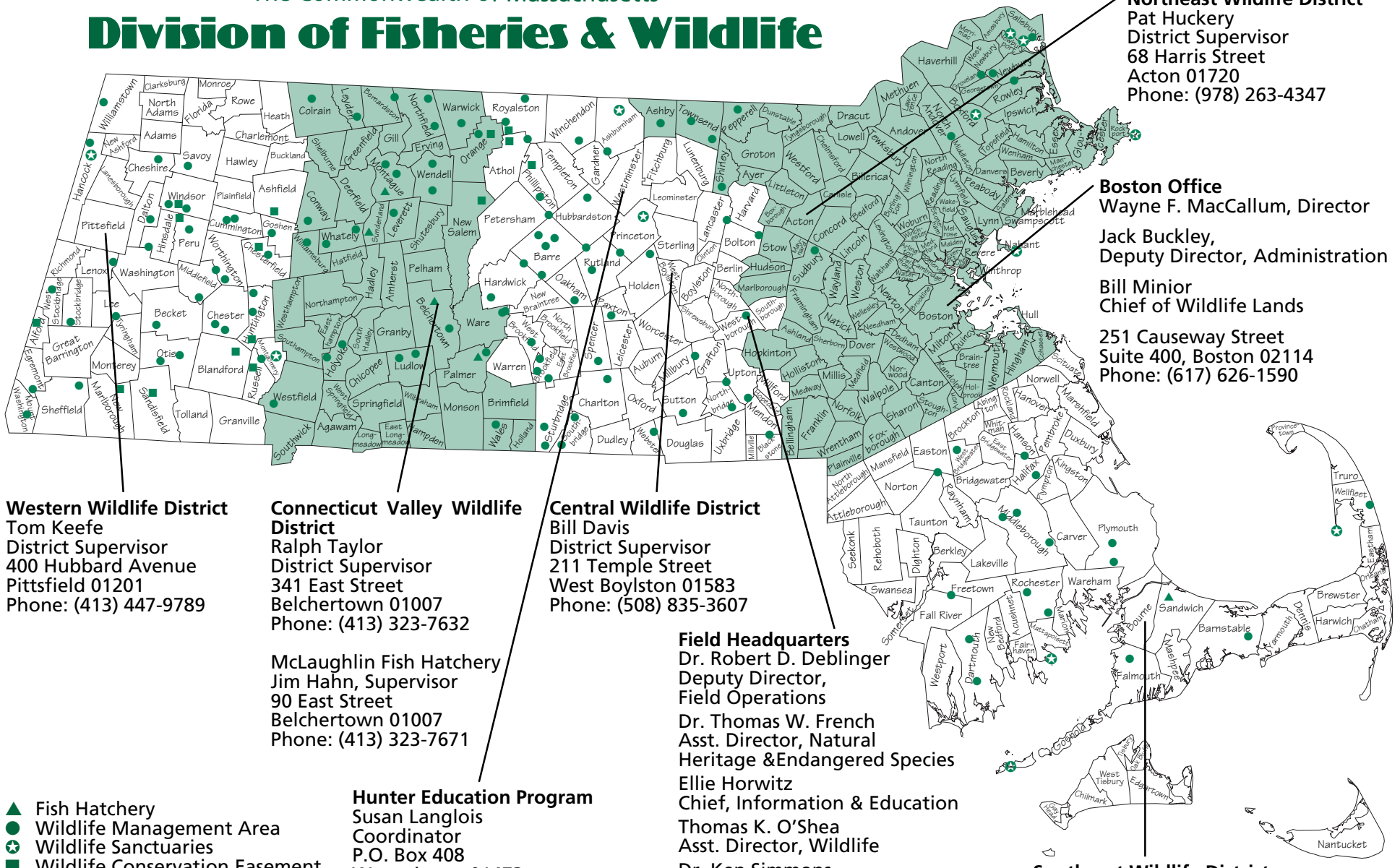
Office of Fishing & Boating Access
Department of Fish and Game
1440 Soldiers Field Road
Brighton, MA 02135



MassWildlife's Outdoor Recreation Map features maps and grids with information on Wildlife Management Areas, State Forests and Parks, and Boat Access sites statewide. Copies can be obtained from a number of **DCR** and ***MassWildlife*** locations.

The Commonwealth of Massachusetts

Division of Fisheries & Wildlife



Northeast Wildlife District
Pat Huckery
District Supervisor
68 Harris Street
Acton 01720
Phone: (978) 263-4347

Boston Office
Wayne F. MacCallum, Director

Jack Buckley,
Deputy Director, Administration

Bill Minior
Chief of Wildlife Lands

251 Causeway Street
Suite 400, Boston 02114
Phone: (617) 626-1590

Western Wildlife District
Tom Keefe
District Supervisor
400 Hubbard Avenue
Pittsfield 01201
Phone: (413) 447-9789

Connecticut Valley Wildlife District
Ralph Taylor
District Supervisor
341 East Street
Belchertown 01007
Phone: (413) 323-7632

McLaughlin Fish Hatchery
Jim Hahn, Supervisor
90 East Street
Belchertown 01007
Phone: (413) 323-7671

Central Wildlife District
Bill Davis
District Supervisor
211 Temple Street
West Boylston 01583
Phone: (508) 835-3607

Field Headquarters
Dr. Robert D. Deblinger
Deputy Director,
Field Operations

Dr. Thomas W. French
Asst. Director, Natural Heritage &Endangered Species

Ellie Horwitz
Chief, Information & Education

Thomas K. O'Shea
Asst. Director, Wildlife

Dr. Ken Simmons
Chief Fish Culturist

Dr. Mark Tisa
Asst. Director, Fisheries

1 Rabbit Hill Rd., Westboro, 01581
Phone: (508) 792-7270

▲ Fish Hatchery
● Wildlife Management Area
✪ Wildlife Sanctuaries
■ Wildlife Conservation Easement

Hunter Education Program
Susan Langlois
Coordinator
P.O. Box 408
Westminster 01473
Phone: (508) 792-7434
or (617) 727-3623

Southeast Wildlife District
Jason Zimmer
District Supervisor
195 Bournedale Road
Buzzards Bay 02532
Phone: (508) 759-3406

All ***MassWildlife*** lands and facilities are open to the general public without regard to race, color, creed, sex, handicap or age.

Office of Law Enforcement

To Report Violations Call: 1-800-632-8075

MAIN OFFICES	**Director** James Hanlon, *Director* 251 Causeway Street, Suite 101 Boston, MA 02114	617-626-1650 FAX: 617-626-1670
INLAND ENFORCEMENT	**Inland Bureau Headquarters** Roger Arduini, *Major* 183 Milk Street Westboro, MA 01581	508-366-1176 508-366-6537 FAX: 508-366-1182
	Eastern Massachusetts Tom Sousa, *Captain* 11 Hawks Avenue Hanson, MA 02341	781-293-4745 FAX: 781-293-4746
	Western Massachusetts Bruce Bennett, *Captain* 316 Turners Falls Road Montague, MA 01351	413-367-0016 FAX: 413-367-0032
COASTAL ENFORCEMENT	**Coastal Enforcement Headquarters** Kathleen Dolan, *Acting Major* 349 Lincoln Street, Building 45 Hingham, MA 02043	781-740-2577 781-740-2442 781-740-1163 FAX: 781-740-4113
	Ray Lennon, *Captain* 2 State Fish Pier Gloucester, MA 01930	978-283-7764 978-283-1162 FAX: 978-283-6729
MARINE THEFT/ BOATING SAFETY	George Agganis, *Captain* 251 Causeway Street, Suite 101 Boston, MA 02114	617-626-1666 FAX: 617-626-1605
BOATING & RECREATIONAL VEHICLE SAFETY	Lawrence Chenier, *Lieutenant* 1019 Iyanough Road Hyannis, MA 02601	617-727-8760 508-790-9360 FAX: 617-727-2617
ENVIRONMENTAL STRIKE FORCE	Gail Larson, *Lieutenant* 1 Ashburton Place Boston, MA 02108	617-727-2200 FAX: 617-727-5755



MarineFisheries

A Commonwealth of Massachusetts Agency

Have any questions regarding regulations pertaining to the harvesting of salt water fish species? Call the Massachusetts Division of Marine Fisheries information hotline: **(617) 626-1520**.

TRANSPORT OF FISH AND WILDLIFE

It is a violation of **FEDERAL LAW** to transport illegally taken fish or wildlife across state lines. For additional information contact the U.S. Fish & Wildlife Service, Office of Law Enforcement, Phone: (617) 889-6616.

For Boat Registration Information
phone: (617) 626-1610.

FEDERAL WILDLIFE LAW INFORMATION

Please note that fishing and hunting laws on federal parks, refuges and reservations such as that controlled by U.S. Fish & Wildlife Service, or the National Park Service may differ from state regulations. Contact the agency in question.

ROAD-KILLED DEER may be kept by Massachusetts driver or passenger of vehicle killing deer if reported to Law Enforcement at **1-800-632-8075** immediately and then tagged at ***MassWildlife*** or at a Law Enforcement office within 24 hours and free permit issued.

Education Programs

MassWildlife offers a wide range of educational and skills programs. With suitable lead time, these programs can be adapted to the needs of virtually any group.



Angler Education —The Angler Education Program (AEP) teaches people of all ages, especially children, about the relationships between fish and their environment. The program teaches freshwater fishing skills, basic safety techniques, outdoor ethics and aquatic ecology through workshop sessions and/or through family fishing festivals .

Hunter Education Program — provides courses in the safe handling of firearms, and other outdoor activities related to hunting and firearm use.Designed for novices, courses in Basic Hunter Education, Bowhunter Education, Trapper Education, Muzzleloader Education and Map & Compass are offered statewide throughout the year. Certificates in certain courses satisfy hunting license requirements for Massachusetts as well as other states and Canadian provinces. Call (508) 792-7434 for more information.

Becoming an Outdoors-Woman — These special weekend and occasional one-day programs offer women of all ages an opportunity to sample a variety of outdoor activities from archery to wildlife photography and from kayaking to fly fishing. Sessions are designed for novices.



Natural Heritage and Endangered Species Program — Information highlighting rare and endangered species, their habitats and protection strategies is available in the form of fact sheets, a vernal pool certification packet, posters, a field guide to vernal pools, another for dragonflies and damselflies, a county checklist of vascular plants, and a guide to the protection of freshwater biodiversity. For further information visit www.nhesp.org.

Junior Duck Stamp Program — Students participate in a state-wide duck stamp contest that combines art with wetlands and waterfowl information. Co-sponsored by the Massachusetts Wildlife Federation and Ducks Unlimited.



Massachusetts Junior Conservation Camp — A two week summer program for campers 13 to 17 years old. The program stresses outdoor sports including fishing, hunting, boating and instruction in fisheries, wildlife management and forestry, all in a fun setting. Co-sponsored by the Massachusetts Sportsmen's Junior Conservation Camp, Inc., the Dept. of Conservation and Recreation, the Office of Law Enforcement, and GOAL.

Project WILD — Emphasizes wildlife, people and the environment which they share. Six hour workshops are available for people who work with children in grades K - 12. Participants receive either the Project WILD or Aquatic WILD activity guide. PDPs are available.

Youth Hunts — Special Youth Pheasant Hunt Program and Youth Waterfowl Hunt are offered in fall. Each consists of range practice, an instructional field workshop and a day of hunting. For more information contact your local Wildlife District office or Field Headquarters.

For information on any of these programs call *MassWildlife* (508) 792-7270.

STEP OUTSIDE™

Share your enjoyment of outdoor sports. Ask a friend, neighbor, child, spouse, or fellow worker to **STEP OUTSIDE**™ and share the outdoor sporting experience. You'll be glad you did and so will they. Call (203) 426-1320.

2006 FEES

F1	Resident Fishing	$27.50
F2	Resident Minor Fishing (Age 15-17)	11.50
F3	Resident Fishing (Age 65-69)	16.25
F4	Resident Fishing (Age 70 or over or paraplegic, blind, mentally retarded)	FREE
F6	Non-resident Fishing	37.50
F7	Non-resident Fishing (3 day)	23.50
F8	Resident Fishing (3 day)	12.50
F9	Non-res. Fishing (Age 15-17)	11.50
F10	Quabbin One Day Fishing (Quabbin only) (no land stamp required; sold by DCR & C. V. District)	5.00
H1	Resident Citizen Hunting	27.50
H2	Resident Hunting (Age 65-69)	16.25
H3	Resident Hunting, Paraplegic	FREE
H4	Resident Alien Hunting	27.50
H5	Non-resident Hunting, Big Game	99.50
H6	Non-resident Hunting, Small Game	65.50
H7	Non-resident Commercial Shooting Preserve (1 day)	10.00
H8	Resident Minor Hunting (Age 15-17)	11.50
H9	Resident Commercial Shooting Preserve (1 day)	10.00
S1	Resident Sporting	45.00
S2	Resident Sporting (Age 65-69)	25.00
S3	Resident Sporting (Age 70 or over)	FREE
T1	Resident Trapping	35.50
T2	Resident Minor Trapping (Age 12-17)	11.50
T3	Resident Trapping (Age 65-69)	20.25
DF	Duplicate Fishing	2.50
DH	Duplicate Hunting	2.50
DS	Duplicate Sporting	2.50
DT	Duplicate Trapping	2.50
M1	Archery Stamp	5.10
M2	Waterfowl Stamp	5.00
M3	Primitive Firearms Stamp	5.10
W1	Wildlands Stamp, Resident	5.00
W2	Wildlands Stamp, Non-resident	5.00

NOTE: Fee for FIRST resident license, ALL non-resident licenses **include** a $5.00 fee for the Wildlands Conservation Stamp. Fee for SECOND RESIDENT LICENSE in calendar year, DOES NOT include a $5.00 fee for the Wildlands Conservation Stamp. City and town clerks MUST add an additional One Dollar ($1.00) and other sales agents MAY add up to an additional One Dollar and Fifty Cent ($1.50) service fee to the price of each license sold. There is NO SERVICE FEE charged for the purchase of licenses at offices of ***MassWildlife.***

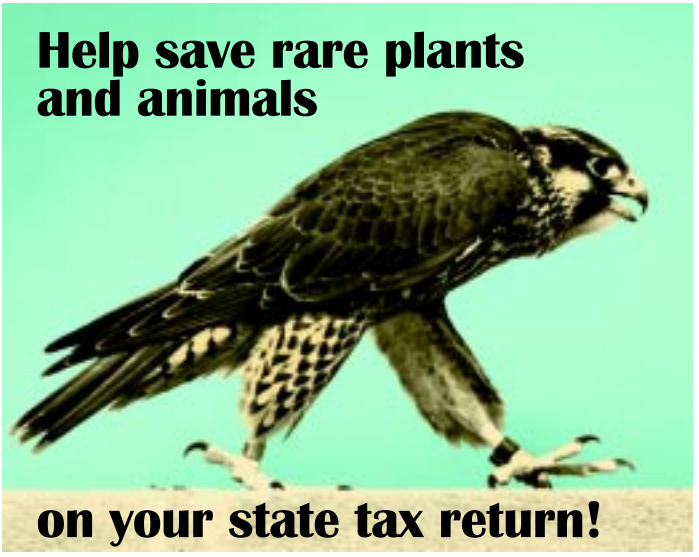


Photo by Bill Byrne

Peregrine Falcon (Endangered)

Massachusetts regulates 448 species of rare animals and plants. Census, inventory and research are high priority needs for these species. The MDFW's Natural Heritage & Endangered Species Program protects these species and their habitats to preserve the biological diversity of the Commonwealth. As a citizen of Massachusetts **you can help** protect these rare animals and plants by contributing on your state income tax form, or by donating directly to:

NATURAL HERITAGE & ENDANGERED SPECIES FUND

Please make checks payable to the **Natural Heritage & Endangered Species Fund**, and mail to: Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife,1 Rabbit Hill Road, Westborough, MA 01581. Thank you!

MASSACHUSETTS WILDLIFE

Four Issues Per Year

TRADITION - Fifty years at the forefront of superb wildlife reporting.
BEAUTY - Exceptional nature photography.
VARIETY - From Cape Cod beaches to the Berkshire Hills.
ACTION - Tips on hunting, fishing, wildlife viewing, Follow biologists in the field.
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Yes! I'm enclosing $6. Please start my subscription with the next issue.

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Address _____

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Send check or money order to:
MASSACHUSETTS WILDLIFE
Division of Fisheries & Wildlife, Dept. AB2006
Field Headquarters, Westboro, Massachusetts 01581

HUNTING

OPEN SEASON (All Dates Inclusive)
NO HUNTING ON SUNDAY

Species	Open season	Daily Bag Limit	Possession Limit	Season Limit
Birds:				
Crow[1]	Jan. 2 - Apr. 10 Jul. 1 - Apr. 10, 2007	-	-	-
Pheasant[2]	Oct. 14 - Nov. 25	2	4	6
Quail[3]	Oct. 14 - Nov. 25	4	8	20
Ruffed Grouse[4]	Oct. 14 - Nov. 25	3	6	15
Turkey[5] Spring:				
Zones 1 - 10; 13:	Apr. 24 - May 20			
Zones 11 & 12:	Apr. 24 - May 6	} See Note # 5		
Fall:				
Zones 1 - 9; 13:	Oct. 30 - Nov. 4			
Waterfowl / migratory birds (including woodcock) see Migratory Bird Abstracts.				
Mammals:				
Black Bear[6]	Sep. 5 - Sep. 23 Nov. 6 - Nov. 25	See Note # 6		
Bobcat[7]	Jan. 2 - Mar. 8 Dec. 20 - Mar. 8, 2007	See Note # 7		
Cottontail Rabbit:				
Zones 1 - 12:	Jan. 2 - Feb. 28 Oct. 14 - Feb. 28, 2007	5	10	-
Zones 13 & 14:	Jan. 2 - Feb. 28 Nov. 15 - Feb. 28, 2007	5	10	-
Coyote[8]	Jan. 2 - Feb. 28 Nov. 1 - Feb. 28, 2007	-	-	-
Deer (archery)[9]	Oct. 16 - Nov. 25			
Deer (shotgun)[9]				
Zones 1 - 11; 14:	Nov. 27 - Dec. 9			
Zones 12 & 13:	Nov. 27 - Dec. 2	} See Note # 9		
Deer (muzzleloader)[9]				
	Dec. 11 - Dec. 30			
Fox (red or gray)	Jan. 2 - Feb. 28 Nov. 1 - Feb. 28, 2007	-	-	-
Gray Squirrel[10]				
Zones 1 - 9:	Sep. 11 - Jan. 2 , 2007	5	10	-
Zones 10 - 14:	Oct. 14 - Jan. 2 , 2007	5	10	-
Jackrabbit[11]	Nov. 15 - Dec. 30	1	2	-
Opossum[12]	Jan. 2 - Jan. 31 Oct. 2 - Jan. 31, 2007	-	-	-
Raccoon[12]	Jan. 2 - Jan. 31 Oct. 2 - Jan. 31, 2007	3	-	-
Snowshoe Hare				
Zones 1 - 4:	Jan. 2 - Feb. 28 Oct. 14 - Feb. 28, 2007	2	4	-
Zones 5 - 12:	Jan. 2 - Feb. 4 Oct. 14 - Feb. 5, 2007	2	4	-
Zones 13 & 14:	Jan.2 - Feb. 4 Nov. 15 - Feb. 5 , 2007	2	4	-
Reptiles and Amphibians:				
Bullfrog & Green frog[13]	Jul. 16 - Sep. 30	12	24	-
Snapping Turtle[13]	Jan. 1 - Dec. 31	-	-	-

ALL HUNTING SEASONS except waterfowl ARE CLOSED during shotgun deer season from Nov. 27 to Dec. 9 in Zones 1 - 11 & 14 and from Nov. 27 to Dec. 2 in Zones 12-13.

The following species may be taken by licensed hunters with no daily or seasonal bag limit: English sparrow, starling, chipmunk, flying squirrel, red squirrel, weasel, porcupine, skunk, woodchuck.

Closed season throughout the year on all birds and mammals not mentioned herein or in Massachusetts migratory bird regulations.

Hunter harassment is against state law. Report violations to the Office of Law Enforcement 1-800-632-8075 or state or local police and prepare to provide a description of violators.

Hunting hours are from 1/2 hour before sunrise to 1/2 hour after sunset on each day of open season **except** for: **(A)** spring turkey, raccoon and opossum (see footnotes 5 & 12) and **(B)** WMA REG #10 (pg. 12) which states that no person shall hunt before sunrise or after sunset on any WMA where pheasant or quail are stocked during the pheasant or quail season (Oct.14 to Nov. 25) except for the hunting of raccoons and opossums between 9P.M. and 3A.M. **(C)** Hunting for rabbit, hare, fox and coyote which closes at midnight.

FURBEARER CHECK STATIONS: Check stations are located at all Wildlife District Headquarters, Bitzer and Sunderland State Fish Hatcheries, Newbury WMA Headquarters, and Westboro Field Headquarters (Monday - Friday excluding holidays). **Call check station prior to bringing pelts for sealing.**

[1]**Crow** - May be hunted only on Friday, Saturday and Monday during the open season. Hunting hours close 1/2 hr. after sunset except as noted in WMA Reg #10 (See hunting hours above).

[2]**Pheasants** - Zone from the New Hampshire border south on I-95 to I-495 south to I-95, north on I-95 to I-93/128, east on I-93/128 to Route 3, south on Route 3 to Route 228, north on 228 to the Hull town line. Cocks and hens west of zone line and on all Wildlife Management Areas. Cocks only east of zone line including Hull and in Dukes and Nantucket counties. See WMA Reg. #10 under hunting hours above.

[3]**Quail** - Season limited to Zones 11 - 14. See WMA Reg #10 under hunting hours above.

[4]**Ruffed Grouse** - see WMA Reg. #10 under hunting hours above.

[5]**Turkey** - Permit required. **Official safety sticker must be adhered to firearm in such a manner as to be visible when hunter is sighting down the barrel.** Send self addressed stamped envelope to MassWildlife's Field Headquarters office (See p. 13) if new or replacement sticker is needed. **Spring hunting hours**: 1/2 hour before sunrise to 12:00 noon. **Fall hunting hours**: 1/2 hour before sunrise to 1/2 hr. after sunset except as noted in WMA Reg #10 (See hunting hours above). **Bag limit:** (A) 2 bearded birds in spring season (1 per day) with NO fall bird allowed, **OR** (B) 1 bearded bird in spring season, and 1 bird of either sex in fall season. Hunting only with shotguns no larger than 10 gauge and restricted to shot sizes #4 - #6, or with bows 40 lbs. pull or greater. Electronic calls, dogs, bait, driving prohibited. Successful hunters must tag bird immediately (with tag attached to permit) and bring bird to an official checking station within 48 hours.

[6]**Bear** - Permit required - submit application attached to license to Westboro Field Headquarters prior to season opening. Zones 1 - 9 ONLY. Hunting only with rifle .23 caliber or larger, muzzleloader .44 - .775 caliber, bows with 40 lb. pull or greater, or revolvers .357 Magnum or .40 caliber or larger. Handguns permitted in September season only - SHOTGUNS PROHIBITED. Dogs prohibited for hunting and training **(See**: **Hunting Dogs**, page 10). Hunting hours close 1/2 hr. after sunset except as noted in WMA Reg #10 (See hunting hours above). Successful hunters must tag bear immediately (with tag attached to permit) and bring bear to an official checking station within 48 hours. **Limit 1 bear per year.**

[7]**Bobcat** - Hunting hours close 1/2 hour after sunset. Hunting limited to Zones 1 - 8. All bobcats taken must be checked within four working days of date of harvest. The Director will close the season when the total harvest reaches 50 animals.

[8]**Coyote & Fox** - Hunting hours end at midnight. Pelts must be tagged within four working days of the end of the season. **Rifles** chambered to take larger than .22 caliber long rifle rimfire ammunition, pistols and revolvers larger than .38 caliber between the hours of 1/2 hour after sunset and 1/2 hour before sunrise **are prohibited**. Weapons other than shotguns and bows and arrows are prohibited on WMAs stocked with pheasant or quail during the pheasant and quail season. Possession or use of any rifle chambered larger than .22 long rifle in any place where birds or mammals may be found in Barnstable, Bristol, Dukes, Plymouth, and Nantucket counties is prohibited, November 1 - March 31.

[9]**Deer- Hunting hours** begin 1/2 hour before sunrise and close 1/2 hr. after sunset except as noted in WMA Reg. #10 (See hunting hours pg.6).

The following is a combination of Federal and Massachusetts Migratory Game Bird Laws and Regulations in force from September 2005 - March 2006

BAITING - No person shall take migratory game birds by baiting (placing corn or any other food to constitute a lure or enticement) or hunting over a baited area. An area is considered baited for 10 days after removal of the bait. It is not necessary for the hunter to know that the area is baited to be in violation of this section.

BOW & ARROW - Lawful for hunting migratory game birds.

DRESSING - The head and one fully-feathered wing must remain attached to each migratory game bird while it is transported to the hunter's home or preservation facility.

DRIVING - A person shall not hunt migratory game birds from or in connection with a motor driven land conveyance, aircraft or any kind of motor or sail boat used in concentrating or driving birds either for himself or for others.

ELECTRIC CALLS - No person shall take migratory game birds using pre-recorded calls or sounds or any electronic imitations of calls.

FALCONRY - All permitted ducks and coot may be taken by falconry October 6 - February 7. Limits in falconry are 3 daily, 6 in possession singly or in aggregate. Falconry closed Sunday.

IMPORTATION - No person shall import migratory game birds killed in any foreign country except Canada unless such birds are dressed, drawn, and the head and feet removed. One fully-feathered wing must remain on each bird transported between port of entry and the hunter's home or preservation facility. No person shall import migratory game birds belonging to another. For further information on migratory game birds killed in another country, consult Title 50 CFR 20.61-20.66.

LIVE DECOYS - No person shall hunt migratory game birds with the aid of live decoys or domesticated fowl of any kind. Such fowl must be removed for 10 consecutive days prior to hunting and be confined in an enclosure which reduces the audibility of their calls and conceals them from the sight of migratory waterfowl.

NON-TOXIC SHOT - Is required for **all** waterfowl and coot hunting - no lead shot in possession. Waterfowl hunters must use non-toxic shot up to and including BBB shot while hunting waterfowl. Steel, bismuth, tungsten-iron, tungsten-polymer, tungsten-matrix, tungsten-bronze, tungsten-tin-bismuth, tungsten-nickel-iron and Hevi-metal shot are legal.

PROHIBITED DEVICES - No one shall hunt migratory birds using a sinkbox, trap, snare, net, crossbow, rifle, pistol, swivel gun, punt gun, battery gun, machine gun, fish hook, poison, drug, explosive or stupefying substance.

SHIPMENT - Any package containing migratory game birds must be marked on the outside with the name and address of the sender and recipient and number of birds, by species, contained inside.

SHOTGUN - Migratory game birds may be hunted with shotguns no larger than 10 gauge, fired from the shoulder. Shotguns capable of holding more than 3 shells may not be used unless plugged with a one-piece filler which limits the gun's total capacity to 3 shells and which cannot be removed without disassembling the gun.

STAMPS - Each waterfowl hunter 16 years or older must carry on his person a valid federal waterfowl stamp and each hunter 15 years or older must carry a valid Massachusetts waterfowl stamp. Both stamps must be signed across the face in ink. Stamps are required for hunting any ducks (including seaducks) geese or brant, but not required for hunting rails, snipe, woodcock or American coot.

Federal stamps are valid July 1 - June 30

Massachusetts stamps are valid Jan. 1 - Dec. 31

TAGGING - Any migratory game birds not in the custody of the hunter must be tagged with the hunter's signature, address, total number of birds by species, and dates such birds were killed. No person shall receive or have in custody another's migratory game birds unless such birds are properly tagged.

VEHICLES - No person shall hunt migratory game birds from or with the aid of a motor vehicle or other motor driven land conveyance or aircraft except that paraplegics may take game birds from a stationary motor vehicle or other land conveyance. Further, no person may hunt from or by means of any motor boat or sailboat unless the motor has been completely shut off and/or sails furled and all progress therefrom has ceased. However, a hunter may pick up or retrieve dead or crippled birds from a craft *under power* and may shoot injured birds from powered craft in coastal waters seaward of the first upstream bridge.

WANTON WASTE - All migratory birds killed or crippled shall be retrieved if possible, immediately killed, and retained by the hunter as part of the daily bag.

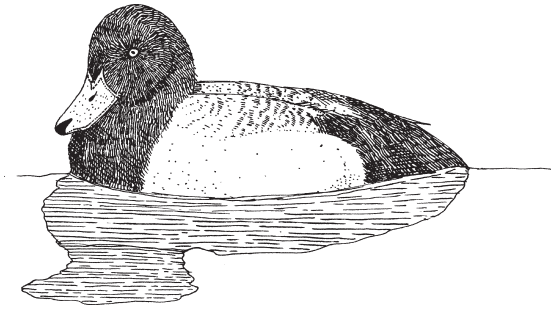
Note: No one may take migratory birds except during days and hours open to hunting as described herein. No one shall take more than one daily bag limit per day nor possess more than one daily bag limit in the field or while returning to vehicle, hunting camp, home, etc.

YOUTH WATERFOWL HUNT - Youth ages 12 - 15. Ducks, coots, mergansers and geese. All youths must be accompanied by a licensed adult hunter with valid Massachusetts waterfowl stamp. One firearm only. Adult may not hunt and may carry firearm only when unloaded and cased. No license or stamp needed for youths ages 12 - 14. License and Massachusetts waterfowl stamp needed for youths age 15. No federal stamp required. All other hunting regulations apply.

REPORT ALL BANDED BIRDS - ***Call: 1-800-327-BAND (2263)***

MassWildlife

Migratory Bird Regulations for 2005 - 06 Season



H.I.P. number required for all migratory bird hunting!

A 2005 Harvest Information Permit (H.I.P) number is required for ALL migratory bird hunters for the remainder of the calendar year. This includes woodcock hunters. The number is good for the entire calendar year and is free. You need a hunting license in order to receive an H.I.P. number. A new HIP number is required for 2006.

CALL 1-800-WETLAND
(1-800-938-5263)

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

251 Causeway Street
Boston, Massachusetts 02114
(617) 626-1590

Wayne F. MacCallum, *Director*

Office of Law Enforcement

1-800-632-8075 (to report violations) **or 617-727-6398**

APPROVED BY STATE PURCHASING AGENT
9 / 05 15M

2005 – 06 MIGRATORY BIRD REGULATIONS

SEASON	DATES		BAG	POSSESSION
Sora Rail	Sep. 1 - Nov. 8		5	5
Virginia Rail	Sep. 1 - Nov. 8		10	10
Snipe	Sep. 1 - Dec. 15		8	16
Woodcock	Oct. 13 - Oct. 29 & Oct. 31 - Nov. 12		3	6
Ducks[A]	Duck Dates	Canvasback Dates		
Berkshire:	Oct. 11 - Nov. 26	Oct. 11 - Nov. 14	6*	12*
	Dec. 3 - Dec. 24		6*	12*
Central:	Oct. 12 - Nov. 26	Oct. 12 - Nov. 15	6*	12*
	Dec. 16 - Jan. 7		6*	12*
Coastal:	Oct. 13 - Oct. 22	Dec. 19 - Jan. 21	6*	12*
	Nov. 24 - Jan. 21		6*	12*
American Coot	Same as ducks		15	30
Mergansers[B]	Same as ducks		5*	10*
Regular Goose (except Snow & Blue)				
Berkshire:	Oct. 22 - Nov. 26		3	6
	Dec. 9 - Dec. 24		3	6
Central:	Oct. 12 - Nov. 26		2	4
	Dec. 16 - Jan. 7		2	4
Coastal:	Oct. 13 - Oct. 22		2	4
	Nov. 24 - Jan. 21		2	4
Early Canada Goose (Statewide)	Sep. 6 - Sep. 24		5	10
Late Canada Goose (Central)	Jan. 16 - Feb. 15		5	10
(North Coastal)	Jan. 23 - Feb. 15		5	10
Snow & Blue Goose	Same as ducks		15	30
Late Snow / Blue Goose (Central/N.Coastal)	Same as Canada Goose		15	30
Sea Ducks[C] (Scoter, Eider, Long-tailed duck [oldsquaw])	Oct. 6 - Jan. 21		7**	14**
Brant (Coastal Zone Only)	Dec. 19 - Jan. 21		2	4
Falconry (Ducks and Coot only)	Oct. 6 - Feb. 7		3*	6*
Youth Waterfowl Hunt (Statewide)	Oct. 8 & Oct. 10		special provisions apply	

* Singly or in the aggregate

** Singly or in the aggregate, no more than 4 scoter, 4 eider(1 hen), 4 long-tailed duck [oldsquaw] in the daily bag.

A. The daily bag may contain no more than:

Mallard	4 (only 2 female)	Canvasback	1	Pintail	1
Scaup	2	Fulvous whistling	1	Harlequin	NONE
Wood Duck	2	Mottled	1	Hooded Merganser	1
Redhead	2	Black Duck	1	All other duck species	4

Possession limits are double the daily bag. (e.g. Mallards — possession 8 of which only 4 may be female).

B. Daily bag of mergansers may not include more than 1 hooded merganser; no more than 2 hooded in possession.

C. Scoter, eider and long-tailed duck [oldsquaw] during the open period other than open season for other ducks may be hunted **only** in coastal waters and rivers and streams seaward of the first upstream bridge.

Non-toxic shot required for all hunting of waterfowl and American coot statewide.

Hunting Hours: 1/2 hour before sunrise to sunset.

P.F.D. - Anyone aboard a canoe or kayak from Sept. 15 - May 15 must wear a life jacket or vest.

ZONE LINES - During the 2005-06 waterfowl hunting season the state will be divided into the following three zones:

Berkshire - Westward of a line running from the Vermont boundary, southward along I-91 to Route 9, West on Route 9 to Route 10, South on Route 10 to Route 202 and South on Route 202 to the Connecticut line.

Central - Eastward of the Berkshire zone line and westward of a boundary which will run from the New Hampshire line southward on I-95 to Route 1, South on Route 1 to I-93, South on I-93 to Route 3, South on Route 3 to Route 6, West on Route 6 to Route 28, West on Route 28 to I-195, West on Route I-195 to the Rhode Island line except that the waters and the lands 150 yards above the high water mark of the Assonet River to the Route 24 bridge and the Taunton River to the Center Street/Elm Street bridge shall be in the Coastal Zone.

Coastal - Eastward and southward of the Central zone line to the coast.

North Coastal Zone (late Goose season only) is that portion of the Coastal Zone north of the Cape Cod Canal to the New Hampshire line. During the late Canada goose season, goose hunting is **not** permitted south of this line.

***

This publication is a summary of state and federal regulations concerning the hunting of migratory birds. The actual federal regulations may be found in Title 50, Code of Federal Regulations, Section 20, with some additional regulations in other locations. For additional information on federal regulations contact the Resident Agent-in-Charge, US Fish & Wildlife Service, Office of Law Enforcement, 70 Everett Ave., Suite 315, Chelsea, MA 02150, phone: (617) 889-6616. State regulations may be found in the Code of Mass. Regulations, 321 CMR 3.02(2) and in several sections of Ch.131 MGL. Special regulations may apply on National Wildlife Refuges open to hunting. A violation of state regulations is also a violation of federal law.

COMMONWEALTH of MASSACHUSETTS
DIVISION of FISHERIES & WILDLIFE

United States Department of the Interior

NATIONAL PARK SERVICE
Northeast Region
200 Chestnut Street
Philadelphia, PA 19106-2878

REPLY REFER TO:

October 7, 2002

Memorandum

To: Deputy Assistant Secretary for Fish and Wildlife and Parks

Through: Director, National Park Service

From: Regional Director, Northeast Region

Subject: Waiver of policy regarding pheasant stocking/hunting at Cape Cod National Seashore

Hunting is permitted by the enabling legislation (16 U.S.C. § 459b-6(c)) for Cape Cod National Seashore (the Seashore). The Secretary is authorized to promulgate regulations to manage such activity, but is required to consult with the state before doing so. The Secretary is also authorized to enter into "cooperative arrangements" with the state regarding hunting. The state of Massachusetts has been conducting a program for stocking pheasants (a non-native species) since the 1940s.

NPS Management Policies (MP) disfavor continuation of exotic species programs but explicitly state that "in general, new exotic species will not be introduced into parks" (MP 4.4.4.1) and that NPS will "in cooperation with states, as appropriate . . . prevent the introduction of exotic species into units of the National Park System" (MP 4.4.1.1). Harvesting of stocked species for recreational purposes is permitted under MP 4.4.3 where it has historically been conducted and when it will not impair park natural resources or processes, but only in national recreation areas or preserves, or under other circumstances that do not appear to apply here. Because this unit is a national seashore, questions have been raised about the validity of continuing this activity.

The General Management Plan/Environmental Impact Statement for the Seashore calls for development of a comprehensive non-native species management plan with restoration of natural self-sustaining ecosystems, supported by scientific information. It anticipates limiting or eliminating use of exotic species, specifically pheasants, and, as natural habitats are restored, promoting the restoration of quail and grouse populations. The Seashore proposes a gradual phase-out of the pheasant stocking as commensurate habitat restoration and quail and grouse hunting opportunities increase.

Although it is not clear whether a waiver from MP is needed in this case, we are seeking a waiver to address questions resulting from the MP provisions cited above and to obtain high-level concurrence that this course of action is consistent with sound park management.

NOTE: None of the other game species currently hunted are affected by this waiver. Deer, waterfowl, squirrel, quail, etc. are all native species and hunting of these species is entirely consistent with the Seashore's authorizing legislation, management policies and park plans.

Background:

By 1961, the year the Seashore was created, the Massachusetts Department of Fish and Wildlife had been stocking pheasant on Cape Cod for an annual hunt for around 20 years. Originally the birds had been stocked on state-owned land (the Province Lands, which then became part of the Seashore). In 1971, the state requested permission to expand the program to the Marconi area, which was designated a wildlife management area at that time. The Seashore's advisory commission reviewed the request and agreed to allow the program for an experimental period, which has never been closed out.

The program is small. Of the 40,000 birds stocked statewide, 800 are stocked annually in the Seashore. The season runs for six weeks (excluding Sundays), and a portion of the 800 birds are released each week, late on Fridays and on days preceding holidays (a total of six to eight releases per year) in three locations. Hunters usually gather the morning after the release, and rangers estimate that on opening day as many as 35-50 hunters will be present. On succeeding Saturdays the number drops to around 25 hunters. Small numbers of hunters may sometimes be found on other days of the week. Most hunters bag their two birds quickly, moving only yards off the trail where the stocking took place. Within an hour or two of the start of the hunt each morning after a release, most hunters have gone home.

In the context of the broader hunting program at the Seashore the pheasant program is also small. The entire hunting season lasts from mid-September until mid-February, while the pheasant season lasts for only six weeks of this period. Deer and a broad variety of migratory waterfowl and upland game are hunted during the hunting season, with hunters using shotguns, bows and even, for a brief period, black powder. Dogs are used to hunt pheasant and rabbit. Pursuant to NPS authorities, the entire hunting program is managed in compliance with state regulations, and the state pays for the pheasant program in its entirety.

In response to concerns expressed in the mid-1990s by animal rights groups that the pheasant-stocking program was harmful and inappropriate, the Seashore conducted a two-year research program. An environmental assessment outlining the reasons for the research was prepared to focus attention on the management question. The purpose of the research was to identify ecological impacts, if any, to Seashore resources and values. After two years of monitoring and sampling, researchers found essentially no ecological impacts from the stocking program (Bump, 1999). For example, the study found no evidence that pheasants survive beyond the winter in great enough numbers to establish a breeding population.

In 1998 the Seashore completed a final environmental impact statement (EIS) as part of the general management planning process. Because hunting is allowed in the Seashore's enabling legislation, and because there is such strong support for it from a variety of constituencies, the EIS and resulting General Management Plan (GMP) call for it to continue in ways that remain compatible with the purposes of the Seashore. The GMP also provides that the Seashore will develop a "comprehensive management plan for nonnative species based on studies of . . . impacts of nonnative species on native biota and natural processes." See GMP, pages 39-40. Specifically, in relation to wildlife, the GMP emphasizes that fishing and hunting "focusing on native species" will be allowed as compatible "with sustainable populations and ecosystems" and anticipates developing a consistent policy towards stocking programs with the state Division of Fish and Wildlife "encouraging the use of native species." See GMP, page 41.

The EIS expressly considered a No-Action Alternative, which was to continue stocking with no changes (Alternative 1). Alternative 1, which acknowledged that the stocking programs "are based primarily on state policy rather than NPS policy and include 'put and take' programs using exotic species" would have continued these programs "even in the absence of good information regarding impacts of these programs on natural systems." See EIS, pages 207-8. Alternative 3 would have immediately ceased stocking of nonnative animals for hunting. See EIS, pages 37, 117, 261.

The selected alternative, Alternative 2, commits the Seashore to develop a comprehensive program for the management of invasive and non-native species. This alternative emphasizes acquisition of additional scientific information with consideration of impacts on resources, cultural values, and visitor experiences, in cooperation with local and state governments and partners. It anticipates that the "wildlife management activities at the seashore could affect hunters or fishermen by reducing or eliminating hunting or fishing opportunities for nonnative species that are currently stocked" but anticipates that "stocking of substitute native species could be increased." See EIS, page 243. It calls for the Service to: "work with the Massachusetts Division of Fish and Wildlife to evaluate wildlife management activities at the Seashore, especially those involving stocking and reintroductions of both native and nonnative species. The NPS goal of restoring natural, self-sustaining ecosystems could lead to limiting or eliminating the use of exotic species . . . [and] studies would be undertaken to determine the impacts of exotics, especially pheasants, on native species." See EIS, page 236. The EIS also discusses the problems with invasive and exotic vegetation throughout the Seashore and directs the Seashore to "manage fish and wildlife on a more sustainable basis, supported by a scientific database." See EIS, page 193. In the development of its comprehensive nonnative species management program, the EIS anticipates that the program will "control or eliminate invasive, nonnative species; use native species in all NPS revegetation efforts," and "[e]nhance cooperative management efforts with the state for hunting, stocking and reintroduction programs." See EIS, page 37.

The Seashore is now in the process of developing its comprehensive new program for the management of invasive and other nonnative species. The first component of such a program is an inventory, and current indications are that the inventory process will take some time. It is also obvious even at this early state that there are numerous invasive and very damaging nonnative

species, mostly plants, which have serious, immediate adverse impacts on Seashore resources. Specific species evaluations have been completed for pheasant impacts (the Bump study) and for the brown tail moth.

Since the completion of the research and the publishing of the EIS/GMP in 1998 the Seashore has allowed the program to continue (which it has without incident or further protest until very recently). There were several reasons for this. First, the Bump study clearly indicated that native Seashore resources are not put at risk by this program. Moreover, the early stages of the inventory process (as noted above) indicate that other nonnative species pose far more serious and immediate problems. Second, the program pre-dates the creation of the Seashore, and is very popular with a local constituency of hunters, many of them local residents. Given the longstanding nature of this program (it has now been in existence for over 40 years) and the presence of active advocates for it (it is still considered by many to be a desirable form of recreation), it has a certain standing through sheer longevity. Although this would not be sufficient justification for it to continue were there any evidence of damage, absent such evidence this factor carries some weight. Finally, there has been no significant change in the last five years in hunter versus non-hunter safety related incidents (i.e., no reports of injuries or "near miss" occurrences) associated with the program, despite dramatic increases in fall visitation and the year-round population. According to the state, there is clear evidence in the form of declining license sales that the number of hunters is shrinking both Cape-wide and around the state, so we would have no reason to expect any future increase in such incidents.

Over the winter of 2001/2002 the Seashore again began hearing from animal rights groups raising the issue of the program. In the interest of full discussion the Seashore asked the advisory commission if it would take another look and consider advising the Seashore whether the program is appropriate. The commission discussed the topic at several meetings and held a public forum to get input. Sessions were well attended by hunters, animal rights supporters, and others. In addition, animal rights groups organized at least two write-in campaigns; commissioners were provided with access to all written comments. At the commission's last meeting in April 2002 it reached no consensus, and held over the issue till Fall. The commission chair agreed to prepare a written report for commissioners to consider before the next meeting.

Discussions among Seashore staff this year have centered on whether or not any new information was raised by public or commission comment that might cause the Seashore to reconsider its earlier decision. Two issues in particular came up, one relating to antibiotic use by the state in raising the birds, and the other concerning trampling of vegetation and dog impacts. Staff investigated both issues. Regarding antibiotic use, it appears that the birds are fed antibiotics for only a few days after hatching. They are stocked when several months old, making the likelihood of retained antibiotics slim. Measuring chronic impacts from introduced residual antibiotics or from resistant bacteria in the birds is virtually impossible, according to staff scientists. Regarding trampling, it is almost impossible to distinguish any enhanced level of impact from this activity versus other activities that also create foot traffic in vegetated and forested areas. Much more popular than pheasant hunting are hiking, deer and all other forms of hunting combined, berry picking and mushroom hunting. Rabbit hunting also involves dogs. Tens of thousands of persons use the Seashore in these ways each year.

The portion of this use belonging to pheasant hunters is relatively small. However, as part of the monitoring program, the Seashore has initiated work on visitor use impacts that will address pedestrian-based effects.

A review of MP and NPS-77 (Exotic Species Management) gives no guidance that directly conflicts with a decision to allow the program to continue, as long as adverse impacts do not appear. MP 4.4.4.1 says, "In general, *new* exotic species will not be introduced into parks" (emphasis added). Although the intent to limit the presence of exotic species is clear, the longstanding nature of this program means that the birds are not a new exotic species. Further, NPS-77 directs that "exotic species . . . may be introduced to carry out NPS programs consistent with park objectives only when all the following conditions exist:

Available native species will not meet the needs of the program.

Based on scientific advice from appropriate federal, state, local and non-governmental sources, the exotic species will not become a pest.

Such introductions will not spread and disrupt desirable adjacent natural plant and animal communities and associations, particularly those of natural zones."

The first consideration is strongly advocated for by the state, whose officials indicate that for pheasant hunters only pheasant will do. The second two considerations have been addressed by the Bump report in the considered judgment of staff scientists. Further, recent communications from USGS researchers actively engaged in the Seashore's meso mammal populations studies indicate no increase in the numbers and times that coyotes are present in the stocked areas during the period of the hunt. In addition, Inventory and Monitoring bird studies in upland areas and directly within pheasant release areas have not documented a single observation of a pheasant outside the period of the hunt in over two years. The researchers believe that the short-term, ephemeral nature of the stocking program is not sufficient to attract predators to the area.

NPS-77 also defines "innocuous species" and the description fits pheasants at the Seashore closely. In the case of these species the direction is clear: "Management efforts should not be squandered on innocuous species." Although this language is directed toward management of species that have been introduced beyond our control, it is still indicative of an appropriate general approach.

Other MP sections also apply here. Section 1.4.5 discusses the manager's responsibility to determine what might constitute an impairment of park values. Section 2.1.1 requires a logical, documented decision making process. Section 2.3.1.8 describes required environmental analysis. And Section 5.2.1 discusses the requirement to consult with interested parties. In all cases we feel our process and our decisions to date as described above meet the intent of the policy guidance.

Proposed Action:

In the GMP reference is made to standardizing policies about stocking programs (pheasant are not the only stocked non-native species) and to encouraging the use of native species. We will continue to discuss this issue with Massachusetts Fish and Wildlife officials toward this end. State officials have indicated very clearly that the pheasant program has a specialized clientele (traditional bird hunters and those new to the sport, since pheasant hunting is among the least challenging), and that, should the Seashore decide to end the program, substitutes will take some time to become accepted.

In addition, the state has agreed to certify that the birds are fed antibiotics only during the first few days of life, and that they are disease free when released into the Seashore.

The Seashore has discussed with the state the Seashore's intentions to restore specific habitats as described in the GMP. During the last 50 years natural succession has changed vegetation patterns within the seashore, with open fields and heathlands succeeding to the mostly closed-canopy pitch pine and oak forest (NPS, 1998). The successional changes occurring are compounded by fire suppression and intensify the loss of important habitat for native and sensitive species. Because of the importance of these environments, both locally and globally, the Seashore understands the need for restoration of these changing habitats. As a result, the Seashore has initiated a series of studies to assess habitat needs and is currently developing heathland/grassland management plans. An exotic plant management environmental assessment and plan is also in preparation, as exotic plant control is pivotal to success in habitat restoration. Upon completion of these tasks, impacted lands will be targeted for restoration.

Successful restoration of the communities will translate to improved habitat for native species, including sensitive species such as grasshopper and vesper sparrows and upland species such as grouse and quail. Therefore, a logical extension of these actions would be to promote an expansion of quail and grouse hunts sufficient to maintain equivalent levels of hunting simultaneous with phasing out the stocking of pheasants, should the Seashore ultimately decide to do such a phase-out.

Summary justification:

Serious scrutiny of this program over a period of years has revealed little, if any, discernable impact in terms of environmental damage or safety risks. In the judgment of Seashore staff, there is no impairment from this program under the Organic Act and related park authorities. Because of this, the program does not violate the intent of MP to prevent impairment of park values. Although some language in MP gives clear guidance that stocking of nonnatives is inappropriate, there is also language in several sections that, taken as a whole, gives the manager some discretion when impairment does not occur and there are other strong considerations.

In accordance with the GMP, the Seashore continues to pay close attention to the program and related research, and is moving as described in its strategic plan to improve habitat for other hunted native species. The Seashore's intention over time is to shift the emphasis of the state hunting program to these more appropriate species.

Certainly this program would not be established as a new program today. However, it has been small but popular for 50 years and a group of hunters looks forward to it each year. Generally our relationship with state wildlife officials is strong and cooperative. To cancel this program at the last minute without compelling reasons to do so would, in our judgment, be inappropriate and damaging to our relationship with the state and with the local hunting population.

Waiver request:

For the reasons described above we are requesting a waiver of Management Policies to the extent necessary to allow the pheasant stocking/hunting program to continue uninterrupted while we continue to examine options for phasing it out.

The waiver of policy is specific to Cape Cod National Seashore, and the presently proposed continuation and phasing-out program for pheasant stocking applies only to this case and is based on its unique circumstances and individual merits. It may not be viewed as precedential.

Chupandra S. Watts

for Marie Rust

I Concur:

Paul Hoff

Deputy Assistant Secretary for Fish and Wildlife and Parks

Appendix B

MOU for Pheasant Hunting 1968 and 1971

RECEIVED
DEC 30 1968
FISH & GAME DIV.

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

REPLY REFER TO:

December 20, 1968

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE COMMONWEALTH OF MASSACHUSETTS, DIVISION OF
FISHERIES AND GAME
AND
THE NATIONAL PARK SERVICE
RELATING TO WILDLIFE MANAGEMENT IN
CAPE COD NATIONAL SEASHORE

This MEMORANDUM OF UNDERSTANDING is between the Massachusetts Division of Fisheries and Game, represented by the Director, and hereinafter referred to as the Division, and the National Park Service represented by the Director, and hereinafter referred to as the Service.

Whereas the Division has been created under the constitution of the Commonwealth of Massachusetts to provide an adequate and flexible system of control, propagation, management, protection and regulation of all wildlife within Massachusetts, and

Whereas Congress provided in Section 7 of the act establishing the Cape Cod National Seashore (herein referred to as the "Seashore"):

> (c) The Secretary may permit hunting and fishing, including shellfishing, on lands and waters under his jurisdiction within the Seashore in such areas and under such regulations as he may prescribe during open seasons prescribed by applicable local, State and Federal law. The Secretary shall consult with officials of the Commonwealth of Massachusetts and any political subdivision thereof who have jurisdiction of hunting and fishing, including shellfishing, prior to the issuance of any such regulations, and the Secretary is authorized to enter into cooperative arrangements with such officials regarding such hunting and fishing, including shellfishing, as he may deem desirable, except that

the Secretary shall leave all aspects of the propagation and taking of shellfish to the towns referred to in Section 1 of this act.

Whereas Congress further provided in Section 7 of the act establishing the Seashore:

(a) Except as otherwise provided in this Act, the property acquired by the Secretary under this Act shall be administered by the Secretary subject to the provisions of the Act entitled "An Act to establish a National Park Service, and for other purposes", approved August 25, 1916 (39 Stat. 535), as amended and supplemented, and in accordance with laws of general application relating to the national park system as defined by the Act of August 8, 1953 (67 Stat. 496); except that authority otherwise available to the Secretary for the conservation and management of natural resources may be utilized to the extent he finds such authority will further the purposes of this Act.

In order that the seashore shall be permanently preserved in its present state, no development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing or with the preservation of such historic sites and structures as the Secretary may designate:

.....

Provided further, that the Secretary may develop for appropriate public uses such portions of the Seashore as he deems especially adaptable for camping, swimming, boating, sailing, hunting, fishing, the appreciation of historic sites and structures and natural features of Cape Cod and other activities of similar nature.

Whereas, on March 12, 1965, the Service issued the following statement on "Wildlife Management Policy--National Recreation Areas" which was developed in cooperation with the International Association of Game, Fish and Conservation Commissioners:

Public hunting and fishing are resource uses which are desirable and compatible with fulfilling the mission of the national recreation areas administered by the National Park

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Service. This policy has its foundation not alone in the legislation affecting specific areas but also in the report of the Secretary of the Interior's Special Advisory Board on Wildlife Management in the National Parks, approved by the Secretary on May 2, 1963. It is the responsibility of the National Park Service to implement this policy through sound administration, management, and use of the wildlife and fisheries resources in these recreation areas.

Fish and Wildlife management involves two principal management functions; i.e., (1) The management of the habitat--soils, water, and vegetation; and (2)the management of harvesting fish and wildlife populations by the public.

In national recreation areas administered by the National Park Service, this latter function is recognized as being within the regulatory authority of the individual states. The states should regulate the taking of fish and wildlife by the public, including such matters as season, bag limits, and licensing, and provide for the joint cooperative enforcement of such regulations.

The first management function is recognized as the responsibility of the National Park Service. In carrying out this function, as well as its responsibility for the overall recreation program of the area, the Service may designate zones where, and establish periods when, no hunting or fishing shall be permitted for reasons of public safety, administration, or other public use and enjoyment of the area. Regulations prescribing such restrictions shall be issued after consultation with the states.

The management of fish and wildlife in recreation areas must be a cooperative endeavor with the states. These cooperative endeavors will be effected through Memorandums of Understanding with the respective states.

Whereas the parties to this agreement wish to implement the aforesaid act and policy through joint and cooperative endeavors which will focus the skills and abilities of the Division and the Service toward achieving maximum public benefit and proper management of the lands and waters involved:

Now, therefore,

A. The Service agrees, on lands within the Seashore which are administered by the Service:

1. To cooperate with the Division through a separate agreement with the Massachusetts Department of Natural Resources, Division of Law Enforcement, in the joint enforcement of applicable game and fish laws through appointments as Deputy Natural Resource Officers, without compensation, for certain uniformed employees of the Service.

2. To practice those forms of resources management that will benefit fish and wildlife, and enhance opportunities for their harvest by the public, compatible with other authorized uses of the Seashore.

3. To consult with the Division prior to issuing regulations which affect hunting and fishing in the Seashore for reasons of public safety, administration, or public use and enjoyment, or to designating zones where, or establishing periods when, no hunting and fishing will be permitted, as provided for in Section 7 of the act establishing the Seashore.

4. To permit the harvest of fish and wildlife by the public in accordance with State laws and regulations when areas are open to hunting and fishing, as provided for in Section 7 of the act establishing the Seashore.

B. The Division agrees:

1. To consult with the Service before establishing any special hunting or fishing seasons and regulations

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pertaining to the Seashore.

2. In the performance of work under this agreement and any supplemental agreement which may result from this agreement, to comply with Section 202 of Executive Order 11246, dated September 24, 1965, as amended by Executive Order No. 11375, dated October 13, 1967, which is attached and made a part of this agreement.

C. The Division and the Service mutually agree:

1. To meet jointly on the first Monday in February and to provide for other meetings as deemed necessary for discussion of matters relating to the management of natural resources on lands and waters within Cape Cod National Seashore.

2. To encourage the joint publication of press releases and the interchange between parties of all pertinent agency policies and objectives, statutes, rules and regulations, and other information required for the wise use and perpetuation of the natural and historic resources of the Cape Cod National Seashore.

3. To enter into working arrangements as occasion demands for the use of lands, buildings, and other facilities owned and operated by either party hereto, for special projects.

4. To jointly evaluate fish and wildlife resources and to initiate and carry out jointly approved management programs, such as, but not limited to, the restocking and introduction of game fish and wildlife species.

5. To jointly consider and evaluate probable overall ecological effects of any proposal to control fish and wildlife populations by toxic chemicals or trapping and the introduction of plant and animal species into Cape Cod National Seashore.

6. Each and every provision of this Memorandum of Understanding is subject to the laws of the Commonwealth of Massachusetts and the laws of the United States, and to the delegated authority in each instance.

7. Nothing in this Memorandum of Understanding shall be construed as obligating either party hereto to the expenditure of funds or for the future payment of money in excess of appropriations authorized by law.

8. Nothing contained herein shall be constructed as limiting in any way the responsibility and authority, as defined by law, of the Director, Massachusetts Division of Fisheries and Game, and the Director, National Park Service, in connection with the administration and protection of lands and resources under their respective administrations.

9. No member of, or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of the Memorandum of Understanding or to any benefit to arise therefrom, unless it is made with a corporation for its general benefit.

10. This Memorandum of Understanding shall become effective when signed by the parties hereto and shall

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continue in force until terminated by mutual agreement or by either party upon six (6) months notice in writing to the other of his intention to do so. Amendments to this Memorandum of Understanding may be proposed by either party and shall become effective upon approval by both parties.

IN WITNESS WHEREOF, the parties hereto have executed this Memorandum of Understanding as of the date last signed below.

NATIONAL PARK SERVICE

DATE FEB 6 1969

By: Edward Kurmel
Associate Director

MASSACHUSETTS DIVISION OF FISHERIES AND GAME

DATE 12/31/68

By: David H. Stevens
Director

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PERSONAL COPY.

SOUTHEAST WILDLIFE DISTRICT HEADQUARTERS
Division of Fisheries and Game
Buzzards Bay, Massachusetts

December 29, 1971

Evaluation of Experimental Wildlife Management Area
Located Within the Cape Cod National Seashore-1971
Marconi Beach Area, Wellfleet, Massachusetts

With completion of the 1971 operation, the following observations, comments, and statistics are submitted for discussion and evaluation prior to submitting a formal report at the annual meeting scheduled for late February, 1972. The opinions submitted here relating to the success of program are assessed in the primary interest of the Division.

The overall operation should be considered a complete success, far exceeding our utmost expectations, that is, at least from the viewpoint of the local sportsmen and the Division. Although several minor problems developed, which required immediate adjustments in the scope of our original operational plan, (stocking/patrol routes, and selected stocking sites) and several other suggestions remain to be discussed at this meeting.

I will endeavor to summarize the program and problems as follows:

1. Location, size, and evaluation of physical characteristics.
2. Site preparation, before and after season.
3. Stocking, before and during season.
4. Hunting pressure and control.
5. Recovery factors.
6. Comments (pro and con)
7. Recommendations for present and future operations.

1. Location: It has proven to be ideally situated for relieving the heavy hunting pressure on towns comprising the lower Cape. This statement is supported by statistics extracted from information gathered during the 14 days when hunter utilization forms were accomplished, and includes information gathered while conducting 7 pre-stocking checks. (Reference Plates #1

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i. Size: Very sufficient. It should remain adequate even with the anticipated increase in utilization resulting from the population explosion now taking place on Cape Cod. Although this will require some minor adjustments in accessibility, parking, and stocking, in addition to limited habitat management.

j. Evaluation of Physical Characteristics: Of the 1150 acres available for hunting, the western and northern 750 acres varies from good to very good cover for hunting with or without dogs. This area could use limited brush cutting to reopen existing trails for ease of access.

There is approximately 260 acres running south of beach parking area, and continuing slightly beyond the old air strip, which is rated fair to poor due to being so heavily overgrown with scrub oak that even old Army trails are indistinct from the surrounding cover. If this area could be managed by the brush cutting of old trails and possible gridding on 100 yd. intervals, it could be on a par, or superior to, the northern section.

The remaining 140 acres south of the air strip, and abutting the southern boundary, is covered by semi-mature stands of hard wood and pine. At present, hunting pressure or penetration does not justify any management other than alternate cutting of brush threatening to close boundary road. This area may be well suited for attempting to reestablish the Ruffed Grouse, and thereby extending its primary range beyong its present Brewster/Orleans limits. If studies indicate this potential, then the area should remain in its present state as it seems nearly ideal Grouse cover. The only question seems to be fresh water, and where the natural habitat boundary exists.

2. Site Preparation:

a. Control signs--concur with this year's erection, with the possible reduction in the number of signs required along beach bluff and southern boundary.

b. Access signs--sufficient at present, but will require additional arrows and signs when and if additional parking areas are desired (be be

c. Band Recovery boxes and signs: Sufficient—four located as follows: 3 in area and 1 on power line.

d. Club and Local Participation: Expand! By inviting the Highland Rod and Gun Club to assist in erection of control signs. Contact other local Scout troops so they can participate in releasing the pheasants as part of their conservation training. This was accomplished last year with the Eastham Rod & Gun Club, in conjunction with Eastham Scout Troop #83 with outstanding results in the public relation phase of conservation. Their efforts could also be utilized in future habitat improvement programs and in clearing trails and paths where mechanical methods are not suitable, due to adverse terrain or soil conditions.

3. Stocking: The present quota of 400 cock pheasants seem to be sufficient, considering the local hunter population, and the amount of private land still being stocked, but indications of the impending loss of several more stocking sites in the Towns of Truro and Wellfleet may require implementing an in-week token stocking. If this is determined to be necessary, it is recommended that a 25 bird release be made on Tuesday or Wednesday nights dueing the first four weeks of the 1972 season. The 500 banded pheasants would be color coded to continue the survival and recovery studies initiated in 1971.

The spring stocking of surplus brood stock at the ratio of 36 hens to 4 or 8 cocks in the vicinity of Fresh Brook should be continued. Also, the early fall stocking of 12 week old cocks will be continued at least one more year to allow additional evaluation. All banded birds released in this phase of the study will be color coded to eliminate any confusion with bands recovered in other areas.

Several adjustments in stocking sites and amounts were made during the past season. Release sites #4 & 5 were eliminated, and their birds adjusted into sites #1,2,6, and 8. This was necessitated due to poor recovery encountered [illegible] release, as the hunters would not pursue the birds into the

4 Hunting Pressure and Control: The seasonal hunting pressure was determined by utilizing statistics obtained from daily hunter utilization reports and spot checks. By use of the Lincoln method of computation, an estimated total utilization was projected. (Reference 14 daily utilization reports and 7 spot checks as related on Plates #1 thru #6.)

Plate #1 correlates information derived from utilization sheets compiled by the Fish & Game representative while on duty within the management area.

289 cars
405 Hunt.

a. 289 cars counted
b. 629 hunters counted
c. 481 hunters contacted
d. 946 hunters estimated for the 14 days covered by this phase of the study.

Plate #2 spot checks; accomplished late in the afternoon just prior to stocking provided the following information:

a. 22 cars counted
b. 34 hunters contacted —No effort to estimate totals was attempted as stocking was the primary objective.

Plate #3 combines information from Plates #1 & #2 for an estimated total of 980 hunters utilizing the area during 21 days.

Plate #4 using information contained in Plates #1 thru #3, a daily average of 27 hunters was determined for the remaining 15 week days, for an estimated total of 1,385 hunters utilizing the management area in 1971.

Plate #5 indicates frequency of utilization by those vehicles identified during utilization checks: 104 cars were recorded once, 25 cars checked at least twice, and 13 cars were counted 3 times. In addition, 4 cars were recorded 4 times, 3 cars were seen 5 times, with 2 vehicles being recorded 6 times, and 1 car was recorded in the parking lot 10 times.

Plate #6 provides abreakdown of Cape hunters contacted by towns and indicated below:

Provincetown 63, Truro 55, Wellfleet 60, Eastham 63, Orleans 53, Brewster 16, Chatham 32, Dennis 5, Harwich 11, Yarmouth 5, Barnstable 0, Sandwich 12, Bourne 13, and Falmouth 0.

The towns of Falmouth and Barnstable have some type of public shooting areas

Springfield, Boston, and Manchester, Conn., many of whom were visiting on the lower Cape and participated in our program.

Control: Overall hunter cooperation and compliance with rules and regulations were commendable; a few (14) violations were recorded as follows: 3 for hunting early, 6 lacked hunter orange, 2 hunters were late in leaving area, 2 hunters for discharging firearms within 150 ft. of a paved highway, 1 involving excessive speed, and 2 signs were reported to have been been damaged by "shot". I feel the sign with shotgun pellets resulted from one of the reported weapons being discharged within 150 ft. of the road. The other incident, when examined proved to be made by 22 cal. bullets, and point of exit was well weathered, indicating the incident had taken place prior to the establishment of the management program.

All of the 14 violations were recorded and verbal warnings issued. The hunters lacking orange hats were directed to leave area until suitable atire was obtained. The three early hunters were booked, their offenses discussed with local Natural Resources officer, and the decision was to place them on file for a year. The other minor offenses were handled similarly with verbal warnings issued.

I feel that as the local hunters become more familiar with the rules and regulations governing the operation of a management area the incidents mentioned above will become nearly non existent. If not, offenses such as speeding, shooting near the road, or hunting early will be discussed at the Orleans rotary.

4. Recovery Factors:

Of the 400 color coded banded birds released, 56.25%, or 225 pheasants were recovered as indicated by band returns. The first year's recovery factor of 56% compares favorably with our desired 60 to 65% recovered on our more extensively managed areas. It is felt that changes indicated in evaluation of area (limited brush cutting of access trails and grid lines) and changes in

desired objective.

Along with the above recovery data, at least two of the sixteen 12 week old cock pheasants released during August in the vicinity of Fresh Brook were recovered (this was verified by band wear and discoloration). At least three native birds were taken in the vicinity of Fresh Brook and the old air strip. The native bird shot on November 6th was examined, and verified by me as a young mature cock pheasant. (This was determined by appearance of bill, legs, and wing areas). These birds are the product of surplus brood stock released last spring.

This bird had been feeding on insects, greenery, and pokeberry, and appeared to be well developed, and healthy. Approximately nine banded birds were checked and found to be feeding on the usual grit, insects, (ants, woolyworms, and undistinguishable matter), greenery, pokeberries, acorns, plant buds, and root buds of the hog cranberry plant. Two other birds were reported to be full of hog cranberries, but those examined by me did not so incidate. (Room for more extensive study next year). I examined two other birds, thin but healthy, yet were not feeding at all as indicated by field dressing.

From information contained in preliminary study, and that obtained this year, it is felt that a small native or residual population could be maintained. Also, stocked birds remaining at the end of the season should have no problem in surviving once they adapt to the local habitat and food conditions.

5. Comments from Rangers, Hunters, and Other Interested Parties: considered to have merit for consideration or discussion:

Rangers: Hunter's parking illegally near beach building, and in "no parking" areas on access road. Location of hunters parking moved to northern end of parking lot. Parking violations continued, but now offenders were identified as surfers, beach watchers, and campers. The only other area of dispute was in the vicinity of the ticket booth turn-around, which had been used for parking by several elderly or handicapped hunters. (to be discussed

in parking lot near central pump station.

Other Interested People: Numerous compliments on opening of the management area have been received from local merchants and business men of Eastham, Orleans, and Wellfleet. The sporting clubs, and related businesses are staunch supporters of the program. The activities of the Eastham Rod & Gun Club, and Eastham Boy Scout Troop #83 received much deserved publicity in the Orleans Oracle on November 18, 1971.

The only non-complimentary comments I received were from a lady walking her dog on the old railroad bed who jokingly stated that since the opening of bird season she couldn't walk her dog in the locust grove above the pot hole. Also met several irate archers who had a big, black Labrador dog spook several deer they were stalking. However, they too said if they had been bird hunting, it would have been fine as they moved three pheasants and a covey of quail that morning along the power line.

9. Recommendations (for present and future operations).

Present:

a. Continued support and expansion of the management study, including the possibility of increasing the stocking quota upward to 500 pheasants in anticipation of increased utilization during the 1972 fall season.

b. Increasing accessibility to, and within, the area by limited control of undesirable ground cover by mechanical brush cutting.

c. Possible reduction and/or relocation of certain control signs within management area.

d. Expand the existing club and local interest by inviting other clubs scout troops, and interested individuals to participate in the management program.

e. A more complete and extensive coverage of objectives, rules, and regulations through the two major Rod & Gun Clubs, and advance notice to the Cape Cod, Orleans, and Provincetown newspapers.

Future:

a. To consider a tentative study to determine the feasibility of

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The Commonwealth of Massachusetts

OFFICE OF THE SECRETARY
STATE HOUSE, BOSTON, MASS.

Rules and Regulations filed in this Office under the provisions of CHAPTER 30A as amended.

Filed by DIVISION OF FISHERIES & WILDLIFE

PUBLIC SHOOTING GROUNDS - WILD MANAGEMENT AREAS

Date Filed November 29, 1978

Date Published December 7, 1978

Chapter 233, sec. 75

Printed copies of rules and regulations purporting to be issued by authority of any department, commission, board or Officer of the Commonwealth or any city or town having authority to adopt them, or printed copies of any ordinances or town by-laws, shall be admitted without certification or attestations, but if this genuineness is questioned, the court may require such certifications or attestations thereof as it deems necessary.

Attested as a true copy
PAUL GUZZI

Paul Guzzi

SECRETARY OF THE COMMONWEALTH

Copies of this Document Approved by Alfred C. Holland, State Purchasing Agent.
(13-2BF)
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Appendix C

CACO Enabling Legislation: Public Law 87-126

GENERAL AGREEMENT
1443 GA 1730-01-002

Between

The Commonwealth of Massachusetts

Division of Fisheries and Wildlife

and

The National Park Service

Cape Cod National Seashore

ARTICLE I – BACKGROUND AND OBJECTIVES

This GENERAL AGREEMENT is between the Massachusetts Division of Fisheries and Wildlife, represented by the Director (hereinafter referred to as the "Division"), and the National Park Service as represented by the Superintendent, Cape Cod National Seashore (hereinafter referred to as the "Service").

Whereas, the Division has been created under the constitution of the Commonwealth of Massachusetts to provide an adequate and flexible system of control, propagation, management, protection and regulation of all flora and fauna within Massachusetts; and

Whereas, the Cape Cod National Seashore (hereinafter referred to as the "Seashore") was authorized and established by the Congress to be administered in accordance with 16 USC 1, as amended; and

Whereas, Congress specifically provided in Section 7, Public Law 87-126, the Act establishing the Seashore, that:

> "(c) The Secretary may permit hunting and fishing, including shellfishing, on lands and waters under his jurisdiction within the Seashore in such areas and under such regulations as he may prescribe during open seasons prescribed by applicable local, state and federal law. The Secretary shall consult with officials of the Commonwealth of Massachusetts and any political subdivision thereof who have jurisdiction of hunting and fishing, including shellfishing, prior to the issuance of any such regulations, and the Secretary is authorized to enter into cooperative arrangements with such officials regarding such hunting and fishing, including shellfishing, as he may deem desirable, except that the Secretary shall leave all aspects of the propagation and taking of shellfish to the towns referred to in Section 1 of this Act."; and

Whereas, Congress further provided in Section 7 of the Act establishing the Seashore:

> "(a). Except as otherwise provided in this Act, the property acquired by the Secretary under this Act shall be administered by the Secretary subject to the provisions of the Act entitled "An Act to establish a National Park Service, and for other purposes", approved August 26, 1916 (46 Stat. 535), as amended and supplemented, and in accordance with laws of general application relating to the National Park System as defined by the Act of August 8, 1953 (67 Stat. 496); except that authority otherwise available to the Secretary for the conservation and

management of natural resources may be utilized to the extent he finds such authority will further the purposes of this Act.

(b)(1). In order that the Seashore shall be permanently preserved in its present state, no development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing or with the preservation of such historic sites and structures as the Secretary may designate."; and

Whereas, the parties to this agreement wish to implement the aforesaid act and policy through joint and cooperative endeavors which will focus the skills and abilities of the Division and the Service toward achieving maximum public benefit and proper management of the lands and waters involved.

ARTICLE II – STATEMENT OF WORK

A. Now, therefore, the Service agrees, on lands within the Seashore which are administered by the Service:

1. To cooperate with the Division of Law Enforcement, through a separate agreement with the Division, in the joint enforcement of applicable environmental laws through appointments as Deputy Environmental Police Officers without compensation, for certain uniformed employees of the Service.

2. To practice those forms of resource management that perpetuates the native flora and fauna of the Seashore as part of the natural ecosystem.

3. As provided for in Section 7 of the Act establishing the Seashore, to provide opportunities for hunting and fishing consistent with ecosystem preservation and pubic safety and compatible with other authorized uses of the Seashore and in accordance with state and federal laws and regulations.

4. To consult with the Division prior to issuing regulations which affect hunting and fishing in the Seashore for reasons of resource protection, public safety, administration, or public use and enjoyment or in designating zones where, or establishing periods when, no hunting and fishing will be permitted, as provided for in Section 7 of the Act establishing the Seashore.

B. The Division agrees:

1. To consult with the Service before revising or establishing any hunting or fishing seasons and regulations which may affect the management of the Seashore, preservation of its resources, for public use and safety.

2. In the performance of work under this agreement, and any supplemental agreement which may result from this agreement, to comply with Section 202 of Executive Order No. 11246, dated September 24, 1965, as amended by Executive Order No. 11375, dated October 13, 1967, which is attached and made a part of this agreement.

C. The Service and the Division mutually agree:

1. To meet jointly at least once every year and to provide for other meetings as deemed necessary for discussion of matters relating to the management of flora and fauna populations on lands and waters within the Seashore.

2. To initiate or continue cooperative studies pertaining to flora and fauna populations and routinely to exchange information and resources on such studies or programs.

3. To encourage the joint publications of studies, press releases and the interchange between parties of all pertinent agency policies and objectives, statutes, rules and regulations, and other information required for the appropriate use and perpetuation of the natural and historic resources of the Seashore.

4. To enter into working arrangements, as occasion demands, for the use of lands, buildings, and other facilities owned and operated by either party hereto, for special projects.

5. To evaluate jointly the overall ecological effects of proposals to manage biotic resources and to initiate and carry out mutually agreeable management programs.

6. Each and every provision of this General Agreement is subject to the laws of the Commonwealth of Massachusetts and the laws of the United States, and to the delegated authority in each instance.

7. Nothing in this General Agreement shall be construed as obligating either party hereunto to the expenditures of funds or for the future payment of money in excess of appropriations authorized by law.

8. Nothing contained herein shall be construed as limiting in any way the responsibility and authority, as defined by law, of the Director, Massachusetts Division of Fisheries and Wildlife, and the Superintendent, Cape Cod National Seashore, in connection with the administration and protection of lands and resources under their respective authorization and jurisdiction.

ARTICLE III – TERM OF AGREEMENT

This General Agreement shall become effective when signed by the parties hereto and shall continue in force for five (5) years from the date of execution.

ARTICLE IV – KEY OFFICIALS

The Superintendent, Cape Cod National Seashore and the Director, Massachusetts Division of Fisheries and Wildlife are the key officials responsible for this General Agreement. The Superintendent, Cape Cod National Seashore has delegated responsibility for the day to day administration of this agreement to the Chief Ranger and the Chief of Natural Resources. The Director, Massachusetts Division of Fisheries and Wildlife has delegated the day to day administration of this agreement to the Deputy Director, Field Operations.

Contact information for key officials is as follows:

Cape Cod National Seashore
Superintendent, Maria Burks, 508-349-3785 X201
Chief Ranger, Kevin FitzGerald, 508-349-3785 X213
Chief of Natural Resources, Nancy Finley, 508-349-3785 X216

Massachusetts Division of Fisheries and Wildlife
Director, Wayne F. MacCallum, 617-792-7270
Deputy Director/Field Operations, Carl Prescott, 508-792-7270

ARTICLE V – PROPERTY UTILIZATION

Not applicable.

ARTICLE VI – PRIOR APPROVAL

Not applicable

ARTICLE VII – REPORTS AND/OR DELIVERIES

Not applicable

ARTICLE VIII – TERMINATION

This General Agreement may be terminated by mutual agreement, or by either party's providing sixty (60) days notice in writing to the other of its intention to do so. Amendments to this General Agreement may be proposed by either party and shall become effective upon approval by both parties.

ARTICLE IX – STANDARD CLAUSES

1. Civil Rights

During the performance of this agreement, the participants agree to abide by the terms of US Department of the Interior Civil Rights Assurance Certification, non discrimination and will not discriminate against any person because of race, color, religion, sex or national origin. The participants will take affirmative action to ensure that the applicants are employed without regard to their race, color, religion, sex or national origin.

2. Officials Not to Benefit

No member of, or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of the General Agreement or to any benefit to arise therefrom, unless it is made with a corporation for its general benefit.

3. Promotions

The Commonwealth of Massachusetts, Division of Fisheries and Wildlife shall not publicize, or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts or other publications) which states or implies Federal Governmental, Departmental, Service or Federal Government employee endorsement of a product, service, or position which the

Commonwealth of Massachusetts, Division of Fisheries and Wildlife represents. No release of information relating to this agreement may state or imply that the Government endorses the Commonwealth of Massachusetts, Division of Fisheries and Wildlife work product as superior to other products or services.

4. Public Information Release

Commonwealth of Massachusetts, Division of Fisheries and Wildlife must obtain prior approval from the National Park Service Key Official for any public information releases which refer to the Department of the Interior, the National Park Service, any sub-unit or employee thereof (by name or title), or this agreement. The specific text, layout, photographs, etc., of the proposed release must be submitted, with a request for approval

ARTICLE X – AUTHORIZING SIGNATURES

IN WITNESS WHEREOF, the parties hereto have executed this General Agreement as of the date last signed below.

NATIONAL PARK SERVICE

Date: 3/13/01

By: Maria Burks
Maria Burks
Superintendent
Cape Cod National Seashore

MASSACHUSETTS DIVISION OF FISHERIES AND WILDLIFE

Date: 3/23/01

By: Wayne F. MacCallum
Wayne F. MacCallum
Director

W34

December 27, 2001

Ms. Ellie C. Horwitz
Mass Wildlife Field Headquarters
1 Rabbit Hill Rd.
Westborough, MA 01581

Dear Ms Horwitz:

The National Park Service and U.S. Fish and Wildlife Service are requesting that a new piece of information be included in the next publication of the Mass Wildlife abstract of fish and wildlife laws. Often times hunters believe that all regulations in the state abstracts apply to federal lands as well. This is not always the case. In order to better inform the hunting and fishing public, we are requesting that agencies be contacted directly to learn of any specific regulations or restrictions not listed in the abstracts. Below are some examples of verbiage, which you might want to consider for inclusion in the abstract.

Example: **NOTE! Regulations may differ on federal, state and MDC parks, refuges, and reservations. Contact the respective agency for more information.**

Example: **NOTE! Regulations may differ on federal parks, refuges, and reservations. Contact the agency directly for additional information.**

This information will assist the public and us. Thank you for your assistance. Any questions may be directed to me at (508) 349-3785 x219.

Sincerely,

William Hooper
Cape Cod National Seashore

cc: Bill Davis, Mass Wildlife
cc: Chris Dowd, USF&WS

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APPENDIX A: LEGISLATION AND THE TRANSFER OF FORMER STATE AND TOWN LANDS

UNITED STATES CODE, TITLE 16 — CONSERVATION

§ 459b. Cape Cod National Seashore; description of area

(a) The area comprising that portion of the land and waters located in the towns of Provincetown, Truro, Wellfleet, Eastham, Orleans, and Chatham in the Commonwealth of Massachusetts, and described in subsection (b) of this section, is designated for establishment as Cape Cod National Seashore (hereinafter referred to as "the seashore").

(b) The area referred to in subsection (a) of this section is described as follows:

Beginning at a point in the Atlantic Ocean one-quarter of a mile due west of the mean low-water line of the Atlantic Ocean on Cape Cod at the westernmost extremity of Race Point, Provincetown, Massachusetts;

thence from the point of beginning along a line a quarter of a mile offshore of and parallel to the mean low-water line of the Atlantic Ocean, Cape Cod Bay, and Provincetown Harbor in generally southerly, easterly, and northerly directions rounding Long Point and then southwesterly to a point a quarter of a mile offshore of the mean low-water line on the harbor side of the dike depicted on the United States Geological Survey Provincetown quadrangle sheet (1949) crossing an arm of the Provincetown Harbor;

thence northerly, along a line a quarter of a mile offshore of and parallel to the low-water line at the dike to a point easterly of the point of intersection of the said dike with the boundary of the Province Lands Reservation as depicted on the said Provincetown quadrangle sheet;

thence westerly to the said point of intersection of the dike and the Province Lands Reservation boundary;

thence along the boundaries of the Province Lands Reservation northwesterly, northeasterly, northerly, and easterly to the easternmost corner of the reservation being near United States Route 6;

thence leaving the said easternmost corner along an extension of the southerly reservation boundary line easterly to the northerly right-of-way line of United States Route 6;

thence along the northerly right-of-way line of United States Route 6 in a general easterly direction crossing the Truro-Provincetown line and continuing in the town of Truro in a generally southeasterly direction to a point four-tenths of a mile southeasterly of the southerly right-of-way line of Highland Road;

thence easterly five-tenths of a mile to a point;

thence turning and running in a southeasterly direction paralleling the general alinement of United States Route 6 and generally distant therefrom five-tenths of a mile to a point approximately 700 feet northwesterly of Long Nook Road;

thence southwesterly along a ridge generally paralleling the alinement of Long Nook Road and distant approximately 700 feet therefrom to a point two-tenths of a mile northeasterly of the northerly right-of-way line of United States Route 6;

thence southeasterly paralleling the general alinement of United States Route 6 and generally distant two-tenths of a mile northeasterly thereof to a point 300 feet south of the southerly right-of-way line of Higgins Hollow Road;

thence in a general easterly direction paralleling the southerly alinement of Higgins Hollow Road and 300 feet distant southerly therefrom to a point five-tenths of a mile east of the easterly right-of-way line of said Route 6;

thence turning and running in a southeasterly and southerly direction paralleling the general alinement of United States Route 6 and distant five-tenths of a mile easterly therefrom to a point 300 feet north of the northerly right-of-way line of North Pamet Road;

thence in a generally southwesterly direction paralleling the general alinement of North Pamet Road and generally distant 300 feet northerly therefrom to a point approximately two-tenths of a mile east of the easterly right-of-way line of United States Route 6;

thence in a southerly direction paralleling the alinement of United States Route 6 and generally distant two-tenths of a mile easterly therefrom to a point three-tenths of a mile south of South Pamet Road;

thence west to the intersection of Old County Road and Mill Pond Road;

thence following the easterly right-of-way line of Old County Road southward to a point opposite the southerly right-of-way line of Ryder Beach Road at its intersection with Old County Road;

thence eastward to a point 300 feet east of the easterly right-of-way line of said Old County Road;

thence in a southerly direction paralleling Old County Road at a distance of 300 feet to the east of the easterly right-of-way line of said road to a point 600 feet south of the southerly right-of-way line of Prince Valley Road;

thence in a generally westerly direction, crossing Old County Road and the New York, New Haven, and Hartford Railroad right-of-way to the southern extremity of the town landing and beach in the Ryder Beach area, and continuing to a point in Cape Cod Bay a quarter of a mile offshore from the mean low-water line of Cape Cod Bay;

thence turning and running along a line a quarter of a mile offshore of and parallel to the mean low-water line of Cape Cod Bay in a general southerly and easterly direction rounding Jeremy Point and thence in a general northerly direction along a line a quarter

of a mile offshore of and parallel to the mean low-water line on the westerly side of Wellfleet Harbor, to a point one quarter of a mile due north of the mean low-water line at the eastern tip of Great Island as depicted on the United States Geological Survey Wellfleet quadrangle sheet (1958);

thence north to the mean high-water line on the north shore of the Herring River estuary in the vicinity of its confluence with Wellfleet Harbor;

thence following the mean, high-water line southwesterly, northwesterly, and northeasterly to the easterly right-of-way line of Chequesset Neck Road at its crossing of Herring River;

thence following the course of Herring River along the 20-foot contour line of the southeasterly shore thereof to a point near Mill Creek;

thence crossing Mill Creek in a northeasterly direction to the 20-foot contour level near to and northeast of the confluence of Mill Creek and Herring River;

thence following generally northerly and easterly along the easterly edge of the Herring River marshes on the 20-foot contour to a point north of which the easterly right-of-way line of a medium duty road, as depicted on said Wellfleet quadrangle sheet, crosses northward across a marshy stream near the juncture of said medium duty road with Bound Brook Island Road;

thence crossing said marshy stream along said easterly right-of-way line of said medium duty road and continuing in a northerly direction to the 20-foot contour level on the north side of said marshy stream;

thence following the 20-foot contour line westward approximately 1,000 feet to its intersection with an unimproved dirt road, as depicted on said Wellfleet quadrangle sheet, leading from a point near the juncture of Bound Brook Island Road and the said medium duty road;

thence following said unimproved dirt road northwesterly for approximately 1,600 feet to the 20-foot contour line bordering the southerly edge of the Herring River marshes;

thence following said 20-foot contour line in an easterly direction to Route 6;

thence crossing Route 6 and continuing to a point on the easterly right-of-way line of a power transmission line as depicted on said Wellfleet quadrangle sheet;

thence in a general southerly direction along the said easterly right-of-way line of a power transmission line to the Eastham-Wellfleet town line;

thence southeasterly for a distance of approximately 5,200 feet to a point due north of the intersection of the easterly right-of-way line of Nauset Road with the northerly right-of-way line of Cable Road;

thence due south to the intersection of the said easterly right-of-way line of Nauset Road and the said northerly right-of-way line of Cable Road;

thence in a general southerly direction crossing Cable Road and along said easterly right-of-way line of Nauset Road to a point 500 feet north of the northerly right-of-way line of Doane Road and its intersection with Nauset Road;

thence west to a point 500 feet west of the westerly right-of-way line of Nauset Road;

thence southerly and westerly 500 feet from and parallel to the said right-of-way line of Nauset Road to the easterly right-of-way line of Salt Pond Road;

thence southerly along the easterly right-of-way line of said Salt Pond Road to its intersection with the southerly right-of-way line of Nauset Road;

thence westerly along the southerly right-of-way line of Nauset Road to its intersection with the easterly right-of-way line of United States Route 6;

thence southerly along the easterly right-of-way line of said Route 6 a distance of about four-tenths of a mile to the northerly boundary of the Eastham town hall property;

thence easterly to a point one-tenth of a mile from United States Route 6;

thence turning and running in a generally southerly direction paralleling the general alinement of United States Route 6 and generally distant therefrom one-tenth of a mile to a small stream approximately one-tenth of a mile beyond Governor Prence Road extended;

thence southeasterly along the said stream to the Orleans-Eastham town line;

thence along the Orleans-Eastham town line to the southerly tip of Stony Island;

thence generally southeasterly in the town of Orleans by Nauset Harbor Channel to a point due north of the northerly tip of Nauset Heights as depicted on United States Geological Survey Orleans quadrangle sheet (1946);

thence due south to the 20-foot contour line in Nauset Heights as delineated on the said Orleans quadrangle sheet;

thence generally southerly along the said 20-foot contour to a point about one-tenth of a mile northerly of Beach Road;

thence southwesterly along a line intersecting Beach Road at a point two-tenths of a mile easterly of the so-called Nauset Road leading northerly to Nauset Heights;

thence southerly to a head of a tributary to Little Pleasant Bay at the northerly tip of Pochet Neck as depicted on the said Orleans quadrangle sheet;

thence generally southerly along the thread of channel of the said tributary passing westerly and southwesterly around Pochet Island and thence southwesterly into Little Pleasant Bay passing to westerly of the northerly tip of Sampson Island, the westerly tip of Money Head, and the southwesterly tip of Hog Island following in general the centerline of Little Pleasant Bay to Pleasant Bay;

thence generally southeasterly in Pleasant Bay along a line passing midway between Sipson Island and Nauset Beach to a point on the Chatham-Orleans town line one-quarter of a mile westerly of the mean low-water line of Pleasant Bay on the westerly shore of Nauset Beach;

thence generally southerly in Pleasant Bay in the town of Chatham along a line a quarter of a mile offshore of and parallel to the said mean low-water line of Pleasant Bay on the westerly shore of Nauset Beach to a point a quarter of a mile south of the mean low-water line of the southern tip of Nauset Beach;

thence easterly rounding the southern tip of Nauset Beach along a line a quarter of a mile offshore of and parallel thereto;

thence generally northerly and northwesterly, and westerly along a line a quarter of a mile offshore of and parallel to the mean low-water line of the Atlantic Ocean on the easterly shore of Nauset Beach and on to the outer cape to the point of beginning.

(Pub. L. 87-126, § 1, Aug. 7, 1961, 75 Stat. 284.)

SEPARABILITY OF PROVISIONS

Section 10 of Pub. L. 87-126 provided that: "If any provision of this Act [sections 459b to 459b-8 of this title] or the application of such provision to any person or circumstance is held invalid, the remainder of this Act [such sections] or the application of such provision to persons or circumstances other than those to which it is held invalid shall not be affected thereby."

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 459b-1 to 459b-8 of this title.

§ 459b-1. Acquisition of property

(a) Authority of Secretary; manner and place; concurrence of State owner; transfer from Federal agency to administrative jurisdiction of Secretary

The Secretary of the Interior (hereinafter referred to as "Secretary") is authorized to acquire by purchase, gift, condemnation, transfer from any Federal agency, exchange, or otherwise, the land, waters, and other property, and improvements thereon and any interest therein, within the area which is described in section 459b of this title or which lies within the boundaries of the seashore as described pursuant to section 459b-2 of this title (both together hereinafter in sections 459b to 459b-8 of this title referred to as "such area"). Any property, or interest therein, owned by the Commonwealth of Massachusetts, by any of the towns referred to in section 459b of this title, or by any other political subdivision of said Commonwealth may be acquired only with the concurrence of such owner. Notwithstanding any other provision of law, any Federal property located within such area may, with the concurrence of the agency having custody thereof, be transferred without consideration to the administrative jurisdiction of the Secretary for use by him in carrying out the provisions of sections 459b to 459b-8 of this title.

(b) Use of funds; fair market value

The Secretary is authorized (1) to use donated and appropriated funds in making acquisitions under sections 459b to 459b-8 of this title, and (2) to pay therefor not more than the fair market value of any acquisitions which he makes by purchase under sections 459b to 459b-8 of this title.

(c) Exchange of property; cash equalization payments; reports to Congress

In exercising his authority to acquire property by exchange, the Secretary may accept title to any non-Federal property located within such area and convey to the grantor of such property any federally owned property under the jurisdiction of the Secretary within such area. The properties so exchanged shall be approximately equal in fair market value: *Provided*, That the Secretary may accept cash from or pay cash to the grantor in such an exchange in order to equalize the values of the properties exchanged.

The Secretary shall report to the Congress on every exchange carried out under authority of sections 459b to 459b-8 of this title within thirty days from its consummation, and each such report shall include a statement of the fair market values of the properties involved and of any cash equalization payment made or received.

(d) "Fair market value" defined; appraisal

As used in sections 459b to 459b-8 of this title the term "fair market value" shall mean the fair market value as determined by the Secretary, who may in his discretion base his determination on an independent appraisal obtained by him.

(Pub. L. 87-126, § 2, Aug. 7, 1961, 75 Stat. 287.)

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 459b-2 to 459b-8 of this title.

§ 459b-2. Establishment

(a) Notice in Federal Register

As soon as practicable after August 7, 1961, and following the acquisition by the Secretary of an acreage in the area described in section 459b of this title that its in the opinion of the Secretary efficiently administrable to carry out the purposes of sections 459b to 459b-8 of this title, the Secretary shall establish Cape Cod National Seashore by the publication of notice thereof in the Federal Register.

(b) Distribution of notice and map

Such notice referred to in subsection (a) of this section shall contain a detailed description of the boundaries of the seashore which shall encompass an area as nearly as practicable identical to the area described in section 459b of this title. The Secretary shall forthwith after the date of publication of such notice in the Federal Register (1) send a copy of such notice, together with a map showing such boundaries, by registered or certified mail to the Governor of the Commonwealth of Massachusetts and to the board of selectmen of each of the towns referred to in section 459b of this title; (2) cause a copy of such notice and map to be published in one or more newspapers which circulate in each of such towns; and (3) cause a certified copy of such notice, a copy of such map, and a copy of sections 459b to 459b-8 of this title to be recorded at the registry of deeds for Barnstable County, Massachusetts.

(Pub. L. 87-126, § 3, Aug. 7, 1961, 75 Stat. 288.)

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 459b–1, 459b–3 to 459b–8 of this title.

§ 459b–3. Acquisition by condemnation

(a) Right of use and occupancy for residential purposes for life or fixed term of years; exercise of right of election; impairment of interests of lienholders, etc.; right as running with land; transfer, assignment and termination of right; computation of compensation

(1) The beneficial owner or owners, not being a corporation, of a freehold interest in improved property which the Secretary acquires by condemnation may elect, as a condition to such acquisition, to retain the right of use and occupancy of the said property for noncommercial residential purposes for a term of twenty-five years, or for such lesser time as the said owner or owners may elect at the time of such acquisition.

(2) The beneficial owner or owners, not being a corporation, of a freehold estate in improved property which property the Secretary acquires by condemnation, who held, on September 1, 1959, with respect to such property, an estate of the same nature and quality, may elect, as an alternative and not in addition to whatever right of election he or they might have under paragraph (1) of this subsection, to retain the right of use and occupancy of the said property for noncommercial residential purposes (i) for a term limited by the nature and quality of his or their said estate, if his or their said estate is a life estate or an estate pur auter vie, or (ii) for a term ending at the death of such owner or owners, or at the death of the survivor of them, if his or their said estate is an estate of fee simple.

(3) Where such property is held by a natural person or persons for his or their own life or lives or for the life or lives of another or others (such person or persons being hereinafter called "the life tenant"), with remainder in another or others, any right of election provided for in paragraph (2) of this subsection shall be exercised by the life tenant, and any right of election provided for in paragraph (1) of this subsection shall be exercised by the concurrence of the life tenant and the remainderman or remaindermen.

(4) The beneficial owner or owners of a term of years in improved property which the Secretary acquires by condemnation may elect, as a condition to such acquisition, to retain the right of use and occupancy of the said property for noncommercial residential purposes for a term not to exceed the remainder of his or their said term of years, or a term of twenty-five years, whichever shall be the lesser. The owner or owners of the freehold estate or estates in such property may, subject to the right provided for in the preceding sentence, exercise such right or rights of election as remain to them under paragraphs (1) and (2) of this subsection.

(5) No right of election accorded by paragraphs (1), (2), or (4) of this subsection shall be exercised to impair substantially the interests of holders of encumbrances, liens, assessments or other charges upon or against the property.

(6) Any right or rights of use and occupancy retained pursuant to paragraphs (1), (2), and (4) of this subsection shall be held to run with the land, and may be freely transferred and assigned.

(7) In any case where a right of use and occupancy for life or for a fixed term of years is retained as provided in paragraph (1), (2), or (4) of this subsection, the compensation paid by the Secretary for the property shall not exceed the fair market value of the property on the date of its acquisition by the Secretary, less the fair market value on such date of the said right retained.

(8) The Secretary shall have authority to terminate any right of use and occupancy of property, retained as provided in paragraph (1), (2), or (4) of this subsection, at any time after the date when any use occurs with respect to such property which fails to conform or is in any manner opposed to or inconsistent with any applicable standard contained in regulations issued pursuant to section 459b–4 of this title and in effect on said date: *Provided*, That no use which is in conformity with the provisions of a zoning bylaw approved in accordance with said section 459b–4 which is in force and applicable to such property shall be held to fail to conform or be opposed to or inconsistent with any such standard. In the event that the Secretary exercises the authority conferred by this paragraph, he shall pay to the owner of the right so terminated an amount equal to the fair market value of the portion of said right which remained on the date of termination.

(b) Suspension of authority for one year and during existence of zoning regulations

(1) The Secretary's authority to acquire property by condemnation shall be suspended with respect to all improved property located within such area in all of the towns referred to in section 459b of this title for one year following August 7, 1961.

(2) Thereafter such authority shall be suspended with respect to all improved property located within such area in any one of such towns during all times when such town shall have in force and applicable to such property a duly adopted, valid zoning bylaw approved by the Secretary in accordance with the provisions of section 459b–4 of this title.

(c) Suspension of authority respecting property used for commercial or industrial purposes

The Secretary's authority to acquire property by condemnation shall be suspended with respect to any particular property which is used for commercial or industrial purposes during any periods when such use is permitted by the Secretary and during the pendency of the first application for such permission made to the Secretary after August 7, 1961 provided such application is made not later than the date of establishment of the seashore.

(d) "Improved property" defined

The term "improved property," wherever used in sections 459b to 459b–8 of this title,

shall mean a detached, one-family dwelling the construction of which was begun before September 1, 1959 (hereinafter referred to as "dwelling"), together with so much of the land on which the dwelling is situated, the said land being in the same ownership as the dwelling, as the Secretary shall designate to be reasonably necessary for the enjoyment of the dwelling for the sole purpose of noncommercial residential use, together with any structures accessory to the dwelling which are situated on the land so designated. The amount of the land so designated shall in every case be at least three acres in area, or all of such lesser amount as may be held in the same ownership as the dwelling, and in making such designation the Secretary shall take into account the manner of noncommercial residential use in which the dwelling and land have customarily been enjoyed: *Provided, however,* That the Secretary may exclude from the land so designated any beach or waters, together with so much of the land adjoining such beach or waters as the Secretary may deem necessary for public access thereto.

(e) Acquisition of clear, marketable and encumbrance-free title

Nothing in this section or elsewhere in sections 459b to 459b-8 of this title shall be construed to prohibit the use of condemnation as a means of acquiring a clear and marketable title, free of any and all encumbrances.

(Pub. L. 87-126, § 4, Aug. 7, 1961, 75 Stat. 288.)

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 459b-1, 459b-2, 459b-4 to 459b-8 of this title.

§ 459b-1. Zoning regulations

(a) Standards for approval; submission to Congress and municipalities; publication in Federal Register; approval of local bylaws; revocation of approval

As soon after August 7, 1961, as may be practicable, the Secretary shall issue regulations specifying standards for approval by him of zoning bylaws for purposes of section 459b-3 of this title. The Secretary may issue amended regulations specifying standards for approval by him of zoning bylaws whenever he shall consider such amended regulations to be desirable due to changed or unforeseen conditions.

All regulations and amended regulations proposed to be issued under authority of the two preceding sentences of this subsection shall be submitted to the Congress and to the towns named in section 459b of this title at least ninety calendar days (which ninety days, however, shall not include days on which either the House of Representatives or the Senate is not in session because of an adjournment of more than three calendar days to a day certain) before they become effective and the Secretary shall, before promulgating any such proposed regulations or amended regulations in final form, take due account of any suggestions for their modification which he may receive during said ninety-day period. All such regulations and amended regulations shall, both in their proposed form and in their final form, be published in the Federal Register.

The Secretary shall approve any zoning bylaw and any amendment to any approved zoning bylaws submitted to him which conforms to the standards contained in the regulations in effect at the time of the adoption by the town of such bylaw or such amendment unless before the time of adoption he has submitted to the Congress and the towns and published in the Federal Register as aforesaid proposed amended regulations with which the bylaw or amendment would not be in conformity, in which case he may withhold his approval pending completion of the review and final publication provided for in this subsection and shall thereafter approve the bylaw or amendment only if it is in conformity with the amended regulations in their final form. Such approval shall not be withdrawn or revoked, nor shall its effect be altered for purposes of section 459b-3 of this title by issuance of any such amended regulations after the date of such approval, so long as such bylaw or such amendment remains in effect as approved.

(b) Commercial and industrial use prohibition; acreage, frontage, setback and miscellaneous requirements

The standards specified in such regulations and amended regulations for approval of any zoning bylaw or zoning bylaw amendment shall contribute to the effect of (1) prohibiting the commercial and industrial use, other than any commercial or industrial use which is permitted by the Secretary, of all property within the boundaries of the seashore which is situated within the town adopting such bylaw; and (2) promoting the preservation and development, in accordance with the purposes of sections 459b to 459b-8 of this title, of the area comprising the seashore, by means of acreage, frontage, and setback requirements and other provisions which may be required by such regulations to be included in a zoning bylaw consistent with the laws of Massachusetts.

(c) Adverse provisions and absence of notice for variance as requiring disapproval of local bylaws

No zoning bylaw or amendment of a zoning bylaw shall be approved by the Secretary which (1) contains any provision which he may consider adverse to the preservation and development, in accordance with the purposes of sections 459b to 459b-8 of this title, of the area comprising the seashore, or (2) fails to have the effect of providing that the Secretary shall receive notice of any variance granted under and any exception made to the application of such bylaw or amendment.

(d) Termination of suspension of authority for acquisition by condemnation because of nonconforming variances and uses; agreements concerning exercise of authority

If any improved property with respect to which the Secretary's authority to acquire by condemnation has been suspended by reason of the adoption and approval, in accordance with the foregoing provisions of this section, of a zoning bylaw applicable to such property (hereinafter referred to as "such bylaw")—

(1) is made the subject of a variance under or an exception to such bylaw, which variance or exception fails to conform or is in any manner opposed to or inconsistent with any applicable standard contained in the regulations issued pursuant to this section and in effect at the time of the passage of such bylaw, or

(2) is property upon or with respect to which there occurs any use, commencing after the date of the publication by the Secretary of such regulations, which fails to conform or is in any manner opposed to or inconsistent with any applicable standard contained in such regulations (but no use which is in conformity with the provisions of such bylaw shall be held to fail to conform or be opposed to or inconsistent with any such standard),

the Secretary may, at any time and in his discretion, terminate the suspension of his authority to acquire such improved property by condemnation: *Provided, however,* That the Secretary may agree with the owner or owners of such property to refrain from the exercise of the said authority during such time and upon such terms and conditions as the Secretary may deem to be in the best interests of the development and preservation of the seashore.

(Pub. L. 87-126, § 5, Aug. 7, 1961, 75 Stat. 290.)

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 459b-1 to 459b-3, 459b-5 to 459b-8 of this title.

§ 459b-5. Certificate of suspension of authority for acquisition by condemnation

The Secretary shall furnish to any party in interest requesting the same, a certificate indicating, with respect to any property located within the seashore as to which the Secretary's authority to acquire such property by condemnation has been suspended in accordance with the provisions of sections 459b to 459b-8 of this title, that such authority has been so suspended and the reasons therefor.

(Pub. L. 87-126, § 6, Aug. 7, 1961, 75 Stat. 291.)

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 459b-1 to 459b-4, 459b-6 to 459b-8 of this title.

§ 459b-6. Administration of acquired property

(a) Utilization of authority for conservation and management of natural resources

Except as otherwise provided in sections 459b to 459b-8 of this title, the property acquired by the Secretary under such sections shall be administered by the Secretary subject to the provisions of sections 1 and 2 to 4 of this title, as amended and supplemented, and in accordance with laws of general application relating to the national park system as defined by sections 1b to 1d of this title; except that authority otherwise available to the Secretary for the conservation and management of natural resources may be utilized to the extent he finds such authority will further the purposes of sections 459b to 459b-8 of this title.

(b) Preservation of seashore; incompatible visitor conveniences restricted; provisions for public enjoyment and understanding; developments for recreational activities; public use areas

(1) In order that the seashore shall be permanently preserved in its present state, no development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing or with the preservation of such historic sites and structures as the Secretary may designate: *Provided,* That the Secretary may provide for the public enjoyment and understanding of the unique natural, historic, and scientific features of Cape Cod within the seashore by establishing such trails, observation points, and exhibits and providing such services as he may deem desirable for such public enjoyment and understanding: *Provided further,* That the Secretary may develop for appropriate public uses such portions of the seashore as he deems especially adaptable for camping, swimming, boating, sailing, hunting, fishing, the appreciation of historic sites and structures and natural features of Cape Cod, and other activities of similar nature.

(2) In developing the seashore the Secretary shall provide public use areas in such places and manner as he determines will not diminish for its owners or occupants the value or enjoyment of any improved property located within the seashore.

(c) Hunting and fishing regulations; navigation

The Secretary may permit hunting and fishing, including shellfishing, on lands and waters under his jurisdiction within the seashore in such areas and under such regulations as he may prescribe during open seasons prescribed by applicable local, State and Federal law. The Secretary shall consult with officials of the Commonwealth of Massachusetts and any political subdivision thereof who have jurisdiction of hunting and fishing, including shellfishing, prior to the issuance of any such regulations, and the Secretary is authorized to enter into cooperative arrangements with such officials regarding such hunting and fishing, including shellfishing, as he may deem desirable, except that the Secretary shall leave all aspects of the propagation and taking of shellfish to the towns referred to in section 459b of this title.

The Secretary shall not interfere with navigation of waters within the boundaries of the Cape Cod National Seashore by such means and in such areas as is now customary.

(Pub. L. 87-126, § 7, Aug. 7, 1961, 75 Stat. 291.)

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 459b-1 to 459b-5, 459b-7, 459b-8 of this title.

§ 459b-7. Cape Cod National Seashore Advisory Commission

(a) Establishment; termination

There is established a Cape Cod National Seashore Advisory Commission (hereinafter referred to as the "Commission"). Said Commis-

sion shall terminate 30 years after the date the seashore is established under section 459b–2 of this title.

(b) Membership; term

The Commission shall be composed of ten members each appointed for a term of two years by the Secretary as follows:

(1) Six members to be appointed from recommendations made by each of the boards of selectmen of the towns referred to in section 459b of this title, one member from the recommendations made by each such board;

(2) One member to be appointed from recommendations of the county commissioners of Barnstable County, Commonwealth of Massachusetts;

(3) Two members to be appointed from recommendations of the Governor of the Commonwealth of Massachusetts; and

(4) One member to be designated by the Secretary.

(c) Chairman; vacancies

The Secretary shall designate one member to be Chairman. Any vacancy in the Commission shall be filled in the same manner in which the original appointment was made.

(d) Compensation and expenses

A member of the Commission shall serve without compensation as such. The Secretary is authorized to pay the expenses reasonably incurred by the Commission in carrying out its responsibilities under sections 459b to 459b–8 of this title upon vouchers signed by the Chairman.

(e) Majority vote

The Commission established by this section shall act and advise by affirmative vote of a majority of the members thereof.

(f) Consultation of Secretary with Commission

The Secretary or his designee shall, from time to time, consult with the members of the Commission with respect to matters relating to the development of Cape Cod National Seashore and shall consult with the members with respect to carrying out the provisions of sections 459b–3 and 459b–4 of this title.

(g) Advice of Commission for commercial or industrial use permits and establishment of public use areas for recreational activities

No permit for the commercial or industrial use of property located within the seashore shall be issued by the Secretary, nor shall any public use area for recreational activity be established by the Secretary within the seashore, without the advice of the Commission, if such advice is submitted within a reasonable time after it is sought.

(h) Exemption from other provisions of law

(1) Any member of the Advisory Commission appointed under sections 459b to 459b–8 of this title shall be exempted, with respect to such appointment, from the operation of sections 281, 283, 284, and 1914 of title 18 and section 190 of the Revised Statutes (5 U.S.C. 99) [1] except as otherwise specified in paragraph (2) of this subsection.

(2) The exemption granted by paragraph (1) of this subsection shall not extend—

(i) to the receipt or payment of salary in connection with the appointee's Government service from any sources other than the private employer of the appointee at the time of his appointment; or

(ii) during the period of such appointment, and the further period of two years after the termination thereof, to the prosecution or participation in the prosecution, by any person so appointed, of any claim against the Government involving any matter concerning which the appointee had any responsibility arising out of his appointment during the period of such appointment.

(Pub. L. 87–126, § 8, Aug. 7, 1961, 75 Stat. 292; Pub. L. 99–420, title II, § 201, Sept. 25, 1986, 100 Stat. 960.)

[1] See References in Text note below.

REFERENCES IN TEXT

Sections 281, 283, 284, and 1914 of title 18, referred to in subsec. (h)(1), were repealed by Pub. L. 87–849, § 2, Oct. 23, 1962, 76 Stat. 1126, "except as they [sections 281 and 283] may apply to retired officers of the armed forces of the United States", and were supplanted by sections 203, 205, 207, and 209, respectively, of Title 18, Crimes and Criminal Procedure. For further details, see Exemptions note set out under section 281 of Title 18.

Section 190 of the Revised Statutes (5 U.S.C. 99), referred to in subsec. (h)(1), was repealed by Pub. L. 87–849, § 3, Oct. 23, 1962, 76 Stat. 1126. See section 207 of Title 18.

AMENDMENTS

1986—Subsec. (a). Pub. L. 99–420 substituted "30 years" for "ten years".

REESTABLISHMENT AND EXTENSION OF COMMISSION

Pub. L. 99–349, title I, July 2, 1986, 100 Stat. 731, provided: "That the Cape Cod National Seashore Advisory Commission established under section 8(a) of the Act of August 7, 1961 (Public Law 87–126; 75 Stat. 292) [16 U.S.C. 459b–7(a)] is reestablished and extended through February 28, 1996".

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 459b–1 to 459b–6, 459b–8 of this title.

§ 459b–8. Authorization of appropriations

There are authorized to be appropriated such sums as may be necessary to carry out the provisions of sections 459b to 459b–8 of this title; except that no more than $42,917,575 shall be appropriated for the acquisition of land and waters and improvements thereon, and interests therein, and incidental costs relating thereto, in accordance with the provisions of such sections.

(Pub. L. 87–126, § 9, Aug. 7, 1961, 75 Stat. 293; Pub. L. 91–252, May 14, 1970, 84 Stat. 216; Pub. L. 98–141, § 3, Oct. 31, 1983, 97 Stat. 909.)

AMENDMENTS

1983—Pub. L. 98–141 substituted "$42,917,575" for "$33,500,000".

1970—Pub. L. 91–252 substituted "$33,500,000" for "$16,000,000".

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 459b–1 to 459b–7 of this title.

AUTHORIZATION OF CONVEYANCE OF COMMONWEALTH LANDS

Chapter 777
THE COMMONWEALTH OF MASSACHUSETTS

IN THE YEAR ONE THOUSAND NINE HUNDRED AND SIXTY-TWO, AN ACT authorizing and directing conveyance of certain lands to the United States of America.

WHEREAS, the deferred operation of this Act would tend to defeat its purposes, which is to forthwith for the Commonwealth to convey to the United States of America certain lands to effect establishment of the Cape Cod National Seashore, therefore it is hereby declared to be an emergen necessary for the immediate preservation of the public health and convenience.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the a of the same as follows:

SECTION 1. The Commissioner of Public Works, acting in the name and on behalf of the Commo is hereby authorized and directed to convey, without consideration, to the United States of America, all t title and interest of the Commonwealth in and to so much of the Province Lands in the Town of Provin except that part thereof which is described in Chapter Seven Hundred and One of the Acts of Nineteen H and Sixty-two, and to so much of any other lands under the jurisdiction or control of the Department of Works in the Town of Truro, including, in each instance, buildings thereon and lands covered by water, as ated within the boundaries of the Cape Cod National Seashore, as described in Section One of Public L 126.

SECTION 2. The Commissioner of Natural Resources, acting in the name and on behalf Commonwealth, is hereby authorized and directed to convey without consideration to the United St America, all the right, title and interest of the Commonwealth and to so much of the Pilgrim Spring Stat and, in and to so much of any other land under the jurisdiction or control of the Department of Natural Re in the town of Truro, including in each instance buildings thereon and lands covered by water, as is within the boundaries of the Cape Cod National Seashore as described in Section One of Public Law 87-12

SECTION 3. The Deed of Conveyance under Section One shall provide

(1) That a portion of the lands so conveyed is subject to a lease between the Commonwealth a Town of Provincetown, dated January second, Nineteen Hundred and Sixty-one, for public airport and purposes;

(2) That such additional area as shall be agreed upon between the Secretary of the Interior, designee, and the Town of Provincetown, acting through its Airport Commission, shall be made availab lease or otherwise to said Town for public airport and access purposes;

(3) That such area as may be agreed upon between the Secretary of the Interior, or his designee, a said Town acting through its duly authorized representative, shall be made available to said Town for di purposes;

(4) That in the case of disagreement under sub-paragraphs (2) or (3) of this section, the matter sh submitted to arbitration, each party to select one arbitrator, and said arbitrators so chosen, to select a arbitrator, and that the decisions of such arbitrators shall be binding on both parties.

SECTION 4. The Deeds of Conveyance under Sections One and Two shall provide

(1) That the jurisdiction of the United States of America over and within the lands so conveyed sh proprietary only; that the Commonwealth shall continue to exercise all of the jurisdiction, power and auth possessed by it on or before the effective date of this Act over and within the land so conveyed, including right to serve criminal or civil process, and the right to tax persons and corporations, their franchises property; and that persons residing on such lands shall have the right to vote at all primaries and elections w the town and county in which said lands are located.

(2) That the Secretary of the Interior may permit hunting and fishing, including shellfishing, on lands and waters under his jurisdiction within the Cape Cod National Seashore in such areas and under such regulations as he may prescribe during open seasons prescribed by applicable local, state and federal law; that said Secretary shall consult with officials of the Commonwealth and any political subdivision thereof who have jurisdiction of hunting and fishing, including shellfishing, prior to the issuance of any such regulations; that said Secretary is authorized to enter into cooperative arrangements with such officials regarding such hunting and fishing, including shellfishing, as he may deem desirable, except that he shall leave all aspects of the propagation and taking of shellfish to the towns referred to in Section One of Public Law 87-126; and that the fishing rights of the public shall be the same in the coastal waters within the Cape Cod National Seashore as prior to such conveyances.

(3) That the Commonwealth, through the State Reclamation Board and the Cape Cod Mosquito Control Project, or its successor, shall continue to provide for the control of mosquitoes and greenhead flies in the lands so conveyed, and shall have the right to construct and maintain such ditches, culverts, dams and any other installations on the lands so conveyed as may be necessary for the proper control of mosquitoes and greenhead flies.

(4) That if at any time the United States of America fails to use the lands so conveyed for the purposes in said Public Law 87-126, the title to such lands shall revert to and revest in the Commonwealth.

APPROVED July 26, 1962

TOWN OF EASTHAM
TO
UNITED STATES OF AMERICA
QUITCLAIM DEED
COAST GUARD BEACH AREA

TOWN OF EASTHAM, a municipal corporation duly organized and existing by law in the County of Barnstable and Commonwealth of Massachusetts, acting by and through its Board of Selectmen, in consideration of these premises, grants to the UNITED STATES OF AMERICA and its assigns with quitclaim covenants the parcel of land and beach known as "Coast Guard Beach" located in Eastham, Barnstable County, Commonwealth of Massachusetts shown as Parcels No. 25, No. 26, No. 27 and No. 31, Block 17, Sheet 4A on the Eastham Assessor's Map bounded and described as follows:

[descriptions of parcels not included]

All of said boundaries, except the water lines, are determined by the Court to be located as shown on subdivision plan 8939-D dated March 5, 1929. . . .

Said land is conveyed subject to the express condition that the Taxpayers of the Town of Eastham and their families shall have the right to use the above described beach and other beaches developed by the National Park Service within the Town of Eastham together with the adjacent parking areas without charge, and reserving to property owners the right to pass and repass over the same by existing or future ways between the Town Road and the property lying Southerly of the above described premises, and to use said ways as ways are commonly used in the Town of Eastham; and whenever the Cape Cod National Seashore Park Service does not use the same for the purposes as stated, said beach and land are to revert to the Inhabitants of the Town of Eastham.

After transferring all rights of way and easements in the Town ways, described below, reserving full rights of way to the taxpayers of the Town of Eastham, and their families and/or tenants, the right to use the same as now located and as they may hereafter be relocated by the National Park Service, as ways are commonly used in the Town of Eastham viz: Nauset Road from its intersection with Route 6 running thence Easterly and Northerly a distance of about eight-tenths (.8) mile to the intersection of Doane Road; and Doane Road from the intersection of Nauset Road running thence Easterly and Southerly a distance of about one and one-tenth (1.1) mile to Coast Guard Beach, so called, said roads to be maintained, policed, and kept in good repair by the National Park Service; and whenever the Cape Cod National Seashore Park Service does not use for the purposes as stated, the said Town ways are to revert to the Inhabitants of the Town of Eastham.

The Vote of the Inhabitants of the Town of Eastham in meeting assembled February 18, 1963 authorizing this conveyance is attached hereto.

Intending hereby to convey with quitclaim covenants to the United States of America and its assigns all right, title or interest which the grantors may have in the banks, beds and waters of any streams or ponds adjacent to or fronting upon said land in any alleys, roads, streets, ways, strips, gores, or railroad rights of way abutting or adjoining said land, and in any means of ingress or egress appurtenant thereto.

This conveyance is subject to existing easements for public roads and highways, for public utilities, railroads and pipelines.

Excepting, however, to the Town all aspects of the propagation and taking of shellfish in connection with the above described land and beach. The consideration being nominal, no revenue stamps are required.

In witness whereof the Town of Eastham has caused its seal to be affixed hereto and these presents executed for and in its behalf by the undersigned the Board of Selectmen hereunto duly authorized this 3rd day of June 1963.

TOWN OF EASTHAM
BY:
/s/ Maurice W. Wiley
/s/ Luther P. Smith
/s/ Maurice A. Moore

TOWN OF EASTHAM
TO
UNITED STATES OF AMERICA
QUITCLAIM DEED
NAUSET LIGHT BEACH AREA

TOWN OF EASTHAM, a municipal corporation duly organized and existing by law in the County of Barnstable and Commonwealth of Massachusetts, acting by and through its Board of Selectmen, for consideration paid, grants to the UNITED STATES OF AMERICA and its assigns all its right, title and interest in and to certain parcels of land situate in Eastham, Barnstable County, Commonwealth of Massachusetts more particularly described as follows:

* * * * *

PARCEL THREE

That parcel of land and beach known as "Nauset Light Beach" comprised of the following Lots:

[lot description not included]

All of said boundaries are determined by the Court to be located as shown on subdivision plan 17649-B dated Sept. 15, 1943. . . .

Containing one acre of land more or less.

Reserving to the taxpayers of Eastham, and their families, the right to use the above described beach and adjacent waters for swimming, the adjacent parking area, and without charge. Provided however, that whenever the Cape Cod National Seashore Park Service does not use the same for purposes as above stated, the said beach and land are to revert to the Inhabitants of the Town of Eastham.

* * * * *

PARCEL FOUR

Rights of way and easements in the below described Town way: viz: Cable Road from its' [sic] intersection with Nauset Road and running East to its' [sic] termination at the Atlantic Ocean.

Reserving full rights of way to those persons legally entitled thereto and to the taxpayers of the Town of Eastham and their families and/or tenants the right to use the same as ways are commonly used in the Town of Eastham both now and hereafter over the same.

Provided, however, that said road be maintained, policed and kept in good repair by the National Park Service as a free point of access for the taxpayers of the Town of Eastham and their families and/or tenants to the bathing beaches; and provided further that whenever the Cape Cod National Seashore Park Service does not use the same for the purposes as stated, the Town ways are to revert to the Inhabitants of the Town of Eastham.

* * * * *

In witness whereof the Town of Eastham has caused its seal to be affixed hereto and these presents to be executed for and in its behalf by the undersigned the Board of Selectmen hereunto duly authorized this 25th day of January 1965.

TOWN OF EASTHAM
BY:
/s/ Fred G. LaPiana, Jr.
/s/ Luther P. Smith
/s/ Maurice A. Moore

Chapter 360

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Eighty-four

AN ACT CEDING TO THE UNITED STATES OF AMERICA CONCURRENT JURISDICTION OVE
UNITS OF THE NATIONAL PARK SERVICE IN THE COMMONWEALTH.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the author of the same, as follows:

SECTION 1. The commonwealth hereby cedes concurrent jurisdiction over those lands and buildi hereinafter provided and administered by the National Park Service of the United State Department of Interior.

The lands and buildings so included are as follows:

* * * * *

(d) Cape Cod National Seashore, in the towns of Chatham, Orleans, Eastham, Truro, Provincetown Wellfleet, as described in a plan of land titled "Boundary Map, Cape Cod National Seashore", dated Febru 1978.

* * * * *

SECTION 2. Said concurrent jurisdiction shall be vested upon acceptance by the United States of Ame when the Director of the National Park Service files a notice of such acceptance with the governor and the s secretary.

SECTION 3. Exclusive jurisdiction in and over such tracts shall revert to and revest in the commonwe whenever such tracts shall cease to be used for the purpose set forth in section one.

House of Representatives, December 11, 19

Passed to be enacted, /s/ Thomas W. McGee, Spe

In Senate, December 12, 19

Passed to be enacted /s/ William M. Bulger, Presi

December 18, 1984

Approved,

/s/ Michael J. Dukakis, Governor

Appendix D

Comment Letters Received from Agencies and Organizations

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

June 15, 2006

George E. Price, Jr.
Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

RE: Comments on the Draft Environmental Impact Statement, Cape Cod National Seashore Hunting Program

The Massachusetts Division of Fisheries & Wildlife (MDFW) offers the following comments concerning draft alternatives "A" through "C" and associated elements of the Draft Environmental Impact Statement, Cape Cod National Seashore Hunting Program.

Pheasant hunting is a traditional important recreational activity on lower Cape Cod. Since the early 1900's MDFW has been stocking pheasants on state-owned lands that were transferred to the National Park Service for $1.00 to when the Cape Cod National Seashore was established. At the time of transfer, there was an implicit understanding that traditional hunting would be continued on Seashore lands. Further, there are no other existing suitable stocking areas for pheasant hunting on the lower Cape Cod region outside of the Seashore boundaries. A1

Not only has pheasant stocking been a long-standing tradition prior to the creation of the Cape Cod National Seashore, but it also has been continually supported by the National Park Service without any evidence of adverse impacts or impairments to park values. A2

There is nothing inconsistent with National Park Service polices relative to the stocking program based on either existing enabling legislation, National Park Service Management Plan Policies, Seashore General Management Plans / Environmental Impact Statements, or National Park Service Natural Resource Management Guidelines. A3

As you are aware, a waiver of Management Policies regarding pheasant stocking and hunting at Cape Cod National Seashore was requested by the Regional Director of the National Park Service's Northeast Region in a memorandum dated October 7, 2002 for the purposes of allowing "the pheasant stocking / hunting program to continue uninterrupted while we continue to examine options for phasing it out." A4

However, the 2002 waiver is clear that pheasant stocking and hunting has continued at the Seashore consistent with National Park Service policies based on the following:

1) Hunting is permitted by enabling legislation (16 U.S.C. S459b-6(c)) for the Cape Cod National Seashore.

2) 2001 NPS Management Policies (MP), section MP 4.4.3 permits the "harvesting of stocked species for recreational purposes where it has historically been conducted and when it will not impair park natural resources or process, but only in national recreation areas or preserves..." which is consistent with the enabling legislation (16 U.S.C. S459b-6(c)) which refers to the Cape Cod National Seashore under Chapter 1 National Parks, Military Parks, Monuments, and Seashores and Subchapter LXIII National Seashore Recreational Areas designating the Seashore as a recreation area.

   While there has been a question as to whether this section applies to National Seashores, the 2006 Draft NPS Management Policies, section 4.4.3 (Harvest of Plants and Animals) proposes that "In some situations, the Service may stock native or exotic animals for recreational harvesting purposes, but only when...such stocking is in an area that has continually been stocked by a government agency (in these same situations, stocking only of the same species may be continued)..."

3) The 1998 General Management Plan (GMP) and resulting EIS called for the Seashore to "develop a comprehensive management program for the management of invasive and non-native species." A study of pheasant stocking and potential impacts (the Bump Study) found that there were no impacts or risks to the Seashore resources by the program.

4) The 2002 waiver of policy also reported that according to Seashore staff, "there is no impairment from this program under the Organic Act" and likewise no impairment of park values. The waiver further states that "although some language in MP gives clear guidance that stocking of non-natives is inappropriate, there is also language in several section that, taken as a whole, gives the manager some discretion when impairment does not occur."

5) MP 4.4.4.1 says "In general, new exotic species will not be introduced in parks" which clearly does not apply to pheasants in this case as substantial stocking of pheasants by MDFW which had occurred on state-owned lands that were later transferred to the National Park Service for $1.00 to create the Cape Cod National Seashore.

6) NPS-77 (Exotic Species Management) says that "exotic species...may be introduced to carry out NPS programs consistent with park objectives only when all of the following conditions exist:

A5

- Available native species will not meet the needs of the program
- Based on scientific advice from appropriate federal, state, local and non-governmental sources, the exotic species will not become a pest.
- Such introductions will not spread and disrupt desirable adjacent natural plant and animal communities and associations, particularly those of natural zones."

NOTE: The transition of NPS-77 into Reference Manual #77 is in progress. Some sections are still being revised including "Non-native Species Management" and "Hunting and Trapping" sections.

7) Seashore staff review of MP and NPS-77 ("Exotic Species Management" section of the Natural Resource Management Guideline, issued in 1991 under the previous NPS guideline series) determined that these policies are not in conflict with allowing the program to continue provided that there are no adverse impacts.

   Further, it is stated that Seashore staff believe that pheasants meet the definition of "innocuous species" in NPS-77 and, therefore the document provides a "general approach" to dealing with pheasants based on NPS-77 reference to "Management efforts should not be squandered on innocuous species."

8) There have been no safety incidents or issues related to pheasant hunting on the park property according Seashore staff.

9) The Seashore recognizes that pheasant hunting has been a long-standing valuable traditional recreational activity on lower Cape Cod with a dedicated clientele.

A5

For these reasons, **MDFW fully supports and recommends Alternative A – No Action.**

Alternative B – Develop an Improved Hunting Program – Preferred and Environmentally Preferred Alternative

MDFW is opposed to certain language proposed in Alternative B "Element 1: Apply Adaptive Management to Phasing Out the Pheasant Stocking and Hunting Program", but supports Elements 2 through 4 as described below.

Specifically, MDFW is opposed to Element 1 of Alternative B which proposes an arbitrary 15-year elimination of the pheasant stocking and hunting program independent of the success or failure of upland game bird restoration activities to provide upland game bird hunting opportunities commensurate to a "stocked pheasant hunt". The arbitrary 15-year phase-out deadline is not substantiated by any scientific or documented experiences related to successful native upland game bird habitat restoration nor to achieving native game bird levels that would be commensurate to existing pheasant hunting opportunities.

A6

Furthermore, the rigid phase-out approach is not consistent with the "adaptive strategy" proposed in the Element 1 of Alternative B which implies that management would respond adaptively to corresponding ecological conditions on the landscape that result in commensurate levels of native upland game bird opportunities rather than on a deadline basis. A truly adaptive approach in this case would be a pheasant stocking program that is responsive and sensitive to the hunter demand for pheasant hunting opportunities independent of native upland game bird habitat restoration. A6

While MDFW strongly supports Seashore efforts proposed in Element 3B of Alternative B to restore and expand grassland, heathland, and other early-successional habitats for a diversity of species including native upland game birds, the presumed resulting increase in native game birds in Element 1 does not offer an equivalent substitute to the hunting opportunities and experiences provided by the pheasant program. Pheasants offer a unique recreational hunting experience particularly based on their size, behaviors, and aesthetics. A7

In regards to the proposed monitoring of pheasant hunter effort and take within Element 1, MDFW does not have sufficient resources at this time to undertake such a monitoring effort of the pheasant stocking program on the Seashore. A8

Element 2 – Simplify and Clearly Delineate Hunting Areas
MDFW questions the Seashore's proposed hunting buffer increase adjacent to paved bike paths from 150 feet to 500 feet. The existing setback of 150 feet from paved bike paths on the Seashore is entirely consistent with state statute (M.G.L. Chapter 131, Section 58) which has proven to be an ample setback. A9

Element 3 – Alter Hunted Species and Hunting Seasons
MDFW has and will continue to support and encourage the establishment of turkey hunting on the Cape Cod National Seashore as a valuable recreational activity and use of this restored wildlife resource as proposed in Element 3A. A10

Relative to "Element 3C – Wildlife and Hunting Monitoring", MDFW welcomes a wildlife monitoring program on the Seashore that can provide information that complements information from wildlife monitoring programs conducted by MDFW. MDFW also welcomes the National Park Service efforts in studying and monitoring New England cottontail on the Seashore and believes that such a program may provide valuable information in managing New England cottontail populations statewide. MDFW recommends that further study and data is necessary before any modifications are made to the existing rabbit hunting program. A11

Element 4: Improve Hunter and Non-hunter Information:
MDFW has and will continue to encourage information, education, and outreach to the public regarding wildlife and hunting. A12

MDFW is completely opposed to Alternative C – Eliminate Hunting
Alternative C is clearly inconsistent with the Cape Cod National Seashore's enabling legislation (16 U.S.C. S459b-6(c)) that provides the statutory authority and recognition for hunting as a legitimate recreational activity on the Seashore and further authorizes the Secretary of the Interior to enter into cooperative arrangements with officials of the Commonwealth of Massachusetts who have jurisdiction of hunting.

A13

Sincerely,

Wayne F. MacCallum

Wayne F. MacCallum, Director

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June 19, 2006

George E. Price, Jr.
Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Attention: EIS 20060143 – Cape Cod National Seashore Hunting Program

Dear Superintendent Price:

We are writing on behalf of more than nine million members and constituents of our organizations, of whom more than 351,000 reside in Massachusetts, to submit comments on the "Draft Environment Impact Statement, Cape Cod National Seashore (CACO), Hunting Program" (hereafter, DEIS). We have been concerned about your hunting program, most especially the practice of pheasant stocking, for some time and wish to maintain a strong record of public comment on the issues. As we describe in greater detail below, the DEIS fails to address the main controversial issues before NPS at the National Seashore, and its decision to continue the general hunting program, including the evaluation of the program's impacts, is wholly unsupported and biased. Moreover, the continuation of the pheasant stocking program is utterly unjustified by science, precedent, or common sense, and the evaluation of the program's impacts is oblique, completely one-sided and outcome-oriented

B1

The Court in *The Fund for Animals v. Mainella* held that the National Park Service (NPS) was required to complete an environmental impact statement of the effects of hunting on the National Seashore in compliance with the National Environmental Policy Act (NEPA). We find the analysis and conclusions in the DEIS as falling far short of satisfying even the most basic requirements of the NEPA. The DEIS fails to identify and evaluate significant biological, ecological and social impacts and does not contain an impartial, science-based review of the current hunting program and alternatives. The cumulative impact analysis and justification for the chosen alternative are based on data and hypotheses that are often insufficient and incorrect. The selection of alternatives is arbitrary and no discussion of other reasonable alternatives is considered.

B2

The interests of key affected groups, including those concerned with animal welfare issues, but also those concerned about population status and species conservation of the animals hunted on the National Seashore, are dismissed or

B3

ignored without fair consideration. As will be delineated below in greater detail, the agency decision is based on unsupported, speculative, and false premises and is, therefore, an arbitrary and capricious decision that cannot be justified in law.

B3

Moreover, NPS is violating its own core mission in presenting and defending its preferred alternative in this document. That mission, as described in the National Park Service Organic Act and amendments thereto establishes the fundamental purpose of the parks as being "...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."[1] Instead of complying with the mission, the DEIS reads as a defense of the very exploitation of federal lands for recreational and consumptive activities that NPS was created to prevent. Where NPS should be promulgating and advancing activities to protect the ecologically sensitive biotic communities on this National Seashore, the agency instead does the opposite. This action stands in stark contrast to the purpose, policies, philosophy and mandates of NPS.

B4

The failings of NPS in this matter are pervasive and substantial and shake the very foundation of NPS' goals and mission statement. The people of the United States have long entrusted the NPS to be the national leader in natural resource protection and conservation. The National Parks, as clearly indicated through the Organic Act of 1916 and all subsequent statements of management are designed to be areas where protection, conservation and preservation have substantive meaning. They are places where Americans can seek out the natural beauty of our lands in as unaltered a state as possible, and where park visitors derive pleasure and satisfaction from knowing that they will remain that way. The NPS' decision to allow hunting on the Seashore shatters that trust and violates the very essence of the National Park System and discredits the work of those who defend protected lands against preventable human intrusions.

B5

This DEIS must be withdrawn and completely recast to (1) address the ecological conditions and relationships between the animal and plant species under protection and the effect of hunting on those species, (2) equate the policies and practices under which consumptive activities are so liberally and indiscriminately allowed in such apparent disregard for core agency values, (3) admit that virtually no information exists on the status and condition of hunted species in the park and that speculations as to the absence of effect from hunting are nothing more than that, and (4) critically examine the defense that hunting is a cultural tradition whose disallowance on the National Seashore would substantially affect the human environment.

B6

We address specific points pertinent to the general criticisms below.

[1] 16 U.S.C. 1 2 3 and 4; Act of Aug. 25 1916 (39 Stat. 535)

Purpose of the Proposed Action

The purpose described in the DEIS predetermines the outcome of the analysis: the DEIS enumerates a series of statements[2] to describe the purpose of the proposed action in ways that are antithetical to the language and spirit of NEPA, which seeks the consideration of the broadest range of alternatives that can reasonably be implemented. Not surprisingly, under the narrow confines of the statement of purpose which is predicated on the continuation of hunting, the range of alternatives is severely limited and completely biased toward the retention of hunting. The first part of the purpose ("manage hunting") is explicitly based on an assumption that hunting will continue on the Cape Cod National Seashore. This dismisses out of hand Alternative C – No Hunting – and makes it impossible for the DEIS to give serious consideration to that alternative. B7

Further evidence that the purpose of the proposed action predetermines a specific outcome appears in a chart comparing the three alternatives where the NPS presents issues under each of the main goals.[3] The authors of the DEIS state only two issues under Goal 4 ("Provide opportunities for future generations to enjoy the natural and cultural resources, cultural heritage, and recreation values of CACO"): "Provide hunting opportunities for future generations" and "Provide enough land area for future hunting opportunities."[4] This is unreasonably narrow in scope and realistically allows for only those alternatives that incorporate some form of consumptive use, i.e. hunting. The FEIS must evaluate whether each of the alternatives provide other kinds of opportunities for future generations to enjoy CACO, including wildlife watching and other kinds of recreation, such as walking, bicycling and photography. B8

Agency decision makers and the courts have long recognized the importance of defining the stated purpose of an Environmental Impact Statement in broad terms to elicit the greatest amount of relevant information possible and to meet the requirements of the National Environmental Policy Act. The Council on Environmental Quality, in correspondence with the Department of Transportation, cautioned agencies against

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[2] DEIS, p. 1:

1. manage hunting to minimize effects to wildlife population resources and ecosystems and to sustain natural processes;
2. manage hunters, and non-hunters to reduce or avoid wildlife and human conflicts;
3. protect natural and cultural resources, cultural heritage, and recreational values;
4. provide opportunities for future generations to enjoy the natural and cultural resources, cultural heritage, and recreational values of the CACO; and
5. develop management solutions that address potential concerns related to the current hunting program to ensure diverse and high quality public experiences.

[3] DEIS p. 65-67

[4] DEIS p. 66

defining the purpose of an EIS "so narrowly as to define competing 'reasonable alternatives' out of consideration (and even out of existence)."[5]

A revised purpose must correct additional errors in the original. As written, for example, it aims to minimize hunting's effects to wildlife, rather than eliminate them altogether, and it seeks to address "potential concerns related to the current hunting program," rather than find solutions to the actual concerns that have been presented at public hearings, as well as potential concerns by any proposed changes.

The Selection of Alternatives

The consideration of only three alternatives, with one being the no-action or status quo alternative is wholly insufficient to examine fully the broad spectrum of alternative actions that is contemplated by NEPA. The limited alternatives do not enable the agency to take a "hard look" at the environmental consequences of the proposed action as required by NEPA. *See Robertson v. Methow Valley Citizens Council,* 490 US 332, 350 (1989). Meaningful alternatives must be considered if the proposed action will have "some impact" on the environment. *Village of Palatine v. United States Postal Service,* 742 F. Supp. 1372, 1380 (N.D. Ill. 1990); *see also, Lower Alloways Creek Township v. Public Serv. Elec. & Gas Co.*, 687 F.2d 732, 739-40, n.14 (3rd Cir. 1982).

"The 'detailed statement' of 'alternatives to the proposed action' called for by § 102(2)(C) of NEPA, 42 U.S.C. § 4332(2)(C), has been aptly characterized as the 'linchpin of the entire impact statement.'" *Alaska v. Andrus*, 580 F.2d 465 (D.C. Cir. 1978), *vacated in part as moot*, 439 U.S. 922 (1978). The discussion of the validity and benefits of each proposed alternative, including associated costs and risks, should be detailed enough to reveal the agency's thought processes and analysis.[6]

The narrow range of alternatives presented in the DEIS is insufficient to allow the agency to consider options that serve to promote non-consumptive uses of the National Seashore. The agency clumps all non-hunter uses of the National Seashore into one large, indistinguishable group and unjustifiably dismisses the non-hunter interests as being insignificant and lower in priority than the hunting special interests.

In scoping comments to NPS[7] The Humane Society of the United States (HSUS) quoted at length from a leading work on white-tailed deer by Dale McCullough to ensure that NPS understood that value-based issues associated with hunting must not obfuscate sincere biological inquiry in the analysis of the National Seashore's hunting programs. Upon

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[5] *Simmons v. US Army Corps of Engineers*, 120 F.3rd 664 (7th Cir. 1997)
[6] Id.
[7] HSUS to NPS, 5/5/04

reading the evaluation of alternatives in the DEIS, we can only conclude that NPS failed to give serious consideration or merit to this point. To restate this again:

> It is possible to recognize the legitimate interests and necessary roles of human hunters without becoming apologists or advocates for the recreation. Bias toward hunting in situations where hunting is not necessary can only result in loss of credibility. Professional integrity demands that no side of a controversy be given favor on biological grounds that cannot be justified by the biology of the case under review (1984: 240).[8]

B12

In almost every instance where the DEIS considers limiting existing hunting programs in any way, the authors dismiss these alternatives by insisting that they would adversely affect CACO users who hunt or that certain hunting practices are customary or effective. The DEIS repeatedly ignores, however, the potential benefits of limiting hunting activity. The FEIS must evaluate how each alternative would affect other user groups, biological communities, wildlife populations, and individual animals. From such an analysis, decision makers would be able to make an objective evaluation of what is in the public interest, rather than exclusively catering to the interests of a single user group.

B13

Below we present comments on specific alternatives discussed in the DEIS.

2.2.1 Modify Hunting – Options That Describe Alterations to Season Length

I. The DEIS considers shortening hunting seasons; however, the evaluation of this alternative emerges almost entirely from the perspective of what hunters have to gain or lose. It states: "shorter seasons could increase the numbers of hunters present during the limited open hunting days, compromising the safety of hunters in the field"[9].

B14

This alternative is casually dismissed without consideration that some form of hunting is allowed six days per week from mid October to mid April,[10] resulting in 150 days or more of hunting activity each year. The ability of other users to enjoy National Seashore lands is severely compromised during that time. This issue must be accorded further consideration in the FEIS before the option of shortening season length is dismissed.

Elsewhere, the DEIS states that few hunters actually use the Seashore for hunting. For example, it notes that one of the most popular hunting seasons – deer shotgun season – seems to attract no more than 75 to 100 hunters in total.[11] The FEIS must provide evidence

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[8] McCullough, Dale. R. 1984. Lessons from the George Reserve. Pp. 211-242. In: Lowell Halls (ed.), *White-Tailed Deer Ecology and Management.*
[9] DEIS p. 49
[10] DEIS p. 10
[11] DEIS p. 10

for its claim that shorter seasons would compromise hunter safety due to high densities of hunters on seashore lands. Likewise, the DEIS fails to consider that some hunters use the Seashore repeatedly during any given hunting season, therefore limiting open hunting days would not necessarily increase the numbers present but may simply limit the number of days any given hunter has in the field. B15

II. While ultimately dismissing an extended hunting season for coyotes and predators, the DEIS claims that such a season "could benefit rare and endangered species that may be preyed upon..."[12] We agree that an extended hunting season for predatory animals is not appropriate on the National Seashore. We caution NPS, however, against making the unsubstantiated claim that reducing predator populations could benefit rare and endangered species. The health of biotic communities is dependent upon a balance among predator and prey species. Eliminating predators could increase numbers of other species which could then compete with rare and endangered species, further threatening their numbers. B16

However, if planners wish to claim that killing predators helps endangered species, the FEIS must: 1) cite evidence that recreational hunting has a statistically significant benefit for rare and endangered species; 2) demonstrate that hunting activity would not adversely affect these species' success (for example, the nesting success of rare and endangered shorebirds); and 3) explain how such a policy meets, or at least does not violate, the Seashore's stated management objective to "maintain native biological and physiographic diversity to sustain thriving, dynamic natural communities and systems."[13]

2.2.2 Modify Hunting – Options That Describe Alterations to the Management of People or Hunting Location

IV. The DEIS dismisses setting a cap on the number of hunters who could use the Seashore by stating that the density of hunters is not exceeding the area available to them and other visitors and that this option would entail increased responsibilities for staff.[14]

The DEIS states that hunting seasons occur when "workloads for the rangers are greatly reduced" and that "some rangers find this time of year much less stressful and more enjoyable than the peak summer season."[15] If planners wish to assert that setting a cap on the number of hunters would create an undesirable increase on the workload of staff during hunting season, the FEIS must define how taxed staff already is during this period and how much additional work would be required. The FEIS must state whether a hunter cap would require additional staffing or volunteer resources and quantify the cost so that the public can evaluate whether it is reasonable. B17

[12] DEIS p. 49
[13] DEIS p. 33
[14] DEIS, p. 49
[15] DEIS, p. 44

Additionally, we note that setting a cap on the number of hunters would eliminate the possibility of compromised hunter safety resulting from shortened hunting seasons (Section 2.2.1 – Option I). We encourage NPS to consider whether implementing these two measures together could eliminate some of the authors' concerns about either individual alternative. Moreover, they could be combined with alternatives discussed elsewhere in the DEIS for additional potential benefits. The DEIS, for example, dismisses the option of hiring seasonal rangers to regulate hunting because of the additional financial and management strain. However, hunting fees could provide the funds needed to hire seasonal rangers to regulate hunting, if desired, and the additional staff could help manage the permit system. Fewer hunters and shorter hunting seasons would further minimize any burden a fee system would create. This is only one example of an additional viable alternative that must be considered in the FEIS. B18

VII. The DEIS dismisses prohibiting hunting on 90 percent of Seashore lands, as it would "create an area too small to support the number of hunters, which would create safety concerns among hunters using this reduced area"[16] and would set an unfair precedent for the allocation of Seashore lands for various uses. B19

The number of hunters using a reduced portion of the Seashore could be managed by a permit system or other means; it is not an insurmountable obstacle to the consideration of this alternative. While National Seashore lands should not be strictly allocated according to visitor use, it seems unreasonable that 31,146 of the Seashore's 43,582 acres are open to an activity that is both highly unpopular -- since a vast majority of the state's population never engages in hunting -- and excludes other uses, such as wildlife watching, hiking, bicycling and photography. B19a

Moreover, the DEIS should be corrected when referring to the number of people who hunt. It currently states "that 10 percent of the population are hunters." In Massachusetts, however, about 1 percent of the population hunts, according to the U.S. Fish and Wildlife Service.[17] B20

VIII. The elimination of hunting – Alternative C – is dismissed without any substantive consideration, in a manner that is completely contrary to the requirements of NEPA. The DEIS simply asserts that this alternative is "contrary to the mission of the NPS and CACO and is inconsistent with the purpose of this project."[18] This is a clear demonstration of how B21

[16] DEIS p. 50
[17] USFWS. 2002. National Survey of Fishing, Hunting, and Wildlife Associated Recreation 2001. US Department of the Interior, Fish and Wildlife Service, and US Department of Commerce, Bureau of the Census.
[18] DEIS p. 50

B21

the unlawfully narrow purpose of the proposed action completely predetermines and limits the analysis and range of alternatives.

B22

Hunting is allowed in only 53 of the National Park Service's 470 properties (fewer than 12 percent), according to a May 11, 2004 presentation at a National Seashore sponsored informational meeting at Nauset Regional Middle School in Orleans. The FEIS must include an in-depth look at hunting in the parks that addresses whether it finds the 88 percent of NPS properties that do not allow hunting are functioning contrary to NPS' mission.

2.2.3 Modify Hunting – Options that Describe Alterations to Hunting Techniques

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XVII. The DEIS dismisses the elimination of driving white-tailed deer for hunting as it is a "legal and customary technique" and is "effective for hunting low-density deer populations."[19]

Some legal activities are banned at the Cape Cod National Seashore. For example, elsewhere it is legal to walk pet dogs off leash, but that practice is not allowed on Seashore lands. Likewise, some customary activities that harm the Seashore's natural resources are also banned. The NPS has the right to allow or prohibit otherwise legal and customary activities from its properties based on whether those activities are compatible with the mission and purposes of the properties.

B24

The DEIS here contradicts the principle of harvest theory that is used to justify recreational hunting in 3.0 Affected Environment. There, Robinson and Bolen are quoted:

> Hunting reduces the population, but the loss also increases the growth rate. The increase in growth rate is the consequence of higher birth rates and lower death rates, which result from decreased competition for food and resources.[20]

The FEIS must be consistent about whether the recreational deer hunt increases or decreases the deer population.

B25

Even if hunting effectively achieves the purpose of reducing the density of deer populations, the efficacy of a practice does not justify either its use or the purpose for which it is used.

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[19] DEIS p. 51
[20] DEIS p. 68

XVIII. Eliminating or limiting the use of hunting dogs is dismissed because it would not reduce interactions between hunting dogs and the public and it would "deprive rabbit hunters of the opportunity to hunt over a full compliment of dogs."

B26

The DEIS fails to articulate why members of the public requested that this alternative be considered: namely, to prevent or reduce the amount of canine fecal matter on Seashore lands and to prevent or reduce the number of dogs abandoned on Seashore lands, which put an unnecessary strain on local animal control agencies. This option would effectively achieve these goals.

2.2.4 Modify Hunting – Alternatives That Describe Alterations to Species Hunted or Species Specific Changes

XXII. The DEIS dismisses the elimination of agricultural pest species hunting because it states that eliminating the hunt provides no tangible benefits.

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This hunt is neither popular nor does it provide sustenance to those who engage in it. While NPS claims it may provide few tangible benefits, those who requested its elimination believe such a change would improve animal welfare at virtually no human cost. The DEIS fails to provide a substantive reason to dismiss this alternative, and the FEIS must examine this in detail.

XXIII. The DEIS states the various drawbacks of reproduction intervention for deer, an alternative that is also dismissed.

B28

The main reason to dismiss this alternative is that there is no need for it; deer populations are not considered abundant on the National Seashore. The FEIS must address this and provide more information on the size and composition of the deer herd.

XXIV. The DEIS considers creating a native quail put and take hunt, but ultimately dismisses the possibility due to a lack of local farmed-quail stock. No mention is made of the ethical or humane implications of such a hunt. Quail, like pheasants, are subjected to common poultry rearing practices including over-crowding and debeaking. If too many birds are placed in a small space, quail in particular resort to cannibalism. In the wild these birds form coveys, or circles, to protect against predators. Farm-rearing does not create birds with the ability to resort to natural behaviors when confronted with a threatening situation.

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B29a

Stewards of wildlife acting on behalf of the public should not expend resources on creating an artificial hunt for a select minority. Shooting tame birds in a put and take situation violates any ethic of fair chase or sound wildlife management principle under which

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B30

wildlife agencies claim to operate. Fair chase is defined by only occasionally succeeding while the animal generally escapes, a principle clearly violated by put and take hunting.

Legislative History

The discussion and analysis of legislative history lacks sufficient detail to allow readers of this document to fairly and objectively understand the background to this issue, as well as determine the relationship between the park and the state wildlife agency.

The park's mission is defined as "to preserve the nationally significant and special natural and cultural features, distinctive patterns of human activity and ambiance that characterizes the Outer Cape, along with the associated scenic, cultural, historic, scientific and recreational values, and to provide opportunities for current and future generations to experience, enjoy and understand these features and values."[21]

The Seashore's Enabling Legislation ({Public Law 87-126) is fairly clear as it establishes the parameters for hunting with the borders of the Park. Section 7 of the legislation states [clarification added in italics]:

B31

> (c) The Secretary may *[discretionary with the Secretary and not mandated by Congress]* permit hunting and fishing, including shellfishing, on lands and waters under his jurisdiction within the Seashore in such areas and under such regulations as he may *[once again, discretionary]* prescribe during open seasons prescribed by applicable local, state, and federal law. *[Note that the authority of the local, state, and other federal entities pertains to the establishment of open season and not to other elements of hunting regulations.]* The Secretary shall consult with officials of the Commonwealth of Massachusetts and any political subdivision thereof who have jurisdiction of hunting and fishing, including shellfishing, *[the jurisdiction referenced above covers general authority over hunting and fishing in the area and does not establish jurisdiction for hunting and fishing within the Seashore]* prior to the issuance of any such regulations....

The Section goes on to state explicitly that specified towns would continue to have authority over the propagation and taking of shellfish located within the National Seashore's boundaries.

The last part of the Section is crucial to ascertain the Congressional intent with respect to the authority of the Secretary to establish hunting at the National Seashore. Had Congress expressly desired to give the local authorities jurisdiction over the establishment and management of hunting within the National Seashore, they would have stated so in the

[21] DEIS p. 32

same manner that they did with regard to shellfishing. However, the language makes it clear that the establishment (and continuation) of hunting at the National Seashore was solely discretionary with the Secretary. Had the Secretary decided not to issue regulations that permitted hunting at the National Seashore, the Secretary had no requirement to consult with any state or local official. Moreover, the Secretary was only required to issue regulations if he decided to permit hunting in the Seashore. Therefore, the establishment of hunting was an overt action on behalf of the Secretary to change the National Seashore from a non-hunting park at its creation to one that permitted hunting.

B31

The DEIS is rife with insinuations that Congress created the Seashore with the intent to continue hunting. Further, the DEIS gives the state and local authorities an unprecedented say over the hunting operations of the park. The language of the enabling statute refutes those assertions and analogies.

Traditional Uses

At the heart of the DEIS' preferred alternative to allow and expand the seashore's hunting programs is the belief that hunting is both a valuable tradition and an essential cultural component of the Outer Cape. We do not refute the premise that some people on Cape Cod have practiced some forms of hunting for a long time; however, the DEIS, in its defense of this "traditional use," implies that hunting is a static activity that has not changed significantly over time.

B32

The majority of the hunting permitted within the Seashore's boundaries has little in common with the traditional pursuit of game that would have been familiar to our ancestors. For example, ring-necked pheasant stocking and hunting, while popular practices for 60 or 70 years, are not traditional uses of the Outer Cape. The practice of pen-rearing Asian birds simply to provide the rush of a fast kill would have been a foreign concept to the Cape Cod of long ago.

B32a

Hunting, as practiced today, is essentially a modern phenomenon. If the authors of the DEIS intend to defend hunting as a "traditional use" of Cape Cod, they must define which forms of hunting – based on the species hunted, the methods of pursuit, the weapons used, and the purposes for which animals are killed -- currently practiced on Cape Cod are actually traditional. The FEIS must examine whether hunting disturbs other traditional forms of recreation, such as berry picking, mushroom gathering, and wildlife observation.

B33

As we have stated elsewhere, other activities closely identified with local cultural heritage – such as whaling -- have rightly passed from existence as people have found other resources to meet their needs. Hunting birds and land mammals on the Cape Cod National Seashore is now as indefensible as hunting sea mammals off of its coast.

NPS would be better off preserving the spirit of the Outer Cape than allowing modern perversions of tradition to disrupt other uses, harm wildlife, and destroy the beauty of the National Seashore. The National Seashore's management philosophy includes preserving flora and fauna, as well as a "certain ambiance … that provides both a sense of peace and relative isolation."[22] Hunting activities violate that philosophy by destroying fauna, threatening flora, and creating noise that disrupts the ambiance of the National Seashore. B34

Moreover, evidence of hunting, including shotgun shells, dead and dying animals, and feces from hunting dogs, can disrupt many people's sense of peace. Many religious and spiritual people eschew hunting because it is seen as violent, rather than peaceful. B35

The DEIS suggests that Alternative C would not continue the customary activities that were in place when the National Seashore was established because it would eliminate hunting.[23] This fails to acknowledge that hunting already interferes with other customary activities and the possibility that eliminating hunting could prevent these conflicts, actually improving the quality of such activities and the number of users engaged in them. The DEIS later states: B36

> Data collected by an NPS intern suggested that common winter activities such as hiking and dog walking decrease during the week-long shotgun hunting season, suggesting that hunting deters other types of recreation.[24]

Additionally, the continuation of hunting may limit opportunities for people to experience, enjoy and understand the Outer Cape's features and values, as many people have testified during public meetings that they avoid using the National Seashore during the various hunting seasons specifically because of the nature of hunting. Less than 1 percent of Massachusetts residents hunt, whereas more than 20 percent enjoy wildlife watching.[25] B37

Moreover, the DEIS states that: B38

> …visitation in the 'shoulder' months of early spring and late fall has grown, partly as a result of marketing and promotional efforts made by planners and business owners. Some individuals do not visit CACO during the fall and winter based on concerns related to safety.

[22] DEIS p. 33
[23] DEIS p. 66
[24] DEIS p. 150
[25] US Fish and Wildlife Service (FWS). 2002. National Survey of Fishing, Hunting, and Wildlife Associated Recreation 2001. US Department of the Interior, Fish and Wildlife Service, and US Department of Commerce, Bureau of the Census.

> Not only do some individuals avoid using areas where hunters are presented (sic), but they avoid using areas closed to hunting.[26]

There is further evidence in the sociological study cited in the DEIS that suggests that hunting interferes with other customary activities. The DEIS reads:

> [i]n a general sense, both residents and seasonal CACO users do not support hunting for a variety of reasons" and that "the visitor survey provided evidence that non-hunters often feel hunting is in conflict with other activities and the CACO general purpose.[27]

The visitor survey found that 51 percent of respondents felt that there are too many year-round residents for hunting to be safe and over 55 percent of residents disagree with the statement that hunting for sport is an appropriate activity for CACO and that, moreover, roughly 20 percent of Cape Cod residents and CACO users expressed the belief that hunting is unethical.[28] The DEIS also states:

> [a] large portion of residents (47%) avoided certain areas where hunting was likely to be taking place. ...Approximately 27 percent of residents avoided visiting CACO on days when hunting was likely and 24.1 percent felt they were unable to participate in activities at CACO.[29]

Accordingly, the body of evidence presented in the DEIS does not support the continuation of hunting as a traditional activity, but rather suggests that limiting or eliminating hunting would allow other traditional and customary activities to flourish. The FEIS must address this.

B38

Impact of Hunting

It is unclear whether NPS has provided a comprehensive review of all species that might be hunted on the National Seashore. The FEIS must address this directly.

B39

At essence, the issue of hunting on CACO involves the contrast between the wildlife management policies, goals and objectives of federal agencies such as NPS and state agencies such as MassWildlife. The DEIS reads, as noted earlier, as a defense and in support of hunting not so much as a cultural tradition or social practice on the Cape than as an economic and commercially valuable activity in whose stake the state wildlife agency

B40

[26] DEIS p. 142
[27] DEIS p. 150
[28] DEIS p. 151
[29] DEIS p. 152

has compelling interests. Federal land managers appear complacent to accept the state wildlife agency's preferences and allow them to override their own interests, by submissively allowing the state to not only manage the natural resources it (the NPS) should protect, but to dictate the terms of that management. There is an enormous conflict of interest between what the state stands to gain from promoting hunting on the National Seashore and what NPS is mandated to protect and preserve, and the DEIS does not even begin to address that issue.

B40

The differing interests and roles of managers must be discussed objectively and directly within the DEIS. By way of emphasizing what we view as the striking contrast here, let us say that the DEIS as written seems laden with comments, suggestions, assumptions and speculations about hunting and its consequences that might come directly from an introductory text in wildlife management[30] while it never seems to even open the first page of an introductory ecology text. Where is there any discussion about the relationship of species to one another, the existence of food webs, of interdependencies, of predator-prey relationships, of trophic levels, of ecological impacts? The DEIS completely fails to address any of the potential impacts of hunting on ecological communities and instead directs its faulty analytical tact at a traditional, population-level discussion of the theoretical consequences of imposing additional sources of mortality ("harvest") on wildlife populations. This one-sided approach is completely unacceptable and unlawful under NEPA.

B41

The DEIS frankly admits that wildlife monitoring has been and is very limited[31] and establishes in these comments the absolute certainty that NPS does not know what the effects of hunting on either individual populations or the larger biotic communities with which they interact is. The FEIS must address the ecological consequences of hunting on the National Seashore.

B42

Below we discuss individual species or groups of animals that are described in the DEIS. Again, we believe there also are species that are hunted or could be hunted on the National Seashore for which the DEIS provides no description or analysis.

B43

Cottontails. The analysis and projection of impacts concerning the New England cottontail (NEC) population is speculative and does not refute that hunting would endanger the populations on the Seashore. As part of the selection of alternatives, the DEIS describes the rationale behind a cottontail research project as being that the New England

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[30] e.g. XXIX. Wildlife and Hunting Monitoring on page 53, which discusses integrating MassWIldlife's annual wildlife monitoring program into CACO management decisions to "...insure sound wildlife management..."
[31] DEIS p. 63 and elsewhere

cottontail is uncommon or rare in much of the state and has been considered for listing as a threatened or endangered species.[32]

Additionally, the New England cottontail is a species of regional concern given the declines in its numbers.[33] This lagomorph prefers early successional habitats with dense underbrush including old agricultural fields. [34] This type of habitat is in severe decline throughout New England due to increased development and the recolonization of forest on abandoned farmland.[35] Additionally, research has shown that the NEC is more vulnerable to predation than the eastern cottontail (*Sylvilagus floridanus*) in fragmented landscapes.[36]

B44

Even experienced wildlife rehabilitators have difficulties distinguishing between NEC and eastern cottontails at close range. Scientists have attempted to develop a means to distinguish the species through a series of precise body measurements and coat analysis.[37] Even this method is only useful in the winter and on animals that are immobilized. The only reliable way to determine species is genetic testing.[38] It is impossible to determine which species is being pursued during a chase. Given that the planners acknowledge that the NEC's population status is unknown but believed to be threatened or endangered, the only responsible course of action is for the Cape Cod National Seashore to ban the hunting of rabbits on its lands.

Yet the DEIS paradoxically argues that the effects of cottontail rabbit hunting are likely to be beneficial by reducing competition during the winter for available food resources, citing a 1964 study that found that when hunters killed 75 percent of a population, the population was not depressed the following fall.[39]

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Eliminating rabbit hunting would not result in beneficial effects on the population, according to the analysis of Alternative C, because "[h]unting mortality is compensatory; as such, those rabbits not taken would likely succumb to mortality factors and/or

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[32] DEIS p.53 and U.S. Fish and Wildlife Service. 2005. New England Cottontail: *Sylvilagus transitionalis*. Northeast Region, U.S. Fish and Wildlife Service Hadley, MA. Available online: http://www.fws.gov/northeast/pdf/necotton.fs.pdf

[33] http://www.mass.gov/dfwele/dfw/dfwcotontail.htm

[34] Litvaitis, J.A. et al. 2003. Distribution and habitat features associated with remnant populations of New England cottontails in Maine. Can. J. Zool. 81: 877 – 887.

[35] Litvaitis, J.A. 1993. Response of early successional vertebrates to historic changes in land use. Cons. Biol. 7(4): 866- 873.

[36] Smith, D.F. and J.A. Livaitis. 2000. Foraging strategies of sympatric lagomorphs: implications for differential success in fragmented landscapes. Can. J. Zool. 78(12): 2134-2141.

[37] Livaitis, J.A. et al. 1991. A field method to differentiate New England and eastern cottontails. Trans. Northeast Sec. Wildl. Soc. 48: 11-14.

[38] Kovach, A.I. et al. 2003. Evaluation of fecal mtDNA analysis as a method to determine the geographic distribution of a rare lagomorph. Wildl. Soc. Bull. 31(4): 1061 – 1065.

[39] DEIS p. 166

reproduction levels would be reduced in response to an elevated population." However, the DEIS then states: "[e]liminating rabbit hunting could have a negligible to minor adverse effect relating to the potential for increased diseases and competition for habitat resources that may result from an increased rabbit population."[40]

B45

The DEIS is contradictory. If hunting mortality is compensatory, the population level would not change in the absence of hunting. The analysis fails to consider the two distinct yet visually indistinguishable rabbit species present at the National Seashore and their dramatically different population statuses. The FEIS must address this.

White-tailed Deer. The DEIS addresses white-tailed deer (*Odocoileus virginiana*) at numerous places throughout the document, including a section on this species as part of a synopsis of the natural history of game mammals.[41] The information communicated to the reader concerning the presence and abundance of deer on the seashore is confused and the FEIS must be rewritten to clarify the information known and available on the deer population on the National Seashore. The description of deer abundance notes that a direct survey completed in 2003[42] yielded an estimate on CACO of 1.45 to 2.08 deer for each square mile, while density estimates calculated for what is described as "CACO habitat" in a following paragraph use an estimate of 15-17 deer for each square mile to derive an estimated population of 430-520 deer as "supported by CACO habitat."[43] To the average reader it appears that an indirect and less precise method has been used to estimate population density for a deer population that has already been the subject of more than one direct research study. The FEIS must clarify what is being said here and, more importantly, clearly identify what actual monitoring efforts have shown as the best available direct information estimating the density of deer populations on the National Seashore. If anything, estimates for deer density on the National Seashore appear to be significantly lower than even the state-advised density "goal."

B46

Throughout the DEIS the assumption is made that hunting on the Seashore "controls" the white-tailed deer population and that the consequences of withdrawing that "control" would be to change certain important factors, as discussed below, in a generally negative manner. For example, under 2.5 Alternative C [44] the authors assume that if the deer hunting program at CACO were to be eliminated the NPS would need to "...generate a deer management program..." similar in scope to that of Gettysburg National Battlefield, but provide no comparative analysis and discussion of the different sites, their goals and objectives, the nature and basis of their concerns for deer under their individual

B47

[40] DEIS p. 179
[41] DEIS p. 108-111
[42] DEIS p. 109
[43] DEIS p. 109, para. 6
[44] DEIS p. 64

management objectives or any other differentiating factors as a basis for that claim and suggestion. The issue of white-tailed deer and their interactions with NPS lands is highly controversial and has been the object of concerted study, discussion and debate within NPS for many years. The FEIS should make a concerted effort to address this in all its complexity to ensure that no misleading assumptions are made concerning the status and fate of the deer population if the hunting program currently administered by the state game agency were to be stopped. B47

The DEIS proposes a plan to have the MassWildlife establish a program to monitor deer populations and biological impacts,[45] apparently yielding to the state agency the role of scientific monitoring and research on the federal lands. It does this without establishing the state's interest and focus on the economic aspects of deer management by which the state agency derives income. The economic consequences of deer hunting at CACO, including income derived and direct and incidental costs to both NPS as well as MassWildlife are important components of any deer hunting program and must be included in the FEIS. B48

Deer and Vegetation. The DEIS suggests that managing deer populations by hunting will reduce the potential for damage to vegetation and landscaping,[46] and also maintains that the effects of hunting on white-tailed deer "are generally beneficial to a minor or moderate degree," because it maintains the population at or below carrying capacity and helps to maintain habitat. It does not establish, however, any objective basis for describing deer-plants interactions, including the identification and enumeration of sensitive, rare or endangered plants that could be impacted by deer herbivory. The FEIS must address this, identify the extent to which the nature of deer herbivory as an influence on CACO plant communities is known, and the rationale for seeking to influence those relationships by reducing deer numbers. This information, as well as a discussion comparing state agency objectives and goals in its hunting programs in contrast to what would be the goals and objectives of NPS as an ecosystem rather than population manager must be addressed in the FEIS. B49

Deer and Lyme disease. The DEIS more than once advances the argument that deer hunting would benefit human health and safety by reducing the potential for Lyme disease.[47] The argument that the current low deer density influences human exposure to Lyme disease is flawed. No published study has documented a reduction in the actual B50

[45] DEIS p. 36-37
[46] DEIS p. 173 and pp. 167-169; DEIS p. 182
[47] For example, DEIS p. 49, "...lower deer numbers have been shown to appreciably reduce Lyme disease occurrences." P. 165, "Furthermore, benefits to health and safety occur by reducing the potential for deer/automobile collisions and Lyme disease." P. 183, "An increase in game species may increase Lyme disease reservoirs."

incidence of Lyme disease or risk of Lyme disease to humans when deer numbers are reduced.

Although tick densities have been found to correlate with deer densities in a given area, attempts to reduce the incidence of Lyme disease by reducing deer populations, even dramatically, have been unsuccessful. For example, even when a deer population was reduced as much as 83% to approximately 27 deer per square mile, the authors noted that while immature ticks did decline yet 5-7 years after the depopulation effort, adult tick numbers actually increased throughout the study period. And interestingly, in the final two years of depopulation, the nymph tick population rose to about the same level as when sampling began. The authors concluded that despite the magnitude of the deer removal, "the reduction in tick numbers was insufficient to reduce the number of female ticks that reproduced."[48]

B50

Current thinking is that this multi-host disease cannot be controlled by attempts to reduce adult-stage hosts (white-tailed deer). It remains unclear how far a population needs to be reduced to impact the transmission dynamics of Lyme disease and tick-human transmission of the disease.[49] Research suggests that the critical threshold must be extremely low. The DEIS is correct in concluding that to try to achieve this goal by virtually eliminating the deer would be impractical. Furthermore, recent study also demonstrates that interannual variation in entomological risk of exposure to Lyme disease is correlated positively with prior abundance of key hosts for the immature stages of the tick vector (mice, chipmunks) and with critical food resources (acorns) for those hosts. In no case did inclusion of deer improve the predictive power of models.[50]

Rather, new technologies such as the *4-Poster* or *Maxforce* acaricide systems which specifically target ticks attached to either the main immature and adult stage hosts (mice/chipmunks and deer, respectively) *do* appear to significantly reduce the tick populations. For example, in a *Maxforce* bait box study done by Connecticut Agricultural Station, there was an 80% and 96% reduction in nymphs by the first and second years of

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[48] Wilson, M.L. and R.D. Deblinger, 1993. Vector management to reduce the risk of Lyme Disease. p.126-156 in H.S. Ginsberg (ed.), *Ecology and Environmental Management of Lyme Disease*, Rutgers Univ. Press, New Brunswick, NJ. Deblinger, R.D., M.L. Wilson, D.W Rimmer, and A. Spielman. 1993. Reduced abundance of immature *Ixodes dammini* (Acari: Ixodidae) following incremental removal of deer. J. Med. Ent. 30: 144-150.

[49] Ginsberg, H.S. and K.C. Stafford III, 2005. Forum: Management of Ticks and Tick-Borne Diseases. In Tick-Borne Diseases of Humans, edited by J.L. Goodman et al, 2005 Asm Press, Washington DC.

[50] Ostfeld RS, Canham CD, Oggenfuss K, Winchcombe RJ, Keesing F. 2006. Climate, deer, rodents, and acorns as determinants of variation in Lyme-disease risk. PLoS Biol 4(6): e145. DOI: 10.1371/journal.pbio.0040145.

the study, respectively, and infectivity was lowered 67% by the second year.[51] Another study found that by using the *4-Poster* system, adult ticks were completely eliminated by the second year of the study; all stages were reduced 91-100% by year three.[52] These and other emerging technologies and ecologically sound approaches to managing tick populations would appear to be far more effective and practical approaches for Lyme disease control then vector depopulation efforts. The FEIS should address these or eliminate its argument concerning deer and Lyme disease as a rationale for population management entirely.

B50

Deer-automobile collisions. The DEIS, as it does for Lyme disease, asserts rather than demonstrates that hunting on CACO has a positive benefit to human safety by reducing the number of deer/automobile collisions.[53] This is an important issue concerning deer and one that must be taken seriously. The FEIS should provide considerably more detail about deer/automobile collisions on CACO, including their annual and seasonal incidence, damage and injury sustained, and yearly trend information if available. The FEIS should as well provide a comparative summary of deer population estimates and the frequency of deer/automobile collisions on the National Seashore as part of a risk assessment for deer-automobile collisions. It is unclear to us, but should be part of the FEIS section on this subject, how a yearly harvest of 20 to 30 deer over the Seashore's nearly 44,000 acres (most of which are roadless) has an effect on automobile collisions. The possible effect of hunting in causing deer movements to increase and lead deer to cross roads with greater frequency, especially in early morning or late afternoon poor light conditions, should also be mentioned and discussed in the FEIS.

B51

Nuisance animals. The DEIS refers to hunting in conjunction with the control of "nuisance" wildlife in several places and claims that its preferred alternative – the continuation of hunting -- will help "...reduce or avoid wildlife and human conflicts."[54] The DEIS does not, however, identify and list these purported "nuisance" species nor explain what sort of conflicts may arise with any species deemed to be problems, beyond a general discussion involving white-tailed deer. The FEIS must address this ambiguity. A catchall phrase such as "nuisance animal" creates a huge loophole in which a wide variety of taxonomically disparate species may be snared. Such jargon may allow for

B52

[51] Dolan, M.C. and G.O. Maupin, B.S. Schneider, C.Denatale, N.Hamon, C. Cole, N.S. Zeidner, and K. C. Stafford III, 2004. Control of immature *Ixodes scapularis* (Acari: Ixodidae) on rodent reservoirs of B*orrelia burgdorferi* in a residential community of southeastern Connecticut. J. Med. Ent..41 (6) pp. 1043-1054.
[52] Solberg, V.B. , J.A. Miller, T. Hadfield, R. Burge, J.M. Schech and J.M. Pound. 2003. Control of *Ixodes scapularis* (Acari: Ixodidae) with topical self-application of permethrin by white-tailed deer inhabiting NASA, Beltsville, Maryland. J. Vector. Ecol. 28: 117-134.
[53] DEIS p. 167. P. 183, "An increase in game species may increase motor vehicle strikes."
[54] E.g. DEIS p. 64-65.

indiscriminate and widespread "control" under the auspices of wildlife conflict resolution. This complete lack of specificity makes it impossible to quantify what effects this type of hunting may have on the ecosystem of the National Seashore, and is therefore not permissible under NEPA. At a minimum, the FEIS must identify what species constitute a "nuisance," what type of conflict these species cause, and how hunting can be projected as a means by which to mitigate any "nuisance" wildlife issues.

B52

Wild turkey. The premise that wild turkey (*Meleagris gallopavo*) would comprise a suitable alternative species for hunters that would withstand hunting mortality and substitute for pheasants is not substantiated in the DEIS. The DEIS uses broad scale estimates for overall populations of eastern wild turkey and Florida wild turkey[55] has no application to the status of turkey population at CACO and represents as do many similar injections of numbers and population statistics for other species simply an attempt to fill out parts of a document where there is no good existing information of local significance or import. Inasmuch as the wild turkey is offered as a potential substitute in the preferred alternative to pheasant hunting, and given the disparity in numbers of turkeys harvested on the Cape as opposed to pheasants,[56] the shortcoming of the analysis on this species is even more apparent than that for others and the FEIS must address that.

B53

Additionally, the proposed turkey hunting season will be conducted while females are nesting so that only males are targeted. This arrangement supposedly eliminates female mortality and therefore is purported to have less of an impact on the overall population. Yet, the illegal take of nesting females during the spring hunting season has been recorded.[57] Additionally, turkey nests are very susceptible to predation with nest losses of up over 80% recorded in some areas.[58] Any disturbance of females during the nesting season can only serve to further increase the potential for nest predation.

B54

There is also some evidence to suggest that peaks in gobbling do not necessarily coincide with peaks in incubation.[59] Furthermore, research shows that females greatly increase their home range before incubation when searching for suitable nesting habitat.[60] A lack of synchrony between gobbling and breeding in addition to increased movements of females during the spring could lead to increases in female mortality. This would have a major,

B55

[55] DEIS at P. 76
[56] DEIS at p. 76, Table 10
[57] Norman, G.W. et al. 2000. 2000. Reproductive chronology, spring hunting, and illegal kill of female wild turkeys. Proc.Nat. Wild Turkey Symp. 8:269-279.
[58] Badyaev, A.V. 1995. Nesting habitat and nesting success of eastern wild turkeys in the Arkansas Ozark Highlands. The Condor 97: 221 – 232.
[59] Miller, D.A. et al. 1997. Chronology of wild turkey nesting, gobbling, and hunting in Mississippi. *J.* Wildl. Manage 61(3):840-845.
[60] Chamberlain, M.J. and B.D. Leopold. 2000. Habitat sampling and selection by female wild turkeys during preincubation. *Wilson Bull.* 112(3): 326 – 331.

negative effect on the currently unknown population levels of wild turkey on the National Seashore being that the survivorship of adult hens is the most significant factor affecting reproductive success in this species. [61]

B55

Hence, it is essential that the FEIS address the need for a population study on the wild turkey on the National Seashore before considering this species to be killed for recreation.

B56

Ruffed grouse. The DEIS notes that no information exists on ruffed grouse (*Bonasa umbellus*) hunting on the Seashore and thus acknowledges having no information on the population status of an animal that may be taken by hunters, purposely or otherwise, and whose populations on the National Seashore may in fact be at some risk.[62] It is inconsistent with any sound hunting program that populations at depressed levels would be open to further reduction, and it certainly is well beyond the scope of NPS policies, procedures or mandates to allow the taking of species of such concern from its lands. The FEIS must address this.

B57

Bobwhite quail. The bobwhite quail (aka northern bobwhite, *Colinus virginianus*) is one of the most intensively researched, managed, and hunted species in North America. Consequently it is also undergoing precipitous, range – wide population declines.[63] Hunting harvest of bobwhites is generally additive and one of the major causes of mortality, especially during the winter months.[64] In fact, in some hunted areas winter survivorship of this species can be as low as 20%. [65] It is apparent that the bobwhite quail does not fair well under hunting pressure. There has been virtually no research conducted on the population biology of bobwhites of Massachusetts since the 1950s.[66]

B58

Based upon this dearth of population data for Massachusetts and considering the known population declines of the species over most of its range, the idea of opening a hunting season for bobwhite on the Shore is completely negligent. In order to justify such a hunting season, the park must provide evidence that this species has a stable population

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[61] Norman, G.W. et al. 2001. Reproduction of eastern wild turkeys in Virginia and West Virginia. J. Wildl. Manage. 65(1): 1 – 9.
[62] P. 74
[63] Williams, C K. et al. 2004. The northern bobwhite decline: scaling our management for the twenty -first century. Wildl. Soc. Bull. 32(3): 1 – 9.
[64] Cox, S.A. 2004. Survival and cause – specific mortality of northern bobwhites in western Oklahoma. J. Wildl. Manage. 68(3): 663 – 671.
[65] Williams, C.K. et al . 2004. Winter survival and additive harvest in northern bobwhite coveys in Kansas. J. Wildl. Manage. 68(1): 94 – 100.
[66] Ripley, T.H. 1958. Ecology, Population Dynamics, and Management of the Bobwhite Quail, *Folinus virginianus marilandicus (L.)* in Massachusetts. PhD dissertation, Virginia Polytechnic Institute and State University Virginia, USA.

that could sustain hunting losses. Based upon data from other states, this task would most likely prove impossible. The FEIS must address this issue. B58

American Crows. The DEIS also enumerates information on crows[67] without addressing the possible impact of hunting on breeding, migratory or wintering populations on the Cape. No information is given regarding numbers taken and/or the ability of local populations to withstand recreational harvest. No discussion of or data pertinent to the role of crows in the biotic community is given, or of the ecological consequences of their being harvested. The FEIS must correct this. B59

Waterfowl. The National Seashore allows for the hunting of all migratory birds approved by MassWildlife. Some number of these species have been undergoing known population declines over the last 20 years. Of the hunted species, the American black duck (*Anas rubripes*), the Northern pintail (*Anas acuta*), and both species of Scaup (*Aythya marilla & A. affinis*) continue to suffer precipitous population declines while they are still subjected to hunting.

The most obvious of all population declines is in the number of American Black Ducks, occurring from the 1950s to the present day. This decline has been so severe that the USGS Fish and Wildlife Research unit in Georgia has been working for years to decipher and halt its causes. In 2002 they produced a monograph on the factors affecting black duck populations.[68] This 64 page volume modeled the effects of four major factors on black duck population declines: 1) degradation / loss of breeding habitats; 2) degradation / loss of winter habitats; 3) harvest; and 4) mallard interactions (competition and hybridization). This model found that harvest levels and mallard interactions were having a significantly greater effect on black duck populations then was habitat loss. Despite this glaring evidence, the monograph simple recommends using Adaptive Harvest Management to regulate black duck populations. Additionally, a 2005 progress report recognized that there has been a 25 – year decline in the abundance of this species and that a harvest rate of 15% may be capable causing the extinction of this species.[69] Despite all of these incriminating data, the hunt continues. B60

The Northern Pintail has been in steady decline, and well below its population management goals, for over 25 years. Research into the population declines of this species suggested that natural predation and nest failure may be the primary causes for these B61

[67] The species is not named but American crow refers typically to *Corvus brachyrhynchos*, while Fish crow identifies the closely related species, *C. ossifiragus*.
[68] Conroy, M.J. et al. 2002. Identification and synthetic modeling of factors affecting American black duck populations. Wildl Mon.150: 1-64.
[69] Johnson, F.A. and M. J. Conroy. 2005. Harvest potential and management of American black ducks. U.S. Department of the Interior. Washington D.C. USA.

reductions.[70] However, nesting success for this species was no different from that of similar nesting species throughout its range. Additionally, these birds evolved under predation pressure and should have the means to maintain their populations under such circumstances. The authors suggest habitat monitoring and predator control as possible solutions to save plummeting populations. The effect of hunting is only given a cursory examination, one paragraph to be exact.

B61

Collectively, the Greater and Lesser Scaup have undergone marked declines in the last twenty years. In fact, the Waterfowl Report states that the current Scaup estimate is at a record low, being 35% below its long – term average. A Scaup Workshop was held in September of 1999 to discuss the possible causes of Scaup population declines.[71] The USGS members at this workshop suggested a wide variety of factors including habitat loss, changes in food resources, environmental contaminants, reduced fecundity, and increased mortality. No hard data was presented on any of these factors and the published report from this meeting states that the role of harvest or natural mortality in the Scaup population is uncertain. However, the group still did not consider hunting as even a minor contributing factor to these population declines.

B62

Studies over the last decade indicate that most waterfowl hunting mortality is additive, even for species that exhibited only compensatory hunting mortality in the past, like mallards.[72] This being the case, the FEIS must address the issue of hunting of species when they are in known population declines.

B63

In addition to the population issues associated with a number of hunted waterfowl species, the issues of crippling loss and skybusting must also be addressed in any consideration of waterfowl hunting. Skybusting refers to the act of shooting at waterfowl that are out of gun range. Research has found that this activity is primarily due to a competitive attitude amongst hunters and a desire to emulate other hunters.[73] This thoughtless practice either results in a miss or an inaccurate hit of the target. If the bird is hit, it is not typically killed, due to the inaccuracy of shotguns at range and the loss of shot velocity over long distances. These birds are the victim of crippling loss, which is discussed below.

B64

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[70] Miller, M.R. and Duncan, D.C. The northern pintail in North America: status and conservation needs of a struggling population. Wildl. Soc. Bull. 27(3): 788 – 800.
[71] Austin, J.E. et al. 2000. Declining scaup populations: issues, hypotheses, and research needs. Wildl. Soc. Bull. 28(1): 254 – 263.
[72] Poysa, H. et al. 2004. Ecological basis of sustainable harvesting: is the prevailing paradigm of compensatory mortality still valid? Oikos 104(3): 612 – 615.
[73] Kuentzel, W. F. and T.A. Heberlein. 1998. Why do hunters skybust? Personal disposition or social influence. Human Dim. Wild. 3(1): 1 – 15; Kuentzel, W. F. 1994. Skybusting and the slob hunter myth. Wild. Soc. Bull. 22: 331 – 336.

Crippling and unretrieved loss occurs when a bird is hit by shot but 1) is hurt but not killed and continues to fly, or 2) is hit and drops from the sky but is not dead or ever retrieved by the hunter. This phenomenon does occur when hunters are aiming at birds within range, but is even more common when hunters skybust. One of the first studies to document crippling loss did so inadvertently. A study conducted in 1947 that was aimed at detecting lead shot in live duck gizzards using x-rays actually revealed a 30% incidence of lead shot scattered throughout the bodies of surviving ducks.[74] Some of the ducks even had different size shots embedded in their tissues indicative of multiple shootings. Of the more than 900 total wild ducks trapped for this study, 19 (about 2%) had fractured wings that healed and allowed for a return to flight. This study also revealed that out of 60 dead ducks picked up randomly during the winter, 27 had detectable gunshot wounds and 18 of these had mortal wing fractures.

A 3 – year radiotelemetry based study in Minnesota found that 16 of the 102 monitored birds (mallards and wood ducks) were shot and never retrieved by hunters.[75] Of these 16, 11 of them were not dead when radiolocated. Of the 11 survivors, 3 were shot by hunters again at a later date and retrieved, 4 were crippled and subsequently fell prey to mink, 1 was sent to pathology for tests, and 3 recuperated enough to leave the study area. It is clear from these data that crippling loss, even of obviously radiomarked animals (with unit backpacks) may be substantial and may result in the prolonged suffering of incidentally shot birds. B64

A more recent study in Canada examined the incidence of embedded shot in American black ducks, mallards, Canada geese, and common eiders.[76] Using a portable x – ray system, researchers revealed that about 25% of the 1624 live waterfowl examined contained shotgun pellets. Furthermore, breeding female common eiders had highest proportion of embedded shot (53%), followed by migrating Canada geese at 35%. Many of these pellets had struck vital areas (skull, vertebrae, around the heart) but did not kill the birds. Due to the shallow penetration of the shot, researchers concluded that many of these animals had been shot when out of range. The FEIS must address the issue of skybusting and wounding not only within the context of impacts to hunted birds, but with respect to enforcement demands in patrolling, monitoring and education of hunters about these threats to waterfowl.

Another issue that the FEIS must address is the danger to threatened and endangered waterfowl that is posed by waterfowl hunting. Research has shown that hunters chronically misidentify or are completely unable to recognize most waterfowl species, even in – hand. B65

[74] Whitlock, S.C. and H.S. Miller. 1947. Gunshot wounds in ducks. J. Wildl. Manage. 11(3): 279 – 281.
[75] Kirby, R. E. et al. Recuperation from crippling in ducks. Wildl. Soc. Bull. 9(2): 150 – 153.
[76] Hicklin, P.W. and W.R. Barrow. 2004. The incidence of embedded shot in waterfowl in Atlantic Canada and Hudson Strait. Waterbirds 27(1): 41 – 45.

While most hunters in the United States and Canada can usually identify mallards, their performance with other species is poor. For example, duck hunters in Alberta, Canada could only on average identify 58.9% of the birds they bagged, and that includes mallards.[77] A study in the United States examined hunter identification success of only the twelve most common species harvested in their area (the Mississippi flyway). Even with such a restricted number of test species, respondents could only identify both sexes of three species with ≥ 70% accuracy. These were the mallard, the wood duck, and the green – winged teal.[78] Gadwalls, ring – necked ducks, blue – winged teals, American widgeons, American black ducks, northern pintails, hooded mergansers, redheads, and canvasbacks of both sexes were all misidentified over 50% of the time. This issue would be of particular concern to NPS given its conservation mandate, and the FEIS must address this, not only from the perspective of population and ecological impacts, but from the administrative perspective in involving CACO staff in monitoring, enforcement and hunter education.

B65

B65a

Coyote. The coyote (*Canis latrans*) is a relative newcomer to the National Seashore. This canid is believed to have made its debut in Cape Cod sometime in the late 1970's.[79] In the absence of the native wolf, this species is now one of the top carnivore at the National Seashore. We find it contradictory that the DEIS touts hunting as a means of maintaining the deer populations while endorsing the hunting of coyotes. Coyotes are known to cause substantial mortality to deer fauns, especially in northeastern North America.[80] If the National Seashore perceives that their deer population is in need of regulation and they truly wish to follow the NPS mission of preserving natural systems, they should not even consider coyote hunting in the park. Once again, the complete lack of recognition of food web and species interactions is accentuated by the call for coyote hunting in the DEIS. The FEIS must address this.

B66

Other mammals. The gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), bobcats (*Lynx rufus*) and red (*Vulpes vulpes*) and gray fox (*Urocyon cinerargenteus*) all follow the same general pattern established elsewhere in this section by noting the dearth and paucity of information about the species on the National Seashore. Virtually all of the natural history information given is descriptive and no attempt exists anywhere in the DEIS to identify, characterize or describe any aspect of wildlife community dynamics and/or the ecological relationships wildlife species to one another or to plant communities. In places, even the enumerative descriptions of species

B67

[77] Nieman, D.J. et al. 1987. Monitoring hunter performance in prairie Canada. Trans. North Am. Wildl. Nat. Res. Conf. 52: 233 – 245.
[78] Wilson, B.C. and Rohwer, F.C. 1995. In – hand duck identification by hunters at Mississippi Flyway public hunting areas. Wildl Soc. Bull. 23(3): 472 – 480.
[79] Way, J.G. 2002. Radiocollared coyote crosses Cape Cod Canal. Northeast Wildl. 57: 63 – 65.
[80] Patterson, B.R. and V.A. Power, 2002. Contributions pf forage competition, harvest, and climate fluctuation to changes in population growth of northern white – tailed deer. Oecologia 130: 62 – 71.

natural history appear to contain obvious errors of fact.[81] The FEIS must address these issues and include better comparative information on animal ecology.

Marsh birds. The DEIS does not evaluate the hunting of impacts of hunting on American Coots (*Fulica americana*), Sora (*Porzana carolina*) or King rails (*Rallus elegans*), the killing of which is permitted under state law. The FEIS should discuss the biology and conservation status of these and other marsh bird species known to be present on the seashore[82] and identify not only the extent to which hunting of these species currently occurs on CACO, but the extent to which it might increase. The FEIS should also discuss the status of other marsh bird species similar to those for which hunting is allowed, identify potential threats to their populations and establish how NPS will attempt to prevent their incidental taking. As for other all other wildlife species for which hunting is allowed, the NPS must address and discuss objectively and in detail the relationship between its mission to conserve populations and species and the *de facto* abrogation of that responsibility that might allow populations to decline through recreational killing.

The king rail is listed as a "Game Birds Below Desired Conditions" (GBBDC), i.e. a species for which there is evidence of "declining population trends."[83] This secretive bird does not undergo annual population estimations due to the difficulty of conducting sight counts in their preferred habitat. The taxonomic status of the king rail has been called into question. This species and the clapper rail are considered by some to be one and the same. Both call–response studies and molecular phylogenetic studies have been unable to definitely delineate these two species.[84] Due to the dearth of data on rail populations in general, the assumed rarity of this bird is based upon both reduced harvest numbers and known sources of mortality and habitat loss. Rails are very sensitive to wetland degradation because they normally inhabit the edge of this habitat type, where alterations normally begin.[85] As with all of the other species under scrutiny, the effects of hunter harvest on the population status of this species is unknown.

[81] E.g. p. 121 where in the description of opossum it is said "Opossums appear to have discrete home ranges." Most research on this species suggest that they do not.
[82] Erwin, Michael R., Courtney J. Conway, Steven W. Hadden. 2002. Species occurrence of marsh birds at Cape Cod National Seashore, Massachusetts. Northeast Nat. 9(1): 1-12
[83] http://www.fws.gov/migratorybirds/reports/reports.html
[84] Rabatsky, A. M. 1997. Responses of two closely – related rail species, *Rallus longirostris* and *Rallus elegans*, to conspecific and heterospecific calls. Florida Scientist 60(1): 16 – 20; Avise, J.C. and R.M. Zink. 1988. Molecular genetic divergence between avian sibling species: king and clapper rails, long – billed and short – billed dowitchers, boat – tailed and great – tailed grackles, and tufted and black – crested titmice. The Auk 105: 516 – 528.
[85] Elphick, C. et al. (eds.) 2001. *The Sibley Guide to Bird Life and Behavior*. Alfred A. Knoph, New York, USA.

The FEIS must address many issues surrounding the taking of marsh birds in a comprehensive way and include discussion of this group as well under 3.3.5, "Wildlife Species That are Endangered, Threatened, or of Special Concern." B68

Affected Environment

The DEIS devotes a significant number of pages under the affected environment to a discussion of hunting theory and background and goes into a long review of individual species and their population status without giving any consideration or attention to the biotic communities in which those species have membership. Individual, population and community interactions comprise the fundamental basis for ecological relationships in animals, and it is the ecological consequences of hunting that the DEIS fails completely to address. The FEIS must address this. B69

The focus on hunting theory and background in the DEIS does not attempt to encompass the socially significant debate about the ethics of hunting, in its broadest context. The DEIS dismisses concerns raised by animal welfare interests about this issue with the argument that the National Park Service, the Cape Cod National Seashore, and the Commonwealth of Massachusetts recognize hunting as a legitimate recreational activity on the Seashore, and "...making judgments regarding the ethics of hunting is beyond the NPS authority and purview and is not a part of the analysis and decision making process."[86] The DEIS claims that concerns about hunting techniques, equipment, and sportsmanship are also considered to be "non-NEPA impact topics."[87] Nonetheless, the DEIS describes opposition to hunting as based on the belief that it can "...deplete or adversely affect the population" and that "...there is no need for individuals to participate in hunting for recreational purposes,"[88] suggesting that a dialogue would be an appropriate impact topic for this DEIS. B70

More importantly, this response misses a crucial point. NPS is not being asked to render a "judgment regarding the ethics of hunting," but simply to engage fully and honestly in the NEPA process, so that the public and the agency might be better informed. The DEIS completely fails to do this, and is dismissive of the very area of concern that has driven the issue examined here, again, resulting in the predetermination of the outcome of the process. It is because a sizable number of individuals, groups and organizations have concerns over hunting on the National Seashore that NPS has been forced to comply with its NEPA obligations. The FEIS must engage in a far more responsible effort to address this issue – it truly is at the heart of the matter under consideration. B71

[86] DEIS p. 39
[87] DEIS p. 41
[88] DEIS p. 70

Finally, with respect to any human activity that involves animals and that might lead to situations compromising their welfare, the FEIS must deal with "humaneness" as a relevant and germane component of the human environment. Although some claim "humaneness" to be a subjective concept, there are certain and definitive means by which we identify and measure animal pain, suffering, stress, distress, and other physiological and psychological factors associated with what can be called an animal's "welfare state." We note as well that unnecessary death is a significant issue in any proposed management action. Unnecessary death should be avoided unless compelling justification (immediate threat to human health and safety, for example) exists. Lethal control of animals without action to prevent recurrence of problems (either before or after control) is, as we have repeatedly emphasized in our NEPA comments to other federal agencies, unacceptably shortsighted and inappropriate. These points are especially relevant where actions regarding "nuisance" wildlife are under consideration and the FEIS must address this as well as the broader issues of humaneness, welfare and unnecessary death. B72

Pheasant Stocking

Much of the controversy surrounding the hunting programs on the National Seashore revolves around the stocking of ring-necked pheasants (*Phasainus colchicus*). When stocking pheasants for recreational hunting on the National Seashore, the NPS and MassWildlife purchase farm-reared birds from private breeders and release the birds just prior to the hunt to try to maximize success for the shooter. In developing a preferred alternative, the DEIS discusses "put and take" hunting options, including continuing the pheasant stocking program for a 15-year duration. We feel that this raises substantive issues and concerns that are unaddressed in the DEIS regarding NPS policies, mandates and historic traditions, environmental consequences, animal welfare issues and even questions concerning hunting ethics that must be addressed. B73

The park's mission is defined as:

> "to preserve the nationally significant and special natural and cultural features, distinctive patterns of human activity and ambiance that characterizes the Outer Cape, along with the associated scenic, cultural, historic, scientific and recreational values, and to provide opportunities for current and future generations to experience, enjoy and understand these features and values."[89] B74

Thus, FEIS must explain and justify pheasant stocking as being nationally significant and distinctive, since these are the keys to justifying which cultural traditions are of importance to the identity which NPS seeks to protect with regard to this park. Pheasants are not

[89] DEIS p. 32

native to the Outer Cape and the DEIS suggests that they have only been stocked since around 1906,[90] with the practice becoming popular in the 1930s or 1940s.[91] The DEIS does not remotely make the case that pheasant stocking preserves some unique cultural and recreational value on the Outer Cape and it clearly stretches the very idea of "unique" that it evens attempts to do so. The FEIS must address this matter in a much more objective and direct manner than is done in the DEIS. B74

The Seashore's management objectives include seeking to "understand, foster, and maintain native biological and physiographic diversity to sustain thriving, dynamic natural communities and systems."[92] These seem to be diametrically in opposition to the practice of stocking non-native animals to provide a recreational opportunity. The FEIS must address this closely. B75

During put and take hunting, the tame nature of the quarry and their inability to escape creates the conditions for an unethical hunt. Birds accustomed to human presence and handling, reared in brooding boxes, fed timed grain feedings and fitted with pick-guards that restrict their ability to both receive and react to normal visual stimuli are simply not equipped to defend themselves against either hunters or the elements. Researchers have proven that farm-reared birds lack appropriate predator-avoidance behavior,[93] foraging skills and any long-range ability to assimilate into naturalized birds.[94] The culminating hunt includes birds quickly extinguished by shooters and the remaining animals killed by predators, cars or starvation -- points the DEIS raises to argue that pheasant stocking does not violate NPS policies against introduction of exotic species because the birds die before affecting the environment. B76

Put and take hunting of any species will be viewed by many hunters as inappropriate and the FEIS must address this. Under the wildlife management system, first envisioned by Aldo Leopold[95] and developed into national practice, a fiduciary relationship was deliberately created in which managers directed the consumptive use practices of recreationalists under a banner of ecological stewardship. In an effort to prevent rampant exploitation of animals, the conservation philosophy that ensued emphasized the need for extensive knowledge of the hunted animals and their surroundings, thus creating a sense of B77

[90] DEIS p. 159
[91] DEIS p. 12
[92] DEIS p. 33
[93] Krauss, G.D., H.B. graves, and S.M. Zervanos. 1987. Survival of wild and game-farm cock pheasants released in Pennsylvania. J. Wildl. Manage. 51(3): 555-559.
[94] Leif, Anthony P. 1993. Survival and reproduction of wild and pen-reared ring-necked pheasant hens. J. Wildl. Manage. 58(3): 501-506. Diefenbach, Duane R, Carl F. Riegner, and Thomas S. Hardisky. 2000. Harvest and reporting rates of game-farm ring-necked pheasants. Wildl. Soc. Bull. 28(4): 1050-1059.
[95] Leopold, A. 1933. *Game Management*. New York: Scribner.

obligation to the environment and its inhabitants. Put and take hunting removes the necessity for this knowledge and embodies the exploitation Leopold feared. When tame animals are stocked solely for the gun, not only is fair chase violated, but the situation is conducive to producing a form of wildlife agriculture in which hunters do not comprehend the impact of their individual actions. B77

There are many concerns about pheasant stocking that arise from an animal welfare perspective, and the DEIS is notably lacking in any attempt to address welfare issues. In several places, the DEIS describes pheasant rearing, stocking, and hunting. The DEIS describes the facilities as "free-ranging" and states that partial beak amputation prevents injuries from pecking.[96] This, from a welfare perspective, glosses over the fact that pheasants are routinely reared in pens with hundreds or thousands of other birds under conditions that prevent them from behaving naturally as suggested by the term "free-ranging" and the text that follows. The FEIS should specify that partial beak amputation is performed to prevent injuries within the flock; as this procedure is described, it suggests that the birds would injure themselves with un-amputated beaks. Dr. Michael Appleby of The HSUS testified to the Cape Cod National Seashore Advisory Committee[97] in documenting that the beak does not always grow back to the point that it is functional for feeding and drinking, as the DEIS suggests.[98] B78

Moreover, the environmental consequences of pheasant stocking are not adequately addressed in the DEIS and a significantly broader review and analysis of these impacts must be provided in the FEIS. The DEIS contends that the introduction of ring-necked pheasants "does not appear to cause any adverse effects towards other wildlife species"[99] and references a 1999 report[100] to demonstrate that pheasant stocking does not cause environmental damage.[101] Notably, the DEIS does not address the critique of this study by The HSUS in its comments to the Cape Cod National Seashore Advisory Committee. In this, The HSUS agreed with the research finding that suggested pheasants probably do not establish breeding populations on the National Seashore and did not significantly contribute to the caloric intake of predator species, but also noted that the study failed to address whether the presence of pheasants displaces other birds or offers competition for resources, whether pheasants carry diseases that may impact wild species, and whether the B79

[96] DEIS p. 12
[97] In a letter of 2/1/02
[98] DEIS p. 12
[99] DEIS p. 122
[100] Bump, C. A. and R. Field. 1999. Survival and Ecological Impacts of Released Ring-necked Pheasants on Cape Cod National Seashore. Final Report. Massachusetts Cooperative Fish and Wildlife Research Unit, Biological Research Division, USGS: Amherst, MA.
[101] DEIS p. 32 and elsewhere

hunting activity associated with pheasant stocking has an impact on the overall ecology of the seashore.[102] The FEIS must address these impacts in full. B79

In addition, the FEIS must take a much closer look at the potential for stocked birds to act as disease vectors to native and domestic animals in and around the National Seashore. Pheasants are closely related to domestic fowl such as chickens and turkeys and may share, carry and transmit many of the same diseases. They are known reservoirs for both Lyme disease and Salmonella bacteria in the British Isles.[103,104] This species is also a vector for domestic fowl strains of coronaviruses, a group that includes SARS.[105] The ring-necked pheasant is also a viable host for H5N1 bird flu.[106] To treat these pen-reared pheasants against diseases common to captive flocks antibiotics are used during a period of development. This demands a risk assessment in the FEIS of the potential for creating conditions that could lead to the development of antibiotic resistant micro-organisms, endangering the health of resident wildlife. B80

The DEIS describes a modified pheasant hunt as part of the preferred alternative.[107] It states that the MassWildlife "would monitor the take and stocking effort to ensure that the number stocked is equal to the take," as well as provide health documentation about the stocked pheasants so that NPS could evaluate whether the stocking locations were appropriate.[108] If the pheasant stocking program is reinstated, it appears that this alternative should require that fewer than 250 birds be stocked the first year, as it was determined in 1999 that "approximately one-third (267) of the 800 stocked pheasants are [killed]"[109] and the popularity of pheasant hunting is in decline. The DEIS argues that Alternative B eliminates conflicts with NPS policies regarding the pheasant stocking program, but this assumption is not critically discussed. The pheasant stocking program involves the intentional release of exotic birds for recreational shooting. NPS policies work to ensure that wildlife populations and the community and ecological associations they form are not adversely affected by preventable human actions and the FEIS must address the broad discrepancies and conflicts apparent in this. B81

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[102] Jessica Almy to CACO Advisory Commission, 2/1/02
[103] Piesman, J. and L. Gern. 2004. Lyme borreliosis in Europe and North America. Parasitology 129: S191-S220.
[104] Pennycott, T.W. and G. Duncan. 1999. *Salmonella pullorum* in the common pheasant (*Phasianus colchicus*). Vet. Rec. 144(11):283 – 287.
[105] Cavanagh, D. 2005. Coronaviruses in poultry and other birds. Avian Pathology 34(6): 439 – 448.
[106] Perkins, L.E.L. and D.E. Swayne. 2001. Pathobiology of A/chicken/Hong Kong/220/97 (H5N1) avian influenza virus in seven gallinaceous species. Vet. Path. 38: 149 – 164.
[107] DEIS p. 54
[108] DEIS p. 80
[109] DEIS p. 46

The evaluation of Alternative C states that eliminating the pheasant stocking and hunting program "would not have any beneficial or adverse effects on pheasants and predators."[110] This appears to contradict Section 4.4.2, which acknowledges a benefit from phasing out the introduction of an exotic species.[111] The FEIS must clarify this. Section 4.4.2 likewise acknowledges that eliminating pheasant stocking could have a negligible effect on predators and scavengers, but does not continue with an elaboration of this under Alternative C as it does for other issues raised. Given the serious animal welfare concerns related to pheasant rearing, stocking, and hunting, it is incorrect from an animal welfare perspective to say that the elimination of such a program would not have a beneficial effect on pheasants, or on the numerous humans who are concerned with their welfare, including many users of the National Seashore. If the DEIS is referring only to pheasant populations here this must be clarified in the FEIS. But the argument that eliminating pheasant stocking and hunting would not have a benefit to individual birds certainly remains and the FEIS must explore this more fully as well as incorporate it into the evaluation matrix wherever warranted.

B82

Recreation and Safety

One of the most compelling arguments against the continuation of hunting on the Cape Cod National Seashore is that hunting has a serious impact on and unfairly excludes other visitors from enjoying extensive portions of the National Seashore for a significant period of time each year.

B83

Nonetheless, the DEIS understates this effect. Instead, it claims that continuing hunting as it has occurred (Alternative A) will result in negligible adverse effects, even though "...some visitors avoid using portions of CACO during the hunting season."[112] The DEIS defines negligible effects for land use and recreation as resulting in "no noticeable change in public use and experience or in any indicators of visitor satisfaction or behavior."[113] Elsewhere, however, the DEIS states that significant numbers of visitors avoid hunting areas (47%), avoid visiting the National Seashore at all on days hunting is likely (27%), and feel they are unable to participate in activities on the Seashore (24%) because of hunting.[114] The DEIS also cites data that suggests that fewer people engage in hiking and dog walking during the deer shotgun season.[115] This adverse effect therefore is more accurately described as major.

B84

[110] DEIS p. 178
[111] DEIS p. 172
[112] DEIS, p. 169
[113] DEIS, p. 163
[114] DEIS, p. 152
[115] DEIS, p. 150

B85

Additionally, the DEIS fails to describe the indirect adverse effects as people who would otherwise use the Seashore engage in recreation in places where hunting is not allowed, resulting in more crowded conditions.

B86

The DEIS also fails to provide sufficient information to determine whether visitors' concerns regarding hunting are justified -- and if so, whether seashore managers intend to take meaningful action to address such concerns. Although the DEIS describes "close calls" and arguments and threatening behavior among hunters,[116] NPS aims to "Improve visitors' perception of hunting safety,"[117] rather than establish a protocol to make actual improvements in safety. Only retrospectively will NPS be able to evaluate whether Alternative B actually improves safety or visitors' perception of it. A better way to address this issue, should hunting continue on Seashore lands, would be to try to improve the accuracy of visitors' perception of hunting safety by providing current information to visitors about hunting infractions, hunter disputes, the distance shot and slugs can travel, and safety precautions people should take while using hunting lands.

B87

The FEIS must put hunting violations in context. The information listed in the DEIS concerning violations of park regulations is misleading. The document states, for example, that non-hunting-related violations exceed hunting-related ones by a factor of 35 to 265 times for violations and 56 to 107 times for warnings.[118] This comparison would be more meaningful if it were expressed as a percentage of annual participants. The DEIS states that annual visitation to CACO is 4 to 5 million people per year,[119] whereas deer hunting, one of the four most popular hunting activities, has an annual participation of 75 to 100 people.[120] Elsewhere, the DEIS summarizes hunting as accounting for 0.4 percent of recreational use of the Seashore in the fall[121] and states that 43 percent of Barnstable County's 2,910 hunters – or 1,251 – use the National Seashore.[122] Any of these figures seems to suggest that relative to their number, hunters violate Seashore policies much more frequently than do non-hunting visitors.

B88

The FEIS should also clarify whether any non-hunting related violations reported in the DEIS were committed by people who were hunting (e.g., a hunting party abusing alcohol or controlled substances).

Other Comments by Section

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[116] DEIS p. 21
[117] DEIS p. 66
[118] DEIS, p. 124
[119] DEIS, p. 124
[120] DEIS, p. 10
[121] DEIS, p. 146
[122] DEIS, p. 148

1.0 Introduction and Need

The DEIS refers to The Humane Society of the United States as "animal rights advocates."[123] In scoping comments The HSUS defined itself as "a mainstream animal protection organization with more than 8 million members and constituents, of whom 200,000 reside in Massachusetts." Please make this correction in the FEIS. B89

The DEIS states that there is strong support for hunting from "a variety of constituencies,"[124] as well as from MassWildlife. Please clarify in the FEIS what those "constituencies" are and enumerate them so that the public may be better informed about where support for hunting comes from. B90

The DEIS discusses the regulatory foundation for allowing hunting,[125] but does not discuss the general culture of the National Park Service and address why it is that the majority of parks do not allow hunting. Please provide this information in the FEIS, and indicate whether or not any survey of NPS personnel has been made to evaluate feelings among them on this issue. If not, please discuss why. In addition, the FEIS must examine Section 7 of the Enabling legislation and discuss the rationale of the Secretary in establishing hunting, especially as the grant of hunting authority took an overt action on the part of the Secretary. B91

Table 1[126] provides a summary of wildlife species hunted at the Cape Cod National Seashore. The deer archery season does not appear to be consistent with the season managed by the state. Page 6 of the Abstracts of the 2006 Massachusetts Fish & Wildlife Laws, included in Appendix A, states that the archery season extends from October 16 to November 25, not April 24 through May 6, as stated in the DEIS. If the hunting season at the Cape Cod National Seashore varies from elsewhere in the state, that discrepancy should be explained in the FEIS. The dates are not consistently for the same hunting season (i.e., 2005-06 or 2006-07), making the table difficult to understand. B92

Relevant portions of the General Management Plan are summarized in the DEIS, among them the strategy to evaluate public activities as the need arises. The evaluation is based on the following criteria: B93

> the use is compatible with the purposes and management objectives; user conflicts will be minimized; the use will not result in resource degradation "beyond what is reasonable;" the use will not impair the quality of the desired experience defined for the relevant management

[123] DEIS p. 1
[124] DEIS p. ?
[125] DEIS p. 2
[126] DEIS p. 10-11

> zone; the scale of use will be in character with Cape Cod; and the use will not constitute a public health or safety hazard.[127]

B93

The FEIS should quantify resource degradation due to hunting activity to the extent possible, and if this cannot be quantified provide information to that effect. Elsewhere the NPS takes sometimes considerable pains to prevent access to areas where sensitive resources are located and to erect physical barriers if human traffic is deemed to be injurious to the environment. The FEIS must address whether or not there are normative standard against which degradation of resources is measured by NPS and how the activities of hunters might be interpreted in that light.

B94

The DEIS addresses coastal processes[128] but dismisses them from further analysis, under the assumption that waterfowl hunting is compensatory. The FEIS must produce research to substantiate this conclusion. The definition of compensatory mortality in the DEIS[129] should be corrected to read: "Hunting mortality occurs in lieu of natural mortality, hence natural mortality is reduced. In this case, hunting mortality does not add to natural mortality."

B95

Water resources were also dismissed from analysis[130], because the DEIS claims that hunting generates "negligible pollution" from motorized watercraft used in coastal zones. The FEIS should expand upon this line of reasoning. Two-stroke engines leak gasoline each time air and fuel enter the combustion chamber. When NPS proposed the rule that led to a ban on personal watercraft in park waters, it cited studies that suggested that approximately 25 percent of the fuel put into two-stroke engines is discharged unused.[131] To the extent that these engines are used in waterfowl hunting, the activity is probably contributing to coastal pollution in non-negligible ways that should be further analyzed and discussed in the FEIS. Gasoline spilled into the ocean is a serious threat to wildlife. Research on MTBE, an additive in reformulated gasoline, suggests that it is acutely toxic and may be cancer-causing. Outboard motor emissions have been shown to cause abnormalities and death in the early development of fish and to affect the feeding behavior of adult fish.[132] Scientists have observed the disruption of biological functions caused by engine exhaust at the cellular and metabolic levels.[133] Additional studies have raised

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[127] DEIS 34-35
[128] DEIS p. 42
[129] DEIS p.42
[130] DEIS p. 42-43
[131] Federal Register: September 15, 1998 (Volume 63, Number 178), Proposed Rules, Page 49312-49317
[132] Shulman P & Pomory CM. 2000. The effects of hydrocarbon pollution from a two-stroke outboard engine on the feeding behaviour of *Lythrypnus dalli* (Perciformes: Gobidae). Marine Freshwater Beh. and Physio. 33(3): 213-220.
[133] Tjarnlund U et al. 1996. Further studies of the effects of exhaust from two-stroke outboard motors on fish. Marine Environmental Research 42 (1-4): 267-271.

concerns about the effect of MTBE on amphibians and invertebrates, such as zooplankton.[134] The FEIS should address these potential concerns.

B95

The DEIS argues that the financial costs of the hunting program including ranger salaries (which would be paid regardless), costs to post "no hunting" areas, and costs to print the hunting brochure "... are a minimal and insignificant portion of the CACO budget."[135] This is clearly an area where facts and not assumptions need to be provided. The FEIS should quantify the financial cost, so that the public can evaluate whether it is minimal and whether those funds could be better spent on other management activities. The FEIS should also evaluate whether the staff time used to manage and administer the hunting program could better be used on other management issues. For example, the DEIS states[136] that long-term monitoring of small mammals, aquatic turtles, shorebirds, and migratory waterfowl "is not feasible given the management priorities and available resources." The FEIS should include a comparative analysis of the costs and benefits that would be associated by reallocating time and expenses from the hunting program to these other mission-oriented activities.

B96

2.0 Alternatives

Alternative B espouses to "Provide an improved hunting program,"[137] but arguably does not. Instead, it maintains what was *status quo* regarding pheasant stocking prior to our suit, introduces a new turkey hunting season, and resolves some small technicalities regarding areas that were open to hunting in theory but not used for that purpose. In fact, the DEIS states: "Since most of the acres removed cannot be practicably hunted, this would not materially affect hunting opportunities."[138] Alternative B, as presented in the DEIS, would more accurately be defined as "Provide increased hunting opportunities," which label we suggest be used in the FEIS.

B97

2.6 NPS Preferred Alternative

Table 9 compares the three alternatives in relation to the goals set by planners. It states that Alternative C would not allow for the monitoring of hunted species.[139] The FEIS should explain how this would be, since eliminating hunting does not prevent the monitoring of previously hunted species. Many research techniques provide indications of population health and status more accurately than data collected at check stations, and, in fact, the

B98

[134] Werner I et al. 2001. Toxicity of methyl-*tert*-butyl ether to freshwater organisms. Envir. Pollu. 111 (1): 83-88.
[135] DEIS p. 44
[136] DEIS p. 70-71
[137] DEIS p. 48 and elsewhere
[138] DEIS p. 55
[139] DEIS p. 65

park already has employed some monitoring efforts that do encompass legally hunted species.[140]

B98

The DEIS also suggests that Alternative C would not maintain and improve natural communities.[141] The FEIS must explain the basis for this statement, particularly given that both logic and science strongly suggest that eliminating hunting would help restore ecological communities to a more natural state. The FEIS must address the argument that, at the very least, eliminating hunting would not prevent passive habitat management or other improvements that NPS might wish to implement.

B99

3.2 Hunting Theory and Background

The DEIS describes harvest theory to support the practice of hunting.[142] It is naïve to believe that "hunting removes the annual surplus that would die regardless."[143] Hunters do not target animals who are weak or sickly and are most likely to succumb to starvation or the elements. With deer hunting in particular, the most prized kills are of the strongest and largest animals. If the DEIS devotes two pages to harvest theory, it should also describe the animal welfare issues that are raised by the practice of hunting in a more comprehensive way than the cursory explanation given.[144] The DEIS, for example, could reference research that describes the pain endured by animals wounded by hunters. The DEIS states that in altered habitats, "hunting is often a desirable form of wildlife management that helps restore balance."[145] Using hunting to reduce wildlife populations is often a highly undesirable form of wildlife management. On Nantucket, for example, the public opposition to a February deer hunt imposed by the state wildlife board was so vehement that the board rescinded the hunt the very next year. Recently in Connecticut, the state legislature also did not consider a bill to repeal a ban on Sunday hunting intended to add additional opportunity for lethal deer management after hearing strong resistance to the proposal from their constituents.

B100

3.3.3 White-tailed deer

The discussion of the Porter et al. (1994) cites a number of study conclusions but references Porter (1991) as the derivation for at least one of these. This should be clarified in the FEIS and the statement that "…deer population abundance is probably set by annual harvest rather than habitat or weather…" attributed in greater detail.

B101

4.4.1 Alternative A – No Action

[140] Erwin et al. 2002. op cit.
[141] Need page cite
[142] DEIS p. 68-69
[143] DEIS p. 68
[144] DEIS p. 70
[145] DEIS p. 68

The DEIS states that hunting foxes, coyotes, and raccoons has the minor and long-term beneficial effect of reducing predation on shorebirds and pets. It also mentions that raccoons can carry rabies and that raccoon hunting is likely to be compensatory.[146] As in numerous other statements about such matters, these appear to be conjectural and no documentation to support or substantiate them is offered.

B102

The DEIS acknowledges that hunting generally causes temporary – but ongoing – adverse population effects to hunted species,[147] but does not report any indirect or cumulative adverse effects. The FEIS must address this and clarify as well the apparent contradiction here with the suggestion elsewhere that hunting keeps the deer population on the National Seashore in check.[148] It is also somewhat contradictory to the statement that hunting has a beneficial effect controlling wildlife populations for species that can damage cultural buildings,[149] and that hunting has beneficial effects on cottontail populations.[150] The FEIS should take these examples and other up and provide clear explanations of the reasoning behind them, and it should address the overall issue of consistency by discussing whether NPS believes the effects of hunting are temporary or lasting and, likewise, whether the population effects for various species are beneficial or they are adverse.

B102a

The DEIS also states that "recreational hunting does not adversely affected [sic] natural selection or the ability of wildlife to prosper."[151] This is not substantiated by data or reference to studies that demonstrate it to be true, and, indeed logic would suggest that recreational hunting would have a substantial effect on natural selection, since it is well known that hunters do not indiscriminately take animals such as deer, but base their experience and feelings of success on factors such as size and condition of antlers. The reference to prospering is vague and the FEIS should identify what is meant by this statement.

B103

4.4.2 Alternative B – Create an Improved Hunting Program

Many of the effects outlined for Alternative A are the same for Alternative B. The DEIS states that Alternative B differs from Alternative A in that it would slowly phase-out pheasant stocking as it improves habitat for native upland birds.[152] It also acknowledges the beneficial effect: "An exotic species would eventually not be stocked at CACO."[153] Logically, if eliminating the stocking of an exotic species is a beneficial effect of Alternative B, then continuing the stocking should have a negative effect described in the

B104

[146] DEIS p. 166
[147] DEIS p. 166
[148] DEIS p. 65, 66, 165, 167 and elsewhere
[149] DEIS p. 175
[150] DEIS p. 166
[151] DEIS p. 167
[152] DEIS p. 171-172
[153] DEIS p. 172

analysis of Alternative A. This is not described in the analysis of Alternative A and the FEIS must address it. B104

Among the direct beneficial effects expected for Alternative B, the DEIS lists: "Hunting has been part of the cultural heritage for generations," and, "Many individuals have grown up with a hunting tradition, which is still fostered by many."[154] It is unclear how these would be direct beneficial effects of the "improved hunting program," especially since the DEIS lists them as statements of fact elsewhere. The FEIS must address this. B105

4.4.3 Alternative C – Eliminate Hunting

The DEIS concludes that the short-term and long-term adverse effects of terminating hunting are minor and discusses effects on a species by species basis without reference to the wildlife community or interactions between its members.[155] For some species, such as raccoon, it notes that hunting would result in negligible to minor adverse effects, while at the same time suggesting that hunting "…contributes to the control of the local raccoon population…"[156] It is confusing what the DEIS is attempting to state here and elsewhere when such comments are made, and, in general the DEIS seems arbitrary in its declaration of which animals should be populous and those whose populations should be limited. The FEIS must address this. B106

After acknowledging that the annual fox kill is low and that the coyote kill is as high as some suggest would be necessary to control the population, the DEIS states that "hunting does provide a nominal control on the local fox and coyote populations and contributes to preventing substantial population increases."[157] This fails to acknowledge the role that exploitation plays in increasing reproductive success of coyotes, as well as the relationship between coyote and fox population sizes and territories and the FEIS should address this. Further, it is unclear what precisely the DEIS intends when it states that hunting "…is not having a significant ecological effect on foxes and coyotes, but does provide some control."[158] The FEIS should address this and be more explicit about how ecological effect and control differ, as well as provide data to support the claim that hunting provides control. B107

The DEIS does not acknowledge the indirect beneficial effects of Alternative C on wildlife.[159] Eliminating pheasant stocking to decrease the risk of introduction of antibiotic resistant microorganisms is but example. The FEIS must address these beneficial impacts. B108

[154] DEIS p. 174
[155] DEIS p. 178ff
[156] DEIS p. 179
[157] DEIS p. 179
[158] DEIS p. 179
[159] DEIS p. 180

The DEIS does not recognize any beneficial effects of Alternative C on vegetation,[160] but examples such as the reduction on off-trail trampling by hunters and dogs clearly exist to suggest benefits to fragile vegetation. The FEIS must address these beneficial impacts. B109

The analysis states that Alternative C would result in a moderate, long-term, local and possibly regional adverse effect on cultural heritage, since the National Seashore is the only public area open to hunting in the Outer Cape.[161] The DEIS fails to recognize the significance of Massachusetts' reverse posting law, under which private land is open to hunting unless the owner posts "No Hunting" signs. The National Seashore is the largest public area on the Outer Cape, but there are extensive privately owned lands that would remain open to hunting without any explicit permission or invitation. The FEIS should note this. B110

The DEIS states that the termination of the hunting program would have no beneficial effects on cultural heritage,[162] and, likewise, does not recognize any beneficial effects on land use and recreation.[163] This begs the question of what NPS defines "cultural heritage" to be, but by the admission of the DEIS itself activities such as berry picking and mushroom gathering could certainly benefit, as well as user groups such as hikers, wildlife watchers, bicyclists, artists, writers, and those who use the Seashore for spiritual practices. Walking and enjoying the ambience of the seashore is arguably the most ancient and practiced of all cultural heritages and terminating the hunting program would certainly provide a net benefit to individuals in that practice. B111

The DEIS lists moderate adverse effects on hunters, as their recreational activity would be eliminated, and minor beneficial effects on year-round residents and winter visitors (non-hunters), including increased visits and new visitors[164] It also states that it would have an adverse economic effect, eliminating hunter expenditures of $89,000 to $256,000 per year on the Outer Cape.[165] According to Table 32,[166] a summary of social effects for key affected groups, only Alternative B has positive or neutral (but not negative) effects for hunters, CACO visitors (non-hunter), and Outer Cape residents (non-hunter). This fails to consider those individuals represented by the organizations who sued the NPS over pheasant stocking and hunting more broadly. Alternative B is no improvement over the *status quo*, does not significantly reduce the potential for conflict for Seashore visitors, does not significantly reduce noise and safety threats for Outer Cape residents, and does B112

[160] DEIS p. 180
[161] DEIS p. 181
[162] DEIS p. 181
[163] DEIS p. 182
[164] DEIS p. 184
[165] DEIS p. 184
[166] DEIS p. 186

not sufficiently encourage visitors to use the Seashore during the six months that hunting is presently allowed. Moreover, it does not address their fundamental concern: that hunting is not an appropriate activity on the National Seashore. B112

5.6.2 Bibliography B113

The bibliography should be carefully proofread and, for example, incomplete citations such as those for Porter et al. (1991, 1994) corrected and duplicate citations such as for DeGraff & Yamsaki fixed.

Concluding Comments B114

The DEIS is based on unsupported scientific hypothesis and incomplete and unverifiable data. The structure of the document demonstrates a predecisional bias to the preferred alternative and does not comply with even the basic tenets of NEPA. The NPS needs to withdraw the DEIS as written and, at the very least, issue a supplemental DEIS correcting the numerous shortcomings of the document.

In broad consideration, the DEIS appears to be simply a justification for hunting on the National Seashore and offers two answers as to why CACO seeks to maintain hunting on lands protected by an agency that historically and traditionally has disallowed this activity: first, that it is a time-honored and worthy tradition on the Cape and should be maintained because it possesses some unique historic and cultural significance; and second, that it really does not have any impact on the animal communities there, or, if it did that this would be a positive one. In reality the facts are quite different, as indicated throughout these comments. The data clearly do not support NPS' position. B115

A crucial shortcoming in the documentation and analysis of the impacts of hunting on the National Seashore, as repeatedly noted by NPS itself in this DEIS, is that information has never been collected to measure and evaluate the impact of hunting on either the individual species pursued or, more critically, the communities of which they are a part. To an individual hunter the taking of an animal -- say a squirrel -- is of little or no consequence as long as the opportunity to take another squirrel in a similar way presents itself at some time in the future. As long as the squirrel population recovers from the impact of hunting, then for the hunter all is fine. That is not the case for the squirrel, of course, nor for other species that might benefit from that squirrel's continued presence in the environment, whether as the distributor of acorns, a potential prey item, a builder of tree cavities or any of the other innumerable things it might do as a member of a biotic community. Nor, of course, is it the case for the numerous individuals who derive immeasurable aesthetic benefits from observing ecosystems in their most natural state. The DEIS almost wholly disregards such real or potential relationships and fails utterly to conduct an ecological analysis of the consequences of hunting that would take such matters into consideration. B116

The DEIS fails to consider the cumulative impacts of the alternatives in any meaningful way. B116

We find it absolutely indefensible, above all, that the park would continue to extend special consideration to the artificial stocking of birds in the archaic and outmoded "put and take" operation. That the NPS can offer no better management alternative as its preference than to find ways to utilize native bird species to support this egregious type of practice is indefensible. To plan to continue to introduce an exotic species into the National Seashore for a fifteen year period following this NEPA action is also an absolute abrogation of responsibility at the federal level in addressing exotic species issues. B117

The National Parks are not hunting preserves. There are millions of acres of public and private lands that serve that function in our nation, and precious few that are devoted to allowing the natural interactions of biological communities to proceed without the imposition of humans. Yet, this is the vital purpose that the Cape Cod National Seashore should serve. We urge you to address this issue transparently and to decide now whether the seashore will be managed to allow it be unimpaired and enjoyed as a national treasure by all future generations. B118

We request that NPS give these comments thorough and complete analysis and review before either a supplemental DEIS or EIS is issued

Yours Sincerely,

John Hadidian, PhD
Director, Urban Wildlife Programs
The Humane Society of the United States

Kara L. Holmquist

Kara Holmquist, Esq.
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June 1, 2006

George E. Price, Jr.
Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

RE: Comments on the Draft Environmental Impact Statement, Cape Cod National Seashore Hunting Program.

The Wildlife Management Institute, Inc. (WMI) provides the following comments concerning the National Park Service (NPS) statements and findings contained in the Introduction section and the NPS selection of Preferred Alternative (B). C1

1. FINDING: NPS CLEARLY DEMONSTRATES THE CULTURAL AND HISTORICAL SIGNIFICANCE OF UPLAND GAME BIRD HUNTING

   WMI agrees with the NPS finding that upland game bird hunting is "is considered a part of the cultural heritage and fabric of life on Outer Cape Cod." (Introduction p. 1).

2. FINDING: NPS POLICY AND CACO STATUTE CLEARLY SUPPORT PERPETUATION OF HUNTING PROGRAMS ON CAPE CODE NATIONAL SEASHORE (CACO)

   WMI agrees with the NPS interpretation that policy and statute, as appended below, clearly provide for the perpetuation of hunting programs on CACO C2

   > "The legislation that created CACO in 1961 acknowledged the need to protect the variety of Cape Cod's outstanding resources for the enjoyment of residents and visitors alike, while at the same time seeking to perpetuate many of the traditional values, pastimes, and ways of life that have helped shape the special ambiance of the Cape. One of the customary activities at CACO, the hunting of upland game and waterfowl…" (Introduction page 3).
   >
   > "When Public Law 87-126 established CACO in 1961, its enabling legislation

specifically authorized that hunting and fishing may be allowed to continue in CACO, as discussed in Section 1.2.3 above." (Introduction page 23).

C2

3. FINDING: NPS POLICY ALLOWS FOR STOCKING OF RINGNECKED PHEASANT ON CACO

WMI agrees with the NPS interpretation that historical and future stocking of ring-necked pheasant on CACO is supported by NPS policy, in part as appended below:

> "In national recreation areas and preserves where the enhancement of fish and game species for hunting and fishing is authorized, preference will be given to enhancing native species. However, where stocking of exotic fish and same species has historically occurred, stocking for the same species may be continued unless it is known to be damaging native resources." (Introduction page 32)

C3

> "In some situations, the NPS may stock native or exotic animals for recreational harvesting purposes, but only when such stocking will not impair Park natural resources or processes and:
>
> - such stocking is in an NRA or preserve that has historically been stocked (in these situations, stocking only of the same species may be continued); or
> - Congressional intent for stocking is expressed in statute or a House or Senate report accompanying a statute.
>
> Management of exotic species can include allowing that species to remain on NPS lands under specific conditions. "(Introduction page 35).

4. FINDING: RING-NECKED PHEASANTS DO NOT IMPACT CACO NATURAL RESOURCES

Based upon our review of existing literature, including NPS sponsored studies as appended below, WMI agrees with the NPS interpretation that inhabitation of CACO by ring-necked pheasants does not impact CACO natural resources.

C4

> "A study completed by Bump and Field (1999) did not find any evidence that pheasants survive beyond the winter in numbers great enough to establish a breeding population. This study showed that native resources are not put at risk by this program."

5. FINDING: NPS DOCUMENTS PUBLIC CONCERNS REGARDING INTRODUTION OF NON-NATIVES AND PUT-AND-TAKE HUNTING PROGRAMS

C5

WMI could find no documentation to assess the methods employed by CACO to describe the statistical validity of the statements related to public concerns regarding management activities on CACO. Public hearings frequently do not provide an unbiased sample of public desires. WMI questions the validity of reported findings, but accepts that at some

level, NPS has received concerns from some citizens, as appended below, regarding hunting in general and the appropriateness of "put-and-take" pheasant stocking.

> "Some residents, visitors, and other interested parties have questioned the need for hunting in general, whether it is an appropriate activity within CACO, and whether it conflicts with other uses. Some question only the appropriateness and the legality of an annual "put-and-take" pheasant-stocking program that has occurred in certain areas of CACO since the 1940s." (Introduction page 2)

C5

6. NPS PREFERRED ALTERNATIVE:

C6

WMI does not accept the scientific presumptions implicit in the NPS Preferred Alternative. In addition, WMI finds that NPS has failed to provide documentation that would allow the environmental impacts of proposed actions to be evaluated.

NPS presumes that native quail populations will increase to a level adequate to support the current hunting opportunity for ring-necked pheasants from "cultural landscape restoration". WMI offers the following information to challenge that assumption. Information to support our challenge was gleaned from published literature and consultation with state and federal quail managers associated with the Northern Bobwhite Conservation Initiative (NBCI). The primary work of the NBCI occurs in southeastern U.S. in a climate region more temperate than that of CACO.

C7

- NPS documents that the current pheasant stocking activity results in an annual kill of 800 pheasants. NPS proposes to manage for a native quail population that can sustain an annual harvest that replaces the harvest opportunity afforded by the pheasant stocking program.
- NPS does not define equality between pheasant hunting and quail hunting opportunity. At one level, a 1:1 replacement would indicate that NPS proposes to provide wild quail hunting opportunity that results in a kill of 800 wild quail. Reasonable arguments could be made, however, that because of the differences in size, behavior and hunting characteristics, NPS should expect to produce a harvest of 1600 to 3000 wild quail to provide equality in harvest opportunity. Rather than select an arbitrary number, the following statements assume NPS provides *at the minimum* a harvest of 800 wild quail. WMI encourages NPS to better define equality by discussing the issue with CACO sportsmen and the MA Division of Fisheries and Wildlife.
- NBCI quail managers accept a 30% harvest rate as reasonable and sustainable. Therefore, to sustain a harvest of 800 wild quail, the CACO wild quail population must be at least 2,600.
- NBCI quail managers accept that a density of 0.5 wild quail per acre can be achieved on intensively managed quality habitat in a temperate climate. Therefore, to sustain a population of 2,600 wild quail, NPS must actively manage at least 5,200 acres of quality habitat on CACO.
- NBCI quail managers have documented that bobwhites require a robust grass/forb ground layer composed primarily of native species, especially native clump

C7a

grasses. Woody succession must be interrupted through controlled burning, brush control or grazing. NBCI managers have documented that intensive management of wild bobwhite habitat requires disturbance every two to four years, depending on numerous factors such as rainfall, growing season length, soil fertility, etc. Therefore, assuming a three-year disturbance rotation, to produce habitat capable of supporting at least 2,600 wild quail, NPS must commit to intensive management of at least 1,700 acres of habitat per year on CACO.

C7 C7a

NPS has not proposed a habitat management initiative equal to the scope necessary to produce habitat to support the native wild bobwhite populations large enough to replace current harvest opportunity on ring-necked pheasant. Therefore, the core strategy of the Preferred Alternative has almost zero chance of succeeding.

C8

Furthermore, NPS proposes to initiate a put-and-take quail hunting program if passive restoration of upland game bird habitat fails to achieve levels necessary to support a native quail population of size sufficient to equalize hunting opportunity with put-and-take pheasant stocking. WMI is opposed to this proposal for the following reasons:

C9

a. NPS has received public criticism of put-and-take hunting, and it contradicts NPS policy to be proposing an action within the Preferred Alternative that is clearly contrary to public input.
b. There is no cultural history of stocking quail or hunting of stocked quail on CACO. Stocked quail provide significantly different hunting experiences than wild quail and NPS would be introducing a new cultural experience onto CACO rather than maintaining a historically relevant cultural activity.
c. NPS documents that wild quail populations are present and persevere on CACO without stocking. This population of wild quail may be the northern-most extension of bobwhite on the eastern seaboard and is therefore unique from a genetic perspective. NPS should take actions to protect this population that has adapted to conditions at CACO. Dilution of the wild quail gene pool caused by stocking of domestic quail may cause extinction of the wild quail population through heritability of genes that dampen survivability. From a genetic perspective, domestic quail are an exotic species to CACO. Therefore, NPS cannot defend stocking of domestic quail onto CACO against a challenge that such stocking would impact CACO natural resources.

C9a

Therefore, WMI requests that Alternative A, the no-action alternative, be adopted by the NPS. Summary support for our recommendation includes:

C10

a. The cultural and historical significance of upland game bird hunting on CACO.
b. Policy and statute support for perpetuation of hunting programs on CACO.
c. NPS policy support for perpetuation of stocking of ring-necked pheasants on CACO.
d. The finding that ring-necked pheasants do not impact CACO natural resources.
e. The failure of NPS to document the extensive and expensive steps necessary to achieve restoration of native quail populations. The likelihood of NPS achieving the core strategy of its preferred alternative is nearly zero.

f. The secondary strategy of the NPS Preferred Alternative in implementing a put-and-take quail hunting program is contrary to perceived public input received to date, contradicts historical cultural relevancy, and threatens the genetic integrity of an existing wild quail population.

C10

If NPS would agree to commit the resources necessary to achieve native quail restoration in a manner similar to the guidance received by WMI from the nation's leading quail experts, and include estimates for such management treatments, acreage and timing within their Preferred Alternative, WMI would reconsider our position opposing that component of the NPS Preferred Alternative describing restoration of wild quail. As a corollary, we find that such treatments would benefit a far larger array of cultural and biological resources than hunting and bobwhite alone by returning CACO vegetation to a heath-land/savannah condition similar to historic norms. Regardless of the outcome of wild quail restoration, WMI will challenge the NPS proposed action of creating a put-and-take quail hunting program.

C11

Regards

Scot Williamson
Vice President

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June 16, 2006

George E. Price, Jr.; Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA, 02667

Dear Mr. Price:

On behalf of the National Wild Turkey Federation, I am submitting this letter in support of the continuation of the hunting program at CACO. The opportunity for the continuation of hunting was included in the enabling legislation that was passed establishing CACO and I believe that statement should be the foundation for future management of CACO. While I agree with the decision to select Alternative B as the preferred alternative, I would like to address a few items of particular interest to our organization.

I strongly support the addition of wild turkey hunting opportunities at CACO. We would like NPS staff to permit turkey hunting in spring and to leave the option open for fall turkey hunting if and when MDFW allows fall turkey hunting in the southeastern region. D1

I am concerned about the reduction in over 1,500 acres that would be open to hunting under Alternative B, through the increase in buffer zone distance around bike paths. Section 1.2.3 (*Enforcement*) of the DEIS states, "However, there have never been any documented "close calls" involving hunters and non-hunters". Also, as stated in section 2.2.2 (XII), "Hunter awareness of safety concerns and the rules of sportsmanship do not appear to be issues". Therefore, it is our conclusion that expanding those buffers from 150 feet to 500 feet would serve no real purpose other than decreasing the amount of land open to hunting. D2

Bobwhite quail population dynamics and habitats have been extensively studied over the years. Based on the available literature, NPS has not outlined a habitat management strategy that would allow for quail populations to expand to the level needed to provide a comparable hunting experience to what the pheasant program would provide. While I support habitat enhancement efforts to improve conditions for quail and other species, the pheasant program should continue with no schedule to end it. D3

The effects listed for Alternative C, eliminating hunting, seem to be underestimated. To suggest that terminating deer hunting would only have minor adverse effects on the deer population is in contrast to what has been thoroughly documented in numerous locations where deer numbers are not reduced annually through hunting. D4

It is the mission of the NWTF *to conserve the wild turkey resource and preserve the hunting tradition.* Hunters have always been the backbone of conservation in the nation by providing the funding to support natural resource research and management. Considering the strong regulatory foundation for allowing hunting at CACO and that hunting is considered part of the cultural heritage and fabric of life on Outer Cape Cod, I feel that Alternative B is the most appropriate option with the incorporation of the suggestions above. Thank you for the opportunity to comment on this important issue.

Sincerely,

James Earl Kennamer

James Earl Kennamer, Ph.D.
Senior Vice President for Conservation Programs



June 19, 2006

Via e-mail: CACO_Hunt_EIS@nps.gov and first class mail

George E. Price, Jr., Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Re: Comments of Safari Club International and Safari Club International Foundation on the Draft Environmental Impact Statement, Cape Cod National Seashore Hunting Program

Dear Superintendent Price:

Safari Club International and Safari Club International Foundation (collectively "SCI") appreciate the opportunity to comment on the Draft Environmental Impact Statement, Cape Cod National Seashore Hunting Program ("DEIS"). SCI participated as amici in the litigation that led to the preparation of the DEIS and has long been active in hunting issues related to the Cape Cod National Seashore ("CCNS"). With one exception, SCI fully supports the preferred alternative, Alternative B. The staff of the CCNS has obviously put a great deal of thought and effort into developing the DEIS. The document and the preferred alternative recognize the historic and cultural importance of sport hunting to the local community and residents. But SCI requests that the National Park Service ("NPS") slightly alter the preferred alternative to remove the mandatory elimination of the pheasant hunt in 15 years. In short, SCI requests that the NPS instead use adaptive management principles to retain the pheasant hunt for as long as strong interest remains with local hunters and the Commonwealth of Massachusetts.

E1

Safari Club International, a nonprofit IRC § 501(c)(4) corporation, has approximately 50,000 members worldwide, including many who hunt in CCNS and, in doing so, contribute to the sustainable use of the wildlife in the area. Its missions include the conservation of wildlife, protection of the hunter, and education of the public concerning hunting and its use as a conservation tool. Safari Club International Foundation is a nonprofit IRC § 501(c)(3) corporation. Its missions include the conservation of wildlife, education of the public concerning hunting and its use as a conservation tool, and humanitarian services. More specifically, the conservation mission of SCIF is: (a) to support the conservation of the various species and populations of game animals and other wildlife and the habitats on which they depend, and (b) to

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demonstrate the importance of hunting as a conservation and management tool in the development, funding and operation of wildlife conservation programs.

Alternative B, the preferred alternative, continues and improves hunting opportunities and recognizes the important recreational and cultural values represented by traditional hunting activities. For these reasons, SCI generally supports adoption of this alternative. SCI also supports efforts to improve opportunities for quail and turkey hunting, but not at the expense of other longstanding hunting activities. SCI appreciates that the NPS is allowing the pheasant program to continue, but opposes the mandated elimination of the pheasant stocking and hunting program after 15 years. As long as hunters have a strong interest in the hunt and the Commonwealth is willing to conduct the hunt, the NPS should continue to support and allow it as a valued cultural and recreational activity. Instead of deciding now to stop a popular activity 15 years in the future, the NPS should defer to the Commonwealth to gauge whether the level of interest is sufficient to continue the program. The NPS should also rely on adaptive management principles to ensure that the program continues to not have an adverse impact on native species or the ecosystem. E1

The Commonwealth-run pheasant hunt predates the establishment of the CCNS by at least 20 years and remains a popular traditional activity, especially with local and some less-experienced hunters. October 7, 2002 Waiver Memorandum, pp. 4-5. The NPS has concluded that the pheasant hunt has no adverse impact on the natural resources and values of the unit and thus does not impair the unit. For example, the number of pheasants released and that are not taken during the hunt is not sufficient to create a persistent population. The release of the pheasant also does not affect the predator populations (particularly coyote) in the area. The hunt has not created any public safety concerns. DEIS, p. 32, citing Bump and Field Study 1999. E2

Although NPS Management Policies generally favor native species, the NPS also has recognized that in some situations the historic stocking of a non-native species can continue unless the practice causes damage to native resources. For the CCNS, the NPS has determined that the pheasant program is causing no damage to native resources. In addition, the pheasant-stocking program does not involve the introduction of a species never before seen on the CCNS. In fact, the State has been releasing pheasants for hunting for at least 60 years. NPS Management Policies discourage only the introduction of "new exotic species." DEIS, p. 32; October 7, 2002 Waiver Memorandum, p. 5, citing NPS Management Policies 4.4.4.1 E3

In addition to not being warranted under NPS policies, eliminating the pheasant hunt would be contrary to the mission of the CCNS. The mission of the CCNS includes "to preserve ...cultural features, distinctive patterns of human activity ... [and] recreational values, and to provide opportunities for current and future generations to experience, enjoy and understand these features and values." Pheasant hunting is a longstanding cultural feature, a distinctive pattern of human activity, and a recreational value to many who live in and frequent the area. If it is eliminated in 15 years despite continued interest, future generations will not be able to experience and enjoy this E4

activity. DEIS, p. 32, citing Strategic Plan for the Cape Cod National Seashore Fiscal Year 2001-2005; see also DEIS, p. 174 ("Initiating an adaptive management approach to the pheasant stocking program would retain the cultural aspects of this hunting activity for as long as the program remains in effect.") E4

As the 2000 General Management Plan ("2000 GMP") recognizes, one of the goals of establishing the CCNS was to preserve the area in its 1961 state as much as possible. "Preservation would include a mixture of resources and activities that could change but must remain comparable in character and scale to that in existence in 1961." Other management objectives identified in the 2000 GMP echo this idea. "Encourage a commitment to the stewardship of the ... activities, ... of Cape Cod that best exemplify its traditional character, ..." and "[p]rovide opportunities for a diverse range of quality experiences that are based on the resources and values of Cape Cod, with consideration for sustainable practices and traditional uses, and that are consistent with the purposes of the national seashore." Eliminating the pheasant hunt, which dates back at least to the 1940s, would not honor this commitment to preserving activities historically carried on in the area. 2000 GMP, pp. 12, 19. While the 2000 GMP expresses a general preference for native species, this preference is not absolute and should not override other traditional cultural and recreational values represented by the longstanding pheasant-hunting program. E5

As long as sufficient interest remains, there is no reason that the pheasant hunt cannot continue indefinitely alongside efforts to develop opportunities to hunt native quail and turkey. Although the pheasant is not historically native to the area, the longstanding practice of stocking the birds for the hunt gives the species a native quality for this limited purpose. None of the problems sometimes caused by exotic, invasive species (*e.g.*, adverse impacts to native plants or animals) are present here. The carefully managed nature of the program distinguishes it from the uncontrolled "invasion" of some non-native species. As noted above, this program does not involve the introduction of a "new" non-native species. E6

Further, nothing in the *Fund for Animals* decision mandates that the NPS terminate the pheasant hunt or deal with the pheasant hunt differently than other hunting issues. Neither the decision nor the National Environmental Policy Act dictates any particular substantive result (*e.g.*, the elimination of the pheasant program). *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) ("NEPA itself does not mandate particular results, but simply prescribes the necessary process."). The *Fund for Animals* decision simply directed the NPS to review its hunting program by preparing an environmental assessment. The preparation of an EIS more than complies with the Court order. E7

Thus, the NPS has not identified any reason to terminate the pheasant program after 15 years. The *general* NPS policy favoring native species is not absolute and is subject to exceptions that *are applicable here*. The NPS, SCI, and other commenters have identified numerous reasons to continue this program, including the absence of adverse impacts on native species or the ecosystem, the strong public interest in E8

continuing the program, the fact that the Commonwealth of Massachusetts believes in and runs the program, and the goal of continuing historical and traditional practices within the CCNS. E8

For the reasons discussed above, SCI requests that the NPS modify Alternative B, the preferred alternative, to remove the mandatory elimination of the pheasant hunt program in 15 years. Instead, the chosen alternative should rely on the adaptive management principles discussed in the DEIS to assess the situation in 10-15 years to determine whether to continue or to eliminate the program based on current interest by hunters and the Commonwealth and other relevant factors. E1

SCI appreciates the opportunity to comment on this important issue. We look forward to working with the NPS, the Commonwealth, and affected local entities on the Cape Cod hunting program. If we can provide any further information, please let us know.

Sincerely,

Mike Simpson
President,
Safari Club International
Safari Club International Foundation

U.S. SPORTSMEN'S ALLIANCE

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Formerly The Wildlife Legislative Fund of America

June 19, 2006

VIA EMAIL: CACO_Hunt_EIS@nps.gov

Mr. George E. Price
Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Re: Draft Environmental Impact Statement for the Hunting Program, Cape Cod National Seashore (No. 20060143), Barnstable County, Massachusetts; National Park Service, Interior; Federal Register: April 21, 2006 (Volume 71, Number 77); Pages 20660-20661.

Dear Mr. Price:

The U.S. Sportsmen's Alliance ("USSA") and its approximately 1.5 million members and affiliates appreciate the opportunity to comment on the National Park Service's ("NPS") Draft Environmental Impact Statement ("DEIS") for the Hunting Program at Cape Cod National Seashore ("CACO").

The NPS DEIS sets forth three alternatives to the hunting program at CACO:

(A) Alternative A - No Action. USSA fully supports and recommends that NPS implement Alternative A. Pheasant hunting has been a long-held tradition and recreational activity on lower Cape Cod, dating back before CACO was established. Since the early 1990s, there has been an implicit understanding that the tradition of pheasant stocking and hunting would continue in the CACO region. There are no other available stocking areas for pheasant hunting in this region. In addition, pheasant stocking has been consistently supported by the NPS without any evidence of adverse effects to CACO. F1

NPS's Northeast Region Regional Director requested a waiver of Management Policies regarding pheasant stocking and hunting at CACO on October 7, 2002. This waiver requested that the "pheasant stocking/hunting program continue uninterrupted while we continue to examine options for phasing it out." The 2002 waiver is clear that pheasant stocking and hunting has continued at CACO consistent with the following NPS policies: F2

(1) Hunting is permitted at CACO under 16 U.S.C. § 459b-6(c).

(2) The 1998 General Management Plan and resulting Environmental Impact Statement requested that CACO "develop a comprehensive management program for the

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Protecting & Advancing America's Heritage of Hunting, Fishing & Trapping

management of invasive and non-native species." A study of pheasant stocking and possible impacts revealed that there were no impacts or risks to CACO by the pheasant stocking program.

(3) The 2002 waiver of policy stated that "there is no impairment from this [pheasant stocking] program under the Organic Act" and also no impairment of CACO park values. The waiver also stated that "although some language in [Management Policies] gives clear guidance that stocking of non-natives is inappropriate, there is also language in several sections that, taken as a whole, gives the manager some discretion when impairment does not occur."

(4) 2001 NPS Management Policies ("MP"), section 4.4.3 permits the "harvesting of stocked species for recreational purposes where it has historically been conducted and when it will not impair park natural resources or process, but only in national recreation areas or preserves." This section also states that "In some situations, the Service may stock native or exotic animals for recreational harvest purposes, but only when ... such stocking is in an area that has continually been stocked by a government agency (in these same situations, stocking only of the same species may be continued) ... ."

F2

(5) While MP section 4.4.4.1 states that "In general, new exotic species will not be introduced in parks," this clearly does not refer to pheasant stocking, since this had already been a practice by the Massachusetts Division of Fisheries & Wildlife ("MDFW") prior to the transfer of its state-owned lands for the creation of CACO.

(6) NPS-77 (Exotic Species Management) states that "exotic species...may be introduced to carry out NPS programs consistent with park objectives only when the following conditions exist": (a) "Available native species will not meet the needs of the program" (b) "Based on scientific advice from appropriate federal, state, local and non-governmental sources, the exotic species will not become a pest" and (c) "Such introductions will not spread and disrupt desirable adjacent natural plant and animal communities and associations, particularly those of natural zones."

(7) CACO review of MP and NPS-77 concluded that pheasant stocking and hunting policies are not in conflict, provided that there are no adverse impacts. In addition, CACO staff has stated that pheasants are "innocuous species" under NPS-77, and that "Management efforts should not be squandered on innocuous species."

(8) CACO recognizes that pheasant hunting has been a long-standing cultural and recreational activity in the CACO region, and there have been no safety incidents or issues related to pheasant hunting on CACO property.

F3

(B) Alternative B – Develop an Improved Hunting Program. USSA is opposed to several parts of Element 1 of Alternative B- Apply Adaptive Management

to Phasing Out the Pheasant Stocking and Hunting Program. USAA is opposed to language in Element 1 that proposes an arbitrary 15-year elimination of the pheasant stocking and hunting program independent of the success or failure of upland game bird restoration activities and opportunities commensurate to a "stocked pheasant hunt." In addition, this phase-out approach is inconsistent with the proposition of an "adaptive strategy" of management response to ecological conditions, rather than on a timed deadline basis. An adaptive approach would be a pheasant stocking program that is responsive to hunter demand and independent of native upland game bird habitat restoration. Furthermore, USSA believes that an increase in native game birds due to a restored habitat will not offer an equivalent substitute to the pheasant hunting program. Finally, USSA does not believe that MDFW has sufficient resources to monitor the CACO pheasant stocking program. F3

USSA does, however, support Elements 2 through 4 of Alternative B. USSA supports Element 2 - Simplify and Clearly Delineate Hunting Areas. USSA supports Element 3 - Wildlife and Hunting Monitoring. USSA supports NPS's efforts in monitoring the New England cottontail, and recommends that further study is necessary before modifying the existing rabbit hunting program. USSA also supports Element 4 - Improve Hunter and Non-hunter Information. F4

(C) Alternative C- Eliminate Hunting. USSA is completely opposed to Alternative C. This alternative is inconsistent with the goals, objectives and enabling legislation of CACO, 16 U.S.C. § 459b-6(c), that give statutory authority and recognition for hunting as a legitimate cultural and recreational activity in the CACO region. F5

For the above-mentioned reasons, USSA fully supports and recommends that NPS adopts Alternative A - No Action.

Sincerely,

William P. Horn
Director, Federal Affairs

cc: Rob Sexton
Wayne MacCallum, MDFW

G:\100670\3\590039.DOC

Mashpee Wampanoag Indian Tribal Council, Inc.
483 Great Neck Rd. P.O. Box 1048 Mashpee, MA 02649
Phone (508) 477-0208 Fax (508) 477-1218

G

June 19, 2006

George Price, Superintendent
Cape Cod National Seashore
99 Marconi Station Site Road
Wellfleet, MA 02667

Dear Superintendent Price:

I enclose comments from the Mashpee Wampanoag Tribe regarding the Draft Environmental Impact Statement prepared by the National Park Service (NPS) describing the scope of the administrative decision-making process regarding the hunting program at the Cape Cod National Seashore (CACO (NPS 2001a). These comments were approved by a unanimous vote of the Tribal Council at a meeting held on June 15, 2006.

Kindly contact me should you have any questions.

Yours very truly,

Glenn Marshall

Glenn Marshall, Chairman

Comments of the Mashpee Wampanoag Tribe on the Draft Environmental Impact Statement prepared by the National Park Service (NPS) describing the scope of the administrative decision-making process regarding the hunting program at the Cape Cod National Seashore (CACO (NPS 2001a).

The Mashpee Wampanoag Tribe ("Tribe") submits these comments regarding the Draft Environmental Impact Statement (EIS) prepared by the National Park Service (NPS) describing the scope of the administrative decision-making process regarding the hunting program at the Cape Cod National Seashore ("CACO").

The Tribe supports Alternative B as described in the Draft EIS to the extent that it is compatible with the Tribe's use of the CACO and requests that the Draft EIS be expanded to include reference to the significant contribution of the Mashpee Wampanoag Tribe and its ancestors to cultural heritage of the CACO.

G1

June 16, 2006

George E. Price, Jr.
Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Dear Superintendent Price:

The National Rifle Association appreciates the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the Cape Cod National Seashore (CACO) Hunting Program. After thoroughly reviewing the three alternatives proposed, the NRA supports a modification of Alternative A, the No Action Alternative.

The NRA is completely opposed to Alternative C that would phase out all hunting within CACO. If implemented, this Alternative would violate the statute creating CACO that is explained in 1.2.2. History and Significance of CACO as "seeking to perpetuate many of the traditional values, pastimes, and ways of life that have helped shape the special ambiance of the Cape. One of the customary activities at CACO, the hunting of upland game and waterfowl, is the focus of this DEIS." As noted in the Introduction section of the DEIS, hunting is "considered a part of the cultural heritage and fabric of life on Outer Cape Cod." Put-and-take pheasant stocking has occurred in certain areas of CACO since the 1940's, well predating the creation of CACO in 1961.

H1

Alternative C also contradicts the National Park Service's (NPS) policy on introduction of exotic species. As explained in the Draft EIS, preference is given to enhancing native species; however, "where stocking of exotic fish and same species has historically occurred, stocking for the same species may be continued unless it is known to be damaging native resources." The stocking and

hunting of ring-neck pheasant and the hunting programs for deer, rabbit, waterfowl, and other game species have been demonstrated to have no adverse effects on natural or cultural resources.

This leads then to concerns over NPS' Preferred Alternative, Alternative B, that is described as improving the hunting program. The NRA supports elements of this Alternative. We support Element 3A that would establish a new hunting season for eastern wild turkeys in accordance with the Massachusetts Division of Fisheries and Wildlife (MDFW) regulations. We support Element 3B that would include habitat improvement for upland game birds, focusing on the northern bobwhite quail, in the development and implementation of landscape restoration activities as outlined in CACO's general management plan. However, we support an "active"habitat restoration program, not a "passive" restoration program that the DEIS addresses. And, we support Element 3C that would integrate MDFW's annual wildlife monitoring results into CACO's management decisions to ensure sound wildlife management with a focus on deer, rabbits, turkey and quail. H2

The NRA also supports Element 4 to improve hunter and non-hunter information with major caveat. One of the objectives listed is to "inform hunters of the need to be courteous and respectful towards other users, and to follow the maps and regulations." The National Park Service should, at the same time, inform other users of CACO to be courteous and respectful of hunters. All fifty states have recognized the problem with hunter harassment through enactment of statutes to punish those whose intent is to disrupt or halt a lawful recreational activity. It would also be helpful to the non-hunter to know that hunting in CACO has an exemplary safety record. Other recreational uses should also be informed about the Seashore's maps and regulations to ensure compliance with policies and laws. H3

The NRA strongly opposes Element 1 because it would phase out the pheasant stocking and hunting program. By quoting policy and statute, the DEIS has made a solid case for supporting the continuation of the pheasant stocking and hunting program since the program meets the threshold of cultural heritage and no adverse environmental effects. While it is laudable that the NPS desires to attain a "no net loss of hunting opportunity" by replacing the pheasant hunt with upland bird hunting, Alternative B sets a phase out period for pheasant stocking and hunting with no documentation to show that the quality of hunting experienced over these many years will not suffer in the future, measured by the number of birds available to the hunter and the hunter's enjoyment of pheasant hunting vs quail hunting. H4

The DEIS provides no scientific data to suggest that CACO will be successful in restoring bobwhite quail and at the level of birds needed to fully replace the annual pheasant hunt. Furthermore, Alternative B calls for terminating the pheasant stocking and hunting program in 15 years, **"independent of the upland game restoration activities"** (emphasis added). This deadline makes a farce of the "adaptive strategy" that would be applied to phase out the pheasant hunting program as numbers of native game birds increased and of the statement that it is CACO's intent to "minimize any loss of hunting opportunity by creating an alternative to the pheasant hunt through the restoration of native upland species." H5

To offset the possibility (or likelihood) that the population of quail will be unable to rise to the

level of the stocked numbers for pheasant hunting, the NPS proposes to work with MDFW to create opportunities for a stocked quail hunt. However, the DEIS does not reference any authority for the NPS to substitute pheasant stocking for quail stocking. To the contrary the DEIS suggests that the NPS does not have the authority. Under Section 1.2.7. CACO's Mission Statement, Management Philosophy, Objectives and Goals it states:

In some situations, the NPS may stock native or exotic animals for recreational purposes, but only when such stocking will not impair Park natural resources or processes and: such stocking is in an NRA or preserve that has historically been stocked (In these situations, stocking only of the same species may be continued); or Congressional intent for stocking is expressed in statute or a House or Senate report accompanying a statute.

H6

It would seem that the NPS could open itself up to a lawsuit by anti-hunters against the stocked quail hunt. The outcome could be termination of the stocking/hunting program without any recourse since Alternative B would terminate the pheasant stocking and hunting program independent of the upland game restoration activities.

Element 2 ostensibly would assist the hunter and other recreational users by simplifying and clearly delineating areas opened to hunting. However NRA is opposed to increasing the buffer zone adjacent to bike paths from 150 feet to 500 feet. The DEIS clearly states in Section 1.2.3 CACO Hunting Program that **"There has never been a serious hunting accident recorded at CACO** (emphasis added)**."** The DEIS also notes that "**there have never been any documented "close calls" involving hunters and non-hunters** (emphasis added). The NPS has not made a case for the need to expand the buffer zone around bike paths. The DEIS was developed in response to a court ruling that enjoined the pheasant stocking and hunting program until an environmental assessment was completed by the NPS. User conflicts or potential safety issues were not the reasons for nor the subjects of the court's action and should not have been part of an "environmental review" under the National Environmental Policy Act.

H7

In summary, there are too many negative elements in Alternative B for the NRA and its hunter-members to support. Therefore, the only remaining alternative that is supportable is Alternative A. However, the NRA would like to see Alternative A modified to include the following elements of Alternative B: Element 3A to establish a turkey hunting program; a modification of Element 3B to proactively restore upland game bird habitat; Element 3C to work with the MDFW in implementing sound wildlife management practices with a focus on game species; and a modification of Element 4 to improve hunter and non-hunter information as addressed above.

Thank you, again, for the opportunity to comment on the DEIS.

Sincerely,

Susan Recce
Director

Conservation, Wildlife and Natural Resources
National Rifle Association

May 11, 2006

George E. Price, Jr.
Superintendent, Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Dear Mr. Price:

This letter is in response to your April 2006 letter requesting comments for the Draft Environmental Impact Statement (DEIS) for the hunting program at the Cape Cod National Seashore (CACO) in Massachusetts. Our comments are provided in accordance with Section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531-1533).

We reviewed the DEIS with respect to federally-listed or proposed threatened or endangered species that might be affected by the proposed hunting program at the CACO and offer the following corrections to the DEIS. On page 122, section 3.3.5 Wildlife Species That Are Endangered, Threatened or of Special Concern, the DEIS states that the USFWS lists 17 animal species within the CACO as endangered or threatened. This is incorrect. Based on a review of information in our files, the following federally-listed species (and the jurisdictional agency) are extant or were historic (H) within the CACO:

I1

- Northeastern Beach Tiger Beetle (H) - USFWS
- Piping Plover - USFWS
- Roseate Tern – USFWS
- Turtle, leatherback* (Oceanic summer resident) – NMFS
- Turtle, loggerhead* (Oceanic summer resident) – NMFS
- Turtle, Atlantic ridley* (Oceanic summer resident) – NMFS
- Whale, blue* Oceanic – NMFS
- Whale, finback* Oceanic – NMFS
- Whale, humpback* Oceanic – NMFS
- Whale, right* Oceanic – NMFS
- Whale, sei* Oceanic – NMFS
- Whale, sperm* Oceanic – NMFS

The DEIS also states that the Service is proposing that portions of the CACO be designated as critical piping plover habitat. This is no longer true. Critical habitat for the winter range of the

I2

piping plover has been designated; however, the CACO is not within the plover's winter range. At this time, the Service does not intend to designate critical habitat for the plover's summer range. I2

The DEIS did not provide an effects analysis specific to federally-listed species that occur on the CACO for any of the alternatives reviewed for the hunting program. We recommend that an effects analysis specifically addressing federally-listed species be provided in the Final Environmental Impact Statement. I3

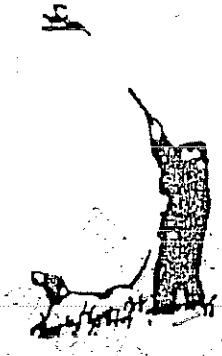
Thank you for providing us with a copy of the DEIS to review, and please contact me at 603-223-2541, extension 22, if we can be of further assistance.

Sincerely yours,

Susanna L. von Oettingen

Susanna L. von Oettingen
Endangered Species Biologist
New England Field Office

League of Barnstable County
Sportsman's Clubs, Inc.
P.O. Box 653
Yarmouthport, MA 02675-0635



June 3, 2006

MEMORANDUM FOR: Mr. George E. Price, Jr.
Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

FROM: Michael J. Veloza, President
Barnstable County League of Sportsmen's Clubs

SUBJECT: Draft Environmental Impact Statement, Cape Cod National Seashore Hunting Program

The Barnstable County League of Sportsmen's Clubs which represents numerous Clubs and approximately 3,000 plus members here in Barnstable County, also part of the Massachusetts Sportsmen's Council, a larger statewide organization, submits the following comments on the Draft Environmental Impact Statement Alternatives and the Elements contained within for the Cape Cod National Seashore Hunting Program.

Decades prior to the establishment of the Cape Cod National Seashore, Cape Cod Hunters enjoyed the recreational experience of hunting pheasants in the fall on the same lands that today is being proposed to be phased-out in 15 years according to the preferred Alternative B. Not only does this proposal threaten to eliminate a valuable, traditional and cultural experience for Cape Cod hunters particularly on the lower Cape, but it also has no documented justifiable basis.

From the beginning when the Cape Cod National Seashore was first established, there was an understanding that hunting would continue on these lands and this understanding is reflected in the language of the enabling legislation that created the Seashore. Prior to, and since the establishment of the Seashore there has been a continued history of pheasant stocking by the Massachusetts Division of Fisheries & Wildlife for the enjoyment of all hunters. Pheasant hunting is a tradition that bonds families and friends and provides a real opportunity for young people to become involved in hunting as a healthy outdoors activity and experience. Is this not the philosophy of the National Park Service to preserve and make available safe and healthy outdoor activities and experiences for all, rather then eliminating these traditional activities for special interest groups?

We would like to see grouse and quail restored on the Seashore for increase native upland bird hunting opportunities. Unfortunately even if the Seashore was able to successfully increase native upland game population levels, grouse and quail do not provide the same recreational experience as pheasant hunting.

Pheasant hunting is unique because of the size of the bird, the way the birds flush, there unique feathers and its quality for cooking.

We do support the Elements 2 and 4 that help clearly delineate hunting areas and improve hunter and non-hunter information.

We also strongly support Element 3A which would establish turkey hunting on the Seashore. The Massachusetts Division of Fisheries & Wildlife has done and outstanding job with there turkey restoration program bring back this magnificent bird to its native land. We are very encouraged by the Seashore's consideration and true cooperation with the sportsmen and women of Cape Cod in supporting turkey hunting opportunities which is part of our traditional hunting heritage here in Massachusetts and Cape Cod.

We completely oppose Alternative C to "Eliminate Hunting". There is absolutely no basis for selecting this Alternative which is completely in conflict with the enabling legislation that established the Cape Cod National Seashore and other National Park Service policies.

We ask that you strongly consider our comments and concerns that we have had for some time now throughout this process and be responsive to the comments contained within this letter. The sportsmen and women here on Cape Cod are strong advocates for hunting, but we are also strong advocates for the conservation of natural resources and the use of public resources for the benefit of all. We trust that as long–time residents of this region and users of the Cape Cod National Seashore that you will recognize our tradition of pheasant hunting as valuable and legitimate and continue to work cooperatively in our relationship with the Seashore.

On Behalf of the Membership

Michael J. Veloza, President
Barnstable County League of Sportsmen's Clubs

Testimony of: The Humane Society of the United States (HSUS) on

Draft Environment Impact Statement, Cape Cod National Seashore, Hunting Program

June 10, 2006

On behalf of more than 9 million members and constituents of The Humane Society of the United States (HSUS), of whom 250,000 reside in Massachusetts, I thank you for the opportunity to testify on the draft environmental impact statement on hunting on the Cape Cod National Seashore (National Seashore). The HSUS has been concerned about and involved with many aspects of your hunting program, most notably the stocking of pheasants, and has a long record of public comment on the issues involved here. The comments presented today should be considered in conjunction with and as a part of our past comments and the written comments that will be submitted by the 20 June deadline.

The Court in The Fund for Animals v. Mainella held that the National Park Service (NPS) was required to complete an environmental review of the effects of hunting on the National Seashore. We agree with the NPS that the issue is of sufficient consequence to the human environment to warrant a comprehensive Environmental Impact Statement (DEIS). However, the document as drafted falls far short of identifying and evaluating the significant biological, ecological and social factors involved here and fails to satisfy the basic requirements of the National Environmental Policy Act, as required by the Court The draft document does not contain an impartial, science-based review of the current hunting program and alternatives. The purpose of the proposed action favors a specific outcome, the selection of alternatives is arbitrary, and the interests of key affected groups – those concerned with the welfare as well as population status of the animals hunted on the National Seashore – are dismissed or ignored without being given fair consideration.

The DEIS reads as an apologetic defense of hunting as a social tradition rather than a biological assessment of the impact of hunting on the ecologically sensitive biotic communities at the National Seashore. It thereby stands in stark contrast to the purpose, policies, philosophy and mandate of NPS to protect, preserve and conserve those communities. The DEIS ignores long-standing principles and tenets that define the very essence of the National Park Service's goals and missions. There is a reason that NPS has never allowed hunting on the overwhelming majority of the lands it administers and the explanation, rationale and justification for that lies at the core of the issues that should be, but are not, addressed in the Draft Environmental Impact Statement.

Beyond the failure of the DEIS to address the NPS mission and agency mandates, this analysis of the hunting program at the National Seashore fails in many of its specifics to capture and characterize fairly important facts about the program. We look forward to the opportunity to address the many instances in which we have found this in our written testimony. For now, we note the absence of even a good-faith effort to conduct the necessary scientific studies or monitoring efforts required to determine the population status of the species recreationally pursued in the current hunting program, to conduct

population analyses and projections necessary to evaluate hunting impacts, to identify and define the impacts of hunting in biological and ecological contexts, and to make good economic determinations of the costs of a hunting program, among others.

We also wish to note that we find the discussion and analysis of legislative history to be lacking in sufficient detail to allow readers of this document to fairly and objectively understand the background to this issue, as well as determine the relationship between the park and the state wildlife agency.

Moreover, the evaluation of alternatives in the DEIS is based on several premises that are either speculative or patently false. We question:

- The premise that pheasant stocking and hunting, popular practices for 60 or 70 years, are *traditional* uses of the Outer Cape;
- The premise that pheasant stocking and hunting do not harm native wildlife or impact ecological communities;
- The premise that alternative, native, upland game birds, especially the bobwhite quail, occur in sufficient numbers to withstand hunting mortality;
- The premise that the New England cottontail population is not adversely affected by hunting;
- The premise that deer hunting on the Seashore controls the white-tailed deer population and that the population needs to be controlled;
- The premise that the current low deer density influences human exposure to Lyme disease;
- The premise that eliminating hunting would result in a greater loss of recreational opportunities than allowing it to continue would; and
- The premise that stocking non-native pheasants until other huntable species have increased to replace hunting opportunity is an acceptable wildlife management activity.

These failings concern us deeply, and we find the NPS to be without a credible defense to the charge that it violates its own core mission in presenting this document and defending its chosen alternative here. The DEIS analysis is faulty, incomplete, and does not satisfy the basic NEPA requirements. The cumulative impact analysis and justification for the chosen alternative are based on data and hypotheses that are incorrect and insufficient. Any agency decision that is based on these unsupported, speculative, and false premises is an arbitrary and capricious decision that cannot be justified in law.

The National Parks are not hunting preserves. There are many millions of acres of public and private lands that serve that function in our nation, and precious few that are devoted to allowing the natural interactions of biological communities to proceed without the heavy hand of humans imposed upon them. Yet, this is the vital purpose that the Cape Cod National Seashore should serve. We urge you to address this issue transparently and to decide now whether the seashore will be managed to allow it be unimpaired and enjoyed as a national treasure by all future generations or lose its splendor and identity in

continuing to serve simply as a hunting property that is a functional auxiliary of a state game and fish agency .

We thank you again for this opportunity to comment on the DEIS and request that these comments be incorporated into our written comments that will be submitted pursuant to the Notice.

APCC
Association to Preserve Cape Cod

3010 Main St., P.O. Box 398
Barnstable, MA 02630-0398

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June 6, 2006

George E. Price, Jr., Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Dear Superintendent Price:

The Association to Preserve Cape Cod (APCC), the region's leading nonprofit environmental advocacy organization, has reviewed the Environmental Impact Statement (EIS) for the Cape Cod National Seashore Hunting Program and submits the following comments about the hunting program as it pertains to the policy for ring-necked pheasant hunting.

Prior to 2003, the Massachusetts Division of Fisheries and Wildlife (MDFW), in cooperation with the National Park Service (NPS), stocked farm-raised, non-native ring-necked pheasant in certain areas of the Cape Cod National Seashore for the purpose of hunting. The EIS states that the practice of stocking ring-necked pheasant on the Outer Cape was started by the state in the 1930s and 1940s, before the 1961 establishment of the Seashore. A memorandum of understanding between MDFW and the NPS has continued that tradition until recently. In 2003, a court order was issued that placed a halt to the stocking and hunting of non-native ring-necked pheasant on the Seashore. In accordance with the court order, an EIS was prepared, the purpose being to study and develop a hunting management plan for the Seashore that would:

- minimize the effects of hunting on wildlife populations and ecosystems, and to sustain natural processes;
- reduce or avoid conflicts between humans and wildlife;
- protect natural and cultural resources, cultural heritage, and recreational values;
- provide opportunities for future generations to enjoy the above resources and recreational values of the Cape Cod National Seashore;
- provide visitors with a diverse and high quality experience; and
- address concerns related to the current hunting program, including the ring-necked pheasant stocking and hunting program.

The EIS offers three alternative policies for a future hunting management program on the Seashore.

Alternative A analyzes no action, or change, in the National Seashore hunting program as practiced prior to the 2003 court order.

Alternative B analyzes a modified hunting program that retains most of the existing program, adds a spring turkey hunting season, and phases out the non-native ring-necked pheasant hunting program over a period lasting up to 15 years.

During the phasing-out period, the development of a quail hunting program will be established through habitat restoration and the possible stocking of quail.

Alternative C analyzes the elimination of all hunting on the Cape Cod National Seashore.

The NPS states in the EIS that Alternative B is its preferred alternative.

APCC believes that the guiding principle behind any hunting program adopted for the Seashore should be based on wise management and conservation of wildlife that is native to the Outer Cape. Such a program should, above all, ensure that native game species inhabiting the Seashore remain at sustainable population levels. A program of this nature would be compatible with the NPS's mission to preserve, maintain and enhance the native animal and plant species and natural environment of Outer Cape Cod lands found on the Cape Cod National Seashore.

The ring-necked pheasant stocking program, as conducted until 2003, is not consistent with the principles stated above. The ring-necked pheasant is a species native to Eurasia, not North America. Introducing non-native species to the Cape Cod National Seashore, no matter the reason behind it, appears to APCC to be at odds with the NPS's goal of preserving the natural qualities of the Outer Cape region that are under its jurisdiction. Furthermore, APCC views the practice of stocking non-native birds as being in conflict with modern conceptions of environmental stewardship.

The introduction of ring-necked pheasant to the Seashore through a stocking program is an unsustainable practice. The EIS states that any individual ring-necked pheasant that survive the hunting season are unlikely to survive the winter. It seems ill-conceived to APCC that the NPS and MDFW would continually restock designated areas of the National Seashore in order to perpetuate hunting of a non-native species.

Ring-necked pheasant hunting has already been halted on the Seashore since 2003. If the goal of the NPS, as stated in the EIS, is to eventually eliminate ring-necked pheasant hunting, it is puzzling to APCC why the NPS would propose the resumption of hunting after the three-year ban, only to phase it out again.

The NPS's efforts would be better served by permanently suspending hunting of ring-necked pheasant on the Cape Cod National Seashore, and focusing its attention on restoring sustainable populations of native animal species, including traditional native upland game bird species.

Thank you for this opportunity to comment.

Sincerely,

Maggie Geist
Executive Director

Don Keeran
Assistant Director

33 Swamp Rd
West Stockbridge, MA 01266
June 14, 2006

George E. Price, Jr.; Superintendent
Cape Cod National Seashore
99 Marconi Site Rd.
Wellfleet, MA, 02667

Dear Mr. Price:

As the Massachusetts State Chapter President for the National Wild Turkey Federation, I am writing you with regards to the Draft EIS (DEIS) for the Cape Cod National Seashore (CACO) Hunting Program. As stated in the DEIS Introduction, the opportunity for the continuation of hunting was included in the enabling legislation that was passed establishing CACO and we believe that statement should be the foundation for future management of CACO.

We strongly support the addition of wild turkey hunting opportunities at CACO. We would like NPS staff to permit turkey hunting in spring and to leave the option open for fall turkey hunting if and when MDFW allows fall turkey hunting in the southeastern region. Opening CACO for turkey hunting would not only provide additional recreational opportunities for hunters, it would also provide an economic incentive to the local communities and provide NPS staff a necessary option with respect to wild turkey management.

We are concerned about the reduction in acres that would be open to hunting under Alternative B, through the increase in buffer zone distance around bike paths. Section 1.2.3 (*Enforcement*) of the DEIS states, "However, there have never been any documented "close calls" involving hunters and non-hunters". Also, as stated in section 2.2.2 (XII), "Hunter awareness of safety concerns and the rules of sportsmanship do not appear to be issues". Therefore, it is our conclusion that expanding those buffers from 150 feet to 500 feet would serve no real purpose other than decreasing the amount of land open to hunting. The expansion of these buffer zones for no real purpose would compromise additional areas open to hunting in the future as bike paths are added and/or modified. For these clearly defined reasons, we ask that you not increase the buffer zone from 150 to 500 feet.

While we support habitat enhancement efforts geared toward bobwhite quail, we do not wish to see pheasant hunting phased out. Improving habitat certainly will not result in quail densities increasing to levels needed to ensure CACO can offer a comparable hunting experience to the pheasant program. Looking at population dynamics of bobwhite quail and density estimates in the literature based on areas with excellent quail habitat, it is not likely that populations of quail could grow to the level NPS seems to anticipate. Pheasant hunting provides a significant recreational opportunity for many young hunters and we do not wish to see this opportunity systematically phased out at CACO.

The effects listed for Alternative C, eliminating hunting, seem to be underestimated. To suggest that terminating deer hunting would only have minor adverse effects on the deer population is in contrast to what has been thoroughly documented in numerous locations where deer numbers are not reduced annually through hunting. There are other occasions through Section 4.4.3 that seem to under-estimate the negative impact terminating the hunting program would have.

It is the mission of the NWTF *to conserve the wild turkey resource and preserve the hunting tradition.* Hunters have always been the backbone of conservation in the nation by providing the funding to support natural resource research and management. Our organization, in cooperation with others, are working tirelessly to address the concern of declining hunter numbers through a wide array of surveys, programs, and regulations designed to reverse this trend. One of the more significant obstacles to hunter recruitment and retention is access to land for hunting.

Considering the strong regulatory foundation for allowing hunting at CACO and that hunting is considered part of the cultural heritage and fabric of life on Outer Cape Cod, we feel that Alternative B is the most appropriate option with the incorporation of our suggestions above. Thank you for considering our comments.

Sincerely;

Brian Korte
MA State Chapter President
National Wild Turkey Federation

Massachusetts Sportsmen's Council Inc.

Post Office Box 191
Millbury, Massachusetts 01527
Telephone 508-865-5617 or 508-865-4828
Fax 508-865-0310

June 12, 2006

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Norfolk County League Of Sportsmen's Clubs

Plymouth County League of Sportsmen's Clubs

Massachusetts Beach Buggy Association

Massachusetts Bowhunters Association

Massachusetts Sporting Dog Association

Massachusetts Trappers Association

Mr. George Price Jr.,
Superintendent
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Dear Mr. Price

The Massachusetts Sportsmen's Council, after having followed through on the Pheasant Stocking issue on the CCNS since the initial law suit, strongly supports the continuation of pheasant stocking as it has since the creation of the National Seashore.

We have read the environmental impact statement and agree, as we stated in the beginning, that there has been no environmental impact as a result of pheasant stocking and hunting on the seashore and is consistent with the National Park Service management policies.

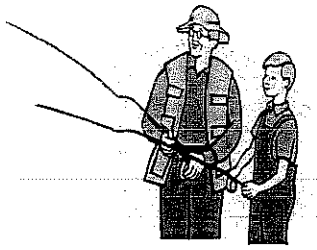
We do not agree with phasing out the pheasant stocking program and are surprised that it is offered as a solution with out a plan. Our members oppose phasing out the program and thereby reducing recreational opportunities on the Seashore. However, the members would welcome programs to improve habitat for the benefit of Quail and Turkey populations on the seashore as stated in option two.

The Council would be willing to work with the Seashore and the Division of Fisheries and Wildlife to make this possible.

Of the real things that have been offered at the conclusion of the Environmental Impact Study, the Council Supports option one (no change), and are willing to work on these other suggested programs without phasing out any present programs.

Respectfully Submitted,

Mike Moss
President, Massachusetts Sportsmen's Council



Highland Fish & Game Club, Inc.

Kerry L. Adams, Secretary
33 Conant Street
Provincetown MA 02657
(508) 487-2351



U.S. Dept. of the Interior, National Park Service
Cape Cod National Seashore
Mr. George Price, Superintendent
99 Marconi Site Road
South Wellfleet MA 02663

June 6, 2006

RE: *Draft Environmental Impact Statement, Cape Cod National Seashore - Hunting Program*

Dear Superintendent Price;

On behalf of the officers, executive board and membership at large of the Highland Fish and Game Club, I would like to take this opportunity to respond for the record to the Draft Environmental Impact Statement as proposed:

The study has proposed three separate hunting alternatives for consideration; from "Alternative C", the total elimination of hunting, to "Alternative A", leaving the sport as it was before the pheasant-hunting ban. We understand that "Alternative B" is the CCNS "preferred" alternative. While we agree with this plan in general, there is a very disconcerting piece of this alternative that we find completely unacceptable. That piece is the elimination or "phasing out" of the pheasant-hunting program over a 15-year time frame. It is the position of our club that since pheasant hunting predates the CCNS, it is a "traditional use" and "cultural resource" that the CCNS should seek to protect. The elimination of this activity will ultimately result in the loss of a number of hunters that have traditionally involved themselves in this activity for many years, as well as the loss of many future hunters that would have learned of this sport from their predecessors. For the past three years, there has been no pheasant-hunting program in place due to the injunction brought against the NPS by the animal rights activist groups. The result of this loss of a huntable species has forced an undue amount of hunting pressure on alternative species. We have also witnessed a serious decline in the number of hunters participating in their sport here on the lower cape.

In keeping with "Alternative B", it is the CCNS plan to replace the Ring Neck Pheasant species within a fifteen-year time frame with another upland bird, specifically the Bobwhite Quail. In our opinion, this replacement is not a suitable one for multiple reasons; Bobwhite Quail and Ring Neck Pheasants are a totally separate and different bird. Pheasants flush and fly higher and completely different from the Bobwhite Quail. Ring Neck Pheasants are a much larger bird that are highly sought after by hunters for their quality meat, prized and colorful tail feathers, and unique huntability. The Bobwhite Quail is a small bird that flushes and flies almost laterally. The result forces the hunter to shoot at a much lower level to the ground making the safety factor a more difficult one in confined areas. Therefore, we do not support any phase out of pheasant stocking and hunting. We thoroughly approve of the additional species and the improvement of habitats for hunting as proposed in "Alternative B".

In addition, we support the proposal to introduce a Turkey season to the CCNS. The introduction by the Division of Fish & Wildlife of this native bird back into the CCNS has proven itself to be a tremendous success. It would be very unfortunate if the CCNS did not take the initiative to allow the hunting of this exceptional bird.

In closing, please consider the following points when making your final decision:

1) We oppose any phase out of pheasant hunting in the CCNS. There should be no time limit set. The pheasant-stocking program has been in place since the 1930's and has been a successful one by providing an extremely popular game bird to the hunting community of Cape Cod. Your own studies have conclusively proven that the stocking of this species has had absolutely no detrimental environmental impact to the ecology of the CCNS.

2) We support any and all habitat improvement within the CCNS. The CCNS should work in concert with the hunting community to devise ways to add to the huntable species available within the CCNS.

3) We encourage the support and nurturing of additional huntable species including grouse, partridge, quail, woodcock, turkey, pheasant, etc. to the CCNS.

4) We vehemently oppose "Alternative C" that would seek to ban hunting (or pheasant hunting) in the CCNS.

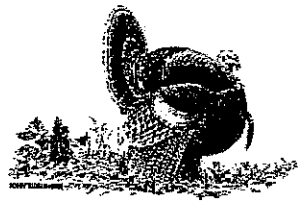
5) We support any efforts by the CCNS that would more concisely delineate hunting areas and provide more easily available information to the hunting and non-hunting public about hunting in the CCNS.

Thank you for giving us the opportunity to express our views on this subject. We appreciate the time and effort that you have put into this study. We look forward to a continued relationship with the CCNS and offer our support and assistance to you in any way that will help foster a hunting program that sportsmen and women, through the investment of their sporting tax dollars, so richly deserve.

Sincerely;

Kerry L. Adams, Secretary
Highland Fish & Game Club, Inc.

KLA



Cranberry Country Longbeards Chapter

of the National Wild Turkey Federation

June 16, 2006

George E. Price, Jr.; Superintendent
Cape Cod National Seashore
99 Marconi Site Rd.
Wellfleet, MA., 02667

To whom it may concern:

As the Chapter President for Cranberry Country Longbeards Local Chapter of the National Wild Turkey Federation (CCLC/NWTF), I am writing you with regards to the Draft EIS (DEIS) for the Cape Cod National Seashore (CACO) Hunting Program. As stated in the DEIS Introduction, the opportunity for the continuation of hunting was included in the enabling legislation that was passed establishing CACO and we believe that statement should be the foundation for future management of CACO.

Members of the CCLC/NWTF have been actively involved with efforts to enhance wildlife habitat, educate kids through the NWTF's JAKES program (Juniors Acquiring Knowledge, Ethics and Sportsmanship) and a host of other outreach programs for the community. Many of the members of our local chapter have hunted at CACO in the past and have enjoyed the time spent with family and friends while in the field. Expanding the opportunities for hunting to allow sportsmen and women to hunt wild turkeys at CACO would be very well received among our chapter members. Our chapter strongly supports the addition of wild turkey hunting opportunities at CACO. We would like NPS staff to permit turkey hunting in spring and to leave the option open for fall turkey hunting if and when MDFW allows fall turkey hunting in the southeastern region. Opening CACO for turkey hunting would not only provide additional recreational opportunities for hunters, it would also provide an economic incentive to the local communities and provide NPS staff a necessary option with respect to wild turkey management.

Our Local Chapter is concerned about the reduction in land open to hunting by 1,546 acres under Alternative B, through the increase in buffer zone distance around bike paths. This proposed reduction in acres open to hunting was made despite statements throughout the EIS, which acknowledge there is no need for the changes. Section 1.2.3 (*Enforcement*) of the DEIS states, "However, there have never been any documented "close calls" involving hunters and non-hunters". Also, as stated in section 2.2.2 (XII), "Hunter awareness of safety concerns and the rules of sportsmanship do not appear to be issues". Therefore, it is our conclusion that expanding those buffers from 150 feet to 500 feet would serve no real purpose. For these clearly defined reasons, we ask that the buffer zone around bike paths not be increased.

While we support habitat enhancement efforts geared toward bobwhite quail, we do not wish to see pheasant hunting phased out. Pheasant hunting provides a significant recreational opportunity for many young hunters and MDFW has implemented a Youth Pheasant Hunting Program that has been very well received across the state. The opportunity for adult hunting mentors to take youth afield hunting pheasant has provided a hands-on continuing education program for youngsters. Our local chapter would like CACO to allow pheasant hunting to continue so this opportunity remains for young hunters.

Our local chapter members are the active in carrying out the mission of the NWTF, which is *to conserve the wild turkey resource and preserve the hunting tradition.* Hunters have always been the backbone of conservation in the nation by providing the funding to support natural resource research and management. Our organization, in cooperation with others, are working tirelessly to address the concern of declining hunter numbers through a wide array of surveys, programs, and regulations designed to reverse this trend. One of the more significant obstacles to hunter recruitment and retention is access to land for hunting.

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Considering the strong regulatory foundation for allowing hunting at CACO and that hunting is considered part of the cultural heritage and fabric of life on Outer Cape Cod, we feel that Alternative B is the most appropriate option with the incorporation of our suggestions above. Thank you for considering our comments.

Sincerely;

Mark S. Galkowski, President
Cranberry Country Longbeards Local Chapter/NWTF

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