

New York State Department of Environmental Conservation

Division of Public Affairs & Education

Five Rivers Environmental Education Center

Draft Unit Management Plan

Albany County

Towns of New Scotland & Bethlehem

February 2007

Eliot Spitzer, Governor

Executive Summary

It is the policy of the New York State Department of Environmental Conservation (DEC) to manage New York State lands for multiple benefits to serve the People of the State. The mission of DEC in operating the Five Rivers Environmental Education Center (Center) is:

- 1. To carry out a comprehensive program of interpretive, education and information services which leads the public to a better understanding, appreciation and sense of responsibility for the environment, and which raises public awareness and understanding of DEC's programs and responsibilities for natural resource and environmental quality management, and*
- 2. To preserve, protect and enhance the natural and cultural resources of the Five Rivers Environmental Education Center.*

The 446-acre Center includes 12 miles of trails and interior roads, 16 ponds and wetlands, and expanses of forest, field and brush land habitats. Two factors make this property an ideal location for the DEC to conduct environmental education programming - its location near Albany in the Capital District of eastern New York, providing close access to more than 250,000 people, and its high diversity of habitats that are linked by walking paths that give visitors convenient access to view and learn from this natural diversity.

The original parcels of the Center property were purchased by DEC's predecessor, the New York State Conservation Department, for use as a research game farm, investigating propagation methods for upland game birds. A rich history of wildlife studies at the Delmar Game Farm produced many important techniques used to this day, including the method of aging deer by tooth wear and replacement, and the use of canon nets for capturing wildlife for study or relocation.

Located just six miles from the Albany City boundary, the Center lies in an area of rapid residential development. The *New York State Open Space Plan* identifies Five Rivers as a priority area for adding open space lands to public ownership.

Management Goals

- DEC will take steps to improve the facilities available to support environmental education programs at Five Rivers. Proposed actions include:
 - Construct a new visitor center building and picnic shelter, replacing the existing visitor center, school programs building, and picnic shelter. Improve parking, trail access, picnic area and visitor orientation features. The estimated cost for these improvements is \$4,238,000.
 - Construct a new maintenance and operations facility and remove three existing operations buildings - the cost for this later phase of improvements is yet to be determined.
 - Improve pedestrian safety on the site.
 - Study and evaluate buildings outside the "intensive use area," planning for their maintenance or removal.
 - Provide public access, as appropriate, to recently purchased lands.

An evaluation of the intensive use area of the Center was conducted in 2005 by the New York State Office of General Services (Appendix 1, Program Report, Study to Provide Master Plan). The report concludes that the Visitor Center, Goose Lodge and Operations Headquarters buildings have outlived their useful life-spans and should be replaced. The report further recommends improvements to the parking, public vehicle access and trail access features of the Center. Preliminary plans for a new visitor center building and the associated improvements have also been prepared by OGS (Appendix 2, Schematic Design Narrative - Site Improvements).

2. DEC will continue the environmental education program at the Center. The goals of the education program are to:

- Provide interpretive programs and services for a range of public users including adults, families, conservation/environmental organizations, civic groups and special needs visitors.
- Provide education programs and services for school and youth groups.
- Provide training and support services to teachers, youth leaders and environmental educators.
- Educators and other providers in the content and methods of environmental education and interpretation.
- Partner with the non-profit support group Friends of Five Rivers and with other groups to provide programs and services.
- Strive to provide better access to the Center's programs for under-served groups in the eastern New York region, especially for urban audiences.

3. DEC will strive to maintain the current biological diversity that exists at the Center. DEC's goals are to:

- Maintain a variety of habitat types within the Center lands to provide habitat for a diversity of plants and wildlife.
- Eradicate or control invasive exotic species that are negatively impacting existing habitats or could potentially do so.
- Monitor habitats within the Center lands to look for indications that additional management activities may be needed to meet habitat protection goals.

4. DEC will strive to maintain viable populations of all native fish and wildlife species currently found at the Center at levels compatible with existing habitat, ecological and social concerns, public interest, and types and levels of public use. In general, DEC's goals for fish and wildlife management are to:

- Protect and enhance the site's fish and wildlife diversity.
- Increase fish and wildlife research occurring on site.
- Respond to any nuisance wildlife problems that may occur on the site.

Wildlife management concerns will be addressed through a wildlife issues task team, to be convened in the next two years and composed of appropriate staff from DEC and stakeholders from the region.

5. DEC will undertake a variety of health and safety measures to further ensure the safety of employees, volunteers and visitors to the site.

ACKNOWLEDGMENTS

This plan has been prepared by the NYS DEC Bureau of Environmental Education, with assistance from a team of DEC Central Office and Regional members listed below. It incorporates public comment gathered at 6 public scoping sessions and from focus group meetings.

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The NYS Office of General Services conducted a comprehensive survey of the physical condition and functional arrangement of the site, and facilitated a series of scoping meetings with representatives from DEC and the Friends of Five Rivers during the conceptual development phase.

This draft plan updates and supplements the Center's original *Master Plan* (May 1987) and its serial updates (1988, 1989, 1990, 1992, 1993), which were developed by Five Rivers Center staff in cooperation with The Friends of Five Rivers, a not-for-profit citizens support group.

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I. INTRODUCTION

Five Rivers Environmental Education Center was opened by DEC in June 1972 on the grounds of the former Delmar Game Farm. The Center was the second such facility created by DEC, following the Rogers Environmental Education Center in Sherburne, NY, that opened in 1966. The intent was to open an education center in each of DEC's eight administrative units (excepting the New York City region). Four such centers are now operating.

It is the policy of DEC to manage New York State lands for multiple benefits to serve the people of the State. DEC prepares a Unit Management Plan for all land areas that it manages as a step in carrying out that policy. Unit Management Plans are intended to assess the natural and physical resources present within a unit, identify opportunities for recreational use and consider the ability of the resources and ecosystems to accommodate public use. Further, they identify management objectives for public use which are consistent with the land classification guidelines and the character of these lands.

DEC's Division of Public Affairs and Education worked closely with the Divisions of Lands & Forests, Fish, Wildlife & Marine Resources and Operations to develop this plan. DEC consulted with the public in preparing the Plan. In February and March of 2005, DEC held 6 scoping sessions to gather initial public input for use in drafting the Plan. DEC also took written comments from interested parties during the scoping time period.

This Plan has been developed to address management activities at the Five Rivers Environmental Education Center for the next 5 year period. Some management recommendations may extend beyond five years. Factors such as budget constraints, unforeseen changes in the Center caused by weather, etc. may necessitate deviations from scheduled management activities.

A. LAND USE AND OWNERSHIP HISTORY

1. Pre-contact Period

Though there is no evidence to suggest that the Five Rivers Center property was a permanent pre-contact settlement, the general vicinity is known to contain ample archaeological evidence of pre-contact use, with some 17 archaeological sites located within two miles of the Center, one within one mile, and one important site discovered on the unit lands.

Preliminary investigations of a former State Archaeologist (Ritchie, 1980, 1986) suggested that native populations may have used the Five Rivers site on a seasonal basis. In the last 20 years, there have been four anecdotal reports of pre-contact cultural material turning up in various locations on the grounds, and two archaeological surveys related to recent capital projects also found pre-contact material, indicating at least transient native American activity on-site (see Appendix 15 for locations).

2. Settlement Era

Little is known of site occupancy during the settlement period. An early eighteenth century map of the vicinity depicts some of the earliest residential structures in Albany County, and shows a residence of Adrian Bratt along the Vlomankill, near to (if not the same as) the site of the present day Farmhouse (Building 8). County census documents of the mid-nineteenth century attest to a variety of agricultural endeavors of the landowners Radley and Jones.

3. Game Farm Era

During the 1930s, the state acquired eight contiguous parcels totaling 231 acres to establish the Delmar Experimental Game Farm. The bulk of these parcels comprised a fruit farm owned by Edward and Catherine Ackerman consisting of two farmhouses, two barns and a wagon shed on 207 acres.

To assist the state in developing the game farm, a Civilian Conservation Corps (CCC) camp was established on the site, consisting of approximately 16 structures and 200 CCC enrollees. From 1933-1936, enrollees completed a variety of construction projects: the Vlomankill was dammed in three places for waterfowl propagation; four small ponds were scoured out of upland fields for duck-rearing; field pens and fencing were erected for grouse propagation; and several brooder houses, laboratories and storage barns were constructed or remodeled from pre-existing farm structures.

From 1933 until its dissolution in 1970, the Delmar Game Farm consisted of approximately five staff, and annually raised upwards of 100,000 upland game birds, as well as a variety of ducks and geese, for distribution throughout the state.

In 1941, wildlife pathology operations were moved from abandoned CCC barracks to a new Wildlife Research Laboratory constructed on the site. In addition, several new wildlife biologist positions were created to carry out innovative field work with game species such as white-tailed deer and snowshoe hare.

In 1948, Game Farm staffer Clint Bishop remodeled several abandoned CCC barracks as public exhibition areas, assembling a small menagerie of animals in what became known locally as the Delmar Zoo. Thousands of children and adults enjoyed this collection for 20 years, thus establishing a vibrant connection between the community and the facility. In 1966, a cafeteria on the State Office Campus was declared surplus, disassembled and erected on the site to serve as a sign shop.

4. Environmental Education Center Era

In 1970, the state dissolved the Game Farm and Zoo operations. Concerned about the prospect of losing a vital community institution, a group of local citizens formed Five Rivers Limited (a.k.a. - "The Friends of Five Rivers"), a not-for-profit citizens support group in 1971. Their advocacy helped in the establishment of the Environmental Education Center in 1972.

To prepare the site for environmental education purposes, an outdoor amphitheater and stage was constructed, the sign shop was re-furbished as a Visitor Center, and several Game Farm and CCC buildings were re-modeled for use by environmental education and maintenance staff. A network of hiking trails was begun. Obsolescent CCC barracks were demolished, and field pens and fencing were removed.

Since 1973, the state has purchased eight adjoining parcels totaling 215 acres, bringing the Center to the site configuration seen today.

**HISTORY OF LAND ACQUISITION
FIVE RIVERS ENVIRONMENTAL EDUCATION CENTER**

Parcel	Grantor	Acreage	Date	Book/Page
Proposal 1	Edward Ackerman	1.0	3/1933	856/82
Proposal 2	Edward Ackerman	112.3	3/1933	856/93
Proposal 3	Ira Smith	4.5	3/1933	856/95
Proposal 4	Ernest Miller	2.9	7/1933	856/177
Proposal 5	Ariel Morehouse	.7	7/1934	856/275
Proposal 6	John Martt	2.6	8/1934	856/307
Proposal 7	John Martt	13.0	11/1937	880/240
Proposal 8	Edward Ackerman	94.0	1/1939	880/430
Proposal 9	Richard Herrman	14.4	1973	
Proposal 10	Donald Hoenig	2.4	1973	
Proposal 11	Albany County	.2	1979	
Proposal 12	Avis Morehouse	81.8	1989	
Proposal 13	Frances Bishop	17.5	1996	
Proposal 14	Carol Foresman	6.0	2001	
Proposal 15	Robert Joel	50.0	2001	
Proposal 16	OSI/Donald Miller	43.0	2006	
Total: 446.3 acres				

B. UNIT GEOGRAPHICAL INFORMATION

Five Rivers Center is located in Albany County five miles southwest of the City of Albany. It lies mostly in the Town of New Scotland with a smaller portion of land in the Town of Bethlehem. The Center's 446 acres have elevations ranging from 200 to 270 feet.

The major topographical feature types at the Center are:

1. Drainage Features

- The Vlomankill stream traverses the site roughly north to south on the western perimeter, lying at the bottom of an eroded valley, now mostly stabilized by mature forest.
- The Phillipinkill, running from northwest to southeast, drains the northeast portion of the property.
- An unnamed stream drains Sunfish Pond and Baltimore Marsh in the southeast quarter of the property and joins the Phillipinkill beyond the property boundary.

2. Uplands

- Flat plains and gently rolling slopes, formerly farmland, characterize the remainder of the property, including the most recent land acquisitions on the property's north, east and south edges.

3. Roads

- Game Farm Road, a Town of New Scotland road, crosses the property near its southern boundary.
- Orchard Street, a Town of Bethlehem road, adjoins the property at its southeast corner.

4. Other Constructed Features

- Buildings, internal roadways and trails have been constructed at the Center over the more than 70 years of public ownership; some structures date from before that time.

Two adjacent off-site features have visual and audible impacts on the center:

- The CSX railroad runs along the western boundary of the property.
- Several National Grid high transmission line rights-of-way extend south and west of Five Rivers and a major electrical substation bounds the railroad line along Game Farm Road.

II. INFORMATION ON RESOURCES AT FIVE RIVERS CENTER

A. VEGETATION TYPES AND STAGES

The following description of vegetation types within the Center's 446 acres is based on aerial photography and on ground inspection (for a graphical representation, see appendix 3, Five Rivers Habitats).

<u>Vegetative Type</u>	<u>Acreage</u>	<u>% of Total</u>
Grassland	176	39.5
Mature Hardwood Forest	117	26.2
Conifer Forest	60	13.5
Brush land	51	11.4
Wetland	19	4.3
Non-Vegetative	16	3.5
Early Successional Stage Forest	4	0.9
Orchard	<u>3</u>	<u>.7</u>
Total	446	100

Grassland – Areas composed primarily of graminoids (grasses, sedges and rushes) and such associated forbes as goldenrods and asters.

Mature Hardwood Forest – Trees of small saw timber size or larger in mixed deciduous stands of sugar maple and oak with scattered conifers larger than 9 inch *dbh* (*diameter at breast height*) for conifers, and 11 inch *dbh* for hardwoods.

Conifer Forest – Naturally seeded successional sites or plantations of needle-leaved trees known commercially as softwoods, covering areas generally more than 0.5 acres in size; mostly hemlock and white pine.

Brush Land – Sites dominated by shrubs. Dominant shrubs at Five Rivers include alders, sumacs, viburnums, dogwoods, and honeysuckles.

Wetland – Open water in ponds and streams and their adjacent banks. Also included are poorly drained uncultivated lands with standing water for at least part of the year.

Non-vegetative – Infrastructure features including buildings, roads and parking lots.

Early Successional Stage Forest – Sites with stands of young trees resulting from natural succession or planting. Trees are of seedling, small sapling to pole size (*under 11 inch dbh for hardwoods*), including aspen, birch, white pine, oak, maple, hickory and locust.

Orchard – Areas where fruit trees are dominant. Apple trees at Five Rivers are remnants of commercial orchards once at the site. Many varieties of crab apples persist from Game Farm era plantings.

B. WILDLIFE

The Five Rivers Center has a rich variety of wildlife species, as would be expected on a diversely vegetated 446 acre site surrounded by similar old field and forest habitats. The Center's forest, grassland, brush land, pond and stream habitats provide ample cover and food resources for the mostly stable wildlife populations, sufficient for habitat stability and for visitor education and recreational enjoyment. (See Appendices for listings of vertebrate and invertebrate species cataloged to date.)

1. Mammals

At least 20 species of mammals are found on the Five Rivers lands. Beaver and white-tailed deer are the species that most significantly impact their habitats. Deciduous and coniferous stands (both natural and plantations) support both red and gray squirrels. Beaver, muskrat, otter and mink are the significant wetland species. The eastern coyote has established itself in recent decades as the top terrestrial predator. See Appendix 7 for a list of mammals found on the unit grounds.

All nine New York species of bats are potential summer residents. The silver-haired, Indiana (State Endangered) and small-footed (State Special Concern) are least likely to occur. Red, hoary, and silver-haired are migrants. The species that winter locally are little brown, Indiana, small-footed, northern long-eared, eastern pipistrelle, and big brown.

Resident game species include gray squirrel, cottontail rabbit, muskrat, beaver, white-tailed deer, coyote, red fox, gray fox, raccoon, mink, striped skunk, and river otter.

2. Birds

Center staff members maintain annual bird species data that are collected during public programs and through observations by staff and visitors on the grounds. The Hudson-Mohawk Bird Club and the Audubon Society of the Capital District conduct field trips to the Center and their sightings are added to the data. Bird lists include year-round residents, seasonal migrants and summer breeding migrants. Waterfowl and wading birds rest, feed and breed in the wetlands at the Center. Local Canada goose populations sometimes reach nuisance numbers, but the nest population on the unit has remained at reasonably low, stable numbers over the past three decades. Illegal waterfowl feeding by the public is discouraged.

Several bird species listed as State endangered, threatened and special concern species observed at the Center are listed below. None are known to breed at the Center:

- Three State Endangered bird species are seen occasionally at the Center: peregrine falcon, golden eagle, and short-eared owl.
- Five State Threatened species have been recorded - pied-billed grebe, bald eagle, northern harrier, sedge wren, and Henslow's sparrow. (The sparrow was listed as a probable nester in the 1980 *NY Breeding Bird Atlas*, but has not been found in recent years.)
- Thirteen State Special Concern species are occasionally seen: common loon, American bittern, osprey, sharp-shinned hawk, Cooper's hawk, northern goshawk, red-shouldered hawk, common nighthawk, red-headed woodpecker, horned lark, yellow-breasted chat, vesper sparrow, and grasshopper sparrow.

See Appendix 8 for a checklist of birds found at the Center.

3. Amphibians and Reptiles

Amphibian populations at Five Rivers appear to be stable in both species and numbers within species. The toads and frogs found are eastern American toad, pickerel frog, leopard frog, gray treefrog, spring peeper, American bullfrog and northern green frog. The salamanders are spotted salamander, eastern red-backed salamander, northern dusky salamander, two-lined salamander and red-spotted newt.

Reptile species and individual numbers also appear to be stable. Three turtles are found - snapping, painted and musk. Wood turtle occurred historically, and some have been reintroduced in 2006. The three resident snake species include northern brown snake, eastern garter snake, and eastern milk snake.

See Appendix 9 for a checklist of reptiles and amphibians found at the Center.

4. Butterflies, Dragonflies and Damselflies

The great popularity of birding has recently generated interest in showy insect species. Birders with quality binocular optics now also use them to view butterflies (Lepidoptera) and dragonflies (Odonata). Center staff have added butterfly and dragonfly listing to their public program offerings. Similar programs are planned to include damselflies and the larger moth species. See Appendix 10 for a checklist of 41 species of butterflies identified to date and Appendix 11 for a checklist of dragonflies, with 14 species identified to date.

C. WETLANDS AND WATER RESOURCES

Streams, ponds and wetlands present on the Center lands total about 19 acres. The Center's most significant stream, the Vlomankill, traverses the site roughly north to south on the western perimeter, and lies at the bottom of an eroded valley. The Vlomankill is rated as a Class C, C(T) stream, suitable for primary and secondary-contact recreation and fishing (NYS Surface Water Quality Standards). Its headwaters are in the Colonie Country Club in Voorheesville and it is fed by several tributaries before entering Center property.

The Phillipinkill runs from northwest to southeast in the northern quadrant of the property in the area of the Joel parcel and is rated as a Class C, C stream. An unnamed stream drains Sunfish Pond and Baltimore Marsh in the southeast quarter of the property and joins the Phillipinkill beyond the property boundary.

When the property was used for breeding game fowl and waterfowl, the Vlomankill Creek was dammed at three places:

1. Beaver Pond was created by a dam at the southern edge of the property.
2. Heron Pond was created by a dam where Game Farm Road crosses the stream.
3. Along the present-day Vlomankill Trail are the remains of a dam that supplied water to ponds along the stream valley and in the Old Field Trail area of the Center.

More recently, seven new ponds were dug by the University at Albany in the northeast section of the property for use in research projects. They continue to provide aquatic habitat. In several low-lying areas, marshes and wetlands (some seasonal) provide additional aquatic habitat.

Ponds and streams at Five Rivers are inhabited by a variety of minnow and game fish species. The ponds are managed for use in fresh water studies and for fishing instruction.

While all of the Centers water bodies and wetlands contribute to the scenic appeal of the Center for visitors, none have any official wild, scenic or recreational designations. The Center's most scenic watercourse is the Vlomankill, with steep, mature forested banks, rock outcroppings, riffles and small waterfalls.

State-protected wetland areas are designated on the property, including the Beaver and Heron pond area, wetland C-38, and wetland areas upstream along the Vlomankill valley, wetland C-5 (see Appendix 12). No wetlands in the area of the Center are included on the National Wetland Inventory, however, there is a potential that wetlands on the unit would meet the criteria for federal wetland protection.

D. BIO-DIVERSITY

1. Natural Communities

There are no habitat communities on or near the Center that are designated as being of statewide significance. The forested community is the most natural and high-quality at the site. Mature forest along the Vlomankill has a well-established flora of groundcover, understory and canopy species. The other communities are largely agricultural lands in various early to late successional stages and have a higher percentage of non-native naturalized and invasive species than in the forested habitats.

2. Rare, Endangered, Threatened and Special Concern Species

There are no known species of rare plants at the Center. See section IV, D for a list of known state-listed animal species. There are no USFW identified Significant Habitat areas at the Center.

E. TRANSPORTATION CORRIDORS

Five Rivers Center is located near major interstate highways, I-87 going north/south and I-90 going east/west. While much of the Center's draw is from the greater Capital District, entries in the guest register often reflect day-visit tourism from throughout the tri-state region, and many entries show points of origin much farther away.

Game Farm Road, the local access road to the Center, is a permanent, all-season paved road maintained for motor vehicle traffic by the Town of New Scotland. It cuts through Center property for approximately ½ mile.

There is no public transit access to Five Rivers Center. The majority of school groups travel to the Center by school bus, but many arrive in parent-driven car pools. Most other visitors arrive in private vehicles.

F. INTERIOR ROADS AND TRAILS

1. Administrative Interior Roads

The Center maintains a network of paved, all-season service roads totaling approximately 1 mile. These roads provide access for administrative purposes, and are open for pedestrian use, providing access to interpretive and recreational trails.

In addition, the Center maintains a 2-mile unpaved Service Road Loop to support trail maintenance and land management. This is a seasonal road (snow is not plowed) and serves dual use, also being used as a foot trail.

2. Right of Way and Easement

DEC owns one right of way and one easement through adjacent privately owned parcels:

- A utility easement from Orchard Street through the Tate property allows DEC access to the Center's sewer and water facilities.
- A right of way from New Scotland Road South through the Guyette property provides access to the Miller parcel.

3. Interpretive and Recreational Trails

The Center's system of interpretive and recreational trails totals approximately 8 miles and is organized around three principal goals:

- provide public access without compromising environmental protection
- highlight natural areas which have high interpretive value and which can reasonably accommodate visitation
- direct public visitation away from buffer areas, administrative areas and areas with unique or fragile resources

The trail network presents a broad spectrum of recreational settings, from highly developed to primitive. Different trail surfaces and designs are used, having varying degrees of challenge for visitors. Design objectives are to create compelling arrangements of space, memorable landmarks, and interesting views. Each trail visits a variety of vegetative cover types and topography, offering a variety of landscape features and exhibiting diverse plants and wildlife. Meandering trail routes and planned viewing areas provide stimulating experiences.

The arrangement of trails helps to protect unique and fragile resources by providing designated use corridors, distributing interior visitation throughout a broad area, and directing attention away from sensitive areas. Common resource protection concerns, such as drainage, erosion and compaction problems are usually temporary, minor in scope and can usually be rectified through increased maintenance attention.

For a map of trails, see Appendix 13.

4. Carrying Capacity

In general, overcrowding on the Center's interpretive and recreational trails has not been a serious issue. The trails receive heavy use, however, and regular maintenance is needed to prevent erosion, compaction and other damage. These trails are built to higher standards than regular hiking trails on most other DEC lands, with steps, railings and trail surfacing materials (generally wood chips, pavement or stone dust) employed to ensure visitor safety and to prevent damage.

The main potential for overcrowding on trails occurs on weekday mornings during Spring and Fall seasons. These are the prime times for large school groups to visit for field trips, both on guided lessons and on self-guided visits conducted by their own teachers and chaperones. The result of overcrowding at the visitor center building and on trails is the diminishing of the outdoor experience.

Several techniques are employed to overcome possible crowding situations:

- limits are set for the total number of students that will be scheduled to visit the Center on a given morning. The limit generally used is 300 students
- different trails and teaching stations are used for self-guided groups and the guided lesson groups
- class arrival times are staggered to separate groups

5. Routine Maintenance

Trail routes are generally well-marked and identifiable, but directional signs could be improved. Standard trail widths of 4 to 6 feet are maintained by cutting back brush along the trail's edge and vertical clearance on trails is maintained by cutting overhanging vegetation to a height of at least 8 feet.

Education staff check each interpretive trail at least weekly and file a trail condition report documenting any potential hazards. Any unsafe condition so identified is documented, reported to the Delmar Operations Site Supervisor, and duly remediated. Recreational trails are checked regularly by maintenance staff.

Wherever possible, trail surface materials are selected specifically to blend with the site and the types and levels of use. To increase accessibility, two trails feature hardened surfaces such as asphalt, boardwalk or crushed stone. Trails with grass surfaces are mowed regularly to facilitate access and to provide clear route delineation. Surfaces of crushed stone, wood chips and shredded bark are reconditioned as needed.

Cross-draining trail culverts and gravel fill are used to reduce seasonal drainage problems. Kick-rail curbing and "stay on trail" signage are maintained to discourage off-trail wandering in sensitive areas. Bare earth areas and unauthorized herd paths are cordoned off or blocked, and impacted areas are mulched and re-seeded as necessary.

G. INVENTORY OF FACILITIES

1. Intensive Use Area

Comprising a 15-acre parcel around the Visitor Center and parking lot, the Intensive Use Area is the primary hub of activity at the Center. It includes the following facilities (see Appendix 14).

a. Visitor Center – Building 7

In 1966, a temporary cafeteria on the State Office Campus was dismantled and re-erected at Five Rivers as a carpenter shop. It was remodeled to serve as the visitor center after the 1972 opening of the Education Center. Open and staffed every day except state holidays, the Visitor Center features public exhibit areas, a bird viewing area, a multi-purpose meeting room, a kitchenette/small meeting room, restrooms, and staff offices.

Although the visitor center building has served the public for more than 30 years, it has severe limitations. It was not built for long-term use, being constructed of paperboard siding and having no wall insulation. When acquired as a surplus item from the Office of General Services (OGS), it was placed on an uninsulated slab foundation and given no elevation above ground level, allowing winter meltwater to routinely run into the building from outside. Overall, the building is in poor condition, as described in the *OGS Study to Provide Master Plan* (Study) submitted to DEC in July 2005 (see Appendix 1).

b. Visitor Parking

A paved parking area near the visitor center building can accommodate about 70 vehicles. The surface pavement of the parking lot is quite old and in poor condition, showing cracks and numerous potholes. The parking lot overflows its capacity at times, with the extra vehicles using the bus parking lot and/or the parking spaces near building 3. Overflow of the lot is most likely at the following times: weekday mornings in spring and fall when visiting school groups happen to arrive by private car, weekend days when snow conditions are good for cross-county skiing and snowshoeing, and weekend days in spring and fall when good weather brings a large number of drop-in visitors.

c. Bus Parking

A separate bus parking area holding up to 6 buses is located near the comfort station and picnic pavilion. It is designed in a circular form, so buses can pull in and park, then continue straight ahead to leave. Backing up a bus can pose serious safety hazards, and many school districts forbid their bus drivers to back up unless there is an adult spotter behind the bus.

The Center draws an average of 15,000 school students each year for guided and self-guided field trips, generally during weekday mornings. The bus parking area is used as an informal overflow parking area for cars.

d. Goose Lodge – Building 2

Constructed as part of the site's Civilian Conservation Corps camp, this structure is currently the storage and staging area for the guided school lesson programs. It contains a small classroom, two instructor preparation rooms with storage shelves and cabinets, and a bathroom. An unheated section of the building is used for general storage. The building is in poor condition as noted in the OGS study.

Although this building does not appear in the few earliest photos of Civilian Conservation Corps Camp S-72, it is shown in film footage taken in 1936, and is identified on a 1937 site map as the CCC carpentry shop.

In spring 2005, Historic Preservation Officers from DEC and OPRHP thoroughly inspected the structure. Based on its deteriorating condition and on significant alterations, the Preservation Officers determined the structure not to be historically significant and to be beyond historic reclamation.

e. Bear Pen Picnic Pavilion and Classroom – Building 7A

Constructed in the early 1950s to exhibit live black bears at the Delmar Zoo, the building contains a small unheated classroom and a covered picnic area that is open on three sides. The interior and exterior are heavily used both in March for maple sugaring programs and in the summer for the Summer Family Program. In spring and fall, they are also regularly used for Guided School programming. In winter, the interior is used for storage.

f. Picnic Area

Approximately 15 picnic tables are positioned on the open lawn area adjacent to the parking lot, and a few tables under the small shelter at the Bear Pen. School groups and day-use visitors often bring a bag lunch to eat in the picnic area. No reservations are taken for use of picnic tables or pavilion space.

g. Operations Field Crew Headquarters – Building 3

This wooden structure was built in the 1930s and is used as a field headquarters for the DEC Operations maintenance crew that operates at Five Rivers. It also is used to store equipment such as trailers, pickup trucks, and lawn mowers.

Like the Goose Lodge nearby, the building apparently dates from the later years of the CCC camp. It does not appear in the few earliest photos of Camp S-72, but does appear in the film taken in 1936, and is identified on a 1937 site map as the CCC maintenance garage. This building was also inspected by Preservation Officers who determined the structure not to be historically significant.

This building is in poor condition and will be replaced by a new Maintenance Center building by 2012. Building 3 is in a location that causes potentially dangerous cross traffic between service vehicles and pedestrians. There is a lack of daylight in occupied work spaces such as the office and break room. The shop area also does not receive adequate task lighting. The bathroom does not meet ADA requirements. The hot air furnace is ceiling-hung and open to the general area. The OGS study recommends a new, modern building to be built with improved energy conservation measures, additional insulation, better windows and doors, higher efficiency HVAC equipment, etc.

h. Maintenance Center – Building 1

This is a pre-engineered metal-framed building with metal and wood siding built around the late 1970s. The first floor has 4 work bays, 3 with automotive lifts, an office and a lunch room. It provides vehicle maintenance for Five Rivers, 2 campgrounds in the eastern part of Region 4 and various vehicles assigned to Law Enforcement and Forest Ranger personnel in the eastern counties of Region 4.

The building lacks adequate storage for the types of petroleum-based liquids used at this site. A forced hot-air furnace is on the second floor loft space and is open to the first level where chemicals are stored. The HVAC equipment cantilevers out over the workspace below. The bathroom is also located on the second floor and is not ADA compliant. It also cantilevers out over the workspace below. This building will also be replaced by the new combined crew headquarters and maintenance shop.

I. Nature's Accessible Backyard Trail

Designed and constructed in 1996 with funds raised by the Friends of Five Rivers, this ¼ mile loop is a Class I trail with asphalt surfaces, built to ADA specifications for the mobility impaired. The trail features plants and animals common to domestic backyards and contains a wildlife garden, bird feeding area, water garden, an observation deck, a viewing gazebo, and resting benches located every 150 feet. The deck and gazebo offer views of the Beaver and Heron ponds. Several short-cut options along the trail allow visitors to shorten or lengthen their time and distance on the path.

Built in 1996, the trail was improved with the installation of a water garden in 2002. Guided interpretive programs are frequently conducted for visiting groups using this trail.

j. Amphitheater

This outdoor gathering area features rustic plank-bench seating and a fire ring. It is used for occasional large group instruction and by local youth groups for campfire programs. A grove of sugar maple trees has been planted along the periphery of this area to enhance privacy and aesthetics, as well as for educational and interpretive use. Additions to this grove of maples are planted periodically.

k. Comfort Station – Building 7B

Constructed in 2002, this public restroom facility is the only building in the intensive use area that is built with modern materials and that has good energy efficiency. It is open for use throughout daylight hours, including times when the Visitor Center is closed. Electronic door locks set on a clock timer allow the building to be secured automatically at night. This provides an important service to people who visit early in the day and during evening hours, when restroom facilities in the Visitor Center building are not open. It also provides restrooms and a water fountain close to the picnic and bus parking areas. The comfort station can nicely accommodate large school groups arriving for field trips, relieving use pressure on the visitor center restrooms.

1. Garden Shed

Currently used for the storage of grounds keeping tools, this structure was erected in the early 1970s to house the mechanicals for a closed-loop sewage system. This system was replaced around 1980. Tools stored in this building are used primarily by volunteers who maintain the wildlife garden and other plantings and trails.

2. OGS Study Findings

The OGS Study (Appendix 1) revealed a series of significant deficiencies in the physical condition and functional arrangement of buildings and other fixed assets in the Intensive Use Area.

a. Evaluation of the Site

The survey by OGS identified several issues related to site safety, site use and visitor orientation:

- the current Visitor Center is too close to Game Farm Road, posing both safety and aesthetic problems
- the site distances at the main parking lot entry point are poor
- there is a conflict between pedestrians and vehicular traffic at the main parking lot entry
- lighting capabilities of the parking lot and walkways are insufficient
- there is a shortage of parking
- storm water runoff from parking areas is not handled properly
- connectivity to the trails and outlying areas is not well designed
- buildings of similar use are not in proximity

b. Evaluation of the Visitor Center

Deficiency – Due both to the pressure of increased public use and deficient infrastructure, the Visitor Center is inadequate for its many public and administrative uses.

From a programmatic perspective, functions conducted in the classroom frequently draw overflow audiences which spill over into exhibit areas. There are also urgent needs to accommodate larger audiences in the exhibit room, and to consolidate staff offices under one roof for more efficient Center administration. Because of the lack of space, there is quite a bit of overlap between areas used for public access, storage and administration. From an infrastructure perspective, there is poor interior ventilation and storage rooms do not have appropriate fire separations.

Conclusion – Because of the structure's poor condition and the difficulty in upgrading it to modern specifications, the OGS Study strongly recommends construction of a new Visitor Center and removal of this structure.

c. Evaluation of the Parking Areas

Deficiency – Though parking capacity is exceeded only periodically, given continued growth in site use, it will become a concern in the near term. Also of concern is the traffic conflict between visitor cars and school buses. The parking lot surface has reached the end of its useful life, and stormwater runoff from the main parking lot runs directly to the Beaver Pond.

Conclusion – There should be formal separation between car and bus access, and parking capacity

should be increased. Parking lot surfaces need replacing. A stormwater management system is needed to mitigate impacts.

d. Evaluation of the Goose Lodge

Deficiencies of Goose Lodge – Overall, this building does not meet code requirements for the current program uses. The concrete block foundation is in very serious disrepair. There is no ventilation system, nor bathroom exhaust system. The bathroom layout and fixtures are not ADA compliant.

Conclusion – Because of the difficulty in upgrading this structure to modern office specifications, the OGS Study recommends that this structure be removed and its functions subsumed within the proposed new Visitor Center.

e. Evaluation of the Bear Pen

Deficiency of the Bear Pen – Though structurally sound, this building is not heated and is poorly lit. Given the site configuration proposed in the OGS Study, the structure is in a very disadvantageous location.

Conclusion – The OGS Study recommends that the Bear Pen be removed and its current program and picnic use functions be relocated.

f. Evaluation of the Operations Field Crew Headquarters

Deficiencies – Deficiencies identified in Building 3 are a lack of sufficient interior lighting and a bathroom that is not ADA compliant. However, a major concern is the location of this facility. Truck traffic to and from the Operations Field Crew Headquarters negatively affects pedestrian traffic at a most vulnerable spot, where school buses currently unload and students cross over to the Goose Lodge.

Conclusion – The OGS Study recommends that a new Maintenance Facility be developed near the current Auto Repair Shop, integrating the functions of both buildings. The current Operations Field Crew Headquarters, Auto Repair Shop and Tire Barn would then be demolished.

3. Buildings Outside of the Intensive Use Area

a. Jones Barn – Building 3A

Built by the Jones family around the 1850s, the barn is a significant nursery for an estimated 300-500 little brown bats. The barn is currently used to store vehicles and equipment. A health issue involving bat and raccoon feces present in the barn has caused DEC to limit employee access to the structure. A landmark element of the Service Road Loop, it gives the site a distinctive farm-country character and will be retained as long as it remains structurally sound. The bat nursery is of considerable interest to the public, and is the subject of several education programs at the Center each year. The exterior was repaired and painted in summer 2001.

b. Spruces – Building 4

The complex of buildings and roads in this area formed the hub of the old Experimental Game Farm. The Spruces was the pheasant hatchery, the lower floor housing incubators. The building is currently used for storage by the education staff. The roof of the building was replaced in 2000.

c. Annex – Building 4A

Before the Wildlife Resources Laboratory was built in 1941, research biologists operated out of this office building, which is now used for exhibit storage. The structure is sound and the framing square. It will require replacement of the roofing within the next five years.

d. Powerhouse – Building 4B

This small building formerly served as the Center's electrical distribution point and has been unused since the new electrical service to the grounds was installed.

e. Warehouse – Building 6

Often referred to as the "Brooder House," this building originally served as the Game Farm's pheasant rearing building. Currently, several DEC units use it for storage of supplies and materials. It is the only facility on site that has a loading dock that can accommodate semi-trailer delivery. The roof and siding on the building are in poor condition and the building contains asbestos wallboard.

f. Exhibit Shop – Building 5

Built sometime in the 1940s as a storage barn and garage, this structure housed DEC's exhibit production unit from 1972 until it was discontinued in 1995. Several DEC units use the Exhibit Shop today for various purposes. Division of Fish, Wildlife and Marine Resources staff use it as a bird-banding station for seven days in the summer, Division of Public Affairs staff use it for storage, and summer work crews from the Albany Boys and Girls Club use it for staging grounds and storage for their tools and equipment. If the building is to be retained, the siding needs to be repaired and painted, and the roof replaced.

g. Farmhouse – Building 8

This structure is on or near the site of the home of Adrian Bratt, which appears on the earliest maps of Albany County. The building has undergone a series of upgrades in recent years and is in good condition. The roof and furnace were replaced in 2006. The building is currently used for offices, teacher resource center, library and meeting room.

h. Radley Barn – Building 8A

This building's architecture is highlighted by pit-sawn timbers and other architectural elements of early barns. The barn is in fair to good condition and is used for storage.

I. Joel House

Since purchase of the Joel parcel in 2001, the house has been used as a residence for temporary education staff and interns. The structure is in fair to poor condition and is costly to heat. Water seepage in the basement presents a significant mold problem.

j. Joel Garage

This 2-story, 3-bay garage is in poor condition, and needs extensive rehabilitation. It is currently used by DEC Law Enforcement staff for storage of vehicles and other equipment.

4. Utilities

a. Electrical System

In 1999, the Center's electrical distribution system was replaced with an underground system.

b. Telephone

Service for telephones enters the property in front of the visitor center on overhead wires, linking to the visitor center building and to the Wildlife Resources Center through overhead wire. Other buildings with phone service are linked through underground wires, originating at the visitor center. The overhead wire and pole system is in only fair condition, and is subject to damage from falling trees. The wire entry to the property is unsightly.

c. Optic Fiber Cable

Network and Internet service to buildings runs from the Wildlife Resources Center to the Visitor Center by way of underground optic fiber cable.

d. Water and Sewer

A project connecting the Five Rivers complex to Town of Bethlehem water and sewer systems was completed in 2002.

e. Dams/Ponds

A system of dykes and water control devices serves to create a series of ponds and wetlands on the Center grounds. These structures date from the game farm days and range in condition from good to poor.

f. Old Boundary Fencing

A good deal of old fencing is present along the historic boundaries of the Delmar Game Farm, installed to contain animals being reared on the farm and to keep out neighborhood dogs and other predators. Due to further land acquisitions, some of this fence is no longer on the boundaries of the unit. Most of the fencing is in poor condition, overgrown with grape vines and other vegetation. The resulting overgrown fence lines provide significant wildlife habitat and will be retained.

H. GEOLOGY

Clay soils at the Center are evidence of its glacial history, when glacial Lake Albany extended from Bennington, VT to Amsterdam and Kingston, NY. A thick layer of sediment was deposited into Lake Albany from large volumes of glacial meltwater rushing into the lake from the north and west. Most of the site is reasonably flat except the valley carved by the Vlomankill. Bedrock outcroppings are exposed in several sections along this stream where sediment-loaded glacial meltwater eroded down through the shale bedrock.

Most of the soil is *neutral clay loam*, characteristic of deposits elsewhere in the Hudson Valley. Soils are identified as *Hudson* and *Rhinebeck*, high in potassium, with moderate to low phosphates. Acidity varies from pH of 5.5 in conifer forest regions to a pH of 7.2 at the stream-bed level. *Madalin Silty Clay Loam* is found in some of the old pond sites, while areas bordering the Vlomankill have soils classified as *Nunda Silt Loam*.

Drainage of most of the property is poor due to the underlaying thick stratum of clay. Clay depths to 100 feet make finding significant yields of groundwater difficult. Many surface areas are characterized by seasonal wetness. Heavy runoff associated with spring thaws and storms produces active erosion that is quite evident along the banks of Vlomankill. Annual precipitation in the area averages 35.7 inches.

I. ADMINISTRATIVE FACILITIES

There are four Administrative Areas located within the Five Rivers Complex that are administered by other DEC Divisions, or are otherwise not open for public access and use. These areas comprise offices, storage buildings, residences, outdoor field pens and outdoor equipment storage/parking areas. These include the aforementioned Maintenance Center and Tire Barn, the Operations Field Headquarters, Joel Barn and Garage. An additional administrative area is the Wildlife Resources Center - Building 9. Built in 1941 and expanded in 1968, the Wildlife Resources Center is a six-acre complex administered by DEC's Division of Fish, Wildlife and Marine Resources at Central Office. The administrative area comprises a laboratory, garage, incinerator, outdoor rehabilitation pens and parking areas.

J. CULTURAL RESOURCES

The site's archaeological and architectural resources endow Five Rivers with a distinctive "sense of place," adding cultural dimensions to the environmental education program.

1. Archaeological Resources

Based on its physiographic characteristics, Five Rivers Center is considered to be sensitive for the location of both pre-contact and historic cultural resources. Pre-contact evidence is discussed in Section I, A.

a. 1992 Investigation

In 1992, Collamer & Associates conducted a Stage 1A Cultural Resource Investigation of the Five Rivers property. The sensitivity assessment suggested a high probability for the location of pre-contact and historic resources on the site.

b. 1999 Investigation

In 1999, Hartgen Associates located arrowhead and flint-napping fragments at 2 locations (sites 1 & 2 on map, appendix 15) during Stage 1B shovel testing. Expanded Stage 1B digging at these sites found additional cultural material.

c. 2000 Investigation

In July 2000, Hartgen Associates found remnants of a fire-ring which were subsequently carbon-dated to 2000 B.C., the Normanskill Period (site 3, appendix 15). As a result of this discovery, DEC's Historic Preservation Officer has petitioned NYS OPRHP for nomination of that site to state and federal Registers of Historic Places.

2. Architectural Resources

The site's historical architecture has considerable documentary value and interpretive potential.

a. Settlement Era

An early eighteenth century map of the vicinity shows a residence of Adrian Bratt along the Vlomankill, near to (if not the same as) the present day Farmhouse (Building 8), quite possibly one of the earliest residential structures in Albany County. The Radley Barn (Building 8a) might go back to the late 1700s, and the Jones Barn (Building 3a) to the mid-1800s.

b. Civilian Conservation Corps Structures

Five Rivers is one of the few places in New York State where structures directly related to a Civilian Conservation Corps (CCC) encampment remain intact and in use. Both the Goose Lodge (Building 2) and the Maintenance Shop (Building 3) were built originally as part of CCC Camp S-72, which resided at the site from 1933 to 1936. Unfortunately, modifications to these buildings made over the years now render them of little historic value, according to State historic preservation officials.

c. Experimental Game Farm

A complex of buildings comprising the Spruces (Building 4), Annex (Building 4a), Powerhouse (Building 4b) and Warehouse (Building 6) were constructed in the early 1930s, forming the hub of the Delmar Experimental Game Farm.

K. LANDSCAPE CONDITIONS

The surrounding landscape has changed dramatically since the state began using the site in 1933. Aerial photos of the property taken during the Game Farm Era show the site surrounded by large open agricultural areas on all sides.

By contrast, today Five Rivers is one of the largest remaining single tracts of open space in an increasingly developed suburban community. The 2006 *New York State Open Space Conservation Plan* lists Five Rivers Center as one of the state's "Project Priority" areas.

The Five Rivers Center property spans the boundary of two towns. The western section of the Center lies in the Town of New Scotland, with the surrounding lands zoned *Industrial* and *Residential-agricultural* (see Town of New Scotland Zoning Map, Appendix 16). The eastern section of the property lies in the Town of Bethlehem and is zoned *Residential-Agricultural*. Currently, Five Rivers Center property abuts the property of 16 different landowners. Several of these neighboring parcels are undeveloped lands, either forest or retired agriculture, of 30 acres or more. In the last 15 years, the Town of Bethlehem has seen substantial residential growth and development, and several of undeveloped parcels abutting or in proximity to the Center are in sub-division planning stages. During this time, public use of Center facilities has increased annually at an average rate of 4%.

L. SITE CONCEPT

To ensure that Center management and operation plans are compatible with the site's characteristics and the carrying capacity of its resources, the site has been conceptually divided into four succeeding (eccentric) management zones (see map, Appendix 17). In managing the Center's lands, DEC seeks to balance the needs of the visiting public with habitat protection efforts. Generally, the needs of the visiting public take precedence in the Intensive Use Area, but are of decreasing importance in succeeding zones, whereas habitat protection is of the utmost consideration in Buffer Areas.

1. Intensive Use Area ("A" on map)

Comprising a 15-acre envelope around the Visitor Center, the *Intensive Use Area* is the hub of activity at the Center. Amenities include the Visitor Center (Building 7), Bear Pen (Building 7a), the picnic area, the Goose Lodge (Building 2), the amphitheater, the Comfort Station (Building 7b), Nature's Accessible Backyard Trail, and parking areas.

2. Interpretive Areas ("B" on map)

Interpretive Areas are easily accessible areas of high natural resource interest which are within ½ mile or so of the Intensive Use Area. They generally comprise areas associated with interpretive trails and instructional sites.

Typical amenities may include covered pavilions or other "outdoor classrooms" with bench seating, vistas and observation areas, and interpretive and directional signage. Interpretive Areas are the most popular of our outdoor destinations, and the corridors which connect them are high-to-moderate use areas with higher maintenance requirements.

3. Resource Management Areas ("C" on map)

Resource Management Areas are generally large and often remote expanses of field, forest or wetland which may be managed, in whole or in part, to achieve specific resource management objectives, and to serve as examples of good conservation practices. Trails here are generally longer, more remote, and offer fewer amenities. They may feature interpretive and directional signage, resting benches and scenic vistas. Visitation is moderate, as are maintenance needs.

4. Buffer Areas (“D” on map)

Buffer Areas share boundaries with neighboring parcels, and are reserved as wildlands to mutually protect the Center and its neighbors from impacts associated with each other’s activity, and to provide wildlife habitat. Where deemed appropriate, these areas may feature minimal public amenities such as footpaths, resting benches and directional signage. They are generally characterized by lower public use and lower maintenance requirements.

M. SITE DESIGN

The Center’s public amenities have generally been laid out to best serve two large and typical user groups: drop-in day-users (adults and families) and school field trip groups that visit most often on weekdays.

The typical drop-in (day-use) visitor arrives by the family car with an average of 2.5 people aboard, often on Saturday or Sunday, for a 1½- to 2-hour visit. Most of the time spent on-site involves walking (or skiing, snowshoeing) the trail system, with a short stop at the Visitor Center (10 minutes or less) to use the restroom and visit the exhibit room.

A typical school group arrives by school bus between the hours of 9:00 -10:00 AM on a weekday morning with 50 students aboard. Those classes arriving for a guided lesson do a quick bathroom stop before going afield for 1½ to 2 hours, and end their visit with a short lunch in the picnic area afterwards. School groups visiting on a self-guided basis spend ½ hour in the Visitor Center, taking part in a staff-conducted orientation presentation, using the restrooms and enjoying the exhibits before going afield for 1½ hours, also finishing up with a short lunch at the outdoor picnic area before departing.

Several observations follow from these basic visitor itineraries:

- current visitors, regardless of type, spend much of their time out on the trails; the outdoor experience would appear to be a primary reason for visiting the site
- a smaller amount of time is spent indoors; DEC’s intent of using the visitor center to peak the visitor’s interest and lead them to spend time on the grounds is succeeding
- there are obvious “down times” at popular amenities and some underused amenities, which could easily accommodate growth without impacting the experience of current users
- visitation is strongly influenced by the weather
- as expected, the restrooms are the highest traffic areas

III. USE AND DEMAND AT FIVE RIVERS

Since the opening of Five Rivers in 1972, the lands have been managed to support the Center's environmental education programs and for passive recreational use. The land management goals have been to:

- Provide a wide variety of wild plants and animals for public enjoyment and for use with the Center's educational programs
- Maintain the biodiversity present at the site
- Provide access for visitors to conveniently observe and enjoy the resources at the site

Public use of the lands has increased steadily over the more than 30 years the Center has been in operation. The site is now visited by more than 100,000 people per year. Appendix 18 is a chart of visitor numbers for calendar year 2006, broken down into a number of visitor categories.

Members of the public use the lands in several ways:

A. RECREATION AND NATURE OBSERVATION

The Center grounds are open for public visitation every day of the year during daylight hours. Visitors use the trails and grounds for hiking, cross-country skiing, snowshoeing, wildlife observation, plant study, photography and for general enjoyment of the natural setting. In addition to trails and walking paths, drop-in visitors make use of facilities such as restrooms, water fountains and the picnic area.

B. ENVIRONMENTAL EDUCATION PROGRAMS

Programs are offered year-round by DEC staff and by Center volunteers and partnering organizations. Audiences attending these programs can be divided into major groups:

1. School and college groups visit the Center to take part in guided lessons on topics involving natural resources and environmental quality protection. The heaviest visitation is by classes of children aging from preschool to grade 5, though the center sees substantial visitation by older groups up to college classes. These groups also use the center for self-guided visits, usually attending an orientation talk by a Center staff person, then using Five Rivers trails and educational materials to conduct their own activities.
2. Youth groups such as Girl and Boy Scouts, 4-H Clubs, Boys & Girls Clubs and YMCAs take part in scheduled learning activities conducted by Center staff, volunteers and partners. These groups also use the facilities for self-guided visits. As with school groups, they are usually attending an orientation given by Center staff or volunteers before conducting their own program using the grounds. Most groups visit the Center on a day basis, remaining for several hours and often having a picnic meal during the visit. Limited overnight camping is provided for school, college and youth groups that are conducting conservation learning activities on the grounds. Camping is limited to these groups and is by reservation.

3. Adults and families visit the Center to take part in a wide variety of programs, including interpretive walks, workshops, lectures, and nature art shows.
4. Teachers and youth leaders come to the Center to take part in training workshops related to natural resources and environmental stewardship.
5. Conservation-related organizations make use of the Center grounds and facilities to hold meetings and conduct activities for their members and the public.

C. RESEARCH

Research involving natural resources and environmental quality is conducted at times on the Center grounds. Units of DEC, college professors and students, school students and members of organizations may use the grounds for such uses with permission from the facility manager.

D. VISITOR ORIGINATION

Visitors to the Center primarily come from a wide area of eastern New York. For schools using the center for field trips, the usual area of draw is from Glens Falls to the north, Catskill to the south, Johnstown/Gloversville to the west and the Massachusetts border to the east. This area of primary draw for visitors is roughly a 30-40 mile circle.

A substantial number of visitors come from farther away, however. Many people signing the visitor logs are from other states and foreign countries. Analysis of visitor sign-in books kept at the front desk of the visitor center show that Five Rivers is a popular spot for those living in eastern New York to bring out-of-town guests.

IV. MANAGEMENT GOALS AND ACTIONS

The management goals and actions that follow are compatible with and provide support for the environmental education goals of the Center, which are to:

- Provide interpretive programs and services for a range of public users including adults, families, conservation and environmental organizations, civic groups and special needs visitors
- Provide education programs and services for school and youth groups
- Provide training and support services to teachers, youth leaders, environmental educators and other providers in the content and methods of environmental education and interpretation
- Develop and maintain partnerships to enhance programs and services
- Provide access to the Center's programs to under-served residents, especially for urban audiences

Lands and facilities at Five Rivers Environmental Education Center will be managed to meet goals for environmental education and environmental interpretation. To meet these goals the following major objectives are set forth:

- Encourage public visitation at the Center for participation in educational and interpretive activities and for low-impact outdoor recreation
- Provide ready public access to the grounds and facilities, compatible with good stewardship of the unit's resources
- Provide for the health and safety of visitors and staff
- Provide a high diversity of native plants and animals for the enjoyment of the public and for use in educational programs

A. MANAGEMENT FOR ENVIRONMENTAL EDUCATION AND INTERPRETATION

1. Proposed Reconstruction of Intensive Use Area

Buildings and other facilities in the intensive use area of the Center, with one exception, are in need of replacement, as stated in the Program Report - Study to Provide Master Plan (Appendix 1). The exception is the Comfort Station, building 7B, that was recently constructed and is in very good condition.

The OGS Study proposes that the building functions in the intensive use area be consolidated and the existing buildings replaced with new construction. Using the OGS Study as a guide, DEC commissioned a Schematic Design Narrative - Site Improvements (OGS Schematic), to include a new multi-purpose Visitor Center with accompanying improvements to parking areas and surrounding public amenities (Appendix 2). The cost estimate for these improvements and the removal of the buildings to be replaced totals \$4,238,000. Major elements of the design include:

- A Visitor Center building of approximately 8,000 s.f., containing an entry/foyer, reception desk, exhibit area, wildlife viewing area, multi-purpose meeting room, dividable classroom, offices, restrooms, and storage areas. The design calls for incorporating the existing Comfort Station into the new building. A welcome and orientation plaza will be located near the main entry, giving clear direction and access to trails. The new visitor center will be a *green* building, constructed using the best practical techniques for environmentally friendly construction and energy efficiency.

LEED certification is desirable, but will be pursued only if found practical for this relatively small building. The green features of the building will be highlighted through public displays and programs, setting an example for future buildings in the region.

- The new Visitor Center will consolidate functions now disbursed between buildings 2, 7, 7A and 8. This consolidation offers advantages of energy efficiency and reduced travel time for staff between facilities. Potential problems created by concentrating multiple groups visiting the Center at a given time will be addressed by the layout of the new building, which allows separation of visiting groups among the classrooms, exhibit/viewing areas and meeting room.
- The functioning of the current Visitor Center and Goose Lodge buildings will be continued until the new Visitor Center is operating, allowing continued public use of the Center with as little disruption as possible. When new facilities are completed, the existing buildings will be removed, with the exception of Building 7B.
- Parking areas will be modified for improved safety, efficient use of space, reduced visual impact, reduced light pollution, increased shading, increased capacity, and engineered for effective management of stormwater runoff. Paved areas presently allow parking for about 110 cars which includes the main parking lot, two sub-lot areas, a bus turnaround and parking, and the areas surrounding buildings 2 and 3. Other than the main lot, these other areas are undesirable mainly for reasons of pedestrian safety and the appearance of parking lot sprawl. Under the OGS Design, parking spaces will increase to approximately 140. Portions of the hard surfaces where buildings 3 and 7 now stand will be restored to green spaces using “green paving” techniques, allowing these areas to accommodate overflow parking situations which will still occur occasionally.
- Bus entry and parking areas will be separated from the main vehicle parking area to improve safety.
- Current problems with stormwater runoff from hard surfaced areas will be addressed to meet modern standards. Erosion along the Beaver Tree Trail has long been a problem, caused by stormwater runoff from the existing parking areas.
- The picnic area will be relocated for convenient access from the public parking areas and a new pavilion will be built. The current Nature’s Backyard Trail will be easily accessed from the picnic area, making it inviting for visitors to enjoy a walk on that path.
- The Wildlife Viewing Area immediately west of the new Visitor Center will be a quiet natural area, serving to enhance wildlife use and sightings. Bird feeding stations and plantings of vegetation that are attractive to wildlife will be included in that area.
- The current buildings 1, 1a and 3 used by the Division of Operations will be replaced by a new Maintenance Center, located to the north of Building 1. This will improve the efficiency and utility of the work spaces, while enhancing the safety and aesthetics of the public areas. Vehicle access to the new Maintenance Center will be possible without the current need to pass through public areas to reach Building 3.

During public scoping sessions, several participants expressed concern about the increase in impervious surfaces resulting from this proposal. Analysis by the DEC Division of Operations shows a modest increase of 17% in the impervious surfaces in the Intensive Use Area. This increase will be mitigated by improved handling of stormwater runoff through recharge wetlands.

2. Alternatives to Reconstruction of Intensive Use Area

If the decision is made not to proceed with the reconstruction proposals, or if the project is delayed by lack of funding, the public buildings in the intensive use area will need extensive renovations or replacement with temporary structures in order to meet codes and provide for public safety. Needed work will include:

- Visitor Center - Install ventilation and cooling systems, replace flooring, replace damaged hanging ceilings, repair/replace interior walls and trim, replace exterior doors, replace dated restroom fixtures, repair/replace and paint exterior siding and trim.
- Goose Lodge - Constructed as a shop building in the 1930s or 40s, this building is not economically repairable. A replacement structure, either temporary or permanent, will be needed.
- Parking areas and interior roadways in the intensive use area are in poor condition and will need repair and repaving. Changes will be needed to properly control storm water runoff from hard surfaced areas. Safety concerns will be addressed by an alternate plan.

3. Manage Fixed Assets Beyond Intensive Use Area

The following actions are planned involving buildings and other fixed assets on the Center grounds beyond the bounds of the intensive use area. The intent of the actions is to enhance visitor experiences and to convey stewardship messages:

a. Evaluate Buildings

Many of the buildings outside the Intensive Use Area of the Center date to the Delmar Game Farm times or earlier. Some have current uses, others do not. Several are in poor condition and will need extensive repairs if they are to remain sound and safe. An evaluation of these buildings will be undertaken by DPAAE, the Division of Operations and other DEC divisions using the site. Decisions will be made on which buildings to retain and which to remove based on this evaluation and on the Cultural Resources Management Plan (see Part IV, A, 4).

b. Create and Install Wayside Interpretive Signs

Interpretive display signs will be placed at opportune locations on the grounds, where they will convey messages about natural resources and environmental management. These signs will be of modest size will be kept relatively low in number to keep them from detracting from the natural scene. Examples of appropriate interpretive messages are:

- field habitat management favoring grassland nesting birds
- wetland ecology at a marsh
- reasons for not feeding waterfowl

c. Enhance Access to Water and Wetland Areas

Public access areas involving waters and wetlands are among the most interesting to visitors. Access to the edges of ponds and wetlands will be enhanced to allow greater use of these opportunities, while protecting the Center's water resources. Wet edges like these are vulnerable to foot trampling that results in damage to plants and in soil erosion. Projects planned include:

- providing ADA access to the Beaver Tree Trail boardwalk and long bridge
- installing pond access docks at post #5 on the Beaver Pond and at the Research Ponds, allowing safe use by guided ecology lesson groups and by the visiting public.

d. Provide Scenic View of Wildlife Habitat Improvement Parcel

Construct a viewing platform within the WHIP parcel to provide an elevated view of the fields and to enhance opportunities for wildlife viewing.

e. Provide Assess Information to Users of Trails

All trails at the Center will be assessed using the Universal Trail Assessment tools, evaluating the accessibility of each. Access information will be added to trail head information signs to allow visitors to make informed choices of which trails to use.

f. Create Interpretive Displays in Building 4 (Spruces)

Establish the use of this building for interpretive displays that will be open to the public, staffed by DEC personnel or by volunteers. This feature would draw visitors to an area beyond the intensive use area, and would allow display of more extensive materials than the Visitor Center can hold. This building also is representative of the CCC era of Five Rivers and is considered to have some historical significance.

g. Deepen Pond Areas to Enhance Educational Use

Sedimentation and pond succession threaten to make several of the Center's water ecology teaching sites unusable in the near future. Areas of the Beaver, Heron, Goose and Sunfish Ponds will be deepened to provide for continued educational use and for aquatic habitat.

4. Manage Cultural Resources

Cultural resources on the Center grounds help provide an historic context for visitors and lead to a better understanding of the relationships of humans and natural resources. An inventory and evaluation of cultural resources is needed to identify significant resources, and to provide for their protection and interpretation. Assets that are not culturally significant or not economically maintainable will be identified and plans made for their removal.

The Cultural Resource Management Plan will be done by DEC staff with involvement and input from stakeholders. Assistance will be sought from the New York State Historic Preservation Office.

B. MANAGEMENT FOR PUBLIC USE AND ENJOYMENT

The Five Rivers property receives a large number of visitors who come for reasons other than the Center's formal education and interpretation programs. These informal visitors come to enjoy the trails, wildlife and other resources in a variety of recreational ways, including walking, running, hiking, photography, wildlife watching, studying wildflowers and other plants, nature sketching, snowshoeing, cross-country skiing, and picnicking. To enhance this informal use and enjoyment, several actions will be taken.

1. Maintain Condition of Grounds and Facilities

Heavy public use of the grounds and facilities requires the considerable effort to keep the Center's buildings, trails, parking areas, picnic area and other amenities in good condition and safe for public use. Good care of trails is especially important to allow use by large numbers of people without degrading the trail system.

a. Partner with Division of Operations

Considerable progress has been made recently in the effort to maintain Five Rivers in good condition, partly through institution of a work planning system. Work needs and priorities are agreed on between the divisions of Operations and Public Affairs & Education prior to the beginning of each fiscal year. Routine custodial and maintenance needs are specified, rehabilitation and improvement projects listed and prioritized, and capital construction projects listed. These plans are used in the budgeting process each year. Good communication between the divisions will be maintained and enhanced when needed to keep this process working smoothly.

b. Develop and Maintain Partnerships with Groups Outside DEC to Enhance Care

A number of individuals and not-for-profit organizations now work with the 2 DEC divisions to maintain and improve the public facilities at Five Rivers. Most of this work is done on a volunteer basis, although a group may occasionally work on a fee basis, such as the Albany Boys & Girls Club summer work program. People working on a volunteer basis include those from organizations like Girl and Boy Scouts, schools, religious and service groups, professional organizations and businesses. The Friends of Five Rivers organization coordinates and funds many such projects.

A prospect for the future would be the formation of a trail care volunteer group, perhaps working under DEC's Adopt a Natural Resource program. The objective would be to help maintain the various trails on the center grounds by performing trail evaluations and light maintenance activities.

2. Improve Public Access to Facilities

a. Increase Universal Access

Improving access for persons with disabilities has been the focus of considerable effort at the Center. Facilities in the Intensive Use area and two interpretive trails are universally accessible. Trail interpretive brochures for several trails are made available in large print face and in braille. Sign interpreters are made available for programs by special arrangement.

DEC will continue to improve universal access to the grounds and programs. Parts of the Beaver Tree Trail will be evaluated for providing access to the boardwalk and long bridge areas. This would provide ready access to the water's edge, improving the learning and enjoyment opportunities for persons with mobility challenges. Parking would be developed for one or two vehicles at the point of access.

b. Provide Trail Access to New Lands

DEC will develop hiking trail loops on two parcels of land recently added to the Center, the Miller and Joel parcels. For the Miller lands, a loop trail could be constructed running from existing trails and may include a new bridge across the Vlomankill. Access to the Joel parcel from existing trails will present the challenge of bridging the Phillipinkill and its associated wetlands.

c. Link Trail System to Other Public Trails

DEC desires to link the trails at the Center, when feasible, to trails on other public lands in the area. Two suggestions have been made by local officials: a link along the Phillipinkill valley to a property of the Mohawk-Hudson Land Conservancy located near the intersection of Delaware Avenue (Rt. 443) and Fisher Boulevard, and a link to the proposed Rail Trail that would follow the old rail bed between Voorheesville and Albany. Easements or land purchases would be necessary to complete either of these links.

d. Enhance Directional Signs

A system of directional signs lead visitors to various trails and other locations on the grounds. Occasional comments from the public indicate that they have trouble finding their way along trails, and suggest improvements in directional signage. DEC will review the current array of directional signs and will make improvements as needed.

3. Develop and Maintain Partnerships for Stewardship

Since the Center's inception, volunteer and partnership efforts have provided important contributions to the stewardship of the site. Each year, the Friends of Five Rivers and other partner organizations typically devote service time to caring for trails, displays and other features of the Center. DEC will pursue additional partnerships with the goal of improving stewardship of the Center and increasing its educational value to the public.

C. MANAGEMENT FOR HABITAT DIVERSITY

The environmental education mission of the Center is best served by having available for educational use a rich diversity of natural habitats and of living things that are supported by those habitats. The following discussion of land management focuses on maintaining the bio-diversity present on the grounds and enhancing it when practical. Native species are given preference, but it is recognized that a large number of naturalized species are present. Managing for a diversity of habitats involves efforts to maintain a variety of successional stages in both aquatic and terrestrial habitats.

1. Manage for Bio-diversity

The goal of the Center's resource management program is to maintain a diversity of wetland and upland cover types and differing age classes within cover types. DEC will continue to inventory and assess the site's flora and fauna, and to maintain as broad a range of representative ecological communities.

DEC will endeavor to maintain viable populations of all native fish and wildlife species currently found on the grounds at levels compatible with existing habitat, ecological and social concerns. Management to maintain and enhance biodiversity will be a key element in the creation of a Forest Management Plan and a Wildlife Management Plan for the Center.

2. Manage Wetlands and Stream Corridors

Five Rivers contains portions of two stream corridors – the Vlomankill and the Phillipinkill Wetlands are associated with both corridors. An additional unnamed drainage exists in the Old Field Trail area of the Center and joins the Phillipinkill after leaving the State lands. Wetlands, ponds and stream habitats are present in the Old Field drainage.

The value of wetlands, ponds and streams on the Center grounds for education and interpretation is high. Where ponds are concerned, the forces of natural pond succession make these water bodies more shallow and higher in nutrients over time. For educational purposes, it is desirable to maintain a variety of successional stages of pond development. This requires the occasional removal of sediments from a portion or the entire area of a pond, setting the forces of succession back to an earlier stage.

a. Vlomankill Corridor

Beaver Pond - The concrete floor of the spillway area of the dam shows wear and will be inspected to determine repair needs. The water control valve near the spillway is a safety concern and improved railings are needed to discourage public access. The wooden control housing was rebuilt in 2000, but maintenance work and beaver activity have created herd paths to it. Recent guidance from the DEC Dam Safety Unit requires removal of all woody vegetation from the berm to reduce the potential for water infiltration along the root systems. When this work is done and the berm is repaired, fencing will be installed along the berm to limit public access to the water's edge to improve safety and to limit erosion caused by foot traffic.

The viability of teaching sites for fresh water studies located on the Beaver and Heron Ponds are threatened by siltation. As the pond waters at those sites decrease below 2 feet in depth, sampling for aquatic insects, fish, amphibians and other life becomes less productive. Teaching sites on these two ponds will be considered for dredging to enhance educational value and to preserve habitat for aquatic life. Deepening of water sites is planned for the areas of the sampling decks on the north end of Beaver Pond and on the eastern side of Heron Pond. These are the two sampling sites closest to the Heron Pond spillway. Otherwise, DEC will allow natural development of wetlands at these two ponds.

To provide for better use for pond ecology lessons, improvements will be made to the teaching site near post #5 on the Beaver Pond, involving the installation of a small sampling dock.

Vlomankill Dam – In the long term, the damaged three-foot-high concrete dam along the Vlomankill Trail will be removed to eliminate possible safety hazard to the public and to restore the natural scene. One half of this dam has fallen over, the other half is standing.

b. Phillipinkill Corridor

Joel Pond – The earthen dam which impounded the Joel Pond was breached and the pond drained before state purchase of the property. DEC does not plan to restore this dam during the time span of this UMP.

c. Old Field System

This drainage system includes 13 impoundments – four of them characterized as wetlands, the rest as ponds.

SUNY Research Ponds – It has been suggested that the research ponds be turned into one large pond by removal of the ten-foot-wide earthen berms that divide the 6 impoundments. However, the site works well as currently configured for aquatic education and fishing instruction because of its interconnected pond perimeters. Keeping these ponds separated may also be advantageous for research use. The shallow nature and limited size of the ponds may present winter fish kill problems in the future. If so, DEC will take action to connect two or more of the research ponds and deepen the resulting larger pond. To enhance use of the ponds for pond study classes, small sampling decks or docks will be added to two of the ponds closest to the pavilion. Most woody vegetation will be removed from the berms of the research ponds to preserve the condition of the berms and to allow improved access for educational use.

Wood Duck and Fox Marshes – These two wetlands were ponds in the Game Farm days and have become shallow due to siltation. As wetlands, they hold good populations of amphibians and are attractive to birds. DEC will inspect the water controls on these ponds and will repair them as necessary to help maintain desired water levels.

Goose and Sunfish Ponds – Also dating to Game Farm times, these two ponds were re-dug in the late 1970s. Pond succession has since created low oxygen conditions, and fish no longer can survive in these ponds. Both ponds will be rehabilitated to allow fish populations to exist once more, and to provide improved conditions for use as aquatic teaching sites. Water control structures will be inspected and repaired as needed.

3. Manage Field Habitats

At the Center, field habitat types tend to be short-lived due to the forces of plant succession. Grassland changes to old field, old field to brush land, and brush land turns into early stage forest, all in relative short numbers of years. To maintain a diversity of these habitats, active management is needed – most often periodic mowing with a “brush hog” type machine.

The map of field habitat management areas (Appendix 19), shows three management categories:

a. Instructional Field Areas

Each area marked “A” contains a variety of closely spaced grassland, old field and brush land habitats. These areas are actively used for teaching with school classes, youth groups and general public audiences. Evaluations of the habitat status will be done annually by the Center Director and School Programs Coordinator. Management action will be taken to maintain the habitat diversity best suited to the educational needs anticipated for the coming year. Portions of each “A” sector that are to be kept as grassland will be mowed on an approximate three-year rotation. Portions to be maintained as old field and brush land will be managed as needed, on a longer rotation.

b. Grassland Areas

These areas will be maintained by mowing on an approximate three-year rotation, with about 1/3 of the total “B” area mowed each year. A large portion of this habitat type is contained in the WHIP parcel (Wildlife Habitat Improvement Program). Three adjoining 17-acre plots were fitted and seeded under this program of the federal Natural Resource Conservation Service. Contractual requirement calls for the mowing of one parcel each year for the 10-year span of the agreement. The Friends of Five Rivers organization is involved as a partner in the WHIP effort, accepting grant funds and arranging for work to be done by local farmers.

c. Mixed Habitat Areas

Old field and brush land cannot be maintained in steady state, since mowing essentially sets brush land back to grassland or old field. Therefore, these two habitat types will be rotated within the “C” sectors.

4. Manage Forest Habitats

Maintaining a variety of forest types is desirable to provide educational opportunities at the Center. Forest management will focus on the following objectives:

- Maintaining a diversity of forest types and age structures
- Maintaining the bio-diversity of species within forests on the Center grounds
- Demonstrating forest management practices

To successfully attain these objectives, a forest management plan will be developed within three years working with the DEC Division of Lands & Forests. Some possible elements to be considered in such a plan include:

- A demonstration plot showing best practices for timber harvest
- An interpretive feature on firewood, with a cord of wood shown stacked to the standard dimensions
- Management of aspens for wildlife habitat
- Old growth forest and the interpretation of its values for wildlife habitat
- White pine forest with a demonstration area of thinned and un-thinned trees

5. Address Invasive Species

Several species of invasive, non-native plants exist on the Center lands. As resources are available, DEC will undertake control programs for known invasive species that can be reasonably addressed. Current targets, in order of urgency for control, include:

a. Purple Loosestrife

This invasive species often crowds out cattails and other native emergent vegetation. In summer 2000, biologists from the Wildlife Resources Center conducted an experimental loosestrife control treatment, releasing 2,000 *Galerucella* beetles at the Heron Pond. A followup release of 1,000 beetles was conducted in 2006. Over the next few years, the beetles are expected to significantly reduce loosestrife there, with an expected expansion of the beetles to adjoining areas.

b. Water Chestnut

This non-native species has recently spread to cover nearly the entire Beaver Pond surface during summer. It chokes out other aquatic vegetation and adds large amounts of organic matter to the pond bottom. Water chestnut seeds can remain dormant for many years, so the effort to eradicate this species will be difficult.

c. Other Wetland Vegetation

There are no plans at this time to treat or remove unwanted or over-abundant aquatic vegetation in any of Center's wetlands. However, this could change should there be overriding public benefit or DEC support, especially in the unlikely event that non-native Eurasian milfoil or giant *Salvinia* were to appear. Introduction of native wetland vegetation may be considered in the future, particularly at one or more of the SUNY Research Ponds or other relatively barren aquatic areas.

d. Multi-flora Rose

Sold by DEC in the past as a wildlife improvement plant, this species spreads fairly rapidly, creating thorny hedges and displacing native vegetation. The species has considerable value for wildlife food and cover, but its spread is cause for concern. The rapidly growing rose brambles will be controlled by pruning along trails where they impede visitor passage.

6. Control Human Impact on Habitats

The intensity of human use on the lands at the Center is high compared to most of the lands managed by DEC. With more than 100,000 visitors annually, there is potential for negative impacts on the lands of the Center. DEC will continue to monitor visitor use of the trails and lands and will take action, when appropriate, to mitigate negative impacts on habitats. Special attention will be continued in the following situations:

a. Erosion along Trails and Pathways

Slippery clay soils and sloping terrain along the trails both contribute to erosion impacts. Active monitoring will be continued to identify impact areas and action will be taken to address problems. Remedies may include the covering of trail surfaces with materials like wood chips and stone dust, the addition of kick rail along trails to retain surfacing materials and to guide visitor travel, addition of

signs to direct visitors, the re-routing or other modifications of trails, the use of stone rip-rap, trail re-sloping and seeding, and the addition of stabilization plantings.

b. Impact on Water Edges

A natural interest in waters and the life they hold causes visitors to gravitate to the edges of ponds and streams. Wet soils and steep slopes along these water margins result in heavy impact to areas where people walk. Actions will be continued to limit access in such areas to hardened locations such as observation decks and docks. Elements such as rail fence, kick rails along trail surfaces and signage will be used to mitigate impacts along waters as they develop.

D. MANAGEMENT OF FISH & WILDLIFE RESOURCES

The Center's general fish and wildlife management goals are:

- to protect and enhance the site's fish and wildlife diversity
- to enhance fish and wildlife education and research opportunities on site
- to maximize public enjoyment of the site's fish and wildlife resources
- to address nuisance wildlife problems on the site in a way that is compatible with visitor uses

1. Protect and Enhance Fish and Wildlife Diversity

a. Identify and Assess the Condition of the Resource

Records are kept and archived on the occurrence of several groups of wildlife on the Center grounds. Bird records for the grounds have been systematically catalogued for more than 25 years and form a considerable body of ornithological data. The data recorded include annual first sighting dates for each bird species observed on the grounds, Christmas Bird Count records (the site is part of the Albany County count), and species found on the annual New Year's Day bird counts.

In recent years, annual records have been maintained for butterflies, dragonflies, mammals, reptiles and amphibians seen on the grounds. More rigorous programs currently monitor the productivity of the Center's breeding birds. DEC expects to broaden such wildlife record-keeping initiatives in the future.

b. Wildlife Resource Conservation and Enhancement Opportunities

DEC will work to maintain viable populations of fauna currently found on the grounds. Particular efforts will be made to favor certain species which either are of statewide concern, of special importance for Center programming, or of special public interest. Wildlife management objectives may be accomplished through a variety of conservation strategies such as habitat manipulation and management of overabundant or invasive species. DEC will create within the next two years a Wildlife Management Plan for the Center. A planning team composed of DEC staff and stakeholders from the region will be convened to address wildlife management issues and to make recommendations for this plan. Hunting, fishing and trapping activities may be considered by this team as options for either species control or for public use of resources.

Species of Statewide Concern

The following list contains species that are designated as endangered, threatened or of special concern in New York State and that have been observed on or from the Center lands. For most species, the number of years that the bird was found during the period 1973 to 2006 are listed in parenthesis. These records include sightings by DEC staff, volunteers and visitors.

Endangered Species

Peregrine Falcon (4)
Golden Eagle (1)
Black Tern (1)

Threatened Species

Northern Harrier - Regular fall, winter and spring resident
Pied-billed Grebe (12)
Bald Eagle (9)
Henslow's Sparrow - Resident nester in the 1970's; no recent records
Sedge Wren (1)

Species of Special Concern

Known residents:

Wood Turtle (introduced 2006), also records from the 1970's.
Cooper's Hawk (confirmed breeding 2003)
Sharp-shinned Hawk - Resident in the area

Seen occasionally:

American Bittern (14)	Cerulean Warbler (2)
Northern Goshawk (9)	Grasshopper Sparrow (1)
Vesper Sparrow (9)	Osprey (30)
Golden-winged Warbler (7)	Red-shouldered Hawk (11)
Horned Lark (5)	Common Nighthawk (23)
Red-headed Woodpecker (4)	Common Loon (16)
Yellow-breasted Chat (3)	

Fish and Wildlife Resources in Ponds and Wetlands

In recent years, several of the pond habitats for fish on the Center grounds have degraded due to siltation and the related growth of vegetation (the process of pond aging and succession). Accumulations of silt and organic matter have made the Beaver, Heron, Goose and Sunfish ponds increasingly shallow and more subject to summer and winter kills of fish due to low dissolved oxygen concentrations. At present, fish populations are stable only at the six Research Ponds and the related Recharge Pond. Fish populations are declining in the Beaver and Heron ponds, and appear to be gone entirely in the Goose and Sunfish ponds (see appendix 13, *Trails at Five Rivers*, for pond locations).

To maintain and increase fish habitats, DEC plans to rehabilitate the Goose and Sunfish ponds by removing sediments and repairing or replacing water control structures. Beaver and Heron ponds would be unreasonably expensive to completely rehabilitate. DEC plans dredge areas at pond sampling sites, but otherwise to allow those ponds to continue succeeding to marsh, increasing the acreage of that scarce habitat on the grounds.

The dam of the Beaver Pond is not in compliance with DEC standards, according to an inspection report prepared by the DEC Dam Safety Unit. Woody vegetation should be removed from the dam and the drain structure repaired or replaced. This work will be scheduled as funding is available.

To support the use of the Research Ponds for fishing instruction programs, DEC will manage fish populations through stocking and other recognized fisheries management techniques. Use of these ponds for fisheries research will also be considered when proposed by DEC's Bureau of Fisheries or by a college or university, providing such proposals have any needed permit approvals and are compatible with the Center's mission.

Angling at the ponds will continue to be limited to fishing instruction programs. General recreational fishing will continue to be banned due to the very limited resource and the need to reserve resources for fishing instruction and for other aquatic studies. This follows recommendations from the Region 4 Fisheries unit. Fish and other pond wildlife are observed, caught and studied in the course of a variety of pond ecology classes throughout much of the year at the Center.

Grassland Wildlife Resources

Grassland bird species are of concern to DEC, showing long-term decline in New York State. To favor grassland birds, existing grassland resources in the unit will be maintained through a program of rotational mowing. Grasslands which may be acquired in the future will be considered for inclusion in this mowing rotation.

The Center will continue to maintain its system of about 40 bluebird nest boxes that are positioned in grassland habitats. Volunteers with the Friends of Five Rivers regularly monitor and maintain the boxes during the nesting season, tracking the nesting success of eastern bluebirds and other species that use the nest boxes.

Forest Wildlife Resources

Forest habitats of early-succession stages are quite limited on the unit lands. Management has been conducted to maintain its presence over the past 20 years, including regeneration cuts for aspen clones, done partly to favor ruffed grouse and American woodcock. This effort will be continued.

Wood duck nest boxes now in place in wooded margins of wetlands and ponds will be maintained. These boxes are used by the target species and occasionally by other cavity nesting species like eastern screech-owl and grey squirrel. Den trees on the site will continue to be protected as long as their condition does not threaten the safety of trail users or vehicular traffic.

Management of the Built Environment

Some of the Center's fixed assets have special wildlife values. Jones Barn (Building 3a) is an important summer nursery for a population of 300-500 bats – mostly little brown bats. Though now obsolete and disconnected, the overhead power lines leading to the barn have been left in place to provide perching and/or nest-box sites for a variety of birds such as the American kestrel, great horned owl and eastern bluebird.

The Five Rivers site demonstrates several environmentally friendly landscaping practices that serve as a model for homeowners. Among these are the use of native flora and the use of non-native plant species that have important wildlife values. As a matter of policy, native plants will be used for landscaping at the center, with exceptions made when certain non-native species offers especially outstanding wildlife or interpretive values. Gardening efforts at the Center will be done with the intent of providing wildlife habitat, not for purely aesthetic purposes.

2. Enhance Education and Research Opportunities

DEC will continue to emphasize the educational and research values of the fish and wildlife resources on the site through the Center's educational programming, special "citizen science" activities, and fish and wildlife management demonstrations and research.

a. Conduct Research-oriented Activities

- Field Experiences – In cooperation with other DEC staff and environmental partners, the Center will continue to involve the public in several "citizen science" projects as an excellent way to provide wildlife stewardship education and to encourage the public to participate in stewardship activities. Typical projects include the Audubon Christmas Bird Count, Frog Watch, Project Feeder Watch, and dragonfly surveys.
- Collections – Where it serves to advance sanctioned research, the limited collection of plant and animal specimens on the grounds by individuals with proper permits will be allowed. Permission for collecting must be granted by the Center Director.

b. Develop Demonstration Areas

Certain wildlife management projects are conducted on the grounds which enrich the Center's educational and interpretive programs. These wildlife management initiatives demonstrate best management practices and/or demonstrate management practices which individuals may wish to replicate on their own property.

- Wildlife Habitat Incentives Program (WHIP) – Begun in 2000, the WHIP initiative involves the management of fields to favor grassland bird species. In succeeding years, three contiguous 20-acre plots were seeded to cold season grasses (timothy, brome grass and orchard grass). These plots will be mowed in a rotation, each plot about once every three years, to maintain field habitat favored by grassland birds such as eastern meadowlark, savannah sparrow and bobolink.
- Wildlife Garden – Located in the Intensive Use Area, the Center's wildlife garden is planted and maintained by Friends of Five Rivers volunteers, in consultation with the Center staff. The garden is a living exhibit demonstrating methods that homeowners can use to attract hummingbirds, butterflies and other wildlife.
- Water Garden – Installed in 2002 by the Friends of Five Rivers, a water garden along Nature's Backyard Trail provides habitat for many species of wildlife and will be maintained.

c. Support Research Activities

The Center will continue to cooperate with DEC units and other conservation partners in several research endeavors such as Canada goose banding, experimental rabies vaccine distribution, and house finch studies. The Center will continue to support fish and wildlife research that is consistent with its educational mission and compatible with program activities.

- **Songbird Banding** – In cooperation with Center staff, DEC biologists established a MAPS (Monitoring Avian Productivity and Survivorship) Station in 2001. This is one of 20 such stations in New York State that study breeding bird populations, with the objective of building a baseline of data to monitor long-term trends in avian breeding populations.
- **Fisheries Research** – In cooperation with Center staff, Region 4 fisheries biologists have conducted periodic aquatic surveys of the Center ponds (1972, 1999). In 1984, the Center entered into an agreement with the University at Albany Biology Department to permit construction of six research ponds, at which SUNY Albany students conducted a variety of field studies through 1996. Currently, SUNY Cobleskill is conducting research programs in two of these ponds.

3. Manage for Public Use and Enjoyment

a. Conduct Guided Interpretive Programs

The Center offers a comprehensive schedule of guided field experiences focusing on seasonal fish and wildlife activities. These “watchable wildlife” interpretive programs are well-received by the public and allow Center staff to deliver fish and wildlife management messages to a wide range of age and interest groups, while cultivating a basic awareness and appreciation of wildlife resources.

The Center offers a range of skills development seminars related to fish and wildlife resources, including instruction in pursuits such as hunting, fishing, birding and wildlife photography. These are often conducted in partnership with conservation organizations such as rod & gun clubs, bird clubs and Audubon chapters.

b. Self-guided Experiences

As a supplement or alternative to guided experiences, the Center offers self-guided visitors a variety of interpretive media to help them better understand and experience wildlife on their own.

- **Wildlife Viewing** – Current management activities at the Center are aimed at enhancing wildlife habitat, thereby enhancing wildlife viewing opportunities on the grounds. Several methods will be employed to better interpret these management activities, including the installation of wayside display signs and the inclusion of management information in interpretive booklets for nature trails. DEC plans to enhance viewing opportunities throughout the grounds with the following initiatives - cutting two new vistas along overgrown areas of the Service Road Loop area, installing an observation platform within the WHIP parcel, and installing a platform at the water's edge at post #5 of the Beaver Tree Trail.
- **Live Animals on Exhibit** – Live animals are of high interest to the public and can be effectively used for educational purposes. At the same time, DEC must make sure that animals are well cared for, have appropriate living spaces and that keeping them is fully justifiable. Mammals and birds will generally be kept only when disabled and not able to be released, as is the case with the injured

barred owl that has been kept on educational display for many years. As a matter of policy, only native animals will be used in live animal displays. The Center will also display on a temporary basis a few healthy specimens of fish, amphibians and/or reptiles. These are generally captured on site, and returned to the wild after an appropriate period of display.

4. Respond to Nuisance Wildlife Problems

A variety of wildlife species can become a nuisance when numbers exceed tolerance levels or an animal otherwise poses a risk to human health. Center staff will cooperate with other DEC staff and with local officials to help prevent or to address situations where wildlife may present a public nuisance or threaten public health and safety. Some species having such potential on site are:

a. Native Species

Certain species may cause nuisance situations on the Center lands or in the surrounding area by their activities or their abundance. Some species with potential in this regard include Canada goose, white-tailed deer, beaver and muskrat.

b. Rabies Vector Species

In the past 10 years, raccoons recovered from the grounds have tested positive for rabies at a rate of about one per year. A bat recovered in 2003 also tested positive. Reports of any animal behaving abnormally, especially rabies-vector species (raccoons, skunks, bats), will be promptly transmitted to the appropriate staff in the Bureau of Wildlife.

c. Feral Animals, Pets and Livestock

Pets are not allowed on Center grounds. Leashed or unleashed, pets can spread disease or parasites to wild animals through their droppings, can disturb local fauna, often leave droppings on footpaths, and can harass or intimidate Center visitors. Abandonment of domestic animals on the Center property is not legal. Any domestic or feral animal on the premises may come in contact with rabies vector species, thus posing a danger to any person who may try to feed, care for or capture it.

Within the limits of public and staff safety, reasonable efforts will be made to humanely remove feral animals from the premises. Problems related to such animals will be referred to appropriate DEC staff or an authorized animal control agent.

d. Releases/Introductions of Wild Fauna

Unauthorized transport and/or release of wild fauna anywhere in New York State is illegal. Any lawful introduction or release of fish or wildlife (e.g., authorized stocking of fish or pheasants) on Center grounds, including rehabilitated wildlife, may only be undertaken with or under the authority of requisite federal and state permits, and with the knowledge and approval of the Center Director.

E. MANAGEMENT FOR LAND STEWARDSHIP

The Center's overall land stewardship goal is to work cooperatively within the agency and with local governments, non-profit land conservancies, and individual landowners, to protect the Center's open space and natural resource values, specifically to advance the mission of environmental education.

1. Land Acquisition

Land development in areas near Five Rivers is occurring rapidly. It is important to DEC that the Center's lands provide both viable habitats for wildlife and plants, and open space for public education and recreation. Therefore, DEC will seek to increase the acreage of the Center where it is possible and reasonable. Two major criteria are used when considering projects for land acquisition:

- Availability - The owner of the subject parcel must be a willing seller.
- Contiguity - The subject parcel generally should be contiguous to the Center's current land base, or could reasonably be expected to become contiguous in the future.

In addition, a parcel which is both available and contiguous should also satisfy one or more secondary criteria:

- The subject parcel offers protection of an important environmental area, such as wetland or riparian areas, or habitat for vulnerable species.
- The subject parcel offers important spatial or visual buffering from existing or potential industrial or residential uses.
- The subject parcel itself has a high level of vulnerability, or bears a reasonable expectation of significant adverse impact from existing or potential local development.
- The subject parcel offers exceptional natural resource, cultural resource or interpretive value(s).
- The subject parcel offers opportunities for public access, use and enjoyment, or needed access for administrative purposes.

As part of the evaluation and assessment process for any future proposed acquisitions, staff will develop a plan, consistent with this *Unit Management Plan*, for the use, management and maintenance support of the subject parcel.

2. Coordination with Adjoining Landowners

The Center's land stewardship program has benefitted from the active cooperation and support of several non-profit conservation partners. The Friends of Five Rivers has taken an active role in land protection at the Center. The Friends group acts an intermediary with neighboring landowners, periodically discussing with landowners the Center's land protection goals and of the DEC's interest in fee and easement acquisition, or voluntary initiatives such as access or management agreements.

The Friends group has assisted in physical inspection and qualitative review of prospective parcels, and has actively participated in periodic updates to DEC's *State Open Space Conservation Plan*. The Friends groups' expeditious purchase of the 17-acre Bishop Parcel in 1990 and subsequent sale to the state in 1995 is a model of cooperative public/private efforts in open space protection.

The Open Space Institute is also excellent example of a cooperating third party which has shown the willingness and ability to purchase, with the intent of selling back to the state, parcels which the state ultimately desires, yet in a more timely manner than the state could have accomplished for itself. The Mohawk Hudson Land Conservancy has also graciously provided logistic support and advice on several initiatives of mutual interest.

3. Coordination with NYS Open Space Conservation Plan

Five Rivers is listed as an “Open Space Priority” in the *2006 New York State Open Space Conservation Plan* as follows:

“The Five Rivers Environmental Education Center is located between the rapidly growing suburban towns of Bethlehem and New Scotland in Albany County. The Center receives over 100,000 visitors annually and serves as an important wildlife preserve and popular birding area. Opportunities currently exist to increase public use areas and to establish protective buffers around the Center. These opportunities, when combined with continued vulnerability to ongoing subdivision and development activity, result in continued priority protection status for this area.”

F. MANAGEMENT FOR HEALTH AND SAFETY

1. Safety Inspections and Procedures

a. Annual Environmental Audit

DEC Region 4 Operations staff members conduct an annual Environmental Audit of the Center to identify actual or potential environmental threats to the site and to public health. Wherever conditions are found to be non-compliant, Operations staff plan and implement the necessary remedial actions.

b. Annual Fire Inspection

The Fire Services Bureau of the NYS Department of State’s Office of Fire Prevention and Control conducts an annual Fire Inspection at all facilities of the Five Rivers complex. Operations staff plan and implement remedies to any reported violations.

c. Emergency Preparedness

Staff and site-related personnel regularly review emergency protocols related to medical, missing person, fire incidents and emergency communications. Protocols are outlined in an *Emergency Procedures Manual*, which is posted at each phone station in the Visitor Center, Farmhouse and Goose Lodge. Staff and site-related personnel also have desk copies for reference.

d. Standard Operating Procedures

Any program or staff activity involving specialized skill or degree of risk, such as canoeing or operation of motorized equipment, is carried out in a safe and healthful manner and is only conducted by certified or duly trained personnel. For skill-based public programs (e.g., canoeing), staff develop a rigorous safety plan, carefully inspect all equipment and abide by generally accepted standard operating procedures. All participants receive required safety gear and a safety orientation prior to the activity.

2. Site Safety and Security

a. After-hours Use

Although the Center grounds are closed at sunset, the Director may issue a permit to an individual or group wishing to engage in educational activities on the grounds after sunset. Staff and local authorities check the premises after dark and check for use permits.

b. Security Lighting

Security floodlights illuminate a portion of the main parking lot, Goose Lodge, Operations Field Crew Headquarters, Auto Repair Shop and Wildlife Resources Center throughout the night. Within the next two years, DEC will assess the Center's lighting to provide security and safety while considering energy conservation and limiting light pollution.

c. Fixed Asset Liabilities

Buildings which do not appear to be kept up may become targets of vandalism. Increased attention will be given, though the work planning process with DEC Division of Operations, to maintaining the exterior appearance of the many outbuildings on the property. This includes roofing, glass, painting and repair of foundations and exteriors, doors and locks, and access roadways and walkways.

3. Child Protective Measures

a. Two-adult Rule

When conducting programs for school or youth groups, all DEC Education programs require that two adults accompany children at all times (unless in the care of his/her own parent or legal guardian), eliminating situations where a visiting child is left in the care of only one adult.

b. Staff and Volunteer Screening

DEC uses the NYS Department of Criminal Justice's Sex Offender Registry as part of the staff/volunteer screening process. The DEC Education program also requires that prospective personnel provide a positive character reference from a recognized institutional or community representative such as a teacher, landlord or former employer. When interviewing without portfolio (no professional references), positive recommendations from at least two character references are required.

c. Roving Patrol

On weekdays with scheduled guided lessons, a staffer is designated as the roving duty staff for that day. In addition to preparing lesson materials, greeting the arriving school buses and giving out field assignments to center volunteers, the duty staffer conducts periodic roving surveillance by checking in on the field parties. Volunteer naturalists also frequently conduct roving interpretation and patrol on weekends.

d. Uniformed Staff

Five Rivers field staff are required to wear uniform apparel when on duty. The presence of uniformed staff discourages abusive behavior and readily identifies who the first-line authorities are, providing additional comfort and security.

e. Model Releases

Before staff may use or lend photographic images showing any identifiable children, model releases signed by parents or guardians must be on file at the Center.

4. Pedestrian Safety

a. Game Farm Road

Game Farm Road is a public thoroughfare which passes several important points of public access as it curves through the Five Rivers property. As such, it represents the most dangerous single element in the Center's landscape (see Appendix 20). The Town of New Scotland is responsible for public safety on Game Farm Road, installing and maintaining signs for speed limit and pedestrian crossings, clearing snow, maintaining and repairing the road surface and shoulder. Safety concerns that DEC will address include:

- **Road Geometry** – The road's geometry is most dangerous just as it meets the Center's main entry. As motorists get closer to the Visitor Center, the sight distances become shorter and the road shoulder width becomes narrower. Visibility and shoulder width are especially poor where Game Farm Road makes a quick, steep downhill S-curve along the Beaver Pond. Because the sight distances here are of concern, Town of New Scotland work crews and Delmar Operations staff aggressively control roadside vegetation along this stretch.
- **Vehicle entries** – In addition to its poor geometry, this segment of road bears additional loads with cars and buses coming out of the main parking lot, cars and trucks coming out of the service entrances to the Auto Repair Shop and Visitor Center, pedestrians crossing the road to and from the Beaver Tree Trail and walking along the roadway itself. These factors are all critical safety elements which can be distracting to motorists, and they all converge where the sight distances and shoulder width are poorest. This is regarded as a high-risk situation for DEC. The implementation of a change in the location of the main parking entrance and the separation of bus and car traffic outlined in the OGS Study and Schematic (see Appendices 1 and 2) will greatly improve safety at these points of entry.
- **Crossings** – Because of poor sight distances along Game Farm Road, the entry to the Beaver Tree Trail was recently redesigned to allow safer crossings to and from the Visitor Center and parking lot. A split-rail fence was erected along the Visitor Center lawn and crosswalk striping was established to channel pedestrians to cross Game Farm Road at a safer point. Crosswalk striping was also established at the crossover from the Game Farm Road bridge to the Beaver Tree Trail spur.
- **Roadside/Roadway Walking** – Many people choose to walk along Game Farm Road, especially up and down the hill between Beaver Pond and the Visitor Center. An unauthorized path leading off Game Farm Road to the Beaver Pond footbridge along this section contributes to roadway walking.

Efforts to close off this path have not been successful. It is expected that the improved walkways and trail access setup offered by the OGS plan will lower the propensity for visitors to walk this roadway.

Given the road's crest-and-sag topography along this entire segment, the poor sight distances, narrow road shoulder, increasing public use of the site, faster road surface and one-lane bridge, DEC proposes to work with the Town of New Scotland and traffic safety professionals within the next year to study the potential for solutions that will improve safety for Center visitors. As appropriate, DEC may involve pedestrian advocacy groups such as the Bethlehem Citizens For Pedestrian Safety, the Governor's Traffic Safety Council, and DOT's Bicycle and Pedestrian Transportation Program.

b. Interior Service Roads and Crossings

Service vehicles conducting routine business occasionally conflict with pedestrian use and enjoyment in the Center's interior. Efforts to improve safety include:

- **Signage** – All interior roadways are posted for authorized use only. There are STOP signs at critical intersections.
- **Crosswalks** – Crosswalk striping for pedestrians has been established at heavily used service road crossings at the Goose Lodge and the Old Field trail head. Movable "children crossing" signs are used at the Goose Lodge crossing during periods of heavy use. Their use will be continued, especially when snow covers the painted crosswalk.
- **Speed Bumps** – Currently there is a speed bump where Nature's Accessible Backyard Trail crosses the Visitor Center service road. DEC will consider installing additional speed bumps at the Heron Pond Road gate and service road crossings at the Old Field trail head and the Goose Lodge school bus unloading zone.
- **Gates** – During the Daylight Savings Time period, the gate protecting the intersection of Nature's Accessible Backyard Trail and the Visitor Center service road is closed across the service road for pedestrian safety. Drivers must stop their vehicles and manually open the gates to drive through. During the Eastern Standard Time period, when pedestrian use of the trail is reduced, the gates are open to both vehicular and pedestrian traffic. Also for safety purposes, the security gate at the Heron Pond Road entry is closed when guided school lessons are being conducted at the Heron Pond.

c. Intensive Use Area

Safety considerations for this area include:

- **Parking Lot Capacity** – The main lot is frequently filled, or nearly so, during weekday mornings when school classes are visiting. Visitors frequently use the bus parking area during those times, relieving congestion in the main lot. An issue which bears watching is the increase in school groups coming to the Center via car pool on weekday mornings. While there is ample parking for school buses, a group arriving by car pool will require 10-15 times as much parking space as a similar sized class coming by school bus. The full implementation of the proposed OGS Plan will increase the amount of parking spaces and will improve pedestrian safety.

- **Traffic Routing** – To increase pedestrian and vehicular safety on weekday mornings, one-way traffic flow for school buses is in place. Buses enter a designated school bus entrance at the Auto Repair Shop, park in a designated school bus parking area near the Comfort Station, and exit through the main parking lot. This has been very well received among school bus drivers and has significantly reduced parking lot congestion. DEC plans to follow the OGS plan proposal to separate bus and car parking. Buses will enter and exit the grounds through the driveway by the Auto Repair Shop, and a gate will be installed to separate the auto parking lot from the bus parking (this solution is not practical at the present time, since the bus parking area is used for overflow parking by smaller vehicles). This will improve safety in the auto parking lot, eliminating the bus traffic through that lot. The OGS Plan would also relocate the main entry to the Center so that sight distances are improved. Given the current rate of growth, these initiatives will provide adequate parking for visitors, also helping to provide a safe pedestrian environment and eliminating conflicts of bus and car traffic exiting and entering the Center at the same point.
- **Lighting for Pedestrian Safety** – Current walkway and parking lot lighting capacity is inadequate to serve evening meetings, especially during the Daylight Savings Time period. The OGS Plan will resolve a critical and long-standing need to provide better safety lighting for pedestrians along the walkways to the Visitor Center and in the parking lot.
- **Regulated Use** – For safety reasons, several activities are prohibited in the Intensive Use Area. Lawn sports pose a danger to picnickers, and distract from the quiet use and enjoyment of the grounds. Open fires are allowed only in designated areas on a permit basis, and only as part of a sanctioned educational program such as a Scout ceremony.

d. Trails and Outdoor Amenities

Safety factors include:

- **Hazard Reporting** – Five Rivers staff check all major interpretive trails on a weekly basis. Identified hazards and other safety problems are catalogued and referred to the DEC Operations staff. Operations staff also conduct periodic checks of trails and amenities to identify and correct threats to health and safety.
- **Construction Standards** – Outdoor amenities are built in accordance with public safety and handicapped-accessibility design specifications outlined in the Uniform Fire Prevention and Building Code, and the Americans With Disabilities Act.
- **Water's Edge** – In addition to posing a safety hazard, indiscriminate access by visitors to shorelines of ponds and streams results in the destruction of vegetation and in soil erosion. To improve public safety and reduce bank erosion, DEC plans to improve and expand areas of water's edge access. Unauthorized herd paths leading to the water's edge along ponds and streams will be discouraged by posting signs and creating barriers. Of particular interest is providing safe water access to mobility impaired visitors. The recent construction of a pavilion at the SUNY Research Pond complex, and bridge and boardwalk initiatives on Fordham's Crossing and the Beaver Tree Trail, are initial elements of a long-term vision to provide enhanced water experiences for persons with disabilities.

5. Environmental Factors

a. Severe Weather Protocol

When travel, severe weather or wind chill advisories are posted, scheduled public programs may be cancelled at staff discretion. Before taking groups afield, staff and site-related personnel discuss weather forecasts, and designate alternative field routes or indoor program areas in the event that changing weather conditions dictate a retreat from outdoor areas.

b. Trail Condition Advisories

Staff check all interpretive trails regularly and may close a trail during periods when general flooding or icing make foot travel dangerous. During periods when minor or localized flooding/ icing exist but may be safely circumvented, caution signs are posted at trailheads to clearly identify the hazard.

c. Routine Snow and Ice Removal

Operations personnel are responsible for snow and ice removal on all interior roadways, parking lots and walkway areas. For safety purposes, calcium chloride, sand or rock salt is applied as deemed necessary along walkway surfaces and in parking lots.

d. Water Quality at Stream Sampling Sites

Guided lessons and public programs related to stream and pond ecology involve conducting water quality tests and/or searching the water for aquatic invertebrates. To minimize potential exposure to *E. coli* contamination, water samples from the Vlomankill and Old Field systems are tested on an annual basis.

e. Rabies Vector Species

In the past 10 years, raccoons recovered from the grounds have tested positive for rabies at a rate of one per year. A bat recovered in 2003 also tested positive. Procedures for handling sightings or reports of animals acting suspiciously on Five Rivers property are reviewed annually.

f. Pets

Pets are not allowed on the grounds. Leashed or unleashed, pets can spread disease or parasites to other animals through their droppings, disturb local fauna, befoul footpaths and may harass Center visitors.

g. Integrated Pest Management

For localized or site-specific treatment (for instance, to eliminate a hornet's nest), state law requires applications be made under the supervision of a licensed pesticide applicator (there is generally one on our Operations staff), and the use of IPM alternatives wherever possible.

6. Conflicting State Uses

The Five Rivers complex is a multiple-task campus. In addition to the Environmental Education Center, Departmental units from the Divisions of Fish, Wildlife & Marine Resources, Operations, and Law Enforcement administer their own fixed assets on the premises.

a. Traffic Impacts

Routine activities of other DEC units on site have ongoing negative safety-related impacts on the Education Center's operation. Daily traffic from to and from the Maintenance Shop and Auto Repair Shop, as well as interior venues of the Exhibit Shop and Warehouse, is troublesome, especially in the area of the bus unloading zone. The full implementation of the OGS Study would resolve much of this conflict.

b. Impact on Visual Resources

Certain practices by other DEC units in Administrative Areas have a negative impact on the visual environment. Staging and storage of items like machinery, vehicles, construction materials and waste tires is routinely done by units from both DEC Central Office and Region 4. In some areas, a small amount of vegetative screening has been used to help minimize visual impacts. The full implementation of the OGS Study would help resolve these conflicts.

G. MANAGEMENT OF ADMINISTRATIVE FACILITIES

1. Wildlife Resources Center

The Wildlife Resources Center (Buildings 9, 9A and 10) will continue to be managed by DEC's Division of Fish, Wildlife & Marine Resources, and will be treated as an administrative area separate from the Environmental Education Center campus. No substantial changes to these facilities is planned at this time.

2. Maintenance Center and Tire Barn

The Maintenance Center and Tire Barn (Buildings 1 and 1A) are scheduled to be removed and replaced with a new facility in an effort to consolidate maintenance functions on-site and to improve interior traffic flow. In the vacated areas, the entry roadway will be clearly delimited to accommodate bus traffic, and remaining asphalt and building footprints will be removed and the areas rehabilitated as planted permeable surfaces.

3. Operations Field Crew Headquarters

The Operations Field Crew Headquarters, (Building 3) is scheduled to be removed and its maintenance functions transferred to the proposed new maintenance facility, once constructed. In the vacated areas, Vlomankill Lane will be clearly delimited, and the unneeded paved areas and building footprints will be removed and planted. Part of the repaired area will be made into overflow parking area with permeable surfaces, using grass paving techniques.

4. Farmhouse – Building 8

When the construction of a new Visitor Center reduces the need for offices in the Farmhouse, DEC will refurbish the upstairs into housing for interns and other staff. This will require installing bathroom facilities on the second floor. This location is much preferred to the current housing on the Joel Parcel, being close to the intensive use area of the Center and allowing residents to easily walk to the Visitor Center from their housing.

5. Joel House & Garage

This 10-acre portion of the Joel parcel comprises the four-bedroom Joel House (Building 11) used for intern staff housing and a garage (Building 11A) used for storage. For surveillance and security reasons, the Bureau of Environmental Education manages this part of the unit as an administrative area.

The remainder of the Joel parcel features a 20-acre open field, and a 20-acre forested riparian corridor associated with the Phillipinkill drainage. There are no existing public trails or other amenities within this parcel.

Within the next five years, DEC proposes to construct a foot bridge over the Phillipinkill and establish trail connections to the Joel parcel from the area of the Wild Turkey Trail. A comprehensive inventory of the parcel's natural and cultural resources will be compiled and used for long- and short-term management planning.

Within the next five years, DEC proposes to rehabilitate the Farmhouse (Building 8) to accommodate intern and other short-term housing needs, and to subsequently remove the Joel House and garage.

V. SUMMARY OF MANAGEMENT ACTIONS

A. SHORT TERM (FIVE-YEAR) ACTIONS

1. Proposed Capital Projects

- a. Construct new Visitor Center building and subsequently remove the existing Visitor Center, Goose Lodge and Bear Pen buildings (as per OGS Schematic).
- b. Make improvements to intensive use area, including public parking and bus parking areas, gathering plaza, information kiosk, picnic area and walkways (as per OGS Schematic).
- c. After the new visitor center is constructed, rehabilitate Farmhouse second floor for use as a residence for temporary staff and consider removal of the Joel House and Joel Garage.
- d. Remove unneeded structures in keeping with the Cultural Resources Plan, possibly including buildings 4a, 4b, 5, 6 and 7c.

2. Proposed Health and Safety Initiatives

- a. Bring Beaver Pond dam into compliance. Remove woody growth from earthen berm and rehabilitate the berm as needed, pursuant to DEC safety inspection recommendations; erect split-rail safety fence along berm.
- b. Replace wooden observation decks on Beaver Tree Trail, posts #7 and 15.
- c. Enhance directional signage on the grounds.
- d. Study and implement pedestrian safety measures on Game Farm Road.
- e. Improve interior pedestrian safety by installing speed bumps on interior roads as needed.
- f. Assess and improve security lighting throughout the Five Rivers Complex as needed, reducing atmospheric light pollution where possible.

3. Proposed Public Use and Enjoyment Initiatives

- a. Expand wayside interpretive sign system – replace worn wayside signs along Nature’s Backyard Trail and install additional wayside interpretive signs at opportune locations on the grounds.
- b. Establish a new teaching deck on the Beaver Tree Trail near Post #5; establish wheelchair access to the boardwalk and long bridge.
- c. Enhance access at Goose Pond water’s edge areas – replace the teaching deck which was recently decommissioned at north end of Goose Pond; install access ramp onto existing teaching deck across from the new pavilion.
- d. Enhance access at SUNY Research Ponds water’s edge areas – construct wheelchair-accessible

floating decks/ramps along the water's edge at ponds near the new pavilion.

- e. Erect a viewing platform in the WHIP Parcel.
- f. Perform universal trail assessments – assess all interpreted trails in accordance with Universal Trail Assessment standards and provide appropriate access information to visitors.
- g. Refurbish the Spruces Building (Building 4) for use as additional program and display space and for preservation of this historic feature from the Delmar Game Farm era.
- h. Establish new trail routes – extend a foot path onto the Miller Parcel, possibly including a bridge over the Vlomankill; extend a foot path onto the Joel Parcel, including a footbridge across the Phillipinkill.

4. Proposed Resource Management Initiatives

- a. Plan and implement dredging of ponds – reestablish deep water areas in ponds as needed for wildlife habitat and education programs.
- b. Develop resource management plans, including a Forest Resource Management Plan, Fish and Wildlife Resource Management Plan and Cultural Resource Management Plan.
- c. Conduct inventories of biota on recently acquired lands of Joel, Foresman and Miller.

B. LONG TERM ACTIONS

1. Proposed Capital Projects

- a. Construct a new Maintenance Facility and subsequently remove the existing Operations Field Crew Headquarters, Maintenance Center and Tire Barn (buildings 1, 1a and 3).

2. Proposed Public Use and Enjoyment Initiatives

- a. Develop new trail routes as conditions allow, including a connection to future Rails Trail and to a proposed trail through Phillipinkill corridor.

3. Proposed Resource Management Initiatives

- a. Continue periodic dredging to deepen ponds.
- b. Remove old dam structure on Vlomankill Trail.

C. SCHEDULE FOR IMPLEMENTATION AND ESTIMATED BUDGET

The following tables outline a schedule for implementation of the proposed management actions and their estimated costs. Accomplishments are contingent upon sufficient staffing levels and available funding. The estimated costs of implementing these projects is based on historical costs incurred by the Department for similar projects. Values for some projects are based on projected costs for service contracting. These cost estimates do not include capital expenditures for items such as equipment, nor do they include the value of program staff salaries.

Annual Facility Maintenance	Estimated Costs
<p>Visitor Center, Comfort Station, Farmhouse, Goose Lodge, Joel House, and other unoccupied buildings are all cleaned and maintained according to yearly work plans. Plans are generally divided into daily, weekly, monthly, and seasonal tasks.</p> <p>These tasks generally consist of cleaning, recycling, trash removal, mowing, plowing, inspections, and minor repair work necessary to keep facilities in healthful and safe condition.</p> <p>Utilities - figures below are for the fiscal year 2005-06 and are for comparison as improvements are made and energy efficiency is increased.</p> <p>Telephone/Data Connections</p> <p>Fuel</p> <p style="padding-left: 20px;">Fuel Oil - 2,552.80 Gallons</p> <p style="padding-left: 20px;">Propane - 2,040.20 Gallons</p> <p>Electric</p> <p style="padding-left: 20px;">125,990 KWH Usage (excludes Joel House)</p> <p>Sewer</p> <p style="padding-left: 20px;">Annual usage: 2005/06 - 21,880 cu. ft.</p> <p>Water</p> <p style="padding-left: 20px;">Annual usage: 2005/06 - 22,400 cu. ft.</p>	<p>\$60,000</p> <p>\$7,645</p> <p>\$22,957</p> <p>\$17,368</p> <p>\$871</p> <p>\$2,091</p>
Total annual maintenance	\$110,932

Year 1	Estimated Costs
Construct new Visitor Center and make improvements to public parking areas, bus parking, gathering plaza, information kiosk, picnic area and walkways (per OGS Schematic)	\$4,238,000
Improve interior pedestrian safety - build speed bumps as needed	\$750
Develop resource management plans, including a Forest Resource Management Plan, Fish and Wildlife Resource Management Plan and Cultural Resource Management Plan.	Staff Time
Expand wayside interpretive sign system - replace wayside signs along Nature's Backyard trail and install additional wayside interpretive signs at opportune locations on the grounds	\$7,000
Enhance the system of signs that directs visitors walking the grounds by adding or improving signs as needed.	\$500

Year 2	Estimated Costs
Remove existing Visitor Center when new center is operational, also remove picnic pavilion and Goose Lodge buildings	Included above
Bring Beaver Pond dam into compliance per DEC safety inspection - remove woody growth from berm, repair berm, repair dam structure, erect fencing along berm	\$75,000
Replace wooden observation decks on Beaver Tree trail, posts#7 and 15	\$7,500
Enhance directional signage on grounds	\$2,500
Study and implement pedestrian safety measures on Game Farm Road	\$2,000
Assess and improve security lighting on Five Rivers property - reducing atmospheric light pollution where possible.	\$10,000
Perform universal trail assessments - Assess all interpreted trails in accordance with Universal Trail Assessment standards and provide appropriate access information to visitors	Staff Time

Year 3	Estimated Costs
Rehabilitate Farmhouse second floor as residence for interns/temp workers	\$12,500
Remove Joel house and garage	\$30,000
Remove unneeded structures as decided in conjunction with Cultural Resources Plan, possibly 4a, 4b, 5, 6, and 7c	\$75,000
Plan and implement dredging of ponds - Reestablish deep water areas in ponds as indicated in Wildlife Management Plan and responding to education needs (possibly Beaver, Heron, Goose and Sunfish Ponds).	\$50,000
Extend a foot path onto the Miller Parcel, possibly including a bridge over the Vlomankill	\$10,000

Year 4	Estimated Costs
Construct a new teaching deck at water's edge teaching site on Beaver Tree trail near post #5 and construct wheelchair access to boardwalk and long bridge	\$35,000
Enhance access at Goose Pond water's edge areas - Replace the teaching deck which was recently decommissioned at north end of Goose Pond; install access ramp onto existing teaching deck across from new pavilion.	\$3,500
Enhance access at SUNY Research Ponds water's edge areas - Construct wheelchair-accessible floating decks/ramps along the water's edge at ponds near the new pavilion.	\$7,250
Erect New Viewing Platform - Erect a viewing platform in the WHIP Parcel.	\$3,500
Conduct inventories of biota on recently acquired lands of Joel, Foresman and Miller.	Staff Time
Repair water control structures at Wood Duck and Fox Marshes	\$10,000

Year 5 and Beyond	Estimated Costs
Refurbish the Spruces Building (Building 4) for us as additional program and display space and for preservation of an historic feature from the Delmar Game Farm.	\$70,000
Extend a foot path onto the Joel Parcel, including a footbridge across the Phillipinkill.	\$27,000
Construct a new Maintenance Facility and subsequently remove the existing Operations Field Crew Headquarters, Maintenance Center and Tire Barn	\$1,750,000
Develop new trail routes as conditions allow - Rails-to-Trail connection; Phillipinkill corridor.	\$10,000
Continue periodic spot-dredging to deepen ponds.	\$15,000
Remove old dam structure on Vlomankill Trail (inoperative)	\$5,000

VI. RECORD OF ACCOMPLISHMENTS

A. 1999 UMP EFFORT STARTED

In March 1999, Five Rivers staff conducted three public scoping sessions preparatory to developing a Draft UMP. From July thru December 2000, Five Rivers staff conducted nine Draft UMP focus group meetings on specific issues of public concern, including management of fish and wildlife resources; habitat management; land protection; management of fixed assets; increased public use; and public safety. Preliminary drafts of UMP chapters were prepared in 2002.

B. FRIENDS OF FIVE RIVERS INITIATIVE

In Summer 2004, the Friends of Five Rivers met with DEC Executive staff to propose donating \$500,000 to construct a new building at Five Rivers to replace the building out of which the Center's guided school lessons are conducted (building #2). In Fall 2004, DEC staff in Public Affairs, Legal Affairs and Operations conducted a series of scoping meetings with representatives from Friends of Five Rivers to determine if and how the proposal might be undertaken.

C. OGS PREPARES *STUDY TO PROVIDE MASTER PLAN*

Discussions with the Friends group begged a larger question: any new construction should take into account and be consistent with present and future utilization/configuration of the entire site. It was clear that a comprehensive master plan was needed. As a result, DEC hired OGS in February 2005 to develop a *Study to Provide Master Plan* for the site's Intensive Use Area.

Throughout Spring 2005, OGS conducted a comprehensive survey of the physical condition and functional arrangement of fixed assets in the Intensive Use Area. Concurrently, OGS conducted a series of scoping meetings with representatives from DEC and Friends of Five Rivers to gather on-the-ground information.

OGS staff presented their preliminary Study in May 2005. OGS continued a series of planning meetings with representatives from DEC and Friends to fine tune the Study. OGS presented its final proposal in July 2005 and it was accepted by DEC in August 2005.

Among other findings, the OGS Study recommended including the guided school class building needs with a new Visitor Center and demolishing the current Visitor Center and Goose Lodge buildings.

D. 2006 UMP DRAFTED

Five Rivers staff met with Region 4 staff in Fall 2005 to resume the UMP work. A regional UMP planning team was established. Team members were provided 2002 pre-draft UMP text as background. Preliminary discussions with team members were held.

From February through April 2006, Five Rivers staff conducted a series of six public scoping sessions. A summary of public comments was prepared in May 2006 and distributed to UMP team members for review.

In July, Five Rivers staff submitted a pre-draft UMP to the UMP team for distribution and review. A Full Environmental Assessment was submitted to DEC's Region 4 Permit Administrator in September.

VII. REFERENCES

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U.S. Department of Interior; *A Guide to Designing Accessible Outdoor Recreation Facilities*; Heritage Conservation and Recreation Service; Ann Arbor; 1980

Program Report

Study to Provide Master Plan Five Rivers Environmental Education Center

56 Game Farm Road
Delmar, New York

Project No. S1469

Department of Environmental Conservation

Howard Hasenbein, LA
Building Construction Program Manager III
Design and Construction

July 1, 2005



DANIEL D. HOGAN
Commissioner

ROBERT J. FLEURY
First Deputy Commissioner

WILLIAM F. O'CONNOR, AIA
*Deputy Commissioner
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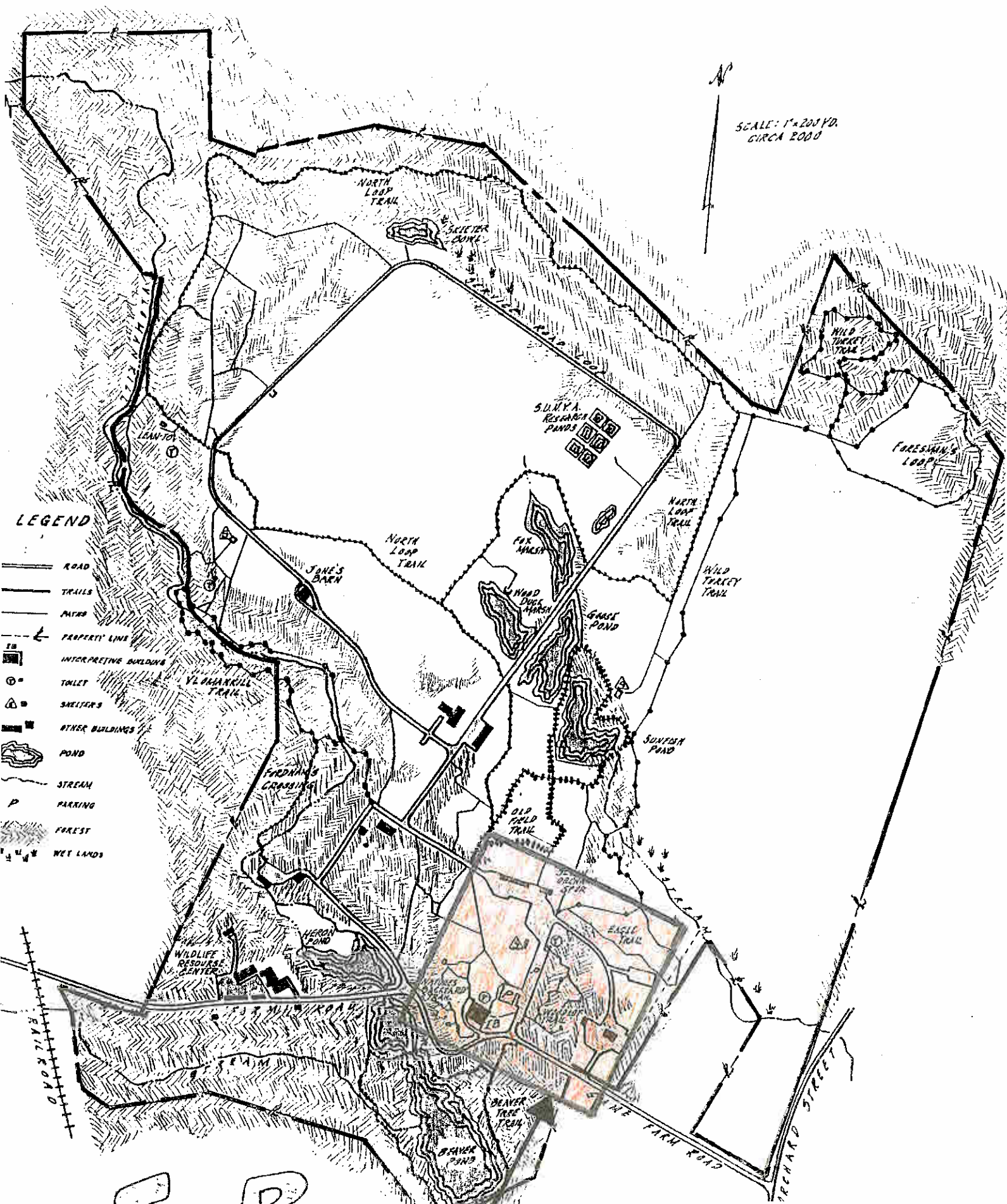
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Partnership Organization

Friends of Five Rivers:

Dan Lewis – President
Leda Loux – Member
Wendy Suozzo - Member
John Smolinsky - Member



FWE RIVERS

ENVIRONMENTAL EDUCATION CENTER
DELMAR NEW YORK

PROJECT LIMITS

Outdoor Restroom Building No. 7B
to remain in use

Operations Building No. 3

Goose Lodge Building No. 2
Guided School Program

Bear Pen Building No. 7A

Visitors Building No. 7-

Tire Barn Building 1A

Auto Maintenance Building No. 1

EXISTING BUILDING LOCATION PLAN

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I. EXECUTIVE SUMMARY

A. Purpose

The aim of this program is threefold:

- to evaluate current site conditions in accordance with the agency's programmatic needs.
- to evaluate 7 buildings on the site in terms of physical parameters: condition, site disposition, relationships to each other and to pedestrian and vehicular circulation.
- to develop a Master Plan for use as a guideline for future development.

B. Scope of Work

Five Rivers Environmental Education Center comprises over 400 acres on a watershed that drains the Capital District. The Vlomankill and Phillipinkill border numerous wetlands, ponds, forests and fields. The habitat it provides, in the trails, ponds and marshes, is beneficial not only to its wildlife but also the community.

Over 100,000 people visit the site annually and it is the most heavily used of all the State's Education Centers. Public programs, guided and self-guided walk, and sitting areas are available to the general public and are a favorite destination for school groups.

This Program is limited to the Visitors Parking area and adjacent green space, and the 7 buildings as depicted in the attached existing conditions site plan. Master Plan is to address proper placement of future structures on a properly developed site that addresses DEC's future programmatic needs.

All site and building Work will comply with Executive Order 111 and will attain LEED Certification by US Green Building Council (USGBC)

Provide geothermal heating

C. Findings

a. Site

The main site problems can be summarized as follows

- Safety:
 - Poor visibility at site entry port

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- Conflict of vehicular and pedestrian traffic
- Poor night lighting (vehicular / pedestrian)
- Functional Problems:
 - shortage of parking spaces
 - lack of draw to main building
 - energy inefficiency and duplication of functions at the building level.
 - Unclear trail designations

b. Buildings

The buildings as a whole, with the exception of the recently constructed Outdoor Restrooms, are approaching the end of their useful lives. A primary example is the Goose Lodge where poor foundation conditions have resulted in freezing pipes.

In terms of best practices for current architectural and engineering standards, basic flaws exist: the lack of compliance to ADA for accessibility, problems with indoor air quality due to no exhaust or ventilation systems, the lack of energy-saving daylighting and the low energy efficiency of windows, in the few cases where they are provided.

D. Recommendations

a. Site

- Maintain separate access roads for buses and public
- Provide a welcoming gathering plaza for dropoff and orientation.
- Provide additional parking with adequate lighting
- Redesign trailheads to originate at welcoming plaza
- Consolidate buildings with similar functions
- Create small wetland areas for stormwater management.

b. Buildings

- Provide new Visitors Center in a more central location. Consolidate Visitors Center with Guided School Program keeping distinct entrances and identity to each entity.
- Combine Operations and Maintenance Buildings keeping distinct entrances and identity to each entity.
- Provide addition to Restroom building for storage.
- Use sustainable ("green") guidelines in the design of the new buildings.
- Demolish all other buildings check for asbestos lead paint..

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- New building replacements- construct new first then decommission old to prevent interruption of services or relocate existing services to other unoccupied buildings

E. Probable Construction Cost (see attached estimate)

F. Schedule

Site Work- PHASE 1

- Schedule project with NYSERDA as "Green" project
- It is recommended that existing conditions survey 1"= 40' scale (topographic one foot contour interval) of entire area be initiated as soon as possible utilizing OGS Survey term contract services. All subsurface utilities to be depicted.
- Initiate archeological Phase 1A Cultural Resource survey in consultation with Charles Vandrei, DEC to insure all future new site and building construction work areas have been surveyed and approved for construction..
- Conduct asbestos and lead paint testing buildings 2, 3 and 7 and 7A. Building 2 and 3 staff will be temporarily relocated to unoccupied buildings at 5 Rivers until new Guided School Program and Operations Building are constructed.
- Develop site design construction documents for construction in FY 2006-7. Develop phasing plan to insure that there is no interruption in accessing existing Visitors Center trails Building 7B and parking at Five Rivers.

Architectural

Visitors and Guided School Program- PHASE 2

- Develop scope of work and develop schematic design and elevation for Guided School Program and Visitors Building. It is important that shared services be considered to provide efficient energy usage. Secure input from Friends of Five Rivers. The future Guided School Program Building will exemplify state of the art "Green" building principles.

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- Prepare construction documents for construction in FY 2007-8. Upon completion of new Visitors Center and Guided School Program Building, abate asbestos and demolish Building 7. Follow procedures for demolition of all state buildings.

Operation and Auto Maintenance Buildings- PHASE 3

- Design and construction of new Operations and Auto Maintenance Building to follow construction of new Visitors Center.
- Conduct asbestos and lead paint testing Buildings 1 and 1A . Insure cultural testing in area north of existing Vehicular Maintenance Building is completed.
- Develop scope of work and schematic design and elevation sketch of Operation and Vehicular Maintenance Building. Prepare construction documents construct when funding is available. Provide shared service
- Upon completion of Operation and Vehicular Maintenance Building, Demolish existing Tire Barn Building and Vehicular Maintenance Building. Remove existing paving and provide new section of road and parking along Vlomankill Rd.

II. ARCHITECTURAL

A. General

Initially Five Rivers served as a State Experimental Game Farm where advances in biological testing in the areas of wildlife management established New York as a leader in the conservation movement. A Civilian Conservation Corps (CCC) was also stationed there in the 1930's and constructed at least one of the buildings.

There are 7 main buildings on the site (with best guess at age):

1. Visitors' Center – No. 7 (originally a cafeteria at the Albany State Office Building Campus that was moved in 1966)
2. Goose Lodge – No. 2 (built in the 1936 by the CCC)
3. Operations – No. 3 circa 1930's(?)
4. Auto Maintenance – No. 1 circa 1970's(?)
5. Tire Barn – No. 1A circa 1970's(?)
6. Bear Pen – No. 7A circa 1950'S (?)
7. Outdoor Restrooms – No. 7B (built in 2004)

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In our survey of the buildings, we saw some common problems throughout. These can be summarized as follows:

Architectural Condition Assessment:

- Structures are aged and have been modified beyond their initial intent.
- Insufficient building insulation.

Functionality:

- Structures are difficult to modify to satisfy future needs.
- No centralized office area, offices are all mixed in with/ and adjacent to public areas.

Code Compliance:

- Heating plants are not in enclosed, fire-rated construction.
- Storage rooms do not have appropriate fire separations.
- Toilet facilities are non-code compliant.

Other Considerations:

Duplication of Services – Each of the 7 buildings in the survey requires separate mechanical systems support as well as duplication of services – e.g., office equipment, supplies, bathrooms, classrooms.

Asbestos – The age of the buildings suggests that asbestos is present; however it is not within the purview of this study to allocate time & expense for testing.

Historical Significance – Mark Peckham of the State Historic Preservation Office has indicated to DEC that there are no compelling historical factors to limit removal or alteration of the buildings. In addition, no photographic record of existing buildings is required for archival purposes.

B. Building Survey

1. Visitors Center- Building No. 7 - 4600 sq. ft.



This structure dates back to at least the 1960's when it served as a cafeteria at the Albany State Office Building Campus. It was physically disassembled and re-located to the Five Rivers site in 1966. It is a wood-framed structure of approximately 4600 sq. ft. The exterior siding is wood and the metal roof appears relatively new. However, the roof utilizes framing that appears independent of the original roof structure creating,

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in fact, a roof over a roof.

Immediately adjacent to the building is an outdoor area with cultivated flower and herb gardens, bird feeding stations, and seating area. Bathrooms are accessible from both inside and outside.

Interior Spaces:

- Exhibit Areas 12x44, 18x21
- Classrooms 25x33, 17x17, 14x21
- Bookstore 8x12
- Breakdown w/ refrigerator, microwave, sink, cabinets 17x20
- Staff Workroom 8x16
- Offices 8x14, 12x14, 12x12, 12x12
- Storage Spaces 6x26, 7x12
- Mechanical 8x14, 4x5
- Restrooms 7x14, 9x14, 6x6 (Handicapped)

Observations:

- The interior receives plenty of daylighting from abundant use of windows. The windows, however, are not energy efficient.
- The lack of a vestibule at the entryway allows dirt and particulates to be brought into the building by high volume traffic.
- The office corridor is too narrow for comfortable passage.
- The recessed areas with live animals are a good feature, but the main exhibit space is too long and narrow to allow for dynamic, three-dimensional exhibits. Most of the information presented is in the form of 2-dimensional literature mounted on the walls.
- The overall floor plan is tight and does not readily allow for alterations.
- The overlap of exhibit and classroom areas seems to be a positive feature, programmatically
- Other functions that overlap, however, are not as desirable, e.g., storage of snowshoes in spaces dedicated to other uses, such as the kitchen and classrooms.



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Recommendations:

In our meeting on April 14 with Craig Thompson, Environmental Educator at the facility, we discussed the concept of a visitors' center that fosters the goal of an "indoor experience" where outdoor lessons are expanded upon inside.

Scope items that can help achieve this goal to maximum effect are:

- Increased square footage of public access areas
- Auditorium space for 120 people; conservation groups, DEC meetings
- Conference room for 15 people
- 10 workstations for director, 3 permanent, 1 seasonal, volunteers
- Gift shop with books, nature kits, t-shirts
- Art space for nature photography, paintings, drawings
- Separate service entrance
- Snowshoe storage area
- Total square footage: 6000 sq. ft.
- Bird viewing area

The sustainability movement in architecture, otherwise known as "green design," goes hand-in-glove with science-based nature education programs. Sustainability is defined as: providing for human needs (social and economic) in ways that keep the world's ecological systems healthy and in perpetual existence.

Included in such a building would be the following:

- Energy efficient windows with direct line of vision glazing from 90% of all occupied spaces; views to incorporate gardens, bird feeding stations, etc.
- Light-colored, reflective roof; currently there is a heat-absorbing, metal roof which acts as a heat island.
- Low-flow toilets, low-flow or waterless urinals; reuse of stormwater and graywater for toilet and urinal flushing
- High-performance energy system perhaps using renewable energy such as geothermal heating and cooling
- Use of recycled and/or rapidly renewable materials in workstation furniture and other equipment; use of wood certified by the Forest Stewardship Council
- Low-VOC emitting materials in adhesives, paints, and carpets.
- Storage and collection of recyclables (administrative policy)

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- Purchase of green power (administrative policy)

After a meeting between OGS and DEC on May 19, DEC it was decided that the new Visitors Building be located in the center of the green area and facing the parking lot, creating and maximizing a "Victorian" grand lawn area. It is important to maintain an architectural aesthetic that is more "rustic vernacular", than modern.

It is our assessment that in order to achieve the programmatic goals in the most energy-efficient way, a new building to replace the current structure is strongly indicated. For energy efficiency and to eliminate duplication of services, integrate with the Guided School Program (see below).

2. Goose Lodge –Building No. 2 - 1400 sq. ft.

Input from Friends of Five Rivers was solicited.

The building functions mainly as a materials resource center for the guided school program, an initiative developed by the Friends of Fiver Rivers. The FFR is a volunteer group which has been offering environmental education support to the Preserve since 1972. Students are dropped off by buses and use mainly the trails to the north: Old Field and North Loop. The building currently has the following spaces:

- Multi-use room – 12x23
- Office - 11x25
- Storage – 10x11
- Bathroom – 6x10
- Large Storage (unheated) – 700 sq. ft.

Observations include:

- Deteriorating foundation condition that has caused relocation of frozen pipes in a previous winter.
- Non-compliant for ADA bathroom layout and fixtures
- Leaking roof in the large storage area
- Large storage area and occupied side of building do not have proper fire separation.
- The building is remote from the Visitors Center making it difficult to share resources, equipment, materials, etc.



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Recommendations:

In 2004 a pledged donation for the creation of a new structure to house both the guided school program and offices for the FFR became available. DEC is now exploring this opportunity with FFR and OGS. The spaces in the new building would include, but not be limited to, the following:

- Multi-use room (dividable into 2 rooms) for: instructor set-up area, indoor classrooms (2), FFR meeting/work space – 600 sq. ft.
- Guided School Program Equipment Storage – 200 sq. ft.
- Cleaning Area – 100 sq. ft.
- Administrative Offices (2) for: Guided program coordinator -150 sq. ft and FFR - 200 sq. ft
- Restroom – 100 sq. ft.
- Large Storage Area for: Birdseed, FFR tents and canopies, signs, snowshoes, vehicles, festival materials, etc – 500 sq. ft.
- Outside sink and drain board
- Total area: 2500 sq. ft.

See Appendix – Friends of Five Rivers Building Initiative for more detailed information.

Because of its poor condition and code-compliance issues, a new building to replace the current structure is strongly indicated. For energy efficiency and to eliminate duplication of services, integrate with the Visitors Center.

The Guided school program can be housed in a distinct structure that is discreetly connected to the Visitors Center through a shared mechanical and private circulation area. Separate entrances and covered outdoor classrooms and spaces will be provided.

3. Operations/Maintenance- Building No. 3 - 3500 sq. ft.

This building is used for large equipment storage such as trailers, pick-up trucks and golf carts. The building is in fair condition and we noticed the following:

- Potentially dangerous location of building in public area (cross traffic between service vehicles and pedestrians)
- Damage to the exterior at the jamb side of the overhead doors

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- Lack of sufficient daylighting in occupied work spaces such as the office and breakroom – also the shop areas do not receive adequate task lighting
- Inadequate storage for types of petroleum-based liquids used at this site.
- Inadequate ventilation for engine repair work
- Bathroom does not meet ADA requirements
- The hot air furnace is ceiling hung and open to the general area

Recommendations:

The building's weakest features are proximity to public areas, poor daylighting and non-code-compliance.

It is recommended that the Operations Building be abandoned and a new one provided integrated with or adjacent to Maintenance Building No. 1.

4. Auto Maintenance Shop – Building No. 1 - 3100 sq. ft.

This is a pre-engineered metal-framed building with metal and wood siding. The first floor is basically one work area with a total of 5 lifts. Its function is to provide vehicle maintenance for Five Rivers and campgrounds support for camping sites in the Heldeberg Escarpment and the Catskill ranges.

Observations:

- No roof leaks apparent
- No structural problems apparent though there is impact damage to the siding at the lower sections, particularly near the overhead doors.
- There are two fuel pumps, one for diesel, the other for gasoline near the front entrance. These pumps are no longer in use.
- There is inadequate storage for the types of petroleum-based liquids used at this site.
- A forced air furnace is on the second floor loft space and is open to the first level where there are chemicals stored. The HVAC equipment cantilevers out over the workspace below.
- The bathroom in the second floor loft is not ADA compliant. It cantilevers out over the workspace below.



Recommendations:

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The building is basically sound and can remain in its current location with certain modifications.

Reconfigure HVAC equipment location and bathroom to meet code requirements. The outside tanks should be removed along with their below grade tanks. Provide proper storage for petroleum-based liquids.

5. Tire Barn – Building 1A - 1250 sq. ft.

The tire barn is an unheated storage area with a loft space. It is a wood-framed structure with exposed wood trusses, wood siding and a shingled roof. Miscellaneous vehicles are stored inside.

Observations:

- No specific problems were noted.

No action required.

6. Bear Pen – Building 7A - 400 sq. ft.

Observations:

- No specific problems were noted.

The building will be removed and its function replaced with a new small storage building behind the new Visitors Center.

7. Outdoor Restrooms – Building 7B - 770 sq. ft.

Observations:

- No specific problems were noted.

No action required.

III. BUILDING SYSTEMS REVIEW: MECHANICAL, ELECTRICAL, PLUMBING

1. Visitors Center Bldg. No. 7

Observations:

- Heating System: Hot air with duct distribution provided by a horizontally suspended No. 2 fuel oil-fired furnace
- Exterior No. 2 fuel oil storage with interior day tank storage

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- Cooling system: None
- Domestic Hot Water: 140 gallon electric water heater
- General Building Ventilation: None observed
- Specific Area or Bathroom Exhaust: None observed

Deficiencies:

- Oil-fired equipment not contained in code-required fire-rated area or enclosure
- Oil storage tank not contained in fire-rated and ventilated area
- Insufficient general building ventilation and exhaust system
- Insufficient specific area or bathroom exhaust
- Fuel oil piping connections and runs do not meet conventional standards

2. Goose Lodge Bldg. No. 2

Observations:

- Heating System: Electric
- Heating Equipment: Electric baseboard elements
- Cooling System: None
- Domestic Hot Water: 30 gallon electric domestic water
- Plumbing: Questionable plumbing fixtures and piping modifications
- General Building Ventilation: None observed
- Specific Area or Bathroom Exhaust: None observed

Deficiencies

- Heating system deficient for building heating load
- Insufficient building ventilation and exhaust

3. Operations Bldg. No. 3

Observations:

- Heating System: Hot air with duct distribution provided by a horizontally suspended No. 2 fuel oil-fired furnace
- Exterior No. 2 fuel oil storage
- Cooling system: None
- Domestic Hot Water: 30 gallon electric water heater
- Building Ventilation: Vehicle tail pipe hook-up exhaust system, no general service area purge exhaust observed; no specific or bathroom exhaust, questionable plumbing system venting

Deficiencies:

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- Oil-fired equipment not contained in code-required fire-rated area or enclosure
- Insufficient plumbing exhaust in service area and specific function areas
- Plumbing modifications do not meet conventional standards

4. Auto Maintenance Bldg. No. 1

Observations:

- Heating System: Hot air, duct distribution and unit heaters
- Interior 250 gallon No. 2 fuel oil tank storage
- Interior horizontally suspended No. 2 fuel oil-fired furnace
- Interior horizontally suspended No. 2 fuel oil-fired unit heater
- Cooling: None
- Plumbing: Questionable fixtures and piping modifications
- Domestic Hot Water: 10 gallon electric domestic hot water heater
- General Building Ventilation: None observed
- Specific area or Bathroom exhaust: None observed

Deficiencies:

- Oil-fired equipment not contained in code-required fire-rated area or enclosure
- Insufficient building exhaust in service area and specific function areas

IV. SITE

A. General

The project site is accessed by Game Farm Road and consists of 18 acres. There are two main turn-offs from Game Farm Road on to the site: the first is to the maintenance building and the second is to public parking.

The site is the starting point to the public trails which include: Vlomankill, North Loop, Old Field, Wild Turkey, Woodlot, Beaver Tree, and Nature's Backyard.

B. Problems:

At our field trips and meetings the following problems have been noted:

- Public Parking Lot:
 1. Poor visibility at site entry port

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2. Shortage of parking space during peak events – there currently exist 70 parking spaces and visitors park on the grass during special events.
 3. Paving is in poor condition.
 4. Night lighting is inadequate.
- Existing trails not linked; some confusion as to origin and location of trails
 - Conflict of vehicular traffic/parking with pedestrian paths, e.g.:
 1. Operations Building parking area interferes with visitor access to trails to north of site.
 2. Bus parking interferes with visitor access to site.
 3. Vehicular entrance to parking lot crosses pedestrian path to Beaver Tree Trail.
 - Visitors Building
 1. Not enough draw to this building.
 2. Building is located too close to State Farm Road, too far from restrooms (450 ft), and at the extreme end of the parking lot.
 - Buildings of similar use are not in close proximity: Maintenance Building and Operations Building; Goose Lodge and Visitors Center.
 - Operations and Goose Lodge Buildings block view of orchards.
 - Existing loading dock at Operations Building no longer performs any useful function.

C. Recommendations:

1. ***Based on the above recommended phasing out of existing buildings that have reached useful life (except newly constructed Restroom Facility Building 7B), an opportunity exists in developing a Master Plan that addresses proper placement of new future structures on a properly developed site that addresses DEC's future programmatic needs. Sustainable design and Green Building and energy efficiency principals are to be utilized where ever possible..***
2. All buildings and site will be ADA compliant.
3. Access: Maintain separate access roads, the first for buses and a consolidated maintenance building and the second for public parking. The bus/maintenance road will lead to a bus loop at the north end of the site with parking for up to 8 buses. The main entrance road will be relocated to the east of the pedestrian entrance to the Beaver Tree Trail. This new entry will provide better road visibility. New entry signage will properly direct visitor and bus traffic. Some vegetation and trees along Game Farm Rd will be

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removed to insure that traffic from Game Farm Rd and Five Rivers entry are in full view of each other.

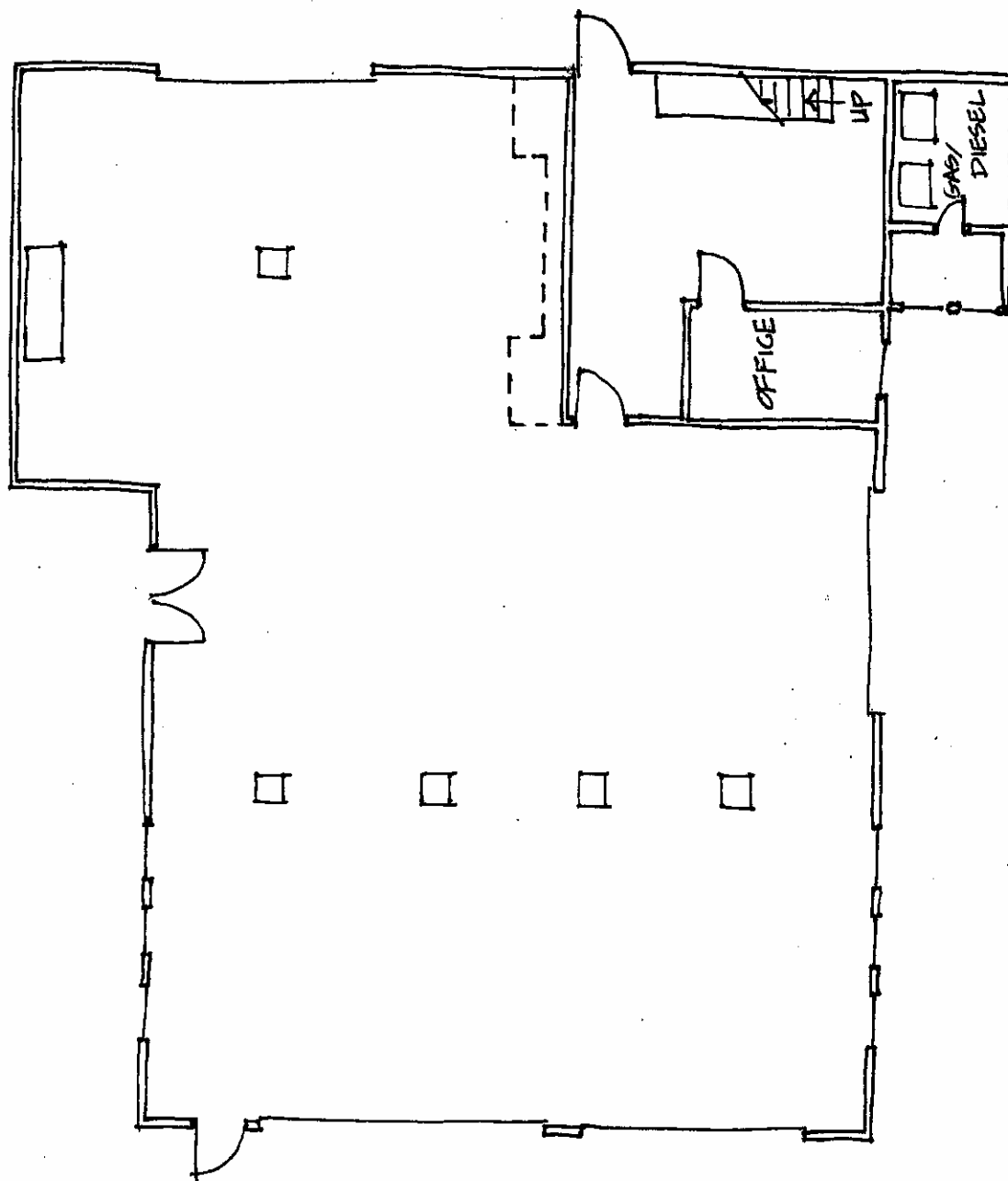
4. Specific Site Items:

- a. Bus-Dropoff: Locate the bus-drop for schoolchildren adjacent to the existing Public Restroom building.
- b. Gathering Plaza: Provide a welcoming paved courtyard adjacent to the bus dropoff. This central orienting location would feature an overhead canopy- removable during winter. Activities under the canopy include "outdoor classroom" area, shelter in the event of rain, gathering area, shady rest area on hot sunny days. The New Storage Structure added on to the Restroom can function as a concession stand during festivals.
- c. Information Kiosk: Strategically locate Kiosk at a central point- near Visitors Center entrance, path to band stand, at vehicular drop off area, close to Guided School Building and along the walk way from bus drop off to Visitors Center. The Kiosk will depict orientation "you are here" map of the entire Five Rivers Property including all trail systems. This will serve as the point of beginning or "trail head" for all the trails. Additional markers will be provided to "point the way." The Kiosk can also function as a bulletin board where up coming events and other useful information can be displayed.
- d. Formal Flag Station: Flag Station displayed at Entry to Visitors Center- acts as a "draw to the entrance" device. Colored flowers near Visitors entrance will also act as a draw.
- e. Parking Lot: Provide a public drop-off directly off the courtyard. Total parking spaces will be approximately 142 cars of which 8 would be for the handicapped. An additional 5 spaces would be for deliveries. Provide a gate between public parking and the bus loop that would allow vehicular passage if necessary. Provide another gate from the bus loop to the access road to the west and add overflow parking on a crushed stone/topsoil mix.
- f. Exterior Lighting: Provide rustic free-standing lighting that can be used for displaying banners of upcoming events (Earth Day, Maple Sugar Festival, etc.).
- g. Trailheads: Redesign to originate at the central courtyard, with well-defined color-coded graphics. Provide interpretative panels along the paths to the trailheads.
- h. Outdoor Gathering area/Bandstand: Provide a paved path from the courtyard to an outdoor gathering area and a gazebo (not elevated). This area will be proximate to the existing amphitheater.
- i. Consolidate Building Functions:
 1. Consolidate all office functions into one new Visitors Center and Guided School Program Building Complex just south of the Welcoming Courtyard. These two distinct entities will share some

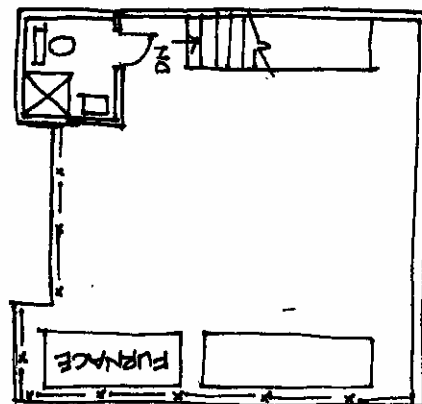
OFFICE OF GENERAL SERVICES
STUDY TO PROVIDE MASTER PLAN
FIVE RIVERS ENVIRONMENTAL
EDUCATION CENTER
OGS Project No. S1469
Program Report July 1, 2005

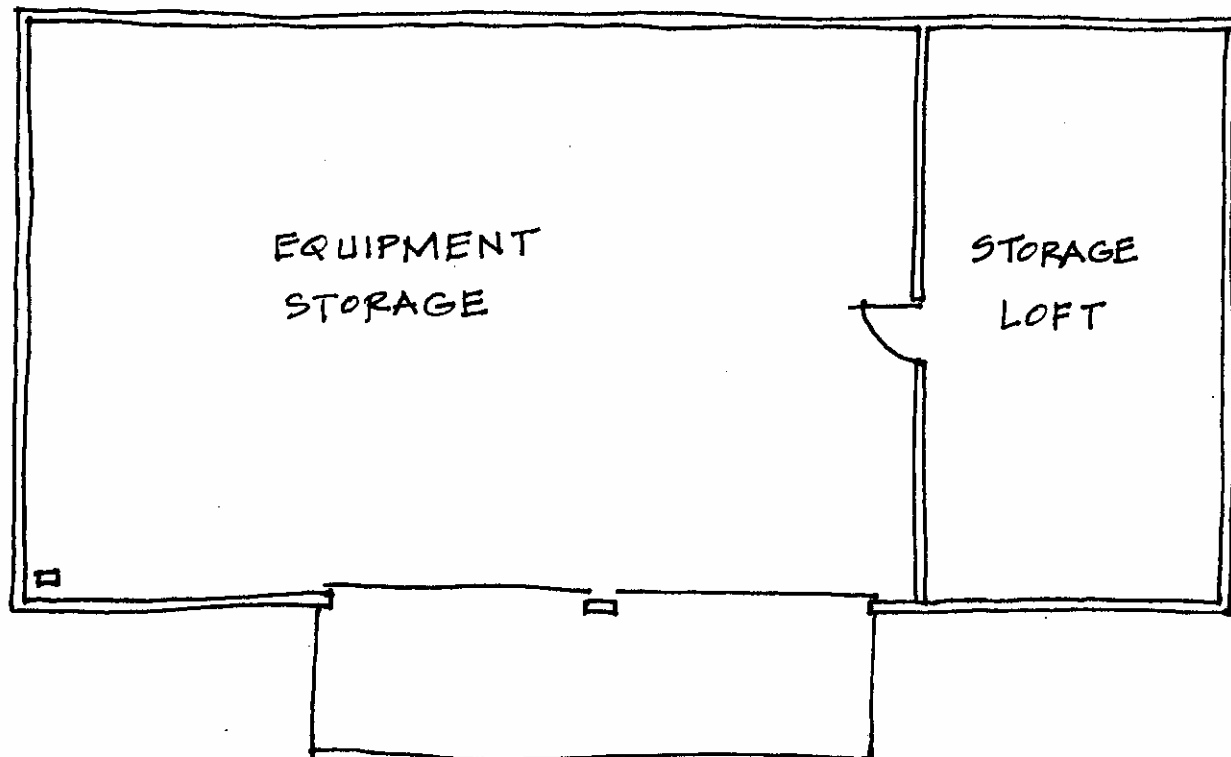
functions and services but will maintain separate entrances and outdoor areas. Common exterior spaces to include the bird watching area and an additional service access to the south. The structure will be oriented east-west to take advantage of passive solar gain. The walkway to to the Guided School Program will connect to trails to the north. Underground telephone lines may need to be relocated.

2. Relocate the Operations building to the Maintenance area, and provide a new building with the two distinct entities having some shared functions and services.
 3. Provide an addition to the existing Restroom Building for storage of picnic tables and other miscellaneous equipment.
- j. Demolish all other buildings on the site. See Part II. Architectural for rationale of this recommendation.
 - k. Create small, esthetically-pleasing wetland areas or retention ponds for stormwater runoff from parking lot. One possible place is the green area just north of the existing Visitors Building.
 - l. Designate a "dog break area" for working dogs (Seeing Eye, Canine Companions for Independence)
 - m. Indigenous plantings will be used where specified.

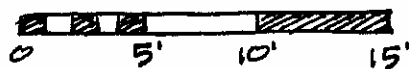


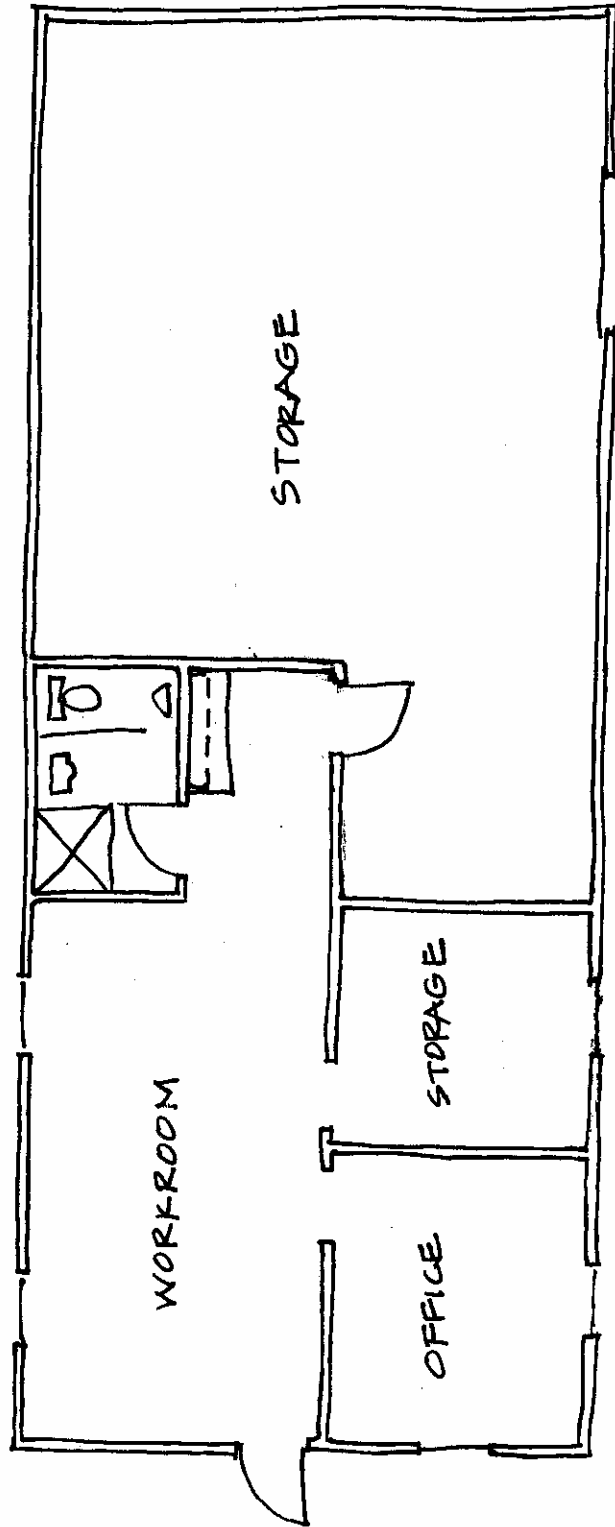
AUTO MAINTENANCE - BLDG. 1





TIRE BARN - BLDG. 1A

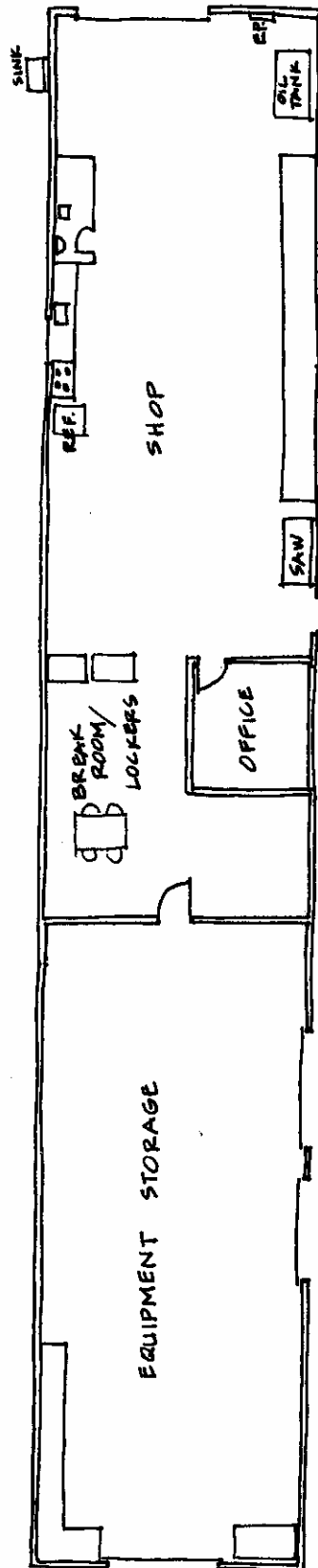




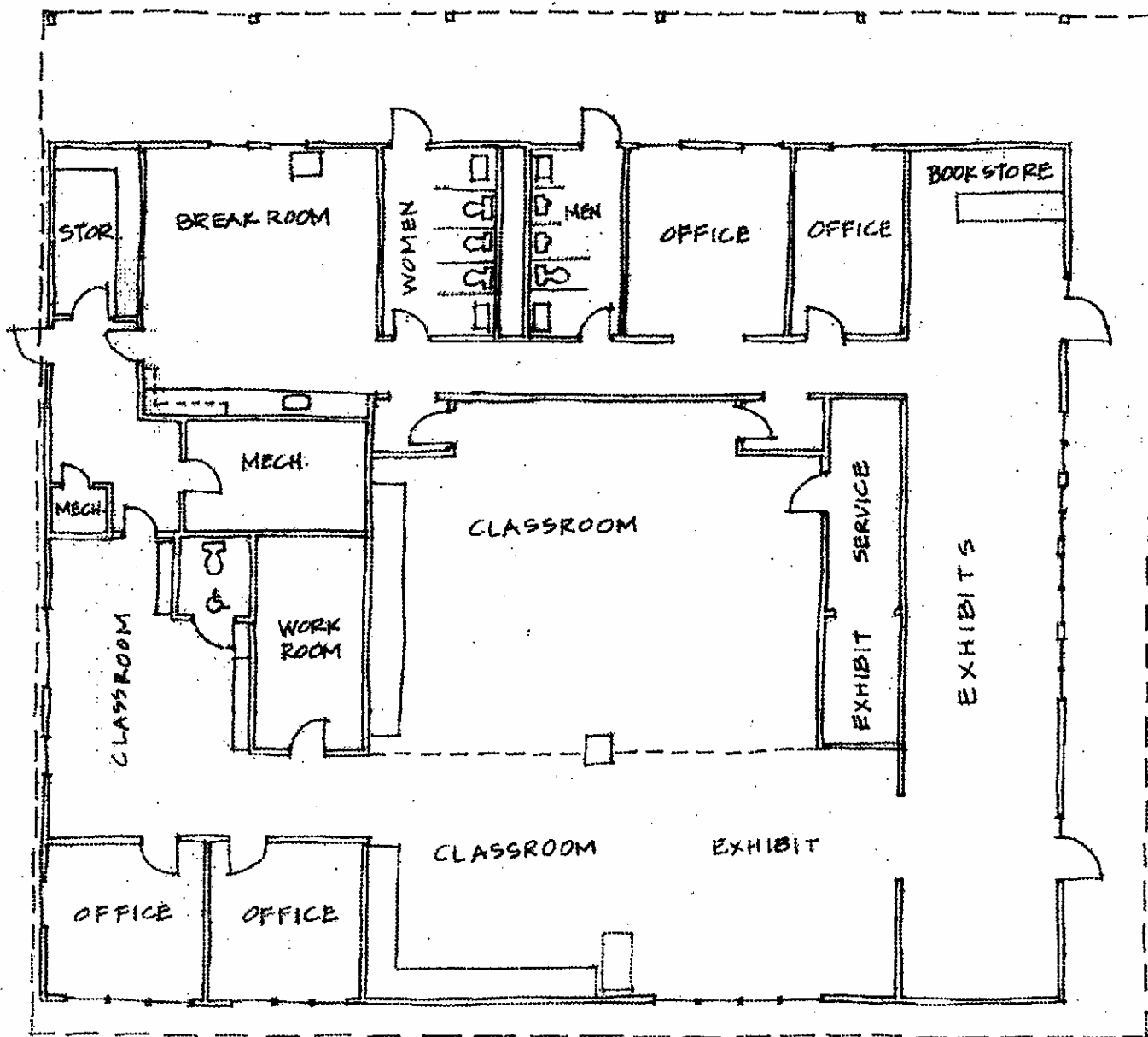
27

GOOSE LODGE - BLDG. 2

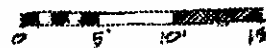


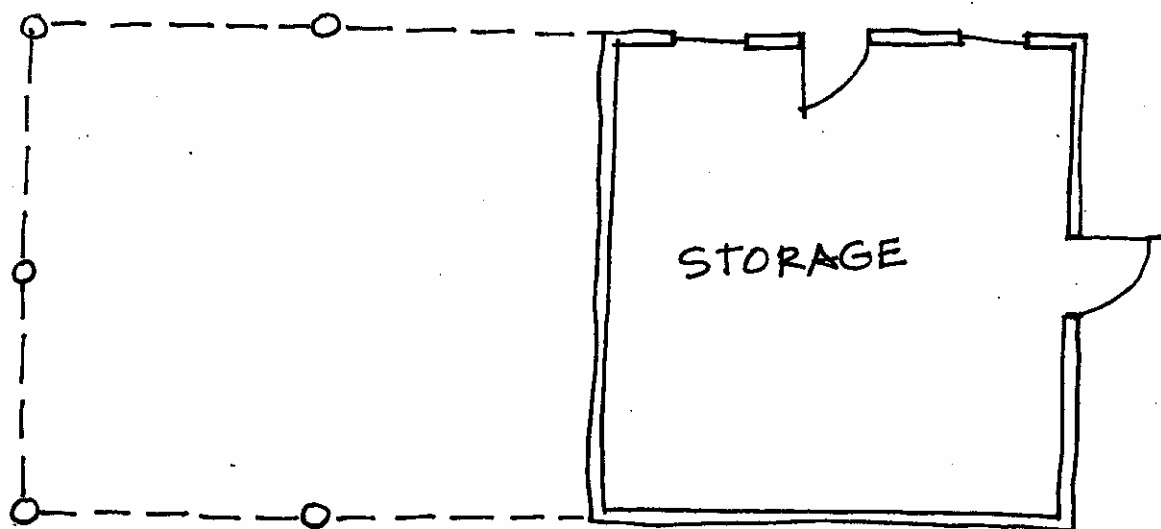


OPERATIONS - BLDG. 3

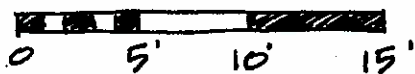


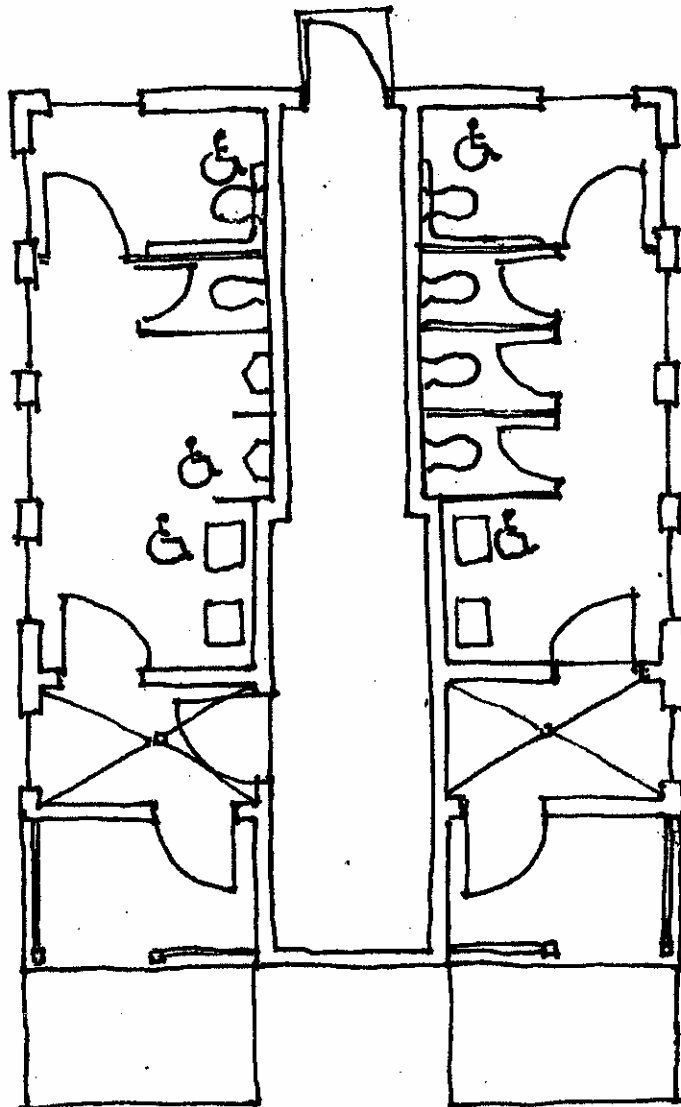
VISITORS CENTER - BLDG. 7



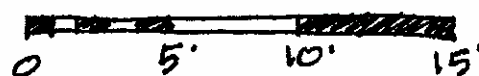


BEAR PEN - BLDG. 7A





OUTDOOR BATHROOM
BUILD. 7B



Operations and Goose Lodge Building and bus parking block view of orchard



See building survey information on the Condition of 7 buildings. Each building requires separate mechanical support and duplication of services- ie copy machines, bathrooms, classrooms, etc. Buildings of similar use are not in close proximity.

Poor visibility at site entry point (Entry point at curve and at top of 7% State Farm Rd slope that drops to Beaver Pond, which causes poor visibility.)



OFFICE OF GENERAL SERVICES
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PHOTOGRAPHS

Visitors Center – No. 7



Goose Lodge – No. 2



Operations – No. 3



OFFICE OF GENERAL SERVICES
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Auto Maintenance – No. 1



Tire Barn – No. 1A



Bear Pen – No. 7A



Restrooms – No. 7B



SCHEMATIC DESIGN NARRATIVE

SITE IMPROVEMENTS

Five Rivers Environmental Education Center
56 Game Farm Road
Delmar, New York

Project No. 43153

prepared for
Department of Environmental Conservation

prepared by
Lewis Engineering, P.C.

October 6, 2006



JOHN J. SPANO
Commissioner

ROBERT J. FLEURY
First Deputy Commissioner

JAMES M. DAVIES, AIA
*Acting Deputy Commissioner
Design and Construction*



**EXECUTIVE DEPARTMENT - OFFICE OF GENERAL SERVICES
DESIGN AND CONSTRUCTION - DIVISION OF DESIGN**

SCHEMATIC DESIGN NARRATIVE

Project Number 43153

October 6, 2006

Site Improvements
Five Rivers Environmental Education Center
56 Game Farm Road
Delmar, NY

PROJECT INTENT

Intent of the project is to replace three existing buildings - 7, 7A and 2, which have reached their useful life, with a new energy efficient 8,000 sf Visitor Center Building. Overhead Shelter/Canopies are also to be provided. Visitor parking is to be expanded and separated from bus traffic. Relocated front entrance, new site appurtenances such as pedestrian/parking lot lighting signage kiosks, welcoming area and walkways are also to be provided.

All work related to this project must comply with Executive Order 111 and be designed to incorporate Green Building design with LEED certification. It is important that new work should fit within the architectural and site context of the surrounding community. Site and design vocabulary developed for this phase will be utilized for all future phases.

EXECUTIVE SUMMARY

The following report outlines the existing site conditions, required site work and description of the proposed HVAC, Electric, Plumbing and Fire Protection systems for the Visitor Center. Review of the existing site conditions includes required modifications necessary to accommodate building construction. System descriptions include system types and capacities.

HVAC

Existing Conditions

The existing building HVAC systems are comprised of No. 2 fuel oil fired furnaces and electric heating systems. The majority of the systems have either reached their serviceable life expectancy, do not meet current building code, or are not sufficient in performance or function to be reused in the new program. The recently built restroom building, Building No. 7B, is intended to be integrated into the new program for the facility and coincidentally the associated HVAC system is to be upgraded accordingly. In conjunction with the demolition of the existing buildings on site, the associated HVAC systems are to be disconnected and removed accordingly as buildings are phased out.

Site Work

A geothermal bore field is to be installed in the location of the parking loop area in close relation to the mechanical room. A closed loop vertical bore type geothermal heat exchanger is recommended as the area required to meet the building load makes use of a horizontal heat exchanger impractical. Initial calculations indicate approximately 20 bores at 350 to 400 feet deep subdivided into 5 circuits of 4 parallel bores/loops will be required to provide sufficient heat exchange to meet building load. This would require a field area of approximately 80 feet by 100 feet.

System Description

The new HVAC system will be selected to be highly energy efficient and incorporate required materials and methods to provide a LEED Accredited building. Ground source geothermal heating and cooling technologies will be designed to provide for space conditioning and ventilation. All refrigeration systems shall incorporate HFC refrigerants in concordance with LEED ozone depletion requirements.

The ground source loop pumping system will be variable speed primary flow with pump speed to vary based on system pressure. The potential for below freezing temperatures in the ground loop will require use of antifreeze. A 20% ethylene glycol or methanol solution will provide the antifreeze protection required while having less pump energy impact than other alternatives. Pumps shall utilize premium efficiency motors. The geothermal system might offer educational opportunities through use of signage and system description literature. Through use of appropriate tagging and signage, students would be able to tour the mechanical system and understand the ecological impact of utilizing the ground source heat exchanger versus traditional fossil fuel based HVAC systems.

The building air side HVAC systems will consist of ground source heat pumps zoned to provide comfortable conditions for all occupants. Ventilation air is to be provided to the spaces via a dedicated energy recovery heat pump air handler. The ventilation is to be ducted to the return air intake of the heat pumps to provide appropriate distribution of fresh air. For locations requiring cabinet heaters or finned tube radiation water to water heat pumps can be utilized to produce heating hot water for this service. All heat pumps will use HFC refrigerants.

The building systems will be monitored and controlled by a state of the art Direct Digital Control system (DDC) to maximize control, scheduling, and optimization capabilities. The DDC will allow monitoring and changing of system setpoints, scheduled maintenance and failure alarm capabilities, trending of system variables, and remote access. The system shall be comprised of interoperable, stand alone digital

controllers communicating on an open protocol communication network. Information resident on the DDC shall be available to local computers as needed via local access network or remotely via the internet. The DDC shall communicate with other building systems such as lighting, energy metering, power management, clock displays, fire-life safety systems and other interoperable devices with communication capabilities.

ELECTRIC

Existing Conditions

The electric service for the site has been recently upgraded and is sufficient for the proposed improvements. The service originates from pad mounted, metal enclosed switchgear, SW-1, located on the south side of Game Farm Road and is distributed at 7620V. The existing primary distribution up to and including pad mounted switch SW-2 will remain. Existing transformer T-2, serving buildings No. 3, and 7a will need to be relocated. Existing primary distribution serving buildings No. 4, 4a, 5 and 6 will need to be relocated to avoid building footprint..

The existing telecommunication service for the site consists of overhead and underground lines and service pedestal all of which will remain. Existing telecommunication service for buildings No. 3, 4 and 4a will need to be relocated.

The existing bathrooms are served by a solar array which will need to be relocated.

Site Work

Existing transformer T-2 will be relocated and reconnected to maintain electric service to buildings 3, 4 and 4a. A new primary feeder will be extended from SW-2 and reconnected to existing underground distribution for buildings No. 4, 4a, 5 and 6.

The existing telecommunication service for buildings No. 3, 4, and 4a will be replaced with new conductors and reconnected to existing service pedestal.

Relocate existing solar array and reconnect to bathrooms. The solar array might offer educational opportunities through use of a display and watt and amp meters. Students would be able to monitor the system and understand the possibilities of the technology.

Electric Service for the Visitor Center building will consist of a new 150 KVA, 7620:208/120V, 3 phase pad mounted transformer, located north east of the building. The transformer will be fed underground from existing manhole HH#2. The existing site distribution will be spliced into at the manhole and extended. Due to the site modifications HH#2 will need to be modified to accommodate elevation changes and traffic loading.

Site lighting will consist of building mounted, bollards and pole mounted HID type fixtures. Fixtures will be provided with shielding and specified to minimize light pollution. Fixtures will be switched to allow for levels of lighting with DDC and photocell controls incorporated.

Telecommunication service for the Visitor Center will consist of new conductors (copper and Fiber) extended from the existing service pedestal to the building Telecom Closet.

System Description

The building will be served by a 400A, 120/208, 3 phase main distribution panel. Additional panels will be located in the building to serve local lighting and power needs. General purpose receptacles will be located throughout the building, including exterior mounted, controlled, receptacles.

Lighting will consist of several types of fluorescent fixtures. General office space and classroom lighting will be recessed, parabolic type. Architectural lighting will be used in public spaces and exhibit/viewing area. All lighting will be controlled via multiple switches, occupancy sensors and day lighting controls to provide variable lighting levels. Footcandle levels, and watts per square foot criteria will be as per LEED requirements.

A zoned, ADA compliant fire alarm system will serve the building. Notification of authorities will be via digital communicator and phone line.

Telephone and data cabling will be installed throughout the building.

PLUMBING

Existing Conditions

The existing toilet facility, building 7b was constructed in 2004. This facility is approximately 770 sq. ft. and is functioning as intended. The existing plumbing fixtures are adequate and meet ADA and Water Conservation requirements. The sanitary sewer discharge is handled by a grinder pump system.

Site Work

The existing grinder pump system is located immediately to the west of the building 7b. This system shall be maintained and incorporated into the proposed project scope. The proposed project should not affect the capacity or function of the existing systems. Coordination with the foundation design will need to be done to incorporate the existing piping mains with the foundation plan. A new 4" combination domestic water and fire service shall be provided. The existing domestic water shall be reconnected to the new service.

System Description

The proposed plumbing systems are to incorporate technologies in agreement with achieving LEED Certification. Materials using low and no flow capabilities are to be incorporated into the design, as deemed appropriate.

The proposed project program incorporates two unisex toilet rooms, kitchenette and janitors closet. All plumbing fixtures shall be ADA compliant as well as water conserving type fixtures. Each sink and lavatory faucet shall be provided with low flow, 0.5 gpm aerators. Lavatories shall be provided with

adjustable, automatic shut off infrared sensor type faucets. Each water closet is to be water conserving 1 gal per flush manual flush valves. Each flush valve is to incorporate "dual Flush" technology.

The domestic hot water system will be replaced in total. A tankless liquid propane hot water heating system shall be provided to serve the existing toilet facility and Visitor Center. Hot water recirculation and timer system will also be provided.

A 1" domestic water main shall be extended from the existing service located in the chase space between toilet rooms of Building 7B. A new 4" sanitary service is to exit the proposed building addition to the west and run due north to the location of the existing grinder pump system. The new gravity line is to connect to the gravity side of the existing sanitary system to the east of the grinder system.

In keeping with the environmentally conscious design of the building as a whole, it is advisable to retrofit all existing plumbing fixtures in Building 7B with the accessories listed above. In addition, the existing

urinals might be replaced with "Waterless Urinals" to provide a more eco friendly system and add benefit toward LEED Certification.

The proposed building addition and existing toilet facilities shall be fully sprinklered. The fire protection system shall be designed as an Ordinary Group 1 hazard utilizing a typical wet pipe system.

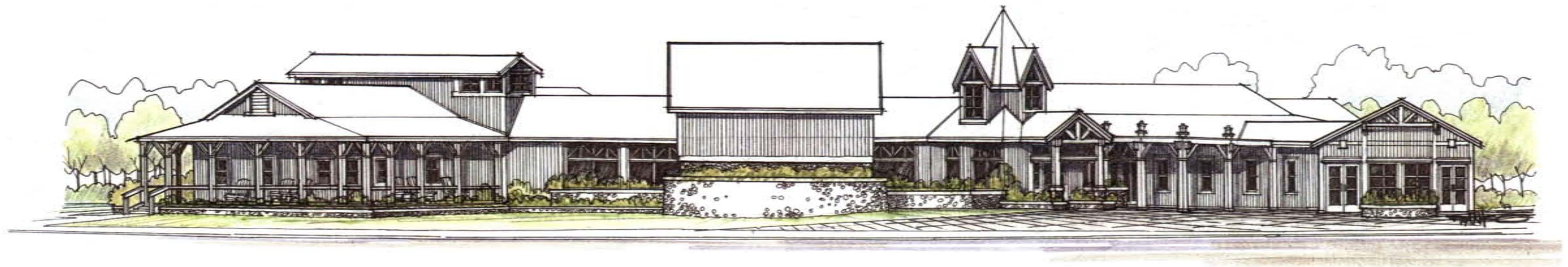
ESTIMATE

The attached Project Estimate dated October 6, 2006, indicates an estimated bid amount of \$4,238,000. Please note the "Valid Until" date indicated on the Project Estimate. Beyond that date, the estimate will be subject to escalation and the possibility of further deterioration of existing conditions.

DRAWINGS

A-001 Schematic Floor Plan and East Elevation

C-001 Schematic Site Plan



PROPOSED EAST ELEVATION - Option 01

SCALE: APPROX. 1/16"=1'-0"

FIVE RIVERS ENVIRONMENTAL EDUCATION CENTER

NYS DEC, Delmar, New York

DATE: October 31, 2006

Hyman Hayes
ASSOCIATES
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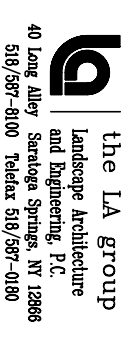


SCALE: APPROX. 1/16"=1'-0"

NYS DEC, Delmar, New York

Hyman  **Hayes**
A S S O C I A T E S

6 WEMBLEY COURT, ALBANY, NEW YORK 12205





LEGEND

1. RELOCATED ENTRY/SIGN
2. PARKING SPACES -147
3. PARKING LOT LIGHTS
4. TURF PARKING
5. RELOCATED ENTRANCE DRIVE
6. BUS ACCESS - FUTURE PHASE
7. GATE
8. VEHICULAR DROPOFF
9. ENVIRONMENTAL CENTER
10. COVERED TEACHING AREA
11. EXISTING BATHROOMS
12. STAFF ACCESS
13. DISABLED ACCESS
14. CLASSROOM ACCESS
15. FLAG STATION
16. BENCHES/INFORMATION KIOSK
17. LOADING/UTILITY
18. TRANSFORMER
19. TELEPHONE BOX
20. BIRD VIEWING - WETLAND/ROOF WATER
21. STORMWATER WETLAND
22. PEDESTRIAN LIGHTING
23. PICNIC AREA
24. BAND STRUCTURE
25. REGRADE - AMPHITHEATER
26. ACCESS ROAD TO THE WEST
27. CONNECT TRAILS TO NORTH
28. GEOTHERMAL BORE FIELD
29. PROPOSED WATER
30. PROPOSED SANITARY
31. PROPOSED ELECTRIC



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CONSULTANT



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THE ALTERATION OF THIS MATERIAL IN ANY WAY,
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PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT,
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FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE
NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS
AND IS A CLASS 'A' MISDEMEANOR.

CONTRACT:

TITLE: SITE IMPROVEMENTS
FIVE RIVERS ENVIRON. ED. CENTER

LOCATION: 56 GAME FARM ROAD
DELMAR, NEW YORK

CLIENT: NYS DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

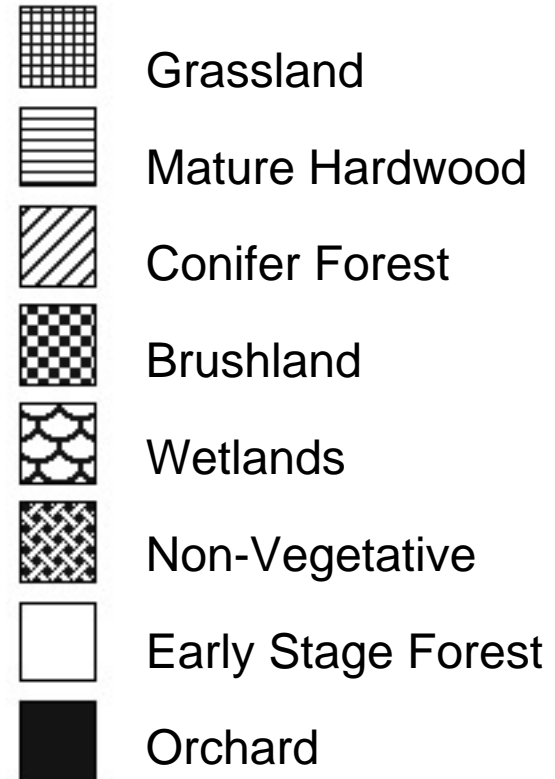
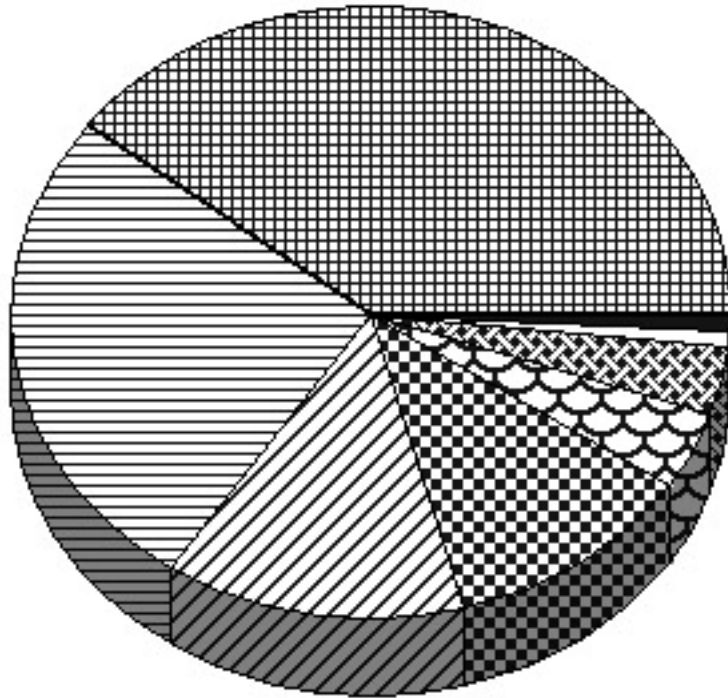
MARK	DATE	DESCRIPTION
PROJECT NUMBER:	43153	
DESIGNED BY:	DRM	
DRAWN BY:	DRM	
FIELD CHECK:	DRB	
APPROVED:	DTM	

SHEET TITLE:
SCHEMATIC
SITE PLAN

DRAWING NUMBER:
C-001

Five Rivers Habitats

446 Acres



Grassland	176 acres	39.5%
Mature Hardwood	117 acres	26.2%
Conifer Forest	60 acres	13.5%
Brushland	51 acres	11.4%
Wetlands	19 acres	4.3%
Non-Vegetative	16 acres	3.5%
Early Stage Forest	4 acres	0.9%
Orchard	3 acres	0.7%

Appendix 4

LIST OF WOODY VEGETATION Five Rivers Environmental Education Center

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<input type="checkbox"/> <i>Acer rubrum</i>	- Red maple	<input type="checkbox"/> <i>Populus deltoides</i>	- Eastern cottonwood
<input type="checkbox"/> <i>Acer saccharum</i>	- Sugar maple	<input type="checkbox"/> <i>Populus grandidentata</i>	- Big toothed aspen
<input type="checkbox"/> <i>Aesculus hippocastanum</i>	- Horsechestnut	<input type="checkbox"/> <i>Populus tremuloides</i>	- Quaking aspen
<input type="checkbox"/> <i>Alnus serrulata</i>	- Smooth alder	<input type="checkbox"/> <i>Prunus serotina</i>	- Black cherry
<input type="checkbox"/> <i>Amelanchier</i> sp.	- Juneberry	<input type="checkbox"/> <i>Prunus virginiana</i>	- Choke cherry
<input type="checkbox"/> <i>Asimina triloba</i>	- Common pawpaw	<input type="checkbox"/> <i>Pyrus</i> sp.	- Mountain ash
<input type="checkbox"/> <i>Berberis thunbergii</i>	- Japanese barberry	<input type="checkbox"/> <i>Pyrus malus</i>	- Common apple
<input type="checkbox"/> <i>Betula lenta</i>	- Black birch	<input type="checkbox"/> <i>Quercus alba</i>	- White oak
<input type="checkbox"/> <i>Betula papyrifera</i>	- Paper birch	<input type="checkbox"/> <i>Quercus palustris</i>	- Pin oak
<input type="checkbox"/> <i>Betula lutea</i>	- Yellow birch	<input type="checkbox"/> <i>Quercus montana</i>	- Chestnut oak
<input type="checkbox"/> <i>Cephalanthus occidentalis</i>	- Buttonbush	<input type="checkbox"/> <i>Quercus rubra</i>	- Red oak
<input type="checkbox"/> <i>Carpinus caroliniana</i>	- Ironwood	<input type="checkbox"/> <i>Rhamnus alnifolia</i>	- Alderleaf buckthorn
<input type="checkbox"/> <i>Carya cordiformis</i>	- Bitternut hickory	<input type="checkbox"/> <i>Rhamnus cathartica</i>	- Common buckthorn
<input type="checkbox"/> <i>Carya glabra</i>	- Pignut hickory	<input type="checkbox"/> <i>Rhus typhina</i>	- Staghorn sumac
<input type="checkbox"/> <i>Carya ovata</i>	- Shagbark hickory	<input type="checkbox"/> <i>Ribes nigrum</i>	- European black currant
<input type="checkbox"/> <i>Castanea dentata</i>	- American chestnut	<input type="checkbox"/> <i>Robinia pseudoacacia</i>	- Black locust
<input type="checkbox"/> <i>Castanea molissima</i>	- Chinese chestnut	<input type="checkbox"/> <i>Rosa</i> sp.	- Wild rose
<input type="checkbox"/> <i>Celastrus orbiculatus</i>	- European bittersweet	<input type="checkbox"/> <i>Rubus allegheniensis</i>	- Northern blackberry
<input type="checkbox"/> <i>Celastrus scandens</i>	- American bittersweet	<input type="checkbox"/> <i>Rubus idaeus</i>	- Red raspberry
<input type="checkbox"/> <i>Cornus</i>	- Grey stemmed dogwood	<input type="checkbox"/> <i>Rubus occidentalis</i>	- Black raspberry
<input type="checkbox"/> <i>Cornus florida</i>	- Flowering dogwood	<input type="checkbox"/> <i>Rubus odoratus</i>	- Flowering raspberry
<input type="checkbox"/> <i>Cornus foemina</i>	- Red panicle dogwood	<input type="checkbox"/> <i>Sambucus canadensis</i>	- Elderberry
<input type="checkbox"/> <i>Corylus americana</i>	- American hazelnut	<input type="checkbox"/> <i>Sassafras albidum</i>	- Sassafras
<input type="checkbox"/> <i>Corylus cornuta</i>	- Beaked hazel	<input type="checkbox"/> <i>Salix</i> sp.	- Willow
<input type="checkbox"/> <i>Crataegus</i> sp.	- Thornapple	<input type="checkbox"/> <i>Smilax</i> sp.	- Greenbrier
<input type="checkbox"/> <i>Eleaegnus umbellata</i>	- Autumn olive	<input type="checkbox"/> <i>Symphoricarpos albus</i>	- Snowberry
<input type="checkbox"/> <i>Eleaegnus</i>	- Russian olive	<input type="checkbox"/> <i>Syringa</i> sp.	- Common lilac
<input type="checkbox"/> <i>Fagus grandifolia</i>	- American beech	<input type="checkbox"/> <i>Thuja occidentalis</i>	- Northern white cedar
<input type="checkbox"/> <i>Forsythia</i> sp.	- Forsythia	<input type="checkbox"/> <i>Tilia americana</i>	- Basswood
<input type="checkbox"/> <i>Fraxinus americana</i>	- White ash	<input type="checkbox"/> <i>Toxicodendron radicans</i>	- Poison ivy
<input type="checkbox"/> <i>Fraxinus nigra</i>	- Black ash	<input type="checkbox"/> <i>Tsuga canadensis</i>	- Eastern hemlock
<input type="checkbox"/> <i>Fraxinus pennsylvanica</i>	- Red ash	<input type="checkbox"/> <i>Ulmus americana</i>	- American elm
<input type="checkbox"/> <i>Halesia tetraptera</i>	- Carolina silverbell	<input type="checkbox"/> <i>Ulmus rubra</i>	- Slippery elm
<input type="checkbox"/> <i>Hamamelis virginiana</i>	- Witch-hazel	<input type="checkbox"/> <i>Viburnum acerifolium</i>	- Mapleleaf viburnum
<input type="checkbox"/> <i>Ilex verticillata</i>	- Common winterberry	<input type="checkbox"/> <i>Viburnum lentago</i>	- Nannyberry
<input type="checkbox"/> <i>Juglans nigra</i>	- Black walnut	<input type="checkbox"/> <i>Viburnum recognitum</i>	- Northern arrowwood
<input type="checkbox"/> <i>Juniperus virginiana</i>	- Red cedar	<input type="checkbox"/> <i>Viburnum trilobum</i>	- Cranberry viburnum
<input type="checkbox"/> <i>Larix decidua</i>	- European larch	<input type="checkbox"/> <i>Vitis</i> sp.	- Wild grape
<input type="checkbox"/> <i>Ligustrum vulgare</i>	- Common privet		
<input type="checkbox"/> <i>Lonicera xylosteum</i>	- European fly honeysuckle		
<input type="checkbox"/> <i>Magnolia acuminata</i>	- Cucumber tree		
<input type="checkbox"/> <i>Morus alba</i>	- White mulberry		
<input type="checkbox"/> <i>Nyssa sylvatica</i>	- Black gum		
<input type="checkbox"/> <i>Ostrya virginiana</i>	- Hop hornbeam		
<input type="checkbox"/> <i>Picea glauca</i>	- White spruce		
<input type="checkbox"/> <i>Picea abies</i>	- Norway spruce		
<input type="checkbox"/> <i>Pinus resinosa</i>	- Red pine		
<input type="checkbox"/> <i>Pinus strobus</i>	- Eastern white pine		
<input type="checkbox"/> <i>Pinus sylvestris</i>	- Scotch pine		

Appendix 5

LIST OF GRASSES AND FERNS Five Rivers Environmental Education Center

GRASSES

<input type="checkbox"/>	<i>Agnopyron repens</i>	Quack grass
<input type="checkbox"/>	<i>Bromas inermis</i>	Smooth brome
<input type="checkbox"/>	<i>Carey crinita</i>	Fringed sedge
<input type="checkbox"/>	<i>Carey scoparia</i>	Pointed broom sedge
<input type="checkbox"/>	<i>Carey spicata</i>	Lesser prickly sedge
<input type="checkbox"/>	<i>Carey stipata</i>	Awl-fruited sedge
<input type="checkbox"/>	<i>Carey tribuloides</i>	Blunt broom sedge
<input type="checkbox"/>	<i>Carey vulpinoidea</i>	Fox sedge
<input type="checkbox"/>	<i>Cignotis alba</i>	Red top
<input type="checkbox"/>	<i>Dachylis glomerata</i>	Orchard grass
<input type="checkbox"/>	<i>Equisetum arvense</i>	Common horsetail
<input type="checkbox"/>	<i>Festuca elatior</i>	Meadow fescue
<input type="checkbox"/>	<i>Glyceria grandis</i>	Reed meadow grass
<input type="checkbox"/>	<i>Histrix patula</i>	Bottlebrush grass
<input type="checkbox"/>	<i>Juncus tenuis</i>	Path rush
<input type="checkbox"/>	<i>Pea annua</i>	Spear grass
<input type="checkbox"/>	<i>Pea compressa</i>	Canada bluegrass
<input type="checkbox"/>	<i>Pea protensis</i>	Kentucky bluegrass
<input type="checkbox"/>	<i>Phalaris arundinacea</i>	Reed canary grass
<input type="checkbox"/>	<i>Phleum pratense</i>	Timothy
<input type="checkbox"/>	<i>Phragmites communis</i>	Reed
<input type="checkbox"/>	<i>Scirpus lineatus</i>	Reddish bulrush
<input type="checkbox"/>	<i>Scirpus rubrotinches</i>	Barberpole sedge
<input type="checkbox"/>	<i>Scirpus validus</i>	American great rush

FERNS

<input type="checkbox"/>	<i>Adiantum pedatum</i>	Northern maidenhair fern
<input type="checkbox"/>	<i>Asplenium platyneuron</i>	Ebony spleenwort
<input type="checkbox"/>	<i>Athyrium asplenoides</i>	Lady fern
<input type="checkbox"/>	<i>Camptosorus rhizophyllus</i>	Walking fern
<input type="checkbox"/>	<i>Cystopteris fragilis</i>	Fragile fern
<input type="checkbox"/>	<i>Dennstaedtia punctilobula</i>	Hay scented fern
<input type="checkbox"/>	<i>Dryopteris carthusiana</i>	Spinulose wood fern
<input type="checkbox"/>	<i>Dryopteris marginalis</i>	Marginal wood fern
<input type="checkbox"/>	<i>Onoclea sensibilis</i>	Sensitive fern
<input type="checkbox"/>	<i>Osmunda cinnamomea</i>	Interrupted fern
<input type="checkbox"/>	<i>Polypodium virginianum</i>	Common Polypody
<input type="checkbox"/>	<i>Polystichum acrostichoides</i>	Christmas fern
<input type="checkbox"/>	<i>Thelypteris novaboracensis</i>	New York fern
<input type="checkbox"/>	<i>Thelypteris palustris</i>	Marsh fern

Appendix 6

LIST OF WILDFLOWERS Five Rivers Environmental Education Center

- ☐ Agrimony (*Agrimonia* sp.)
- ☐ Alexander, Golden (*Zizia aurea*)
- ☐ Anemone, Canada (*Anemone canadensis*)
- ☐ Anemone, Wood (*Anemone quinquefolia*)
- ☐ Aster, New England (*Aster nova-angliae*)
- ☐ Aster, New York (*Aster novae-belgii*)
- ☐ Aster, ssp. (*Aster* spp.)
- ☐ Avens, White (*Geum canadense*)
- ☐ Baneberry, White (*Actaea pacypoda*)
- ☐ Beardtongue (*Penstemon* sp.)
- ☐ Bedstraw, Fragrant (*Galium triflorum*)
- ☐ Bedstraw, Rough White (*Galium asprelunum*)
- ☐ Bedstraw, Yellow (*Galium verum*)
- ☐ Bellwort, Sessile (*Uvularia sessifolia*)
- ☐ Bindweed, Hedge (*Convolvulus sepium*)
- ☐ Bittercress, Pennsylvania (*Cardamine pennsylvanica*)
- ☐ Black-eyed Susan *Rudbeckia hirta*
- ☐ Bloodroot (*Sanguinaria canadensis*)
- ☐ Blue-eyed Grass (*Sisyrinchium* sp.)
- ☐ Blue Flag, Larger (*Iris versicolor*)
- ☐ Boneset (*Eupatorium perfoliatum*)
- ☐ Bouncing Bet (*Saponaria officinalis*)
- ☐ Bugle (*Ajuga reptans*)
- ☐ Burdock, Common (*Arctium minus*)
- ☐ Butter-and-Eggs (*Lunaria vulgaris*)
- ☐ Buttercup, Common (*Ranunculus septentrionalis*)
- ☐ Buttercup, Kidneyleaf (*Ranunculus abortivus*)
- ☐ Buttercup, Swamp (*Ranunculus septentrionalis*)
- ☐ Campion, Bladder (*Silene cucubalus*)
- ☐ Catnip (*Nepeta cataria*)
- ☐ Chickweed, Common (*Stellaria media*)
- ☐ Chickweed, Mouse-Ear (*Cerastium vulgatum*)
- ☐ Chicory (*Cichorium intybus*)
- ☐ Cinquefoil, Common (*Potentilla simplex*)
- ☐ Cinquefoil, Dwarf (*Potentilla canadensis*)
- ☐ Cinquefoil, Rough-Fruited (*Potentilla recta*)
- ☐ Cinquefoil, Silvery (*Potentilla argentea*)
- ☐ Clover, Alsike (*Trifolium hybridum*)
- ☐ Clover, Hop (*Trifolium agrarium*)
- ☐ Clover, Least Hop (*Trifolium dubium*)
- ☐ Clover, Red (*Trifolium pratense*)
- ☐ Clover, White (*Trifolium repens*)
- ☐ Clover, White Sweet (*Melilotus alba*)
- ☐ Clover, Yellow Sweet (*Melilotus officinalis*)
- ☐ Coltsfoot (*Tussilago farfar*)
- ☐ Comfrey (*Symphytum officinale*)
- ☐ Coneflower, Thin-leaved (*Rudbeckia triloba*)
- ☐ Cucumber, Wild (*Echinocystis lobata*)
- ☐ Daisy, Ox-Eye (*Chrysanthemum leucanthemum*)
- ☐ Dame's Rocket (*Hesperis matronalis*)
- ☐ Dandelion (*Taraxacum officinale*)
- ☐ Dock, Curled (*Rumex crispus*)
- ☐ Feverwort (*Triosteum perfoliatum*)
- ☐ Fleabane, Common (*Erigeron philalephicus*)
- ☐ Fleabane, Daisy (*Erigeron annuus*)
- ☐ Foamflower (*Tiarella cordifolia*)
- ☐ Garlic, Field (*Allium vineale*)
- ☐ Geranium, Wild (*Geranium maculatum*)
- ☐ Germander (*Teucrium canadense*)
- ☐ Gill-over-the-Ground (*Glechoma hederacea*)
- ☐ Goat's-Beard, Yellow (*Tragopogon pratensis*)
- ☐ Goldenrod, Canada (*Solidago canadensis*)
- ☐ Goldenrod, Early (*Solidago juncea*)
- ☐ Goldenrod, Lance-leaved (*Solidago graminifolia*)
- ☐ Hawkweed, Mouse-eared (*Hieracium aurantiacum*)
- ☐ Hawkweed, Orange (*Hieracium pilosella*)
- ☐ Heal-All (*Prunella vulgaris*)
- ☐ Hellebore, False (*Veratrum viride*)
- ☐ Hemlock, Poison (*Conium maculatum*)
- ☐ Hepatica, Round-lobed (*Hepatica americana*)
- ☐ Herb-Robert (*Geranium robertianum*)
- ☐ Hog-Peanut (*Amphicarpa bracteata*)
- ☐ Horse-Balm (*Collinsonia canadensis*)
- ☐ Indian Hemp (*Apocynum cannabinum*)
- ☐ Indian-tobacco (*Lobelia inflata*)
- ☐ Jack-in-the-Pulpit (*Arisaema atrorubens*)
- ☐ Jewelweed (*Impatiens carpensis*)
- ☐ Joe-Pye-Weed (*Eupatorium fistulosum*)
- ☐ King Devil [Hawkweed, Yellow] (*Hieracium pratense*)
- ☐ Knapweed, Brown (*Centaurea jacea*)
- ☐ Knapweed, Spotted (*Centaurea maculosa*)
- ☐ Knotweed, Virginia (*Tovara virginiana*)
- ☐ Lady's-thumb (*Polygonum persicaria*)
- ☐ Loosestrife, Fringed (*Lysimachia ciliata*)
- ☐ Loosestrife, Purple (*Lysimachia salicaria*)
- ☐ Lychnis, Evening [Campion, White] (*Lychnis alba*)
- ☐ Madder, Wild (*Galium mollugo*)
- ☐ Marigold, Marsh (*Caltha palustris*)
- ☐ Mayapple (*Podophyllum peltatum*)
- ☐ Mayflower, Canada (*Maianthemum canadense*)

- ☐ Milkweed, Common (*Asclepias syriaca*)
- ☐ Milkweed, Swamp (*Asclepias incarnata*)
- ☐ Mint, Wild (*Mentha arvensis*)
- ☐ Miterwort (*Mitella diphylla*)
- ☐ Moneywort (*Lysimachia nummularia*)
- ☐ Motherwort (*Leonurus cardiaca*)
- ☐ Mountain-mint, Hoary (*Pycnanthemum icanum*)
- ☐ Mountain-mint, [Narrow-leaved?] (*Pycnanthemum sp.*)
- ☐ Mullein, Common (*Verbascum thapsus*)
- ☐ Mustard, Garlic (*Alliaria officinalis*)
- ☐ Nightshade, Purple (*Solanum dulcamara*)
- ☐ Orpine (*Sedum telephium*)
- ☐ Parsnip, Cow (*Heracleum maximum*)
- ☐ Peppergrass, Field (*Lepidum campestre*)
- ☐ Pimpernel (*Anagallis arvensis*)
- ☐ Pineapple-weed (*Matricaria matricarioides*)
- ☐ Pink, Deptford (*Dianthus armeria*)
- ☐ Plantain, Common (*Plantago major*)
- ☐ Plantain, English (*Plantago lanceolata*)
- ☐ Polygala, Fringed (*Polygala paucifolia*)
- ☐ Primrose, Common Evening (*Oenothera biennis*)
- ☐ Queen Anne's Lace (*Daucus carota*)
- ☐ Ragweed, Common (*Ambrosia artemisiifolia*)
- ☐ Rose, Multiflora (*Rosa multiflora*)
- ☐ Rue, Early Meadow (*Thalictrum dioicum*)
- ☐ Rue, Tall Meadow (*Thalictrum polygamum*)
- ☐ St. Johnswort, Common (*Hypericum perforatum*)
- ☐ Sarsaparilla, Wild (*Aralia nudicaulis*)
- ☐ Shepherd's Purse (*Capsella bursa-pastoris*)
- ☐ Skunk Cabbage (*Symplocarpus foetidus*)
- ☐ Solomon's Seal, False (*Smilacina racemosa*)
- ☐ Sorrel, Sheep (*Rumex acetosella*)
- ☐ Speedwell, Common (*Veronica officinalis*)
- ☐ Speedwell, Thyme-leaved (*Veronica serpyllifolia*)
- ☐ Strawberry, Barren (*Waldsteinia fragarioides*)
- ☐ Strawberry, Common (*Fragaria virginiana*)
- ☐ Sundrops (*Oenothera fruticosa*)
- ☐ Tearthumb, Arrow-leaved (*Polygonum sagittatum*)
- ☐ Teasel (*Dipsacus laciniatus*)
- ☐ Thistle, Bull (*Cirsium vulgare*)
- ☐ Thistle, Canada ((*Cirsium arvense*)
- ☐ Toothwort, Cut-leaved (*Dentaria laciniata*)
- ☐ Trefoil, Birdfoot (*Lotus corniculatus*)
- ☐ Trillium, Red (*Trillium erectum*)
- ☐ Trout Lily (*erythronium americanum*)
- ☐ Vervain, Blue (*Verbena hastata*)
- ☐ Vervain, White (*Verbena urticifolia*)
- ☐ Vetch, Cow (*Vivia cracca*)
- ☐ Vetch, Slender (*Vivia tetrasperma*)
- ☐ Violet, Common Blue (*Viola papilionacea*)
- ☐ Violet, Downy Yellow (*Viola pubescens*)
- ☐ Violet, Long-spurred (*Viola rostrata*)
- ☐ Violet, Marsh Blue (*Viola cucullata*)
- ☐ Violet, Round-leaved Yellow (*Viola rotundifolia*)
- ☐ Willow-herb Northern ((*Epilobium glandulosum*)
- ☐ Winter Cress (*Barbarea vulgaris*)
- ☐ Wood-sorrel, Yellow (*Oxalis eruopea*)
- ☐ Yarrow (*Achillea millefolium*)

Appendix 7

LIST OF MAMMALS Five Rivers Environmental Education Center

MAMMALS

- ☐ Opossum
- ☐ Short Tailed Shrew
- ☐ Little Brown Bat
- ☐ Big Brown Bat
- ☐ Red Bat
- ☐ Northern Long Eared Bat
- ☐ Raccoon
- ☐ Fisher
- ☐ Mink
- ☐ River Otter
- ☐ Striped Skunk
- ☐ Red Fox
- ☐ Gray Fox
- ☐ Eastern Coyote
- ☐ Woodchuck
- ☐ Eastern Chipmunk
- ☐ Red Squirrel
- ☐ Gray Squirrel
- ☐ Mink
- ☐ American Beaver
- ☐ White Footed Mouse
- ☐ Meadow Vole
- ☐ Muskrat
- ☐ Norway Rat
- ☐ Eastern Cottontail
- ☐ White Tailed Deer

Appendix 8

LIST OF BIRDS Five Rivers Environmental Education Center

- | | |
|--|--|
| <input type="checkbox"/> Common Loon | <input type="checkbox"/> Semipalmated Plover |
| <input type="checkbox"/> Pied-billed Grebe | <input type="checkbox"/> Killdeer |
| <input type="checkbox"/> Horned Grebe | <input type="checkbox"/> Greater Yellowlegs |
| <input type="checkbox"/> Double-crested Cormorant | <input type="checkbox"/> Lesser Yellowlegs |
| <input type="checkbox"/> American Bittern | <input type="checkbox"/> Solitary Sandpiper |
| <input type="checkbox"/> Great Blue Heron | <input type="checkbox"/> Spotted Sandpiper |
| <input type="checkbox"/> Great Egret | <input type="checkbox"/> Least Sandpiper |
| <input type="checkbox"/> Cattle Egret | <input type="checkbox"/> Pectoral Sandpiper |
| <input type="checkbox"/> Green Heron | <input type="checkbox"/> Short-billed Dowitcher |
| <input type="checkbox"/> Little Blue Heron | <input type="checkbox"/> Common Snipe |
| <input type="checkbox"/> Black-crowned Night Heron | <input type="checkbox"/> American Woodcock |
| <input type="checkbox"/> Tundra Swan | <input type="checkbox"/> Ring-billed Gull |
| <input type="checkbox"/> Snow Goose | <input type="checkbox"/> Herring Gull |
| <input type="checkbox"/> Brant | <input type="checkbox"/> Iceland Gull |
| <input type="checkbox"/> Canada Goose | <input type="checkbox"/> Great Black-backed Gull |
| <input type="checkbox"/> Wood Duck | <input type="checkbox"/> Black Tern |
| <input type="checkbox"/> Green Winged Teal | <input type="checkbox"/> Rock Dove |
| <input type="checkbox"/> American Black Duck | <input type="checkbox"/> Mourning Dove |
| <input type="checkbox"/> Mallard | <input type="checkbox"/> Black-billed Cuckoo |
| <input type="checkbox"/> Northern Pintail | <input type="checkbox"/> Yellow-billed Cuckoo |
| <input type="checkbox"/> Blue Winged Teal | <input type="checkbox"/> Eastern Screech Owl |
| <input type="checkbox"/> Northern Shoveller | <input type="checkbox"/> Great Horned Owl |
| <input type="checkbox"/> Gadwall | <input type="checkbox"/> Snowy Owl |
| <input type="checkbox"/> American Wigeon | <input type="checkbox"/> Barred Owl |
| <input type="checkbox"/> Canvasback | <input type="checkbox"/> Long-eared Owl |
| <input type="checkbox"/> Ring-necked Duck | <input type="checkbox"/> Short-eared Owl |
| <input type="checkbox"/> Lesser Scaup | <input type="checkbox"/> Northern Saw-whet Owl |
| <input type="checkbox"/> Common Goldeneye | <input type="checkbox"/> Common Nighthawk |
| <input type="checkbox"/> Bufflehead | <input type="checkbox"/> Chimney Swift |
| <input type="checkbox"/> Hooded Merganser | <input type="checkbox"/> Ruby-throated Hummingbird |
| <input type="checkbox"/> Common Merganser | <input type="checkbox"/> Belted Kingfisher |
| <input type="checkbox"/> Ruddy Duck | <input type="checkbox"/> Red-headed Woodpecker |
| <input type="checkbox"/> Turkey Vulture | <input type="checkbox"/> Red-bellied Woodpecker |
| <input type="checkbox"/> Osprey | <input type="checkbox"/> Yellow-bellied Woodpecker |
| <input type="checkbox"/> Swallow-tailed Kite | <input type="checkbox"/> Downy Woodpecker |
| <input type="checkbox"/> Northern Harrier | <input type="checkbox"/> Hairy Woodpecker |
| <input type="checkbox"/> Sharp-shinned Hawk | <input type="checkbox"/> Northern Flicker |
| <input type="checkbox"/> Cooper's Hawk | <input type="checkbox"/> Pileated Woodpecker |
| <input type="checkbox"/> Northern Goshawk | <input type="checkbox"/> Olive-sided Flycatcher |
| <input type="checkbox"/> Red-Shouldered Hawk | <input type="checkbox"/> Eastern Wood Pewee |
| <input type="checkbox"/> Broad-winged Hawk | <input type="checkbox"/> Alder Flycatcher |
| <input type="checkbox"/> Red-tailed Hawk | <input type="checkbox"/> Willow Flycatcher |
| <input type="checkbox"/> Rough-legged Hawk | <input type="checkbox"/> Least Flycatcher |
| <input type="checkbox"/> Golden Eagle | <input type="checkbox"/> Eastern Phoebe |
| <input type="checkbox"/> Bald Eagle | <input type="checkbox"/> Say's Phoebe |
| <input type="checkbox"/> American Kestrel | <input type="checkbox"/> Yellow-bellied Flycatcher |
| <input type="checkbox"/> Merlin | <input type="checkbox"/> Great-crested Flycatcher |
| <input type="checkbox"/> Peregrine Falcon | <input type="checkbox"/> Eastern Kingbird |
| <input type="checkbox"/> Ring-necked Pheasant | <input type="checkbox"/> Horned Lark |

- ☐ Ruffed Grouse
- ☐ Wild Turkey
- ☐ Northern Bobwhite
- ☐ Virginia Rail
- ☐ Common Moorhen
- ☐ American Coot
- ☐ Blue Jay
- ☐ Common Raven
- ☐ American Crow
- ☐ Fish Crow
- ☐ Black-capped Chickadee
- ☐ Boreal Chickadee
- ☐ Tufted Titmouse
- ☐ Red-breasted Nuthatch
- ☐ White-breasted Nuthatch
- ☐ Brown Creeper
- ☐ Carolina Wren
- ☐ House Wren
- ☐ Winter Wren
- ☐ Sedge Wren
- ☐ Marsh Wren
- ☐ Golden-crowned Kinglet
- ☐ Ruby-crowned Kinglet
- ☐ Blue-gray Gnatcatcher
- ☐ Eastern Bluebird
- ☐ Veery
- ☐ Gray-cheeked Thrush
- ☐ Swainson's Thrush
- ☐ Hermit Thrush
- ☐ Wood Thrush
- ☐ American Robin
- ☐ Gray Catbird
- ☐ Northern Mockingbird
- ☐ Brown Thrasher
- ☐ American Pipit
- ☐ Cedar Waxwing
- ☐ Northern Shrike
- ☐ Loggerhead Shrike
- ☐ European Starling
- ☐ White-eyed Vireo
- ☐ Solitary Vireo
- ☐ Yellow-throated Vireo
- ☐ Warbling Vireo
- ☐ Philadelphia Vireo
- ☐ Red-eyed Vireo
- ☐ Blue-winged Warbler
- ☐ Golden-winged Warbler
- ☐ Tennessee Warbler
- ☐ Nashville Warbler
- ☐ Northern Parula
- ☐ Yellow Warbler
- ☐ Chestnut-sided Warbler
- ☐ Magnolia Warbler
- ☐ Cape May Warbler

- ☐ Purple Martin
- ☐ Tree Swallow
- ☐ Northern Rough-winged Swallow
- ☐ Bank Swallow
- ☐ Cliff Swallow
- ☐ Barn Swallow
- ☐ Black-and-white Warbler
- ☐ American Redstart
- ☐ Worm-eating Warbler
- ☐ Ovenbird
- ☐ Northern Waterthrush
- ☐ Louisiana Waterthrush
- ☐ Connecticut Warbler
- ☐ Mourning Warbler
- ☐ Common Yellowthroat
- ☐ Wilson's Warbler
- ☐ Canada Warbler
- ☐ Yellow-breasted Chat
- ☐ Scarlet Tanager
- ☐ Northern Cardinal
- ☐ Rose-breasted Grosbeak
- ☐ Indigo Bunting
- ☐ Eastern Towhee
- ☐ American Tree Sparrow
- ☐ Chipping Sparrow
- ☐ Field Sparrow
- ☐ Vesper Sparrow
- ☐ Savannah Sparrow
- ☐ Grasshopper Sparrow
- ☐ Henslow's Sparrow
- ☐ Fox Sparrow
- ☐ Song Sparrow
- ☐ Lincoln's Sparrow
- ☐ Swamp Sparrow
- ☐ White-throated Sparrow
- ☐ White-crowned Sparrow
- ☐ Dark-eyed Junco
- ☐ Snow Bunting
- ☐ Bobolink
- ☐ Red-winged Blackbird
- ☐ Eastern Meadowlark
- ☐ Rusty Blackbird
- ☐ Common Grackle
- ☐ Brown-headed Cowbird
- ☐ Orchard Oriole
- ☐ Baltimore Oriole
- ☐ Pine Grosbeak
- ☐ Purple Finch
- ☐ House Finch
- ☐ Red Crossbill
- ☐ White-winged Crossbill
- ☐ Common Redpoll
- ☐ Pine Siskin
- ☐ American Goldfinch

- ☐ Black-throated Blue Warbler
- ☐ Yellow-rumped Warbler
- ☐ Black-throated Green Warbler
- ☐ Blackburnian Warbler
- ☐ Pine Warbler
- ☐ Prairie Warbler
- ☐ Palm Warbler
- ☐ Bay-breasted Warbler
- ☐ Blackpoll Warbler
- ☐ Cerulean Warbler
- ☐ Evening Grosbeak
- ☐ House Sparrow

1-18-07

Appendix 9

LIST OF REPTILES & AMPHIBIANS Five Rivers Environmental Education Center

REPTILES

- ☐ Snapping Turtle
- ☐ Painted Turtle
- ☐ Musk Turtle
- ☐ Wood Turtle
- ☐ Northern Brownsnake
- ☐ Eastern Gartersnake
- ☐ Eastern Milk Snake

AMPHIBIANS

- ☐ Eastern American toad
- ☐ Gray Treefrog
- ☐ Spring Peeper
- ☐ Pickerel Frog
- ☐ Leopard Frog
- ☐ American Bullfrog
- ☐ Northern Green Frog
- ☐ Wood Frog
- ☐ Spotted Salamander
- ☐ Northern Dusky Salamander
- ☐ Two-lined Salamander
- ☐ Eastern Red-backed Salamander
- ☐ Red Spotted Newt

Appendix 10

LIST OF BUTTERFLIES Five Rivers Environmental Education Center

Swallowtails

- ☐ Black swallowtail
- ☐ Eastern tiger swallowtail
- ☐ Canadian tiger swallowtail

Whites

- ☐ Cabbage white

Sulphurs

- ☐ Clouded sulphur
- ☐ Orange sulphur
- ☐ Cloudless sulphur

Coppers

- ☐ American copper
- ☐ Bronze copper

Hairstreaks

- ☐ Eastern pine elfin

Blues

- ☐ Eastern tailed blue
- ☐ 'Summer' Spring azure

Fritillary

- ☐ Great spangled fritillary
- ☐ Meadow fritillary

True Brush Foots

- ☐ Harris' checkerspot
- ☐ Pearl crescent
- ☐ Baltimore checkerspot
- ☐ Eastern comma
- ☐ Gray comma
- ☐ Compton tortoiseshell
- ☐ Mourning cloak
- ☐ Milbert's tortoiseshell
- ☐ Painted lady
- ☐ Red admiral

Admirals

- ☐ Red-spotted purple
- ☐ White admiral
- ☐ Viceroy

Satyrs

- ☐ Eyed brown
- ☐ Little wood satyr
- ☐ Inornate common ringlet
- ☐ Common wood nymph
- ☐ Monarch

Spread Wing Skippers

- ☐ Silver spotted skipper

Grass Skippers

- ☐ Least skipper
- ☐ European skipper
- ☐ Peck's skipper
- ☐ Tawny edged skipper
- ☐ Long dash
- ☐ Little glassywing
- ☐ Delaware skipper
- ☐ Hobomok skipper

Appendix 11

LIST OF DRAGONFLIES Five Rivers Environmental Education Center

Lestidae

- | | | |
|--------------------------|--------------------|---------------------|
| <input type="checkbox"/> | Elegant Spreadwing | (Lestes inaequalis) |
|--------------------------|--------------------|---------------------|

Coenagrionidae

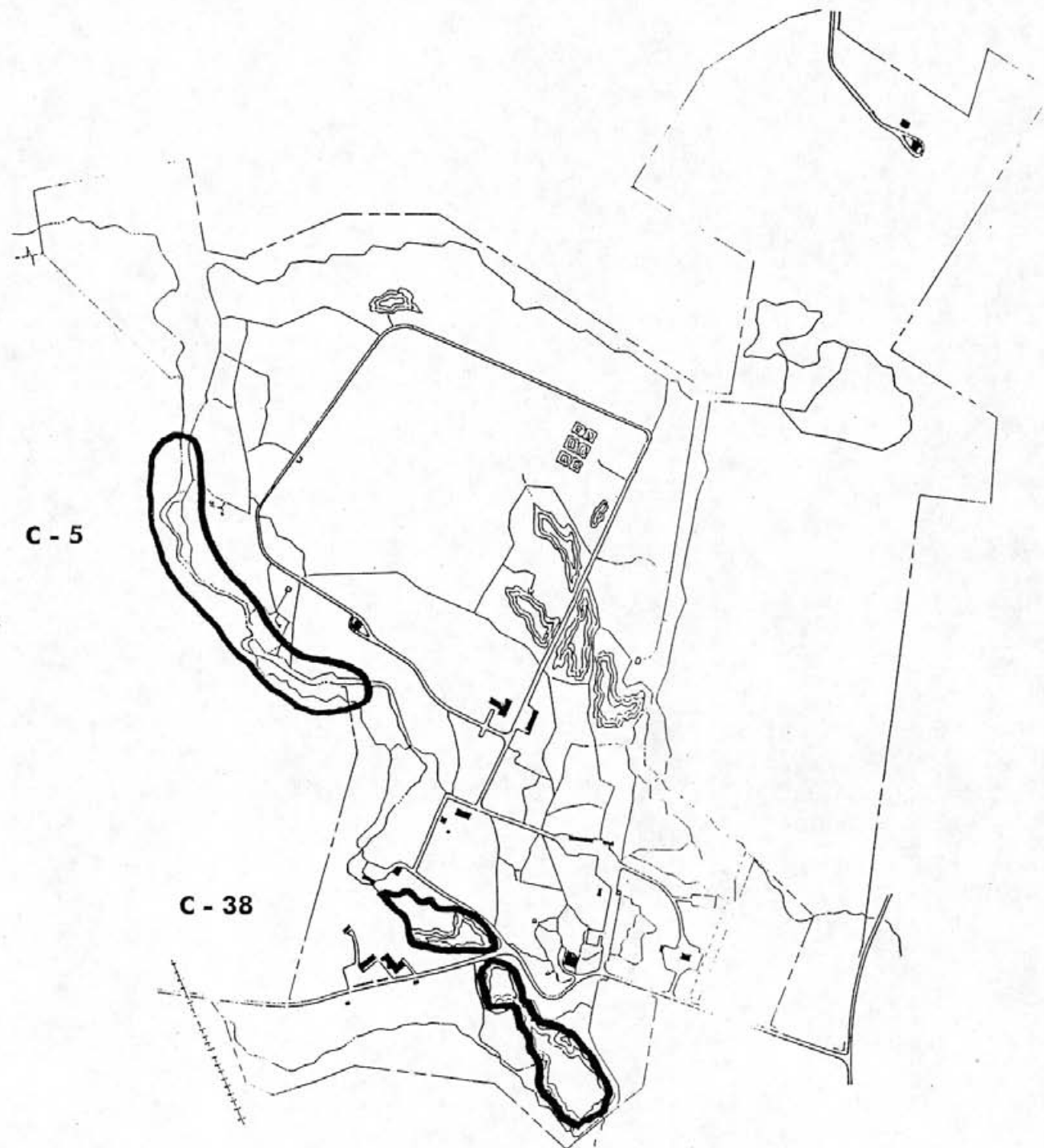
- | | | |
|--------------------------|------------------|-----------------------|
| <input type="checkbox"/> | Powdered Dancer | (Argia moesta) |
| <input type="checkbox"/> | Fragile Forktail | (Ischnura posita) |
| <input type="checkbox"/> | Eastern Forktail | (Ischnura verticalis) |

Libellulidae

- | | | |
|--------------------------|------------------------|----------------------------|
| <input type="checkbox"/> | Calico Pennant | (Celithemis elisa) |
| <input type="checkbox"/> | Halloween Pennant | (Celithemis eponina) |
| <input type="checkbox"/> | Eastern Pondhawk | (Erythemis simplicicollis) |
| <input type="checkbox"/> | Widow Skimmer | (Libellula luctuosa) |
| <input type="checkbox"/> | Twelve Spotted Skimmer | (Libellula pulchella) |
| <input type="checkbox"/> | Blue Dasher | (Pachydiplax longipennis) |
| <input type="checkbox"/> | Eastern Amberwing | (Parithemis tenera) |
| <input type="checkbox"/> | Common Whitetail | (Plathemis lydia) |
| <input type="checkbox"/> | Black Saddlebags | (Tramea lacerata) |

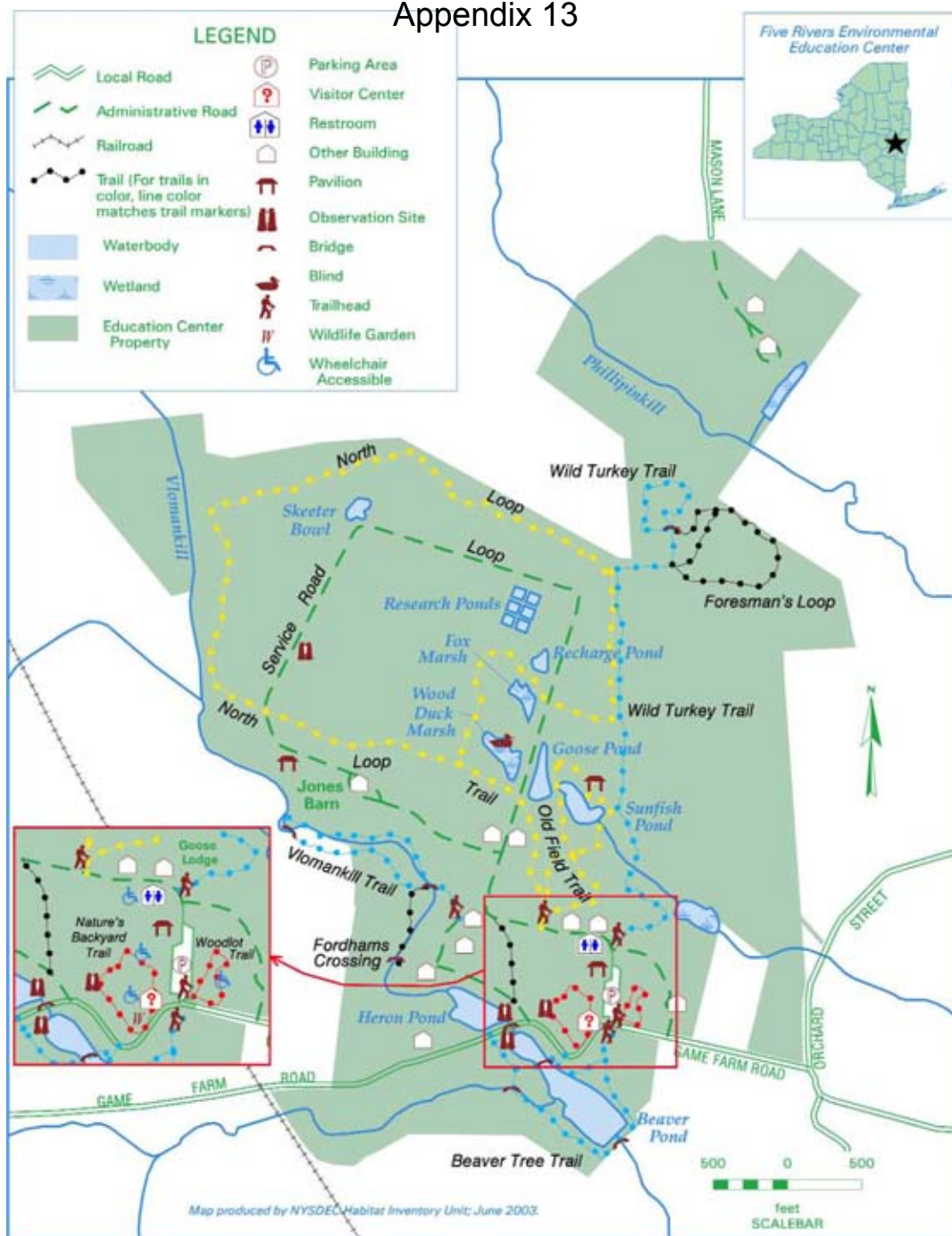
1-18-07

Regulated Freshwater Wetlands



Five Rivers Environmental Education Center

Appendix 13



INTERPRETIVE TRAILS

Seasonal interpretive brochures are available at each trailhead. Braille, large print and audio format guides are available at the Visitor Center.

Nature's Accessible Backyard Trail (0.2 mile) ●●●●

A paved path features a backyard habitat, wildlife garden, water garden, bird feeding areas, gazebo and scenic views. Meets ADA specifications for wheelchair and elderly access.

Beaver Tree Trail (0.5 mile) ●●●●

Circling Beaver Pond, this trail features scenic overlooks and close approaches to the pond, with excellent opportunity to enjoy turtles, ducks and other aquatic wildlife. Includes a 100 foot walkway over the water. Moderate ups and downs and some stairs over a woodchip base.

Woodlot Trail (0.2 mile) ●●●●

This wheelchair-accessible trail winds through a small woodlot which is an excellent place to view songbirds and small mammals. A flat trail over boardwalk and crushed stone.

Old Field Trail (0.6 mile) ●●●●

Explore the ecology of abandoned fields on this trail that features many shrub and tree species, an old orchard and shaded ponds. A gentle grade over grass and woodchip surfaces.

Vlomankill Trail (0.6 mile) ●●●●

A picturesque trail traces the Vlomankill stream through a hemlock-shaded ravine. Towering trees, elevated views and exposed bedrock create a sense of the primeval. Some steep grades over woodchip surface.

OTHER POPULAR TRAILS

North Loop (2.3 miles) ●●●●

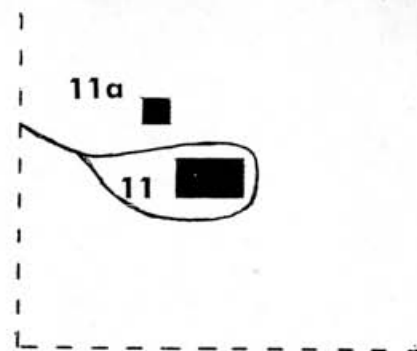
Go the distance on this hiking/skiing trail through old fields to a deep forest of northern hardwoods. Impressive trees, dense cover and dynamic views lend a sense of wilderness. Gentle grades over grass and woodchip surfaces.

Wild Turkey Trail (1.6 miles) ●●●●

Traverse old fields to a wooded ravine of the Phillipinkill stream. Dense northern hardwoods harbor deer, turkey and grouse. Extend your hike by taking **Foresman's Loop** ●●●● that passes through forest and field habitats. Moderate ups and downs over grass and woodchips.

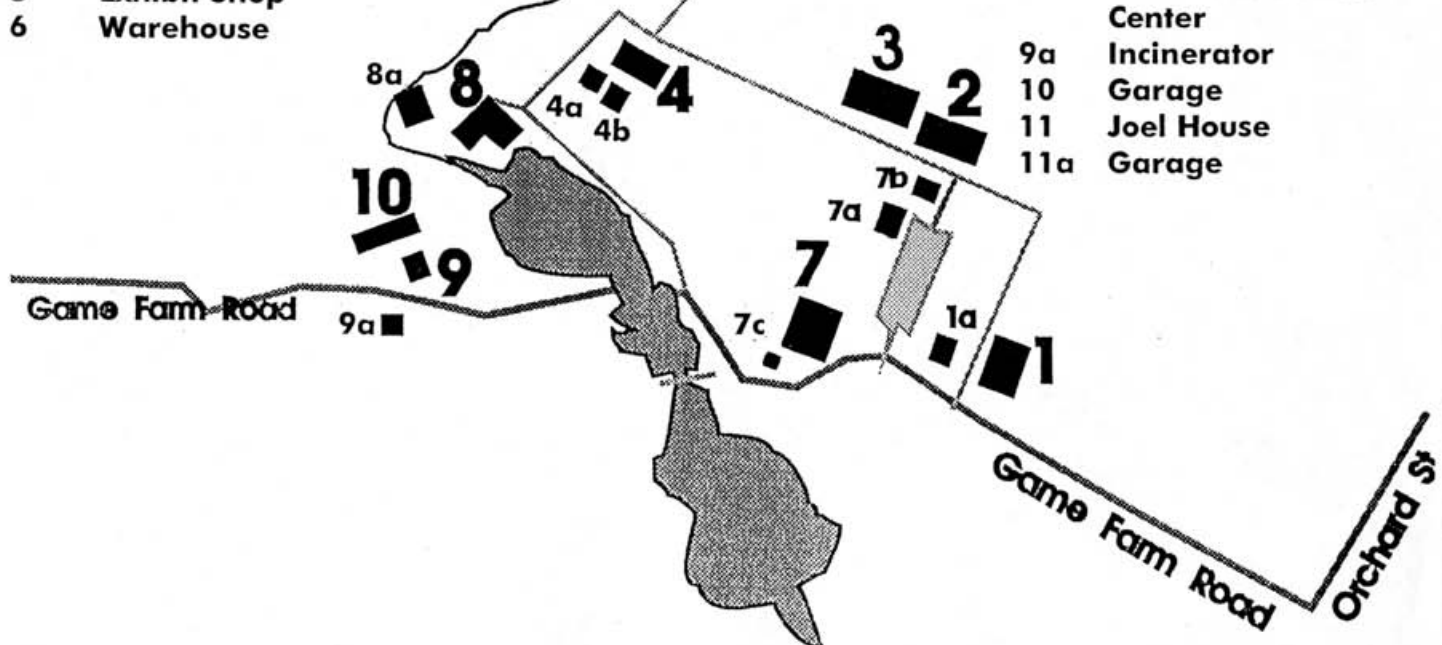
Fordhams Crossing ●●●● is off the Vlomankill Trail and offers additional views of the stream.

The Five Rivers Complex

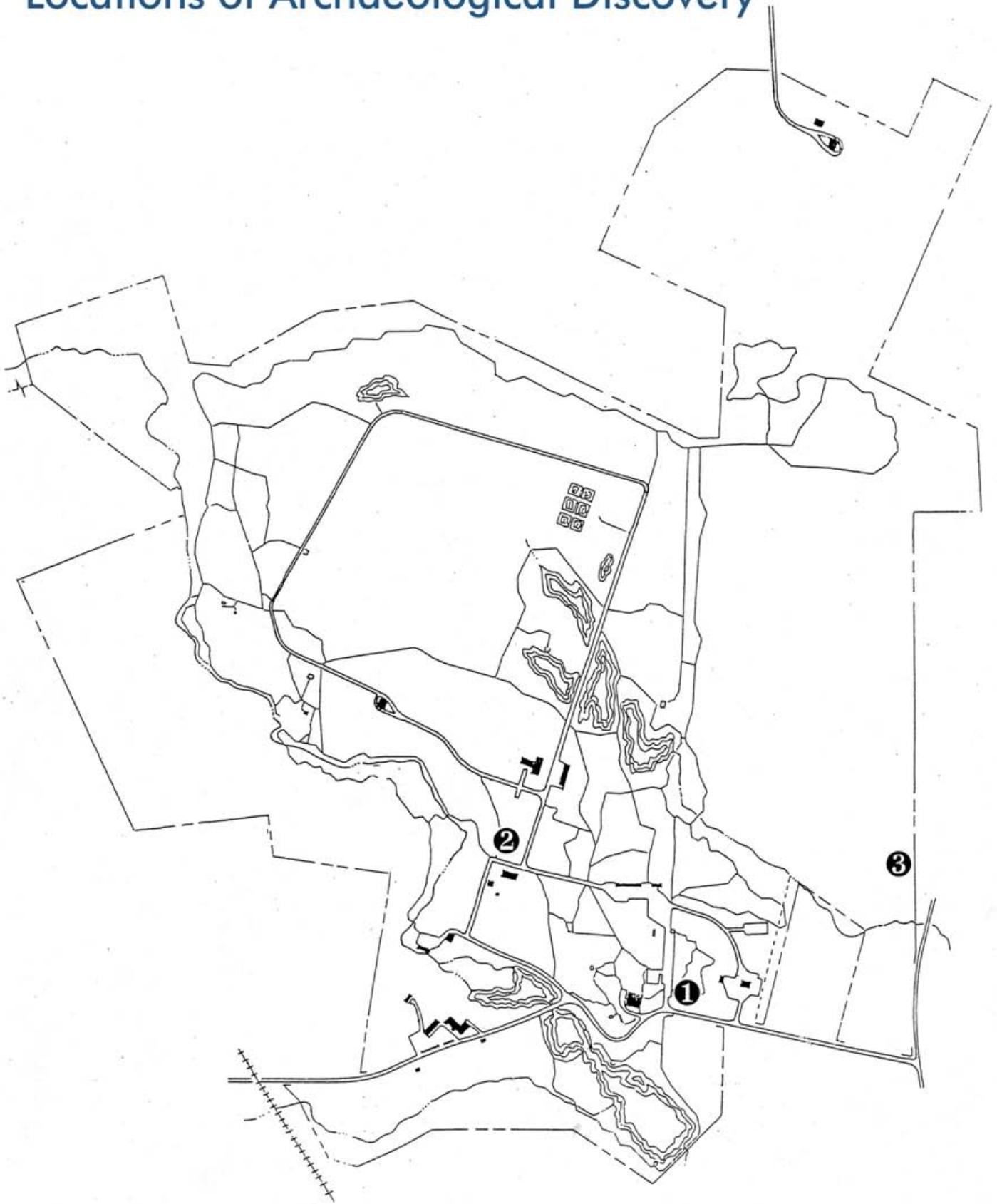


- 1 Auto Repair Shop
- 1a Tire Barn
- 2 Goose Lodge
- 3 Maintenance Shop
- 3a Jones Barn
- 4 Spruces
- 4a Annex
- 4b Powerhouse
- 5 Exhibit Shop
- 6 Warehouse

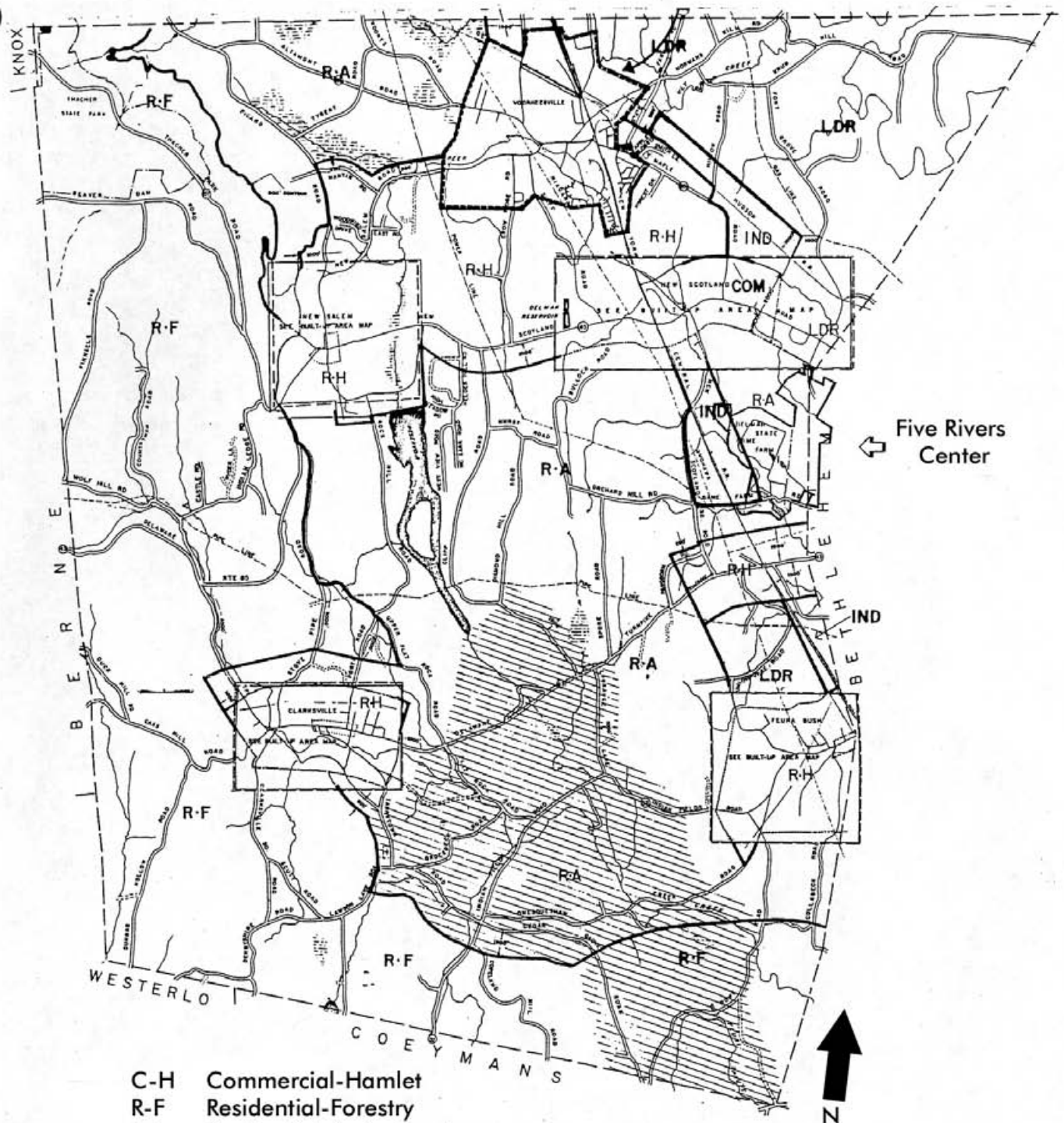
- 7 VISITOR CENTER
- 7a Bear Pen
- 7b Comfort Station
- 7c Gardeners' Shed
- 8 Teacher Resource Center
- 8a Radley Barn
- 9 Wildlife Resources Center
- 9a Incinerator
- 10 Garage
- 11 Joel House
- 11a Garage



Locations of Archaeological Discovery

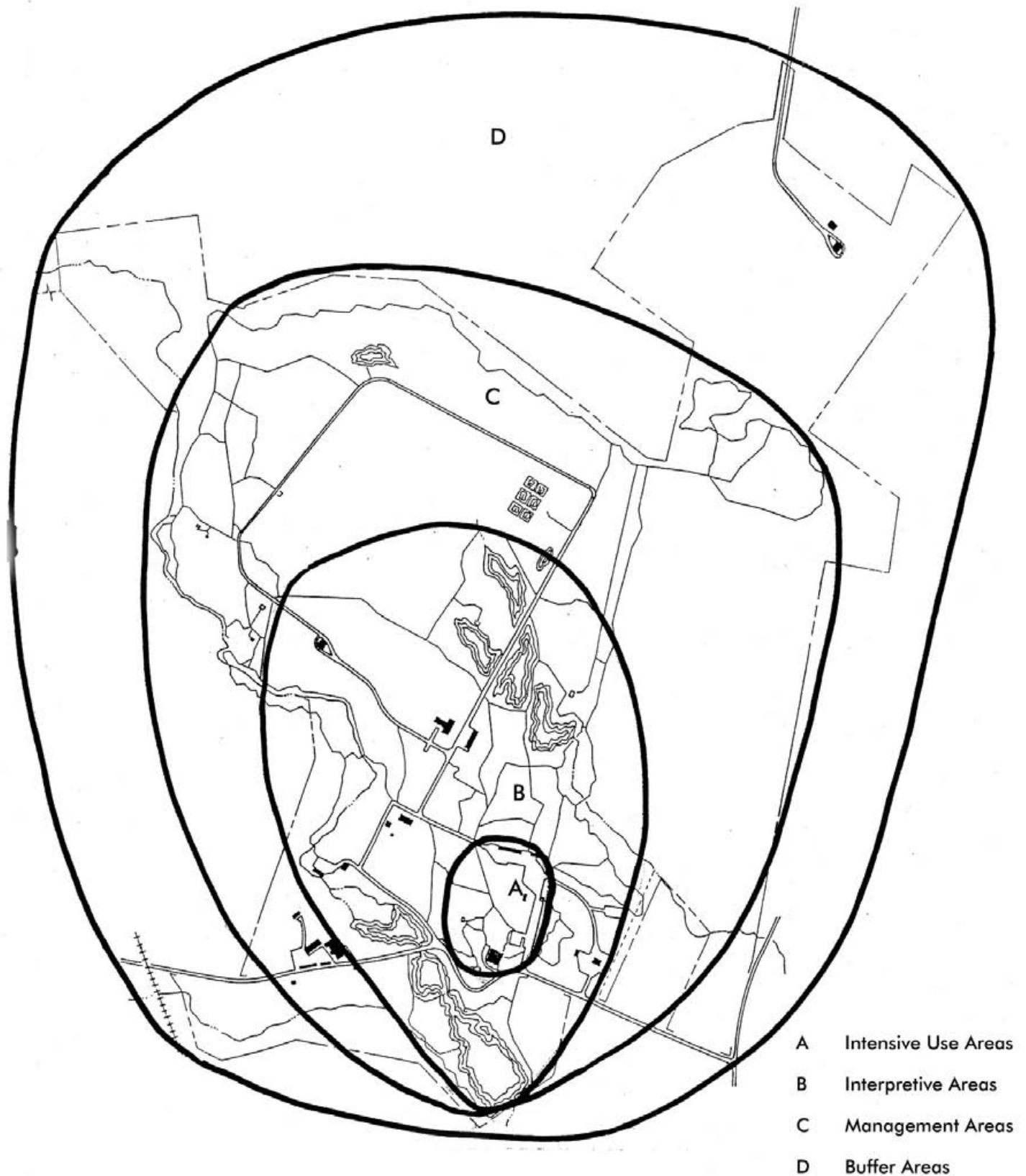


Town of New Scotland Zoning Map



- C-H Commercial-Hamlet
- R-F Residential-Forestry
- R-A Residential-Agricultural
- R-H Residential-Hamlet
- LDR Low Density Residential
- COM Commercial
- IND Industrial
- //// HISTORIC AREA

Management Areas





Five Rivers Environmental Education Center

Annual Contacts

Year 2006

NYSDEC, Bureau of Environmental Education

	Jan 06	Feb 06	Mar 06	Apr 06	May 06	Jun 06	Jul 06	Aug 06	Sep 06	Oct 06	Nov 06	Dec 06	Total
School Guided	426	605	953	164	1923	1418	17	-	231	1229	225	100	7291
Youth Guided	9	108	132	67	78	47	119	305	23	114	23	102	1127
S/YSelf-G'ded	49	-	-	110	1065	1266	258	450	103	351	107	345	4104
Adults	12	-	-	-	83	49	-	-	36	-	-	-	180
Teacher Wksp	79	8	37	136	80	31	-	-	153	44	13	12	593
Public Program	102	89	1256	168	249	139	135	499	20	216	139	102	3114
Spec Events	60	171	9686	725	3974	1137	418	5716	2772	540	52	600	25851
Public Info	578	583	765	748	1033	650	598	692	569	703	478	644	8041
GenVisitation	4805	2866	6528	6524	5574	2973	2409	7083	4013	7844	4742	3010	58371
Civic Groups	-	25	-	40	35	-	-	-	24	28	-	-	152
Int'l Partners	36	13	11	25	50	80	42	42	29	12	23	45	408
Ext'l Partners	46	152	93	88	93	116	127	-	68	70	85	91	1029
Special Needs	51	29	59	60	-	41	294	60	191	80	10	9	884
Tchr Res Ctr	-	2	-	5	8	9	7	-	-	7	6	-	44
Service Project	141	88	134	94	233	129	103	93	118	196	32	38	1399
Monthly Total	6394	4739	19654	8954	14478	8085	4527	14940	8350	11434	5935	5098	112588
Yearly Total	6394	11133	30787	39741	54219	62304	66831	81771	90121	101555	107490	112588	

Game Farm Road Geometry

