UNITED STATES FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the proposed Migratory Bird Hunting Plan for Tennessee National Wildlife Refuge in Henry, Benton, Humphreys, and Decatur Counties, Tennessee:

Check One:

_____ is a categorical exclusion as provided by 516 DM 2, Appendix 1 and 516 DM 6, Appendix 1, Section 1.4 A (4). No further NEPA documentation will therefore be made.

__X__ is found not to have significant environmental effects as determined by the attached Environmental Assessment and Finding of No Significant Impact.

_____ is found to have significant effects and, therefore, further consideration of this action will require a notice of intent to be published in the Federal Register announcing the decision to prepare an EIS.

_____ is not approved because of unacceptable environmental damage, or violation of Fish and Wildlife Service mandates, policy, regulations, or procedures.

_____ is an emergency action within the context of 40 CFR 1 506.1 1. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other Supporting Documents:

Endangered Species Act, Section 7 Consultation, 2007
Compatibility Determination, 2007

Signature Approval:

Clayton Ferrell — (1) Originator — 04/10/07 — Date

(2) Regional Environmental Coordinator — 4/20/07 — Date

(3) Regional Chief, NWRS, Southeast Region — 4/23/07 — Date

(4) Regional Director, Southeast Region — 4/25/07 — Date

FINAL
ENVIRONMENTAL ASSESSMENT

PROPOSED OPENING TENNESSEE NWR TO SPORT HUNTING (MIGRATORY BIRD HUNTING)

FOR FURTHER INFORMATION, CONTACT

REFUGE MANAGER

U. S. FISH AND WILDLIFE SERVICE

TENNESSEE NATIONAL WILDLIFE REFUGE

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ENVIRONMENTAL ASSESSMENT

PROPOSED OPENING TENNESSEE NWR TO MIGRATORY BIRD HUNTING

I. PURPOSE AND NEED FOR ACTION

A. Purpose

In response to a 2003 lawsuit filed by the Fund for Animals, the U.S. Fish and Wildlife Service (Service) will amend or rewrite environmental assessments that describe hunting programs at twenty-three national wildlife refuges located in the Southeast Region. The new environmental assessments will address the cumulative impacts of hunting at all refuges which were named in or otherwise affected by the lawsuit. This document addresses the hunting programs at Tennessee National Wildlife Refuge in Tennessee.

The purpose of the proposed action is to control the population of resident Canada geese (*Branta canadensis*) by opening a September resident Canada goose hunt on Tennessee National Wildlife Refuge (NWR). As a management objective, hunting provides the public with an opportunity to utilize a renewable resource. Since this hunt will occur during the first half of September prior to the arrival of migratory Canada geese the geese taken on this hunt will primarily be from the resident flock. Hunting of the resident goose population is not only compatible with refuge objectives, but sound wildlife management, and in the public's interest on Tennessee NWR.

B. Need

The need for proposing the hunt centers around the growth of the resident Canada goose population. The Tennessee Wildlife Resources Agency (TWRA) has determined through annual spring breeding population surveys that the resident Canada goose population in the West Tennessee Zone has reached a level that is sufficient for providing hunting opportunities during an early September season. The West Tennessee Zone, which consists of that portion of the state lying west of Tennessee State Primary Highway 13, was opened by TWRA to hunting during the 2002 hunting season. Resident Canada goose populations have reached nuisance levels on several lakes in middle and east Tennessee and complaints are increasing in the West Tennessee Zone. Complaints range from depredation in agricultural crops, lawns and golf courses to health and safety concerns at swimming beaches and airports. On Tennessee NWR resident geese cause damage to cooperative farmers= crops and moist soil vegetation, compete with migratory waterfowl for food resources, and interfere with wood duck (*Aix sponsa*) banding

activities. A reduction in the overall resident Canada goose population will be necessary to bring the population down to an acceptable level. Hunting will continue to be used to maintain the population at an acceptable level. Since 1996 approximately 4,000 resident geese have been relocated from other areas on the state to Kentucky Lake, greatly increasing the population. Proposing the September hunting season on the refuge will assist in maintaining populations at levels that are acceptable to most people living in the area and provide recreational opportunities for the general public. To assist in maintaining acceptable population levels and reducing problems associated with too many resident geese, Tennessee NWR will be opened to taking of Canada geese of the family Anatidae (as defined in 50 CFR 20.11 and 50 CFR 10.13), with limited days for taking within the framework of the State September Goose Season.

NEPA considerations by the Service for hunted migratory game bird species are addressed by the programmatic document, ''Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Sport Hunting of Migratory Birds (FSES 88– 14),'' filed with the Environmental Protection Agency on June 9, 1988. We published Notice of Availability in the Federal Register on June 16, 1988 (53 FR 22582), and our Record of Decision on August 18, 1988 (53 FR 31341). Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate Environmental Assessment, "Duck Hunting Regulations for 2006-2007," and an August 24, 2006, Finding of No Significant Impact. Further, in a notice published in the September 8, 2005, Federal Register (70 FR 53776), the Service announced its intent to develop a new Supplemental Environmental Impact Statement for the migratory bird hunting program. Public scoping meetings were held in the spring of 2006, as announced in a March 9, 2006, Federal Register notice (71 FR 12216).

Because the Migratory Bird Treaty Act stipulates that all hunting seasons for migratory game birds are closed unless specifically opened by the Secretary of the Interior, the Service annually promulgates regulations (50 CFR Part 20) establishing the Migratory Bird Hunting Frameworks from which States may select season dates, bag limits, shooting hours, and other options for the each migratory bird hunting season. The frameworks are essentially permissive in that hunting of migratory birds would not be permitted without them. Thus, in effect, Federal annual regulations both allow and limit the hunting of migratory birds.

The Migratory Bird Hunting Frameworks provide season dates, bag limits, and other options for the States to follow based upon Service-prepared annual biological assessments detailing the status of migratory game bird populations. The annual assessments are based upon the distribution, abundance, and flight lines of migratory birds. Thus, the level of hunting opportunity afforded each State increases or decreases each year in accordance with the annual status of

migratory game bird populations.

Each National Wildlife Refuge considers the cumulative impacts to hunted migratory species through the Migratory Bird Frameworks published annually in the Service's regulations on Migratory Bird Hunting. Season dates and bag limits for National Wildlife Refuges open to hunting are never longer or larger than the State regulations. In fact, based upon the findings of an environmental assessment developed when a refuge opens a new hunting activity, season dates and bag limits may be more restrictive than the State allows.

C. Decision That Must be Made

The Fish and Wildlife Service (FWS) Regional Director of the Southeast Region, by approving the alternative selected, will open sport hunting of Canada geese during the early September season on Tennessee NWR.

II. ALTERNATIVES - INCLUDING THE PROPOSED ACTION

A. No Action

Under this alternative the resident population would continue to grow causing increased complaints from the public ranging from depredation of lawns, golf courses, and agricultural crops to health and safety concerns at swimming beaches and airports. Increased depredation of agricultural crops on the refuge would likely jeopardize the cooperative farming program. The carrying capacity for migratory waterfowl and other wildlife would be reduced as crop yields and moist soil production decline. Increases would occur in the competition for food resources with migratory waterfowl populations wintering in this area. Preseason wood duck banding activities also would be impacted adversely with an increase of resident Canada geese, due to competition on the bait sites.

B. Sport Hunting of Canada Geese (Proposed Action)

The proposed action is to open a season at Tennessee NWR to September resident Canada goose hunting. The season will be within the framework of the West Tennessee Zone September Goose Hunting Season and further regulated by refuge regulations according to FWS policy. This hunt will occur during the first half of September prior to the arrival of migratory Canada geese. The costs to the refuge would be limited to administering the hunt and law enforcement.

C. Capture and Euthanasia during Molt for Population Control

This action would involve the capture and killing of a determined number (several hundred) of geese during the summer molt to maintain the population at an

acceptable level. The meat could then be donated to local food banks. This action would probably better address the depredation problem than any other alternative, because population targets could more easily be reached. Cost and manpower associated with the capture of geese and proper handling and processing of the meat could potentially be excessive. Public opinion to euthanasia is likely to be unfavorable. This alternative is considered to be a last resort when all other methods have proven unsuccessful.

D. Shooting for Limited Control in Problem Areas

This action would involve the shooting of a small number of geese by refuge staff from April through August and only in areas where significant problems occur. Shooting could be used as a deterrent under conditions when other forms of non-lethal harassment are not working. Specific problem areas where this method would be used include the wood duck banding site, newly planted agricultural fields, and during the early growth period in moist soil units.

Since only a small number of geese will be removed from the population, each year this action will not in itself control the population. However, this action may be used in addition to the proposed action to address specific problem areas. If this technique is used, it must be included in the refuge=s Animal Control Plan and a permit obtained by the FWS Office of Migratory Birds.

E. Disruption of Nests

Egg shaking, oiling, and replacement with dummy eggs have proven to be successful population control measures at some locations. The manpower required to make a significant difference on a large refuge would be excessive. A high percentage of the resident flock that causes the greatest habitat damage on Tennessee NWR consists of non-breeders. During the summer over 1,000 geese will congregate within a relatively small area of Duck River Bottoms to molt. This population is being supplemented annually by geese released near the refuge by TWRA and USDA Animal and Plant Health Inspection Service' s Wildlife Services program (WS). As long as geese are being relocated into the area, techniques to disrupt nesting will have limited success.

Since only a small number of nests can be located and disrupted each year the impact on the population will be limited and will not in itself control the population. However, this action may be used in addition to the preferred alternative if the hunting does not maintain the resident goose population at tolerable levels. If this technique is used, it must be included in the refuge' s Animal Control Plan and a permit obtained by the FWS Office of Migratory Birds.

F. Scare Strategies and Harassment

Scare devices that produce noise, such as propane cannons, pyrotechnics, distress calls and visual deterrents, such as predator decoys and mylar scare tape can be effective in displacing geese from a specific area. These techniques work best when the area impacted by the geese is relatively small and the deterrents need to be continuous and frequently moved to prevent habituation by geese. Frequent harassment by humans or dogs can also be an effective method of displacement of geese from a specific area.

It is impractical to apply this action at all problem areas on the refuge. The manpower and cost required would be excessive. Propane cannons, pyrotechnics and general harassment have been used to disrupt geese that were feeding in newly planted agricultural fields and at the wood duck banding bait site with limited success. These techniques will continue to be used by refuge staff under certain situations, but alone cannot sufficiently eliminate the problems caused by the geese.

G. Alternatives Considered but Eliminated from Detailed Analysis

Capture and Relocation

This action would involve the capture of resident Canada geese on the refuge during the summer molt and move them out of the Kentucky Lake and Lake Barkley areas. This action would be considered except for the cost in time, manpower, and the lack of an area to relocate the geese. Relocation is only a temporary solution and often creates problems in the area where the geese are released. Since there are no known areas to relocate resident geese this alternative will be eliminated from detailed analysis.

Chemical Repellents

This action would involve the application of chemical repellents to agricultural crops. To be effective repeated applications are needed following rain. With the scale of the problem on the refuge this method is cost prohibited. For this reason this alternative will be eliminated from detailed analysis.

Sterilization

Sterilization of ganders through surgical neutering can be used to reduce the reproductive capabilities of a resident goose population. This technique would require highly trained personnel to perform the surgery. Performing this action on

a refuge-wide scale would be cost prohibited. For this reason this alternative will be eliminated from detailed analysis.

Habitat Modification

Converting habitat to conditions that are not desirable to Canada geese or providing lure crops would result in moving the geese from problem areas into areas where their impact could be tolerated. Allowing a band of woody vegetation to grow between the waterline and an agricultural field might deter goose utilization, especially during the molt when many of the geese are flightless. When altering habitat, care should be taken not to have detrimental impacts to the migrant populations of Canada geese that will utilize these same habitats during the fall and winter. Increasing woody vegetation at the wood duck banding site might make this area undesirable to geese. Again, care should be taken not to impact the success of the wood duck banding operation.

Planting a lure crop, such as clover or wheat, to provide browse when geese would be damaging agricultural crops, moist soil vegetation, or interfering with wood duck banding, might reduce the overall impact of the geese. Lure crops will need to be planted in areas that are desirable to geese and at a distance from the problem sites.

Habitat modification to reduce impacts of resident geese has already been incorporated into the refuge' s management strategy. Efforts along these lines will continue. However, since a primary objective of the refuge is to manage for good waterfowl habitat, the amount of modification that can occur is limited. This action cannot be incorporated at a level to reduce the resident goose population utilizing the refuge without significantly impacting the migrant Canada goose populations. For this reason this alternative will be eliminated from detailed analysis.

III. DESCRIPTION OF AFFECTED ENVIRONMENT

A. Physical Environment

The 51,358-acre Tennessee NWR, located along approximately 65 river miles of Kentucky Lake in Benton, Decatur, Henry, and Humphreys counties, is divided into three units: the Big Sandy, Duck River, and Busseltown units. Most of the lands now managed by the refuge were among the tracts purchased by the Tennessee Valley Authority (TVA) in the construction of Kentucky Dam and the subsequent impoundment of Kentucky Lake. TVA reserved all rights on flood control, navigation, and power production.

There is a total of 3,000 acres of cropland on all three units, with approximately 700 acres on the Big Sandy Unit, 1,600 on the Duck River Unit, and 700 acres on the Busseltown Unit. This land is farmed each year through cooperative farming agreements to provide supplemental food for thousands of waterfowl. In addition, approximately 1,500 acres in the Duck River Bottoms are managed for moist soil vegetation production. The Duck River Bottoms are compartmentalized by a series of levees and water control structures that allow water levels to be controlled for optimum waterfowl food production. The refuge contains approximately 20,000 acres of forest, with the majority consisting of upland stands. Small isolated blocks of bottomland hardwoods occur on the Duck River and Busseltown units. The predominant forest type is oak-hickory. The remainder of refuge not falling into the forested, agricultural, or moist soil categories primarily consists of open water habitats.

One of the objectives of the refuge is to perpetuate the migratory bird resource. A management plan designed to achieve this objective is to band wood ducks during the preseason banding period of July through September 15 each year. Information obtained from the recovery of banded wood ducks is critical for monitoring recovery and survival rates and the derivation and distribution of harvests.

B. Habitat Management and Vegetation

Water Management

There are twenty-two impoundments that provided an annual average of 5,500 acres of seasonally-flooded habitat on the refuge. These impoundments are intensively managed to provide food and cover for waterfowl. Water levels are lowered before and during the growing season so that agricultural crops can be planted and moist soil vegetation can germinate. From early fall to late winter the impoundments are flooded to provide the cover and make the food available for thousands of migrating and wintering waterfowl, rail, and bittern.

Agriculture

Through a cooperative farming program approximately 3,000 acres are farmed annually on the refuge to supplement the natural foods available for waterfowl. Five private farmers plant all of the agricultural lands on the refuge. Currently, they harvest 85% of the crop and leave 15% in the fields as the refuges share. The crops that are typically planted are corn, soybeans, grain sorghum, millet and winter wheat. The refuges share is made available to the waterfowl by flooding, when possible, or knocked to the ground using tractors.

Moist Soil Management

Around 1,500 acres of moist soil habitats are managed each year to enhance the production of seeds from annual plants that naturally grow in seasonally flooded wetlands on the refuge. Natural foods are produced for waterfowl and other wetland dependent species within these wetlands by manipulating water levels on a timely basis to encourage the growth of desirable plants such as, wild millet (*Echinochloa* spp.), annual smartweed (*Polygonum* spp.), redroot flatsedge (*Cyperus erythrorhizos*), beggarticks (*Bidens* spp.) and sprangletop (*Leptochloa filiformis*). Another important component of moist soil management is the abundance invertebrates that thrive in this habitat.

C. Wildlife

Tennessee NWR is located within a biologically diverse area and provides a diversity of habitats such as upland oak/hickory forest, bottomland hardwoods, moist soil impoundments, freshwater marshes, cropland, old fields, seasonal mud flats, wetland scrub/shrub plant communities and open water areas. This combination supports a rich assembly of wildlife, including 294 bird species, 144 fish species, 89 species of reptiles and amphibians, and 51 species of mammals.

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. The refuge serves as an important wintering ground for thousands of migratory waterfowl in the Mississippi Flyway. Tennessee NWR winters about 210,000 ducks and approximately 15,000 Canada geese. The Southern James Bay population of Canada geese makes up about 40-60% of the geese using the refuge during the winter. The refuge is also the most significant area for wintering American black ducks in Tennessee, holding 50-75% of the population migrating to this state (Tennessee NWR and TWRA, unpub. data). Other waterfowl species present in significant numbers during fall and winter include the mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), American wigeon (*Anas americana*), blue-winged teal (*Anas discors*), green-winged teal (*Anas crecca*), northern pintail (*Anas acuta*), ring-necked duck (*Aythya collaris*), and canvasback (*Aythya valisineria*). The waterfowl species that nest in any significant numbers on the refuge are Canada geese, wood ducks, and hooded mergansers.

Non-hunted Wildlife

A variety of non-hunted wildlife is observed on the various units of the refuge during early September, when the hunt will be occurring. Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, songbirds, raptors, woodpeckers, gulls, cormorants, and terns. Other examples of non-hunted wildlife include, but are not limited to small mammals, reptiles and amphibians, mussels, fish, and insects. Shorebirds are common fall visitors to the mudflats of Kentucky Lake during fall migration. A total of 32 species have been identified as occurring on the refuge. Killdeer, least sandpiper, common snipe, and pectoral sandpiper are the most abundant visitors. Several species of herons, egrets, and the occasional ibis utilize the refuge in the fall. Great blue herons are common nesters on the refuge with the occasional great egret. Green herons also nest on the refuge in low numbers. Post-breeding dispersal brings in large numbers of double-crested cormorants, great egrets with smaller numbers of snowy, and cattle egrets. Little blue, black-crowned, and yellow-crowned night herons can also be found in low numbers, mostly within interior wetlands. Resident ospreys are still in the area utilizing Kentucky Lake for feeding. Several species of resident hawks such as red-tailed, red-shouldered, Cooper's, kestrel and broad-winged hawks are typically found over interior wetlands. Several resident and migrant species of rails and bitterns can be found within interior wetlands, primarily within the Duck River Bottoms. Kentucky Lake is also commonly used by gulls and terns migrating through the area. Some of the more common species are the ring-billed gull, Caspian tern, and black tern. Small numbers of resident and migrant pied-billed grebes are observed on Kentucky Lake in September.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. All of these species except for rabbit and fox can be legally hunted on the refuge within established seasons.

Threatened and Endangered Species

There are presently nine federally-listed animal species that occur on the refuge. There are two species of birds: bald eagle (*Haliaeetus leucocephalus*) and least tern (*Sterna antillarum*). Four species of freshwater mussels: pink mucket pearly mussel (*Lampsilis abrupta*), ring pink (*Obovaria retusa*), orange-footed pearly mussel (*Plethobasus cooperianus*), and rough pigtoe (*Pleurobema plenum*), one fish species, the pygmy madtom (*Noturus stanauli*) and lastly two species of bats, the gray (*Myotis grisescen*) and Indiana bat (*Myotis sodalist*). Neither species of

bats has been documented as occurring on the refuge, but they may occur on the refuge. The bald eagle is a frequent fall and winter visitor. Five active bald eagle nests occur on the refuge. The least tern is an infrequent to rare visitor. The pink mucket, ring pink, orange-footed, and rough pigtoe mussels occur on the Duck River Unit of the refuge.

D. Wildlife Dependent Recreation

Due to an abundance of public lands that center around Kentucky and Barkley Reservoirs, fish and wildlife related recreational opportunities are abundant within the region surrounding Tennessee NWR. These manmade reservoirs provide an excellent sport fishery, good waterfowl hunting, and superior wildlife watching opportunities. The refuge is an important segment of these public lands and provides recreational opportunities associated with wildlife observation, fishing, and hunting.

Along Kentucky and Barkley Reservoirs there are three state parks and one wildlife management area in Kentucky, three state parks and seven wildlife management areas in Tennessee, Shiloh National Military Park, Fort Donelson National Military Park, and Land Between the Lakes National Recreation Area. To differing degrees these high use recreation areas provide lodging, golf courses, swimming beaches, picnic areas, marinas, boat launch facilities, hiking trails, hunting, fishing, and campgrounds. U.S. Army Corp of Engineers (USACE) and TVA also provide public use facilities and permit private facilities that serve the general public.
Large concentrations of geese occur at some of these public use facilities and most human/goose conflicts occur due to the excessive fecal matter on golf courses, swimming beaches, boat docks, fishing piers, and picnic areas.

A September hunting season for Canada geese was opened on Kentucky Lake by TWRA in 2002. The waterfowl hunting public is very supportive of this new hunting opportunity and desires that population levels remain high enough to continue this hunt.

E. Refuge Facilities

Refuge facilities are comprised of roads/levees, buildings, parking lots, kiosks, trails, and boat ramps. There are 43 miles of public roads and 18 official boat ramps located on the refuge. There are no public restrooms on the refuge. Buildings, parking lots, boat ramps, and roads cover 240 acres of the refuge.

F. Cultural Resources

The body of federal historic preservation laws has grown dramatically since the enactment of the Antiquities Act of 1906. Several themes recur in these laws, their promulgating regulations, and more recent Executive Orders. They include: 1) each agency is to systematically inventory the historic properties on their holdings and to scientifically assess each property's eligibility for the National Register of Historic Places; 2) federal agencies are to consider the impacts to cultural resources during the agencies management activities and seek to avoid or mitigate adverse impacts; 3) the protection of cultural resources from looting and vandalism are to be accomplished through a mix of informed management, law enforcement efforts, and public education; and 4) the increasing role of consultation with groups, such as Native American tribes, in addressing how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups. The U.S. Fish and Wildlife Service, like other federal agencies, are legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service's cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3. In the FWS's Southeast Region, the cultural resource review and compliance process is initiated by contacting the Regional Historic Preservation Officer/Regional Archaeologist (RHPO/RA). The RHPO/RA will determine whether the proposed undertaking has the potential to impact cultural resources, identify the "area of potential effect," determine the appropriate level of scientific investigation necessary to ensure legal compliance, and initiates consultation with the pertinent State Historic Preservation Office (SHPO) and federally recognized Tribes.

The Mount Zion Baptist Church is the only structure on the refuge on the *National Register of Historic Places*. This building is located on the Big Sandy Unit and is not within the open hunting zone of the goose hunt. Much of the refuge along the Tennessee and Duck Rivers was home to the Chickasaw Indians. A 1978 archaeological survey of the refuge identified 102 prehistoric sites, 6 prehistoric localities, and 8 historic localities. 1981, *A Cultural Resource Reconnaissance of the Tennessee National Wildlife Refuge with Archaeological Survey of the Selected Areas, Benton, Decatur, Henry, & Humphreys Counties, Tennessee*, Tanasi Archaeological Research Associates, Report NO. 1, by Autry, Jr. and Hinshaw

G. Refuge Environment and Community

The total population of the four counties surrounding the refuge was 77,876 out of a statewide population of 5,962,959 based on a 2005 estimate. The average per

capita income was $16,386 compared to the statewide per capita income of $19,293 as shown by 1999 survey data.

Public health and safety risks are a growing concern with increasing populations of resident Canada geese. The primary concern is associated with the excessive fecal matter that is deposited by a substantial resident goose flock in urban areas. Some pubic swimming beaches have to be periodically closed due to elevated levels of fecal coliform. The potential exists for the contamination of water supplies in some local communities due to high levels of bacteria and particulate matter. Residential developments occur along a significant portion the reservoir shorelines. In areas where high populations of resident geese occur conflicts associated with fecal matter on lawns and private docks are a significant issue.

There is a potential for bird-aircraft strikes to become a problem if the resident geese start feeding along the runways of several small airports in the vicinity of the refuge. This is not currently a problem in this area but the potential exists, due to the habitat conditions (low grass) that occur at the airports.

A portion of the general public is opposed to hunting on National Wildlife Refuges and would in all likelihood be opposed to hunting resident geese on Tennessee NWR. There may also be potential conflicts between hunters and adjacent landowners but efforts will be made to minimize this problem by closing sensitive areas to hunting.

Resident Canada geese provide a variety of economic impacts to humans both positive and negative. The money spent by photographers, bird watchers, and hunters contributes significantly to the economy of local communities. On the other hand the damage that feeding geese can inflict on agricultural crops, lawns, and golf courses can result in substantial economic loss.

IV. DIRECT AND INDIRECT IMPACTS

A. No Action

1. Habitat Management and Vegetation

Each year resident geese cause severe damage to a portion of the agricultural crops grown on the refuge when they browse on agricultural crops. This depredation occurs during the early stages of growth and typically results in a total loss of the crops in the areas impacted. This damage reduces the food that will be available to wintering waterfowl and other wildlife.

Depredation results in decreased yields in agricultural crops, negatively affecting the refuge's cooperative farmer by reducing his profit margin and contributing to economic hardship. Some farmers may demand compensation for the crops that are lost to browsing, while others may not be able to withstand the economic losses and quit the farming program.

Resident geese also browse the new growth of moist soil vegetation that grows on the mud flats following a drawdown of the moist soil impoundment. It is unknown to what degree the heavy browsing affects the seed production of moist soil plants, but vegetation stunting does occur. Overbrowsed vegetation in moist soil habitats does not provide adequate food sources for waterfowl due to a reduction in seed yield.

2. Wildlife

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. Under the No Action alternative the resident Canada goose population on the refuge is expected to continue to increase significantly. Previously the opening of the statewide resident Canada goose hunt on surrounding lands forced additional geese onto the refuge worsening the existing problems with crop depredation, overgrazing of moist-soil vegetation, and conflicts at the wood duck banding site. The impacts of such an increase in the resident goose population would also increase direct competition with the migratory waterfowl during the migration and wintering period for the available food resources. This in conjunction with the impacts on the habitat will result in a lower carrying capacity for migrant waterfowl. This will occur due to a decline in the amount of agricultural crops available and a decrease in the amount of moist soil acreage available. Waterfowl would be forced to expend extra energy searching for food both on and off the refuge, possibly leaving the state. This could have a negative impact on waterfowl numbers at the local and regional level but no impact would be expected at the national level. Migrating sora (rails) and common snipe commonly use the moist-soil units and would be expected to lose habitat as geese increasingly damage the moist soil habitat utilized by these species. Mourning doves would see a decline in food resources in harvested agriculture fields as resident geese consumed the waste grain.

If competition with wood ducks on the bait site during banding operation becomes much worse, the number of wood ducks banded by this refuge is anticipated to decline. Eventually, the duck trap location may need to be abandoned for other locations away from concentrations of resident geese. If this occurs, the wood duck banding operation for the refuge will become more costly. Tennessee NWR

has one of the most successful wood duck banding programs in the country so this would be a meaningful loss of data to the wood duck banding program at the local, regional, and national level.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, cormorants, and terns. Other examples of non-hunted wildlife include, but are not limited to small mammals, reptiles and amphibians, mussels, fish, and insects. This action is not expected to significantly impact most of these species. The exception would be the several species of rail and bittern which utilize the moist soil units. Increased damage to the moist soil habitat by resident geese has the potential to reduce the carrying capacity of the refuge for these species.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. This alternative should have no significant impacts on the hunted species using the refuge at the local, regional, or national level.

Threatened and Endangered Species

This action should not impact the threatened and endangered species on the refuge.

3. Wildlife Dependent Recreation

The waterfowl hunting public would not have the opportunity to harvest a renewable resource or participate in a recreational activity on the refuge. There has been a high demand by the hunting public for this hunt. Refuge relations with the waterfowl hunting public would be negatively impacted without this hunt. However, as the goose populations increase conflicts at high public use facilities, such as golf courses, swimming beaches, and picnic areas increase. In some situations temporary closures of certain facilities may be required for public health reasons.

4. Refuge Facilities

No impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

Under this alternative public health and safety issues will increase as the resident goose population grows. Contamination of water supplies in some communities may become more common and treatment more expensive. The probability for bird-aircraft strikes involving resident Canada geese will increase. Aircraft strikes have occurred at other airports and have included the downing of aircraft causing the loss of life such as occurred on 22 September 1995 at Elmendorf AFB, Alaska, in which 24 people were killed. Damage caused by geese on agricultural crops, lawns, and golf courses is expected to increase and result in substantial economic loss. Excessive densities of geese could result in fecal contamination at local recreation areas.

B. Sport Hunting of Canada Geese (Proposed Action)

1. Habitat Management and Vegetation

Sport hunting would reduce the numbers of resident Canada geese on the refuge. Fewer geese would be available to browse on agricultural crops and moist soil vegetation. Damage from overbrowsing would be reduced or eliminated, and crop yields would return to normal levels.

2. Wildlife

Migratory Birds

It is anticipated that sport hunting will help maintain the resident Canada goose numbers on the refuge at levels compatible with management objectives. The numbers of refuge resident geese are expected to decline due to direct harvest. Geese will also learn that the refuge is no longer a desirable place to molt and feed, and will avoid the refuge in the future.

A goose hunt will occur during the banding period for wood ducks. Wood duck banding requires baiting the area of the trap. Baiting would have to stop ten days prior to the proposed goose hunt because the trap is located within the proposed hunt area. This may result in fewer wood ducks banded each year. Some of this loss may be compensated by less competition from resident geese on the bait site,

which has occurred throughout the banding period.

During the September season resident geese are typically hunted in fields or the open water/mudflat habitat of Kentucky Lake. Beginning in early July the lake level is gradually lowered by the Tennessee Valley Authority (TVA) from the summer pool level of 359.0' MSL to 354.0' MSL by December. The purpose of this drawdown is for flood storage. When these mudflats become exposed in late August many of the resident geese move off the moist soil habitat in the managed impoundments to the exposed mudflats. Geese may or may not move off the agriculture fields. The heaviest use of agriculture fields occurs within the Duck River Bottoms where the highest concentration of geese occurs. The geese make this move to take advantage of the fresh green vegetation sprouting on the mudflats. This green vegetation is also composed of moist soil plants which will be utilized by migrating and wintering waterfowl. Their browsing on these plants also stunts their growth most likely contributing to a reduction in seed production. This type of habitat is available both on and off the refuge.

Migratory waterfowl such as wood duck, blue-winged teal, and green-winged teal may be present during the hunt. The statewide dates for the resident goose hunt and the September wood duck/teal season overlap partially or completely depending upon the year. The refuge will be completely closed to goose hunting during the statewide September wood duck/teal season.

Little to no impact is expected to occur for these species for the following reasons:

- Disturbance will be minimal as there is ample habitat available that will not be hunted. This habitat would include areas not open to hunting, since only 40% of the refuge is open to hunting, areas open but difficult to access, and flooded moist soil habitat within managed impoundments, where low goose use occurs at the time of the hunt.

- The short duration of the hunt (a maximum of fifteen days) will produce only low levels of disturbance. Past history has also shown that the heaviest concentration of hunters occurs during the first three days of the hunt. Hunter numbers drop dramatically during the remainder of the early goose season. This will contribute to a significant decline in the level of disturbance throughout all hunted areas.

Sora (rails), common snipe, and mourning doves are a hunted species in Tennessee but are not open to hunting on the refuge. Also the statewide season for sora and common snipe does not overlap with the proposed refuge goose hunt. The statewide mourning dove season does overlap with the proposed goose hunt.

Impacts to these species are expected to be minimal for the same reasons listed previously for waterfowl.

Refuge regulations further mitigate possible disturbance by hunters to these species. For example, vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, cormorants, and terns. Shorebirds, wading birds, gulls, and terns will also be located in the open water/mudflat habitat, but disturbance will be minimal due to the availability of similar habitat in closed areas and the low hunter densities due to poor accessibility to some of this habitat. Expansive areas of shallow water and deep mud make it difficult for hunters to access many of the areas used by these species providing the birds with abundant habitat away from disturbance by hunters. Species such as rail and bitterns will receive very minimal disturbance due to the thick moist soil habitat within the managed impoundments they utilize. Few geese will still be found utilizing this habitat as they will have moved out onto the open lake/mudflat habitat by the time of the hunt.

The hunt is limited to a maximum of fifteen days, which will reduce disturbance to all of the above species to a relatively short time period. Past history has also shown that the heaviest concentration of hunters occurs during the first three days of the hunt. Hunter numbers drop dramatically during the remainder of the early goose season. This will contribute to a significant decline in the level of disturbance throughout all hunted areas.

Songbirds, raptors, and woodpeckers would not be expected to be impacted by the hunt. Other examples of non-hunted wildlife include, but are not limited to small mammals, reptiles and amphibians, mussels, fish, and insects. Hunting activity should have little to no impact on these species.

Refuge regulations further mitigate possible disturbance by hunters to these species. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Hunted Wildlife

Hunted wildlife includes species with statewide hunting seasons (white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey.) Some or all of these species may occur on the refuge. There will be some minor disturbance to

these species when hunters are in the proximity. However, Refuge regulations mitigate possible disturbance. For example, vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Threatened and Endangered Species

This action should not significantly impact the threatened and endangered species on the refuge. Disturbance to bald eagles should be minimal since the hunt will take place during early September, which is after the nesting period and prior to the winter migration. Least terns are occasional to rare visitors to the refuge therefore disturbance is unlikely. There is abundant habitat for these species within the areas closed to hunting, areas difficult to access, and areas not being utilized by geese.

Past history has also shown that the heaviest concentration of hunters occurs during the first three days of the hunt. Hunter numbers drop dramatically during the remainder of the early goose season. This will contribute to a significant decline in the level of disturbance throughout all hunted areas. If an unusual concentration of these species is observed within the hunt area then a closure may be necessary. The potential for a bald eagle or a least tern being shot by an unethical hunter does still exist but is unlikely to occur.

Endangered mussels on the refuge include pink mucket pearly mussel, orange-footed pearly mussel, ring pink mussel, and rough pigtoe. In general these species are located on gravel or sandy bottoms which mostly exist on the upper reaches of the Duck River where it enters the refuge. This is predominately a narrow riverine habitat not very conducive to goose hunting.

A portion of the Duck River Unit from river mile 103.5 to 107.8 is comprised of a state mussel sanctuary. The sanctuary is closed to commercial musseling activities, but other recreational activities are permitted. The pink mucket can be found within the mussel sanctuary. With the exception of the pink mucket, mussels species should not be impacted by hunting activity due to their habitat preferences. Hunters utilizing the Duck River will mostly be located at the mouth of the Duck River where expansive mudflats exist, which are primarily composed of fine silt. The likelihood of hunters coming in contact with any of these mussels is very slim for this reason.

Since 2000 the Tennessee Wildlife Resources Agency has been studying and conducting propagation experiments with the pink mucket pearly mussel within the mussel sanctuary in enclosed structures. Hunters are not expected to be anymore threat to the mussel than produced by existing recreational activities in the area.

There are no additional special closures associated with this study.

The endangered pygmy madtom fish is located in the upper reach of the Duck River on the refuge along with the mussels. Because the hunters will be hunting in the lower reach of the Duck River, there is little chance for this species to be impacted.

Neither Indiana nor gray bats have been documented on the refuge but there is a chance that they utilize the refuge at some time during the course of the year. The likelihood of hunters encountering either of these bat species is very low. If at a later date a bat roost develops within the hunt area then a closure may occur.

Refuge regulations further mitigate possible disturbance by hunters to these species. For example, vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

3. Wildlife-Dependent Recreation

This alternative would increase recreational opportunities for the hunters on the refuge. There is strong demand by the waterfowl hunting public for this hunt, thus by providing this recreational opportunity the Service will be improving public relations. The hunt may cause conflicts with other recreational uses, such as bird watching and fishing, but any conflict should be minimal. Bird watching is not a high public use activity on this refuge due to the refuge's distance from large population centers and poor accessibility to prime bird areas. The numbers of fisherman utilizing the refuge in September is low due to the heat and humidity, which contributes to poor fishing.

4. Refuge Facilities

Increased use of refuge roads and boat ramps may contribute to a slight increase in wear and tear of these assets. Any impacts are expected to be minimal due to the short duration of the hunt.

5. Cultural Resources

The only cultural resources within the hunt area are prehistoric sites that have been surveyed and reported in detail. Refuge Law Enforcement Officers patrol this area to ensure that sure hunters do not disturb the sites.

6. Refuge Environment and Community

A reduction in the goose population could lessen public health and safety issues in

the surrounding community. Fecal contamination of water supplies and at local recreation areas would be less likely due to a reduction in the number of geese in these areas. Conflicts with geese at public use facilities will not be significant. The probability for bird-aircraft strikes involving resident Canada geese should not be affected. Reduced damage to agricultural crops, lawns, and golf courses will have positive economic benefits. Money generated by hunting activities (license sales, motel rooms, restaurants, etc.) will improve the economic health of local communities.

C. Capture and Euthanasia during Molt for Population Control

1. Habitat Management and Vegetation

Capture and euthanasia would reduce the numbers of resident Canada geese on the refuge. Fewer geese would be available to browse on agricultural crops and moist soil vegetation. Damage from overbrowsing would be reduced or eliminated, and crop yields would return to normal levels.

2. Wildlife

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. The resident Canada goose population utilizing the refuge will be significantly reduced, especially in the locations where the greatest densities occur. Since habitat damage will be minor under this alternative, more food resources will be available for migrating waterfowl and other wildlife. During the fall and winter competition for available food resources will also be minimal.

During preseason wood duck banding operations, resident geese occasionally dominate the bait site and exclude the wood ducks. It is anticipated that euthanasia will help reduce competition between geese and wood ducks at the banding site. Euthanasia will also maintain the resident Canada goose numbers on the refuge at levels compatible with management objectives.

Some disturbance may occur to nesting wood ducks and hens with ducklings as the geese are herded to the capture site. This disturbance is expected to be minimal as it only occurs on a fraction of the refuge habitat and for only a brief period of time. Sora (rails), common snipe, and mourning doves would not be affected.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, and terns. Other examples of non-hunted wildlife include, but are not limited to small mammals, reptiles and amphibians, mussels, fish, and insects. Some very minor disturbance may occur to these species. The impact is expected to be very minimal due to the short duration of the roundup and small area in which it occurs

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. Some very minor disturbance may occur to these species. The impact is expected to be very minimal due to the short duration of the roundup and small area in which it occurs.

Threatened and Endangered Species

This action should not have minimal impacts on the threatened and endangered species on the refuge. Resident geese have been rounded up during the molt for banding purposes on the refuge for five years and no bald eagles have been observed in the area during this roundup. Nesting season has ended for most eagles at this time and there are presently no eagle nests within several miles of the roundup site(s). No migrant eagles would be expected in the area at this time. Least terns have not been observed during this time period as they are still on their nesting grounds. The endangered mussels and fish on the refuge are located on the Duck River where as the roundup occurs within the managed impoundments of the Duck River Bottoms.

3. Wildlife-Dependent Recreation

Under this alternative there would be significantly fewer geese in the area for the wildlife viewer and hunters that hunt near the refuge.

Many people, both hunters and non-hunters will be opposed to the killing of a large number of Canada geese for various reasons. Some will feel it is simply inhuman, while others will view it as a recreational loss.

4. Refuge Facilities

No impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

A reduction in the goose population could potentially reduce conflicts between geese and humans at other public use facilities. Under this alternative a substantial reduction in the resident goose population should lessen public health and safety issues. Contamination of water supplies would be unlikely. The probability for bird-aircraft strikes involving resident Canada geese should decrease.

Significantly reduced damage to agricultural crops, lawns, and golf courses will have positive economic benefits. The money brought into the communities by hunters pursuing Canada geese will probably decline due to lower population levels.

D. Shooting for Limited Control in Problem Areas

1. Habitat Management and Vegetation

Under this alternative a slight reduction in the damage to refuge agricultural crops and moist soil vegetation caused by resident Canada geese may be accomplished. This will be limited to locations with the greatest problems because control efforts will be focused in these areas. This should marginally increase the crop yield and amount of food left for migratory waterfowl and other wildlife.

2. Wildlife

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. Removal of a small number of geese will not significantly change the population growth. It is expected that the resident Canada goose population will continue to increase under this alternative. The increase in the resident goose population will increase direct competition for the available food resources with the migratory waterfowl during the wintering period. This in conjunction with the impacts on the habitat will result in a lower carrying capacity for migrant waterfowl and other wildlife on the refuge. Some disturbance will occur to other wildlife species from the gunfire, because shooting activity may be required over an extended period of several months. It is still expected to be minimal though as it will be limited to a small

area for a relatively brief period of time.

This alternative may not help with wood duck banding operations because shooting at the wood duck banding site would also scare off wood ducks. Geese and wood ducks are often around the site at the same time.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, and terns. Some disturbance will occur to other wildlife species from the gunfire, because shooting activity may be required over an extended period of several months. It is still expected to be minimal though as it will be limited to a small area for a relatively brief period of time.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. Some disturbance will occur to other wildlife species from the gunfire, because shooting activity may be required over an extended period of several months. It is still expected to be minimal though as it will be limited to a small area for a relatively brief period of time.

Threatened and Endangered Species

All efforts will be made to avoid disturbing threatened and endangered species while targeting resident geese. Shooting activities will not be conducted if these species are observed in the area. This action should not have any impacts on the threatened and endangered species on the refuge. No disturbance is expected to the mussel, fish and bat species is expected to occur under this action.

3. Wildlife-Dependent Recreation

This action will have minimal impacts to recreational activities on the refuge. However, as the goose populations increase conflicts at high public use facilities, such as golf courses, swimming beaches and picnic areas will increase. In some situations temporary closures of certain facilities may be required for public health reasons.

4. Refuge Facilities

No impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

Under this alternative public health and safety issues will increase as the resident goose population grows. Contamination of water supplies in some communities may become more common and treatment more expensive. The probability for bird-aircraft strikes involving resident Canada geese will increase.

Hunters and non-hunters will be opposed to the killing of Canada geese on the refuge for various reasons. Some will feel it is simply inhuman, while others will view it as a recreational loss.

Damage caused by geese on agricultural crops, lawns, and golf courses is expected to increase and result in substantial economic loss. A potential decline in tourism dollars could result from a decline in public use at local recreation areas due to contamination of the facility by fecal matter. Excessive densities of geese could result in fecal contamination at local recreation areas.

E. Disruption of Nests

1. Habitat Management and Vegetation

This alternative is anticipated to have minimal impacts on the population of resident geese utilizing the habitats of the refuge. It is expected that as the population continues to increase damage to agricultural and moist soil habitats will increase.

Resident geese cause severe damage to a portion of the agricultural crops grown on the refuge. Depredation occurs during the early stages of growth and typically results in a total loss of the crops in the areas impacted. This damage not only reduces the food that will be available to wintering waterfowl and other wildlife, but also causes a financial loss for the cooperative farmer. If this problem continues to become worse, it will become a threat to the continuation of the cooperative farming program on the refuge.

Resident geese commonly browse the new growth of vegetation that occurs following a drawdown of a moist soil impoundment. It is unknown as to the degree of impact that heavy browsing has on seed production of moist soil plants, but stunting of vegetation does occur. As resident goose population increases it is expected that their impacts on the refuges moist soil management program will become more severe. Severe damage of up to 100 acres has been observed by refuge staff.

2. Wildlife

Migratory BirdsMigratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. Since only a limited number of nests will occur within the refuge and a significant portion of the refuge population consists of non-breeders it is expected that nest disruption will not result in a reduction of the resident goose population. Overall, it is expected that the population will continue to increase. An increase in the resident goose population will increase direct competition for the available food resources with migratory waterfowl during the wintering period. This in conjunction with the impacts on the habitat will result in a lower carrying capacity for migrant waterfowl and other wildlife on the refuge.

Competition with wood ducks on the bait site during banding operation is expected to become worse under this alternative. If this occurs, the number of wood ducks banded by this refuge will decline. Eventually, the duck trap location may need to be abandoned for other locations away from concentrations of resident geese. If this occurs, the wood duck banding operation for the refuge will become more costly.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, and terns. Little to no impacts is expected to occur to these species from this action.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. Little to no impacts is expected to occur to these species from this action.

Threatened and Endangered Species

This action should not have any impacts on the bald eagles or least terns utilizing the refuge. No disturbance is expected to the mussel, fish and bat species is expected to occur under this action.

Wildlife-Dependent Recreation

This action will have minimal impacts to recreational activities on the refuge. However, as the resident goose populations increase conflicts at high public use facilities, such as golf courses, swimming beaches, and picnic areas will increase. In some situations temporary closures of certain facilities may be required for public health reasons.

4. Refuge Facilities

No impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

Under this alternative public health and safety issues will increase as the resident goose population grows. Contamination of water supplies in some communities may become more common and treatment more expensive. The probability for bird-aircraft strikes involving resident Canada geese will increase.

Some people will be opposed to the disrupting Canada geese nests on the refuge for various reasons. Some will feel it is simply inhuman, while others will view it as a recreational loss.

Damage caused by geese on agricultural crops, lawns, and golf courses is expected to increase and result in substantial economic loss. A potential decline in tourism dollars could result from a decline in public use at local recreation areas due to contamination of the facility by fecal matter. Excessive densities of geese could result in fecal contamination at local recreation areas.

F. Scare Strategies and Harassment

1. Habitat Management and Vegetation

Under this alternative a slight reduction in damage to refuge agricultural crops and moist soil vegetation caused by resident Canada geese may be accomplished. This will be limited to locations with the greatest problems because harassment efforts will be focused in these areas. This should marginally increase the crop yield and the amount of food left for migratory waterfowl and other wildlife. There is a slight chance of triggering a fire with these devices.

2. Wildlife

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. The resident Canada goose population will continue to increase under this alternative. As the resident goose population increases, direct competition for the available food resources with migratory waterfowl will increase during the wintering period.

This alternative is not expected to improve the problem associated with wood duck banding, since harassment of geese around the banding site will also scare wood ducks from the site. As the resident goose population increases, competition with wood ducks on the bait site during banding operation is expected to become worse. If this occurs, the number of wood ducks banded by this refuge will decline. Eventually, the duck trap location may need to be abandoned for other locations away from concentrations of resident geese. If this occurs, the wood duck banding operation for the refuge will become more costly.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, and terns. Some minor disturbance will occur for those species near where they harassment is taking place.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. Some minor disturbance will occur for those species near where they harassment is taking place.

Threatened and Endangered Species

Some disturbance of bald eagles and least terns may occur depending on the period of year and method of harassment. However, this disturbance should not be significant. No disturbance is expected of the mussel, fish and bat species is expected to occur under this action.

3. Wildlife-Dependent Recreation

This action will have minimal impacts to recreational activities on the refuge. Noise generated by some scare devices may reduce the quality of experience for refuge visitors.

4. Refuge Facilities

No impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

As goose populations increase, conflicts at high public use facilities, such as golf courses, swimming beaches and picnic areas will increase. In some situations temporary closures of certain facilities may be required for public health reasons.

Under this alternative public health and safety issues will increase as the resident goose population grows. Contamination of water supplies in some communities may become more common and treatment more expensive. The probability for bird-aircraft strikes involving resident Canada geese will increase.

Damage caused by geese on agricultural crops, lawns, and golf courses is expected to increase and result in substantial economic loss. A potential decline in tourism dollars could result from a decline in public use at local recreation areas due to contamination of the facility by fecal matter. Excessive densities of geese could result in fecal contamination at local recreation areas.

V. ENVIRONMENTAL CONSEQUENCES

Environmental Justice

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects for either alternative unique to minority or low-income populations in the affected area. Neither alternative will disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low-income populations.

Cumulative Impacts – Anticipated Direct and Indirect Impacts of Proposed Action

A. No Action

1. Habitat Management and Vegetation

As the resident goose population increases it is expected that impacts on vegetation will increase concurrently. For the past three years refuge staff have observed overbrowsing on up to 100 acres of moist soil vegetation. Overbrowsing over a period of time will reduce the quality and quantity of moist soil habitat and reduce seed food sources that are used by waterfowl,and other wetland-dependant wildlife. Eventually, the plant composition may change to less desirable wetland species.

Cumulative impacts associated with crop depredation include the potential loss of cooperative farmers who have suffered economic hardship and can no longer bear the burden. The impacts of overbrowsing on refuge habitat management capability would be substantial, as the cooperative farming program and moist soil management are the primary sources for meeting refuge waterfowl objectives.

2. Wildlife

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. Under the No Action alternative the resident Canada goose population on the refuge is expected to continue to increase. The cumulative impacts to these species would be a reduction in the carrying capacity at the local level, but probably not at the regional or national level.

If competition with wood ducks on the bait site during banding operation becomes much worse, the number of wood ducks banded by this refuge is anticipated to decline. The cumulative impact would be a reduction in the amount of banding data available to determine survival rates for this species, which is used to formulate bag limits and hunting season length.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, cormorants, and terns. Other examples of non-hunted wildlife include, but are not limited to small mammals, reptiles and amphibians, mussels, fish, and insects. This action is not expected to significantly impact most of these species. The exception would be the several species of rail and bittern which utilize the moist soil units. Increased damage to the moist soil habitat by resident geese has the potential to reduce the carrying capacity of the refuge for these species.
The cumulative impact for all of these species is expected to be minimal at the local level with on impacts at the regional or national level.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include
white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. This alternative should have no cumulative impacts on the hunted species using the refuge at the local, regional, or national level.

Threatened and Endangered Species

This action should no cumulative impact the threatened and endangered species on the refuge at the local, regional, or national level.

3. Wildlife Dependent Recreation

The waterfowl hunting public would not have the opportunity to harvest a renewable resource or participate in a recreational activity on the refuge. There has been a high demand by the hunting public for this hunt. The cumulative impact would be a decline in refuge relations with the waterfowl hunting public, but relations with birdwatchers, photographers, hikers, and fisherman may improve.

4. Refuge Facilities

No cumulative impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No cumulative impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

Under this alternative public health and safety issues will increase as the resident goose population grows. The cumulative impact would be a potential decline in tourism dollars, due to a decline in public use at local recreation areas. This would be due to contamination of the facilities by fecal matter.

B. Sport Hunting of Canada Geese (Proposed Action)

1. Habitat Management and Vegetation

The cumulative impact would be a potential reduction in the damage caused by resident Canada geese to crops and moist soil vegetation. This would improve the refuges ability to meet its habitat objectives.

2. Wildlife

Migratory Birds

The U.S. Fish and Wildlife Service, working with partners, annually prescribe frameworks, or outer limits, for dates and times when hunting may occur and the number of birds that may be taken and possessed. These frameworks are necessary to allow State selections of season and limits for recreation and sustenance; aid Federal, State, and tribal governments in the management of migratory game birds; and permit harvests at levels compatible with population

status and habitat conditions. Because the Migratory Bird Treaty Act stipulates that all hunting seasons for migratory game birds are closed unless specifically opened by the Secretary of the Interior, the Service annually promulgates regulations (50 CFR Part 20) establishing the frameworks from which States may select season dates, bag limits, shooting hours, and other options for the each migratory bird hunting season. The frameworks are essentially permissive in that hunting of migratory birds would not be permitted without them. Thus, in effect, Federal annual regulations both allow and limit the hunting of migratory birds.

Migratory game birds are those bird species so designated in conventions between the United States and several foreign nations for the protection and management of these birds. Under the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Secretary of the Interior is authorized to determine when "hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any ... bird, or any part, nest, or egg" of migratory game birds can take place, and to adopt regulations for this purpose. These regulations are written after giving due regard to "the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, and are updated annually (16 U.S.C. 704(a)). This responsibility has been delegated to the U.S. Fish and Wildlife Service as the lead federal agency for managing and conserving migratory birds in the United States. Acknowledging regional differences in hunting conditions, the Service has administratively divided the nation into four Flyways for the primary purpose of managing migratory game birds. Each Flyway (Atlantic, Mississippi, Central, and Pacific) has a Flyway Council, a formal organization generally composed of one member from each State and Province in that Flyway. Tennessee NWR is within the Mississippi Flyway.

The process for adopting migratory game bird hunting regulations, located in 50 CFR part 20, is constrained by three primary factors. Legal and administrative considerations dictate how long the rule making process will last. Most importantly, however, the biological cycle of migratory game birds controls the timing of data-gathering activities and thus the dates on which these results are available for consideration and deliberation. The process of adopting migratory game bird hunting regulations includes two separate regulations-development schedules, based on "early" and "late" hunting season regulations. Early hunting seasons pertain to all migratory game bird species in Alaska, Hawaii, Puerto Rico, and the Virgin Islands; migratory game birds other than waterfowl (e.g. dove, woodcock, etc.); and special early waterfowl seasons, such as teal or resident Canada geese. Early hunting seasons

generally begin prior to October 1. Late hunting seasons generally start on or after October 1 and include most waterfowl seasons not already established. There are basically no differences in the processes for establishing either early or late hunting seasons. For each cycle, Service biologists and others gather, analyze, and interpret biological survey data and provide this information to all those involved in the process through a series of published status reports and presentations to Flyway Councils and other interested parties (USFWS 2006).

Because the Service is required to take abundance of migratory birds and other factors in to consideration, the Service undertakes a number of surveys throughout the year in conjunction with the Canadian Wildlife Service, State and Provincial wildlife-management agencies, and others. To determine the appropriate frameworks for each species, the Service considers factors such as population size and trend, geographical distribution, annual breeding effort, the condition of breeding and wintering habitat, the number of hunters, and the anticipated harvest. After frameworks are established for season lengths, bag limits, and areas for migratory game bird hunting, migratory game bird management becomes a cooperative effort of State and Federal Governments. After Service establishment of final frameworks for hunting seasons, the States may select season dates, bag limits, and other regulatory options for the hunting seasons. States may always be more conservative in their selections than the Federal frameworks but never more liberal. Season dates and bag limits for National Wildlife Refuges open to hunting are never longer or larger than the State regulations. In fact, based upon the findings of an environmental assessment developed when a National Wildlife Refuge opens a new hunting activity, season dates and bag limits may be more restrictive than the State allows. At Tennessee NWR, season length is more restrictive for resident geese than the State allows in years when the early wood duck/teal season overlap the September resident Canada goose season.

NEPA considerations by the Service for hunted migratory game bird species are addressed by the programmatic document, "Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Sport Hunting of Migratory Birds (FSES 88–14)," filed with the Environmental Protection Agency on June 9, 1988. We published Notice of Availability in the Federal Register on June 16, 1988 (53 FR 22582), and our Record of Decision on August 18, 1988 (53 FR 31341). Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate Environmental Assessment,

"Duck Hunting Regulations for 2006-07," and an August 24, 2006, Finding of No Significant Impact. Further, in a notice published in the September 8, 2005, Federal Register (70 FR 53376), the Service announced its intent to develop a new Supplemental Environmental Impact Statement for the migratory bird hunting program. Public scoping meetings were held in the spring of 2006, as announced in a March 9, 2006, Federal Register notice (71 FR 12216). More information may be obtained from: Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Department of the Interior, MS MBSP-4107-ARLSQ, 1849 C Street, NWR, Washington, DC 20240.

It is anticipated that sport hunting will help maintain the resident Canada goose population on the refuge at levels compatible with management objectives. With lower densities of resident geese competition for available food resources will be reduced for wintering waterfowl and other wildlife. The first two years of the hunt were non-quota on all three refuge units. The first year of the hunt hunters harvested approximately 175 - 200 geese, due to high hunter turnout. There had been tremendous interest in this hunt for several years prior to its initiation. There were several reports of popular off refuge sites being devoid of hunters. The following year hunter numbers decreased due to the wearing off of the novelty of waterfowl hunting on the refuge for the first time in several decades. This contributed to a decline in harvest to approximately 100 – 125 geese. This harvest is out of approximately 800 – 1000 resident Canada geese utilizing the refuge in late summer. Hunter numbers did remain high within the Duck River Bottoms. Hunters were mostly competing for a few select agriculture fields. Due to this high demand the Duck River Bottoms will be changed to a quota hunt for the 2007 season. This should contribute to improved hunter satisfaction by not having to compete so closely with other parties. Under the proposed action Tennessee NWR estimates the harvest of resident Canada geese to remain in the range of 100 - 150 birds annually. This harvest represents about 15% of the refuge population. It only represents approximately 0.76% of the state harvest and 0.047% of the flyway wide harvest during the September season, based on preliminary 2005 harvest data. The cumulative impacts on the number of resident geese utilizing the refuge is expected to decline due to direct harvest as well as the geese learning that the refuge is no longer a desirable place to molt and feed. The cumulative effect on the overall Kentucky Lake population of resident Canada geese would be an expected small decline in the population. Little to no cumulative impact is expected to the resident goose population at the regional or national level.

A goose hunt will occur during the banding period for wood ducks. Wood duck banding requires baiting the area of the trap. Baiting would have to stop ten days prior to the proposed goose hunt because the trap is located within the proposed hunt area. This may result in fewer wood ducks banded each year. Some of this

loss may be compensated by less competition from resident geese on the bait site, which has occurred throughout the banding period. Thus the cumulative impact to the wood duck banding program is anticipated to be minimal.

During the September season resident geese are typically hunted in fields or the open water/mudflat habitat of Kentucky Lake. Beginning in early July the lake level is gradually lowered by the Tennessee Valley Authority (TVA) from the summer pool level of 359.0' MSL to 354.0' MSL by December. The purpose of this drawdown is for flood storage. When these mudflats become exposed in late August many of the resident geese move off the moist soil habitat in the managed impoundments to the exposed mudflats. Geese may or may not move off the agriculture fields. The heaviest use of agriculture fields occurs within the Duck River Bottoms where the highest concentration of geese occurs. The geese make this move to take advantage of the fresh green vegetation sprouting on the mudflats. This green vegetation is also composed of moist soil plants which will be utilized by migrating and wintering waterfowl. Their browsing on these plants also stunts their growth most likely contributing to a reduction in seed production. This type of habitat is available both on and off the refuge.

Migratory waterfowl such as wood duck, blue-winged teal, and green-winged teal may be present during the hunt. The statewide dates for the resident goose hunt and the September wood duck/teal season overlap partially or completely depending upon the year. The refuge will be completely closed to goose hunting during the statewide September wood duck/teal season. Little to no cumulative impact is expected to occur for these species for the following reasons. There will be some disturbance to these species, but it is expected to be minimal as there is ample habitat available that will not be hunted. This habitat would include areas not open to hunting, since only 40% of the refuge is open to hunting, areas open but difficult to access, and flooded moist soil habitat within managed impoundments, where low goose use occurs at the time of the hunt. The short duration of the hunt, a maximum of fifteen days, will also contribute to the low levels of disturbance. Past history has also shown that the heaviest concentration of hunters occurs during the first three days of the hunt. Hunter numbers drop dramatically during the remainder of the early goose season. This will contribute to a significant decline in the level of disturbance throughout all hunted areas.

Sora (rails), common snipe, and mourning doves are a hunted species in Tennessee but are not open to hunting on the refuge. Also the statewide season for sora and common snipe does not overlap with the proposed refuge goose hunt. The statewide mourning dove season does overlap with the proposed goose hunt. Cumulative impacts to these species are expected to be minimal for the same reasons listed previously for waterfowl.

Refuge regulations further mitigate possible disturbance by hunters to these species. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, cormorants, and terns. Shorebirds, wading birds, gulls, and terns will also be located in the open water/mudflat habitat, but disturbance will be minimal due to the availability of similar habitat in closed areas and the low hunter densities due to poor accessibility to some of this habitat. Expansive areas of shallow water and deep mud make it difficult for hunters to access many of the areas used by these species providing them with abundant habitat away from disturbance by hunters. Species such as rail and bitterns will receive very minimal disturbance due to the thick moist soil habitat within the managed impoundments they utilize. Few geese will still be found utilizing this habitat as they will have moved out onto the open lake/mudflat habitat by the time of the hunt. The hunt is limited to a maximum of fifteen days, which will reduce disturbance to all of the above species to a relatively short time period. Past history has also shown that the heaviest concentration of hunters occurs during the first three days of the hunt. Hunter numbers drop dramatically during the remainder of the early goose season. This will contribute to a significant decline in the level of disturbance throughout all hunted areas. Songbirds, raptors, and woodpeckers would not be expected to be impacted by the hunt. Other examples of non-hunted wildlife include, but are not limited to small mammals, reptiles and amphibians, mussels, fish, and insects. Hunting activity should have little to no cumulative impact on these species.

Refuge regulations further mitigate possible disturbance by hunters to these species. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. There will be some minor disturbance to these species but it is expected to be minimal. This alternative should have little to no cumulative impacts on the hunted wildlife using the refuge.

Refuge regulations further mitigate possible disturbance by hunters to these species. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Threatened and Endangered Species

Disturbance to bald eagles should be minimal since the hunt will take place during early September, which is after the nesting period and prior to the winter migration. Thus there should be minimal cumulative impact on bald eagles at the local, regional or national level. Least terns are occasional to rare visitors to the refuge and disturbance is unlikely. There is abundant habitat for these species within the areas closed to hunting, areas difficult to access, and areas not being utilized by geese. Past history has also shown that the heaviest concentration of hunters occurs during the first three days of the hunt. Hunter numbers drop dramatically during the remainder of the early goose season. This will contribute to a significant decline in the level of disturbance throughout all hunted areas. If an unusual concentration of these species is observed within the hunt area then a closure may be necessary. The potential for a bald eagle or a least tern being shot by an unethical hunter does still exist but is unlikely to occur. This action should have little to no cumulative impact on these species using the refuge.

Endangered mussels on the refuge include pink mucket pearly mussel, orange-footed pearly mussel, ring pink mussel, and rough pigtoe. The sanctuary is closed to commercial musseling activities, but other recreational activities are permitted. With the exception of the pink mucket these species should not be impacted by hunting activity due to their habitat preferences. In general these species are located on gravel or sandy bottoms which mostly exist on the upper reaches of the Duck River where it enters the refuge. This is predominately a narrow riverine habitat not very conducive to goose hunting. Hunters utilizing the Duck River will mostly be located at the mouth of the Duck River where expansive mudflats exist, which are primarily composed of fine silt. The likelihood of hunters coming in contact with any of these mussels is very slim for this reason.

A portion of the Duck River Unit from river mile 103.5 to 107.8 is comprised of a state mussel sanctuary. The pink mucket can be found within the mussel sanctuary. Since 2000 the Tennessee Wildlife Resources Agency has been studying and conducting propagation experiments with the pink mucket pearly mussel within the mussel sanctuary in enclosed structures. Hunters are not expected to be anymore threat to the mussel than any other recreational activity which commonly occurs in this area. There are no additional special closures associated with this study.

The endangered pygmy madtom fish is also located on the refuge and is found in

habitat very similar to that of the mussels located in the Duck River where it enters the refuge, so again there is little chance for this species to be impacted. Little to no cumulative impact is expected with either the mussel or fish species on a local, regional, or national level. Little to no cumulative impact is expected on either the mussel or fish species on a local, regional, or national level.

Neither Indiana nor gray bats have been documented on the refuge but there is a chance that they utilize the refuge at some time during the course of the year. The likelihood of hunters encountering either of these bat species is very low due to their nocturnal behavior. If at a later date a bat roost develops within the hunt area then a closure may occur. Little to no cumulative impact is expected to these species at a local, regional, or national level.

Refuge regulations further mitigate possible disturbance by hunters to these species. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

3. Wildlife-Dependent Recreation

This alternative would increase recreational opportunities for the hunters on the refuge. There is strong demand by the waterfowl hunting public for this hunt, thus by providing this recreational opportunity the Service will be improving public relations. The hunt may cause conflicts with other recreational uses, such as bird watching and fishing, but should be minimal. Bird watching is not a high public use activity on this refuge due to its distance from large population centers and poor accessibility to prime bird areas. The numbers of fisherman utilizing the refuge in September is low due to the heat and humidity, which contributes to poor fishing. No cumulative impact is expected to the birdwatchers or fisherman utilizing the refuge.

A reduction in the goose population could potentially reduce conflicts between geese and humans at other public use facilities.

4. Refuge Facilities

Increased use of refuge roads and boat ramps may contribute to a slight increase in wear and tear of these assets. The cumulative impact is expected to be minimal due to the short duration of the hunt.

5. Cultural Resources

The only cultural resources within the hunt area are Native American Indian artifact sites. These sites have been surveyed and identified. Refuge Law

Enforcement keeps a close eye on these sites and will make sure hunters do not disturb the sites. Little to no cumulative impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

Under this alternative a reduction in the goose population could lessen public health and safety issues in the surrounding community. The probability for bird-aircraft strikes involving resident Canada geese should not increase. Reduced damage to agricultural crops, lawns, and golf courses will have positive economic benefits. Conflicts with geese at public use facilities will not be significant. The money brought into the communities by hunters pursuing Canada geese will further add to the economic benefits generated by hunting in this area. The cumulative impact is expected to be improved relations with the community.

C. Capture and Euthanasia during Molt for Population Control

1. Habitat Management and Vegetation

Under this alternative a substantial resident goose population decline will occur. The cumulative impact would be a potential reduction in the damage caused by resident Canada geese thus improving the refuges ability to meet its management objectives.

2. Wildlife

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. Cumulative impact would be an increase an increase in the carrying capacity of the refuge and wood duck banding objectives. It should have a minimal effect on migratory birds at the regional or national level.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, and terns. Other examples of non-hunted wildlife include, but are not limited to small mammals, reptiles and amphibians, mussels, fish, and insects. Some very minor disturbance may occur to these species. The cumulative impact is expected to be very minimal due to the short duration of the roundup and small area in which it occurs

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. Some very minor disturbance may occur to these species. The cumulative impact is expected to be very minimal due to the short duration of the roundup and small area in which it occurs

Threatened and Endangered Species

There should be little to no effect on any of the threatened or endangered species at a local, regional, national level.

4. Wildlife-Dependent Recreation

Under this alternative there would be significantly fewer geese in the area for the wildlife viewer and hunters that hunt near the refuge. There would be little to no cumulative effect on the birdwatchers using the refuge as there are many other species present. There would be some impact to hunters at the local level due to the substantial reduction in the local population of geese in the immediate area of the refuge. Little to no cumulative impacts to hunting would be expected at the regional or national level.

4. Refuge Facilities

No cumulative impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No cumulative impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

The cumulative impact would be mixed within the community due to a significant decline in the goose population. Members of the community that use golf courses and beaches would see a benefit, but this would be offset some by a decrease in relations with the hunting community and those businesses which benefit from hunters business. Both the hunting and non-hunting public oppose large scale euthanasia thus contributing to poor public relations with several different groups.

D. Shooting for Limited Control in Problem Areas

1. Habitat Management and Vegetation

Under this alternative a slight reduction in the damage to refuge agricultural crops and moist soil vegetation caused by resident Canada geese may be accomplished. This will be limited to locations with the greatest problems because control efforts will be focused in these areas. This should marginally increase the crop yield and amount of food left for migratory waterfowl and other wildlife. The cumulative benefits will be minimal due to only slight improvements in habitat.

2. Wildlife

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. Removal of a small number of geese will not significantly change the population growth. Some disturbance will occur to other wildlife species from the gunfire, because shooting activity may be required over an extended period of several months. The cumulative impact of this is still expected to be minimal though as it will be limited to a small area for a relatively brief period of time.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, and terns. Some disturbance will occur to other wildlife species from the gunfire, because shooting activity may be required over an extended period of several months. The cumulative impact of this is still expected to be minimal though as it will be limited to a small area for a relatively brief period of time.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. Some disturbance will occur to other wildlife species from the gunfire, because shooting activity may be required over an extended period of several months. The cumulative impact of this is still expected to be minimal though as it will be limited to a small area for a relatively brief period of time.

Threatened and Endangered Species

All efforts will be made to avoid disturbing threatened and endangered species while targeting resident geese. Shooting activities will not be conducted if these species are observed in the area. No disturbance is expected to the mussel, fish and bat species is expected to occur under this action. This action should not have any cumulative impacts on the threatened and endangered species on the refuge.

3. Wildlife-Dependent Recreation

This action will have minimal cumulative impacts to recreational activities on the refuge.

4. Refuge Facilities

No cumulative impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No cumulative impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

Under this alternative public health and safety issues will increase as the resident goose population grows. The cumulative impact would be a potential decline in tourism dollars, due to a decline in public use at local recreation areas. This would be due to contamination of the facilities by fecal matter.

E. Disruption of Nests

1. Habitat Management and Vegetation

This alternative is anticipated to have minimal cumulative impacts on the population of resident geese utilizing the habitats of the refuge. As the resident goose population increases it is expected that impacts on vegetation will increase concurrently. For the past three years refuge staff have observed overbrowsing on up to 100 acres of moist soil vegetation. Overbrowsing over a period of time will reduce the quality and quantity of moist soil habitat and reduce seed food sources that are used by waterfowl,and other wetland-dependant wildlife. Eventually, the plant composition may change to less desirable wetland species.

Cumulative impacts associated with crop depredation include the potential loss of cooperative farmers who have suffered economic hardship and can no longer bear the burden. The impacts of overbrowsing on refuge habitat management capability would be substantial, as the cooperative farming program and moist soil management are the primary sources for meeting refuge waterfowl objectives.

3. Wildlife

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. Under the No Action alternative the resident Canada goose population on the refuge is expected to continue to increase. The cumulative impacts to these species would be a reduction in the carrying capacity at the local level, but probably not at the regional or national level.

If competition with wood ducks on the bait site during banding operation becomes much worse, the number of wood ducks banded by this refuge is anticipated to decline. The cumulative impact would be a reduction in the amount of banding data available to determine survival rates for this species, which is used to formulate bag limits and hunting season length.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, and terns. This action is not expected to significantly impact most of these species. The exception would be the several species of rail and bittern which utilize the moist soil units. Increased damage to the moist soil habitat by resident geese has the potential to reduce the carrying capacity of the refuge for these species. The cumulative impact for all of these species is expected to be minimal at the local level with on impacts at the regional or national level.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. This alternative should have no cumulative impacts on the hunted species using the refuge at the local, regional, or national level.

Threatened and Endangered Species

This action should not have any cumulative impacts on the bald eagles or least terns utilizing the refuge. No disturbance is expected to the mussel, fish and bat species is expected to occur under this action.

Wildlife-Dependent Recreation

The waterfowl hunting public would not have the opportunity to harvest a renewable resource or participate in a recreational activity on the refuge. There has been a high demand by the hunting public for this hunt. The cumulative impact would be a decline in refuge relations with the waterfowl hunting public, but relations with birdwatchers, photographers, hikers, and fisherman may improve.

4. Refuge Facilities

No cumulative impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No cumulative impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

Under this alternative public health and safety issues will increase as the resident goose population grows. The cumulative impact would be a potential decline in tourism dollars, due to a decline in public use at local recreation areas. This would be due to contamination of the facilities by fecal matter.

F. Scare Strategies and Harassment

1. Habitat Management and Vegetation

Under this alternative a slight reduction in damage to refuge agricultural crops and moist soil vegetation caused by resident Canada geese may be accomplished. As the resident goose population increases it is expected that impacts on vegetation will increase concurrently. For the past three years refuge staff have observed overbrowsing on up to 100 acres of moist soil vegetation. Overbrowsing over a period of time will reduce the quality and quantity of moist soil habitat and reduce seed food sources that are used by waterfowl,and other wetland-dependant wildlife. Eventually, the plant composition may change to less desirable wetland species.

Cumulative impacts associated with crop depredation include the potential loss of cooperative farmers who have suffered economic hardship and can no longer bear the burden. The impacts of overbrowsing on refuge habitat management capability would be substantial, as the cooperative farming program and moist soil management are the primary sources for meeting refuge waterfowl objectives.

2. Wildlife

Migratory Birds

Migratory birds refer to those species of migratory birds which are hunted statewide, but may or may not be hunted on the refuge. The resident Canada goose population will continue to increase under this alternative. The cumulative impacts to these species would be a reduction in the carrying capacity at the local level, but probably not at the regional or national level.

If competition with wood ducks on the bait site during banding operation becomes much worse, the number of wood ducks banded by this refuge is anticipated to decline. The cumulative impact would be a reduction in the amount of banding data available to determine survival rates for this species, which is used to formulate bag limits and hunting season length.

This alternative is not expected to improve the problem associated with wood duck banding, since harassment of geese around the banding site will also scare wood ducks from the site. As the resident goose population increases, competition with wood ducks on the bait site during banding operation is expected to become worse. If this occurs, the number of wood ducks banded by this refuge will decline. The cumulative impact would be a reduction in the amount of banding data available to determine survival rates for this species, which is used to formulate bag limits and hunting season length.

Non-hunted Wildlife

Non-hunted wildlife includes, but is not limited to non-hunted migratory birds such as shorebirds, wading birds, rails, bitterns, songbirds, raptors, woodpeckers, gulls, and terns. This action is not expected to significantly impact most of these species. The exception would be the several species of rail and bittern which utilize the moist soil units. Increased damage to the moist soil habitat by resident geese has the potential to reduce the carrying capacity of the refuge for these species. The cumulative impact for all of these species is expected to be minimal at the local level with on impacts at the regional or national level.

Hunted Wildlife

Hunted wildlife would include those species with statewide hunting season which may or may not occur on the refuge. This would include white-tailed deer, rabbits, squirrels, coyotes, fox, beaver, and eastern wild turkey. This alternative should have no cumulative impacts on the hunted species using the refuge at the local, regional, or national level.

Threatened and Endangered Species

Some disturbance of bald eagles and least terns may occur depending on the period of year and method of harassment. This action should not have any cumulative impacts on the bald eagles or least terns utilizing the refuge. No disturbance is expected to the mussel, fish and bat species is expected to occur under this action.

3. Wildlife-Dependent Recreation

Noise generated by some scare devices may reduce the quality of experience for refuge visitors but this should be minimal. This action will have minimal cumulative impacts to recreational activities on the refuge.

4. Refuge Facilities

No cumulative impact to refuge facilities is expected to occur under this action.

5. Cultural Resources

No cumulative impact to refuge cultural resources is expected to occur under this action.

6. Refuge Environment and Community

As goose populations increase, conflicts at high public use facilities, such as golf courses, swimming beaches and picnic areas will increase. In some situations temporary closures of certain facilities may be required for public health reasons.

Under this alternative public health and safety issues will increase as the resident goose population grows. Contamination of water supplies in some communities may become more common and treatment more expensive. The probability for bird-aircraft strikes involving resident Canada geese will increase.

Damage caused by geese on agricultural crops, lawns, and golf courses is expected to increase and result in substantial economic loss. A potential decline in tourism

dollars could result from a decline in public use at local recreation areas due to contamination of the facility by fecal matter.

VI. OTHER PAST, PRESENT, PROPOSED, AND REASONABLY FORESEEABLE HUNTS AND ANTICIPATED IMPACTS

Cumulative effects on the environment result from incremental effects of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative effects may result from individually minor actions, they may, viewed as a whole, become substantial over time. The proposed hunt plan has been designed so as to be sustainable through time given relatively stable conditions. Changes in refuge conditions, such as sizeable increases in refuge acreage or public use, are likely to change the anticipated impacts of the current plan and would trigger a new hunt planning and assessment process.

The implementation of any of the proposed actions described in this assessment includes actions relating to the refuge hunt program (see 2007 Migratory Bird Hunting Plan for Tennessee NWR). These actions would have both direct and indirect effects (e.g., new site inclusion would result in increased public use, thus increasing vehicular traffic, disturbance, etc); however, the cumulative effects of these actions are not expected to be substantial.

The past refuge hunting program has been very similar for many years until the need arose for this proposed action. Changes to the hunt program in the past decade have been made to increase harvest of an overabundant white-tailed deer population within the refuge The refuge does not foresee any changes to the proposed action in the way of increasing the intensity of hunting in the future.

VII. ANTICIPATED IMPACTS IF INDIVIDUAL HUNTS ARE ALLOWED TO ACCUMULATE

National Wildlife Refuges, including Tennessee NWR, conduct hunting programs within the framework of State and Federal regulations. Tennessee NWR is at least as restrictive as the State of Tennessee (resident Canada geese) and in many cases more restrictive (deer, turkey, squirrel, raccoon, coyote, beaver). By maintaining hunting regulations that are as, or more, restrictive than the State, individual refuges ensure that they are maintaining seasons which are supportive of management on a more regional basis. The proposed hunt plan has been reviewed and is supported by the Tennessee Wildlife Resources Agency. Additionally, refuges coordinate with TWRA annually to maintain regulations and programs that are consistent with the State management program.

VIII. COMPLIANCE, CONSULTATION AND COORDINATION WITH OTHERS

A. Cooperating Agencies

Consistent with NEPA requirements, agencies with a significant interest in the refuge or proposed action received a copy of the draft Environmental Assessment and Hunt Plan so as to provide them with an opportunity to review and comment on the plan. There comments were incorporated into the final document. The agencies contacted were Tennessee Valley Authority (TVA), U.S. Army Corp of Engineers (USACE), USDA Animal and Plant Health Inspection Service's Wildlife Services program (WS), and Tennessee Wildlife Resources Agency (TWRA).

While the refuge lands are fee title property of the FWS, the USACE has mandated flood control responsibilities of Lake Barkley/Cumberland River, which supersede the refuge's wildlife management mission. Because USACE flood control operations impact the refuge's wildlife management programs, the USACE is a cooperating agency in this review. Some refuge lands are under easement to TVA for power transmission. Future TVA actions on these rights-of-ways could also require cooperatively initiated management of resident Canada geese. The WS program provides the Federal leadership in managing conflicts between humans and wildlife. Since WS personnel have expertise in resolving conflicts with resident Canada geese, they were requested and agreed to be a cooperating agency.

TWRA was the only agency to provide comments to the plan. They supported the Proposed Alternative of opening the refuge to migratory bird hunting of resident Canada geese. They specifically noted that No Action was not an appropriate option due to the damage being caused and that euthanasia was not an appealing option due to the opposition from the hunting and non-hunting public. It was pointed out that the other options required a considerable amount of manpower of which the USFWS appears to lack due to the major cuts in staff that were recently announced. An annual meeting is held with TWRA to consult/coordinate hunt procedures and regulations for the upcoming season. During the hunt meeting, a proposed hunt schedule is discussed and recommendations and/or additional proposals by the State are outlined. Following the meeting, hunt dates are submitted to TWRA for publication in State brochures.

B. Public Comment

The draft Environmental Assessment and Hunt Plan was made available for thirty-day public review and comment period. Public announcements in the local newspapers and radio stations were used to inform the public that the draft Hunting Plan and Environmental Assessment were available for review at the public libraries and refuge offices. See appendix for comments.

C. List of Preparers

The following FWS staff provided input during the development of this document:

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U.S. Fish & Wildlife Service, Tennessee National Wildlife Refuge. 1988. Hunt Plan. Paris, Tennessee.

U.S. Fish & Wildlife Service, Tennessee National Wildlife Refuge. 2003. Hunting Plan, Amendment No. 1. Paris, Tennessee.

FINDING OF NO SIGNIFICANT IMPACT

2007 Migratory Bird Hunting Plan for Tennessee National Wildlife Refuge

The U.S. Fish and Wildlife Service proposes to open to hunting 40% of Tennessee NWR to a September resident Canada goose hunt. Hunting activities will be permitted, but administratively limited to those areas specified in the refuge-specific regulations. All or parts of the refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for other reasons. Alternatives considered included: proposed action (open to hunting), no action (not open to hunting), capture and euthanasia during molt, shooting by staff for limited control, disruption of nests, and scare strategies and harassment.

The Service has analyzed the following alternatives to the proposal in an Environmental Assessment (copy attached):

No action alternative	Under this alternative, hunting would be limited to areas currently open to hunting and to species currently allowed to be hunted. There would be no change to current public use and wildlife management programs.
Proposed action	Under this alternative, 40% of the refuge would be opened to hunting during the statewide September resident Canada goose season on Tennessee NWR. The refuge would be closed during the statewide September wood duck/teal season, when those two seasons overlap.
Capture and euthanasia during the molt	Under this alternative resident Canada geese would be rounded up during the molt and euthanized.
Shooting for limited control	Under this alternative refuge staff would selectively target geese in problem areas.
Disruption of nests	Under this alternative refuge staff would oil eggs or otherwise reduce reproduction.
Scare strategies and harassment	Under this alternative refuge staff would use pyrotechnics and other scare devices to scare resident geese out of problem areas.

The preferred alternative was selected over the other alternatives because:

1. The preferred alternative would allow the refuge to manage wildlife populations, allow the public to harvest a renewable resource, promote a wildlife-oriented recreational opportunity, increase awareness of Tennessee NWR and the National Wildlife Refuge System, and meet public demand.

2. The preferred alternative is compatible with general Service policy regarding the establishment of hunting on National Wildlife Refuges.

3. The preferred alternative is compatible with the purpose for which Tennessee NWR was established.

4. This proposal does not initiate widespread controversy or litigation.

5. There are no conflicts with local, state, regional, or federal plans or policies.

Implementation of the agency=s decision would be expected to result in the following environmental, social, and economic effects:

1. The refuge could better manage wildlife populations.
2. This would allow the public to harvest a renewable resource.
3. The public would have increased opportunity for wildlife-oriented recreation.
4. Local businesses would benefit from hunters visiting from surrounding counties.
5. The Service will be perceived as a good steward of the land by continuing traditional uses of land in Tennessee.

Measures to mitigate and/or minimize adverse effects have been incorporated into the proposal. These measures include:

1. Hunting will be limited to 40% of the refuge.
2. Hunting will be limited to a maximum of 15 days but usually less. Hunting will be closed during the statewide wood duck/teal season, which usually overlaps the dates of the statewide resident goose season.
3. The refuge law enforcement program and closely regulated hunting season will ensure hunt regulation compliance and will protect refuge resources.
4. Close individual hunt zones if undue threats occur to endangered or threatened species.
5. Inform hunters in writing about the possible presence of endangered species and their identification.

The proposal is not expected to have any significant adverse effects on wetlands and flood plains, pursuant to Executive Orders 11990 and 11988 because this area has historically had a high use of recreational hunting and fishing with no detrimental long-term effect on wetlands.

The proposal has been thoroughly coordinated with all interested and/or affected parties. Parties contacted include:

- U.S. Fish and Wildlife Service, Division of Ecological Services, Cookeville, TN
- Tennessee Wildlife Resource Agency, Waterfowl Biologist, Wildlife Division

Copies of the Environmental Assessment are available by writing:

Tennessee National Wildlife Refuge
3006 Dinkins Lane
Paris, TN 38242

Therefore, it is my determination that the proposal does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of the National Environment Policy Act of 1969 (as amended). As such, an environmental impact statement is not required. This determination is based on the following factors (40 CFR 1508.27):

(for each factor list the page numbers of the EA where the factor was discussed.)

1. **Both beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment (EA, page 24, 25)**

2. **The actions will not have a significant effect on public health and safety (EA, page 25).**

3. **The project will not significantly effect any unique characteristics of the geographic area such as proximity to historical or cultural resources, wild and scenic rivers, or ecologically critical areas (EA, page 12, 13 & 24,25).**

4. **The effects on the quality of the human environment are not likely to be highly controversial (EA, page 24, 25).**

5. **The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment (EA, page 24, 25).**

6. **The actions will not establish a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration (EA, pages 34,35).**

7. **There will be no cumulative significant impacts on the environment. Cumulative impacts have been analyzed with consideration of other similar activities on adjacent lands, in past action, and in foreseeable future actions (EA, pages 34,35).**

8. **The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural, or historic resources (EA, pages 12,13 & 24,25).**

9. **The actions are not likely to adversely affect endangered or threatened species or their habitats (Intra-Service Section 7 Biological Evaluation Form attached to EA).**

10. The actions will not lead to a violation of federal, state, or local laws imposed for the protection of the environment (EA, pages 30).

References: Environmental Assessment of 2007 Migratory Bird Hunt Plan for Tennessee NWR, Hunting Plan, Compatibility Determination, Letters of Concurrence, Refuge-specific Regulations, Intra-Service Section 7 Evaluation

Regional Director

4/25/07
Date