

ORIGINAL / SIGNED
FONSI + EA
Included.

***AMENDED ENVIRONMENTAL ASSESSMENT
HUNT PROGRAM PROPOSAL
CANAAN VALLEY NATIONAL WILDLIFE REFUGE
April 2007***

***U.S. Department of the Interior
Fish and Wildlife Service
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia***

TABLE OF CONTENTS

LIST OF FIGURES/TABLES vi

LIST OF ACRONYMS vii

I. Introduction 1

II. Purpose and Need for the Proposed Action5

 A. Proposed Action5

 B. Purpose5

 C. Need for the Proposed Action6

III. Proposed Action and Its Alternatives.....6

 A. Summary of the Alternatives7

 B. Alternatives Dismissed from Consideration7

 C. Description of Alternatives.....7

 1. Regulations Common for Hunting Alternatives7

 2. Alternative 1. Proposed Action - Open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia with some exceptions..... 11

 3. Alternative 2 - Open Canaan Valley National Wildlife Refuge to White-tailed Deer Hunting Only..... 13

 4. Alternative 3 - (No Action) Do Not Open Canaan Valley National Wildlife Refuge to hunting 14

IV. Affected Environment 14

 A. Vegetation 14

 B. Wildlife 15

 1. Upland (Small) Game..... 15

 Ruffed Grouse..... 15

 Northern Bobwhite 15

 Rabbits and Hare 16

 Squirrels..... 16

 Raccoon, Foxes (Red and Gray) and Bobcat 16

 Coyote..... 17

 Opossum, Skunk, and Woodchuck 17

 2. Big Game..... 17

 White-tailed Deer..... 17

FINDING OF NO SIGNIFICANT IMPACT CANAAN VALLEY NATIONAL WILDLIFE REFUGE HUNTING OPPORTUNITIES

The U.S. Fish and Wildlife Service (Service) proposes to open the Canaan Valley National Wildlife Refuge (Refuge) to hunting. Three alternatives were carefully analyzed to evaluate their impacts to the Refuge's environment and their contribution to the mission of the National Wildlife Refuge System and the Refuge's purpose. 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.

The Service has analyzed the following alternatives to the proposal in the 2007 Hunt Environmental Assessment:

Alternative 1: This alternative was the proposed action in the Draft 2007 Hunt EA. This alternative would open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia with some exceptions (refer to 2007 Hunt EA and/or Hunt Plan for exceptions).

Alternative 2: Under this alternative, the Refuge would be open to deer hunting only. Hunting of all other species would be prohibited.

Alternative 3: Under this alternative, the Refuge would remain closed to any form of hunting. All Refuge boundaries would be posted with "no hunting zone" signs.

The preferred alternative, Alternative 1, was selected over other alternatives because:

1. The preferred alternative would allow the Refuge to manage wildlife populations, allow the public to harvest a renewable resource, promote wildlife-oriented recreational opportunity, increase awareness of Canaan Valley National Wildlife Refuge and the National Wildlife Refuge System, meet public demand, and contribute to the local economy.
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 Canaan Valley National Wildlife Refuge was established.
4. The preferred alternative does not initiate widespread controversy.
5. The preferred alternative does not conflict 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. The public would be allowed to harvest a renewable resource. Over 1800 hunters currently are permitted to hunt on the Refuge.
3. The public would have an opportunity to participate in a wildlife-dependent recreation.
4. There would be a positive impact on the local economy. The local purchases of gas, food, lodging, hunting licenses, equipment, and supplies, from mostly out-of-state hunters contributes significantly to the local economy.
5. The Service would be a good steward of the land by continuing traditional uses of the land in West Virginia.

Copies of the 2007 Hunt Environmental Assessment are available by visiting the Refuge's website at _____, or by writing:

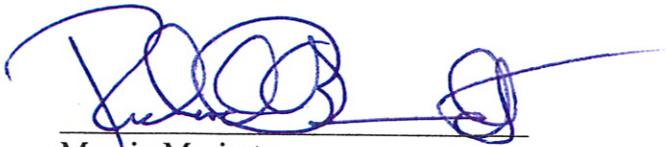
Canaan Valley National Wildlife Refuge
HC 70 Box 200
Davis, West Virginia 26260

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):

- 1. Both beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment (EA, page 40-52, 60-61).**
- 2. 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 24-26, 36, 59, 60-61).**
- 3. 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 62).**
- 4. 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 25, 36, 58).**
- 5. 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).**

6. The actions will not lead to a violation of federal, state, or local laws imposed for the protection of the environment (EA, pages 93).

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



Marvin Moriarty
Regional Director
U.S. Fish and Wildlife Service
Hadley, Massachusetts

Acting

4-27-07
Date

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 action of (describe action):

Check One:

_____ is a categorical exclusion as provided by 51 6 DM 2, Appendix I and 516 DM 6, Appendix 1. 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 1506.11. 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 (list):

Signature Approval:

Acting Refrge Manager

Erin Holmes

(1) Originator

4/20/07

Date

Mr. EGW

(2) WO/RO Environmental Coordinator

4/25/07

Date

Acting
St. M. Lynch

(3) AD/ARD

4-27-07

Date

[Signature]

(4) Director/Regional Director

[Signature]

4/27/07

Date

	Black Bear	18
	Wild Turkey	19
3.	Migratory Game Birds.....	19
	Waterfowl (Ducks and Geese)	19
	Rails, Gallinule and Coot.....	20
	Mourning Doves	21
	American Woodcock	21
	Wilson's Snipe	23
4.	Endangered, Threatened, and other Non-game Species	23
C.	Socio-Economic/Cultural Resources	24
	1. Socio-Economic.....	24
	2. Cultural Resources.....	25
V.	Environmental Consequences of the Proposed Action and Its Alternatives	26
	1. Anticipated Direct and Indirect	
	Impacts.....	26
	A. Alternative 1 (Proposed Action) - Open Canaan Valley National Wildlife	
	Refuge to hunting as regulated by the State of West Virginia with some	
	exceptions.....	26
	1. Vegetation.....	26
	2. Wildlife	27
	a. Upland (Small) Game	27
	Ruffed Grouse	27
	Rabbits and Hare.....	28
	Squirrels.....	29
	Raccoon, Foxes (Red and Gray), and Bobcat	29
	Coyote.....	30
	Opossum, Skunk, and Woodchuck.....	31
	b. Big Game	31
	White-tailed Deer	31
	Black Bear	31
	Wild Turkey	33
	c. Migratory Game Birds	33
	Waterfowl (Ducks and Geese)	33
	Rails, Gallinule, and Coot.....	34
	Mourning Doves	34
	American Woodcock	34
	Wilson's Snipe	35
	d. Endangered, Threatened and other Non-game species	35
	3. Local Economy	36
	4. Cultural Resources.....	36

- B. Alternative 2 - Open Canaan Valley National Wildlife Refuge to white-tailed deer hunting only 36
 - 1. Vegetation 36
 - 2. Wildlife 37
 - a. Upland (Small) Game 37
 - b. Big Game 37
 - White-tailed Deer 37
 - Black Bear 37
 - Wild Turkey 37
 - c. Migratory Game Birds 37
 - d. Endangered, Threatened, and other Non-game species 38
 - 3. Local Economy 38
 - 4. Cultural Resources.....38

- C. Alternative 3 (No Action) - Do Not Open Canaan Valley National Wildlife Refuge to hunting..... 38
 - 1. Vegetation 38
 - 2. Wildlife 39
 - a. Upland (Small) Game 39
 - b. Big Game 39
 - White-tailed Deer 39
 - c. Migratory Game Birds 39
 - d. Endangered, Threatened, and other Non-game Species 39
 - 3. Local Economy 40
 - 4. Cultural Resources.....40
- 2. Cumulative Impact Analysis.....40
 - A. Anticipated Direct, Indirect and Cumulative Impacts to Wildlife.....40
 - 1. Alternative 1 (Proposed Action) - Open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia with some exceptions...40
 - A. Vegetation.....40
 - B. Wildlife.....41
 - 1. Upland (Small) Game.....41
 - 2. Big Game.....44
 - 3. Migratory Game Birds.....46
 - 4. Other Wildlife.....51
 - 5. Threatened and Endangered Species.....52
 - 2. Alternative 2 - Open Canaan Valley National Wildlife Refuge to white-tailed deer hunting only52
 - A. Vegetation.....52

B. Wildlife.....52

 1. Upland (Small) Game.....52

 2. Big Game.....53

 3. Migratory Game Birds.....53

 4. Other Wildlife54

 5. Threatened and Endangered Species.....54

3. Alternative 3 (No Action) - Do Not Open Canaan Valley National Wildlife Refuge to hunting.....54

 A. Vegetation.....54

 B. Wildlife.....54

 1. Upland (Small) Game.... 54

 2. Big Game.....54

 3. Migratory Game Birds.....55

 4. Other Wildlife55

 5. Threatened and Endangered Species.....55

B. Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources.....55

 1. Other Wildlife-Dependent Recreation.....55

 2. Refuge Facilities.....57

 3. Cultural Resources.....58

C. Anticipated Impacts of Proposed Hunt on Refuge Environment and Community.....60

D. Other Past Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts..62

E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate.....63

VI. Consultation and Coordination.....69

 A. Planning..... 69

 B. Public Involvement..... 70

 1. Documents 70

 2. News Releases and Advertisements 70

 3. Open House and Public Meeting 70

 C. Summary of Comments..... 71

 D. Responses to Comments 71

 1. 1997 EA Comments 71

 2. 2007 EA Comments 71

VII. Regulatory Compliance.....94

VIII. Literature Cited..... 95

VIII. Appendices..... 105

LIST OF FIGURES AND TABLES

Figure 1. Canaan Valley National Wildlife Refuge 3

Figure 2. Delineation of No Rifle Zones and Safety Zones, Canaan Valley National Wildlife Refuge 9

Figure 3. Hunting seasons for species hunted on the Refuge and the average number of hunters per year reporting hunting during those seasons (2002-2005)65

Figure 4. Number of visitors to the Canaan Valley National Wildlife Refuge for hunting and other activities.....69

Table 1. Open hunting seasons at Canaan Valley National Wildlife Refuge.....64

Table 2. Average number and percentage of hunters with unknown hunting seasons four species with multiple open seasons.....65

LIST OF ACRONYMS/ABBREVIATIONS

CITES Convention on International Trade in Endangered Species

NFRTC Northeast Furbearer Resources Technical Committee

NWR National Wildlife Refuge

Refuge Canaan Valley National Wildlife Refuge

Service U.S. Fish and Wildlife Service

USFWS U.S. Fish and Wildlife Service (literature citations)

WVDNR West Virginia Division of Natural Resources

Valley Canaan Valley area – which includes Refuge

In response to a 2003 lawsuit filed by the Fund for Animals, the U.S. Fish and Wildlife Service (Service) is required to amend environmental assessments that describe hunting programs at sixteen national wildlife refuges located in the Northeast Region. The amended environmental assessments will address the cumulative impacts of hunting at all refuges which were named in the lawsuit. This document addresses the hunting programs at Canaan Valley National Wildlife Refuge in West Virginia.

Hunting at Canaan Valley National Wildlife Refuge was first proposed in the *Final Environmental Impact Statement Canaan Valley National Wildlife Refuge West Virginia* (1979). The *Station Management Plan Canaan Valley National Wildlife Refuge* (1994) and *Final Environmental Assessment Canaan Valley National Wildlife Refuge* (1994) outlined the continuation of traditional hunting opportunities, and the 1997 *Final Environmental Assessment Hunt Program Proposal* evaluated the proposed actions and alternatives. Following a public comment period and the acquisition of land, the hunting program was initiated in Fall 1997.

The remainder of this document details the hunting program alternatives that were developed and finalized in the 1997 EA. Cumulative impacts of the current hunting programs at Canaan Valley National Wildlife Refuge will be addressed following a description of the alternatives that were first proposed in 1997.

I. Introduction

In August 1994, the U. S. Fish and Wildlife Service (Service) established the Canaan Valley National Wildlife Refuge (Refuge) in Tucker County, West Virginia, just near the town of Davis. The idea of a National Wildlife Refuge (NWR) in Canaan Valley was first proposed as early as 1961, but did not come about until 30 years later. The historical overview of establishing the Refuge and assessing its impacts are examined in the Final Environmental Impact Statement issued by the Service in 1979 (USFWS, 1979), and updated in an Environmental Assessment issued by the Service in 1994 (USFWS, 1994a). Copies of these documents are available from the Refuge office.

The Refuge was officially established under the authority of the Fish and Wildlife Act of 1956 and the Emergency Wetlands Resources Act of 1986. Under these Acts, the legal purpose of the Refuge is "...for the development, advancement, management, conservation, and protection of fish and wildlife resources....for the benefit of the United States Fish and Wildlife Service, in performing its activities and services." Canaan Valley was one of the Service's highest priorities for a National Wildlife Refuge, due to the national significance of its wetland and wildlife habitat resources. Its principal value is its diverse and unusual mix of habitats and boreal (northern) species. The Valley contains a system of plants and animals usually found much farther north in New England and Canada. These unique characteristics all occur within the confines of the Valley, making it a self-contained unit. Canaan Valley was characterized in its National Natural

Landmark designation documentation as a “virtual living museum of Pleistocene Time in West Virginia” due to its diversity of relict habitats and species.

The Refuge was established to ensure the ecological integrity of the Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States. The valley encompasses more than 8,400 acres of wetlands -- the largest such complex in both West Virginia and the central and southern Appalachians. It is listed as a priority for protection under the Emergency Wetlands Resources Act of 1986, as implemented by the Service’s Regional Wetlands Concept Plan, and considered by the State of West Virginia as “the most important wetland in the State.” The Refuge acquisition boundary originally included approximately 28,000 acres, but due to land development between 1979 and 1994, the acquisition boundary was revised to approximately 25,000 acres. Currently, the Refuge consists of **thirty-eight tracts totaling 15,950 acres (owned) and 23 acres in conservation easements.** (See **Figure 1.**) Through ongoing acquisition and management efforts, the Refuge continues to grow and enhance its capability to protect the valuable habitats and wildlife of Canaan Valley.

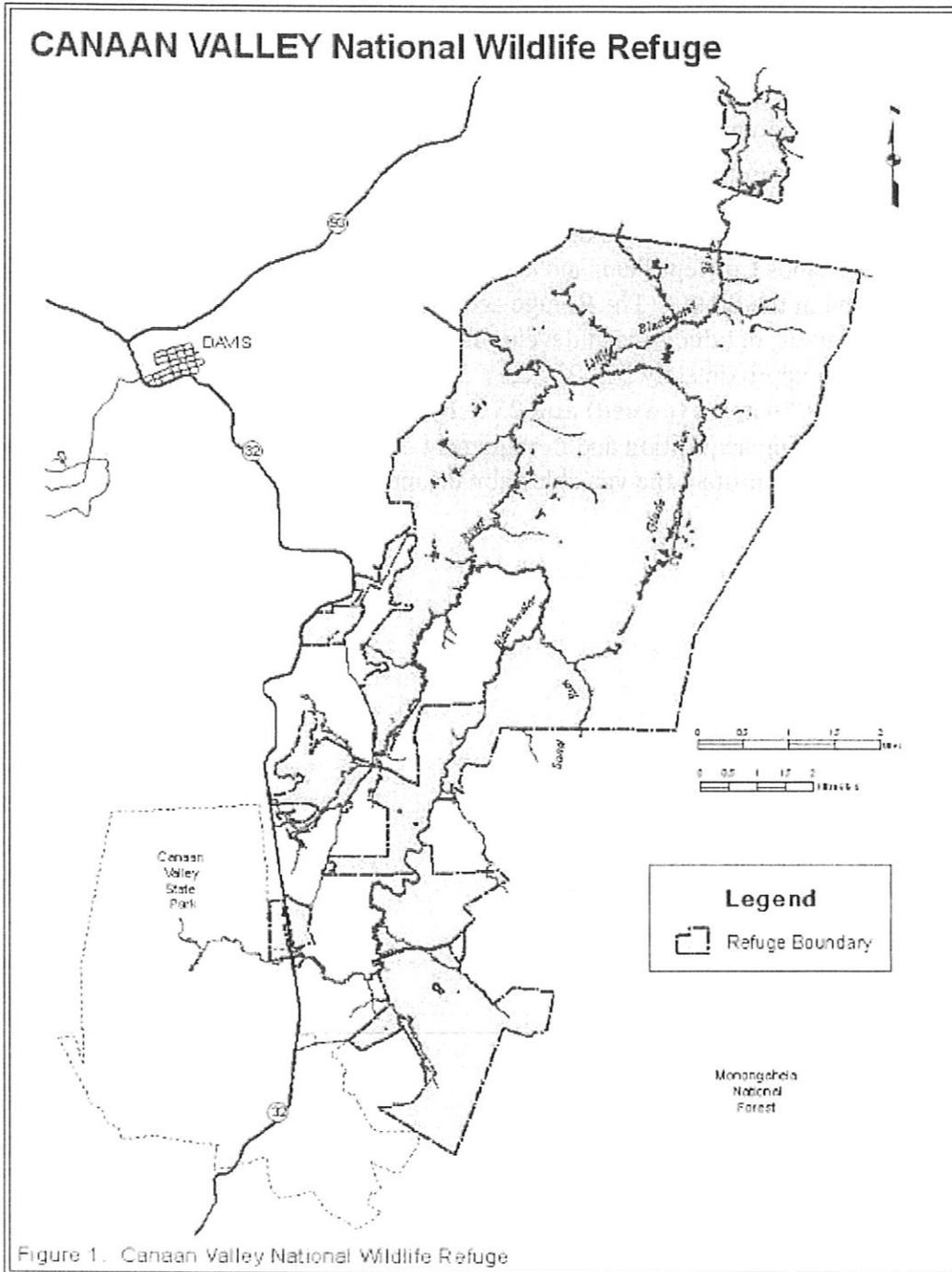


Figure 1. Canaan Valley National Wildlife Refuge.

As identified in the Environmental Assessment (USFWS, 1994a), the Refuge was established to meet the following objectives:

Preserve in perpetuity approximately 24,000 acres of relict boreal habitat and unique ecosystem, with its diverse flora and fauna;

Provide a unique educational opportunity by assisting with field studies of environmental interrelationships and stimulating curiosity of living things by offering a variety of first-hand outdoor experiences;

Provide for bird watching, photography, nature study, hunting, fishing, and other wildlife-oriented activities consistent with other Refuge objectives;

Establish a Woodcock Research and Management Area consistent with other Refuge objectives;

Provide and develop habitat for waterfowl consistent with preservation of existing ecosystems.

In the Station Management Plan (USFWS, 1994b) developed for the Refuge, the Service identified the following management objectives:

Acquire and protect habitats (land);

Build a staff; administer the Refuge;

Develop and maintain up-to-date biological information base;

Preserve and protect endangered and threatened species;

Perpetuate the migratory bird resource and natural biodiversity;

Provide educational, interpretive, and recreational opportunities;

Identify existing water quality problems.

All of these objectives are discussed at length in the Station Management Plan (USFWS, 1994b). The Plan identifies hunting as an acceptable and traditional form of recreation, particularly on lands that have historically supported hunting, as is the case in Canaan Valley. As a part of the National Wildlife Refuge Improvement Act of 1997, Congress identified hunting as one of six wildlife-dependent priority public uses that should be facilitated on national wildlife refuges. In 1998, 50 CFR Part 32 (*1998-1999 Refuge-Specific Hunting and Sport Fishing Regulations*)

added Canaan Valley National Wildlife Refuge to the list of refuges open for hunting. This rule specifically allowed the hunting of migratory game birds, upland game and big game at Canaan Valley National Wildlife Refuge as a wildlife-dependent recreational activity.

II. Purpose and Need for the Proposed Action

A. Proposed Action

The Service proposes to open designated portions of the Canaan Valley National Wildlife Refuge annually to hunting for a variety of species as regulated by the State of West Virginia, with some exceptions. Hunting on the Refuge would be conducted within the framework of applicable state and federal regulations. Additionally, a limited number of Refuge-specific regulations would be enacted to ensure safety, practice sound management, comply with legal mandates, and ensure compatibility with the purposes for which the Refuge was established. Therefore, certain tracts of the Refuge used for other activities might be closed to hunting. The hunt program would apply to lands now a part of the Refuge and lands added to the Refuge in the future.

B. Purpose

The purpose of the proposed action is to encourage the use of Refuge lands for wildlife-dependent public recreation as outlined in various laws, regulations, and Service guidance policies governing the National Wildlife Refuge System. The Service considers hunting an acceptable and desirable form of wildlife-dependent recreation. Hunting can also be a valuable management tool to make productive use of harvestable wildlife surpluses and collect biological data while effectively controlling population levels, thus alleviating habitat destruction resulting from overpopulation. Specifics of the hunt program are described in the Canaan Valley National Wildlife Refuge Hunting Management Plan.

The Service encourages the development of hunting programs on National Wildlife Refuges when they are compatible with the refuge's legal purpose, biologically sound, affordable, properly coordinated with other refuge programs, and fit the Service description of a quality hunt. "Quality hunts" are defined as those which are planned, supervised, conducted, and evaluated to promote positive hunting values and ethics such as fair chase and sportsmanship. The Service strives to provide hunting opportunities on refuges which are superior to those available on other public or private lands, and to provide participants with reasonable harvest opportunities, uncrowded conditions, fewer conflicts among hunters, relatively undisturbed wildlife, and limited interference from, or dependence on, mechanized aspects of the sport (USFWS, 1996a).

C. Need for the Proposed Action

The need for the proposed action is two-fold. First, hunting would provide a viable means of population and habitat management and biological data collection. Overbrowsing by white-tailed deer on plant communities in the Valley is well documented. Deer are suppressing plant growth and succession, and deer browsing has defoliated trees and shrubs in many areas to a height of six feet. Due to deer overbrowsing, ferns and clubmosses have replaced the natural diversity of understory plants and natural abundance of woody species regeneration, thus altering the habitat the Refuge was created to protect.

Second, hunting is one aspect of a broad education and recreation program to increase public awareness of wise stewardship that benefits wildlife. Hunting provides an opportunity to extend this message to an important segment of the public. This is particularly important on lands that have traditionally supported recreational hunting. Public access and use, including hunting, have been allowed and regulated by private landowners in the Valley for many years. In particular, deer hunting and upland game hunting have been very popular. During public meetings before the Refuge was established, many citizens stated that they were in favor of maintaining hunting on Refuge lands. Service representatives assured the local citizens that hunting would be evaluated within a few years of Refuge establishment, and if found to be compatible with Refuge purposes, hunting would continue. The Service reiterated this position in the Preliminary Station Management Plan issued in March 1994.

III. Proposed Action and Its Alternatives

A. Summary of the Alternatives

The Service analyzed impacts of the proposed action and two alternatives for addressing the need for a hunting program at the Refuge:

Alternative 1 (Proposed Action): Open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia with some exceptions;

Alternative 2: Open Canaan Valley National Wildlife Refuge to white-tailed deer hunting only;

Alternative 3 (No Action): Do not open Canaan Valley National Wildlife Refuge to hunting.

These alternatives reflect management approaches based on existing wildlife populations, existing state and federal regulations, the Refuge's purpose and objectives, endangered species concerns, Service policies and guidance, and safety considerations. These three alternatives represent a reasonable range as required by the National Environmental Policy Act of 1969.

B. Alternatives Dismissed from Consideration

Several alternatives were considered unreasonable to implement for varying reasons. These included, but are not limited to, the following:

1) Open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia without any exceptions. This would have included year-round hunting for species such as woodchuck, opossum, skunk, etc. This alternative was rejected because there is no precedent for year-round hunting on National Wildlife Refuges for any species.

Allowing hunting during the nesting/brood rearing seasons would not be compatible with Refuge goals. Such hunting could also cause conflicts with other Refuge activities in the spring and summer.

2) Open Canaan Valley National Wildlife Refuge to hunting under regulations much more conservative than those of the State of West Virginia, such as restricting species that could be hunted, shorter hunting seasons for most species, extensive reporting requirements for each hunter, etc. This was rejected because it would be more expensive to implement due to the increased number of law enforcement personnel required and because it would not allow the Refuge to meet deer harvest objectives.

3) Open Canaan Valley National Wildlife Refuge to hunting without “no rifle zones.” This was rejected because it could pose problems to human safety in southern Canaan Valley, which has many homes and businesses close to Refuge tracts.

C. Description of Alternatives

1. Regulations Common for Hunting Alternatives

Both alternatives under consideration for allowing hunting on the Refuge would be contingent on specific regulations enacted by the Service for refuges in general and Canaan Valley National Wildlife Refuge in particular. These are in addition to state regulations, and would take precedence where they are more restrictive than the state regulations. General stipulations for refuge hunting as contained in the Code of Federal Regulations (50 CFR Part 32) state that hunters must have a valid state license, valid Migratory Bird Hunting and Conservation Stamp (“Duck Stamp”) for waterfowl hunting, comply with all current federal hunting regulations including the migratory bird regulations (50 CFR Part 20), and comply with all state hunting and safety regulations. Additionally, hunters must comply with the terms and conditions established by the Refuge for access to the Refuge itself and for its hunting program. Specific regulations for Refuge lands include the following:

1) Hunters must use and possess non-toxic shot while hunting waterfowl on the Refuge.

- 2) The use of all terrain vehicles (ATVs) or other vehicles on Refuge lands is prohibited.¹
- 3) The use of nails, wire, bolts, etc., to attach a stand to a tree is prohibited, as is the use of a tree with existing nails, wire or bolts.
- 4) Hunting over bait is prohibited.
- 5) The use or possession of alcoholic beverages while hunting is prohibited.

Hunting on the Refuge would also be contingent on the following specific stipulations:

1. While participating in hunts on the Refuge, hunters must have in their possession a current, signed Canaan Valley National Wildlife Refuge Hunting Permit and the appropriate State hunting license(s). The Refuge permit includes a card which must be displayed on the dashboard of the hunter's vehicle while hunting. Hunters are able to get a Refuge hunting permit by contacting the Refuge headquarters.
2. Only the following game species may be taken on the Refuge: white-tailed deer, black bear, wild turkey, waterfowl, mourning dove, rails, gallinule, coot, woodcock, snipe, squirrels, ruffed grouse, rabbits, hare, foxes, raccoon, bobcat, woodchuck, coyote, opossum and striped skunk.
3. It is unlawful to shoot or discharge any firearm within 500 feet of a dwelling house or occupied building.
4. The Refuge will be closed to hunting between March 1st and August 31st of each year, except for the spring turkey season.
5. All game that is killed or crippled shall be retrieved, if possible, and retained in the custody of the hunter in the field.

¹ As the refuge grows, and especially if the refuge acquires large tracts of roadless lands, the Service may consider allowing hunters to use horses or bicycles to transport deer or bear carcasses to the roads.

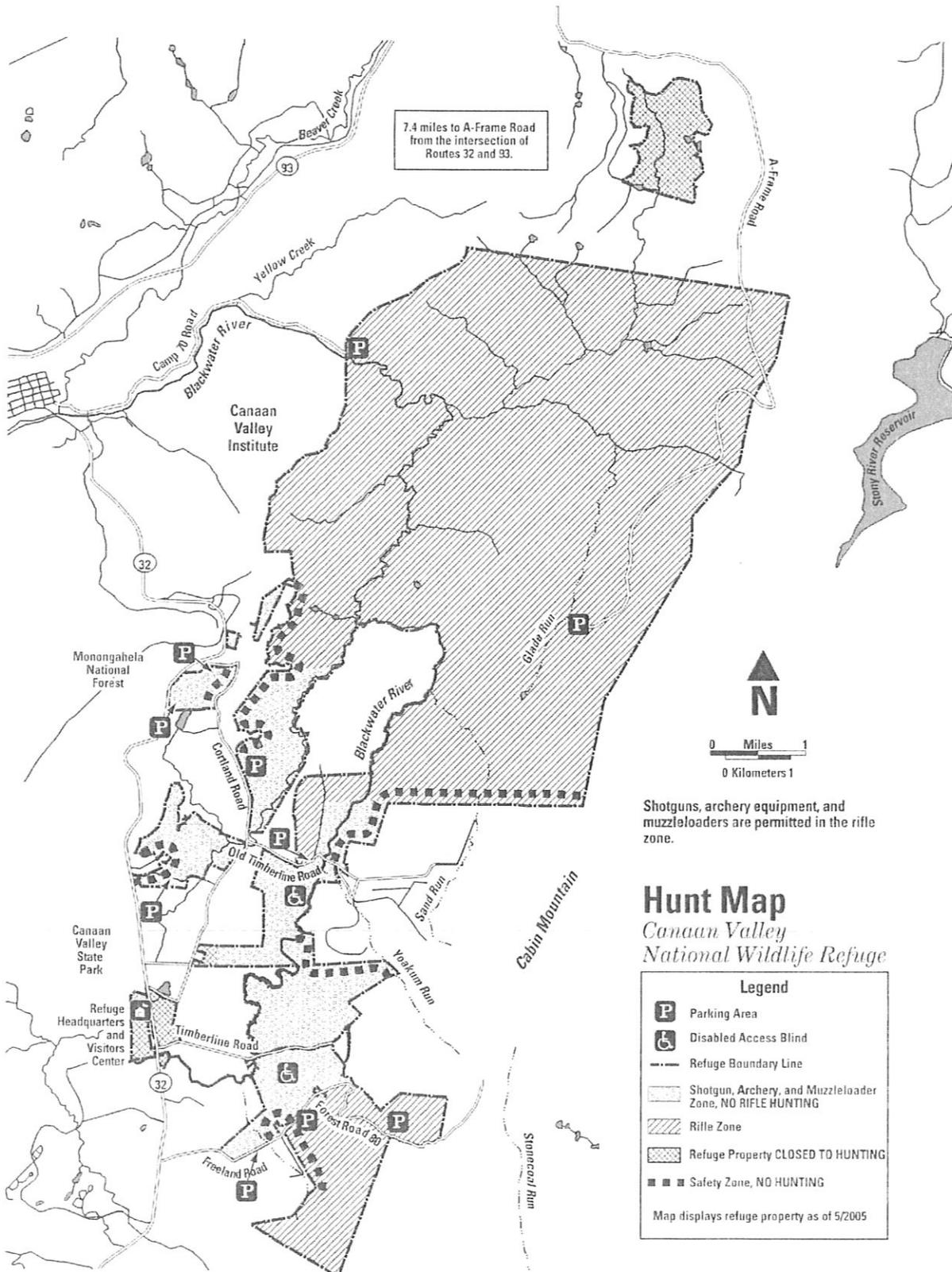


Figure 2. Delineation of No Rifle Zones, Canaan Valley National Wildlife Refuge

6. In the no-rifle zone of the Refuge, the following stipulations are in place:
 - The take of big game will be restricted to archery, muzzleloader, and shotgun. The take of upland/small game will be restricted to shotgun only.
 - Handguns will be prohibited.
 - Muzzleloaders will be restricted to the type defined by State regulations; telescopic sights will be permitted during buck, antlerless, and muzzleloader seasons.
 - Shotguns firing slugs will be permitted for deer hunting.
7. Hunting birds with pointing and/or retrieving dogs will be permitted, but no more than two dogs per hunter will be allowed in the field. Extra dogs remaining in a hunter's vehicle will not count as dogs in the field.
8. The take of wild turkeys with rifles will be prohibited throughout the Refuge, and shot larger than #4 will be prohibited.
9. A minimum of 400 square inches of blaze orange must be worn by all hunters, except for waterfowl, turkey and archery hunters. For waterfowl, turkey, and archery hunters, 400 square inches of blaze orange must be worn while traveling between stands and/or blinds.
10. Portable tree stands are the only type permitted on the Refuge.
11. Trimming or cutting branches is prohibited. Hunting from blinds made from cut conifer tree branches (balsam fir, red spruce, hemlock) is prohibited.
12. All tree stands must have the name and address of the owner clearly printed on the stand. All stands must be removed by the last day of deer season.
13. The Refuge bear gun season will be the same as the state season.
14. Bear gun hunters will be limited to six dogs each. Releasing and picking up dogs on Cortland Road and Old Timberline Road will be prohibited.
15. All dogs are required to wear a collar displaying the owner's name, address, and telephone number.
16. Hunters who lose dogs will be required to search for them for three days, and will not be allowed to hunt during the search period.
17. Dog training is prohibited except during legal hunting seasons.

- 18.. Hunting rabbits and raccoons with pursuit dogs will be permitted, but no more than four dogs per hunter will be allowed in the field. Extra dogs remaining in a hunter's vehicle will not count as dogs in the field.
 19. Raccoon dog training and/or "night hunts" will be prohibited except during raccoon hunting season.
 20. Night hunting on the Refuge will be by Special Use Permit only. Hunters will have to apply for the permit in person or by mail or telephone.
 21. Hunting will be prohibited on Refuge lands west of Highway 32 and adjacent to Canaan Valley State Park.
 22. No camping is allowed on Refuge lands.
 23. All accidents and injuries must be reported to the Refuge office as soon as possible.
- 2. Alternative 1. Proposed Action - Open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia with some exceptions;**

Under this alternative, the Refuge would be opened to hunting according to the State of West Virginia's regulations, with some exceptions. General exceptions to the State's regulations are discussed below:

- 1) The Refuge shall be closed to hunting, except for the spring turkey season, from March 1 through August 31 each year. This exception is designed to minimize disturbance to wildlife during the periods for nesting and rearing of young. It also addresses concerns raised by the public regarding safety during periods of higher use for other forms of recreation on the Refuge.
- 2) Hunting on the Refuge with dogs is permitted under the following stipulations:
 - a) dogs must be under the control of the hunter/owner at all times;
 - b) each bird hunter may have no more than two (2) dogs;
 - c) each bear hunter may have no more that six (6) dogs;
 - d) each raccoon or rabbit hunter may have no more than four (4) dogs.

As defined by the Service Manual, hunting on refuges may be allowed for migratory game birds and resident game species, which are generally sub-divided into big game and upland (small) game species. The Service proposes to allow hunting on Canaan Valley NWR for all three categories. Exceptions to the state's regulations are delineated below:

Migratory Game Birds:

- 1) Each bird hunter may have no more than two (2) dogs.

Big Game:

- 1) White-tailed Deer: Open to full state gun and archery seasons with the following stipulations:

- a) Each gun hunter (excepting turkey and waterfowl) must wear a minimum of 400 square inches of blaze orange. For archery hunters, 400 square inches of blaze orange must be worn while traveling between stands and/or blinds.
- b) Archery, muzzleloader, or shotgun only allowed in designated "No Rifle Zones" of the Refuge;
- c) Portable tree stands are the only type permitted; and,
- d) The Service may request that the West Virginia Division of Natural Resources (WVDNR) make the Refuge a "designated management area" for antlerless deer hunting. As such, the antlerless deer hunting season may be longer than that in the surrounding county, and it may be open to non-state residents when the surrounding county is open to residents only.

- 2) Black Bear: Open to full state gun and archery season. Archery only is allowed in designated "No Rifle Zones" of the Refuge. Gun hunting would also be subject to the following stipulations:

- a) Each gun hunter would be allowed to have one pack of no more than six (6) dogs;
- b) Dogs may not be released or picked up along Cortland Road or Old Timberline Road; and,
- c) Bear dog training on the Refuge would be prohibited except during the Refuge bear gun season.

d) Any hunter who loses a dog would be required to search for it for three (3) days and not be permitted to hunt during the search period.

3) Wild Turkey: Open to full state spring and fall seasons with the following stipulations:

- a) Only shot size of #4 or smaller allowed;
- b) Rifle hunting prohibited.

Upland (Small) Game:

- 1) Open to all species allowed under State regulations, except northern bobwhite, spotted skunk, all weasels, European starling, English (house) sparrow, and crow;
- 2) Archery, muzzleloader or shotgun only allowed in designated "No Rifle Zones" of the Refuge;
- 3) Each rabbit or raccoon hunter would be allowed to have one pack of not more than four (4) dogs;
- 4) Each hunter must apply either in person or by mail for a Special Use Permit to hunt on the Refuge at night;
- 5) Raccoon dog training and or "night hunts" would be permitted only during raccoon season.

3. Alternative 2 - Open Canaan Valley National Wildlife Refuge to White-tailed Deer Hunting Only

Under this alternative, the Refuge would be opened to deer hunting only. Hunting of all other species would be prohibited. The main objective of this hunt program would be to limit the number of deer on the Refuge so that overbrowsing does not occur. A priority would be to maximize the harvest of antlerless deer on the Refuge. The Service may request that WVDNR make the Refuge a "designated management area" for antlerless deer hunting, which could allow for non-residents to hunt on the Refuge when the surrounding county is open to residents only. A second objective would be to provide a high quality deer hunting experience for the public. A deer hunting program on the Refuge would be subject to the conditions listed above. Additionally, the Refuge may be open for hunting to non-West Virginia residents as well as residents during antlerless deer season when Tucker County is open only to state residents. For safety, only archery, muzzleloader, or shotgun would be allowed in designated "No Rifle Zones" of the Refuge.

4. **Alternative 3 - (No Action) Do Not Open Canaan Valley National Wildlife Refuge to hunting**

The Refuge would remain closed to any form of hunting under this alternative. All Refuge boundaries would be posted with "no hunting zone" signs.

IV. Affected Environment

The physical environment of Canaan Valley has been fully described in the Final Environmental Impact Statement issued by the Service in 1979 (USFWS, 1979) and the updated Environmental Assessment issued in 1994 (USFWS, 1994a). These descriptions are incorporated by reference, with the affected resource areas summarized here. The scope of the analyses and discussion is limited to vegetation, wildlife populations, local economy, and cultural resources which were determined to be the resources impacted by a hunting program.

A. Vegetation

With an average elevation of 3,200 feet above sea level and a 35,000-acre watershed, Canaan Valley is the highest valley of its size east of the Rocky Mountains. The Blackwater River and its tributaries originate in and drain the valley. The valley has a cold, humid climate with annual precipitation of about 58 inches. Sub-freezing temperatures have been recorded during every month of the year. This combination of altitude and climate maintain a unique ecosystem that supports many plants usually found in more northern regions. Of the over 580 plant species found in the valley, 109 have distinctly northern ranges (Fortney, 1975).

Canaan Valley was once dominated by a red spruce forest, but the logging and subsequent fires of the early 1900's removed the soil mantle in drier areas, leaving organic muck and peat in wet areas. This left a mosaic of soil conditions allowing differential colonization by species present in the original community. Fortney (1975) identified 13 major vegetation types comprised of 40 distinct plant communities, 23 of which are wetland types. Wetland community types include swamp forests, dominated by balsam fir, and wet thickets, dominated by spiraea, alder or similar shrubs. There are a large number of non-woody wetland communities including wet meadows and marshes and 14 distinct bog communities dominated by either sphagnum or polytrichum moss. Together they make up the largest wetland complex in West Virginia and in the central and southern Appalachians. There are 8,450 wetland acres in the Valley, and 6,570 acres within the approximately 25,000-acre land acquisition boundary (USFWS, 1994a).

The northern hardwoods community is the most extensive upland plant community in the Canaan Valley basin and surrounding slopes. Canopy species include beech, maple, birch, cherry and several others. The once luxuriant herbaceous layer is now sparse and dominated by rhizomatous

ferns and clubmosses. Non-forested upland communities include hawthorn savannas and a variety of old field communities (Fortney, 1975).

Upland valley habitats have recently been characterized as severely degraded by deer browsing. Decreased regeneration of forest canopy species was also observed, little or no shrub layer exists in the forests and a depauperate herbaceous layer consisting primarily of ferns was noted. Early successional shrub stages, which would be expected in the old fields, are also lacking because of the dense deer population in the valley (Michael, 1993; Laskowski and Sepik, 1995).

B. Wildlife

The diverse habitats of the valley support equally diverse wildlife populations, with 288 species of mammals, birds, reptiles, amphibians, and fishes known or expected to occur there. It is a breeding and fall migration area for the American woodcock, and supports many other migratory birds including raptors, waterfowl, wading birds, shorebirds and Neotropical migrants. Ruffed grouse and wild turkey are common upland game birds. The most frequently observed large mammal is the white-tailed deer, but black bears are also seen in the valley, as are several smaller mammals such as woodchuck, beaver, raccoon, and cottontail rabbit.

1. Upland (Small Game)

The small game populations include ruffed grouse, northern bobwhite, rabbits and hare, red, gray and fox squirrels, raccoon, red and gray foxes, bobcat, coyote, opossum, skunk, woodchuck, weasels, European starling, English (house) sparrow, and crow. With the exception of the non-native starling and English sparrow, these species are an important component of the diversity of wildlife within the Refuge.

Ruffed Grouse. The ruffed grouse is the most popular game bird in West Virginia. In 1991, 46 percent of license buyers stated that they hunted grouse (WVDNR, 1992). Specific population data for Canaan Valley or Tucker County do not exist, but the valley has been known as a "hot spot" for grouse hunting (Anonymous, 1973). However, grouse hunting in the mountain region of the state, which includes the valley, is substantially less (11-23 hunts per month reported) than in the southern and western regions (22-112 hunts per month reported). This is particularly true during the last two months of the 20-week season, which begins in mid-October and ends the last day of February (Rieffenberger, 1988). The heavy snows and colder weather typical of the higher elevations make grouse hunting much more difficult, especially in the less accessible areas of Canaan Valley (Michael, 1974).

Northern Bobwhite. Although very little suitable habitat for the northern bobwhite (also called the bobwhite quail or quail) occurs in Canaan Valley, bobwhite have been recorded there and breeding has been confirmed on the Refuge and in two nearby counties (Buckelew and Hall, 1994). Hence, it is possible that a Refuge visitor could encounter one while hiking, hunting or

bird-watching. Because of their rarity, hunting for northern bobwhite will be prohibited on the Refuge. This may give more hikers and wildlife watchers an opportunity to see and hear one. Since hunting for bobwhite would be prohibited, it will not be discussed further in this document.

Rabbits and Hare. Three species of lagomorphs inhabit Canaan Valley NWR; these are eastern cottontail, Appalachian cottontail, and snowshoe (varying) hare. Old fields are the preferred habitat of the eastern cottontail, whereas the Appalachian cottontail prefers conifer stands of spruce, fir and/or hemlock. The species of cottontails are difficult to distinguish, but they are not likely to use the same habitat. Conifer stands and wet meadows and marshes are the preferred habitat of the snowshoe hare (Michael, 1993). Population status of eastern cottontail is very secure; however, the Appalachian cottontail appears to be a species of much lower abundance, while snowshoe hares are at the southern limits of their range. Based on surveys by the WVDNR, cottontails harvested from Canaan Valley are most likely the Appalachian cottontail because the habitat is more suitable for the Appalachian species (Craig Stihler 2007 personal communication).

Squirrels. Both gray and fox squirrels have been reported from Canaan Valley (Michael, 1993), but they are uncommon due to the absence of oaks and hickories (Fortney, 1975).

Raccoon, Foxes (Red and Gray) and Bobcat. Except for bobcats, no county-specific data exists for these four species. Healthy populations of these four species exist in West Virginia (Brown, unpublished data) and throughout the northeastern U.S. and Canada (Northeast Furbearer Resources Technical Committee [NFRTC], 1996a). All four species have been reported in the valley, with varying population levels (USFWS 1979).

Tucker County, in the northern Allegheny Plateau region of the state, has poor to fair raccoon habitat. As reported in the Final EIS for the Refuge (USFWS, 1979), the valley supported a raccoon population of about 250 animals, which occurred primarily along streams and around beaver ponds. Since 1992, raccoon populations in West Virginia have been monitored using data from raccoon hunting club field trials. Although raccoon numbers, as indicated by "raccoon hunting success," has varied from year to year and from region to region, the overall number of raccoons has remained fairly stable. There are no population data specifically for Tucker County because there is no local raccoon hunting club that conducts field trials there (Rogers, 1996).

Bobcats inhabit almost every county within the state. They use a wide variety of habitats ranging from brushy fields, mature woodlands and clearings, to rhododendron thickets or rocky outcrops. Favorite areas include those that support high populations of rodents and rabbits (Dale, 1996). Because bobcats are listed in Appendix II of the Convention on International Trade in Endangered Species (CITES) of Wild Flora and Fauna, their biological status is closely monitored by the Service. Although recent population data from West Virginia is not available, population modeling in Pennsylvania indicated a population increase of 4-6% annually (Lovallo 2000).

Coyote. The population of coyotes in West Virginia is healthy and steadily increasing. In the mid 1990s they were found in 41 of the 55 counties. Adaptable to a wide variety of habitats, the coyote's diet consists primarily of small mammals and white-tailed deer fawns (80 percent), with the remainder composed of wild fruits and insects. During periods of greatest abundance, fruits and insects can comprise up to 80 percent of the coyotes diet. As the population increases, so do concerns of predation upon livestock, particularly sheep, and other wildlife (Bonwell, 1996). In 1995, 4600 sheep, mostly lambs, were reportedly killed by coyotes. Two of the three most important sheep counties are adjacent to Tucker County (West Virginia University Cooperative Extension Service, 1995). Coyotes also prey on deer fawns and could help to reduce deer numbers. They have also been known to prey on red foxes, and eliminate them from some areas, (Brown, unpublished data).

Opossum, Skunk, and Woodchuck. Healthy populations of opossum, striped skunk and two species of weasel exist in West Virginia (Brown, unpublished data; NFRTC, 1996b). The spotted skunk and least weasel are listed as species of special concern by WVDNR. As such, animal damage control agents are prohibited from taking them by a recent state law (WV Code 58-41-7.1.9). The least weasel has been reported from Tucker County, and the spotted skunk has been reported from nearby counties.

Although woodchucks are commonly seen in parts of Canaan Valley, most of the land within the Refuge boundary is not typical woodchuck habitat. They may be found in the old fields that have been acquired. However, siting a woodchuck is difficult because some of these fields are unmowed while others are mowed on a rotational basis. Although this does present a safety concern for the southern portion of the Refuge as hunters may be shooting over a field where roads and public use trails are at a high density, there have been no reported incidents from the Refuge on in the State related to this use.

2. Big Game

White-tailed Deer. White-tailed deer populations have increased steadily in the State of West Virginia over the past few decades. The harvest of bucks on deer range in West Virginia has increased from 2.6 per square mile in 1983 to 5.1 per square mile in 1992 (LaRoe, et al., 1995). In 1995, Tucker County had a harvest of 4.1 bucks per square mile of deer range (Crum, 1995). In 2005, after the acquisition by FWS of 15,000 acres in Canaan Valley over 10 years, the number of bucks harvested in Tucker County per square mile was 1.7 (G. Foster personal communication).

Based on WVDNR's 1980-1993 deer harvest information for Canaan Valley, the white-tailed deer population is thriving. These figures indicate an average of 726 deer are harvested annually in Canaan Valley -- over 16 deer per square mile. About half (315/year) are harvested during the buck-only, 2-week gun season in late November. Archery and muzzleloader seasons account for

approximately 31 percent of the deer harvest in Canaan Valley each year. The December antlerless season accounts for the remaining annual harvest (Brown, 1993).

Black Bear. Under the state's management program, the black bear population has been growing and expanding its range (Thorn, 1996). Based on tagging and mortality indices, the adult black bear population for the state was estimated to be 4,676 at the end of 1995. An estimated 1,000 cubs were expected in January, 1996, which would give a fall population of 5,676. Over 10,000 bears were believed to occur in West Virginia in 2006 (Chris Ryan, personal communication). Black bear mortality from hunting in West Virginia is approximately 15% of the annual population (Rieffenberger, 1995). Population estimates by county are unavailable; however, the population, as indexed by annual mortality in Tucker County, has been increasing during the past 10-year period. Tucker County is one of the top four bear-hunting counties in the state (Thorn, 1996), with an average of 83 bears killed from 1997 – 2006 (Chris Ryan, personal communication).

In the adjacent western Maryland counties of Garrett and Allegheny, the Maryland DNR has estimated the black bear population using genetic information. They estimate that the population in their study area has increased from 79 bears in 1991 to 227 in 2002, and to 326 adult and subadult bears in 2005 (Spiker, 2006). These data indicate an increasing black bear population.

Factors influencing population size include reproductive potential and food availability. Black bear reproduction and population growth is strongly associated with nutritional status. Samson and Huot (1995) found that bears in poor condition, as measured by body weight, did not produce young during that year. Elowe and Dodge (1989) and Eiler, et al. (1989) found a strong correlation between size of fall mast crop and reproduction. During years of mast failure, females either did not breed or resorbed young. Conversely, bears with sufficient food availability/high nutritional status would be expected to have a higher reproductive potential. Examination of reproductive tracts collected by WVDNR showed that 62 percent in 1993, 79 percent in 1994, and 80 percent in 1995 of females had either recently bred or had cubs at their side. In 1995, the collections showed that six females had cubs -- one set of twins, two sets of triplets, and three sets of quadruplets. Of seven females known to have bred in 1995, one set of twins and six sets of triplets were expected in January 1996 (Rieffenberger, 1995). While undocumented by the Refuge Manager, one female bear in Canaan Valley was reported by several observers to have five cubs in 1995. These data indicate that bear reproduction is not being limited, further indicating that the bear population in the state is healthy.

Other factors which influence black bear population size is social interactions--territoriality and dispersal of sub-adults. Hunting technique also influences the sex ratios of bear harvest. There is conflicting information as to whether black bears are territorial or not (Bunnell and Tait, 1981). Elowe and Dodge (1989) found no evidence of territoriality; however a number of researchers have found very little overlap in home ranges of black bears, which would suggest territorial behavior. Adult bears, especially males, tend to regulate population density by either preying on younger bears or forcing them to disperse (Bunnell and Tait, 1981; Young and Ruff, 1982;

Lecount, 1982). Hunting with hounds or using bait tends to increase the take of male bears (Litvaitis and Kane, 1994). The larger home ranges of males also make them more vulnerable to hunting. Dispersing sub-adult males are generally more vulnerable to different mortality factors than are resident adults. Hunting dates can also influence harvest sex ratios because pregnant females den earlier in the fall than males or non-pregnant females (Hellgren and Vaughan, 1989; Schooley, et al., 1994).

Wild Turkey. Historically, wild turkeys were abundant in West Virginia, but by the 1920's deforestation and uncontrolled hunting had nearly eliminated them from most of the state. Turkeys remained in the remote mountain regions, including Tucker County, and the Eastern Panhandle. For over 30 years, WVDNR stocked turkeys from those areas to the southern and western counties with suitable but unoccupied habitat. The program was a success, and wild turkey numbers have been increasing in the state, with record hunter spring harvests occurring for 17 consecutive years, but slightly declining fall harvests. In 1995, the combined spring and fall harvests totaled almost 20,000 birds, which represented the sixth consecutive year of record combined harvests. Since the mid-1990s, the wild turkey population in the state (based on harvest data) has remained level, with a total population estimate approximately 170,000 birds (Pack, 1995; Taylor, 1996; WVDNR 2003). However, results from turkey harvest in the last four years have shown decreasing harvest rates with a state total of 12,087 in 2005.

Population estimates for Tucker County, and specifically for Canaan Valley, are not available. The turkey population in the valley may be limited by the availability of preferred foods during the winter months. Oak mast is the most important fall and winter food for wild turkeys (Dickson, 1990); however, oak trees are very rare in the valley (Fortney, 1975). Because the primary forest in Canaan Valley is the northern hardwood type, beech nuts and cherries are probably the mainstay of the turkey diet there. With increasing numbers of beech trees infested with beech bark disease, there is a decrease in beech mast production. In years of low mast production turkeys often use alternate food sources such as waste agricultural grain or manure from dairy farms (Porter, et al., 1980; Vander Haegen, et al., 1989; Kurzejeski and Lewis, 1990; Roberts, et al., 1995). This is not very likely in the valley where only seven percent of the lands are agricultural. However, spring seeps are important for winter survival of wild turkeys in West Virginia's northern hardwood forests (Healy, 1977; Healy and Pack, 1983). Seeps function as primary forest openings at higher elevations in the dead of winter and provide essential food sources such as seeds and herbaceous vegetation.

3. Migratory Game Birds

Waterfowl (Ducks and Geese). Although West Virginia is not within a major migratory pathway for ducks, several species do migrate through the state each spring and fall. Mallards, black ducks, and wood ducks are probably the most common species seen during the hunting season. Also, green-winged teal, lesser scaup, ring-necked duck, bufflehead, hooded mergansers, widgeon, gadwall, and redhead occur on the state's waterways, marshes and ponds during

migration (Hall, 1983). Mallards, black ducks, wood ducks, and Canada geese are all known to nest in Canaan Valley (Buckelew and Hall, 1994), but the full extent is unknown. According to the Waterfowl Population Report, of these species, gadwalls, redheads, and green-winged teals have 2006 breeding population estimates greater than the planned population goals in traditional survey areas (USFWS 2006). Mallards, black ducks, wigeons, and lesser scaups have 2006 breeding population estimates less than the planned population goals.

Most Canada geese occurring in West Virginia are "resident" geese whose numbers have increased steadily over the past several years. A resident Canada goose season in early September has been started in West Virginia to target and control these flocks. Canaan Valley's resident flock migrates to North Carolina in mid-December and returns at the end of February, escaping the rigors of winter. Although exact estimates of flock size are not available, an average of 135 geese were banded each year during the 1980s (Lesser, 1987). The harvest of Canada geese in Tucker County is relatively low, averaging only five birds per year between 1981-1990 (USFWS, 1991). Continued harvest of this flock would reduce "nuisance complaints" (Wilson, 1996).

Canada geese were brought into the Valley by the DNR beginning in 1967. Between 1967 and 1971 a total of 65 geese were released in Canaan Valley (Michael 1994). The program began through a transplant program to encourage a local nesting population in the Valley. Since that time, Canada geese have been successful in nesting throughout the Valley with flocks numbering over 300 birds. The geese are the only migratory flock in West Virginia, arriving in Canaan Valley in the early spring and departing in November. At least some of the geese have been reported wintering near Durham, North Carolina (Michael 1994).

The development of Timberline Resort, residential community and the Canaan Valley State Park golf course increased the available browse habitat which has increased numbers of geese using the area. These developments may have allowed goose numbers to increase since the 1980s. Goose abundance increased to a level causing Timberline residential community to initiate an active hazing program to prevent goose use of the open water and grassland habitats within the development.

Canaan Valley does provide breeding and migrating habitat for waterfowl, although is not an important over-wintering area. Limited numbers of waterfowl do migrate through Canaan Valley each fall. The Waterfowl Population Report 2006, however, notes that surveys of populations that may migrate through Canaan Valley showed higher numbers of breeding pairs, successful nests, and spring population in 2006 than the 10 year average (USFWS 2006).

Rails, Gallinule and Coot. The sora rail, Virginia rail, common moorhen, and American coot are legally hunted in West Virginia. However, with the exception of the American coot, these birds are considered rare or uncommon migrants in West Virginia (Hall, 1983). All four species appear on the West Virginia Natural Heritage Program rare species list for the state because of

the limited breeding habitat available. These species are quite common elsewhere in North America and their populations are considered stable or secure.

The preferred wetland habitats of these species are not abundant in West Virginia. Their occurrence on the Refuge is dependent upon habitat availability and conditions affecting their migratory behavior. None of these species have been documented to nest in the Canaan Valley wetlands (Buckelew and Hall, 1994), nor is the state considered an important breeding or migration area for these birds. However, the Virginia rail is a likely breeder on the Refuge due to its presence during breeding bird surveys.

Mourning Doves. Mourning dove populations in the eastern United States are relatively stable (LaRoe et al, 1995). In West Virginia, breeding bird surveys conducted from 1966 to 2005 indicate a 5.2 percent increase each year in the breeding population of mourning doves (Sauer et al 2005). Data for mourning dove populations in USFWS Region 5 indicate a steadily increasing trend of 1.2 percent each year (Sauer et al, 2005). Combined, these data show that breeding populations of mourning dove are doing well throughout the Northeast and particularly in West Virginia.

Point count surveys on the Refuge indicate that the south end of the Valley may have a greater population of mourning doves. The heavily wooded areas surrounding Canaan Valley are not good dove habitat. Doves do not over-winter in the valley due to its high elevation and cold climate (Hall, 1983). The importance of Canaan Valley as a breeding and migrating area for mourning dove should be considered minimal.

Recent surveys have shown dove harvest throughout the United States to be decreasing slightly. Reasons for the decline are not clear and may differ depending on which management unit is being reviewed. In one case, the decline in harvest (Western Management Unit) was noted as following a decline in the breeding population. However, the mourning dove remains an extremely important game bird, as more doves are harvested than all other migratory game birds combined (Dolton and Rau, 2006). However, less than 6% of the fall population of mourning doves have been harvested by hunters annually in recent years (Dolton and Rau, 2006).

American Woodcock. Canaan Valley has historically supported the best breeding and migrating populations of woodcock in West Virginia. Woodcock have been a fairly common migrant in West Virginia with the fall migration peaking in late October and early November. Figures of 1,200-1,500 birds present in late-summer and more than 20,000 birds using the area during fall migration have been reported. These numbers are based on information from WVDNR personnel assisting with the early Canaan Valley research (Hall, 1983). Kletzly (1976) also stated that "Canaan Valley is West Virginia's best and most extensive woodcock breeding and hunting area." The Service has also stated on several occasions that "Canaan Valley is nationally recognized as a breeding and fall migration concentration area for the American woodcock." , Most of the studies conducted in Canaan Valley justifying these statements were done in the 1960s and early 1970s.

Much research since the 1970's on woodcock in the Valley and State have tended to focus on habitat suitability on a large scale (Steketee 2000, Webb 1978, Fenwood 1976) or on breeding biology and habitat use (Shissler 1981, Clark 1978).

The Service has conducted breeding woodcock surveys on the southern portion of the Refuge since 1999. These surveys document an average of 3.32 "peenting" males per route. This average greatly exceed the long term State average of 0.52 males per route. This indicates that the Refuge still provides important breeding areas for woodcock in the State and region. On a regional basis, singing ground survey results indicate a long term decline of woodcock breeding populations of approximately two percent per year over the last 38 years in the eastern United States (Kelley and Rau 2006). The long-term data showing a declining population suggests that there may be a decrease in the number of woodcock using Canaan Valley during fall migration. Fall surveys have not been conducted since the 1970s; therefore the long-term trend of woodcock use of Canaan Valley, especially during fall migration and the hunting season, is not known. However, the use of fall harvest information from the State and more recently from the Refuge, may serve as an index for fall population information during this time frame.

Regional average daily and seasonal take indices show a continued decline in daily and seasonal hunting success from 1965-1994. The average daily take in the eastern region was 2.5 in 1965 and 1.8 in 2005 with seasonal averages dropping from 10.2 in 1965 to 2.2 in 1994. Woodcock harvest and the number of woodcock hunters have been declining since the early 1980s based on information collected from the Annual Questionnaire Survey of U.S. Waterfowl Hunters. Estimates supplied by several state agencies have revealed similar patterns. (Bruggink and Kendall, 1995; LaRoe, et al., 1995). The Harvest Information Program (HIP) was initiated to improve the information available to the Service on hunter numbers and harvest success across each state for all migratory birds. This program provides more reliable information on woodcock hunting activity than was previously available under the Annual Questionnaire Survey of U.S. Waterfowl Hunter (Kelley and Rau 2006).

The Service's Region 5 American Woodcock Management Plan (USFWS 1996b) attributes the decline of woodcock in the northeast to a loss in the quality and quantity of habitat. Human encroachment, development, and habitat changes have all undoubtedly affected woodcock numbers in Canaan Valley since the early studies were conducted. Woodcock habitat loss in the northeast is largely attributed to successional changes in forest and open land and loss of agricultural land through urban development. This holds true for Canaan Valley where open land has been developed in recent years, grazing has decreased and early successional forest cover has matured. Nonetheless, recent research found that the Canaan Valley still contained the largest amount of quality habitat in the State (Steketee, 2000). The Refuge conducts habitat management for woodcock including maintaining singing ground habitat and improving early successional aspen and alder cover for foraging and breeding habitat.

Wilson's Snipe. Nesting in small numbers, the Wilson's snipe reaches its southernmost breeding location in Canaan Valley (Buckelew and Hall 1994). Although no large scale snipe surveys have been conducted on the Refuge, coincidental surveys of woodcock have documented snipe breeding activity. Nesting snipe have been also documented in the Refuges grassland management fields on the southern part of the Refuge. Snipe are typically found throughout the northern portion of the Refuge during summer months in wetlands and around beaver ponds.

Snipe migrate throughout the state in spring and fall, concentrations can build up in favored spots during the fall when suitable habitat is more limited (Hall 1983). Information on Wilson's snipe occurrence in West Virginia is conflicting. This species is referred to as a fairly common spring and fall migrant by Hall (1983) but appears on the West Virginia Natural Heritage Program's rare species list as "globally secure" but "critically imperiled" within the state. Apparently the conservative listing as "critically imperiled" is directly tied to the limited amount of suitable habitat. Canaan Valley likely provides the largest contiguous suitable habitat for nesting and migrant snipe in the State. On a larger scale, Wilson's snipe populations in USFWS Region 5 (northeastern region of North America) show a stable population trend from 1966 to 2005 (Sauer et al, 2005).

4. Endangered, Threatened, and other Non-game Species

Four federally listed species, the threatened Cheat Mountain salamander, threatened bald eagle, endangered Indiana bat and the endangered Virginia northern flying squirrel, are found in the Valley. The flying squirrel, which occurs at elevations above 3,200 feet in mature coniferous forests, has been confirmed in the eastern and western portion of the valley. Optimal habitat for them also exists on Cabin Mountain along the southeastern portion of the acquisition boundary (Michael, 1993). The Cheat Mountain salamander also occurs on Cabin Mountain, at the headwaters of two streams that are on the Refuge. Bald eagles, Indiana bats, and peregrine falcons, both protected by the Endangered Species Act, occasionally use the valley during migration. Eagles have been known to nest within 15 miles of the Valley.

Wildlife in Canaan Valley is typical of the West Virginia-Pennsylvania highlands. Many species of hawks, owls and songbirds can be observed. Historical breeding bird records for the valley include several species at the southern extreme of their range, such as the blackbilled magpie and goshawk. Current breeding bird surveys include red-eyed vireo, savannah sparrow, eastern meadowlark, bobolink, song sparrow, ovenbird, common yellowthroat, indigo bunting, and rufous-sided towhee (Northeimer, 1996). Numerous other species, not so easily observed, also occur in the Valley and are an important component of the ecosystem. Small mammals such as shrews, mice, voles, moles and bats feed on plant and insect matter, and provide a food source for such predators as foxes, weasels, fishers, owls and hawks. Furbearers such as beaver, muskrat, mink, skunk, and bobcat also occur in the valley. The beaver is an important component of the ecosystem because of its role as a habitat manipulator. Beaver ponds retard wetland succession

which provides nesting, feeding and resting habitat for waterfowl, shore and wading birds, and a variety of mammals and amphibians.

C. Socio-economic/Cultural Resources

1. Socioeconomic Resources

Early in this century Tucker County was a booming area, thanks to a thriving timber industry and abundant coal. In 1910 the county population was 18,675 and there were 200 miles of railroad. The forests were quickly diminished and coal was replaced by gas and oil, resulting in a decline in the timber and mining industries, followed closely by other sectors of the economy. Though most of Tucker County today is largely reforested, the human population declined and has been at or near its current level of 7,700 since 1960.

No single large employer exists in the county; economic advances in the county have been related to the development of year-round recreational activities. Today the leading industries in the county, tourism and recreation, are centered in Canaan Valley. The county is also experiencing steady growth in the second-home market. Other county manufacturing includes charcoal, leather goods, textiles and wood products. Mining, lumbering, farming, maple syrup production and aquaculture also contribute to the county economy.

Recreational activities include skiing in the winter and mountain biking in the summer. Both Canaan Valley State Park and Timberline Four Seasons Resort have downhill ski areas, as well as several cross-country ski areas and trails. White Grass Ski Touring Center is a popular destination for cross-country and telemark skiing. The State Park also features a golf course and conference facilities, and there are plans for another golf course within the valley. Mountain biking is a growing recreational activity in West Virginia, and in Canaan Valley in particular. Hiking and fishing are popular activities of both residents and tourists alike in the Valley and elsewhere in Tucker County.

In the largely rural state of West Virginia, hunting has always been a traditional recreational activity. During the 1980s and 1990s, hunting decreased in many states, with the overall the number of hunters in the United States decreasing and not keeping pace with population growth. However, in West Virginia the number of hunters and percentage of the population hunting remained statistically the same during the decade (USFWS, 1994c, 2001).

Hunting is also an important economic activity. Hunters contribute to the local economy through purchasing gasoline, food, lodging, ammunition, etc. In their economic study of the effects of establishing Canaan Valley Refuge, Phipps and Fletcher (1993) concluded that hunters spend more money locally than most of the other categories of Refuge visitors. Their data showed that 25 percent of the deer hunters in the county were nonresidents who would be expected to spend

more money locally during hunting expeditions than residents. Michael (1974) studied hunter use in valley for the 1973 season. He interviewed 9,197 hunters, who spent a total of 16,021 hunter days in pursuit of game animals, 14,020 of which were for deer. Thus, hunting was a major contributor to the local economy. The number of hunters requesting permits to hunt within Canaan Valley National Wildlife Refuge between 2002 and 2006 has ranged between 1500 and 2100. USFWS (2001) estimated that the expenditure for trip-related expenses per hunter is \$403.

2. 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; 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.

Service acquisition of land with known or potential archaeological or historical sites provides two major types of protection for these resources: protection from damage by federal activity and protection from vandalism or theft. The National Historic Preservation Act requires that any actions by a Federal agency which may affect archaeological or historical resources be reviewed by the State Historic Preservation Office, and that the identified effects must be avoided or mitigated. The Service's policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible.

Land acquisition by the Service provides some degree of protection to significant cultural and historic resources. If acquisition of private lands does not occur and these lands remain under private ownership, the landowner is responsible for protecting and preserving cultural resources.

Archaeological surveys and other information collected on the Refuge indicate that there are six cultural sites, one of which is a possible pre-historic Native American site, and the other five are settlement sites that date from the late 1800s. The Native American site had pieces of chert. Chert is not naturally found in this area; therefore its presence indicates that trading possibly occurred between tribes in the Valley. This location is in an area closed to hunting, so no impacts are anticipated. The settlement sites are made up of two graves and three foundations that could

have once been cabins. These sites, while located in hunting zones, are relatively unknown locations, and therefore, no impacts from hunters are anticipated.

V. Environmental Consequences of the Proposed Action and Its Alternatives

The scope of analysis for the environmental consequences is limited to those resources that could be impacted by the proposed action and its alternatives -- specifically, the natural environment, both vegetation and wildlife populations, and the local economy. No construction or earth-moving activities would occur. Therefore, implementation of a hunting program on the Canaan Valley National Wildlife Refuge would have no impact on water quality, cultural or visual resources, or land use. Since Canaan Valley is traditionally a heavily hunted area, there should be no increase in traffic resulting from opening the Refuge to public hunting; therefore no impacts are anticipated from traffic congestion or to air quality from vehicular emissions. The impacts of transferring land from private to public ownership to create the Refuge was thoroughly analyzed in the final Environmental Impact Statement issued by the Service in 1979 and updated as an Environmental Assessment in 1994, therefore, is not at issue here.

1. Direct/Indirect Impact Analysis

A. Alternative 1 (Proposed Action) – Open Hunting on Canaan Valley National Wildlife Refuge as regulated by the State of West Virginia with some exceptions

1. Vegetation

The physical effects of hunting various game species on the vegetation of the Refuge are expected to be minimal. The most destructive effects would result from vehicular traffic. All terrain vehicles would not be allowed on the Refuge. Other vehicles are restricted to designated roadways. Hunter use is generally dispersed over large areas. Hunters would have little to no impact on the vegetation.

Positive, indirect effects on the vegetation would result from a reduction in the white-tailed deer population. The impacts of dense deer populations on forest regeneration and the composition and diversity of the herbaceous understory have been well documented (Tierson, et al., 1966; Behrend, et al., 1970; Tilghman, 1989) and observed in Canaan Valley. Opening the Refuge to deer hunting would at least maintain the habitat as it is now and prevent further degradation due to overbrowsing. Well-managed hunting can effectively control deer and produce striking changes in the forest vegetation (Behrend, et al., 1970). The impact of deer hunting on the vegetation would be positive and result in better regeneration of forest canopy species and an increase in the diversity of the herbaceous understory. In summary, there will be little if any significant negative impacts of this alternative to the vegetation of the Refuge and would likely have some positive benefits due to the reduction of deer herbivory from hunter deer harvest.

2. Wildlife

a. Upland (Small) Game

The upland (small) game population s includes ruffed grouse, northern bobwhite, rabbits and hares, red and fox squirrels, raccoon, fox, bobcat, coyote, opossum, skunk, woodchuck, weasel, and crow. These species are an important component of the diversity of wildlife within the Refuge. The Service proposes opening the Refuge to hunting upland (small) game for all game species under State regulations with the following exceptions:

1) No hunting for the following species:

a) Northern bobwhite: with limited habitat present in Canaan Valley, the species is not likely to occur in sufficient numbers to support a hunting program.

b) The spotted skunk and least weasel are listed by the State of West Virginia as “species of special concern” and whose taking by damage control agents is prohibited by State law. The spotted skunk has not been reported from Tucker County, but has been reported from nearby counties. The least weasel has been reported in Tucker County, as well as other species of weasels from which the least weasel is not easily distinguished in the field. To avoid jeopardizing these species, hunting for spotted skunk and all species of weasels would be prohibited on the Refuge.

2) No hunting for upland small game would be allowed from March 1 through August 31 each year,

3) “Night hunting” would be by permit only,

4) Each rabbit or raccoon hunter would be allowed one pack of not more than four (4) dogs,

5) Each bird hunter would be allowed no more than two (2) dogs, and

Anticipated direct, indirect and cumulative impacts to the upland game populations of the Refuge are further described below.

Ruffed Grouse. In recent years, hunters have raised concerns about low grouse populations in West Virginia. Historical population trends are not well documented, but the consensus is that most regional trends have been downward, and that the current levels may be a temporary plateau. Results from the WVDNR bow hunter survey show that the average number of grouse

seen per 100 hours was 5.52 in Tucker County over the ten year period from 1995 - 2005. This exceeded the State-wide average of 3.82 grouse flushed per 100 hours. The ten year trend of grouse flushes in Tucker County indicates a slight downward trend. The decrease in amount of early successional habitat favored by grouse is the major factor affecting grouse populations. Population increases are most likely tied to early successional habitat management (Norman et al 2004).

Myrberget (1985) identified in his grouse study that hunting mortality logically must be compensated for; however the consequences of hunting on population dynamics are poorly understood and more information is needed to completely understand the relationships between hunting and annual mortality. Ellison (1991) also identified an interaction between hunting mortality and immigration for grouse populations. Vacant territories resulting from grouse hunting mortality were filled by dispersing birds from other locations. The birds that filled these vacant territories would have been expected to perish if there were no vacant territories available to them. Ellison (1991) and Small, et al. (1991) found that hunter harvest rates of grouse may be sufficiently high that the population may not sustain itself without increased immigration. However, Herkert, et al. (1991) cautioned that population status on surrounding lands must be considered when relying on immigration to sustain numbers of a wildlife species.

A six year study was begun in 1996 in five States (West Virginia, Virginia, Maryland, Kentucky and Ohio). The Appalachian Cooperative Grouse Research Project (ACGRP) was completed with a final report issued in 2004. The report states that the Appalachian population of ruffed grouse appears to have a lower reproductive success rate and a higher adult survival rate than grouse in northern (i.e. Great Lake States) populations (Norman et al 2004). Research was conducted to evaluate the effects of hunting on grouse populations. Results indicated that hunting mortality on average made up only 12% of the total mortality to monitored grouse. Conclusions of the study include that the main sources of mortality to ruffed grouse in the Appalachians are avian predation (44%) and mammal predation (26%). From these results the authors concluded that hunting mortality was compensatory. Based on these results and since the grouse population has traditionally supported hunting in the Valley, little impact on the grouse population from hunting on the Refuge is expected.

Rabbits and Hare. Population status of the three species of lagomorphs occurring in the Valley is varied. The eastern cottontail population is secure, but the Appalachian cottontail population is less well known, and the snowshoe hare is at the southern end of its range. For rabbits in particular, other natural factors can control their numbers. Woolf, et al (1993) found evidence that tularemia controlled population density of cottontails on a study area in Illinois, and Keith and Bloomer (1993) determined that snow depth significantly increased mortality rates of cottontails due to increased vulnerability to predation. Habitat loss is often cited as the most important factors influencing populations of these species, particularly for Appalachian cottontails (Stevens and Barry 2002, Stihler pers.com. 2007).

Michael's (1974) study of hunter use in the Valley showed very few rabbit or hare hunters, but his study did not extend into January and February, the prime rabbit-hunting period in West Virginia.

Based on hunter information from 2002 to 2005, only 16 rabbits and one hare were harvested on the Refuge. The number of hunters who reported hunting rabbit and hare on the Refuge accounted for less than 1% of all hunters participating in the hunt program from 2002-2005. However, due to the concern and questionable status of Appalachian cottontails, and the fact that they cannot be distinguished from eastern cottontails in the field, the Service proposes to require rabbit hunters to submit samples to the Refuge to determine status and relative proportions of harvest for all cottontail species. The Service would work with the State if possible to establish protocol and procedure for collecting and identify samples. The small amount of hunter interest and apparent low harvest from Refuge land indicates that despite low populations of Appalachian cottontail and snowshoe hare, it is highly unlikely that the harvest of these species will have any direct significant impact to local or regional populations.

Squirrels. Gray and fox squirrels prefer oak and hickory forests, neither of which exist in Canaan Valley. Squirrel populations and reproductive success have been found to be very dependent upon the annual mast crop (Nixon, et al., 1975; Weigl, et al., 1989). Intrinsic population factors, such as social interactions leading to dispersal of young or decreased reproduction at high population densities, have also been found to control species numbers (Nixon, et al., 1975; Thompson, 1978; Nixon, et al., 1985; Hansen and Nixon, 1984). Mosby (1969) found greater reproduction in a gray squirrel population subjected to hunter harvest than a population protected from hunting. Michael (1974) encountered very few squirrel hunters during his hunter use study in Canaan Valley. The occurrence of these squirrels on the Refuge is uncommon; therefore, any take of squirrels is expected to be incidental to hunting other upland game species, and as such, would have little impact on the population of gray or fox squirrels.

Raccoon, Foxes (Red and Gray), and Bobcat. West Virginia permits hunting for raccoon, red and gray fox, and bobcat. Though no county-specific data are available, except for bobcat, healthy populations of these four species exist in the State (Brown, unpublished data, Foster pers.com. 2007). All of the States in which foxes and raccoons are extant allow hunting and/or trapping, and all monitor the populations of these three species through one or more methods (NFRTC, 1996a). In West Virginia, raccoon populations from 1992-2005 were considered stable to slightly increasing (Rogers 2004).

West Virginia hunters spend more hours and dollars in pursuit of raccoons than any other furbearer in the State (Rogers, 1996). As in the rest of the contiguous U.S., most raccoon hunters in West Virginia use dog (Rogers 1995). Hunters would be allowed to hunt with not more than four dogs each. The use of dogs for hunting and/or field trials has been questioned by some who think the dogs unnecessarily harass raccoons and non-target species such as deer. Two studies showed that there was no detriment to raccoons. Roseberry (1980) concluded that spring and summer sport hunting had no detrimental effects on raccoon reproduction, and Fox (1989) concluded that hunting with dogs had no detrimental effect because raccoons in his study resumed

their normal activities shortly after the dogs left. Westholder, et al. (1996) evaluated the impact of night raccoon hunting on deer movements, and concluded that there was no impact. Hunter survey information from the Refuge indicate that from 2002-2005 a total of only 10 people hunted raccoon on the Refuge with an annual average harvest of approximately 16 animals. Following State regulations and based on county and State-wide data indicating at least stable populations, the Service concludes that it is highly unlikely that the harvest of these species will have any direct significant impact to local or regional populations.

Hunting for fox and bobcat in the State is opportunistic in most cases. Most fur prices have declined significantly since the late 1970's and early 1980's, and this has been reflected in the decline in the harvest in West Virginia and elsewhere (Brown, unpublished data; NFRTC, 1996a). The incidental harvest of these species occurs during other open seasons (e.g., deer or bear seasons), and the pelts are often retained for personal use. Since bobcats are a CITES-listed species, WVDNR must report bobcat status information and harvest data to the Service annually.

In 1996, population trends for bobcat were reported as stable in 22 states and increasing in 20 states (Woolf and Hubert 1998). Bobcat trapping records indicate that an average of 1.6 bobcat were taken from Canaan Valley from 1977 to 2001 (Michael 2002). This is approximately 12% of all bobcat reported trapped in Tucker County and less than one percent of the number trapped State wide during the same time period (Michael 2002). Interestingly, the number of bobcat trapped increased from 1993 to 2001 despite a steady decrease in pelt price.

The populations of these four species are stable and healthy, and the harvest on the Refuge has been and is expected to remain small. Most fox and bobcat hunters are hunting other species as well, so there would be little additional disturbance to vegetation or non-target wildlife. Canaan Valley is not a prime raccoon hunting area, so raccoon hunting is expected to be minimal. Because raccoon hunters use dogs and hunt at night, raccoon hunting will be more closely monitored and dog numbers restricted to minimize potential impacts to other wildlife.

Coyote. Coyote hunting in West Virginia has increased and a variety of methods are used because of their increasing numbers and their reputation as livestock predators (Bonwell, 1996). West Virginia fur harvest figures show that no coyotes were harvested for the fur trade until 1989, and that 38 were taken during the 1994-95 season. Numbers of coyotes have apparently increased dramatically in the last 10 years as a total of 539 coyotes were reported taken in West Virginia in 2004. (Brown, unpublished data, Brown 2006). Coyote harvest in the Valley is expected to be small, and their take likely incidental to deer hunting. Prices for pelts have increased from \$3 in 1989 to almost \$20 in 2007, which may be an added incentive for hunting them (Brown, unpublished data). Since coyote hunting would generally be opportunistic, little to no additional disturbance to vegetation or non-target wildlife is anticipated. Under current State regulations the Service concludes that it is highly unlikely that the harvest of these species will have any direct significant impact to local or regional populations.

Opossum, Skunk, and Woodchuck. Most fur prices have declined significantly since the late 1970's and early 1980's, and this has been reflected in the decline in the harvest of furbearers in West Virginia and elsewhere (Brown, unpublished data; NFRTC, 1996a). Hunting for opossum, skunk, and woodchuck in West Virginia is incidental in most cases, to hunting other species. The hunter whose primary prey is something else, such as a raccoon, may see these species, and kill it for the pelt.

Some wildlife species compensate for decreased number (harvest) by increasing reproductive output. Davis, et al. (1964), found that removal of large numbers of woodchucks from a population resulted in a decrease of other mortality factors on the population, increased birth rate, and increases in immigration. Thus, allowing the population size to remain stable even though three times as many woodchucks were removed from the treatment as from the control area. The populations of striped skunk, opossum and woodchuck are stable and healthy, and the harvest on the Refuge is expected to be very small, and primarily incidental. Therefore little disturbance to vegetation or non-target wildlife is anticipated. To avoid accidental taking of these protected species, hunting of spotted skunks and all weasels would be prohibited.

In conclusion, the harvest of small game species will likely have no direct significant impact to local or regional populations of these species.

b. Big Game

White-tailed Deer. As proposed under the State's regulations, deer hunting on the Refuge would occur in various forms for about two and one-half months from mid-October through the end of December. As mentioned in the Affected Environment section, the deer in Canaan Valley are abundant. In fact densities of deer are so great that they are harming other components of the ecosystem. The Service has concluded that a deer management program maximizing the take of antlerless deer would benefit both white-tailed deer through reduction of overpopulation and the habitat through reduction of overbrowsing, thus benefitting both vegetation and other wildlife species.

Safety is a major consideration related to deer hunting on the Refuge. The southern end of the Refuge has numerous homes, businesses, and housing developments either within or immediately adjacent to the Refuge acquisition boundary. Many area residents have expressed concern over deer hunting with rifles on the Refuge. To address these concerns, "no rifle zones" will be delineated, within which only archery, shotgun, and muzzle loader hunting would be allowed, and safety zones will be delineated within which hunting will not be permitted.

Black Bear. The Service proposes to continue black bear hunting on the Refuge according to the State's regulations with the exceptions that on designated "no rifle zones," only archery would be allowed, and the gun season would be approximately one week shorter than State season. The start of the gun season would be delayed until the close of antlerless deer season, so as not to

impede the take of deer in order to reduce the deer herd. This would also give more opportunity for pregnant females to den before the start of the Refuge hunting season.

Annual bear harvest in the State has been increasing dramatically since the mid 1980s. However, Tucker County only comprised an average of 11% of the total number of bear taken from 1966 to 2000. Out of that, an average of only 1.25 bear per year were reported taken in Canaan Valley, Cabin Mountain and Canaan Mountain combined from 1974 to 2000 (Michael 2002). It is likely that the large wetland habitat within the Valley and lack of road access make hunting bears less popular on the Refuge than in surrounding areas of Tucker County. Refuge hunter harvest information indicates that only 1 bear has been reported taken from the Refuge from 2002-2005.

Bear hunting is a time-honored tradition in West Virginia, with Tucker County traditionally being one of the top four bear hunting counties. The bear population in the State has been expanding over the last 10 years. According to state information, bear harvest has increased dramatically between 1971 and 2005 indicating strong population increases (WVDNR 2005). This information shows that current West Virginia harvest regulations are not limiting the population.

Hunting bear with hounds has also been traditional in the Appalachians since colonial times, and is permitted under State regulations in Tucker County. Bear hunting with hounds would be permitted on the less accessible portions of the Refuge. Critics of hunting with hounds say that it fails the "fairness" test and some wildlife managers say that hounds destroy habitat and harass non-target species (Elowe 1990, Begley and Glick 1996). Proponents of hunting with hounds point out that hound hunters have increased success and fewer escaped cripples, both of which are important in areas where bear populations are growing and encroaching on human habitats. Hunting with dogs makes bear hunting more efficient in densely forested mountainous regions such as West Virginia. A recent study in Virginia focused on the effects of hunting with hounds on the bear population. The researchers compared litter size, cub survival rates, and den weights in two populations--one that is hunted with dogs and one that is not hunted. Results indicate that there are no significant differences in cub production or body condition between hunted and non-hunted populations of bear in Virginia (Higgins 1997).

There is no scientific evidence which indicates that bear hunting with dogs, as it is conducted in West Virginia, is detrimental to bear populations. In fact under the State's current management program, the bear population continues to grow and expand, and has probably reached 10,000 individuals (Ryan, 2007). The Tucker County population, as indexed by annual mortality, has been increasing during the past 10 years.

The impact on the Refuge population of black bear will not be significant due to the low number of bear taken each year. Similarly, the cumulative impact of bear hunting on the Refuge will not be significant when combined with bear hunting impacts throughout the county or State. Less than 1.5% of all bear harvests in the State were taken from Canaan Valley habitats and an average of 8.2% of bear harvests from the County were from Canaan Valley from 1974-2000 (Michael

2002). These low harvest rates indicate that by continuing bear harvest on the Refuge (approximately 50% of the Valley's area) it is highly unlikely that the harvest of these species will have any direct significant impact to local or regional populations.

Wild Turkey. The Service proposes to continue wild turkey hunting according to the State's regulations. West Virginia, like most States, has two turkey seasons: a spring season when only gobblers (males) are harvested, and a fall season when either sex may be legal game. Since turkeys are polygamous, spring gobbler seasons have little impact on breeding success and size of turkey populations. Fall hunting is allowed when a population is sufficiently large to withstand increased mortality. Generally, fall hunting mortality would be compensated by a concomitant decrease in other mortality factors. Through extensive research and management efforts, the State has restored the turkey population throughout its historical range. The State also closely monitors fall hunting impacts on population levels. Therefore, hunting on the Refuge should not impact the turkey population. Both spring gobbler and fall either-sex seasons will be allowed on the Refuge.

The Service concludes that it is highly unlikely that the harvest of big game species will have any direct significant impact to local or regional populations. However, the hunting of white-tailed deer would have local positive effects of reducing browse pressure on plant communities and reducing deer densities to help prevent disease spread, particularly, Chronic Wasting Disease.

c. Migratory Game Birds

Waterfowl (Ducks and Geese) The Service proposes to open waterfowl seasons on Canaan Valley NWR according to State regulations, including the early September resident goose season. Although limited in extent, the Refuge likely provides the largest contiguous habitat for breeding and migratory waterfowl in West Virginia. Migratory birds are seen moving through the area in March-April and August-September. Common migratory waterfowl include divers such as lesser scaup, ring-necked duck, bufflehead, hooded merganser and dabblers such as green-winged teal, blue-winged teal.

The Refuge has small numbers of breeding waterfowl including American black duck, mallard, wood duck and Canada goose. Studies conducted from 1980 through 1993 found Canada geese, mallards, wood ducks and black ducks to be the most abundant waterfowl in Canaan Valley (Michael 2002). Of the species present on the Refuge, black ducks are the only species of management concern listed by the Service. Black ducks are one of three species of waterfowl identified with population management objectives that are also showing long term population declines between 1970 and 2003 (North American Waterfowl Management Plan 2004). Black ducks are also listed by the DNR as a species of special concern (S2B: very rare or imperiled) due to the restricted habitat available for this species in the State. Black ducks breed in secluded beaver ponds, oxbows and wetland areas, mostly in the northern portion of the Refuge.

Waterfowl are managed by "flyways," which follow the major migratory routes. Their population trends are monitored by the Service through the collection of data including band recoveries, hunter questionnaires, wing returns, breeding population and habitat surveys and mid-winter waterfowl surveys (Caithamer and Dobovsky, 1995). The migratory waterfowl in Canaan Valley are a very small part of a large population of birds that are managed by the Service on a flyway basis. The Service designs the bag limits and season lengths to maintain healthy populations of these species. Therefore, waterfowl hunting in Canaan Valley would be negligible on State, regional or flyway populations.

Rails, Gallinule, and Coot. The Service proposes that hunting for rails, gallinules and coots on Canaan Valley Refuge follow State regulations. These species are also migratory game birds managed by the Service on a flyway basis, with State regulations established within the framework of the Service's directives. Rails are occasionally heard on the Refuge. Breeding records exist only for Virginia rail which has been documented in the upper Glade Run marshes and in isolated cattail stands throughout the Refuge. During migration, sora rails are seen in some wetland areas around beaver ponds. King rails may also migrate through the Valley; however, no recent records exist for this species on the Refuge. The harvest of these species is likely coincidental with waterfowl hunting and the numbers harvested (if any) on the Refuge would not be significant to the overall flyway populations of these species.

Mourning Doves. The Service proposes that hunting for mourning doves follow State regulations. Like other migratory game birds, mourning doves are managed by the Service on a flyway-wide basis. The occurrence of mourning doves on the Refuge is dependent upon weather conditions, habitat availability and factors affecting their migratory behavior. They are uncommon in the State and in Canaan Valley and the lack of a "hunnable population" makes the quality of such a hunt questionable. Hunting doves in Canaan Valley would have no impact on the population as a whole.

American Woodcock. The Service proposes to hunt woodcock on Canaan Valley NWR in accordance State regulations. The American woodcock is a trust species managed by the Service, and has been categorized as a "species in decline." The loss and degradation of early successional habitat is considered to be the most important factor for these population declines (USFWS 1990). The American Woodcock Management Plan, developed by the Service, focuses on habitat management, but acknowledges that managed recreational harvest of woodcock is desirable and consistent with conservation, and that recreational hunting will continue to be managed under existing regulatory processes in the United States. According to Refuge hunter information, the number of woodcock taken on the Refuge between 2002 and 2005 averaged 318 birds, with a high of 426 reported taken in the 2004 season. The average Refuge harvest for 2002-2005 seasons represents approximately 55% of the State total woodcock harvested in those years.

McAuley et al (2005) note that, hunting mortality was not a significant impact relative to other sources and that habitat loss was still considered to be critical in the decline of woodcock

populations. Pennsylvania implemented very restrictive season lengths in 1984 (21 days) and further restricted the seasons in 1992 (14 days) in an attempt to protect the "Pennsylvania breeding population" of woodcock. Unfortunately, from 1985-1995 the singing-ground surveys in Pennsylvania declined 4.6 % annually compared to a flyway decline of 2.0 % (Bruggink and Kendall, 1995). This indicates that the restrictive season lengths had little to no effect on woodcock in Pennsylvania or that other factors contribute to the State population decline. This finding supports the theory that habitat deterioration is the major problem affecting woodcock in the eastern United States. More restrictive bag limits and season lengths other than those already in effect are not currently supported by the literature as an effective means to protect populations of woodcock. Therefore hunting woodcock on the Refuge is not expected to have an impact on the local, regional or the flyway population.

Wilson's snipe. The Services proposes to hunt snipe on the Refuge in accordance State regulations. Declining populations in the eastern U.S. may lead to more restrictive bags and seasons in the future. Currently snipe population surveys show a stable trend from 1966-2005 (Sauer et al, 2005). These decisions on season length and bag limits are made on a flyway basis, and the State's regulations would reflect any adjustments made by the Service on a national scope.

Weather and habitat conditions, rather than hunting, are likely the predominant factors influencing snipe occurrence and population size at Canaan Valley. According to Refuge hunt information, an average of one snipe per year has been harvested during the years 2002 to 2005. Snipe harvested in West Virginia are likely incidental take by sportsmen engaged in hunting other species; therefore, hunting is expected to have little impact on the local, State or flyway snipe population.

In summary by following federal and state regulations, the harvest of migratory bird species on the Service concludes that it is highly unlikely that the harvest of these species will have any direct significant impact to local, regional, or flyway populations.

d. Endangered, Threatened and other Non-game species.

Anticipated direct, indirect and cumulative impacts to endangered, threatened species and non-game species of the Refuge are described below.

The Refuge requested Section 7 consultation from the USFWS Ecological Services Office for impacts to known threatened and endangered species from a Refuge hunting program. The Section 7 process determined that hunting various game species on the Refuge would not affect the endangered and threatened species inhabiting the area (USFWS 1997). Species that require a more open understory, such as has resulted from deer overbrowsing, could be adversely affected if a reduction in the deer herd produces changes in the understory vegetation. However, as the vegetation returns to its more natural state, the associated fauna should also reflect the more

natural diversity. The overall species diversity of the Refuge is not expected to be diminished by this hunting alternative.

3. Local Economy

This alternative will provide recreational opportunities at Canaan Valley NWR to hunters from all over the country. This activity and program produces a positive impact on the local economy. The local purchases of gas, food, lodging, hunting licenses, equipment, and supplies, from mostly out-of-state hunters contributes significantly to the local economy. Hunters would spread the word to their friends, encouraging them to come to the area to take advantage of the high quality recreation and, thus, positively, affect the economy of the area.

4. Cultural Resources

The Service's policy is to preserve cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible. Archaeological surveys and other information collected on the Refuge indicate that there are six cultural sites, one of which is a possible pre-historic Native American site, and the other five are settlement sites that date from the late 1800's. The Native American site had pieces of chert. Chert is not naturally found in this area; therefore its presence indicates that trading possibly occurred between tribes in the Valley. This location is in an area closed to hunting, so no impacts are anticipated. The settlement sites are made up of two graves and three foundations that could have once been cabins. These sites, while located in hunting zones, are relatively unknown locations, and therefore, no impacts from hunters are anticipated. Furthermore, this alternative requires no development of new trails, roads, or other facilities, and therefore, will not have a negative effect on the Refuge's cultural and historic resources.

B. Alternative 2 - Open Canaan Valley National Wildlife Refuge to white-tailed deer hunting only.

Under this alternative the opportunity for recreational hunting on the Refuge would greatly decrease. There would be no hunting for migratory waterfowl and game birds, upland game, turkey or bear.

1. Vegetation

The impact of this alternative on habitat and plants is the same as those for Alternative 1.

2. Wildlife

The impacts of this alternative on the wildlife populations of the Refuge are discussed below.

a. Upland (Small) Game

The effect of not hunting any of the other resident game species may affect them by allowing their populations to grow; however, this population growth may be offset by higher natural mortality. Therefore, not hunting these resident game species is expected to have little impact on their populations. Many of these species exhibit cyclic populations, which are sensitive to environmental factors such as food availability, predation, and weather. For some species, such as squirrels, and raccoons, the preferred habitat is limited in the Valley; this has a greater influence on the population size than whether or not the population is hunted. The rapidly growing and expanding population of coyotes in the State could reach proportions on the Refuge that pose predation problems to sheep farmers in the counties surrounding the Refuge.

b. Big Game

White-tailed Deer. The impacts of this alternative on white-tailed deer would be same as those for alternative 1.

Black Bear. The effect of not hunting black bear on Canaan Valley Refuge, especially when it reaches its projected size of 20,000 or more acres, could result in an increase in the number of "nuisance" bears.

Wild Turkey. Not hunting turkeys on the Refuge may cause a population increase; however, it could also subject the turkey population to increased natural mortality.

c. Migratory Game Birds.

The effect of not hunting migratory game birds such as ducks, geese, rails, coots, and the migratory populations of woodcock and snipe would not likely affect them in any way. Only a small proportion of these birds are found in Canaan Valley, and even fewer are hunted there. Not hunting the resident geese probably may result in a greater population increase. Currently Canada geese in the Valley are considered "nuisance" geese at Timberline Homeowners Association. Timberline employs "chase dogs" to remove geese from the properties. Not hunting woodcock and snipe could have a positive effect on the local populations, but more needs to be learned about these populations in Canaan Valley before a definite effect could be demonstrated.

d. Endangered, Threatened, and other Non-game species

As previously described, hunting on the Refuge was determined to have no effect on endangered, threatened or other non-game species. Limiting hunting to deer only would also have no effect on these species.

3. Local Economy

This alternative may have different impacts to the local economy, but not significant. An average of 891 visitors a year to the Refuge participates in the hunt program. Approximately 727 of those visitors hunt deer. The decrease in numbers may decrease the impact on the local economy as fewer visitors would contribute to the local purchase of gas, food, lodging, hunting licenses, equipment, and supplies. Yet, deer hunters would spread the word to their friends, encouraging them to come to the area to take advantage of the high quality recreation and, thus, positively, affect the economy of the area.

4. Cultural Resources

This alternative requires no development of new trails, roads, or other facilities, and therefore, will not have a negative effect on the Refuge's cultural and historic resources.

C. Alternative 3 - Close Canaan Valley National Wildlife Refuge to hunting.

1. Vegetation

This alternative could produce devastating effects on the vegetation of the Refuge. The vegetation is currently being impacted by the over abundant deer population. Without deer hunting, this already dense deer population would increase and continue to impact the diversity of vegetation on the Refuge. High deer populations alter forest stand development and reduce wildlife habitat by reducing or eliminating young tree seedlings, shrubs and herbaceous plants (Tierson et al 1966; Tilghman 1989).

The diversity of every layer of the forest could be decreased. A decrease in the overstory diversity would result in a decrease of wildlife foods such as seeds, browse, fruits and insects (Tilghman, 1989). At high densities deer eliminate many forest floor species, including wildflowers such as lilies and orchids and shrubs which provide cover for rabbits and other wildlife. The result is often an understory of ferns, clubmosses and grasses, which provide little habitat for wildlife and inhibit the growth and survival of the tree seedlings which are not eaten by the deer (Jones et al 1993).

Canaan Valley is a unique ecosystem known for its tremendous biodiversity. Not hunting deer would slowly decrease the richness of many of its habitats. Impacts to rare plant communities

have been documented previously (Michael 1997) and current research is documenting impacts to rare plants on the Refuge (Flaherty 2006).

2. Wildlife

The impact of not opening the Refuge to hunting on the wildlife populations is discussed in the following sections.

a. Upland (Small) Game

The short-term effect of this alternative on all other game species would be similar to that of alternative 2. However, as mentioned above, a high deer population would result in less biodiversity, less cover for small animals such as rabbits and grouse and fewer species of wildlife food plants. Over a period of several years populations of some resident species may decrease because their habitat has decreased due to overbrowsing by deer.

b. Big Game

White-tailed Deer. Under this alternative the deer population would increase on the Refuge. The Refuge consists of several thousand contiguous acres, and there is currently a very large deer herd. Although the habitat would suffer long before the deer population, overpopulation would eventually result in an unhealthy deer herd, which is susceptible to parasites and disease. As deer numbers increase through a lack of hunting and other natural predators, the health of the herd will likely decline through lack of food resources and possibly disease. This is particularly of concern with Chronic Wasting Disease, now occurring in West Virginia, it is spread rapidly in overpopulated deer herds.

c. Migratory Game Birds

Effects on migratory game birds from no hunting on the Refuge would be the same as only hunting deer (alternative 2).

d. Endangered, Threatened, and other Non-game Species

The effects of no hunting on the Refuge would be the same on these species as hunting deer only, with the possible exception of those species that currently flourish because the deer maintain an open understory. Without deer hunting, the deer would continue to overbrowse, thus artificially maintaining open habitat species population levels. Ultimately this would prevent forest succession and the main habitat that is required for long term range expansion of the endangered WV northern flying squirrel and Cheat Mountain salamander.

3. Local Economy

In 2001 hunters spent \$223 million in West Virginia to participate in their sport (USDOJ, 2001). At least a portion of that was spent in Canaan Valley. Not allowing hunting would have a negative effect on the local economy; the larger the Refuge, the more severe the effect. During the gun seasons for deer in particular, the local businesses would miss hunters who purchase everything from snacks to lodging for the night. Under this alternative, the Refuge and the local economy would see a negative impact in the contributions to the local economy as a result of decreased visitation to the area. Fewer visitations would mean less purchase of hunting license, lodging, food, hunting supplies, and other materials.

4. Cultural Resources

Under this alternative, there will be no impacts to the cultural and historic resources of the Refuge.

2. Cumulative Impact Analysis

A. Anticipated Direct and Indirect Impacts of Proposed Hunt on Wildlife Species

1. Alternative 1. (Proposed Action) – Open Hunting on Canaan Valley National Wildlife Refuge as regulated by the State of West Virginia with some exceptions

A. Vegetation.

Plant communities are currently being severely impacted by over-abundant white-tailed deer populations in the Valley. Browse impacts to balsam fir, a State listed species of concern, have been documented for over ten years (Michael 1997). Impacts of deer browse to other rare plant species are being documented (Flaherty 2006). Conducting an effective deer management program through a controlled hunt would help alleviate the browse pressure on Refuge habitat and reduce impacts to rare plant species. It may also allow forest understory structure to develop thereby improving habitat for a variety of migratory bird and resident wildlife species.

Possible negative cumulative impacts of the proposed activity include temporary trampling of vegetation and light soil erosion. Spring turkey season, lasting four weeks from mid-April to mid-May, could cause some trampling effects to growing plants especially in wet areas. There are few turkey hunters on the Refuge, most hunting during the fall while other game species are in season. Other hunt seasons occur when the ground is either frozen, covered in snow or when plants are dormant. For these reasons, cumulative impacts to plant communities and soils are not likely to be significant during either the fall or spring hunting seasons.

B. Wildlife

1. Upland small game

Ruffed Grouse. Ruffed grouse are taken in relatively small numbers on the Refuge. Generally hunting for grouse is coincident with woodcock hunting and many grouse harvested on the Refuge may be incidental to woodcock hunting. Weather limits access to many areas on the Refuge and snow likely prevents many grouse hunters from hunting on the Refuge in January and February. Information collected from hunters from 2002-2005 indicates that an average of 55 grouse per year are harvested on the Refuge. During this time an average of 51 people reported hunting for grouse on the Refuge and had an average success rate of 44%. Actual harvest during this time frame for Refuge hunters was an average of about 1 bird per person. State information estimates that 25,000 residents and nonresidents hunted for grouse in 2001. The impact of the Refuge hunt program with an average of only 51 grouse hunters per year on State grouse populations is therefore insignificant to State populations.

There are no available, reliable estimates of grouse populations on the Refuge or in Tucker County. The WVDNR does collect flush and harvest information from grouse hunters through a voluntary survey. According to this data, the mountain counties of West Virginia have higher grouse populations than those of neighboring states (WVDNR 2006). This may indicate loss of habitat and declining populations in neighboring States within the region. However, the WVDNR considers the State population stable and the effect of the Refuge hunt program on local grouse numbers to be negligible (Foster, pers.com. 2007). Additionally data collected from the Appalachian Cooperative Grouse Research Project concluded that hunting mortality for grouse in the Appalachians is compensatory and therefore would not cause significant impacts to the population (Norman et. al. 2004). Ohio River Islands NWR does not permit grouse hunting, therefore there would be no additive impact of Refuge hunting of grouse. The Service concludes that it is highly unlikely that the harvest of these species will have any cumulative significant impact to local or regional populations.

Other Small Game. Included in this category are rabbits (eastern cottontail, Appalachian cottontail snowshoe hare), squirrel, raccoon, fox, bobcat, coyote, opossum, striped skunk and woodchuck. Based on hunter information from 2002 to 2005, only 16 rabbits and one hare were harvested on the Refuge. The number of hunters who reported hunting rabbit and hare on the Refuge accounted for less than 1% of all hunters participating in the hunt program from 2002-2005. The low number of hunters and expected harvest of cottontail and hare on the Refuge are considered to be negligible in relation to local and regional populations but may be an important way to increase the knowledge base on distribution of the Appalachian cottontail (Stihler, pers.com. 2007).

According to WVDNR volunteer bow hunter surveys, rates of rabbit observations in Tucker County have been low and are 75% less than the long term State average. This data suggests that any hunting activities for rabbit on the Refuge may not have significant impacts to State wide

populations. Annual turnover rates for small game species are generally high due to natural mortality; therefore, normal hunting mortality would not affect the annual breeding population. The small amount of hunter interest and low harvest on Refuge lands show that direct, indirect and cumulative impacts of rabbit and hare harvest on the Refuge will not be significant to local, regional or State populations of these species.

The occurrence of squirrels on the Refuge is uncommon; therefore, any take of squirrels is expected to be incidental to hunting other upland game species, and as such, would have little impact on the population of gray or fox squirrels. In fact, information from Refuge hunters indicates that only an average of only 7 people per year hunted for squirrels from 2002-2005. The average Refuge harvest for those years was 19.8 squirrels harvested per year. According to WVDNR volunteer bow hunter surveys, squirrel observations in Tucker County from 1995 to 2005 have averaged 22.4 for every 100 hours spent in the field. Observations for Tucker County are roughly 70% less than State wide averages for the same period. This is likely due to less suitable habitat in the higher elevations in Tucker County for gray and fox squirrels. Due to the low number of squirrel hunters and harvest on the Refuge, and the low population density relative the rest of the State, the cumulative impact of Refuge hunting to squirrel populations on a county and State level will be negligible.

According to Refuge hunter information, there were no reports of hunters hunting or harvesting fox, bobcat or coyote on the Refuge from 2002-2005. Most fox and bobcat hunters are hunting other species as well, so there would be little additional disturbance to vegetation or non-target wildlife. Historical bobcat harvest indicates that up to 12% of the bobcat harvest of Tucker County came from Canaan Valley, however, this represented less than 1% of the State harvest. Results from the WVDNR volunteer bow hunter survey show low observation numbers for raccoons, fox and coyotes in Tucker County and the State. This is likely due to the mostly nocturnal behavior of these species and the larger ranges and secretive nature of predator species such as fox and coyote. Trapping results from Tucker County show that the number of fox, raccoon and coyote pelts sold from the county make up less than 1% of the State total. This could be explained by the low hunting and trapping pressure. Additionally, hunter survey information indicates that from 2002-2005 a total of only 10 people hunted raccoon on the Refuge with an annual average harvest of approximately 16 animals per year. The populations of these species are considered secure by the WVDNR and the low hunter harvest rates are not expected to have negative cumulative impacts local or State populations (Foster pers. com. 2007).

The West Virginia DNR bow hunter survey shows an average of 0.46 raccoon observations/100hours in Tucker County from 1995-2005. This is lower than the State average of 1.13 raccoon/100 hours (WVDNR 2006). Tucker county and other mountain counties in the State are considered fair to poor raccoon habitat with low to moderate hunter densities (Rogers 2004). According to WVDNR, state-wide populations from 1992-2005 were considered stable to increasing slightly (Rogers 2004).

Because many raccoon hunters use dogs and hunt at night, raccoon hunting requires a Special User Permit. This allows the Refuge to closely monitor hunting activity and deny permits to violators. Disturbance to non-target wildlife species is possible as a result of night hunting. Given that most mammal species are most active at night, and the length of raccoon hunting season, there is the potential encountering non-target wildlife during this activity.

Most raccoon hunting occurs in wetland areas and adjacent to access roads where hunters can deploy dogs. Therefore potential areas for disturbance are typically limited. Additionally the Refuge will prohibit releasing dogs on Cortland road and Old Timberline Road, in order to limit the potential of dog trespass on private lands. Cumulative impacts from disturbance may occur to wildlife if night hunting activities overlap with hunting or fishing activities in the same areas during the day. Raccoon season overlaps with most other hunting seasons and fishing occurs year round, therefore the potential for night time hunting areas corresponding to day use is high. However, due to the average low number of hunters participating in the Refuge raccoon hunt; these impacts if any, will be negligible.

Refuge hunter information does not indicate that any individuals participating in the hunt program from 2002-2005 hunted woodchuck, skunk or opossum. If harvest of these species occurs it is likely incidental to other hunted wildlife. Population information for many of the listed small game species is lacking. According to the WVDNR, populations of woodchuck, skunk and opossum are stable and secure and any harvest on the Refuge would not have negative population impacts (Foster pers. com. 2007). Additionally, Ohio River Islands NWR does not permit hunting of most of these small game species therefore no additive effect would occur through hunting these species on CVNWR. Because of known and expected future low hunter participation, small numbers of individuals harvested and incidental nature small game species harvest, it is anticipated that any impact from Refuge hunting would be insignificant on a State or even local level.

In conclusion, the harvest of small game species will likely have no direct significant impact to local or regional populations of these species and negligible temporary impacts through disturbance to other wildlife species on the Refuge.

2. Big Game

White-tailed Deer. Deer in Canaan Valley are abundant, and there is evidence that they are harming other components of the ecosystem. Deer browse lines have been noted in Canaan's forest for years and the lack of a developed forest understory indicates excessive deer browse. Current research conducted by WVU is documenting the impact of deer browse on rare plant communities in the Valley. Preliminary results show Jacob's ladder, a State species of concern and listed as globally rare is experiencing heavy browse damage on Refuge land (Flaherty 2006). Additionally APC (abomasal parasite counts) counts conducted by the State every 5 years in the Valley have show progressive increase in parasite loads indicating deer may be nearing or are exceeding the carrying capacity for the habitat. The Service has concluded that a deer management program maximizing the take of antlerless deer would benefit both white-tailed deer through reduction of overpopulation and the habitat through reduction of overbrowsing, thus benefiting both vegetation and other wildlife species.

According to WVDNR data, the number of deer harvested in Canaan Valley from 2002-2005 averaged 161. This represents an average of only 8% of the total harvest from Tucker County and 0.08% of the total harvest for the State. Deer harvest in the State has increased dramatically since the 1970s indicating a large population that is not being impacted by State wide harvest. By following State regulations, the Refuge harvest of deer is not expected to have significant impacts to Refuge, county or State deer populations. Maintaining a deer harvest program on the Refuge will be critical for reducing the impacts of deer browse on plant communities which ultimately affect much of the wildlife and rare plants the Refuge is charged to protect.

Black Bear. Population estimates of bear have increased steadily since the 1970's as reflected in the exponential bear harvest (WVDNR 2005). Tucker County's bear harvest comprised an average of 11% of the total number of bear taken from the State from 1966 to 2000. However, an average of only 1.25 bear per year were reported taken in Canaan Valley, Cabin Mountain and Canaan Mountain combined from 1974 to 2000 (Michael 2002). This number is much less than 1 % of the current estimated bear population (over 10,000 animals) in the State. It is likely that the large wetland habitat within the Valley and lack of road access make hunting bears less popular on the Refuge than in surrounding areas of Tucker County. According to WVDNR, the lower areas of Canaan Valley (now Refuge) have never been popular for bear hunters, especially those with dogs, as there are not as many places to tree a bear, nor was the habitat very good for bears (Spencer 2002).

Hunting bear with hounds has been traditional in the Appalachians since colonial times, and is permitted under State regulations in Tucker County. Using dogs increases hunting effectiveness. Results from the 2005 bear firearms season in Boone, Fayette, Kanawha and Raleigh counties, showed of the 202 bears harvested, a total of 130 (64%) were harvested with the aide of pursuit dogs (WVDNR 2005). A study of hunted and non-hunted black bear in Virginia found that reproduction and body condition estimates were not statistically different (Higgins 1997). However, Higgins notes that strong conclusions based on the physical conditions should be

viewed carefully. Between hunted and non hunted populations, condition levels were not statistically significant at the 0.05 level but were significant at the 0.09 level. In other words, there was a 91% chance that a real difference existed in body condition between hunted and non-hunted bear populations (Higgins 1997). Notably, however, body condition estimates are heavily tied to mast production. Therefore, if mast production was poor during this study, differences in body condition between hunted and non-hunted populations would be more pronounced. It is possible that during poor hard and soft mast years, hunting bear could be an additive impact to bear condition and reproduction.

Refuge hunter harvest information indicates that only 1 bear has been reported harvested from the Refuge from 2002-2005. From this information, an average of 24 people per year hunted bear on the Refuge. Success rate for Refuge bear hunters is less than 1 %. Additionally, the Refuge harvest is less than 1 % of the total number of bear road kills in 2005. Less than 1.5 % of all bear harvests in the State were taken from Canaan Valley habitats and an average of 8.2 % of bear harvests from the County were from Canaan Valley from 1974-2000 (Michael 2002). This accounts for only 1 % of the total bear harvested on average in the State from the same time period. The impact on the Refuge population of black bear will not be significant due to the low number of bear taken each year. Similarly, the cumulative impact of bear hunting on the Refuge will not be significant when combined with bear hunting impacts throughout the county or State.

Additionally the Refuge proposes to reduce the State bear gun season by one week so as not to impede harvest of antlerless deer on the Refuge. This would also provide one extra week for pregnant female bear to den prior to the hunting season. Current State regulations dictate that allowing pursuit dogs to chase other wildlife, particularly wild turkey and deer is an illegal and punishable offence. Based on current State oversight, the low harvest rates and hunting pressure, the Service concludes that it is highly unlikely that the harvest of these species will have any cumulative significant impact to local or regional populations.

Wild Turkey. According to Refuge hunter information collected, only 24 turkeys have been harvested from 2002-2005. During these years there was an average of 53 people who reported hunting for turkey but only an average of 4.4 hunters were successful. The average hunter success rate for turkey on the Refuge from 2002-2005 is 7.3 %. The average Refuge harvest from 2002-2005 accounted for 5 % of the total harvest from Tucker County and much less than 1 percent of the total State harvest.

The WVDNR coordinates a volunteer spring gobbler survey which helps track the potential nesting trends for turkey in the State. Results indicate a stable long term trend (1983-2004), although results from 2005 were below the long term average. Brood surveys from 1991-2005 also show a stable trend. The State is currently conducting a gobbler survival study (started in 2004) in cooperation with the State of Virginia. Comparisons will be made between two West Virginia hunt areas (traditional fall hunt counties and non-fall hunt counties) as well as between West Virginia and Virginia seasons. This information will be considered when available for evaluating the Refuge impact to local and State turkey populations. Given the small number of

turkey currently harvested on the Refuge and the small percentage contribution to the County and State-wide turkey harvest, it is unlikely that Refuge turkey harvest will have significant cumulative impacts.

The Service concludes that it is highly unlikely that the harvest of these big game species will have any cumulative significant impact to local or regional populations. However, if the deer harvest program is successful in achieving biological objectives in reducing herbivory impacts to Refuge plant communities, there will be an impact on white-tailed deer populations at the local level. This impact is expected and will benefit the plant communities and associated wildlife which is currently being adversely impacted by browse pressure. The impact of a deer harvest on the Refuge will likely have significant impacts to deer populations on a regional or State level.

3. Migratory Game Birds

The U.S. Fish and Wildlife Service annually prescribes frameworks, or outer limits, for dates and times when migratory bird hunting may occur as well as for the number of birds that may be taken and possessed. These frameworks allow State selections of hunt seasons and take 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 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 those 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. Canaan Valley NWR is within the Atlantic 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 2006a).

Because the Service is required to take abundance of migratory birds and other factors into 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, we consider 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.

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. The Service 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).

Anticipated direct, indirect and cumulative impacts to the migratory populations of the Refuge are further described below.

Waterfowl (Ducks and Geese) The State typically has a split season for waterfowl. The first season begins early October and the late season begins in November and runs through early January. Hunter impact to Refuge waterfowl can be greatly limited due to weather conditions, particularly for the late season time frame. In many years open water becomes frozen by late November or early December in Canaan Valley thereby reducing hunt areas in Canaan Valley. Also, excessive snow can severely limit access to the northern portion of the Refuge which can limit hunter participating in the waterfowl season. Hunter information shows that an average of 11 ducks per year and an average of one Canada goose per year have been harvested on the Refuge from 2002-2005. If these figures are typical of hunter waterfowl harvest on Refuge habitats, it represents approximately 6% of the waterfowl harvest and less than 1 % of the Canada goose harvest within Tucker County.

In 2004, the State of West Virginia reported harvesting 13,000 waterfowl (ducks and geese). In this year Tucker County reported 94 ducks and geese harvested representing less than 1 % of the total take for the State. Using the annual average of 11 ducks per year killed on the Refuge, only 6 % of the county waterfowl harvest from 1991-2004 would come from Refuge hunters. This equates to 114 ducks potentially harvested on the Refuge between the 11 year period of 1991-2004. When combined with Ohio River Island NWR both Refuges account for only 1.2 % of the State harvest in 2005.

According to the 2006 waterfowl status report duck populations overall were 9 % above the long term average and 14 % greater than 2005 estimates (USFWS 2006b). Of those species typically harvested on the Refuge, population estimates of mallards, black ducks and green-winged teal in the eastern survey area did not differ from long term averages (USFWS 2006b). Ducks harvested on the Refuge, on average, account for less than 0.001 % of the average breeding population of these three species in the eastern survey area. Overall, due to the low numbers of waterfowl taken on the Refuge the cumulative impact of this activity would have insignificant impacts on county, State and flyway populations. Hunting season also does not overlap with the nesting season for non-hunted migratory birds and therefore, long-term future impacts are not likely.

Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate Environmental Assessment, "Duck Hunting Regulations for 2006-07," and on 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, D.C. 20240.

Rails, Gallinule, and Coot. The harvest of rails, gallinules, and coots that occurs in Canaan Valley is likely negligible. The secretive nature of rails and gallinules also contributes to their limited harvest. Their take is generally incidental to sportsmen engaged in other forms of hunting.

A WVDNR Conservation Officer who has checked hunters in Canaan Valley for many years noted that he had never checked anyone in the Valley hunting specifically for rails and that the harvest of coots and gallinules were mostly incidental species while waterfowl hunting (Spencer pers. comm). Additionally, based on Refuge hunter information between 2002 and 2006, there have been no reported rails, gallinules or coots harvested on the Refuge.

The State opens hunting for rails in early September, therefore the possibility of disturbance to game and non-game wildlife in wetland areas could be an additive cumulative impact over time when taken in context with other hunting seasons, year round fishing and other approved public uses focused on the same habitat. However, the very low number of known waterfowl hunters combined with expected low number of rail hunters indicates that any impact of these activities would not be significant or effect State or flyway populations of these species. Therefore, proposing to allow hunting of these species within the framework of State and federal regulations should have no impact on these populations.

Mourning Doves. There is no information suggesting that Refuge hunters have harvested any appreciable numbers of mourning doves on the Refuge. In fact from Refuge hunter information there have not been any hunters stating that they were hunting for or had harvested doves on the Refuge from 2002-2005. The West Virginia population trend shows an increase by 3.8 % over a ten year monitoring period (birds seen and heard along survey routes). In fact, a significant positive population trend was noted for the eastern management unit (Dolton 2006). State harvest from 2002 to 2005 made up only 0.23% of the eastern management unit harvest total for those years (Dolton 2006). Because of the low potential harvest from the Refuge and the stable long term and increasing 10 year trend in mourning dove populations of the eastern management unit, the Service concludes that it is highly unlikely that the harvest of these species will have any cumulative significant impact to local or regional populations.

American Woodcock. According to Refuge hunter information, the number of woodcock taken on the Refuge between 2002 and 2005 averaged 318 birds, with a high of 426 reported taken in the 2004 season. State woodcock harvest between 2002 and 2005 averaged 650 birds. Based on this information, woodcock harvested on the Refuge accounted for an average of 54.75 % of the States total woodcock harvest for those years. This indicates that the Refuge does contribute significantly to the total State woodcock harvest. The large percentage of woodcock taken from the Refuge relative to the State's total take is not entirely unexpected as the Canaan Valley has long been known for woodcock and woodcock hunting. Additionally, Canaan Valley contains more woodcock habitat than any other single location in the State (Stetketee 2000).

From a flyway perspective, woodcock harvest on the Refuge account for less than 1 % of the total harvest for 2004 and 2005 of the eastern management unit. For the local breeding woodcock population there is some evidence that hunting pressure in Canaan Valley may have greater impacts, especially to locally raised juveniles. According to one paper, mortality rates for hunting in Canaan Valley from 1966-1969 were 38 % of the breeding woodcock population. Of this, a total of 80 % were made up of immature males and females (Goudy 1970). This high rate

of mortality could have been an artifact of the earlier hunt season for woodcock. From 1961 to 1981 woodcock season began on September 1. Although the dates have fluctuated since then, current regulations in West Virginia have begun woodcock season during the third week of October. This should be enough time to allow more migratory birds to move into Canaan Valley and therefore reduce the local hunting pressure on resident woodcock populations. Additionally, woodcock harvest reported from the 1966 to 1969 seasons reported killing a total of 2,102 woodcock, or an average of 525.5 woodcock per season. This harvest rate is considerably greater than the current harvest average (2002-2005) of 318. Again this could be due to the longer hunting season that occurred in the late 1960's or larger flyway populations.

Although woodcock are showing declines in numbers on their breeding grounds, habitat loss is still considered the most important factor. However, researchers reviewing historical harvest data in relation to known losses of available habitat questioned if hunting had possibly become an additive rather than compensatory source of mortality. This assertion was tested in a study conducted by the U.S. Geological Survey, Patuxent Wildlife Research Center in 2005. Results showed no significant differences in woodcock survival between hunted and non-hunted areas. Furthermore, the authors concluded that hunting was not having a significant impact on woodcock numbers in the Northeast (McAuley *et al.* 2005).

According to information from Ohio River Islands NWR, woodcock harvest is very low (none reported harvested in 2005 or 2006 seasons). Based on this information and the fact that hunting season for woodcock starts in mid-late October (when migratory woodcock are using the Valley), it is highly unlikely that Refuge harvest of woodcock will cause cumulative impacts to the State and eastern unit flyway population. The high harvest of woodcock on the Refuge relative to State totals does make future research on Refuge harvest to resident woodcock important to consider. If future research indicates that Refuge harvest of woodcock negatively impacts resident, State or flyway populations, the hunt program will be adapted to lessen or prevent that impact.

Wilson's snipe. Currently snipe population surveys show a stable trend from 1966-2005 (Sauer *et al.* 2005). According to Refuge hunt information, an average of one snipe per year has been harvested during the years 2002 to 2005. Snipe harvested in West Virginia are likely incidental take by sportsmen engaged in hunting other species. Information on snipe harvest in the State is not reliable, but apparently low to negligible. According to harvest information, less than 50 snipe were harvested from West Virginia in 2004 and 2005, with an error of +/-153% and 173% respectively. Even if the State had harvested the upper level of estimated error (126 – 136 snipe) it would account for just 0.27 % of the Atlantic flyway population (USFWS 2006c). Given that it is unlikely that a large number of snipe are harvested in the State, and even more, on Canaan Valley NWR or Ohio River Islands NWR, any incidental harvest of this species on the Refuge would not be significant on a local, State and flyway populations.

In summary by following federal and state regulations, the harvest of migratory bird species on the Service concludes that it is highly unlikely that the harvest of these species will have any cumulative significant impact to local, regional, or flyway populations.

4. Other Wildlife

Hunter disturbance to non-hunted resident wildlife may be a negative cumulative impact; however, such an impact is unlikely because of the timing of the hunt. The hunts will occur during a time of the year when small mammals, reptiles, amphibians, and invertebrates are inactive and thus the likelihood of hunter interaction is rare. Isolated encounters with small mammals, reptiles, amphibians, and invertebrates should not have cumulative negative effects on populations.

Disturbance to non-hunted migratory birds could have regional, local, and flyway effects. Regional and flyway effects would not be applicable to species that do not migrate such as most woodpeckers, and some songbirds such as cardinals, titmice, wrens, chickadees, etc. Disturbance by hunting to non-hunted migratory birds should not have cumulative negative impacts for the following reasons. Hunting seasons do not coincide with the nesting season. Long-term future impacts that could occur if reproduction was reduced by hunting are not relevant for this reason. Disturbance to the daily wintering activities, such as feeding and resting, of birds may occur. Disturbance to birds by hunters is probably commensurate with that caused by non-consumptive users.

Disturbance by hunting to non-hunted wildlife would be the most likely negative cumulative impact. However, disturbance would be unlikely for the following reasons. Small mammals, including bats, are generally inactive during winter when hunting season occurs. Both of these qualities make hunter interactions with small mammals extremely rare. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity during the hunting season when temperatures low. Hunters will rarely encounter reptiles and amphibians during most of the hunting season. Encounters with reptiles and amphibians in the early fall are few and should not have cumulative negative effects on reptile and amphibian populations. Invertebrates are also not active during cold weather and will have few interactions with hunters during the hunting season.

Species that require a more open understory, such as has resulted from deer overbrowsing, could be adversely affected if a reduction in the deer herd produces changes in the understory vegetation. However, as the vegetation returns to its more natural State, the associated fauna should also reflect the more natural diversity. The overall species diversity of the Refuge is not expected to be diminished by this hunting alternative. In fact, if deer densities are decreased through a hunting program, Refuge forest structure should improve which will provide better habitat for a variety of understory migratory birds, mammals and other wildlife. Additionally, a reduction in deer density through an effective hunt program would reduce browse impacts to many rare plant species found on the Refuge. Under this alternative there would be negligible impacts through temporary disturbance to other wildlife through a Refuge hunt program, however, the Service concludes that it is highly unlikely that the harvest of these species will have any cumulative significant impact to local or regional populations.

5. Endangered, Threatened Species

Hunting various game species on the Refuge would not affect the endangered and threatened species inhabiting the area (USFWS, 1979). A Section 7 consultation was completed for the original Hunting EA which determined that no significant impacts to threatened or endangered species would be expected from a Refuge hunt program as described (USFWS 1997). Cheat Mountain salamanders (threatened) are dormant for all but a portion of the hunting season. West Virginia northern flying squirrels (endangered) are active during winter but typically only at night. Both species are very limited in distribution on the Refuge occurring in the high elevations of Cabin Mountain. Although night hunting is permitted for raccoon, it is unlikely that this hunt would disrupt northern flying squirrels because raccoon hunters typically focus on lower areas of the Valley in and around wetlands.

The Refuge also provides habitat for bald eagles (threatened) and Indiana bat (endangered). Most eagle use occurs during the fall, winter and spring in Canaan Valley. Eagles likely use the north end of the Refuge as foraging habitat and could be disrupted by excessive human disturbance. However, it is unlikely that the level of hunter use on the Refuge could create significant impacts or change the behavior of bald eagles using the area. Indiana bats are only known from the Refuge during fall migration. Because bats are foraging in the evening and there is currently little information to suggest that the Refuge plays an important role for Indiana bats, it is highly unlikely that hunting activities will cause significant impacts to their population. In summary, the implementation of a Refuge hunt program as described would not have significant impacts to Refuge or State populations of threatened or endangered species.

2. Alternative 2 - Open Canaan Valley National Wildlife Refuge to white-tailed deer hunting only.

A. Vegetation

The impacts of this alternative on habitat and plants are the same as those for alternative 1.

B. Wildlife

The impacts of this alternative on the wildlife populations of the Refuge are discussed below.

1. Upland Small Game

The effect of not hunting any of the other resident game species may affect them positively and allow their populations to grow; however, not hunting these species may also see this increase offset by higher natural mortality. Therefore, not hunting these resident game species would have little impact on their populations. Many of these species exhibit cyclic populations, which are sensitive to environmental factors such as food availability, predation, and weather. For some species, such as squirrels, and raccoons, the preferred habitat is limited in the Valley, which would

be a greater influence on the population size than whether or not the population is hunted. The rapidly growing and expanding population of coyotes in the State could reach proportions on the Refuge that pose predation problems to sheep farmers in the counties surrounding the Refuge.

2. Big Game

White-tailed Deer. Because deer have been impacting plant communities and wildlife species depending on those plant communities for years, deer hunting on the Refuge would have an overall positive impact locally. A reduction in white-tailed deer density would be expected in a successful hunting program, negatively impacting deer numbers. However, deer health and possibly antler size would benefit from the program, thereby offering Refuge hunters a quality hunting experience. Deer are abundant in Tucker County and throughout the State. A managed hunt for deer on the Refuge would purposefully reduce deer density and therefore have a direct negative impact on deer utilizing Refuge habitats. However, the cumulative impact of a Refuge hunt to deer populations on a County and State level would be insignificant. A positive impact of a deer hunt on the Refuge to plant communities and wildlife populations would greatly outweigh the local and direct negative impacts to the deer herd. (further details are described in alternative 1 – white-tailed deer, page 40).

Black Bear. The effect of not hunting black bear on Canaan Valley Refuge could result in an increase in the number of "nuisance" bears. Currently there are an estimated 30-50 "nuisance" bear complaints in Canaan Valley. This is equal to the number of bear complaints from the rest of Tucker County (Foster pers. com.). It is possible that a reduction in bear hunting could increase the number of bear interactions with residents in the Valley particularly due to recent development occurring in the south end of the Valley.

Wild Turkey. Not hunting turkey would prevent any potential negative impacts to the Refuge turkey population and possibly allow it to expand. Additionally, by eliminating the spring turkey season, additional disturbance to wildlife outside of the regular hunting season would be prevented. However, there could be a possible increase in poult predation thru an increase in mammal predators that are not hunted under this Alternative. One study found a 69% poult mortality rate or which 51% was attributed to mammals (Speake et al, 1985). Overall, there would be no negative cumulative impacts to turkey under this alternative.

3. Migratory Game Birds

Disturbance from hunting would not occur to species using the Refuge during migration. Potential impacts to the local breeding population of woodcock would not occur; however, based on current research, this may not cause an increase in overall woodcock population (McAuley *et al.* 2005). Disturbance from hunters on species using limited open water wetland habitat on the Refuge would not occur possibly allowing waterfowl more opportunities to rest and feed. There would be no negative cumulative impact for migratory birds on a local, State or flyway level under this alternative.

4. Other Wildlife

Under this alternative disturbance to resident wildlife and migratory birds would occur only from deer hunting activities. Typically the duration of deer hunting in West Virginia is 11 weeks (mid October through December). Disturbance would likely be greatest during the opening week of gun season, as this typically is the most popular season on the Refuge. Impacts would be limited to the few migratory birds that occur on the Refuge during this time frame and be temporary and un-evenly distributed throughout the Refuge. For example, migratory birds using wetland and shrub swamp habitat would not be as impacted because most deer hunters avoid these areas. An effective deer hunting program would reduce deer densities to reduce the browse impacts to Refuge habitats. This could have a positive impact to wildlife that are dependent on young tree and understory forest shrub layer growth important to a variety of migratory birds and resident wildlife. As a result, it is likely that there would be no cumulative negative impacts to other wildlife species on the Refuge, in the County or State under this alternative.

5. Endangered and Threatened Species

Hunting on the Refuge was determined to have no effect on endangered, threatened or other non-game species. Limiting hunting to deer only would also have no cumulative impacts on Refuge or State populations.

3. Alternative 3 - Close Canaan Valley National Wildlife Refuge to hunting.

A. Vegetation

The impacts of this alternative on habitat and plants are the same as those for alternative 1.

B. Wildlife

1. Upland Small Game

Impacts to all small game under this alternative would be the same as alternative 2.

2. Big Game

White-tailed Deer. Without deer hunting on the Refuge there would be no immediate negative cumulative impacts to deer populations on the Refuge, County or State level. However, WVDNR herd health surveys have determined that deer densities in the Valley are nearing the upper limit of the expected carrying capacity for maintaining a healthy deer population in the Valley. As deer numbers increase through a lack of hunting and other natural predators, the health of the herd will likely decline through lack of food resources and possibly disease. This is particularly of concern with Chronic Wasting Disease, now occurring in West Virginia. This disease is spread rapidly in over populated deer herds.

Perhaps more important would be the impact of an over-abundant deer herd on the plant communities and associated wildlife species from over browsing Refuge habitats. Current density of deer in the Valley is suppressing woody regeneration, impacting forest structure and wildlife species associated with understory plant communities. There are well documented occurrences of deer impacting balsam fir communities and recent research is being conducted on the impact of deer to other rare plant species on the Refuge (Flaherty 2006). Not hunting deer on the Refuge would have a cumulative negative impact to Refuge and local plant communities and their associated wildlife species. Additionally, negative impacts to the deer population could occur if densities facilitated disease, particularly Chronic Wasting Disease. In this case, there could be cumulative negative impacts to Refuge, County and State deer populations.

Black Bear. Impacts to black bear under this alternative would be the same as alternative 2.

Wild Turkey. Impacts to turkey under this alternative would be the same as alternative 2.

3. Migratory Game Birds

Impacts to migratory game birds under this alternative would be the same as alternative 2.

4. Other Wildlife

Indirect and cumulative impacts to ground nesting resident and migratory birds could occur if mammalian predator populations grew significantly. There would likely be indirect negative impacts to both the deer herd and other wildlife if the deer population was not hunted. Impacts of an over-abundant Refuge deer herd are described under white-tailed deer for this alternative.

5. Endangered and Threatened Species

Impacts to endangered and threatened species under this alternative would be the same as alternative 2.

B. Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources

1. Other Refuge Wildlife-Dependent Recreation

Alternative 1 (Proposed Action): Open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia with some exceptions;

Under the proposed action, the estimated number of hunters and the number of days the Refuge is open to hunting would remain the same. This alternative would have little effect on current recreational opportunities and uses in the Valley; essentially the status quo would be maintained.

Most of the other forms of wildlife-dependent recreation, such as wildlife observation (as facilitated by bicycling, hiking, cross-country skiing and horseback riding), photography, interpretation, environmental education, and fishing, occur during the spring and summer when hunting is closed (except spring turkey season). Some interpretation and environmental education does occur in the winter in partnership with a local ski touring area. Fall hunt season is the busiest time for hunters on the Refuge and that presents the greatest possibility for conflict between hunters and other wildlife-dependent uses. Skiing in the winter occurs primarily in more developed areas, which are not a part of the Refuge. A local ski touring center is issued a permit from the Refuge yearly to conduct cross-country ski operations on 10 miles of Refuge trails. Conflicts between skiers and hunters have been negligible.

Since hunting was opened on the Refuge in 1997, there have been no significant conflicts between the different programs. All other non-hunting users are encouraged to wear blaze orange during the hunt seasons. All public access areas of the Refuge will remain open during hunt season. This alternative will have little if no impact on other wildlife-dependent recreation on the Refuge due to those uses being utilized mostly when the hunting season is closed. With 41 miles of trails open to public uses (31 miles for pedestrians, 22 miles for horseback riders, 23 miles for bicyclists and 7 miles for motorized vehicles), there will be no anticipated net-loss of non-consumptive uses due to hunting.

Weapon restrictions and safety zones are designed to address public safety concerns. The Refuge reserves the right to close certain tracts to hunting should it become necessary to facilitate other uses or safety. The Refuge's Office Automation Clerk acts as the Refuge's hunt permit coordinator with the responsibility of corresponding directly with hunters. This minimizes the workload of other staff members in coordinating the hunt and consequently has minimal effects on wildlife interpretation and environmental education programs.

In summary by following federal and state regulations, the hunt program on the Refuge is not likely to have significant negative impacts to other Refuge wildlife-dependent recreation programs.

Alternative 2: Open Canaan Valley National Wildlife Refuge to white-tailed deer hunting only.

Under this alternative, the public would only have the opportunity to hunt white-tailed deer. Many of the hunters that hunt deer on the Refuge hunt other species as well. This alternative would most likely decrease public support of the Refuge as hunters would not have the opportunity to harvest species, which are open for hunting on the state level, participate in a wildlife-oriented recreation that is compatible with the purposes for which the Refuge was established, have an increased awareness of Canaan Valley National Wildlife Refuge and the National Wildlife Refuge System; nor would the Service be meeting a public use demand. If hunters decreased because they want to hunt multiple species, then the Refuge's biological goal of increasing deer harvest may not be met. There would be no increased conflict between hunters and other wildlife-dependent recreational users. This alternative will have little if any impact on other wildlife-dependent recreation on the Refuge due to those uses being utilized primarily when the hunting season is closed.

Alternative 3 (No Action): Do not open Canaan Valley National Wildlife Refuge to hunting;

This alternative would close the Refuge to all forms of hunting. The public would not have the opportunity to participate in wildlife-oriented recreation that is compatible with the purposes for which the Refuge was established, have an increased awareness of Canaan Valley National Wildlife Refuge and the National Wildlife Refuge System; nor would the Service be meeting a public use demand. This alternative would have no impact on other wildlife-dependent recreation programs.

2. Refuge Facilities

Alternative 1 (Proposed Action): Open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia with some exceptions;

Under the proposed action, periodic maintenance or improvement of existing parking areas, roads, trails, and other infrastructure will cause minimal negative impacts. Current maintenance on Refuge roads and trails is performed for all wildlife-dependent users. There are two existing hunt blinds that require minimal maintenance; but this requirement will not increase with the proposed action. Maintenance of these facilities may cause some wildlife disturbances and small-scale, site-specific vegetation and soil damage. These activities would be timed to cause the least amount of disturbance to wildlife. All disturbed vegetation sites would be restored to as natural a condition as possible.

In summary, the hunt program on the Refuge is not likely to have significant negative impacts to Refuge facilities, including parking areas, roads, trails, and other infrastructure.

Alternative 2: Open Canaan Valley National Wildlife Refuge to white-tailed deer hunting only;

Since the majority of our hunters are deer hunters, maintenance requirements will be similar to Alternative 1. Current maintenance on Refuge roads and trails is performed for all wildlife-dependent users. There are two existing hunt blinds that require minimal maintenance; but this requirement will not increase with the proposed action. Maintenance of these facilities may cause some wildlife disturbances and small-scale, site-specific vegetation and soil damage. These activities would be timed to cause the least amount of disturbance to wildlife. All disturbed vegetation sites would be restored to as natural a condition as possible.

Alternative 3 (No Action): Do not open Canaan Valley National Wildlife Refuge to hunting;

Under this Alternative, periodic maintenance or improvement of existing parking areas, roads, and trails will still be necessary as under Alternative 1. Current maintenance on Refuge roads and trails is performed for all wildlife-dependent users. However, costs and time associated with maintenance of two existing hunt blinds, instructional sign needs, administrative and law enforcement associated with running a large hunt program would not be applicable. The percentage of hunters versus other users of facilities is low. Therefore, road, parking area, and trail maintenance costs will not change significantly under this alternative.

3. Cultural Resources

Alternative 1 (Proposed Action): Open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia with some exceptions;

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; 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.

Service acquisition of land with known potential archaeological or historical sites provides two

major types of protection for these resources: protection from damage by federal activity and protection from vandalism or theft. The National Historic Preservation Act requires that any actions by a Federal agency which may affect archaeological or historical resources be reviewed by the State Historic Preservation Office, and that the identified effects must be avoided or mitigated. The Service's policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible.

Land acquisition by the Service would provide some degree of protection to significant cultural and historic resources. If acquisition of private lands does not occur and these lands remain under private ownership, the landowner would be responsible for protecting and preserving cultural resources. There are not anticipated adverse cumulative impacts to this resource on or off the Refuge resulting from implementing the proposed action.

This alternative would not increase hunter activity or require any type of construction, such as new trails or roads, and therefore, impacts on the Refuge's cultural resources will be minimal. Development of existing roads, trails, and structures would have previously required review by the Service's regional archeologist and notification to the States Historic Preservation Office, as mandated by Section 106 of the National Historic Preservation Act. The Service's policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible.

Archaeological surveys and other information collected on the Refuge indicate that there are six cultural sites, one of which is a possible pre-historic Native American site, and the other five are settlement sites that date from the late 1800's. The Native American site had pieces of chert, a rock not naturally found in this area. Its presence indicates that in the Valley there may have been trading between tribes. This location is in an area closed to hunting, so no impacts are anticipated.

The settlement sites are made up of two graves and three foundations that could have been cabins. These sites, while located in hunting zones, are locations relatively unknown to the public, and therefore, no impacts from hunters are anticipated. Furthermore, since this alternative requires no development of new trails, roads, or other facilities, it will not have a negative effect on the Refuge's cultural and historic resources.

In summary, the hunt program on the Refuge is not likely to have significant negative impacts to Refuge cultural resources.

Alternative 2: Open Canaan Valley National Wildlife Refuge to white-tailed deer hunting only;

This alternative requires no development of new trails, roads, and other facilities, and therefore will not have a negative effect on the Refuge's cultural and historic resources.

Alternative 3 (No Action): Do not open Canaan Valley National Wildlife Refuge to hunting;

This alternative would decrease the number visitors that go off-trail, since only hunters are allowed off-trail access. This alternative would not have a negative effect on the Refuge's cultural and historic resources.

C. Anticipated Impacts of Proposed Hunt on Refuge Environment and Community

Alternative 1 (Proposed Action): Open Canaan Valley National Wildlife Refuge to hunting as regulated by the State of West Virginia with some exceptions;

This alternative will not have any sizeable impacts on the Refuge environment, adjacent lands, or nearby residents, which includes soils, vegetation, air quality, water quality, and solitude. Some disturbance to the soils and vegetation is expected in areas open to hunting, but impacts will be minimal. Hunting would benefit vegetation by keeping resident herbivore wildlife populations in balance with the carrying capacity of the habitat. Impacts on physical resources resulting from trampling of vegetation are expected to be minimal and temporary as vegetation would recover. Wildlife and vegetation surveys, data, and personal communications with other scientists, state biologists, and universities, have led the staff of Canaan Valley NWR to believe that the high density of deer cause more damage to vegetation than hunters.

Air quality and water quality impacts would be minimal and only due to Refuge visitors' automobile emissions and run-off on roads and trails. This effect would not only come from hunters but from a majority of users of wildlife-dependent recreation on the Refuge. The effect of these Refuge-related activities, as well as other management activities, on overall air and water quality in the region are anticipated to be relatively negligible, compared to the contributions of power plants, industrial centers, and non-Refuge vehicle traffic. Existing State water quality criteria are adequate to achieve desired on-Refuge conditions. Therefore implementation of the proposed action would not impact adjacent landowners or uses beyond the constraints already implemented under existing State standards and laws.

Impacts associated with solitude are expected to be minimal, given time and space zone management techniques, such as seasonal access for hunting and area closures, both which are used to avoid user conflicts. If hunters increase, the Refuge can limit permits to ensure a quality hunting experience.

The cumulative effect of closing refuges to hunting may result in decline in social and financial support for wildlife conservation, as hunters have provided, through purchases of hunting licenses and migratory bird conservation stamps, and taxes levied on purchases of hunting equipment, a steady stream of revenue to build the National Wildlife Refuge System, and to restore upland and wetland habitats on millions of acres of public and private lands across the country. (USFWS, 2000). These habitat projects also benefit migratory songbirds and other

wildlife. Conversely, the cumulative effect of closing refuges to hunting may result in decline in duck stamp and hunting license sales, leading to a decline in funds for conservation. The cumulative effect on closing refuges to hunting may be reduced conservation of wildlife habitats if the above revenues are not replaced by another source.

This alternative will provide recreational opportunities at Canaan Valley NWR to hunters from all over the country. Data collected between 2002 and 2005 indicate that an average of 891 people hunt on the Refuge every year. These hunters come from approximately 18 different states. This activity and program produces a positive impact on Refuge management, visitor attitudes, and the local economy. The local purchases of gas, food, lodging, hunting licenses, equipment, and supplies, from mostly out-of-state hunters contributes significantly to the local economy. In 2004, total hunting visitor expenditures in a tri-county area (Tucker, Marion, Monogalia) was 54,800 (USFWS, 2005). Hunters spread the word to their friends, encouraging them to come to the area to take advantage of the high quality recreation and, thus, positively, affect the economy of the area. Deer hunting would also contribute to the reduction of vehicle damage and human injury from collision between deer and vehicles. In 2004 nearly 19,000 deer were reported killed by collision with vehicles in West Virginia.

Increased hunting opportunities would increase the number of licenses and duck stamps sold, as well as the amount of locally purchased hunting supplies. An increase in hunting opportunities on the Refuge will not affect the Refuge's non-consumptive users; therefore there will not be a negative impact on the contributions already made to the local economy by non-consumptive users.

In summary, the hunt program on the Refuge is not likely to have significant negative impacts to Refuge environment, adjacent lands, or nearby residents, which includes soils, vegetation, air quality, water quality, and solitude. There is also not likely to be a negative impact on the community as there most likely will be a positive economic benefit from the hunt program.

Alternative 2: Open Canaan Valley National Wildlife Refuge to white-tailed deer hunting only;

Under this alternative, the impacts to the Refuge environment (soil, vegetation, air quality, water quality, and solitude), adjacent lands, or nearby residents are expected to be the same as Alternative 1. This alternative may have different impacts to the local economy, but not significant. Data collected between 2002 and 2005 indicate that an average of 891 people hunt on the Refuge every year. Approximately 727 of those visitors hunt deer. The slight decrease in numbers may decrease the impact on the local economy as fewer visitors would contribute to the local purchase of gas, food, lodging, hunting licenses, equipment, and supplies. Yet, deer hunters would spread the word to their friends, encouraging them to come to the area to take advantage of the high quality recreation and, thus, positively, affect the economy of the area. Deer hunting would also contribute to the reduction of vehicle damage and human injury from collision between deer and vehicles. Overall, the decrease in hunters would be minimal and would not have a

negative impact on the contributions already made to the local economy by non-consumptive users.

Alternative 3 (No Action): Do not open Canaan Valley National Wildlife Refuge to hunting;

This alternative would decrease the numbers of visitors to the Refuge and the local community. There will not be any sizeable impacts on the Refuge environment, which includes soils, air quality, water quality, and solitude, and adjacent lands or nearby residents. Air quality and water quality impacts would be reduced and only due to Refuge visitors' automobile emissions and run-off on roads and trails. This effect would come from users of other non-hunting wildlife-dependent recreation on the Refuge. The effect of these Refuge-related activities, as well as other management activities, on overall air and water quality in the region are anticipated to be relatively negligible, compared to the contributions of power plants, industrial centers, and non-Refuge vehicle traffic. Existing State water quality criteria and use classifications are adequate to achieve desired on-Refuge conditions.

Data collected between 2002 and 2005 indicate that an average of 891 people hunt on the Refuge every year. These hunters come from approximately 18 different states. This program produces a positive impact on Refuge management, visitor attitudes, and the local economy. The local purchases of gas, food, lodging, hunting licenses, equipment, and supplies, from mostly out-of-state hunters contributes significantly to the local economy. Hunters would spread the word to their friends, encouraging them to come to the area to take advantage of the high quality recreation and, thus, positively, affect the economy of the area. Deer hunting would also contribute to the reduction of vehicle damage and human injury from collision between deer and vehicles. Under this alternative, the Refuge and the local economy would see a negative impact in the contributions to the local economy.

D. Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

The Refuge has been working with the West Virginia DNR to designate parts of CVNWR as a "Special Hunt" area. Refuge staff anticipates that this Special Hunt designation will allow more flexible management of white-tail deer populations and vegetation communities. Any Special Hunts conducted on the Refuge would fall within the state regulations for length and timing of seasons. If the Special Hunt designation is approved, the Refuge goal will be to increase deer harvest in order to reduce deer density. This decrease in population would allow a recovery of the forest and other plant communities, enabling improved habitat conditions for the white-tail deer and other game and non-game species. The increase in hunter-use days is expected to increase hunter spending into the local economy of Tucker County.

In addition, Canaan Valley National Wildlife Refuge is currently evaluating all Refuge uses and management including the hunting program as part of the Comprehensive Conservation Planning

(CCP) process. This process includes an environmental assessment and will re-evaluate cumulative impacts and other past, present, proposed, and reasonably foreseeable hunts and anticipated hunts.

However, until the completion of the CCP and designation of CVNWR as a Special Hunt area, there are no reasonably foreseeable hunts and anticipated impacts in addition to the impacts of the Proposed Action. Consequently, no additional direct or indirect cumulative impacts will occur under the Proposed Action.

Alternative 2 proposes to open Canaan Valley National Wildlife Refuge only to white-tail deer hunting. Because the only foreseeable "Special Hunt" is for white-tailed deer, there are no additional anticipated impacts to those described for the Proposed Action.

There are no additional anticipated impacts from reasonably foreseeable hunts if Alternative 3 is implemented because the Refuge would be closed to hunting.

E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate

U.S. Fish and Wildlife Service staff recognize that all uses of refuge lands create some impact to refuge wildlife and their habitats. These uses, when taken together, have the potential to create accumulating impacts as the number of uses increases. Because of the potential to create accumulating impacts, refuge uses are limited to those uses which have been formally determined to be compatible with the purposes for which the refuge was established and with the Mission of the National Wildlife Refuge System. When these formal compatibility determinations are reviewed (every ten to fifteen years depending on the use) possible accumulating impacts that may have occurred in succeeding years will be considered and will be addressed as necessary.

Hunting for deer, small game, turkey and waterfowl is a historical use of the Valley, long before the establishment of the Refuge. This cumulative impact analysis has looked at each type of hunting allowed on refuge lands and has discussed the impacts associated with individual hunt programs. In this section, potential impacts of all hunts taken together will be addressed.

When considering the accumulation of impacts of the proposed action, the overlap of hunting seasons in space and time, patterns of hunter use by time of year and habitat, and impacts on other Refuge program must be evaluated.

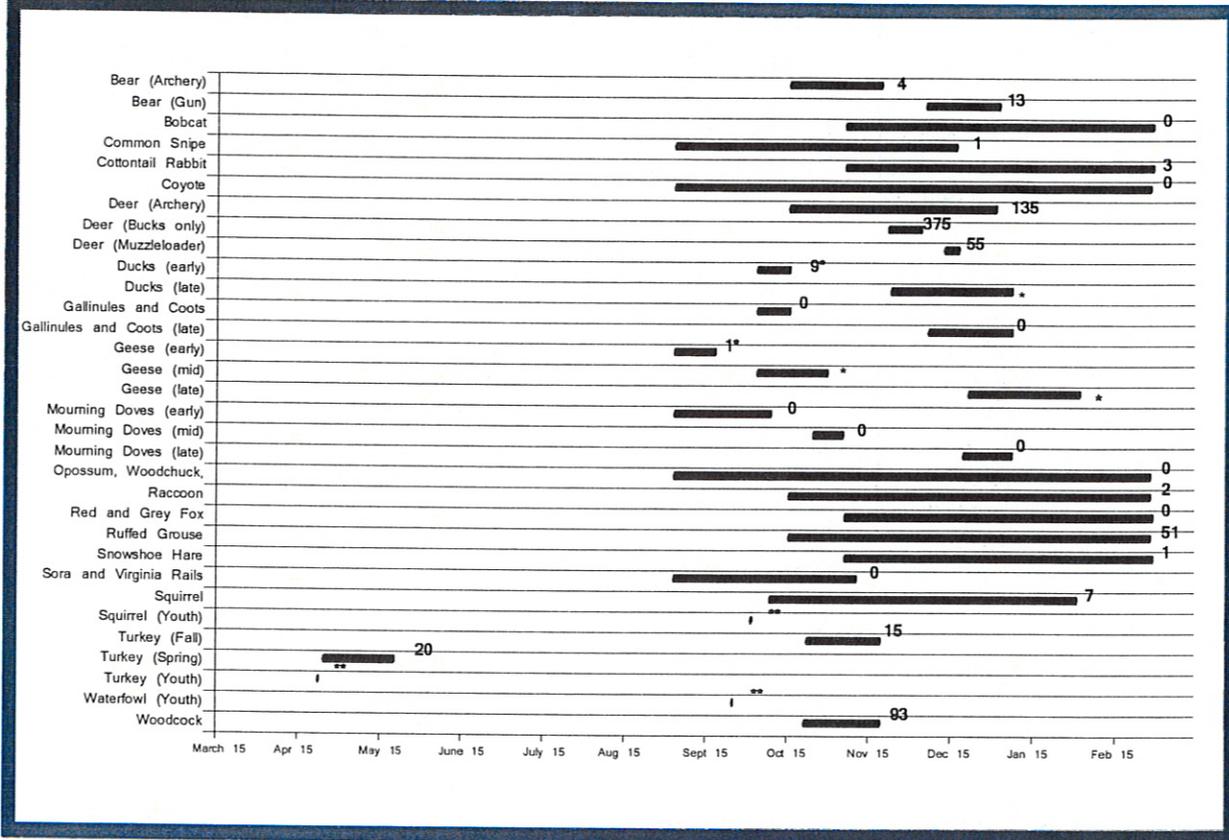
To evaluate hunter use by time of year and habitat type, the best data available to the Refuge are hunting season dates, hunter permits, and hunter interviews (surveys). The following table shows the refuge hunting seasons, along with the dates when these seasons are open (Table 1). The total number of days in which hunting occurs is 207. This is 56% of the year. During the hunting season as well as during the remainder of the year when hunting is not permitted, the public can participate in the other five priority public uses identified in the National Wildlife Refuge System Improvement Act of 1997.

Table 1. Open hunting seasons at Canaan Valley National Wildlife Refuge.

<i>Species</i>	<i>Season Open</i>	<i>Season Closed</i>	<i>Length of Season (days)</i>
Bear (Archery)	October 14, 2006	November 18, 2006	34
Bear (Gun)	December 4, 2006	December 31, 2006	27
Bobcat	November 4, 2006	February 28, 2007	114
Common Snipe	September 1, 2006	December 16, 2006	105
Cottontail Rabbit	November 4, 2006	February 28, 2007	114
Coyote	September 1, 2006	February 28, 2007	177
Deer (Archery)	October 14, 2006	December 31, 2006	77
Deer (Bucks only)	November 20, 2006	December 2, 2006	12
Deer (Muzzleloader)	December 11, 2006	December 16, 2006	5
Ducks (early)	October 2, 2006	October 14, 2006	12
Ducks (late)	November 21, 2006	January 6, 2007	45
Gallinules and Coots (early)	October 2, 2006	October 14, 2006	12
Gallinules and Coots (late)	December 5, 2006	January 6, 2007	31
Geese (early)	September 1, 2006	September 16, 2006	15
Geese (mid)	October 2, 2006	October 28, 2006	26
Geese (late)	December 20, 2006	January 31, 2007	41
Mourning Doves (early)	September 1, 2006	October 7, 2006	36
Mourning Doves (mid)	October 23, 2006	November 4, 2006	11
Mourning Doves (late)	December 18, 2006	January 6, 2007	18
Opossum, Woodchuck, Skunk	September 1, 2006	February 28, 2007	177
Raccoon	October 14, 2006	February 28, 2007	134
Red and Grey Fox	November 4, 2006	February 28, 2007	114
Ring-necked Pheasant	November 4, 2006	January 6, 2007	62
Ruffed Grouse	October 14, 2006	February 28, 2007	134
Snowshoe Hare	November 4, 2006	February 28, 2007	114
Sora and Virginia Rails	September 1, 2006	November 9, 2006	68
Squirrel	October 7, 2006	January 31, 2007	114
Squirrel (Youth)	September 30, 2006	September 30, 2006	1
Turkey (Fall)	October 21, 2006	November 18, 2006	27
Turkey (Spring)	April 23, 2006	May 19, 2006	26
Turkey (Youth)	April 21, 2006	April 21, 2006	1
Waterfowl (Youth)	September 23, 2006	September 23, 2006	1
Woodcock	October 20, 2006	November 18, 2006	28

An average of 1884 hunters per year received permits to hunt on the Refuge from 2002-2005. An average of 1138 hunters per year (60%) returned survey forms reporting whether or not they hunted and if they did hunt, what species were taken, and method of harvest. This information was used to calculate the average numbers of hunters reporting to use the Refuge during each of the open hunting seasons (Figure 1). Because of the discrepancy between the number of hunters receiving permits and the number of hunters returning the surveys, the number of actual hunters may be greater than the numbers reported here.

Figure 3. Hunting seasons for species hunted on Canaan Valley National Wildlife Refuge and the average number of hunters per year reporting hunting during these seasons (2002-2005).



* denotes migratory birds with multiple seasons. CVNWR has not kept records of hunter use distinguishing between multiple seasons. The number reported crosses early, middle, and late seasons for the species.
 ** denotes youth hunts. CVNWR has not kept records of the number of participants in the youth hunts separate from the regular season for the respective species.

An average of 16% of hunters reported hunting bear, deer, and turkey, but did not report the season during which they hunted (Table 2). These numbers were not included in the tally of hunters documented in Figure 1. Evaluation of the number of hunters per year during each season must take into consideration the absence of these data.

Table 2. Average number and percentage of hunters with unknown hunting seasons for species with multiple open seasons.

species	# not reporting season	% of total hunters for the species
bear	7	30
deer	18	34
turkey	93	14

Many hunting seasons overlap and hunters often take advantage of this overlap and hunt concurrently for several species. For example, a hunter may report hunting for deer, bear, squirrel, and turkey during the fall. We recorded this as one hunter for each species (four people), but the physical impact is actually of only one person.

Migratory birds, upland small game, and upland big game are hunted within Canaan Valley National Wildlife Refuge. Canaan Valley is composed of two broad habitat classes (upland and wetland) and wildlife species are typically associated with one or the other of these habitat types. The combination of topography of the Valley—a low basin of wetlands enclosed by upland slopes—and access entry points to Refuge lands conveys certain usage patterns by hunters. Hunters accessing the wetlands for migratory bird hunting must cross and potentially disturb upland habitats. Hunters focusing on upland small and big game are less likely to cross wetlands, limiting disturbance to this habitat type.

Hunting occurs during the fall, winter, and spring. Each season of the year offers a different set of circumstances which may be affected by the presence of hunters. The impacts of overlapping seasons and hunter movements through habitats are considered below.

Fall and winter seasons

Both upland and wetland habitats are hunted during the fall. Migratory birds hunted on the Refuge, except mourning doves, are found in the wetlands and surrounding poorly drained shrublands. Hunters must cross upland habitats to reach suitable areas for hunting species such as woodcock, geese, snipe, and other waterfowl. The open seasons for these migratory bird species begin in early September (snipe, rails, gallinules) and end in late January (geese). Between 2002 and 2005, the Refuge averaged 104 hunters per year for these species, with the majority hunting woodcock (93 per year). The woodcock season is typically 28 days, mid-October to mid-November. Woodcock and waterfowl may be hunted with dogs.

The upland big game seasons (deer, bear, and turkey) extend from mid-October to late December. Between 2002 and 2005, there was an average of 597 hunters per year reporting that they hunted for these species during the fall seasons. Most of these hunters (63%) were hunting white-tail deer using a rifle or shotgun during the twelve-day gun season. This deer season is the most intensely hunted season on the Refuge. During the bear seasons, a total of 61 days, pursuit dogs may be used.

Hunting for upland small game occurs between early September and late February. Ruffed grouse is the most popularly hunted species, with a four-year average of 51 hunters per year during the 134 day season. Ruffed grouse hunters account for 84% of the 64 small game hunters per year average. Dogs can be used to hunt grouse, raccoon, rabbit, and hare.

The fall and winter seasons during which these migratory and upland game species are hunted are past the breeding season for most wildlife species. Deer and bear are an exception. Deer are in rut

in October and November. Hunting during this season is not expected to impact the breeding of other wildlife species. Hunting activities occur when deer are courting and mating. Winter is a difficult time of year for deer to find food and move through deep snow cover. Disturbance to deer during times of deep snow cover can lead to depletion of a deer's stored resources. Although bear may have already bred by the bear hunting season, females are typically pregnant. Excessive harvest of pregnant females could have negative impacts to the local population. Current State seasons have not impacted bear populations, which are showing an increasing trend under State guidelines.

Fall is the season for bird migration, and hunting may disturb their resting and foraging during this critical time, however the impacts are not known, but related to the frequency, type, and duration of the disturbance. For example, a woodcock hunter with a dog is more likely to flush woodcock (and other migratory bird species), than a woodcock hunter without a dog. If one area is hunted more than another, woodcock using that cover will be disrupted more frequently. Also, if an area is hunted in the morning and again in the evening, the duration and effect of disturbance is increased. Migrating and wintering raptors such as ruffed legged hawks may be hunting and roosting in upland and wetland habitats. Hunting activity may cause these birds to unnecessarily take flight, expending energy resources when food resources are limited. Nesting of some species of owls and raptors begins in late winter. The effects on the breeding success of these nesting birds caused by hunters passing in the vicinity of the nest is unknown.

Vegetation is entering dormancy during the fall, and little impact is expected from hunters during this period. Snow cover in winter often protects herbaceous and short-shrubby vegetation from damage by hunters. Trampling in organic soils such as found in the wetlands of the Refuge is known to cause soil compaction which leads to erosion and inhibits plant regeneration. At current hunter density, trampling has not caused irrecoverable damage to the wetland soils and vegetation. Upland big game hunting is expected to have a minimal impact on wetland plant or animal communities because few hunters cross wetlands to access upland areas.

Spring season

Hunting during the spring season is limited to male turkey, an upland game species. The season is typically 26 days long, between late April and mid-May. Between 2002 and 2005, an average of 20 hunters reported hunting during the spring turkey season. Because turkey is an upland species, hunters are less likely to enter wetland habitats. Their disturbance to other wildlife species and vegetation is concentrated on upland habitats.

Migratory birds, especially landbirds, are in the peak of migration during the spring turkey open season. Hunters using upland habitats may temporarily disrupt the migrating birds' feeding and resting. Most herbaceous and woody vegetation is beginning to produce the year's new leaves and spring ephemeral wildflowers are in bloom. Trampling of the understory vegetation may damage individual plants and reduce their reproductive potential for the year. Damage to shrubs and trees by hunters is expected to be minimal.

Threatened and endangered species

Grouse, snowshoe hare, turkey, deer, bear, cottontail rabbits, and other small upland game are hunted in the upland mixed spruce-northern hardwood forests of the Refuge. These spruce-hardwood forests also provide habitat for the endangered West Virginia northern flying squirrel and the threatened Cheat Mountain salamander. Hunted species which are most likely to be found in the spruce-northern hardwood forests are grouse and snowshoe hare. Dogs can be used to hunt several of the species sharing this habitat.

Spruce-northern hardwood forests account for 2% of the upland habitats available on the Refuge. Between 2002 and 2005, an average of 624 hunters per year reported hunting species that can share habitat with these threatened and endangered species. Because the amount suitable habitat for the salamander and northern flying squirrel is a small portion of all upland habitats, the number of hunters using the spruce-northern hardwood forests is expected to be a similar proportion.

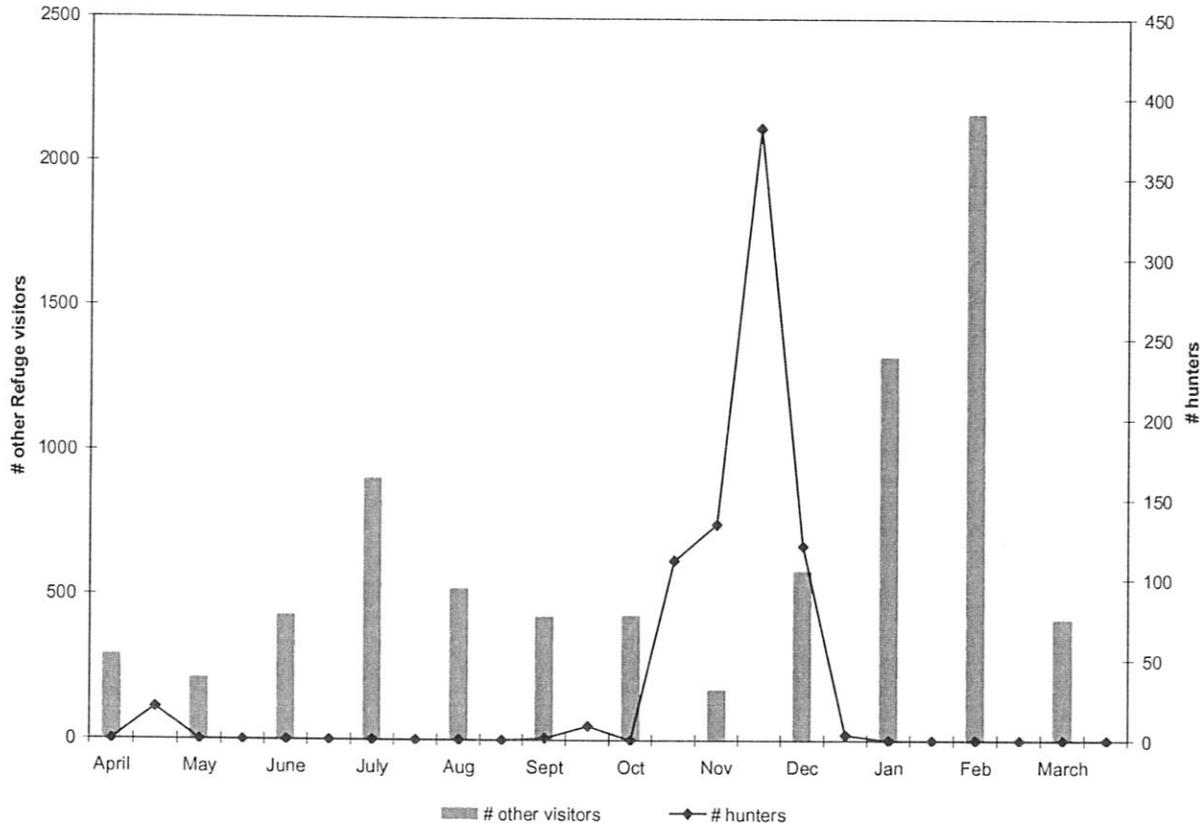
The northern flying squirrel is nocturnal and thus active at night. The species nests during the day in tree dens and drey nests, and occasionally in ground nests. Hunting activity may temporarily disturb the northern flying squirrel especially if ground nests are used. However, no information is available on hunter impacts to the species' longevity or breeding success.

The Cheat Mountain salamander is also nocturnal. During the day, it may be found under rocks or logs on the forest floor, and at night under appropriate conditions, it may be seen crawling on the forest floor during spring and summer, and early fall. During most of the hunting season the salamander is inactive and under the surface. No information is available on the impacts of hunters to this species; however, because of its secretive and protective daytime niches and the absence of nighttime hunting during the seasons when it is active, impact by hunting is expected to be negligible.

Other Refuge uses

Hunting use of the Refuge is highest in the fall and spring. Other Refuge uses have the highest number of visitors during the winter and summer (Figure 2). Impacts by hunting to other Refuge uses do not appear to be accumulating nor considered significant.

Figure 4. Numbers of visitors to Canaan Valley National Wildlife Refuge for hunting and other activities.



Under the proposed action (Alternative 1), based on the accumulated impacts described above, no significant impacts to Refuge resources are anticipated if individual hunts are allowed to accumulate. With the hunting of white-tail deer only (Alternative 2), hunting will be restricted to the fall and early winter seasons and hunting seasons for multiple species will not be open concurrently. Primarily upland habitats will be utilized by hunters. No significant accumulated impacts are expected with Alternative 2. If the Refuge is closed to hunting of all species (Alternative 3), there will be no accumulation of individual hunts or anticipated impacts from these hunts.

VI. Consultation and Coordination

A. Planning

During the original and the most recent planning stages of developing the hunt proposal the refuge manager was in direct contact with several individuals and organizations from the local area. Through informal discussions, the refuge manager was able to identify several needs and concerns of these affected persons and groups early in the planning process. As the agency responsible for managing the state's wildlife and plant populations, we work closely with the West Virginia Division of Natural Resources on the Refuge's hunt program.

The Service recognizes the States expertise in regulating wildlife populations for sustainable harvest. Under State regulations and management, game populations throughout the state have remained stable or have increased. As such, the Refuge has adopted State seasons and regulations to be applied to the Refuge's hunting program. Several informal meetings with the staff of the West Virginia Division of Natural Resources (DNR) were held during 1996 and 1997. Additional conversations were held with biologists from the DNR and the Service while amending this EA in 2007.

We will continue to consult and work closely with the State as we work through the CCP process to ensure that the Refuge hunt program meets State and Refuge goals and objectives.

B. Public Involvement

In 1997, extensive public involvement was sought by the broad distribution of documents, publication of news releases and advertisements, and an open house and public meeting. This amended EA was released for public review beginning March 15, 2007 and the comment period was closed on April 15, 2007.

1. Documents

The 2007 Draft Amended EA was available at four libraries in Tucker and Randolph Counties and at U.S. Fish and Wildlife Service offices in Elkins and Canaan Valley as well as on the internet through the Refuge's website.

2. News Releases and Advertisements

For the 2007 Draft Amended EA, news releases were sent out to over 20 news outlet sources in West Virginia and paid advertisements were posted twice in the *Parsons Advocate and the Elkins Intermountain*.

3. Open House and Public Meeting

While there was no open house or public meeting for the 2007 Amended EA, there was information and a copy of the Draft EA available on the Refuge's website <http://canaanvalley.fws.gov> and at the Refuge Headquarters.

C. Summary of Comments

For the original 1997 Final EA, 44 comments were received, seventeen comments from local people were in support or not opposed to the plan. Fifteen of those had specific comments or requested clarification of an issue. Five local people were opposed to all hunting on the Refuge, and six locals opposed bear hunting with hounds. Sixteen comments were received from non-local people, and all objected to bear hunting with hounds. Two of these messages came from Europe, and three were from national or international animal rights organizations.

For the 2007 Amended EA, there were eight comments received from individuals and four comments received from organizations and agencies; W.V. Department of Natural Resources, Safari Club International, Humane Society of the United States, and the U.S. Sportsmen's Alliance. Summary of comments with responses can be found below in Section D.

D. Responses to Comments

1. 1997 EA Comments:

During the 1997 EA process, each of the local residents who sent written comments received copies of the Final Environmental Assessment and Hunting Management Plan. Each received a letter stating a response to their comment(s). In several cases, the Refuge-specific regulations in the Hunting Management Plan were changed or clarified in response to these comments. Examples include establishing safety zones around the housing areas adjacent to the rifle hunting zone, specifying that blaze orange is required for deer gun hunters only (not archery hunters), specifically excluding handguns from the no rifle zone, etc. In some cases requested changes were not made, and the reason for not making the change were given; in most cases it was already explained in the Compatibility Determination for the specific type of hunting. For example one commenter objected to not hunting unprotected birds such as crows; the compatibility determination includes data which show that many hunters cannot distinguish them from protected species. Local commenters who objected to all hunting on the Refuge were informed about the laws and policies governing the National Wildlife Refuge System which allow--and even encourage--hunting on refuges if it is compatible with primary refuge purposes. More than half of commenters objected to hunting bears with hounds. For more details on the Refuge's response, please refer to the Final 1997 Hunt EA document.

2. 2007 Amended EA Comments:

General --The Refuge received eight comments from public individuals all supportive of the preferred alternative and the hunt program in general. One individual commented that they supported hunting on foot, but requested that no additional vehicle access for hunting be considered. Another individual stated that they support hunting and requested that the Refuge allow youths to harvest antlerless deer during gun season. Although no changes were made to the EA, these recommendations will be considered further as part of the CCP process.

Organizations/Agencies - There were four comment letters received from international, national, and state organizations. A summary of their comments and the Refuge's responses follow:

A. West Virginia Department of Natural Resources:

GENERAL RESPONSE: The Service recognizes the States' expertise in regulating wildlife populations for sustainable harvest. State seasons and bag limits have strongly guided the development of the Refuge hunt program, initially in 1997, and in our current 2007 revision.

We look forward to a continued partnership with the State as we proceed with the CCP process to ensure that the Refuge hunt program meets State and Refuge goals and objectives.

COMMENT:

- Page 7(2) – This alternative should also be rejected because there is no biological justification for it, the restrictions placed on the proposed alternative are impeding the realization of the deer harvest objectives.

RESPONSE: We changed the document (page 7) to reflect our concurrence that this alternative would not allow the Refuge to meet deer harvest objectives.

COMMENT:

- Page 7(C)(1)(1) – Non-toxic shot is only required to hunt waterfowl on the refuge.

RESPONSE: We have changed the document (page 7) to reflect the change to allow lead shot for species other than waterfowl. However, the Service is concerned about the use of lead shot near or on wetlands and will gather more information and address this during the CCP process.

COMMENT:

- Page 10(6) – Despite being unnecessary, the rifle zone is likely having the unintended effect of lowering the deer harvest in that area because the weapons allowed are not as efficient. We question the reasoning and necessity for restricting handguns. Regarding safety, state law restricts hunters from discharging a firearm within 500 feet of a residence and our data (see note on page 18) refutes the unfounded concern that a no rifle zone is necessary. State law was changed five years ago to allow hunters to use scoped muzzleloaders during muzzleloader season.

RESPONSE: We changed the document (page 10) to reflect the change in state law allowing hunters to use scoped muzzleloaders during muzzleloader season. The Service maintains its position that addressing public safety concerns is of primary importance, above the goals of habitat management. We designated no-rifle zones in areas of the Refuge where, according to public comments, the public perceived rifle hunting in proximity to residences as a hazard to human life and property. Refuge policy is also responsive to changes in local conditions. With the acquisition of more extensive tracts

of land in the southern portion of the Refuge that are less populated, we have opened areas of land to rifle hunting (e.g. the Kelly-Elkins tract). We will maintain our position of no hunting with handguns in no rifle-zones as part of our efforts to promote and continue public safety. Charges used for some handguns can cause a projectile/bullet from the gun to travel just as far as a rifle.

COMMENT:

- Page 10(9) – According to your regulations and in concert with state regulations, only deer gun hunters are required to wear 400 square inches of blaze orange.

RESPONSE: As stated on page 10 of the Hunt EA, a minimum of 400 square inches of blaze orange must be worn by all hunters, except for waterfowl, turkey and archery hunters. For waterfowl, turkey, and archery hunters, 400 square inches of blaze orange must be worn while traveling between stands and/or blinds. We realize that our Hunting brochure dated July 2006 stated otherwise and will make corrections to the brochure for the 2007 hunt season.

COMMENT:

- Page 10(14) – Under state management the bear population has flourished, what is the biological justification for shortening the season by a week?

RESPONSE: The 1997 Hunt EA was originally written to shorten the bear season by a week to avoid conflict between hunters that were hunting during the antlerless deer season so as to increase deer harvest. However, since the start of the hunt program, there have been no documentation of any hunter conflict and there have also been years with no antlerless seasons. We will evaluate changing the bear season during our CCP process.

COMMENT:

- Page 10(15) – Requiring bear hunters to check in and out implies there is someone present to do so, is staff present every morning of the season an hour before daylight and a few hours after dark to check hunters in?

RESPONSE: We no longer require bear hunters to check in and out with the Refuge. This change (page 10) has been made in the document.

COMMENT:

- Page 10(16) – Requiring a dog owner to hunt for his animal for three days seems absurd. Hunters who own, train and hunt with dogs do not want to lose them and will look for them until they are satisfied they cannot find them. Setting a minimum time to look for them is not up to the Service.

RESPONSE: We concur and will evaluate during the CCP process.

COMMENT:

- Page 11(17) – Is there a vetted biological justification for prohibiting dog training?

RESPONSE: Dog training is allowed on the Refuge. Such training can occur during the regular hunting seasons.

COMMENT:

- Page 12(1)(b) – The large no-rifle zone in the south is reducing the efficacy of harvest and likely contributing to the increase in deer density. All of our WMAs, forests and the National Forest share common boundaries with private landowners and none of these lands (approaching 1.5 million acres) have as restrictive a hunting regime as our Refuges.

RESPONSE: Refer to response to comments from Page 10(6).

COMMENT:

- Page 13(b,c,d,f) – See comments referencing bears made above. Additionally, if bear hunters using dogs begin their hunt on National Forest property but end up on the Refuge, what consideration will they receive if they are not in compliance with your regulations? It would be very difficult for them to stop mid-hunt and attempt to comply with some of the Refuge's regulations, e.g., check in check out, etc.

RESPONSE: Refer to responses to comments from Page 10(15) and 10(16).

COMMENT:

- Page 13, Upland (Small) Game, (2) – Presently, non-toxic shot is only required to hunt waterfowl on the refuge.

RESPONSE: Refer to response to comments from Page 7(c)(1)(1).

COMMENT:

- Page 18, Opossum, Skunk, and Woodchuck – While preserving woodchucks is within the purview of the Service, we take issue with the broad brushed statement: *“This does present a safety concern for the southern portion of the Refuge as hunters may be shooting over a field.”* We reviewed the previous six years of Hunting Incident Logs and found a total of four hunting related incidents in Tucker County. All involved deer hunters, two of which suffered heart attacks and two bow hunters fell out of their treestands. During this time frame, only one hunter statewide was injured while woodchuck hunting and he was an 82 year old with his finger in the muzzle when the gun discharged. Clearly, safety concerns are unwarranted and should not be identified here.

RESPONSE: We have changed the document (page 17) to reflect the statement that no hunting accidents have occurred during woodchuck hunting.

COMMENT:

- Page 21, Migratory Ducks and Geese – WV does provide migratory and wintering habitat for some of the Southern James Bay (SJB) population of Canada geese, but these birds do not migrate through Canaan, this is misleading. Harvest and trapping records indicate that SJB geese are found only in the western part of the state and no record exists of these birds being harvested or found on this refuge.

RESPONSE: We have changed the document (page 21) to reflect the statement that Southern James Bay Canada geese populations do not migrate through Canaan Valley.

COMMENT:

- Page 22, Mourning Dove – Is the nationwide decline in dove harvests attributable to declining populations, hunter effort, or both? If this information is available, it should be stated.

RESPONSE: The text was modified (page 22) to include a statement concerning this issue from the Mourning Dove Population Status Report (Dolton and Rau 2006).

COMMENT:

- Page 22, American Woodcock – Research and the Services position is presented regarding the importance of Canaan Valley as a major woodcock area. It is then followed up by “*Unfortunately, most of the studies conducted in Canaan Valley justifying these statements were done in the 1960’s and early 1970’s.*” The implication is that these studies and the data they present are now invalid. In addition to the two research papers cited, we call the Service’s attention to the 8 Masters Theses and 1 Doctoral Dissertation concerning woodcock in WV. Without data refuting the previously cited papers, this sentence presents an unnecessary bias. The second paragraph in this section begins with “*Very few woodcock surveys have been conducted in Canaan Valley over the past 20 years and current population levels are not well known.*” We point out that the Service has had management authority in this valley for almost the same amount of time and because surveys were not conducted does not mean that the populations have either disappeared or declined such that hunting opportunity should be reduced.

RESPONSE: The text (pages 22-23) has been modified to incorporate these concerns. The Service acknowledges the 8 Masters Theses and Doctoral Dissertation concerning woodcock in the State and Canaan Valley. Although these documents provide excellent documentation of woodcock habitat as well as document breeding biology in the State and Valley, fall population information is still apparently lacking from the pool of research available. The fall status of the hunted population of woodcock is information that the Service feels is under represented in the literature and should be a focus for Refuge investigation in the future. The Service hopes to work with the State and other partners on this issue as the Refuge moves forward with developing its Comprehensive Conservation Plan. Because woodcock populations are regulated on a flyway level and that current information (McAuley, 2005) re-affirms hunting as compensatory for woodcock populations, the Service is continuing to encourage woodcock hunting on the Refuge as is stated in this document.

COMMENT:

- Page 23 – Includes the following; “*The status of Canaan Valley as a “major” breeding area is also questionable, as the breeding population may also be declining.*” On the previous page, the lack of current data was mentioned, what data is this sentence based upon? The decline in woodcock habitat on the refuge is attributed to plant succession and declines in grazing, both under the control of the Service.

RESPONSE: Canaan Valley remains an important breeding area for woodcock in West Virginia. However, its current and past importance to the eastern flyway has been questioned by Service biologists (Greg Sepik, Hal Laskowski, personal communication). This sentence (page 23) referred to in this comment, however, has been removed because of its confusing structure.

COMMENT:

- Page 27 – The negative connotation of hunting impacts on wildlife begins on this page. After discussing how deer can impact vegetation the summary statement states in part: “*there will be little if any significant negative impacts of this alternative to the vegetation of the Refuge*”. If the purpose of this EA is to refute the litigant’s assertion that hunting is negative, and the data supports it, sentences like this should be positive e.g., lowering the deer density by increasing the antlerless harvest will have a positive benefit on plant regeneration or there will be no significant impact of this alternative...

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our understanding of the current available scientific information related to these issues.

COMMENT:

- Page 27(2)(a) – English sparrows and European starlings are not by definition game animals, they are “Unprotected birds” with no closed season.

RESPONSE: We agree. English sparrows and European starlings were removed from the text on page 27 (2)(a).

COMMENT:

- Page 27(1)(c) – Discusses starlings, house sparrows and crows and states “*Not all hunters can distinguish these birds from the protected species, such as resemblance of crows to ravens; therefore, hunting of these would be prohibited...*” Aside from two of these being nuisance exotic species everywhere else, what data was used to back up this statement? This statement makes hunters appear ignorant and willing to shoot anything which is rarely the case. While supporting the Services ability to regulate harvestable species, we are concerned that the staff is this disconnected with hunters and hunting.

RESPONSE: We concur and have removed the paragraph discussing starlings, house sparrows, and crows from the document.

COMMENT:

- Page 28(2) – According to Series 45 of the WV Legislative Rule, Spring Gobbler season opens the fourth Monday in April and runs for 27 consecutive days; therefore hunting is allowed within the March 1 to August 31 window.

RESPONSE: We adjusted the sentence to read “for upland small game” into the text on page 28 (2).

COMMENT:

- Page 28(6) – Presently, non-toxic shot is only a requirement for waterfowl hunters.

RESPONSE: Refer to comment above for Page 7(C)(1)(1).

COMMENT:

- Page 28, Ruffed Grouse – The WV Bowhunter Survey is an observational survey and reports grouse seen not flushed per 100 hours. The last sentence in the first paragraph states: “*Although the decrease in amount of early successional habitat favored by grouse is thought to be a major factor in the decline, other factors, such as hunting and non-hunting mortality may play a role.*” This sentence is both incorrect and misleading. The reduction of early successional stage habitat is not thought to be a major factor; it is THE factor that drives grouse populations. According to the Appalachian Cooperative Grouse Research Project (ACGRP) which included telemetry data from 3,118 birds captured and monitored from September 1996 through October 2002; hunting mortality averaged 12% and supported the hypothesis that harvest mortality is compensatory.

RESPONSE: We changed the word “flushed” to “seen” on page 28. The end of the first paragraph was amended to reflect the current research findings of ACGRP and the older citation (Allen 1996) was removed.

COMMENT:

- Page 29 (first paragraph) – The ACGRP is cited. If that project’s findings and data were comprehended, why end the previous paragraph alluding to hunting being a potentially significant contributor towards the decline of grouse.

RESPONSE: See response to Page 28 (above).

COMMENT:

- Page 29, Rabbits and Hare – Within this section it is stated that “*whether hunting is an additive or compensatory mortality factor for small game species is far from settled.*” The argument of hunting being compensatory or additive in the literature depends upon species in question and numerous site specific variables with the vast majority of papers concluding that hunting is compensatory. The problem we have with this statement is that it may confuse and unnecessarily

complicate the justification of hunting rabbits on this area. Its mere presence demonstrates a misunderstanding or appreciation for the minimal amount of impact hunters are having on rabbits on this Refuge (annual harvest = 4.25). Within the same paragraph, habitat loss is cited as one of the most important factors influencing populations of these species. This sentence should be changed to reflect that habitat is THE most important controlling factor. It ends with “*However, another study on rabbits (Rose 1977) indicated that hunting may be an additive mortality factor.*” This statement is both misleading and incorrect. Rose 1977, was working with *Sylvilagus floridanus* and not “rabbits” which could be construed to include *Sylvilagus obscurus*. An unbiased, thorough reading of Rose 1977 reveals that the mortality of cottontails in their study area was not significantly different from the reported mortality rates in the literature of their day. Additionally, he goes on to say “*The differing mortality rates for years which did and did not follow falls when hunting was allowed suggests that nonhunting mortality during the winter was not entirely compensatory. Instead, the nonhunting mortality was partly additive, resulting in higher mortality rates when there was hunting. Although hunting increased the total mortality, the fall populations were not correlated with hunting the preceding year (emphasis mine). Thus, greater mortality resulting from hunting was apparently compensated for by a greater production of young, by increased survival of young in summers or falls following hunting, or was masked by effects of other factors such as movements into the study area.*”

Given the low harvest of rabbits and hares on this Refuge, hunter harvest will not “likely impact” local or state population; it will not impact them at all.

RESPONSE: We agree that the Rose (1977) does not implicate hunting as being an additive mortality factor and was removed from the text. The body of the text was modified to reflect these comments.

COMMENT:

- Page 30, Raccoon, Foxes (Red and Gray) and Bobcat – Again, the data exists to say that the harvest of these animals will not significantly impact the local population, say that, not “will not likely.”

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our understanding of the current available scientific information related to these issues. However, text was modified to state “The Service concludes that it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.”

COMMENT:

- Page 31 – “*In conclusion, the harvest of small game species will likely have no direct significant impact to local or regional populations of these species*”; years of experience with these species, the research and literature coupled with declining hunter interest allows us to state unequivocally that the word “likely” is not necessary.

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our

understanding of the current available scientific information related to these issues. However, text was modified to state “The Service concludes that it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.”

COMMENT:

- Page 32, Black Bear – The last sentence of the second paragraph should be changed from “Current West Virginia harvest regulations do not appear to be limiting the population” to are not limiting the population. Within the third paragraph, bear hunting with hounds is traditional, not “*has also been.*” “*Some wildlife managers say that hounds destroy habitat and harass non-target species*” should either be attributed to the USFWS employee that believes this, supported with data or deleted.

RESPONSE: The text was modified to reflect these comments including adding the missing citation to the sentence in question.

COMMENT:

- Page 33 – Please delete the repeated “not likely” caveats and state “will not.” The data supports this conclusion.

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our understanding of the current available scientific information related to these issues. However, text was modified to state “The Service concludes that it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.”

COMMENT:

- Page 34 – While agreeing with the citation of the state status of black ducks, it should be qualified that the rank is due to the limited secluded breeding habitat statewide and that flyway or range wide, they are not rare or imperiled. Due to its location and hunter effort, waterfowl hunting in Canaan Valley does not and will not have any effect on waterfowl populations.

RESPONSE: The Service agrees that the habitat is the primary limiting factor in black duck population and resulting status in West Virginia. However, the statement made in the original text also reflects that the black duck is considered a species of management concern by the Service and is included in the draft list of “Game birds below desired Condition (GBBDC)” and as a “Bird of Management Concern” due to population data that indicates that black ducks are below long term averages and/or are experiencing population declines. The paragraph (page 28) was reworded to reflect this comment.

COMMENT:

- Page 35, American woodcock – After the statement “*and has been categorized as a “species in decline,”*” please add the qualifier due to habitat loss.

RESPONSE: The Service agrees and the text (page 35) was modified to reflect this comment.

COMMENT:

- The second paragraph is problematic at best. It begins with “*Conflicting information exists as to whether or not restricting hunting is an effective means to increase local breeding populations,*” and ends with “*restricting bag limits and season lengths are not supported by the literature as an effective means to protect breeding populations of woodcock*”. If Palmer (pers. com.) has data that is contradictory to the body of vetted research, we suggest he attempt to publish it, otherwise, we would defer to the published studies and omit his communication.

RESPONSE: This statement and citation were made in the approved 1997 Refuge Hunt EA which underwent thorough public and State review at the time. Because new information exists on this issue (McAuley et al 2005) and no information concerning the older citation (Palmer pers.com.) could be found in Refuge files, this statement (page 35) was deleted.

COMMENT:

- Page 35, Wilson’s Snipe – The first two sentences of the second paragraph “*An argument could be made that if this is indeed one of the southernmost breeding areas for this species, there may be some genetic variation in the population that needs to be protected. However, there is little or no information on snipe populations in Canaan Valley.*” introduce an unfounded bias that leads the reader to suspect that hunting snipe on this Refuge could be detrimental to the population. We believe that until proven this should be deleted.

RESPONSE: This statement, written in the approved 1997 Refuge Hunting EA, was likely used to illustrate the uniqueness of the breeding snipe population in Canaan Valley. Because no information could be found in Refuge files that support this statement, it was removed from the text (page 35).

COMMENT:

- Page 36, Summary – The harvest of migratory birds on this Refuge should be changed from “*not likely to have significant negative impacts*” to *will not impact* these populations. The data supports this positive statement.

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our understanding of the current available scientific information related to these issues. However, text was modified to state “The Service concludes that it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.”

COMMENT:

- Page 37(2)(a) – The first sentence introduces a bias against hunting that is pervasive throughout this document. It should be deleted and the sentence reworded to reflect that not hunting small game populations is typically offset by increased emigration and natural mortality.

RESPONSE: This sentence does note that not hunting small game populations may increase natural mortality. The text was changed (page 37) to remove the word “positively” and only indicate that

populations these species may grow.

COMMENT:

- Page 40(3) – The effect of hunters on the WV economy (documented in the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation prepared by the Service) was \$223 million. The data presented in the EA was \$53 million and from the 1991 survey.

RESPONSE: This was corrected in the text (page 40).

COMMENT:

- Page 41(B)(1) – The Ohio River Islands NWR does not permit grouse hunting because they did not feel that the islands were grouse habitat and they didn't want to, not because it was biologically necessary. It is similar to precluding quail hunting on this Refuge. The data exists to support grouse hunting, therefore the impact should *be* changed from its current negative "*will not likely cause significant impacts*" to will not impact populations.

RESPONSE: This statement was written to address potential additive impacts of all refuge hunting programs for ruffed grouse in the State as required. Regardless of whether or not Ohio River Islands hunts or does not hunt grouse, CVNWR must address this issue to comply with potential additive effects of all refuge hunt programs to hunted wildlife species in the state. Grouse hunting is supported by the Refuge as indicated.

COMMENT:

- Page 43 – "*Disturbance to non-target wildlife species is likely as a result of night hunting, especially given that most mammal species are most active at night.*" Without citations, this sounds like a personal opinion. Either provide the documentation or delete.

RESPONSE: The text (page 43) was modified in response to this comment.

COMMENT:

- Page 45 – Data is presented on the bear harvest that may be in error. The statewide 2005 harvest was 1634, Tucker County contributed 84 animals. We are unsure of where the 202 and 130 figures came from. At the end of this section the conclusion is again negatively slanted and should be reworded to be positive.

RESPONSE: The text (page 45) was edited to clarify this information.

COMMENT:

- Page 46 – Summary, The contribution of harvest from big game hunting on this Refuge "Will Not" impact these populations. Additionally, the impact of harvesting a few hundred more deer from this Refuge or the valley will have absolutely "No Impact" on deer populations on a regional or state level – not "will likely have significant impacts."

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our

understanding of the current available scientific information related to these issues. However, text was modified to state “The Service concludes that it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.”

COMMENT:

- Page 46(3) – The USFWS annually prescribes frameworks for hunting “Migratory Birds” not hunting in general.

RESPONSE: The text “migratory bird” was added (page 46) as noted to clarify the sentence.

COMMENT:

- Page 48, Waterfowl – It is stated “*Hunting season also does not overlap with the nesting season for non-hunted migratory birds and therefore, long-term future impacts are not likely,*” while true, this statement should end with “will not occur.” All of these “hedge” words imply a lack of surety on the Services part which is unwarranted.

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our understanding of the current available scientific information related to these issues. However, text was modified to state “The Service concludes that it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.”

COMMENT:

- Page 49, Rails, Gallinule, and Coot – It is stated that Refuge hunt surveys are voluntary; we were under the impression that Refuge hunt permits were contingent upon hunters submitting these surveys from the previous year. Additionally stated that from 2002-2006 “*there have been no rails, gallinules or coots harvested on the Refuge. The State opens hunting for rails in early September, therefore the possibility of disturbance to game and non-game wildlife in wetland areas could be an additive cumulative impact over time when taken in context with other hunting seasons focused on the same habitat.*” Using your own use data which clearly indicates that most hunters pursue deer and turkey (upland species), grouse and woodcock (not wetland dependent) and without data on disturbance, its significance and impact, this “concern” is unfounded opinion and should be deleted.

RESPONSE: The word “voluntary” was deleted and text (page 49) modified to reflect this comment. The Service acknowledges the low hunter participation for waterfowl and snipe hunting and makes this statement in the existing text. However, the statement in question was modified to include hunting, fishing and other approved public uses. These other uses, combined with hunting, must be considered when evaluating the potential for future additive impacts.

COMMENT:

- Page 49, Mourning Doves – Populations are increasing state and region wide, harvest on this Refuge is incidental at best and the conclusion for hunting them is “is not likely to have a significant impact”? Harvest of doves on this Refuge will have no impact whatsoever.

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our understanding of the current available scientific information related to these issues. However, text was modified to state “The Service concludes that it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.”

COMMENT:

- Page 50 – Habitat loss is the most important factor governing woodcock, not “is still considered” which implies that eventually something else, like harvest, will be the driving population factor.

RESPONSE: Comment acknowledged. We believe the population status of any species can change due to known or unknown factors and we must be sensitive to an ever-changing environment.

COMMENT:

- Page 51- Again, migratory bird harvest will not impact not “*is not likely to have significant negative impacts*” to those species on a local, regional or flyway scale.

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our understanding of the current available scientific information related to these issues. However, text was modified to state “The Service concludes that it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.”

COMMENT:

- Page 51(4) – This section begins with “*Hunter disturbance to non-hunted resident wildlife may be a negative cumulative impact*” but does not provide supporting data or applicable citations. This is clearly a biased opinion and should be deleted. Additionally, stated is “*Isolated encounters with small mammals, reptiles, amphibians, and invertebrates should not have cumulative negative effects on populations.*” This should be revised to “will not”. In the second paragraph you state that “*Disturbance to non-hunted migratory birds could have regional, local and flyway effects.*” Again, without data or applicable citations, unfounded statements like this are misleading and inflammatory. The same thing applies for the beginning of the last paragraph that says “Disturbance by hunting to non-hunted wildlife would be the most likely negative cumulative impact.”

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our understanding of the current available scientific information related to these issues. For citations on impacts to non-game wildlife species, please refer to 2003 Compatibility Determination to facilitate priority public uses.

COMMENT:

- Page 56(B)(1) – bicycling and horseback riding are not wildlife dependent uses identified in the 1997 Improvement Act. Conflicts either real or imagined between hunters and skiers must be

settled favoring hunting, since skiing is not a wildlife dependent use. We point out that the weapon restrictions designed to address “public safety concerns” are not based on safety data or statistics.

RESPONSE: The Service agrees that bicycling and horseback riding are not considered priority wildlife dependent uses. These uses are approved (compatible) methods to facilitate wildlife dependent recreation on the Refuge. The text was modified to correct this statement. In regards to potential conflicts between hunting and other activities that facilitate priority public uses (in this case cross-country skiing) the Refuge manager evaluates these issues as they arise and does not give priority to one priority public use over another. The National Wildlife Refuge System Improvement Act (1997) did not establish a hierarchy among priority public uses or develop a clear process for determining such a hierarchy. Because cross-country skiing on the Kelly-Elkins tract accounts for the Refuge’s largest outreach and wildlife observation opportunities during the winter months any conflicts with hunting must be carefully evaluated. Cross-country ski access onto the Refuge to facilitate wildlife dependent recreation exceeds our total number of hunters each year. On average about 4,000 visitors use the Kelly-Elkins tract for wildlife observation, education, interpretation and photography during the winter, while approximately 1,000 hunters use the entire Refuge.

COMMENT:

- Page 57, Summary- The hunt program so far has not had any impact so far, so why hedge and say “*is not likely to have significant negative impacts*”?

RESPONSE: Comment acknowledged. The Service believes that the analysis reflects our understanding of the current available scientific information related to these issues. However, text was modified to state “The Service concludes that it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.”

COMMENT:

- Page 57, Alternative 2 – Within this alternative should be a statement that this is in direct conflict with one of the primary justifications for refuge acquisition.

RESPONSE: The Service is unsure about the exact justification this comment is referring to. The founding legislation approved to allow the Canaan Valley NWR to begin acquiring and managing lands are the Emergency Wetland Resources Act (1986) and the Fish and Wildlife Act (1956). A summary of these legal purposes for the Canaan Valley NWR are as follows:

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...Ó 16 U.S.C. □ 742f(a)(4) "... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...Ó 16 U.S.C. □ 742f(b)(1) (Fish and Wildlife Act of 1956)

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and

conventions ... 16 U.S.C. § 3901(b), 100 Stat. 3583 (Emergency Wetlands Resources Act of 1986)

Reasons for acquiring and managing land were reflected in the statement of objectives for the Refuge as listed in the Station Management Plan (1994, p. 5), the Final Environmental Assessment (1994, Appendix A) and the Land Protection Plan (1994 p. 3). These objectives, as listed in the above documents are:

- 1). To preserve, restore, and enhance in their natural ecosystem (when practicable) all species of animals and plants that are endangered or threatened with becoming endangered.
- 2). To perpetuate the migratory bird resource.
- 3). To preserve a natural diversity and abundance of fauna and flora on refuge lands.
- 4). To provide an understanding and appreciation of fish and wildlife ecology and people's role in their environment, and to provide refuge visitors with high quality, safe, wholesome, and enjoyable recreational experiences oriented toward wildlife to the extent that these activities are compatible with the purposes for which the refuge was established.
- 5). Provide and develop habitat for waterfowl consistent with the preservation of existing ecosystems (found only in Land Protection Plan).

These purposes and objectives are the legal justification for acquiring land and managing the refuge. These do not appear to be in direct conflict with the listed Alternative. Nonetheless, the Service did not select this Alternative as is described in the text of the environmental assessment.

COMMENT:

- Page 61 – Rewrite the summary paragraph from a positive perspective instead of the negative one from which they have all been written.

RESPONSE: Comment acknowledged.

COMMENT:

- Page 62, Alternative 3 – If the second sentence is true, how can you argue that a reduction in deer density will have a positive impact on vegetation and regeneration?

RESPONSE: The Service agrees and has modified the text (page 62) to reflect this comment.

COMMENT:

- Page 63 – The last portion of the last paragraph implies that the refuge is closed to other uses during the hunting season which is not correct. Hunting is not conducted to the exclusion of other uses.

RESPONSE: The text was modified to make this distinction clearer.

COMMENT:

- Page 66 – Mentions the potential disturbance of upland habitats from hunters but does not discuss disturbance, how it is defined, identified or measured and if its been documented as being biologically or statistically significant to the specie(s) in question.

RESPONSE: This statement is purposefully general and implies that human presence traversing any wildlife habitat may cause disturbance to resident and migratory wildlife species and if numbers are great enough, soil compaction and erosion could also result. There are no statements made on significance as the statement was written to alert readers to possible ways that wildlife and habitats on the Refuge could be affected. This statement is particularly important in relation to overlapping hunting seasons, fishing access and other trail use for wildlife observation, education and interpretation. It is the Service's responsibility to acknowledge the potential additive effects of hunting in relation to all other compatible refuge public uses and management actions. The Service would be negligent without noting the potential for disbursed uses causing disturbance to wildlife and habitats the Refuge is bound to protect.

For more information on this topic the Service recommends interested parties review the Compatibility Determinations (2003), particularly for pedestrian travel to facilitate priority public uses on the Refuge.

COMMENT:

- Page 67- Bears breed June-July and have delayed implantation so are unlikely to be impacted. In a typical year, female bears hibernate before males and the bear gun hunting season is timed to coincide with this, thus removing even more females from potential harvest.

RESPONSE: Refer to response for Page 10(14).

B. Safari Club International:

The Safari Club International (SCI) and Safari Club Foundation (SCIF) submitted joint comments. They are a pro-hunting organization and submitted comments that were positive and in favor of the proposed alternative. The SCI was supported of the refuge hunt program. The Service acknowledges the comments.

COMMENT: SCI and SCIF question whether the authors of the draft EA missed an opportunity to consider the beneficial environmental impact of hunting for geese on other migratory bird populations living in and/or using the refuge. Overpopulations of Canada Geese, for example, have been recognized by other National Wildlife Refuge draft Environmental Assessments as potentially harmful to migratory bird habitat as well as to human populations. Consequently, SCI and SCIF recommend that the authors of Canaan Valley National Wildlife Refuge consider adding this element to their analysis of the impact of hunting on the refuge.

RESPONSE: The Service acknowledges that when herbivore populations such as Canada Geese

become over populated, impacts to the habitat of other wildlife populations as well as to plant communities can occur. However, the number of Canada geese present in Canaan Valley is unlikely to be causing significant impacts to plant communities or habitats required by other migratory birds or resident wildlife populations. Nonetheless, one local community has initiated a goose harassment program to reduce the impact of geese on a communal green space and reservoir. Therefore, any Refuge harvest of Canada geese, although quite small, may provide some benefit to the human dimension issue of goose populations in the Valley.

COMMENT: SCI and SCIF note that the draft EA's cumulative analysis appears to focus more on the detrimental cumulative effects of hunting, than on the beneficial ones. We recommend that the FWS add to its cumulative analysis an explanation of how the control and/or reduction of hunted populations, considered collectively with similar wildlife management efforts on numerous refuges throughout the National Wildlife Refuge system, conserves the cumulative health of the habitat of the flyway in which the refuge is located and the migratory birds that utilize that flyway. In addition, the benefits that hunting brings to each refuge improves the entire refuge system's available habitat and native wildlife populations and thus provides the public generally with more valuable and diverse refuge recreational opportunities of all kinds. SCI and SCIF recommend that the authors of Canaan Valley NWR consider adopting a cumulative analysis similar to the one utilized by the authors of Moosehorn NWR's EA. Moosehorn NWR's EA assesses the detrimental impacts of the loss of hunting on a refuge system-wide scale, explaining that

the cumulative effect of closing refuges to hunting may result in decline in social and financial support for wildlife conservation, as hunters have provided, through purchases of hunting licenses and migratory bird conservation stamps, and taxes levied on purchases of hunting equipment, a steady stream of revenue to build the National Wildlife Refuge System, and to restore upland and wetland habitats on millions of acres of public and private lands across the country. (USFWS 2000). These habitat projects also benefit migratory songbirds and other wildlife. Conversely, the cumulative effect of closing refuges to hunting may result in decline in duck stamp and hunting license sales, leading to a decline in funds for conservation. The cumulative effect on closing refuges to hunting may be reduced conservation of wildlife habitats if the above revenues are not replaced by another source.

RESPONSE: The Service acknowledges the first point in this comment in relation to the effect of over populated deer may have larger effects on habitats required by migratory bird species. In the CVNWR EA there are specific comments which indicate that hunting of white-tailed deer on the Refuge is important to reduce the local impacts of deer browse on forest structure and habitat of migratory and resident bird species as well as for the protection of rare plant communities. Additionally, the Service acknowledges that management of mammalian predator species can be critical to ensure the success of many ground nesting bird species throughout the Refuge System.

In regards to the second point, the Service acknowledges the importance of hunter interest in the

support and growth of the Refuge System. Text was added (page 61) to reflect this comment.

COMMENT: SCI and SCIF are pleased that the authors of the planning documents make detailed reference to the extensive cumulative research and analysis that the FWS conducts on migratory bird hunting and its flyway-wide and national environmental effects both on species and habitat. SCI and SCIF suggest, however, that the draft EA feature more prominently the refuge's consultation with state fish and game agencies and we recommend that, in addition to noting the state's concurrence with the Hunt Plan, that the EA add more of the state agency's input about how hunting on the refuge assists with and/or is an element of the state's efforts to manage state wildlife populations. The fact that the refuge coordinates with and is a component of the state's wildlife management is an essential part of the cumulative impact of the refuge hunting program.

RESPONSE: Comment acknowledged. We have recognized and adopted many of the state's regulations for our hunt program. We concur with the comment and have indicated such in multiple places of the Hunt EA. We have consulted with state biologists and have incorporated their comments in this final document.

C. Human Society of the United States:

The HSUS and the Fund for Animals submitted joint comments. HSUS requested that the Refuge not be opened to hunting. The HSUS letter contained comments related to hunting on the National Wildlife Refuge System as a whole and contained elements related to litigation filed in 2003 by Funds for Animals against the Service. The comments submitted by HSUS were generic and aimed at the Service's efforts to produce revised environmental assessments for 74 hunt programs across the country. None of HSUS comments were specific to Canaan Valley NWR.

COMMENT: The HSUS states that the "FWS is failing to provide adequate notice and the opportunity to comment" on the document.

RESPONSE: The original EA was written in 1997 and 30-day review and comment period was provided. Forty-four comments were received, 17 of which were in support of or not opposed to opening the Refuge to public hunting. The EA was amended in 2007 to address cumulative impacts in response to a 2003 lawsuit filed by the Fund for Animals. The amended EA was available for review and comment for a 30-day period from March 15, 2007 to April 15, 2007.

COMMENT: The HSUS states that the Service has not provided adequate time to sufficiently analyze the ramifications of allowing hunting.

RESPONSE: This EA was written by Canaan Valley NWR personnel using information from Refuge staff (manager, biologists, and visitor service professionals) who are professionally and personally knowledgeable about the Refuge and its use by wildlife and visitors.

COMMENT: The HSUS states that the Service can only allow hunting if it is compatible with the purposes for which the Refuge and the Refuge System were established.

RESPONSE: The Service has completed compatibility determinations for hunting, which determined the compatibility of hunting with this Refuge's purposes.

COMMENT: The HSUS states that the Refuge must ensure the availability of sufficient funds before approving hunting on the Refuge under the statutes of the Refuge Recreation Act.

RESPONSE: Sufficient funds are available, as noted in the Hunt Plan, page 11.

COMMENT: The HSUS states that in order for this Refuge to "truly assess the ramifications of allowing hunting at this Refuge" ... "then the end result of this process would be a new regulation."

RESPONSE: The Service notes this comment.

COMMENT: The Service is "...merely undertaking a haphazard, single-minded exercise so it can allow hunting..."

RESPONSE: The Service notes this comment.

COMMENT: The HSUS states that the environmental assessment fails to take into account the "cumulative impacts on the Refuge System from the FWS's decision to expand hunting throughout the System."

RESPONSE: The Service provided a cumulative impact analysis in this EA which looked at national, state, regional and local impacts of hunting on wildlife populations.

COMMENT: The HSUS states that the Service did not "consider the temporal and monetary investment necessary to isolate" consumptive and non-consumptive visitors when proposing the physical and temporal separation of these visitor groups.

RESPONSE: This proposal was not made in the EA.

COMMENT: The HSUS states that the EA includes a statement that while "impacts may become substantial over time, the impacts from hunting are not expected to be substantial."

RESPONSE: This statement was not made in the EA.

COMMENT: The HSUS feels that an EIS should be prepared.

RESPONSE: Please refer to the Finding of No Significant Impact.

COMMENT: The HSUS states that the Service did not identify all the relevant environmental concerns or take a 'hard look' at the impacts of expanding hunting on the Refuge.

RESPONSE: The Service notes this comment.

COMMENT: The HSUS states that "the agency must provide some analysis of the cumulative impacts on the Refuge System from expanding or allowing hunting."

RESPONSE: The Service provided a cumulative impact analysis in this EA which looked at national, state, regional and local impacts of hunting on wildlife populations.

COMMENT: The HSUS states that the Service must consider the impacts of hunting non-migratory birds on migratory birds and their habitats.

RESPONSE: The Service notes this comment. We addressed this issue in the cumulative impacts analysis section of the EA (see pages 51, 54-55).

COMMENT: The HSUS states that the Service did not adequately analyze the impacts of hunting to imperiled Refuge wildlife.

RESPONSE: The Service notes this comment. Impacts to Threatened and Endangered Species were analyzed in the EA and a Section 7 consultation was completed.

COMMENT: The HSUS states that the Service may not unduly narrow the purpose and need for hunting in the Refuge in order to make sport hunting the only alternative that meets the agency's stated purpose.

RESPONSE: The purpose of this EA is to evaluate the impacts associated with a hunt on Canaan Valley National Wildlife Refuge. The hunt program is a part of the overall management program at the Refuge, which includes wildlife and habitat management, public use programs, law enforcement, grounds and buildings maintenance.

COMMENT: The HSUS states that the Service has failed to adequately study, develop, and describe alternative uses to the available Refuge resources.

RESPONSE: The Service notes this comment.

COMMENT: The HSUS states that the Service failed to explain why non-lethal management practices are not among the alternatives being analyzed by the agency.

RESPONSE: The Service notes this comment.

COMMENT: The HSUS asks the Service to consider and provide an analysis of a "Non-Consumptive Use" Alternative.

RESPONSE: Alternative 3 of the EA proposes that the Refuge remain closed to hunting, and thus presents a non-consumptive use alternative.

COMMENT: The HSUS states that the Service has failed to meaningfully involve the public in its NEPA review process for allowing hunting at these Refuges.

RESPONSE: The original EA was written in 1997 and 30-day review and comment period was provided. Forty-four comments were received, 17 of which were in support of or not opposed to opening the Refuge to public hunting. The EA was amended in 2007 to address cumulative impacts in response to a 2003 lawsuit filed by the Fund for Animals. The amended EA was available for review and comment for a 30-day period from March 15, 2007 to April 15, 2007. Additionally, the EA was available for the comment period on the Refuge website. The EA was advertised in local newspapers and distributed to public libraries and was available at FWS offices in Canaan Valley and Elkins, WV.

COMMENT: The HSUS feels that the Service supports hunting despite its negative impact on biological and ecological integrity of Refuge System lands and despite the public opinion opposing hunting.

RESPONSE: The Service notes this comment. The Service also has received positive comments in support of the Refuge hunt program.

COMMENT: The HSUS states that the Service must consider impacts of hunting programs on non-consumptive users.

RESPONSE: The Service notes this comment and refers the reader to pages 63-69 of the EA.

COMMENT: The HSUS feels that the Service maintains hunting in order to appease a vocal minority of users.

RESPONSE: The Service notes this comment. Hunting is an approved compatible use of the Refuge, supports Refuge objectives for wildlife and habitat management and public use and is considered a priority public use of the Refuge System.

COMMENT: The HSUS states that the Service has failed to capitalize on the potential economic gain from non-consumptive users.

RESPONSE: The Service notes this comment. We encourage non-consumptive uses on the Refuge and we have 31 miles of roads and trails to facilitate wildlife observation, environmental

education, photography, and interpretation throughout the year.

COMMENT: The HSUS states that European settlement in this area has altered white-tail deer habitats, instigating changes in deer densities and population dynamics, and making comparisons between past and present deer densities nonsensical.

RESPONSE: We did not make this statement in the EA. Regardless of historic deer densities, current information indicates deer populations in Canaan Valley are negatively impacting plant communities and associated wildlife habitat.

COMMENT: The HSUS states that white-tail deer are a keystone species and that the effects of herbivory by white-tail deer are better interpreted as vegetation state transition than as a negative impact on ecological communities.

RESPONSE: We concur that deer can be considered a keystone species because of the major impact the species can have on the structure and composition of their communities at multiple trophic levels (Waller and Alverson 1997). The Service takes the position that to “let nature take its course” and not manage actively the deer population, would lead to an undesirable loss of floral and faunal species diversity (Rooney 2001). We also concur that deer populations are causing vegetation state transitions and that our interest in preventing this transition is a value-judgement. We are biased towards maintaining and restoring native plant species diversity and the diversity of the associated faunal communities. We are biased towards managing for a stable state that more closely resembles pre-European settlement conditions as directed in the Biological Integrity, Diversity, and Environmental Health Policy (601 FW 3). Because the natural predators of white-tail deer in this area (mountain lion and grey wolf) have been extirpated, and because habitat alterations from human development and use, we recognize that we must actively manage the deer population in order to recover the biological diversity and ecological integrity of our local ecosystem.

COMMENT: The HSUS states that there is no data to support the claim that recreational hunting will reduce deer-vehicle collisions.

RESPONSE: Comment noted.

COMMENT: The HSUS states that bears are apex consumers and as such, their populations are naturally regulated by food availability. They also state that there is no scientific evidence to support a connection between hunting and the reduction of bear/human conflicts. They further state that hunting bears in “wilderness” areas may put selective pressure on bears to move into suburban areas to avoid being hunted.

RESPONSE: The Service did not make such claims in the EA.

COMMENT: The HSUS states that woodcock, American black ducks, pintail, greater and lesser

scaup, and king rails should not be hunted because their populations are declining.

RESPONSE: The Service relies on the Migratory Bird Sport Hunting Frameworks to set hunting regulations of migratory birds annually. The Frameworks are based on the best biological information available.

COMMENT: The HSUS states that the EA does not “elaborate as to the species of duck that may be harvested.”

RESPONSE: The EA does state that hunters must comply with state regulations which dictate the number and species of ducks that may be harvested.

COMMENT: The HSUS states that spring turkey hunting will disturb females during the nesting season and increase the potential for nest predation. The HSUS also states that a hunt during the spring would be “both reckless and potentially detrimental to a wide range of non-target species.”

RESPONSE: The Service notes this comment. We addressed this issue in the direct/indirect impacts and the cumulative impacts analysis of this document (see pages 33 and 45).

COMMENT: The HSUS states that the environmental assessment makes “no effort to assess the impacts of this spring hunt on any aspect of the Refuge or its visitors.”

RESPONSE: The environmental assessment considers and analyzes the impacts of the spring turkey hunt on Refuge facilities, environment and community, non-targeted wildlife, migratory birds, and other wildlife-dependent visitors on pages 60-69.

COMMENT: The HSUS references potential impacts of nuisance wildlife hunting.

RESPONSE: No nuisance wildlife hunting is proposed in the EA.

D. U.S. Sportsmen’s Alliance:

The Sportsmen’s Alliance submitted comments in favor of Alternative 1 in the EA. These comments were positive and generally concurred with the Service’s evaluation of impacts. The Sportsmen’s Alliance was strongly in favor of the hunt program.

VII. Regulatory Compliance

Visitor Services Plan

The Canaan Valley National Wildlife Refuge is scheduled to complete its Comprehensive Conservation Plan (CCP) by the end of 2008. Step-down plans such as the Visitor Services Plan that tier off the CCP will follow. Since 1994, when the Refuge was established, management has been guided by the Station Management Plan (U.S. Fish and Wildlife Service 1994) and Final Environmental Assessment (U.S. Fish and Wildlife Service 1994). These documents helped develop the original Hunting Plan and Hunt EA (U.S. Fish and Wildlife Service 1997).

Compatibility Determinations

Compatibility determinations for hunting on the Canaan Valley NWR have been completed.

National Environmental Policy Act Documentation

This Environmental Assessment meets the NEPA requirements.

Endangered Species Act Section 7 Evaluation

A Section 7 Evaluation was completed for the Hunting Management Plan and EA in 1997.

Copies of Letters requesting State and, where appropriate, tribal involvement and the results of the request

Copies of letters requesting State review of the Hunting Management Plan and EA, and the response is included as an Appendix. No federally recognized tribes are in the vicinity of the Refuge.

News Release

A copy of the news release can be found in the Appendix.

Outreach Plan

The outreach plan can be found in the Appendix.

Refuge Specific Regulations

The Refuge specific regulations can be found in Section III of the EA and Section VII C. in the Hunting Management Plan.

VIII. Literature Cited

- Allen, T.J. 1996. Ruffed grouse population dynamics research proposal. West Virginia Division of Natural Resources. 16pp.
- Anonymous. 1973. Wildlife resources and the Davis Power Project. Unpublished Mimeo Report. 31pp.
- Begley, S. And D. Glick. 1996. Baited for bear. Newsweek, October 28. P. 59.
- Behrend, D. F., G. F. Mattfield, W. C. Tierson and J. E. Wiley. 1970. Deer density control for comprehensive forest management. J. Forestry. 68:695-700.
- Bonwell, W. 2002. Personal conversation with Bill Bonwell. USDA, Wildlife Services. January 2, 2002.
- Bonwell, W. 1996. Coping with coyotes. Wonderful West Virginia 60(8):5-7.
- Brown, C.L. Unpublished data. West Virginia Division of Natural Resources. Personal communication.
- Brown, C.L. 2006. Coyote: an adaptable pioneer. West Virginia Division of Natural Resources. WV Wildlife: Winter 2005. 3pp.
- Brown, Sandra. 1993. Deer harvest figures for West Virginia and specific areas of Tucker County, West Virginia. Unpublished Data.
- Bruggink, J.G. and W.L. Kendall. 1995. American woodcock harvest and breeding population status, 1995. U.S. Fish and Wildlife Service. Laurel, MD. 15pp.
- Buckelew, A.R. Jr. and G.A. Hall. 1994. The West Virginia breeding bird atlas. Univ. of Pittsburgh Press. Pittsburgh, PA. 215pp.
- Bunnell, F.L. and D.E. Tait. 1981. Population dynamics of bears--implications. In Fowler, C.W. and T.D. Smith, eds. *Dynamics of Large Mammal Populations*. John Wiley & Sons, N.Y.
- Burnham, K. P., and D. R. Anderson. 1984. Tests of compensatory vs. additive hypotheses of mortality in mallards. Ecology. 65:105-112.
- Caithamer, D.F. and J.A. Dobovsky. 1995. Waterfowl population status, 1995. U.S. Fish and Wildlife Service. Laurel, MD. 45pp.

- Clark, J.M. 1978. Population dynamics of breeding woodcock in Canaan Valley, West Virginia. M.S. Thesis, WVU 131 pp.
- Code of Federal Regulations. 1992. Title 50, Parts 20-32. Regulations for administering the National Wildlife Refuge System. U.S. Government Printing Office. Washington D.C.
- Crum, J.M. 1995. White-tailed deer. In 1995 Big Game Bulletin. West Virginia Division of Natural Resources. Pittman-Robertson Proj. W-48-R-12, pp. 1-21.
- Dale, T. 1996. Bobcats abound in nearly all counties. *Wonderful West Virginia*. 60(8) 18-19.
- Davis, D. E., J. J. Christian, and F. Bronson. 1964. Effect of exploitation on birth, mortality and movement rates in a woodchuck population. *J. Wildl. Manage.* 28:1-9.
- Dickson, J.G. 1990. Oak and flowering dogwood fruit production for eastern wild turkeys. *Proc. Natl. Wild Turkey Symp.* 6:90-95.
- Dolton, D.D. and R.D. Rau. 2006. Mourning dove breeding population status, 2006. U.S. Fish and Wildlife Service, Laurel, Maryland. 19pp.
- Dolton, D.D. 1995. Mourning dove breeding population status, 1995. U.S. Fish and Wildlife Service. Laurel, MD. 18pp.
- Eiler, J. H., W. G. Wathen, and M. R. Pelton. 1989. Reproduction in black bears in the Southern Appalachian Mountains. *J. Wildl. Manage.* 53:353-360.
- Ellison, L. N. 1991. Shooting and compensatory mortality in tetraonids. *Ornis Scandinavica* 22:229-240.
- Elowe, K. D., and W. E. Dodge. 1989. Factors affecting black bear reproductive success and cub survival. *J. Wildl. Manage.* 53:962-968.
- Elowe, K.D. 1990. Bear hunting with hounds: techniques and effects on the bears and the public. *East. Workshop Black Bear Res. and Manage.* 10:102-109
- Flaherty, K. 2006. 2006 Field season summary results: Canaan Valley NWR. Report to Refuge on current research. West Virginia University, Morgantown, WV. 5pp.
- Fortney, R. H. 1975. The vegetation of Canaan Valley, West Virginia: A taxonomic and ecological study. West Virginia University, Ph.D. Dissertation. Morgantown, WV. 210 pp.

- Foster, Gary. 2006. .M. 2007. Personal communication with Gary Foster. District Wildlife Biologist, West Virginia Division of Natural Resources. Personal communication with K. Sturm, Refuge Biologist, Canaan Valley National Wildlife Refuge February 22, 2007.
- Fox, L. 1989. Rascal research. Kansas Wildlife and Parks Magazine. 46(6):39-43.
- Hall, G.A. 1983. West Virginia birds. Carnegie Museum of Natural History, Special Publication No. 7. Pittsburgh, PA. 180pp.
- Hansen, L. P. and C. M. Nixon. 1984. Effects of adults on the demography of fox squirrels (*Sciurus niger*). Can. J. Zool. 63:861-867.
- Healy, W.M. 1977. Wild turkey winter habitat in West Virginia cherry-maple forests. Trans. NE Section, Wildl. Soc. 34:7-12.
- Healy, W.M. and J.C. Pack. 1983. Managing seeps for wild turkey in northern hardwood forest types in West Virginia. Trans. NE Section, Wildl. Soc. 40:9-18.
- Hellgren, E.C. and M.R. Vaughan. 1989. Denning ecology of black bears in a southeastern wetland. J. Wildl. Manage. 53:347-353.
- Herkert, J. R., C. M. Nixon, and L. P. Hansen. 1991. Dynamics of exploited and unexploited fox squirrel (*Sciurus niger*) populations in the Midwestern United States. pages 864-874. in McCullough, D. R. and R. H. Barrett. ed. Wildlife 2001: Populations. E. L. Sevien Applied Sciences. N. Y.
- Higgins, K.L. Hunting dynamics, condition estimates and movements of black bears hunted with hounds in Virginia. Master's Thesis. Virginia Polytechnic Institute and State University, Blacksburg, VA. 116pp.
- Johansen, P. 1996. West Virginia Division of Natural Resources. Letter to C.W. Dane, U.S. Fish and Wildlife Service, August 26.
- Jones, S. B., D. deCalesta and S. E. Chunko. 1993. Whitetails are changing our woodlands. American Forests. 99:20-25, 53-54.
- Keith, L. B. and S. E. M. Bloomer. 1993. Differential mortality of sympatric snowshoe hares and cottontail rabbits in central Wisconsin. Can. J. Zool. 71:1694-1697.
- Kelley, J.R., Jr., and R. D. Rau. 2006. American woodcock population status, 2006. U.S. Fish and Wildlife Service, Laurel, Maryland. 15pp.

- Kletzly, R.C. 1976. American woodcock in West Virginia. Project W-37-R, Bull. No. 8. West Virginia Dept. of Nat. Res. 46pp.
- Kurzejeski, E. W. and J. B. Lewis. 1990. Home ranges, movements, and habitat use of wild turkey hens in Northern Missouri. Proc. Natl. Wild Turkey Symposium. 6:67-71.
- LaRoe, E.T., G.S. Farris, C.E. Puckett, P.D. Doran, and M.J. Mac, Eds. 1995. Our living resources: a report to the nation on the distribution, abundance, and health of U.S. plants, animals, and ecosystems. U.S. Dept. of Int., National Biological Service, Washington, D.C. 530pp.
- Laskowski, H. P. and G. F. Sepik. 1995. Trip Report - Canaan Valley NWR. Memorandum dated 09/19/95. 4 pp.
- Lecount, A.E. 1982. Characteristics of a Central Arizona black bear population. J. Wildl. Manage. 46:861-868.
- Lesser, W.A. 1987. West Virginia Small Game Bulletin. West Virginia Division of Natural Resources. Charleston, WV.
- Litvaitis, J.A. and D.M. Kane. 1994. Relationship of hunting technique and hunter selectivity to composition of black bear harvest. Wildl. Soc. Bull. 22:604-606.
- Lovallo, M.J. 2000. Bobcat habitat assessment and population density in Pennsylvania. Pennsylvania Game Commission.
http://www.pgc.state.pa.us/pgc/lib/pgc/reports/2000_wildlife/63003-99.pdf (Accessed February 2007).
- McAuley, D.G. et. al. 2005. Effects of hunting on survival of American woodcock in the northeast. Journal of Wildlife Management 69(4): 1565-1577.
- Michael, E.D. 2002. Unpublished data on hunting and trapping collected from West Virginia Division of Natural Resources presented at Canaan Valley Celebration, October 2002.
- Michael, E.D. and S.L. Brown. 2002. Waterfowl Surveys in Canaan Valley: 1980-1993. Report for Canaan Valley Celebration, October 2002. 7pp.
- Michael, E. D. 1993. An evaluation of the wetland and upland habitats and associated wildlife resources in southern Canaan Valley. Report submitted to the Canaan Valley Task Force. Morgantown, WV. 170 pp.
- Michael, E.D. 1997. Impact of deer browsing to balsam fir in Canaan Valley, West Virginia. Northern Journal of Applied Forestry. 9(3): 89-90.

- Michael, E. D. 1974. Hunter use of the Canaan Valley. Report to Allegheny Power Service Corporation. 19 pp.
- Mosby, H. S. 1969. The influence of hunting on the population dynamics of a woodlot gray squirrel population. *J. Wildl. Manage.* 33:59-73.
- Myrberget, S. 1985. Is hunting mortality compensated for in grouse populations, with special reference to Willow Grouse. XVII Congress of the Inter. Union of Game Biologists. pp17-21.
- Nixon, C. M., M. W. McClain, and R. W. Donohoe. 1975. Effects of hunting and mast crops on a squirrel population. *J. Wildl. Manage.* 39:1-25.
- Nixon, C. M., L. P. Hansen, and S. P. Havera. 1985. Demographic characteristics of an unexploited population of fox squirrels (*Sciurus niger*). *Can. J. Zool.* 64:512-521.
- Norman, G.W., Stauffer, D.F., Sole, J., Allen, T.J., Igo, W.K., Bittner, S., Edwards, J., Giuliano, W.M., Tefft, B., Harper, C., Buehler, D., Figert, D., Seamster, M., and Swanson, D. (Editors). Ruffed grouse ecology and management in the Appalachian region: Final project report of the Appalachian Cooperative Grouse Research Project. 2004. Virginia Department of Game and Inland Fisheries, Richmond, VA, USA.
- North American Waterfowl Management Plan, Plan Committee. 2004. North American Waterfowl Management Plan 2004. Strategic Guidance: Strengthening the Biological Foundation. Canadian Wildlife Service, U.S. Fish and Wildlife Service, Secretaria de Medio Ambiente y Recursos Naturales, 22pp.
- Northeast Furbearer Resources Technical Committee. 1996a. Trapping and Furbearer Management: Perspectives from the Northeast. 33pp.
- Northeast Furbearer Resources Technical Committee. 1996b. Unpublished 1996 Species Updates.
- Northeimer, J.E. 1996. Canaan Valley National Wildlife Refuge (CVNWR) 1996 landbird breeding survey. Unpublished report. 8pp.
- Pack, J. C. 1995. Wild Turkey. In 1995 Big Game Bulletin. West Virginia Division of Natural Resources. Pittman-Robertson Proj. W-48-R-12, pp. 22-29.
- Palmer, W. 1996. Pers. Comm. Pennsylvania Game Commission. Grouse, Woodcock, and Forest Habitat Biologist. Spring Mills, PA.

- Phipps, T. T. and J. J. Fletcher. 1993. An assessment of the economic effects of the proposed Canaan Valley National Wildlife Refuge on Tucker County. Report submitted to the Canaan Valley Task Force. Morgantown, WV. 44 pp.
- Porter, W. F., R. D. Tangen, G. C. Nelson, and D. A. Hamilton. 1980. Effects of corn food plots on wild turkeys in the Upper Mississippi Valley. *J. Wildl. Manage.* 44:456-462.
- Rieffenberger, J. C. 1995. Black Bear. In 1995 Big Game Bulletin. West Virginia Division of Natural Resources. Pittman Robertson Project W-48-R-12. pp30-42.
- Rieffenberger, J.C. 1988. Ruffed Grouse. In 1988 Small Game Bulletin. West Virginia Division of Natural Resources.
- Roberts, S. D., J. M. Coffey, and W. F. Porter. 1995. Survival and reproduction of female wild turkeys in New York. *J. Wildl. Manage.* 59:437-447.
- Rogers, R.E. 2004. Monitoring mountain state raccoons. West Virginia Wildlife. West Virginia Division of Natuarl Resources, Charleston, WV.
- Rogers, R.E. 1996. West Virginia Division of Natural Resources. West Virginia raccoon field trial survey, 1995-1996.
- Rogers, R.E. 1995. A review of State raccoon hunting and coondog training regulations. *Wildl. Soc. Bull.* 23:398-406.
- Roseberry, S.E. 1980. Effects of sport hunting on raccoon reproduction, survival and behavior. M.S. Thesis, Oklahoma State Univ., Stillwater, 29pp.
- Ryan, C. W. 2004. Black bear harvest information. West Virginia Division of Natural Resources. <http://www.wvdnr.gov/Hunting/BGB2004BearSResults.shtm> (Accessed February 2007).
- Ryan, Chris. 2007. Wildlife Biologist, West Virginia Division of Natural Resources. Personal communication with L. Ceperley, Refuge Biologist, Canaan Valley National Wildlife Refuge.
- Samson, C. and J. Huot. 1995. Reproductive biology of female black bears in relation to body mass in early winter. *J. Mammal.* 76:68-77.
- Sauer, J. R., J. E. Hines, and J. Fallon. 2005. The North American Breeding Bird Survey, Results and Analysis 1966 - 2005. Version 6.2.2006. [USGS Patuxent Wildlife Research Center](http://www.fws.gov/patuxent), Laurel, MD

- Schooley, R.L., C.R. McLaughlin, G.J. Matula, Jr., and W.B. Krohn. 1994. Denning chronology of female black bears: effects of food, weather, and reproduction. *J. Mammal.* 75:466-477.
- Shissler, B.P. 1981. The breeding biology of the American woodcock in West Virginia. M.S. Thesis, WVU. 192 pp.
- Small, R. J., J. C. Holzward, and D. H. Rusch. 1991. Predation and hunting mortality of ruffed grouse in Central Wisconsin. *J. Wildl. Manage.* 55:512-520.
- Speake, D.W., R. Metzler, and J. McGlinchy. 1985. Mortality of wild turkey poults in northern Alabama. *J. Wildl. Manage.* 49(2):472-474.
- Spiker, H.A. 2006. Black Bear Project Report, 2005 – 2006. Maryland Department of Natural Resources, R. 2002. Personal communication with Rocky Spencer, West Virginia Division of Natural Resources. <http://www.dnr.state.md.us/wildlife/gpar/gpbear.asp> (Accessed February 2007) Conservation Officer. January 10, 2002.
- Stevens, M.A. and R.E. Barry. 2002. Selection, size and use of home range of the Appalachian cottontail, *Sylvilagus obscurus* Canadian Field Naturalist 116(4): 529-535.
- Stetketeer, Ann Klein. 2000. Predicting Habitat Suitability for American Woodcock and Landscape-level Assessment of Habitat in West Virginia. Masters Thesis. West Virginia University, Morgantown, West Virginia.
- Stihler, C. 2007). Personal communication with Craig. 2007. Wildlife Biologist Stihler, West Virginia Division of Natural Resources. Personal communication with K. Sturm, Refuge Biologist, Canaan Valley National Wildlife Refuge, Elkins WV. February 15, 2007.
- Taylor, C.I. 1996. Fall turkey hunting: the dual challenge. *Wonderful West Virginia.* 60(8): 11-13.
- Thompson, D. C. 1978. Regulation of a northern grey squirrel (*Sciurus carolinensis*) population. *Ecology.* 59:708-715.
- Thorn, E. 1996. Bear hunting: a time-honored tradition in the Mountain State. *Wonderful West Virginia* 60(8):2-4.
- Tierson, W. C., E. F. Patric and D. F. Behrend. 1966. Influence of white-tailed deer on the logged northern hardwood forest. *J. Forestry.* 64:804-805.

- Tilghman, N. G. 1989. Impacts of white-tailed deer on forest regeneration in northwestern Pennsylvania. *J. Wildl. Manage.* 53:524-532
- U.S. Dept. of the Interior, U.S. Fish and Wildlife Service and U.S. Dept. of Commerce, U.S. Census Bureau. 2001. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.
- U.S. Department of the Interior, Fish and Wildlife Service. 2006a. Migratory bird hunting activity and harvest during the 2004 and 2005 hunting seasons: Preliminary estimates. U.S. Department of Commerce, the Interior, Washington, D.C. U.S. Census Bureau. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. 170ppA.
- U.S. Fish and Wildlife Service. 2006. Waterfowl population status, 2006. 2006b. Waterfowl Population Status, 2006. U.S. Department of Interior, Washington D.C. U.S.A.
- U.S. Fish and Wildlife Service. 2006c. Migratory bird hunting activity and harvest during the 2004 and 2005 hunting seasons: Preliminary estimates. U.S. Department of the Interior, Washington, D.C. U.S.A. 61pp.
- U.S. Fish and Wildlife Service. 1997. Section 7 Consultation. West Virginia Field Office. Elkins, WV. 2pp.
- U.S. Fish and Wildlife Service. 1996a. Refuge Manual: National Wildlife Refuge System. U.S. Fish and Wildlife Service. Washington D.C.
- U.S. Fish and Wildlife Service, Region 5. 1996b. American woodcock management plan (regional). U.S. Fish and Wildlife Service, Region 5, Division of Refuges. Hadley, Massachusetts. 11pp.
- U.S. Fish and Wildlife Service, Region 5. 1994a. Canaan Valley National Wildlife Refuge Final Environmental Assessment. U.S. Fish and Wildlife Service, Region 5, Division of Refuges. Hadley, Massachusetts. 50pp.
- U.S. Fish and Wildlife Service, Region 5. 1994b. Canaan Valley National Wildlife Refuge Station Management Plan. U.S. Fish and Wildlife Service, Region 5, Division of Refuges. Hadley, Massachusetts. 28pp.
- U.S. Fish and Wildlife Service. 1994c. 1980-1990 Fishing, hunting and wildlife associated recreation trends. U. S. Government Printing Office. 17 pp.
- U.S. Fish and Wildlife Service. 1990. American woodcock management plant. U.S. Fish and Wildlife Service, U.S. Department of Interior. 11pp.

- U.S. Fish and Wildlife Service. 1991. 1981-1990 average waterfowl harvest by species and county for states in the Atlantic Flyway. Memorandum Dated 12/2/91 From J.R. Serie, Office of Migr. Bird Mgmt. 6pp.
- U.S. Fish and Wildlife Service. 1979. Canaan Valley National Wildlife Refuge, West Virginia, Final Environmental Impact Statement. U.S. Fish and Wildlife Service, Region 5, Division of Refuges, Hadley, MA. 157pp.
- U.S. Fish and Wildlife Service, 2005. Banking on America: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation, Division Of Economics, Washington D.C. 297-300pp.
- Vander Haegen, W. M., M. W. Sayre, and W. E. Dodge. 1989. Winter use of agricultural habitats by wild turkeys in Massachusetts. *J. Wildl. Manage.* 53:30-33.
- Vaughan, M.R. 1996. Cooperative Wildlife and Fisheries Research Unit, Virginia Polytechnic Institute and State University. Personal communication with G. Baker, Refuge Manager, Canaan Valley National Wildlife Refuge.
- Webb, L.O. 1978. Woodcock habitat inventory of northern West Virginia, using aerial photographs. M.S. Thesis, WVU. 161 pp.
- Weigl, P. D., M. A. Steele, L. J. Sherman, and J. C. Ha. 1989. The ecology of the fox squirrel (*Sciurus niger*) in North Carolina: implication for survival in the southeast. *Bull. of Tall Timbers Research Station, Tallahassee, Fl.* No. 24:93pp.
- West Virginia Code Annotated. 1989 Replacement Volume. Published by Michie Company, Charlottesville, Virginia.
- West Virginia Division of Natural Resources. 2003. Turkey Harvest Information. <http://www.wvdnr.gov/Hunting/BGB2004TurkHighlights.shtm> (Accessed February 2007).
- West Virginia Division of Natural Resources. 1992. The 1991 West Virginia Hunter/Trapper Survey. 21pp.
- West Virginia Division of Natural Resources. 2006. Grouse Cooperator Report: 2005-2006. Elkins WV. 14pp.
- West Virginia Division of Natural Resources. 2005. Big game bulletin. Wildlife Resources Section Bulletin 06-1. West Virginia Division of Natural Resources, Charleston, WV. 49pp.

- West Virginia University Cooperative Extension Service. 1995. West Virginia's sheep predator situation: the findings of the 1995 West Virginia shepherd's survey. U.S. Department of Agriculture Report. 15pp.
- Westholder, J., T.T. Findley and O.E. Baker. 1996. The impact of sport raccoon hunting on deer movement and deer hunting success. Proc. Southeastern Assoc. of Fish and Wildl. Agencies. 50:
- Wilson, S. 1996. Personal Communication. West Virginia Division of Natural Resources. Waterfowl Biologist, Elkins, WV.
- Woolf, A., D. R. Shoemaker, and M. Cooper. 1993. Evidence of tularemia regulating a semi-isolated cottontail rabbit population. J. Wildl. Manage. 57:144-157.
- Woolf, A. and G.F. Hubert. 1998. Status and management of bobcats in the United States over three decades, 1970's-1990's. Wildlife Society Bulletin 26:287:294.



SECTION 7 EVALUATION

REFUGE: Canaan Valley National Wildlife Refuge
Tucker County, West Virginia

DESIGNATION: Region 5, Fiscal Year 1997

PROGRAM: Public Hunting

LISTED SPECIES

CONSIDERED: Virginia Northern Flying Squirrel - Endangered
American Peregrine Falcon - Endangered
Indiana Bat - Endangered
Virginia Big-eared Bat - Endangered
Cheat Mountain Salamander - Threatened
American Bald Eagle - Threatened

The endangered Virginia northern flying squirrel and the threatened Cheat Mountain salamander are the only listed species known from Canaan Valley. Habitat for both is found in a small portion of the valley, on lands not part of the refuge at present. The major threat to both species is habitat destruction and modification.

Three other endangered species, the American peregrine falcon, Indiana bat and Virginia big-eared bat are not known from Canaan Valley, but the bats have hibernacula elsewhere in Tucker County, and the falcons nest in two adjoining counties and fly over the valley occasionally. A threatened species, the American bald eagle, also nests in two nearby counties. They sometimes fly over the refuge area, and a few eagles have been seen feeding on lakes in the valley.

DESCRIPTION OF ACTION: Much of the refuge would be open to big game, migratory bird and upland/small game hunting in accordance with Federal and State regulations. Specific details are given in the Canaan Valley Hunting Management Plan, Compatibility Determinations, and similar documents.

IDENTIFICATION OF ALL ACTIONS AND ACTIVITIES THAT MAY CUMULATIVELY IMPACT SPECIES: None

OBJECTIVES OF THE ACTION: 1) To provide the public with quality wildlife-dependent recreational experience. 2) To provide an opportunity for the public to use a renewable natural resource. 3) To help manage the deer population in Tucker County, West Virginia.

IMPACT OF ACTION ON LISTED SPECIES: Hunting has occurred in and around the refuge acquisition boundary area for years with no known adverse impact on any listed species. The salamander and flying squirrel exist in a very specific habitat type in the valley, and their existence is threatened by habitat modifying activities such as logging, draining wetlands, etc. It is highly unlikely that a refuge hunting program will have any impact on either species. The other listed species are rare visitors to the valley, and it is equally unlikely that public hunting would affect them.

CONCLUSION: May adversely affect _____
Will not adversely affect ✓

RECOMMENDATION: Because this program is unlikely to affect the endangered and threatened species in the vicinity of the refuge, it is recommended that the refuge be opened to public hunting in accordance with Federal, State and refuge regulations as described in the Canaan Valley National Wildlife Refuge Hunting Management Plan.

Project Leader *Bob Baker* Date 1/13/97
Canaan Valley National Wildlife Refuge

Project Leader *Christy Y. Claver* Date 1/13/97
West Virginia Field Office

GARD/South *James H. Meigs* Date 11/12/97
(Fisheries)

GARD/Central *Richard W. Dyer* Date 12/7/97
(Refuges and Wildlife)

Regional Director *[Signature]* Date 12-12-97

Hunt Plan and Environmental Assessment Outreach Plan

Station/Program Description:

The Canaan Valley National Wildlife Refuge (Refuge) was established in 1994. It is located in Tucker County, WV. The Refuge is a high elevation valley and has one of the largest shrub swamps and the fourth largest bog in the eastern United States. This location makes it a haven for boreal plants and animals, here found at the southern extent of their range.

West Virginia has a long tradition of hunting. Prior to Refuge establishment, the local community was assured that the U.S. Fish and Wildlife Service intended to keep that tradition alive in Canaan Valley. As a result, hunters supported the establishment of the Refuge.

Goal:

Gather public comments on the Hunt Plan and Environmental Assessment (EA).

Messages:

The Hunt Plan and EA are available for public comment for thirty days, starting and ending March 14, 2007 – April 14, 2007.

Re-issuing the Hunt Plan and EA at this time is the result of a nationwide lawsuit. The Service must more carefully analyze the cumulative impacts of hunting on 74 refuges.

At Canaan Valley NWR the preferred alternative is to continue the hunt program as it is currently managed. Other alternatives considered are no hunting and hunting deer only.

Audiences:

Hunters
Anti-hunters
Non-profit environmental organizations
Local community members
WV Division of Natural Resources, Wildlife Section

Tools:

Legal advertisement in two local papers, *the Intermountain* (daily) out of Elkins, Randolph County and the *Parson's Advocate* (weekly) out of Parsons, Tucker County.

Press release to approximately 20 media contacts within two hours of the Refuge.

Documents placed at Refuge office, the Elkins Field Office of the U.S. Fish and Wildlife Service, Elkins Public Library, Harmon Library, Mountaintop Library in Thomas and Five Rivers Library in Parsons. for people to access and review.

Documents placed as PDF file on Refuge website, with information about the comment period and how to comment.



Classified/Legal Advertising Invoice

The Inter-Mountain Legals

520 Railroad Av

Elkins, WV

26241

(304) 636-2121

copied for Cindy

CANAAN VALLEY NATIONAL WILDLIFE REFUGE
HC 70 BOX 200

DAVIS, WV

2007 5:22:30PM

Phone: 304 866-3858

66228

Ad No 66228	Customer No: L00870	Start Date 03-14-2007	Classification: Legal Notices	
Order No	Rate: LE	Lines: 35	Words: 159	Balance 61.57
Publications ... Runs Legals ... 2		Solicitor: LJ	Original: 0	Card Expire
Ident				

State of West Virginia, County of Randolph, ss.

I, Donald W. Smith, General Manager of THE INTER-MOUNTAIN, a newspaper published at Elkins, in said county, do hereby certify that the annexed advertisement was published on the following dates:

March 14 March 17 _____

20 07 _____ as required by law.

Given under my hand this 17th day of March 20, 07

Donald Smith
General Manager

Printer's Fee: \$ 61.57

me this 17th day of March, 20, 07

Robert L. Moore
Notary Public

My Commission Expires the 31st day of October, 20 15

Public Comment period:
Refuge Hunt Plan and
Environmental Assessment

The Canaan Valley National Wildlife Refuge (Refuge) has recently revised its hunt plan and environmental assessment. These documents are now out for public review and comment. The review period will be thirty days, starting on March 14, 2007 and ending on April 14, 2007. Due to time constraints, Refuge staff will not be able to consider comments received after the closing date. To obtain the documents for review, check the Refuge's web site at <http://www.fws.gov/canaanvalley> or visit the Refuge office or a local library. The documents will be at the Refuge office, the Elkins Field Office of the U.S. Fish and Wildlife Service, Elkins Public Library, Harman Library, Mountaintop Library in Thomas and Five Rivers Library in Parsons. For questions please contact Acting Refuge Manager Erin Holmes at 304-866-3858. Send comment to:

Canaan Valley NWR
HC-70, Box 200
Davis, WV 26260
304-866-3858
FAX: 866-3852

e-mail: fw5rw_cvnwr@fws.gov

Sul

3-14, 17

Certificate of Publication

I, Chris Stadelman, publisher of The Parsons Advocate, a weekly newspaper published at Parsons, Tucker County, West Virginia, do hereby certify that the annexed Public Comment Period: Refuge Hunt Plan + Environmental Assessment

in the case of _____

vs. _____

has been published for 2 consecutive weeks in said newspaper, beginning with the issue of March 14

Given under my hand this _____ day of _____ 20__.

Chris Stadelman Publisher

Publication fee \$ 25.51 total \$44.64

2nd \$19.13

STATE OF WEST VIRGINIA, COUNTY OF TUCKER, to-wit:

Chris Stadelman, publisher of The Parsons Advocate, being duly sworn, says that statements contained in the above certificate are true and correct, to the best of his knowledge and belief.

Chris Stadelman Affiant

Sworn to and subscribed before me, this the 14 day of

March 2007.

Mary Michael Dumais Notary Public



My commission expires 11/30/2008, 2008.

Public Comment Period: Refuge Hunt Plan and Environmental Assessment

The Canaan Valley National Wildlife Refuge (Refuge) has recently revised its hunt plan and environmental assessment. These documents are now out for public review and comment. The review period will be thirty days, starting on March 14, 2007 and ending on April 14, 2007. Due to time constraints, Refuge staff will not be able to consider comments received after the closing date. To obtain the documents for review, check the Refuge's web site at <http://www.fws.gov/canaanvalley> or visit the Refuge office or a local library. The documents will be at the Refuge office, the Elkins Field Office of the U.S. Fish and Wildlife Service, Elkins Public Library, Harman Library, Mountaintop Library in Thomas and Five Rivers Library in Parsons. For questions please contact Acting Refuge Manager Erin Holmes at 304-866-3858. Send comments to:

Canaan Valley NWR
HC 70 Box 200
Davis, WV 26260
304-866-3858
FAX: 866-3852
e-mail: fw5rw_cvnwr@fws.gov
3-14-3-21

Public Comment Period: Refuge Hunt Plan and Environmental Assessment

The Canaan Valley National Wildlife Refuge (Refuge) has recently revised its hunt plan and environmental assessment. These documents are now out for public review and comment. The review period will be thirty days, starting on March 14, 2007 and ending on April 14, 2007. Due to time constraints, Refuge staff will not be able to consider comments received after the closing date. To obtain the documents for review, check the Refuge's web site at <http://www.fws.gov/canaanvalley> or visit the Refuge office or a local library. The documents will be at the Refuge office, the Elkins Field Office of the U.S. Fish and Wildlife Service, Elkins Public Library, Harman Library, Mountaintop Library in Thomas and Five Rivers Library in Parsons. For questions please contact Acting Refuge Manager Erin Holmes at 304-866-3858. Send comments to:

Canaan Valley NWR
HC 70 Box 200
Davis, WV 26260
304-866-3858
FAX: 866-3852
e-mail: fw5rw_cvnwr@fws.gov
3-14-3-21

For Immediate Release:

Contact: Jackie Burns
304-866-3858

Refuge Evaluates Environmental Impacts of Hunt Programs, Invites Public Comment

In response to a national lawsuit, the Canaan Valley National Wildlife Refuge has evaluated the long-term and cumulative environmental impacts resulting from its hunt program..

The public may comment on the draft revised hunt plan and environmental assessment through April 14, 2007. To obtain the documents for review, check the Refuge's web site at <http://www.fws.gov/canaanvalley> or visit the Refuge office or a local library. The documents will be at the Refuge office, the Elkins Field Office of the U.S. Fish and Wildlife Service, Elkins Public Library, Harmon Library, Mountaintop Library in Thomas and Five Rivers Library in Parsons. For questions please contact Acting Refuge Manager Erin Holmes at 304-866-3858. Send comment to:

Canaan Valley NWR
HC 70, Box 200
Davis, WV 26260
304-866-3858
FAX: 866-3852
e-mail: fw5rw_cvnwr@fws.gov

The Fund for Animals, a national animal rights organization, sued the U.S. Fish and Wildlife Service in 2003 alleging that the agency did not fully meet the requirements of the National Environmental Policy Act (NEPA) when it opened national wildlife refuges to hunting between 1997 and 2003. The lawsuit affects migratory bird, upland game and big game hunt programs at 74 national wildlife refuges throughout the U.S. U.S. Circuit Court Judge Ricardo M. Urbina ruled in favor of the plaintiffs in August. The court did not stop national wildlife refuge hunt programs and the Service is working to fulfill NEPA requirements for the hunts at issue by May 31, 2007. During this time we are also addressing any similar deficiencies regarding the opening of hunts for 30 refuges opened to hunting since the lawsuit was filed and for seven 2006-2007 proposed refuge openings.



The draft revised hunt plan and environmental assessment for the hunt program at Canaan Valley National Wildlife Refuge includes the Service's analyses of the overall impacts of the hunts on resident wildlife, migratory species, threatened and endangered species, refuge facilities and visitor services, cultural resources, ecosystems, and neighboring lands. The Service also considered the cumulative impacts of past, present, and future hunts on wildlife species, refuge resources, and other wildlife-dependent refuge activities. Where appropriate, we assessed the cumulative environmental impacts at the local, regional, and migratory flyway levels.

The U.S. Fish and Wildlife Service is the principal federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. The Service manages the 95-million-acre National Wildlife Refuge System, which encompasses 545 national wildlife refuges, thousands of small wetlands and other special management areas. It also operates 69 national fish hatcheries, 64 fishery resources offices and 81 ecological services field stations. The agency enforces federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, and helps foreign and Native American tribal governments with their conservation efforts. It also oversees the Federal Assistance program, which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

###

