3 Alternatives

This chapter presents the alternatives for a potential refuge in Cherry Valley including the Service's proposed action that we believe would best fulfill the intent of the Study Act and the proposed purposes, vision, and goals of a new national wildlife refuge in Cherry Valley, first presented in Chapter 1.

The goals are intentionally broad, descriptive statements of the desired condition of potential refuge land in Cherry Valley. They embrace the principal elements of the Study Act, the proposed refuge purposes, and the potential vision statement. Descriptions of the three alternatives, one of which is the proposed action, address the three proposed goals in narrative form, and offer an explanation of how the alternatives meet, or don't meet, the requirements of the Study Act and the proposed refuge's goals. The proposed action (Alternative B) is addressed in more detail in the draft Conceptual Management Plan (Appendix B). As described in Chapter 1, a Conceptual Management Plan provides general, interim management direction for a new refuge until approval of a considerably more detailed Comprehensive Conservation Plan. If a new refuge is approved, we will revise the draft Conceptual Management Plan based upon comments received on this document, including public comments. Developing a Comprehensive Conservation Plan would follow sometime thereafter.

Under NEPA, the proposed action defines what an agency plans to do or recommend, but cannot implement without considering other reasonable, environmentally sensitive alternatives to the proposed action. Other reasonable alternatives to the proposed action that could also be viewed as fulfilling the intent of the Study Act are described herein, thereby offering the Service and the reviewing public an opportunity to consider a range of reasonable alternatives for the proposed action, and thus fulfilling one of the key tenets of NEPA.

3.1 Formulating Alternatives

This chapter describes the process for formulating alternatives and the activities they share in common. For ease in comparison, at the end of this chapter, we have provided Table 3-4 that compares the acres of habitat associated with each alternative and Table 3-5 which compares the basic management approach for each alternative. Please refer to Chapter 2 – Affected Environment – for detailed descriptions of the Study Area's resources.

After identifying the goals for a potential Cherry Valley NWR, we began developing alternatives. Alternatives describe complementary management approaches for achieving the missions of the Service and the Refuge System, the purposes for which a refuge might be established, and its vision and goals, while responding to issues and

opportunities identified during the planning process. We relied on the Study Act to guide our decisions regarding the potential purposes for a new refuge.

We considered a number of alternatives but chose three to fully develop, including the NEPA required "No Action" alternative to provide a baseline for comparing the other two alternatives. There were two main alternatives we considered but did not fully develop. The first was an alternative focused mainly on protection of bog turtle habitat. We concluded that such a narrow approach would not honor the intent of the Study Act. The second included lands for protection in the Minsi Lake Corridor and Shawnee watershed (Figure 3-1) because of the recognized wildlife and habitat values, and the expressed interest from the public. However, we concluded these areas were never intended to be part of the study and should be considered for protection in a separate exercise. We believe the three alternatives presented in this document and their respective narrative descriptions represent a reasonable range of alternatives for achieving the Study Act purposes; the draft purposes, vision, and goals of the proposed refuge; and addressing the issues described in Chapter 1.

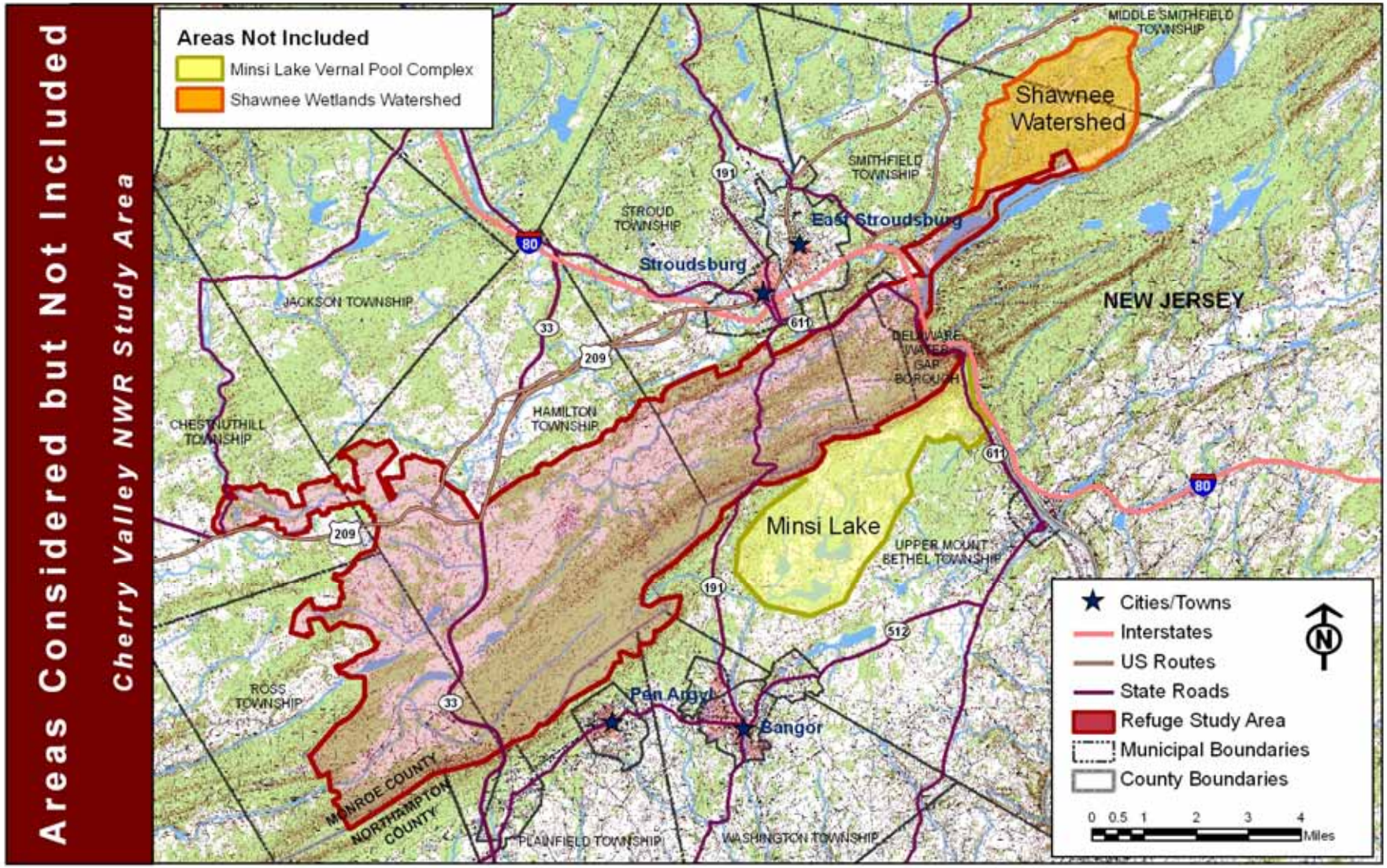

Figure 3-1. Areas outside of the Study Area that were considered but not included in the analysis of alternatives.

3.2 Alternatives

In brief, the alternatives we considered are:

Alternative A. – "No Refuge" This is the "No Action" alternative required by NEPA and serves as a baseline to which other alternatives are compared. In this alternative, there would be no new refuge and no designated acquisition boundary. Habitat protection and management would continue to be done by existing organizations and government programs. Currently there are 6,313 acres of lands protected by agricultural easements, private conservation, and municipal, state, and federal ownerships within the Study Area, of which 4,811 acres contain 12 of the defined Cherry Valley ecological systems (Table 3-1, Figure 3-2). There would be no new opportunities for refuge-based wildlife-dependent public uses, partnerships, or scientific research.

Alternative B. – "Diverse Habitat Complex." This is the Service's proposed action, i.e., this is the option the Service is recommending to establish a refuge. This alternative includes an acquisition boundary of up to 20,466 acres containing portions of 13 of the Study Area's ecological systems (Table 3-2, Figure 3-3). Protection of lands would be done through fee title (approximately 50 percent of the acres) and conservation easements (approximately 50 percent of the acres). This alternative would provide protection for more extensive habitat areas compared to Alternatives A and B, and would better enable the Service to meet the needs of both rare and more common species of wildlife. It would offer more compatible public use opportunities than Alternatives A or C, and would also provide opportunities for extensive, refuge-based partnerships and scientific research.

Alternative C. --"*Wetlands and Ridge Forests*." Complementing the 4,811 acres of the defined Cherry Valley ecological systems already under some protection, this alternative proposes an acquisition boundary of up to 14,124 acres containing portions of 12 of the Study Area's defined ecological systems (Table 3-3, Figure 3-4). Protection of lands would be accomplished through fee title (approximately 65 percent of the acres) and conservation easements (approximately 35 percent of the acres). This alternative would provide important protections and management opportunities for wildlife and habitats in the valley, especially for wetlands and Kittatinny Ridge forests. However, benefits, particularly for riparian and stream species (e.g., brook trout) and species associated with forested wetland ecological systems (see Table 3-4) would be considerably less. Compared to the No Refuge alternative, it would offer substantial opportunities for compatible public uses, along with new refuge-based partnerships and scientific research, but these would be substantially less than with the proposed action (Alternative B).

Within the narrative descriptions of each alternative, we describe possible management activities that would help meet the goals of a proposed Cherry Valley NWR. Maps are used to illustrate lands that could be included within a new refuge (Figures 3-2 through

3-4). Following those descriptions, Tables 3-4 and 3-5 provide side-by-side comparisons of the alternatives. We designed the tables to give the reader a quick overview of: 1) differences in acres by habitat type (Table 3-4); and, 2) actions that distinguish the alternatives and their relationship to the potential goals and key issues (Table 3-5).

3.2.1 Alternative A – No Action

This alternative represents the current state of land protection activity in Cherry Valley without a refuge, thereby offering an important baseline to which the other alternatives can be contrasted. The Service would take no action within this alternative but would continue activities it has pursued over the last several years, noted below. We refer to this interchangeably as Alternative A, "No Action," or the "No Refuge" throughout this Study Report. Currently there are 6,313 acres of lands protected by agricultural easements, private conservation, and municipal, state, and federal ownerships within the Study Area, of which 4,811 acres contain 12 of the defined Cherry Valley ecological systems (Figure 3-2, Table 3-1).

Goal 1. Protect and enhance habitats for federal trust species and species of management concern, with special emphasis on migratory birds and species listed under the ESA, along with protection of wetlands and the Kittatinny Ridge..

Cherry Valley and its surroundings have areas of great natural resource value closely juxtaposed with areas of accelerated commercial and residential development. Residential properties, alone, cover nearly 20 percent of the Study Area. Open space parcels, which include agriculture, parks, forest, vacant, and in this case, property owned by utilities, together account for nearly 70 percent of the Study Area. To date, Cherry Valley has remained modestly developed, primarily due to the conservation ethic of residents, some of whom have negotiated the sale of their properties to conservation organizations. Other landowners have sold off the development rights to their property or placed their land in various types of agricultural and conservation easements. Funding for many of these projects was generated through a Monroe County Open Space Referendum that set aside monies to conserve open space throughout Monroe County; however, those funds are now exhausted.

Recently, however, development pressure has increased. Located less than two hours by car from Philadelphia and New York City, Cherry Valley's quiet landscape is threatened by the onrush of residential development. Several small and modest-sized developments have popped up in the valley and single family home development has been proceeding at a brisk pace. In addition to attracting new residents, the valley's rural character, quality of life, and lower taxes have also sparked a trend in the conversion of seasonal homes to year-round residences.

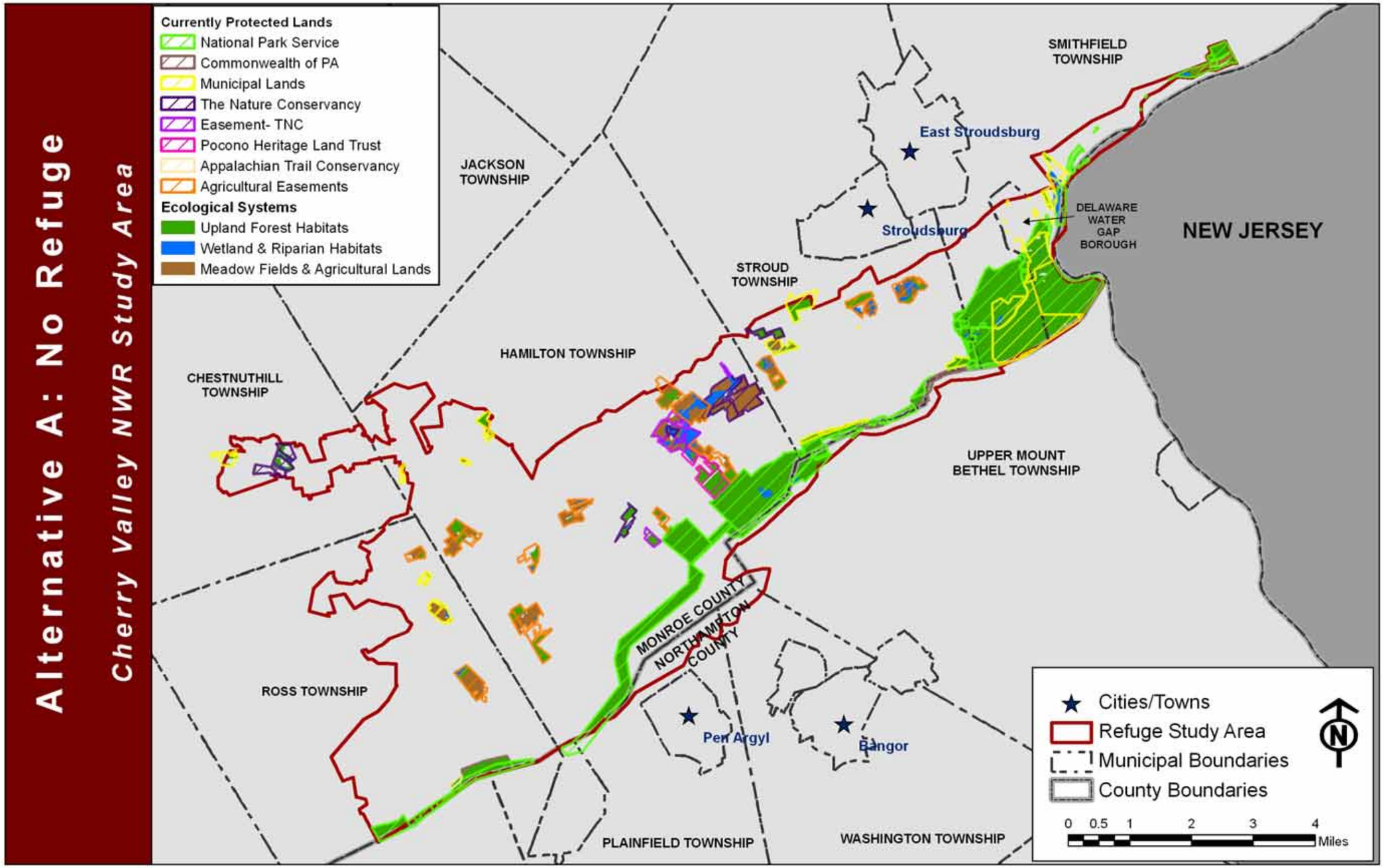

Figure 3-2. Map indicates existing conservation lands that would remain under Alternative A: No Refuge (No Action) within the Cherry Valley National Wildlife Refuge Study Area, Pennsylvania.

Table 3-1. Acres of ecological systems protected under Alternative A.

	Ecological Systems	*Acres*			
		Agricultural Easements	**Private Conservation**	**Municipal, State & Federal**	***Totals***
Upland Forest Habitat	**Appalachian (Hemlock)-Northern Hardwood Forest**	8.30	64.40	138.08	**210.78**
	Central Appalachian Dry Oak-Pine Forest	134.62	47.11	2,635.55	**2,817.28**
	Central Appalachian Dry Oak-Pine Rocky Woodland	0.00	0.00	55.67	**55.67**
	Northeastern Interior Dry-Mesic Oak Forest	131.68	129.20	1,015.80	**1,276.68**
Wetlands & Riparian Habitat	**Central Appalachian Floodplain**	0.00	0.00	94.01	**94.01**
	Central Appalachian Stream and Riparian	43.70	29.32	5.39	**78.41**
	Laurentian-Acadian Freshwater Marsh	0.00	0.17	0.00	**0.17**
	Laurentian-Acadian Wet Meadow-Shrub Swamp	70.86	92.30	10.23	**173.39**
	North-Central Appalachian Acidic Swamp	4.13	0.00	30.38	**34.51**
	North-Central Appalachian Seepage Fen	0.00	0.00	0.00	**0.00**
	North-Central Interior Wet Flatwoods	10.87	26.88	0.00	**37.75**
	North-Central Interior and Appalachian Acidic Peatland	0.00	0.00	8.55	**8.55**
	North-Central Interior and Appalachian Rich Swamp	6.56	17.54	0.00	**24.10**
	Ecological Systems Totals	**410.72**	**406.92**	**3,993.66**	**4,811.30**
	Total Parcel Acres[1] (31,585.8 total boundary acres)	**1,046.97**	**787.73**	**4,477.95**	**6,312.65**

[1] Property lines do not coincide with the Study Area boundary. Parcels have been divided to match the Study Area boundary as closely as possible, but total parcel acres exceeds the total Study Area because of rounding errors during parcel adjustments.

Much of the land already managed or protected in this physiographic area is forested (e.g., Delaware Water Gap National Recreation Area, State Game Lands, state forests and parks). The AT passes through the potential refuge and the National Park Service and other partners own a buffer of land along the trail. The Service would continue to work closely with our conservation partners, all of whom are instrumental in helping us accomplish habitat restoration and protection activities, largely through our Partners for Fish and Wildlife Program, our statutory responsibilities under the ESA, and our advisory role under the Fish and Wildlife Coordination Act.

The Pocono Heritage Land Trust is a locally based conservation group dedicated to protecting important lands and waters, open space, agricultural landscapes, and the natural heritage of the Pocono Mountains region. It currently owns one large tract of land in the valley. Cooperative agreements with other conservation groups have resulted in restoration work on their property. The Nature Conservancy has been successful in Cherry Valley in protecting 1,000 acres through the purchase of land or conservation easements. The primary beneficiary of this effort has been the bog turtle, as numerous wetlands that provide habitat for this species have been protected and restored. Other prominent conservation partners with the Service include the Pennsylvania Natural Heritage Program, Pennsylvania Game Commission, Pennsylvania Fish and Boat Commission, and the Pennsylvania Department of Conservation and Natural Resources.

Taken together, the respective missions of the preceding groups provide an ability to assist in the protection of farmland, threatened and endangered species, scenic areas, grassland habitats, and open space that the local community has identified as significant. This collective ability, however, has proven to be too limited to meet the needs of an expanding population.

Based on this collective effort, the Alternative A would maintain protection of 6,313 acres of lands currently protected by agricultural easements, private conservation, municipal, state, and federal ownerships, of which 4,811 acres contain 12 of the defined ecological systems in the Study Area. Habitats and their respective ecological systems for trust species and species of special management concern would continue to be protected through maintenance of these 4,811 acres (Table 3-1 above). Over 2,800 acres of Central Appalachian Dry Oak-Pine Forest and nearly 1,300 acres of Northeastern Interior Dry Mesic Oak Forest would serve as valuable habitat to breeding forest interior birds such as parula and black-throated green warblers. Over 450 acres of diverse wetlands are protected, contributing to the conservation of foraging bats, wetland birds, waterfowl, shorebirds, bobolink, woodcock, Eastern meadowlark, bog turtles, diverse reptiles and amphibians, mink, river otter, and other species. Over 1,000 acres are held in agricultural easements. These could contribute, if managed appropriately, to the conservation of declining grassland birds such as grasshopper sparrows, bobolink, and Eastern meadowlark.

Goal 2. Create opportunities for hunting, fishing, wildlife observation and photography, and environmental education and interpretation, while promoting activities that complement the purposes of the refuge and other protected lands in the region.

The Service seeks opportunities to promote wildlife-dependent recreation on its refuges. There would be no refuge-based opportunities under the “No Action” alternative. A number of wildlife related recreational activities exit within the valley and would continue. Hunting and fishing occurs in the valley under regulations administered

by the Pennsylvania Game Commission and the Pennsylvania Fish and Boat Commission. Much hunting occurs on private lands. Public hunting is currently limited to approximately 1,200 acres of state and municipal lands. The Pennsylvania Game Commission actively encourages youth hunting through several programs which could benefit from the establishment of a refuge in Cherry Valley.

Fishing includes both cold and warm water species. Flyfishing is popular along Cherry Creek, but public access is very limited. The Delaware River provides a variety of fishing opportunities for warm water and migratory fish species. Public fishing access is available, principally within the Delaware Water Gap National Recreation Area**.**

The Kittatinny Ridge is well known to bird watchers, especially enthusiasts who enjoy watching the extensive hawk migrations throughout the ridge and valley environment. This ridge is home to Pennsylvania's most important greenway. In the 1930s, the Appalachian National Scenic Trail was created along its spine, and the world's first conservation area for birds of prey, Hawk Mountain Sanctuary, was also established here to protect migratory raptors. The 150 mile long Kittatinny Ridge is recognized as a globally significant migration flyway, concentrating up to 20,000 migrating fall raptors. There are 12 recognized hawk watching sites along the ridge. Cherry Valley lies between the Delaware Water Gap site immediately adjacent to the east and the Hawk Mountain Sanctuary (Bake Oven Knob), 30 miles to the west. The ridge is also where people hike, hunt deer, fish for trout, ride bicycles, canoe, and enjoy beautiful fall colors. It provides clean water and ample forest resources for tens of thousands of people. The 2006 "Conservation Plan for Kittatinny Ridge Conservation Corridor" (Audubon Pennsylvania 2006) describes the value of the ridge in detail and includes protection of ridge habitat as a critical priority. Within the No Action alternative, about 4,360 acres of forested ridge habitat would remain protected.

Goal 3. Promote science, education, and research through partnerships to inform land management decisions and encourage continued responsible stewardship of the natural resources of Cherry Valley.

As referenced under Goal 1, there is an active partnership structured to promote land protection in the valley. Other partnerships exist to promote other aspects of the valley's character, principally its natural resource values. The Friends of Cherry Valley, Inc., is a private conservation organization, formed in 2003, to advance conservation and protection of valley resources. It has been and remains a strong advocate of a refuge in the valley. Other important existing partnerships include the Monroe County Conservation District, The Nature Conservancy, Pocono Heritage Land Trust, local municipal governments, the Monroe County Open Space Program, and others.

Cherry Valley currently maintains a firm foundation for conducting science and research within the field of natural resource management. East Stroudsburg University hosts a strong Department of Biology that has participated in a variety of ecological studies over

the years. Research and field studies are carried out by most of the conservation partners mentioned already, notably the Pennsylvania Game, Fish and Boat, and Natural Heritage Commissions. Pennsylvania State University maintains a Cooperative Fish and Wildlife Research Unit, which, for example, has recently surveyed the distribution and status of the dwarf wedgemussel within the northern Delaware River, a species that potentially can reestablish in Cherry Valley. This Unit, a cooperative effort with Pennsylvania State University's School of Forest Resources, the commissions noted above, and The Wildlife Management Institute, also conducts diverse research on black bear, trout, ruffed grouse, stream ecology, and a host of other subjects that may be useful to the Cherry Valley area.

Environmental education currently is performed in each of the school districts for the valley's municipalities: Ross, Chestnuthill, Hamilton, Stroud, and Smithfield townships and Delaware Water Gap Borough. The Monroe County Conservation District maintains a strong and active environmental education program. Its facilities are well designed for large school groups and organizations, and it maintains a trail system, gift shop, and interpretative displays**.**

3.2.2 Alternative B – Diverse Habitat Complex (Proposed Action)

The "Diverse Habitat Complex" alternative is the Service's proposed action. It offers the most comprehensive habitat and wildlife conservation effort without including areas of minimal conservation value. This alternative would fulfill the intent of the Study Act by creating an acquisition boundary of up to 20,466 acres within the 31,500 acre Study Area (Table 3-2, Figure 3-3). Alternative B contains portions of 13 of the ridge and valley's defined ecological systems, compared to the 12 ecological systems protected in Alternatives A and C (i.e., Central Appalachian Floodplain). Protection of lands would be done through fee title (about 50 percent of the acres) and conservation easements (about 50 percent of the acres). The Service concludes that this alternative would provide valuable protection for the numerous wildlife species and habitats referenced in the Study Act. Alternative B also would provide extensive opportunities for wildlife-dependent recreation, new and dynamic partnerships, and scientific research.

Table 3-2. Acres of ecological systems protected under Alternative B (proposed action).

	Ecological Systems	*Acres*				
		Potential Refuge Lands				
		No Current Protection	**Agricultural Easements & Private Conservation**	**Totals**	**Municipal State & Federal**	**Grand Totals**
Upland Forest Habitats	**Appalachian (Hemlock)-Northern Hardwood Forest**	930.06	72.70	1002.76	138.08	**1,140.84**
	Central Appalachian Dry Oak-Pine Forest	7365.41	181.73	7547.14	2635.55	**10,182.69**
	Central Appalachian Dry Oak-Pine Rocky Woodland	17.88	0.00	17.88	55.67	**73.55**
	Northeastern Interior Dry-Mesic Oak Forest	4093.26	260.88	4354.14	1015.80	**5,369.94**
Wetlands & Riparian Habitats	**Central Appalachian Floodplain**	4.29	0.00	4.29	94.01	**98.30**
	Central Appalachian Stream and Riparian	261.97	73.02	334.99	5.39	**340.38**
	Laurentian-Acadian Freshwater Marsh	2.25	0.17	2.42	0.00	**2.42**
	Laurentian-Acadian Wet Meadow-Shrub Swamp	332.90	163.16	496.06	10.23	**506.29**
	North-Central Appalachian Acidic Swamp	275.39	4.13	279.52	30.38	**309.90**
	North-Central Appalachian Seepage Fen	13.70	0.00	13.70	0.00	**13.70**
	North-Central Interior Wet Flatwoods	76.25	37.75	114.00	0.00	**114.00**
	North-Central Interior and Appalachian Acidic Peatland	3.80	0.00	3.80	8.55	**12.35**
	North-Central Interior and Appalachian Rich Swamp	163.28	24.10	187.38	0.00	**187.38**
Ecological Systems Totals		**13,540.4**	**817.6**	**14,358.1**	**3,993.7**	**18,351.7**
	Total Parcel Acres [1] ***(31,585.8 total boundary acres)***	**18,630.9**	**1,834.7**	**20,465.6**	**4,478.0**	**24,943.5**

[1] Property lines do not coincide with the Study Area boundary. Parcels have been divided to match the Study Area boundary as closely as possible, but total parcel acres exceeds the total Study Area because of rounding errors during parcel adjustments.

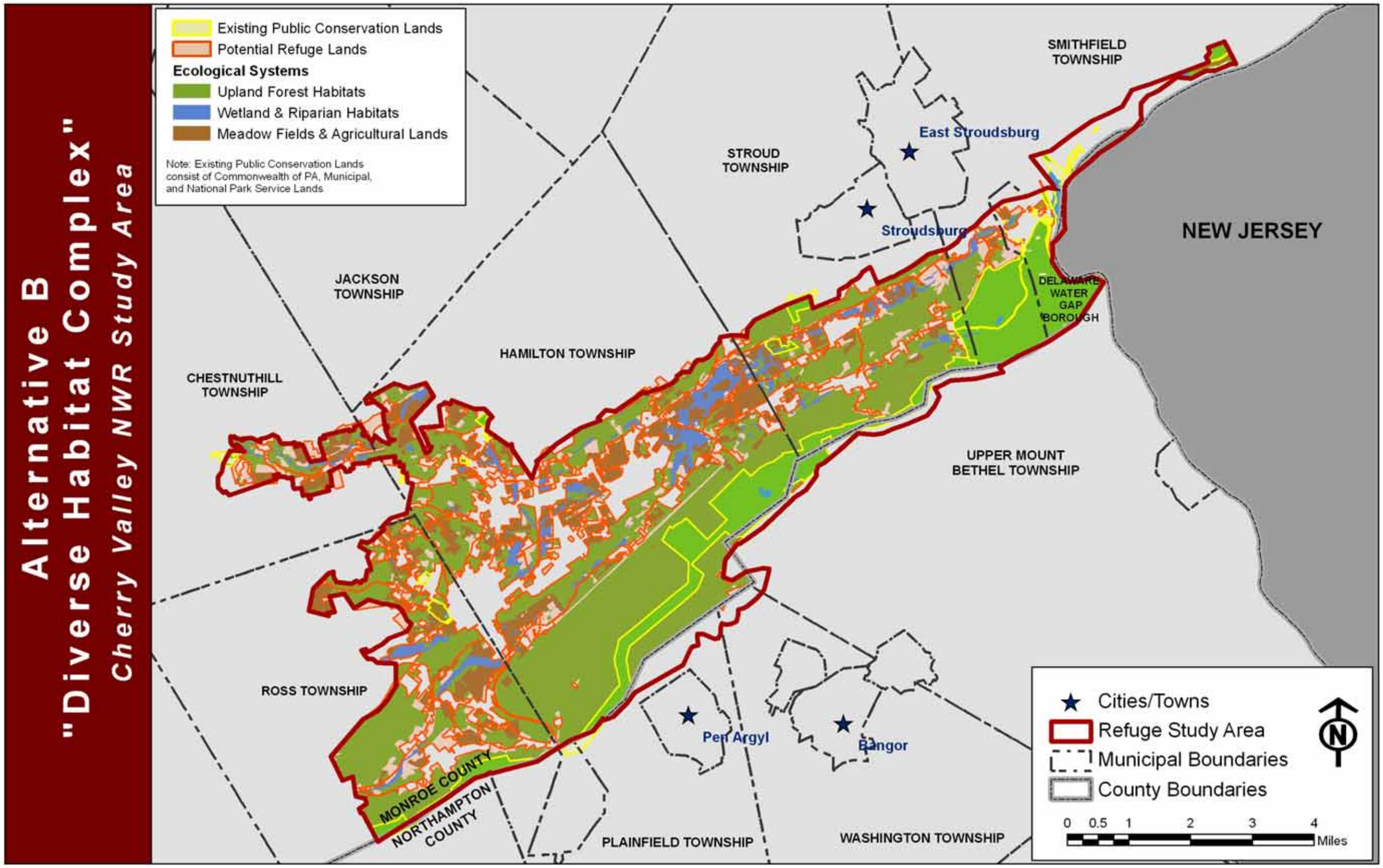

Figure 3-3. Map of ecological systems and habitats protected by Alternative B: Diverse Habitat Complex in the Cherry Valley National Wildlife Refuge Study Area, Pennsylvania.

Goal 1. Protect and enhance habitats for federal trust species and species of management concern, with special emphasis on migratory birds and species listed under the ESA, along with protection of wetlands and the Kittatinny Ridge.

Diverse habitats and their respective ecological systems for trust species and species of special management concern would be protected through this alternative (Table 3-2). Of the 20,466 acres identified for potential protection, over 12,400 acres of upland forests could be protected, over 12,100 more acres than Alternative A and over 2,800 more acres than Alternative C. Compared to Alternative A (No Action), roughly 4,700 additional acres of Central Appalachian Dry Oak-Pine Forest and nearly 3,000 additional acres of Northeastern Interior Dry Mesic Oak Forest would be protected. Appalachian (Hemlock) – Northern Hardwood Forest would increase by 79 percent under Alternative B with an additional 790 acres compared to the No Action Alternative. These forests serve as valuable habitat for birds that breed in interior forests such as ruffed grouse, wood thrush, Eastern wood pewee, scarlet tanager, black-throated blue warbler, and worm-eating warblers.

Over 1,000 additional acres of emergent, scrub-shrub, and forested wetlands could be protected, compared to the No Action Alternative. Protecting these habitats would contribute to the conservation of foraging bats, wetland birds, waterfowl, shorebirds, bobolink, woodcock, turkey, Eastern meadowlark, bog turtles, wood turtles, diverse reptiles and amphibians, mink, river otter, and others. Additionally, over 3,400 acres of agricultural lands could become available for protection and could contribute, if managed appropriately, to the conservation of declining grassland birds such as grasshopper sparrows, bobolink, and Eastern meadowlark. Conserving this habitat would allow the Service to manage these lands for rare grassland birds that require 50+ acre sites for nesting habitat. In addition, in smaller grassland areas adjacent to forests, there may be ways to manage for early successional shrub habitat for woodcock.

Species priorities would include improving habitats for federally-listed species known to be present on the refuge, or known to have a high likelihood of reestablishment. Other priorities for the potential refuge's habitat activities would include actions needed by neotropical forest birds, ridge-migrating raptors, migrating and wintering waterfowl, and grassland birds. Habitat management priorities would focus on wetland restoration, forest health and structural integrity, and maintaining and restoring grassland. The Service would consider appropriate means for controlling invasive plant species on the refuge and improving aquatic habitats for fish and invertebrates. Following are narratives for specific groups of plants and animals that may become subject to refuge management.

Migratory Birds

Cherry Valley lies within the Atlantic Flyway in northeastern Pennsylvania. Numerous neotropical songbirds, ridge migrating raptors, freshwater wetland birds, and waterfowl follow the Kittatinny Ridge as a travel corridor and take shelter, forage, and nest in the

forest, scrub-shrub, grassland, and wetland habitats that are found there. The potential refuge is located in the Northern Ridge and Valley physiographic area, located within NABCI's Appalachian Mountains Bird Conservation Region (AMBCR or BCR # 28) (see Chapter 1, p. 1-9). AMBCR includes portions of 15 states and 11 Partners In Flight (PIF) physiographic regions covering 105 million acres. Based on Breeding Bird Survey data analysis, 86 of the 234 bird species that breed and winter throughout the AMBCR are declining, some significantly (Sauer et al. 2005). Populations for at least 33 species have greater than ten percent of their population in the Appalachian Mountains and at least ten species have greater than 25 percent of their population in the Appalachians. Remarkably, almost 80 percent of the entire cerulean warbler population occurs in the AMBCR. Shorebirds and waterbirds are not considered a high conservation priority within the AMBCR; however, some species such as spotted sandpiper, upland sandpiper, and American bittern occur locally. In addition, the Service has recognized six migratory bird species found within the Study Area as birds of conservation concern: wood thrush, prairie warbler, cerulean warbler, worm-eating warbler, Louisiana waterthrush, and peregrine falcon (USFWS 2002b; also see Appendix C, Table C-2).

Cerulean Warbler

The Cherry Valley Study Area is located within the Delaware River Planning Unit of the Atlantic Coast Joint Venture (ACJV) partnership. The ACJV is designed to help support the North American Waterfowl Management Plan. The Delaware River is recognized by the ACJV as an important spring and fall migration corridor for ducks and geese (ACJV Focus Area Report Delaware River Basin, Pennsylvania Focus Area: Pike County). The Delaware River Unit covers over 1.8 million acres and includes the entire non-tidal Pennsylvania portion of the Delaware River, as well as the eastern half of the Pennsylvania portion of the river's drainage basin. The portion of the planning area north of the Kittatinny Ridge is in the Appalachian Plateau and Ridge and Valley Physiographic Provinces, and is characterized by a rolling to mountainous, predominantly forested landscape with an abundance of natural wetlands. Pike County, just north of Cherry Valley, has been identified as the unit's focus area because of its especially high concentration of exceptional quality wetlands. North of the Kittatinny Ridge, the primary importance of the planning area to waterfowl is as breeding habitat for black duck and wood duck. Breeding mallard and resident Canada geese are common. Common and hooded mergansers also occur.

The Kittatinny Ridge is recognized as a globally significant migration flyway, hosting up to 20,000 migrating fall raptors every year (Hawk Mountain Sanctuary 2008). This ridge is home to the world's first conservation area for birds of prey, Hawk Mountain Sanctuary, established in 1934 solely to protect migratory raptors (Hawk Mountain Sanctuary 2008). Cherry Valley lies northeast of the Hawk Mountain Sanctuary. The 2006 "Conservation Plan for Kittatinny Ridge Conservation Corridor" (Audubon

Pennsylvania 2006) describes the value of the ridge in detail and includes protection of ridge habitat as a critical priority. The ridge serves as migration habitat for at least 16 species of North American raptors, including peregrine falcon, bald eagle, broad-winged hawk, Northern goshawk, and black vulture. There are 12 recognized hawk watching sites along the ridge.

The large blocks of unfragmented forest throughout the ridge also serve as key breeding sites for many interior-forest birds, including: ruffed grouse, wood thrush, ovenbird, scarlet tanager, cerulean warbler, worm-eating warbler, Louisiana waterthrush, Acadian flycatcher, and many others. Some of these are species of conservation concern that may be on the brink of being listed as threatened or endangered, or are on the National Audubon Society's National Bird Conservation WatchList (Butcher et al. 2007). In addition to interior forest songbirds, other species that use the Kittatinny Ridge Corridor for nesting that are on Audubon Pennsylvania's list of "Birds of Concern" include: American woodcock, great egret, bald eagle, red-headed woodpecker, and peregrine falcon. This habitat matrix supports a variety of other species of special concern, including the Pennsylvania threatened Allegheny woodrat and Eastern small-footed myotis (a bat). Black bear, bobcat, wild turkey, and ruffed grouse are found in healthy numbers, not to mention an abundance of white-tailed deer. This alternative could protect up to 12,400 acres of upland forest habitat, thus greatly enhancing the number of acres of forested ridge habitat already protected in the valley area.

Roughly 50 percent of the undeveloped areas in the Cherry Valley Study Area is forested, including forested wetlands; 2 percent is emergent and scrub-shrub wetlands; and another 40 percent is agricultural land consisting primarily of old fields, hay meadows, pasturelands, and croplands. The potential refuge boundary identified in Alternative B provides a diverse mix of habitat types and as such provides habitat for numerous AMBCR and ACJV priority species as referenced in Appendix B (Table C-2) including:

- Emergent and Riparian Freshwater Wetlands (American black duck, wood duck, common and hooded mergansers, bald eagle, American bittern, etc.).
- Agricultural/Grassland (grasshopper sparrow, golden-winged warbler, bobolink, Eastern meadowlark, etc.)
- Shrub-Early Successional (golden-winged warbler, American woodcock, field sparrow, eastern towhee, willow flycatcher, brown thrasher, blue-winged warbler, prairie warbler, etc.)
- Deciduous Oak-Hickory and Riparian Forest (cerulean warbler, worm-eating warbler, wood thrush, Louisiana waterthrush, red-headed woodpecker, Eastern wood-pewee, scarlet tanager, Kentucky warbler, Northern oriole, etc.)
- Northern hardwood-mixed forest (eastern wood-pewee, wood thrush, Canada warbler, olive-sided flycatcher, Louisiana waterthrush, scarlet tanager, yellow throated vireo, etc.)

To the best of our knowledge, the majority of these species are well represented in the region. Indeed, Cherry Valley is recognized as a premiere birding location in the Northeast and is a destination site for birders, academic classes from local education institutions, and others.

The potential refuge described in this alternative would hold a unique position of offering a mosaic of habitats that aid a large diversity of avian species. One of the greatest opportunities in this regard may be the presence of larger, non-forested tracts that could be managed for shrubland birds. Scrub-shrub habitat is a high priority in the Northern Ridge and Valley, primarily because it continues to support numerous breeding populations of golden-winged warblers, one of the highest priority bird species in the area (Appalachian Mountains Bird Conservation Partnership 2005). The PIF plan considers managing for this species as a high priority wherever feasible. Other shrubland species have undergone significant population declines in this physiographic area due to the overall loss of early successional habitats.

The landscape composition around the potential refuge also presents a great opportunity to make significant contributions to the conservation of grassland birds. Grasslands throughout the physiographic area are being significantly degraded by succession and through colonization of these areas by invasive plant species. The expansion of fast spreading invasive species such as multiflora rose and autumn olive into grassland habitats very quickly makes these habitats unsuitable for grassland bird species. A well planned and organized invasive species control program would be crucial to grassland management, as well as management of the other habitats at the potential refuge.

Mature hardwood forest is the top conservation priority in the AMBCR. With much of the existing forestland in this physiographic area lying on ridges, bottomland forests are comparatively rare. Managing for forested bottomland corridors along the Cherry Creek and its tributaries would constitute a significant contribution to the overall goals for Area 17. Management of ridge and slope forested upland habitat and forested wetland habitats would support nesting interior-forest-dwelling birds of concern. Management of non-forested and forested wetland habitat would provide spring and fall migratory waterfowl and shorebird habitat. Extensive pockets of suitable waterfowl and shorebird habitat are present along the entire length of the Cherry Creek riparian corridor and elsewhere in Cherry Valley.

Endangered and Threatened Species

Bog turtle -- The Bog Turtle (*Clemmys muhlenbergii*) Recovery Plan (USFWS 2001) identifies eastern Pennsylvania as a stronghold of this federally-listed, threatened species. The area encompassed by Alternative B (see Figure 3-3 above) includes numerous documented bog turtle wetlands where the species is thriving, and other wetlands where turtles are present but the habitat is in need of restoration. A number of important partnerships between the Service's Partners for Fish and Wildlife program,

The Nature Conservancy, the Pocono Heritage Land Trust, private landowners, and others have resulted in the protection of some of these wetlands, as well as successful bog turtle habitat restoration projects throughout the valley. The potential refuge described in Alternative B would continue and expand upon these partnerships and management opportunities.

Bog turtles live in spring-fed wetlands throughout Cherry Valley. The existing riparian corridor along Cherry Creek and its tributaries provides good habitat connectivity for this species as well as other species of concern. Although some of the wetlands are, in a sense, protected due to conservation-focused easements and ownerships, many such wetlands remain unprotected and are therefore in peril. An additional challenge is that springs that provide water to these wetland systems have their genesis on the ridge and mountain slopes that flank Cherry Valley to the north and south. Only a small amount of these forested slopes is protected. This is of great concern because development or other alterations here would jeopardize the hydrologic link that supports the valley wetlands and the unique assemblage of species that inhabit them. Alternative B (and Alternative C) would provide opportunities to protect the wetlands, slopes, and riparian corridor areas of Cherry Valley.

Indiana Bat -- Indiana bats (*Myotis sodalis*) were present in the Cherry Valley region of eastern Pennsylvania based on historic records from Hartman's Cave. Currently, two bat hibernation sites are known within close proximity to Cherry Valley. They are located in historic mines at Hibernia and Mount Hope, New Jersey, approximately 35 miles away. A thriving summer population of Indiana bats is found at Great Swamp NWR, approximately 15 miles from these hibernation sites and about 65 miles from Cherry Valley. During the spring and summer, Indiana bats make their way to the Great Swamp NWR for foraging, birthing, and rearing of young. The habitat at the Great Swamp NWR that supports these activities consists of large dead snags and dying trees that lie within close proximity to open marshes and stream corridors. Proximity of the Cherry Valley region to the hibernation sites, the presence of high quality summer habitat consistent with that observed at the Great Swamp NWR, and the historical records of Indiana bats in Cherry Valley, all indicate there is a high likelihood that the species is present in the Study Area during the summer months. In addition, it is likely that wintering populations could be restored to the area if Hartman's Cave and other potential hibernation sites are protected from disturbance.

The best potential habitat for the Indiana bat in Cherry Valley, aside from the historical hibernation site at Hartman's Cave, would be late spring and summer foraging habitat in the riparian corridor of Cherry Creek (i.e., Central Appalachian Stream and Riparian ecosystem). Areas where this corridor coincides with large dead and dying snags (for roosting) and wooded and emergent wetlands (for foraging) would be the areas with the highest likelihood of occurrence. Survey work of the area would be merited to establish the current presence or absence of the species. Future management of the area to retain and restore appropriate habitat may serve to attract bats to the area and

expand upon current habitat use. Based on available information, protection and management of appropriate habitat in Cherry Valley has a high potential for aiding the recovery of this species. Surveys for Indiana bats would be a high priority if a refuge is established.

Other Federally-Listed, Threatened and Endangered Species and Federal Species of Concern -- Other species of concern that have been documented in the valley include the federally-listed, endangered northeastern bulrush, and a historical record of the federally-listed, threatened small-whorled pogonia (DCNR 2008). The northeastern bulrush became the second Pennsylvania plant to be federally listed as an endangered species. It is found in small wetlands, usually one acre or less, where the water level is high in spring and drops through the summer. At present, 26 populations are known in Pennsylvania, most have been discovered since the species was listed and brought to the attention of ecologists. This alternative (Alternative B) would allow the Service to provide habitat protection for the one known population of Northeastern bulrush in the Study Area. There is one historical record of small-whorled pogonia in Monroe County. It is thought that the specimen was observed near the Delaware Water Gap, but its exact location is unknown (S. Klugman, personal communication, 2 September 2008). In the Northeast, this orchid typically occurs in mid-successional, mixed deciduous and coniferous forest with gaps in the canopy. Typically soils are acidic sandy loam and topographic slope ranges from 8 to 15 percent, or at the base of steep slopes (Sperduto and Congalton 1996). Consequently, even though the species has not been recorded recently, protection of upland forests as described within this alternative may allow management for and protect of suitable habitat for this species.

Northeastern Bulrush

The American eel has been documented in Cherry Creek (Hartzler 2001, Fisher pers. comm.). The American eel is an interjurisdictional fish that breeds in saltwater and grows and matures in freshwater (i.e., it is catadromous). Because the species is thought to be in decline in some areas, a status review was initiated by the Service in 2004 to evaluate if ESA protection should be extended to the eel. The Service determined in 2007 that, although there was compelling evidence of eel decline in some areas, the overall population is not in danger of extinction nor is it likely to become so in the foreseeable future (USFWS 2007a). Regardless, nearly 335 acres of stream and riparian habitats described within Alternative B would be protected, and possibly enhanced, for the benefit of this and other stream-dependent species.

Cherry Creek also supports a population of eastern brook trout. In the U.S., eastern brook trout populations have declined across their range (Hudy et al. 2005). This

decline has been attributed to many causes, including increases in water temperatures, agriculture, urbanization, exotic fish species, and poor riparian habitat has the top reasons for this decline (Hudy et al. 2005). Within the Study Area, the most prominent reasons for decline of the species are thought to be high water temperature and urbanization (Hurdy et al. 2008). As part of the efforts of the EBTJV, Pennsylvania has identified several goals for this species, including conserving existing populations where they exist (EBTJV 2008). By protecting up to 335 acres of stream and riparian habitat, this alternative offers the best opportunity for conserving and improving the brook trout population in Cherry Creek, in concert with state and regional goals for this species.

Dwarf wedgemussel (an endangered species under the ESA), striped bass (interjurisdictional fish), and American shad (interjurisdictional fish) are documented nearby in the Delaware River. Although this species has not been documented in the Study Area to date, it has been documented in the Delaware River north of Cherry Valley by the Pennsylvania Cooperative Fish and Wildlife Research Unit, thus providing an indication that recovery steps are possible within the potential refuge boundary. Striped bass and American shad likely do not occur in Cherry Creek; however, the dwarf wedgemussel and these interjurisdictional fish species are aided by clean, unpolluted water coming from tributaries to the Delaware River. At a minimum, the Cherry Creek watershed provides a valuable ecological service in this regard.

State-Listed Species -- In Pennsylvania, three different agencies share responsibility for administering the state threatened and endangered species program as well as and other species of special concern. The Pennsylvania Fish and Boat Commission is responsible for fish, reptiles, amphibians, and other aquatic organisms. The Pennsylvania Game Commission is responsible for wild birds and mammals. The Department of Conservation and Natural Resources is responsible for native wild plants, terrestrial invertebrates, significant natural communities, and geologic features. The bog turtle, Indiana bat, and dwarf wedgemussel are identified in the Pennsylvania Wildlife Action Plan (WAP) as “Wildlife of Immediate Concern” in addition to their status as federally-listed, threatened or endangered species (Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission 2008). Alternative B is the only alternative that would afford protection of the Central Appalachian Floodplain Ecological System, possibly providing habitat for the state-listed, endangered sand cherry.

According to an inventory conducted by The Nature Conservancy and the Pennsylvania Natural Heritage Program, Cherry Valley supports 20 state-listed endangered and 13 state-listed threatened species (see Table 2-3, pg. 2-17 for the specific species). Alternative B offers a significant means of protecting a wide diversity of valley habitats that may help to promote the maintenance and potential recovery of these state-listed species.

Ecosystems of Concern

In addition to the individual species discussed above, Cherry Valley includes three ecosystems that deserve mention (Noss et al. 1995). Open Sedge Fens are located in the valley and are considered to be a National Critically Endangered Ecosystem. The Kittatinny Ridge mentioned above is considered to be a National Endangered Ecosystem, again highlighting its importance as a major migration corridor for birds of prey, waterfowl, and song birds. The Riparian Forest Ecosystem is considered to be a National Threatened Ecosystem, and in Cherry Valley provides habitat and habitat connectivity corridors for a great diversity of rare and common wildlife. All three of these ecosystems would be subject to protection within a refuge under Alternative B. Two other imperiled ecosystems, Northern Appalachian Acidic Cliff and Acidic Shrub Swamp, are present in the valley within the potential acquisition boundary for Alternative B and are designated as Pennsylvania Special Concern Ecosystems.

Contributions to National Habitat Initiatives

A refuge in Cherry Valley could contribute to several national habitat directives or initiatives. The migratory bird species already described are priority species under the North American Waterfowl Management Plan, Partners in Flight Plan, and/or the Regional Birds of Conservation Concern List. A refuge would help ensure that migratory bird habitat in the wetlands and uplands of Cherry Valley is protected in perpetuity. Many other birds of high conservation concern would benefit as well. Protection afforded to Cherry Valley on behalf of bog turtles and other species of federal concern would have the indirect effect of protecting habitat for numerous state-listed, threatened and endangered species as well as other species of concern.

<u>Promotes Biological Integrity and Diversity</u>

Recently, various conservation groups, the State of Pennsylvania, and the federal government began to recognize the significance of wildlife habitats in Cherry Valley. With resources tight and evolving community recognition of open space and ecology, initiatives aimed at protecting the valley began to take form at the local government and private levels. Issues related to migratory birds, the federal ESA listing of the bog turtle, and water quality degradation, elevated to a national level the political and resource management understanding of the issues associated with a potential Cherry Valley NWR. During this time conservation partners have been working hard to protect the valley, its surrounding habitats, and associated species to the extent practicable. As development continues to dominate the landscape in Monroe County to the north and Northampton County to the south, the relatively unfragmented habitat in Cherry Valley stands in stark contrast. Because of this, Cherry Valley has become known as an important regional and national asset. Furthermore, management actions by the Service and others have resulted in habitat enhancements that support greater numbers of bog turtles and other species. Biological surveys conducted by the Service and other conservation agencies and groups have documented more than 167 bird species, the location of various bog turtle populations and habitats, and the potential presence of

other species of concern. By creating a new refuge in Cherry Valley, the Service would contribute extensively to protecting the biological integrity and diversity of an important wildlife corridor in northeastern Pennsylvania.

Provides Habitat Connections

Refuge lands would provide a crucial link for migratory birds and crucial habitat for several species of concern. Our land management goals and objectives for a refuge would complement the management of adjacent and nearby conserved lands, both public and private, thus enhancing our wildlife management contribution to the regional landscape (Figure 3-3 above). Links to habitats owned and managed by the Commonwealth of Pennsylvania, The Nature Conservancy, and the Pocono Heritage Land Trust would also help to provide for a more contiguous and intact habitat complex within Cherry Valley. A refuge in Cherry Valley would provide local and regional benefits to wildlife by working in concert with existing conservation areas and partners, for example:

- Delaware Water Gap National Recreation Area and the Middle Delaware National Scenic River. Located just northeast and bordering the potential refuge is the Delaware Water Gap National Recreation Area. The recreation area encompasses 67,000 acres of mountain ridge, forest, and floodplain on both sides of the Delaware River in the states of New Jersey and Pennsylvania. Forty miles of the Middle Delaware River are within the park, as well as trout streams, lakes, and ponds. The mission of these areas is to provide outdoor recreation opportunities while conserving the natural, cultural, and scenic resources of the recreation area. In so doing, the park works cooperatively with surrounding communities and the public to achieve the conservation goals of the Delaware River region.
- Appalachian Trail**.** Running the length of a possible Cherry Valley NWR would be a key segment of the Appalachian Trail. The trail is a more than 2,175-mile long footpath stretching through 14 eastern states from Maine to Georgia, traversing the wild, scenic, wooded, pastoral, and culturally significant lands of the Appalachian Mountains (National Park Service, "Appalachian National Scenic Trail"). The trail is flanked on either side by buffer areas intended to maintain the wild character and scenery encountered along the length of the trail. Numerous partners in addition to the National Park Service hold title to these lands.
- Worthington State Forest. Just across the Delaware River is the nearly 6,600 acre Worthington State Forest, owned by the State of New Jersey. Although a bit more distant from Cherry Valley than the Appalachian Trail and Delaware Water Gap National Recreation Area, the forest continues a habitat block of protected lands that is associated with Cherry Valley by proximity, resource values, and habitats. The most mountainous terrain and scenic views of northern New Jersey are found in Worthington State Forest.

- Hawk Mountain Sanctuary. Located along the Appalachian Flyway to the west of the potential Cherry Valley NWR, the 2,600 acre Hawk Mountain Sanctuary offers visitors an outstanding, year-round, nature experience with its mountaintop vistas, eight miles of hiking trails, and thrilling autumnal raptor migration. Hawk Mountain Sanctuary is one of the best places in the northeastern United States to watch the annual hawk migration. On average 20,000 hawks, eagles, and falcons pass along the Kittatinny Ridge by the Sanctuary's North Lookout each year (Hawk Mountain Sanctuary 2008).
- The Nature Conservancy. The Nature Conservancy has been successful in protecting 1,000 acres through the purchase of land or conservation easements in Cherry Valley.
- Pocono Heritage Land Trust. The Pocono Heritage Land Trust is a locally based conservation group dedicated to protecting important lands and waters, open space, agricultural landscapes, and the natural heritage of the Pocono Mountains region. It has been successful in protecting lands throughout the Pocono Region and currently owns one large tract of land in the Study Area. Cooperative agreements with The Nature Conservancy, the Service, and other conservation groups have resulted in habitat restoration work on this property.
- Pennsylvania Game Commission Game lands**.** The Pennsylvania Game Commission owns more than 1.4 million acres of State Game Lands and manages these lands for the benefit of wildlife and people. State Game Lands are public hunting grounds and lawful hunting and trapping are permitted during open seasons. The commission owns nearly 8,000 acres of mostly forested land in State Game Lands 168 (Northampton County) and State Game Lands 186 (Monroe County), respectively. These properties lie just to the west and north of Cherry Valley.
- County and Local Governments. Monroe County and other local governments, including Stroud Township, have been actively pursuing smart growth principles and protecting land and important landscape features and integrity in Cherry Valley. Although much of this effort in Monroe County has focused on concentrating development along established populations centers and existing highway arteries; along with the preservation of farmlands, woodlands, and open space; an indirect success has been the protection of important wildlife habitat within the valley (Bloss Associates 2001). Land protection within the valley has been promoted by a variety of measures including a $25 million Monroe County open space bond initiative that has been exhausted due to land protection demand.

Invasive Species Control

An inventory was conducted for Monroe County to help facilitate the preservation of native plants and control invasive species (The Nature Conservancy 1999). Alternative B would enable a partnership effort between the refuge and the Pennsylvania Bureau of

Forestry to inventory and control invasive plants such as common reed, purple loosestrife, multiflora rose, and Japanese knotweed.

Goal 2. Create opportunities for hunting, fishing, wildlife observation and photography, and environmental education and interpretation, while promoting activities that complement the purposes of the refuge and other protected lands in the region.

White tailed Deer

The Refuge Improvement Act establishes six priority public uses on refuges. Those priority uses depend on the presence, or the expectation of the presence, of wildlife. These uses are: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Although these priority uses must receive our consideration in planning for public use, they also must be compatible with the purposes for which a refuge is established and the mission of the Refuge System. Compatibility determinations, which evaluate the effects of a particular use (or activity) in the context of species or habitats in a refuge, aid in making those decisions. If refuge lands are acquired in Cherry Valley, compatibility determinations would be used to decide what and where public use opportunities would be permitted.

Public use opportunities contribute to the long-term protection of wildlife resources by promoting understanding, appreciation, and support for wildlife conservation. The six priority public uses would be accommodated to the maximum extent possible, where they would not have significant negative effects on wildlife. Environmental education is addressed in more detail in Goal 3 (below). All of the potential public use activities are contingent upon availability of staff and funding to develop and implement these programs. We would promote opportunities for volunteers and develop community appreciation and public support for the refuge. The Service would consider developing interpretive materials and programs to enhance the communities' awareness of and appreciation for valley wildlife resources. School and other group programs would be considered. We would open newly acquired lands for hunting if they can biologically, ecologically, and safely accommodate hunting within state guidelines. Newly acquired lands that traditionally have been hunted would remain open until we completed our planning process. Before closing any newly acquired lands, we would complete a separate public review process. We would provide an American with Disabilities Act (ADA)-compliant hunt, and would consider a Youth Hunt.

If a refuge is established in Cherry Valley, an increase in public use would be expected from new trails, parking areas, fishing accesses, interpretive overlooks, and observation platforms that would potentially be a part of a new refuge. We would allow public

access for day use on many of the newly acquired lands outside the sensitive bog turtle and bird nesting habitats. Generally, we would allow hunting, based on the Pennsylvania State hunting seasons and consistent with the refuge Annual Hunt Plan (once developed). We would allow fishing along Cherry Creek where accessible, and may be able to support fishing derbies for children. Working with state and local agencies, we would study the feasibility of converting existing historic logging roads into public use trails. A refuge also may provide interpretive and environmental education programs and increase partnership opportunities to interpret the cultural and natural resources within the refuge and the watershed.

This goal will enable the Service to help meet its potential goal herein by supporting the efforts of the Appalachian Trail (AT) MEGA-Transect, designed to enhance management and protection of the AT environment. The AT and its surrounding 250,000 acres of protected lands are a priceless ecological resource, and with its extensive habitat areas, the AT offers new opportunities to work with the National Park Service and the Appalachian Trail Conservancy to promote conservation awareness of the AT and new refuge lands.

It is worth noting that the Delaware Water Gap National Recreation Area has ranked eighth or ninth in recreational visits amongst all National Park System properties for at least the last ten years (1998-2007) (National Park System, "NPS Stats, Ranking Report for Recreation Visits"). Much of this visitation is from the nearby, rapidly expanding New York/northern New Jersey and Philadelphia suburban areas. The draw of the Water Gap would likely contribute to enthusiastic use of a new refuge.

Goal 3. Promote science, education, and research through partnerships to inform land management decisions and encourage continued responsible stewardship of the natural resources of Cherry Valley.

Alternative B would allow for extensive, refuge-related science, education, and research opportunities throughout the Study Area.

Partnerships

Working partnerships with surrounding landowners would be critical to successful refuge management. This document was developed cooperatively with our state fish and wildlife agency partners, and is supported by our land conservation partners working in eastern Pennsylvania. We will continue to cooperate with our conservation partners, all of whom are instrumental in helping us accomplish habitat management goals and objectives. The strength of potential partnerships is illustrated by the team that contributed to the development of this Study Report:

- U.S. Fish and Wildlife Service
- National Park Service (Delaware Water Gap National Recreation Area)
- Pennsylvania Natural Heritage Program

- Pennsylvania Game Commission
- Pennsylvania Fish and Boat Commission
- The Nature Conservancy
- Monroe County Conservation District
- Monroe County Planning Commission
- East Stroudsburg University
- Northampton County Community College
- Pocono Avian Research Center

Taken together, the respective missions of the preceding groups cover the protection of farmland, threatened and endangered species, scenic areas, grassland habitats, and open space that the local community has identified as significant. Based on this effort, Alternative B (proposed action) identifies over 20,400 acres within Cherry Valley that would preserve the areas most critical for maintaining the biological integrity, diversity and environmental health of the potential refuge, and would provide habitat connectivity to other areas of protected land.

As noted in detail above, many of the organizations with whom we are collaborating have already protected key habitats in Cherry Valley and its environs and will continue to do so within the limits of their available resources. Should a Cherry Valley NWR become reality, there is a clear need for continued local and state support. We recognize our inability to solve the problems of habitat fragmentation and land protection on our own. Therefore, we would work to combine our efforts with those of our existing partners, as well as numerous other partners yet to be identified. With Alternative B the Service would be able to establish partnerships and cooperate in creating refuge opportunities and joint conservation initiatives in Hamilton, Ross, Chestnuthill, Smithfield, and Stroud townships, as well as Delaware Water Gap Borough. The Service would seek opportunities to work with local farmers and landowners to manage refuge lands in ways that benefit the goals and interests of the refuge and its neighbors. The Service would also seek opportunities to aid landowners with conservation projects on their own land. The Service and the Refuge System would work toward the biological, cultural, and public use goals that are outlined in Chapter 1 and Appendix B (draft Conceptual Management Plan) in this document. It is clear that partnerships with the public, landowners, neighbors, conservation organizations, and local, county, state, and other federal government agencies would be the only path to a successful Cherry Valley NWR.

Environmental Education

Environmental education, one of the six priority wildlife-dependent uses encouraged on refuge lands, incorporates on-site, offsite, and distance-learning materials, activities, programs, and products that address the audience's course of study, the mission of the Refuge System and the management purposes of the refuge. The goal of environmental education is to promote an awareness of the basic ecological foundations for the

interrelationships between human activities and natural systems. Through curriculum-based environmental education, both on- and off-refuge, refuge staff and partners hope to motivate students and other persons interested in learning the role of management in the maintenance of healthy ecosystems and conserving our fish and wildlife resources.

For years, Service refuges have been connecting children with the land and with the agency's conservation mission. It is now apparent that such connections are of immense importance. New information shows that instead of being outdoors enjoying self discovery of wild "things," most children spend their time indoors glued to television, video games, and even cell phones rather than experiencing nature. Author Richard Louv (2005), whose book *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder* documents this trend, argues that increased urbanization, parental anxiety, residential development restrictions and structured play have kept children inside rather than out. This separation from the natural world can result in a host of physical and mental ailments, Louv warns, from childhood obesity to Attention Deficit Hyperactivity Disorder, and can erode future support for conservation. As the nation's primary conservation agency, the Service has a significant role in addressing this concern. We would also have a strong incentive to promote children in nature activities with the AT MEGA Transect and the Delaware Water Gap National Recreation Area, in addition to the strong effort already underway at the Monroe County Conservation District.

The Service would attempt to work with school districts and teachers to develop environmental education programs featuring unique species or communities at the refuge. We would work with our partners such as the Monroe County Conservation District and the Delaware Water Gap National Recreation Area to promote environmental education, thereby maximizing the use of resources and time commitments for each partner organization. And, we would consider the role of a new refuge in other potential opportunities such as small habitat restoration projects, docent-led trail walks, birding festivals, guest lecturers, youth hunting and fishing efforts, and even simple monitoring of various forms of wildlife on and off the refuge.

Research

The Service would encourage and support research and management studies on refuge land that will improve scientific knowledge and contribute to natural resource management decision-making. The refuge manager would encourage and seek research projects that are relevant to approved refuge objectives and that clearly improve land management and promote adaptive management. Priority research addresses

information that would enhance management of the Nation's biological resources, is important to agencies of the Department of the Interior, the Service, the Refuge System, and state fish and game agencies, and that addresses important management issues or demonstrates techniques for the management of species or habitats.

Refuge staff would maintain a list of research needs that would be provided to prospective researchers or organizations upon request. Refuge support of research directly related to refuge objectives may take the form of funding, partnerships in grant applications, in-kind services such as housing or the use of other facilities, direct staff assistance with the project in collecting data, providing historical records, conducting management treatments, or providing other appropriate assistance. All researchers on refuges, present and future, are required to submit a detailed research proposal following Service policy in Refuge Manual chapter 4, section 6. Proposals would be prioritized based on need, benefit to the refuge, compatibility with refuge purposes and the Refuge System mission, and funding required. Any special use permits that may be issued must also identify a schedule for annual progress reports, on which the Service would base our decisions for continued research activities. We would ask our regional refuge biologists, other Service divisions, state agencies, and appropriate subject matter experts to review and comment on proposals.

The Service would also consider research for other purposes, which may not relate directly to specific refuge objectives, but contributes to the broader enhancement, protection, use, preservation, or management of native populations of fish, wildlife, plants, and their natural diversity in the region or flyway. Those proposals must comply with the Service compatibility policy.

Alternative B would embrace a science-based strategy of adaptive management to keep the management of the refuge relevant and current through scientific research and management. We acknowledge that our information on species and ecosystems is incomplete, provisional, and subject to change as our knowledge base improves. Objectives and strategies must be adaptable in responding to new information and spatial and temporal changes. We would continually evaluate management actions, both formally and informally, through monitoring or research to reconsider whether their original assumptions and predictions are still valid. In that way, management becomes an active process of learning what works best. The refuge manager is responsible for changing management actions or objectives if they do not produce the desired conditions

3.2.3 Alternative C – Wetlands and Ridge Forests

The "Wetlands and Ridge Forests" alternative would create an acquisition boundary of up to 14,124 acres within the 31,150 acre Study Area, containing portions of 12 of the valley and ridge's defined ecosystems (Figure 3-3, Table 3-2). Protection of lands would be accomplished through fee title (about 65 percent of the acres) and conservation

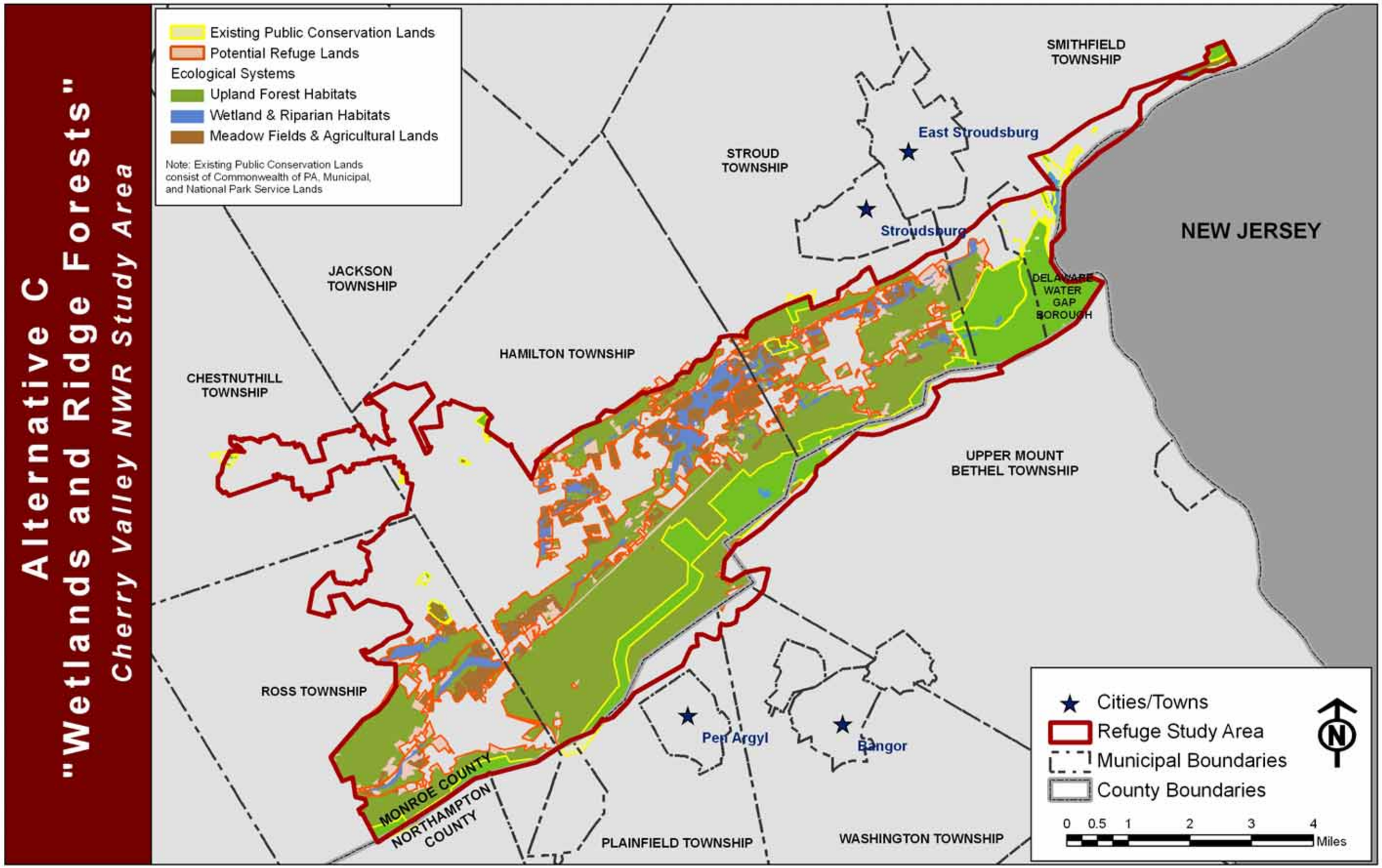

Figure 3-4. Map of ecological systems and habitats protected by Alternative C: Wetlands and Ridge Forests in the Cherry Valley National Wildlife Refuge Study Area, Pennsylvania.

easements (about 35 percent of the acres). Compared to the No Action Alternative, Alternative C would provide substantial protection or rare and unique habitats and species within the Study Area. It would also provide valuable opportunities for opportunities for wildlife-dependent recreation, new partnerships, and scientific research. However, the Service concludes that, compared to the proposed action (Alternative B), this alternative would provide less desirable levels of protection for the numerous wildlife species and habitats referenced in the Study Act. It would also provide fewer opportunities for wildlife-dependent recreation, new partnerships, and scientific research.

Table 3-3. Acres of identified ecological systems protected by Alternative C.

		Acres				
		Potential Refuge Lands				
	Ecological Systems	**No Current Protection**	**Agricultural Easements & Private Conservation**	**Totals**	**Municipal State & Federal**	**Grand Totals**
Upland Forest Habitats	Appalachian (Hemlock)-Northern Hardwood Forest	610.37	64.4	**674.77**	138.08	**812.85**
	Central Appalachian Dry Oak-Pine Forest	5623.00	41.78	**5,664.78**	2,635.55	**8,300.33**
	Central Appalachian Dry Oak-Pine Rocky Woodland	17.88	0.00	**17.88**	55.67	**73.55**
	Northeastern Interior Dry-Mesic Oak Forest	3344.22	209.67	**3,553.89**	1015.80	**4,569.69**
Wetlands & Riparian Habitats	Central Appalachian Floodplain	0.00	0.00	**0.00**	94.01	**94.01**
	Central Appalachian Stream and Riparian	90.95	63.49	**154.44**	5.39	**159.83**
	Laurentian-Acadian Freshwater Marsh	0.01	0.17	**0.18**	0.00	**0.18**
	Laurentian-Acadian Wet Meadow-Shrub Swamp	319.93	163.16	**483.09**	10.23	**493.32**
	North-Central Appalachian Acidic Swamp	176.79	0.72	**177.51**	30.38	**207.89**
	North-Central Appalachian Seepage Fen	13.70	0.00	**13.70**	0.00	**13.70**
	North-Central Interior Wet Flatwoods	76.25	37.75	**114.00**	0.00	**114.00**
	North-Central Interior and Appalachian Acidic Peatland	3.77	0	**3.77**	8.55	**12.32**
	North-Central Interior and Appalachian Rich Swamp	117.95	24.10	**142.05**	0.00	**142.05**
Ecological Systems Totals		**10,394.82**	**605.24**	**11,000.06**	**3,993.66**	**14,993.72**
Total Parcel Acres [1] ***(31,585.8 total boundary acres)***		**12,588.53**	**1,535.83**	**14,124.36**	**4,477.95**	**18,602.31**

[1] Property lines do not coincide with the Study Area boundary. Parcels have been divided to match the Study Area boundary as closely as possible, but total parcel acres exceeds the total Study Area because of rounding errors during parcel adjustments.

Goal 1 Protect and enhance habitats for federal trust species and species of management concern, with special emphasis on migratory birds and species listed under the ESA, along with protection of wetlands and the Kittatinny Ridge.

Of the 14,124 acres that could be acquired under Alternative B, over 9,900 acres of upland forests would be protected. This would generally include roughly 5,700 additional acres of Central Appalachian Dry Oak-Pine Forest and over 3,500 additional acres of Northeastern Interior Dry Mesic Oak Forest compared to the No Action alternative. These forests would serve as valuable habitat for birds that breed in interior forests already mentioned in Alternative B. As with Alternative B, over 1,000 additional acres of emergent, scrub-shrub, and forested wetlands could be protected, contributing to the conservation of foraging bats, wetland birds, waterfowl, shorebirds, bobolink, woodcock, turkey, Eastern meadowlark, bog turtles, wood turtles, diverse reptiles and amphibians, mink, river otter, and others. About 1,700 acres of agricultural lands could become available for protection and could contribute, if managed appropriately, to the conservation of declining grassland birds such as grasshopper sparrows, bobolink, and Eastern meadowlark. Compared to the proposed action (Alternative B), this is about half of the agricultural lands that could be protected, thus substantially decreasing our ability to manage habitat for rare grassland birds that require 50+ acre sites for nesting habitat.

Compared to Alternative A, Alternative C provides about 90 additional acres of riparian and stream habitat; however, this is only 34 percent of the acres that would be protected under Alternative B. Excluding this habitat would result in substantially decreased benefits to associated fishes (e.g., American eel), freshwater mussels, and other species. In addition to more common species, this habitat is used by numerous species of concern, for example: for dispersal (e.g., bog turtle), or feeding and roosting (e.g., likely Indiana bat).

Species priorities and management essentially would be identical to Alternative B, recognizing the diminished management ability for grassland birds. The decrease in wetlands would decrease the benefit to all of the waterfowl and waterbirds discussed in Alternative B, as well as resident fishes, and other water-associated species. Alternative B encompasses the large tracts of forested land along the Kittatinny Ridge, thus benefitting the nesting interior forest birds already mentioned and protecting this important migratory corridor for raptors and migratory neotropical birds. Alternative C does not include the one known northeastern bulrush population in the Study Area; therefore, this

Bald Eagle

species would no longer directly benefit from the establishment of a refuge in Cherry Valley.

Goal 2. Create opportunities for hunting, fishing, wildlife observation and photography, and environmental education and interpretation, while promoting activities that complement the purposes of the refuge and other protected lands in the region.

As with Alternative B, there would likely be ample opportunities for the six wildlife-dependent recreational public uses with Alternative C (Environmental Education is covered in Goal 3.) However, because of the decreased land base in particular, this alternative would likely provide less opportunities for public uses. In particular, because this alternative could protect about half of the stream and riparian habitat of Alternative C, we would have fewer opportunities to facilitate fishing access. There would likely be less opportunity for wildlife interpretation, observation, and photography, and more limited trail establishment. Overall, this alternative has 6,300 fewer acres for these wildlife dependent recreational activities compared to Alternative B.

Goal 3. Promote science, education, and research through partnerships to inform land management decisions and encourage continued responsible stewardship of the natural resources of Cherry Valley.

Alternative C offers strong opportunities for refuge-related partnership and research opportunities. The decrease in land base compared to Alternative B would mean that direct opportunities to partner with Chestnuthill Township would be limited since this township would not be included in proposed refuge lands. Opportunities to partner with Hamilton and Ross townships would also be affected since proposed refuge lands within these townships are substantially less compared to Alternative B. The decrease in proposed refuge lands would not affect partnership opportunities with the AT or Delaware Water Gap National Recreation Area, although opportunities for science cooperation and field research would be somewhat diminished compared to Alternative B. Opportunities for environmental education also would decrease somewhat due to less extensive habitats and fewer municipalities (e.g., no lands in Chestnuthill). Compared to Alternative A, however, this alternative presents a strong basis for all three of the elements within this goal.

3.3 Summary Tables for Alternatives

Table 3-4. Comparison of acres of protected habitat by habitat type for Alternatives A, B, and C as described in this Study Report.

		Alternative A - Acres				*Alternative B – Acres (Proposed Action)*				*Alternative C – Acres*			
		Currently Protected				*Potential Refuge Lands*				*Proposed Refuge Lands*			
	Ecological Systems	**Agricultural Easements**	**Private Conservation**	**Municipal State & Federal**	**Totals**	**No Current Protection**	**Currently Protected[1]**	**Totals**	**Grand Totals[2]**	**No Current Protection**	**Currently Protected[1]**	**Totals**	**Grand Totals[2]**
Upland Forest Habitats	Appalachian (Hemlock)-Northern Hardwood Forest	8.30	64.40	138.08	**210.78**	930.06	72.70	**1,002.76**	**1,140.84**	610.37	64.40	**674.77**	**812.85**
	Central Appalachian Dry Oak-Pine Forest	134.62	47.11	2,635.55	**2,817.28**	7,365.41	181.73	**7,547.14**	**10,182.69**	5,623.00	41.78	**5,664.78**	**8,300.33**
	Central Appalachian Dry Oak-Pine Rocky Woodland	0.00	0.00	55.67	**55.67**	17.88	0.00	**17.88**	**73.55**	17.88	0.00	**17.88**	**73.55**
	Northeastern Interior Dry-Mesic Oak Forest	131.68	129.20	1,015.80	**1,276.68**	4,093.26	260.88	**4,354.14**	**5,369.94**	3,344.22	209.67	**3,553.89**	**4,569.69**
Wetlands & Riparian Habitats	Central Appalachian Floodplain	0.00	0.00	94.01	**94.01**	4.29	0.00	**4.29**	**98.30**	0.00	0.00	**0.00**	**94.01**
	Central Appalachian Stream and Riparian	43.70	29.32	5.39	**78.41**	261.97	73.02	**334.99**	**340.38**	90.95	63.49	**154.44**	**159.83**
	Laurentian-Acadian Freshwater Marsh	0.00	0.17	0.00	**0.17**	2.25	0.17	**2.42**	**2.42**	0.01	0.17	**0.18**	**0.18**
	Laurentian-Acadian Wet Meadow-Shrub Swamp	70.86	92.30	10.23	**173.39**	332.90	163.16	**496.06**	**506.29**	319.93	163.16	**483.09**	**493.32**
	North-Central Appalachian Acidic Swamp	4.13	0.00	30.38	**34.51**	275.39	4.13	**279.52**	**309.90**	176.79	0.72	**177.51**	**207.89**
	North-Central Appalachian Seepage Fen	0.00	0.00	0.00	**0.00**	13.70	0.00	**13.70**	**13.70**	13.70	0.00	**13.70**	**13.70**
	North-Central Interior Wet Flatwoods	10.87	26.88	0.00	**37.75**	76.25	37.75	**114.00**	**114.00**	76.25	37.75	**114.00**	**114.00**
	North-Central Interior and Appalachian Acidic Peatland	0.00	0.00	8.55	**8.55**	3.80	0.00	**3.80**	**12.35**	3.77	0.00	**3.77**	**12.32**
	North-Central Interior and Appalachian Rich Swamp	6.56	17.54	0.00	**24.10**	163.28	24.10	**187.38**	**187.38**	117.95	24.10	**142.05**	**142.05**
Totals		**410.72**	**406.92**	**3,993.66**	**4,811.30**	**13,540.44**	**817.64**	**14,358.08**	**18,351.74**	**10,394.82**	**605.24**	**11,000.06**	**14,993.72**
Total Parcel Acres (31,585.8 total boundary acres)		**1,046.97**	**787.73**	**4,477.95**	**6,312.65**	**18,630.85**	**1,834.70**	**20,465.55**	**24,943.50**	**12,588.53**	**1,535.83**	**14,124.36**	**18,602.31**

[1] Currently Protected consists of agricultural easements and private conservation that occur within the parcels (or portions of parcels) selected for this Alternative.

[2] Grand Totals consist of Potential Refuge Lands plus Municipal, State, and Federal lands that occur within the parcels (or portions of parcels) selected for this Alternative.

Table 3-5. Comparison of actions that distinguish the alternatives and their relationship to the potential goals and key issues for Alternatives A, B, and C evaluated in this Study Report to satisfy the requirements of NEPA and the Cherry Valley National Wildlife Refuge Study Act of 2006.

Goal 1. *Protect and enhance habitats for federal trust species and species of management concern, with special emphasis on migratory birds and species listed under the ESA, along with protection of wetlands and the Kittatinny Ridge.*

		Alternatives		
Habitat Types	**Types of Resources Affected**	**Alternative A - No Refuge**	**Alternative B - Diverse Habitat Complex (Proposed Action)**	**Alternative C – Wetlands and Ridge Forests**
All	Total Acres of Protected Habitat	6,312	up to 20,466	
Emergent, Calcareous & Vernal Wetlands	Ecosystems and acres included:	Laurentian-Acadian Freshwater Marsh; North Central Appalachian Seepage. 0.17 acres	Same as Alternative A but allows protection of almost 16 total acres of this habitat, over 15 more acres compared to Alternative A and two additional acres compared to Alternative C.	Same as Alternative A, but allows protection of up to 13.88 total acres of this habitat
	Trust Species Likely to Benefit:	bog turtle; herons, woodcock, rails, waterfowl, snipe, bobolink, Eastern meadowlark, black duck, solitary sandpiper.	Same as A, but includes only known population of northeastern bulrush and substantial increase in protected acres provides additional benefits particularly to bog turtle and other trust species.	Similar to B, but does not include known population of northeastern bulrush and is 13 percent smaller than Alternative B.
	Species of Concern Likely to Benefit:	spotted turtles; numerous other amphibians and reptiles; highly diverse and rare plants.	Same as Alternative A but expanded because more habitat could be protected.	Similar to A and B, but benefits decrease commensurate with 13 percent decrease in protected area

Goal 1. *Protect and enhance habitats for federal trust species and species of management concern, with special emphasis on migratory birds and species listed under the ESA, along with protection of wetlands and the Kittatinny Ridge.*

Habitat Types	Types of Resources Affected	Alternatives		
		Alternative A - No Refuge	**Alternative B - Diverse Habitat Complex (Proposed Action)**	**Alternative C – Wetlands and Ridge Forests**
Scrub-Shrub Wetlands	Ecosystems and acres included:	Laurentian-Acadian Wet Meadow & Shrub Swamp; North Central Interior & Appalachian Acidic Peatland. Approx. 182 acres.	Same as Alternative A but allows protection of up to 518.5 acres of this habitat, 336.5 more acres than Alternative A and 13 more acres than Alternative C.	Same as Alternative A, but allows protection of up to 505.5 acres of this habitat, 323.5 more acres than Alternative A but 13 less acres than Alternative B.
	Trust Species Likely to Benefit:	herons, woodcock, waterfowl, warblers; possibly golden-winged warbler, field sparrow, willow flycatcher, brown thrasher, blue-winged warbler	The same species as in A, but additional protected acres would provide additional benefits particularly to migratory birds.	The same species as in A and B. There would be substantial positive benefits compared to A because of the additional protected habitat. Benefits would be somewhat less than in B because fewer acres are protected.
	Species of Concern Likely to Benefit:	Rare plants such as swamp dog hobble, swamp sparrows, warblers, small mammals, and bats.	Same as Alternative A, but nearly three times more acres could be protected under this alternative, providing commensurate increases in benefits to these species.	The same species as in A and B. There would be substantial positive benefits compared to A because of the additional protected habitat. Benefits would be somewhat less than in B because fewer acres are protected.

Goal 1. *Protect and enhance habitats for federal trust species and species of management concern, with special emphasis on migratory birds and species listed under the ESA, along with protection of wetlands and the Kittatinny Ridge.*

Habitat Types	Types of Resources Affected	Alternatives		
		Alternative A - No Refuge	**Alternative B - Diverse Habitat Complex (Proposed Action)**	**Alternative C – Wetlands and Ridge Forests**
Forested Wetlands	Ecosystems included:	North Central Appalachian Acidic Swamp; North Central Interior Wet Flatwoods; North Central Interior & Appalachian Rich Swamp; Central Appalachian River Floodplain; Central Appalachian Stream & Riparian. Approx. 269 acres.	Same as Alternative A but allows protection of up to 1050 acres of this habitat, 781 more acres than Alternative A and 332 more acres than Alternative C.	Same as Alternative A, but allows protection of up to 718 acres of this habitat, 449 more acres than Alternative A, but 332 fewer acres than Alternative B.
	Trust Species Likely to Benefit:	breeding neo-tropical migratory birds, cerulean warbler, worm-eating warbler, red-headed woodpecker, eastern wood pewee, Northern oriole, woodcock, bald eagles, Louisiana waterthrush, scarlet tanager, wood duck, herons, Canadian geese, warblers. American eel. May benefit bog turtles and Indiana bats.	Same as Alternative A, but additional protected acres would provide additional benefits particularly for migratory birds, American eel, and bog turtles in select areas. This transitional habitat to be maintained through appropriate forest management applications. Control invasive species.	Same as Alternatives A and B, but Alternative C would provide significantly less habitat protection than Alternatives B, with commensurate decreases in benefits particularly for migratory birds, the American eel, and bog turtles in select areas.

Goal 1. *Protect and enhance habitats for federal trust species and species of management concern, with special emphasis on migratory birds and species listed under the ESA, along with protection of wetlands and the Kittatinny Ridge.*

Habitat Types	Types of Resources Affected	Alternatives		
		Alternative A - No Refuge	**Alternative B - Diverse Habitat Complex (Proposed Action)**	**Alternative C – Wetlands and Ridge Forests**
	Species of Concern Likely to Benefit:	Brook trout, wood turtles, possibly spotted turtles, mink, river otter, diverse plants including Hemlock parsley.	Same as Alternative A, but Alternative B would provide significantly more habitat protection than Alternatives A or C, with commensurate benefits for these species.	Same as Alternatives A and B, but Alternative C would provide significantly less habitat protection than Alternative B, with commensurate decreases in benefits to these species.
Forested Uplands	Ecosystems included:	Central Appalachian Pine-Oak Rocky Woodland; Central Appalachian Dry Oak-Pine; Northeastern Interior Dry-Mesic Oak; Appalachian Northern Hardwood; Northeastern Interior Dry Mesic Oak; Appalachian Northern Hardwood. Approx. 4,360.5 acres.	Same as Alternative A but allows protection of up to 16,767 acres of this habitat, 12,406.5 more acres than Alternative A and 3,010.5 more acres than Alternative C.	Same as Alternative A, but allows protection of up to 13,756.5 acres of this habitat, 9,396 more acres than Alternative A, but more than 3,000 fewer acres than Alternative B.
	Trust Species Likely to Benefit:	breeding neo-tropical migratory birds, possibly golden-winged warbler, black bear, deer, parula and black-throated green warblers	Same as Alternative A, but additional protected acres would provide additional benefits to migratory birds, large and small mammals, diverse reptiles and amphibians, common and rare plants. This climax habitat to be maintained through management applications.	Similar to Alternative B, but Alternative C would provide significantly less habitat protection than Alternative B, with commensurate decreases in benefits particularly for more common plants and animals.

Goal 1. *Protect and enhance habitats for federal trust species and species of management concern, with special emphasis on migratory birds and species listed under the ESA, along with protection of wetlands and the Kittatinny Ridge.*

		Alternatives		
Habitat Types	**Types of Resources Affected**	**Alternative A - No Refuge**	**Alternative B - Diverse Habitat Complex (Proposed Action)**	**Alternative C – Wetlands and Ridge Forests**
	Species of Concern Likely to Benefit:	Timber rattlesnakes, Allegheny woodrat	Same as Alternative A, but additional protected acres would provide additional benefits to species.	Same as Alternatives A and B, but Alternative C would provide significantly less habitat protection than Alternative B, with commensurate decreases in benefits to these species.

Goal 2. *Create opportunities for hunting, fishing, wildlife observation and photography, and environmental interpretation, while promoting activities that complement the purposes of the refuge and other protected lands in the region.*

Refuge Use Opportunities	Alternatives		
	Alternative A - No Refuge	**Alternative B - Diverse Habitat Complex (Proposed Action)**	**Alternative C - Wetlands & Ridge Forests**
Hunting and Fishing	Continue existing hunting and fishing opportunities under State regulation.	New public hunting opportunities would be possible, and would complement activities of the Pennsylvania Game Commission. Opportunities to assist in effective management of white tail deer. ADA and Youth hunts possible.	New public hunting opportunities would be possible compared to Alternative A, but fewer compared to Alternative B. Effort would complement activities of the Pennsylvania Game. Opportunities to assist in effective management of white tail deer. ADA and Youth hunts possible.
Groups Addressed: Traditional hunters, particularly deer hunters and game bird hunters; recreational fishermen for both warm water and cold water fisheries.			
Wildlife Observation, Intrepretation, and Photography	Continue current wildlife observation and interpretation activities through existing state and county programs (e.g., Monroe County Conservation District).	New opportunities for wildlife observation, interpretation, and photography are possible with protection of new lands and habitats across many habitat types within the valley and throughout the municipalities within the Study Area.	Compared to Alternative A, more opportunities for wildlife observation, interpretation, and photography are possible with protection of lands and habitats across within the valley. These opportunities would be less than those offered in Alternative B, particularly in Chestnuthill, Ross, and Hamilton townships.
Groups Addressed: Students, wildlife enthusiasts, hikers, bird watchers, amateur and professional wildlife and nature photographers, botany enthusiasts, insect enthusiasts.			

Goal 2. *Create opportunities for hunting, fishing, wildlife observation and photography, and environmental interpretation, while promoting activities that complement the purposes of the refuge and other protected lands in the region.*

	Alternatives		
Refuge Use Opportunities	**Alternative A - No Refuge**	**Alternative B - Diverse Habitat Complex (Proposed Action)**	**Alternative C - Wetlands & Ridge Forests**
Connection to public lands.	There would be no opportunity to seek mutual benefits of a refuge and the Appalachian Trail or other public lands.	New opportunities are possible to make a connection with a new, extensive refuge and the Appalachian Trail, Delaware Water Gap, and other public lands, due to the broad nature of the refuge embracing many habitat types.	Opportunities for connections to public lands are similar to those in Alternative B, particularly for the Appalachian Trail and Delaware Water Gap National Recreation Area.

Groups Addressed: Hikers, bird watchers, wildlife photographers, and others.

Goal 3. *Promote science, education, and research through partnerships to inform land management decisions and encourage continued responsible stewardship of the natural resources of Cherry Valley.*			
Partnership, Science, and Environmental Education Opportunities	**Alternatives**		
	Alternative A - No Refuge	**Alternative B - Diverse Habitat Complex (Proposed Action)**	**Alternative C - Wetlands & Ridge Forests**
Partnerships	Activities of the Friends of Cherry Valley would continue but would be limited without the presence of a refuge.	Activities of the Friends of Cherry Valley could be expanded due to the presence of a refuge. We would be able to expand on the extensive partnerships that already exist as well as developing new partnerships throughout the area. Refuge staff would help to create new partnership efforts to improve a wide variety of activities beneficial to the wildlife resources of the valley.	Compared to Alternative A, activities of the Friends of Cherry Valley could be expanded due to the presence of a larger refuge. We would still be able to expand on the extensive partnerships that already exist as well as developing new partnerships throughout the area, but this would be reduced compared to Alternative B. Refuge staff would help to create new partnership efforts to improve a wide variety of activities beneficial to the wildlife resources of the valley.
Scientific Research	No new research opportunities would exist. Efforts with East Stroudsburg University, Pennsylvania State University, Pennsylvania Cooperative Fish & Wildlife Research Unit, etc., would continue.	The Service would encourage and support research and management studies on refuge land that will improve scientific knowledge and contribute to natural resource management decision-making on the refuge. The refuge would also consider research for other purposes that contribute to the broader protection, use, preservation or management of native	The Service would encourage and support research and management studies on refuge land that will improve scientific knowledge and contribute to natural resource management decision-making on the refuge. The refuge would also consider research for other purposes that contribute to the broader protection, use, preservation or management of native

Goal 3. *Promote science, education, and research through partnerships to inform land management decisions and encourage continued responsible stewardship of the natural resources of Cherry Valley.*			
Partnership, Science, and Environmental Education Opportunities	**Alternatives**		
	Alternative A - No Refuge	**Alternative B - Diverse Habitat Complex (Proposed Action)**	**Alternative C - Wetlands & Ridge Forests**
		populations of fish, wildlife, plants, and their natural diversity. New Refuge lands would be subject to adaptive management through science applications.	populations of fish, wildlife, plants, and their natural diversity. These opportunities would be reduced compared to Alternative B. New Refuge lands would be subject to adaptive management through science applications.
Environmental Education	There would be no opportunities for refuge-based environmental education. Current county efforts would continue.	New opportunities for environmental education and interpretation would be created due to the opening of extensive lands for public use, and the possibility of constructing facilities, trails, and programs for such purposes. New opportunities to promote "Children in Nature" activities.	New opportunities for environmental education and interpretation would be created due to the opening of fairly extensive lands for public use, and the possibility of constructing facilities, trails, and programs for such purposes. New opportunities to promote "Children in Nature" activities. These opportunities would be less than those offered in Alternative B, particularly in Chestnuthill, Ross, and Hamilton townships.