



Resolution No. 13
Fernald Preserve Natural Resource Trustees

RE: Approval to proceed with the creation of a small (approximately 0.25 acre) vernal pool with adjacent forest establishment within a 7-acre project area and the establishment of a prairie in the 6.6-acre "Triangle Area" at the Fernald Preserve, Ohio.

WHEREAS, the Fernald Preserve Trustee Council was established pursuant to the July 2001 Memorandum of Understanding entered into by the Ohio Environmental Protection Agency ("Ohio EPA"), the United States Department of Energy ("DOE"), and the United States Department of the Interior ("DOI") (collectively, the "Trustees");

WHEREAS, the Natural Resource Damage Consent Decree for the Fernald Preserve, dated November 11, 2008, required DOE to deposit \$13,750,000 into an interest-bearing escrow account in the Registry of the United States District Court for the Southern District of Ohio ("Escrow Account"), and on February 17, 2009, the United States on behalf of DOE deposited \$13,750,000 into the Escrow Account;

WHEREAS, on August 23, 2010, the United States District Court for the Southern District of Ohio ordered the transfer of \$13,781,225.18 from the Escrow Account to the Treasurer, State of Ohio, to be deposited into the Natural Resource Damages Fund, for the Fernald Preserve;

WHEREAS, the Consent Decree, Paragraph 4.6, provides that any transferred funds shall be applied toward the costs of restoration, replacement, or acquisition of the equivalent of injured Natural Resources at and in the vicinity of the Fernald Preserve, as set forth in the Natural Resource Restoration Plan ("NRRP");

WHEREAS, the Consent Decree, Paragraph 4.7, provides that the Trustees shall expend the funds to implement the plan developed pursuant to Section 1.5 of the NRRP;

WHEREAS, on June 17, 2009, the Trustees published a draft Natural Resource Funds Use Plan ("draft NRFUP") for the Fernald site and accepted

comments on the draft NRFUP until August 8, 2009. The Trustees also convened a public availability session on July 8, 2009 at the Fernald site to discuss the draft NRFUP and accept comments and suggestions from the public. On February 23, 2010, the Trustees issued the final Natural Resource Funds Use Plan (“NRFUP”); and

WHEREAS, the attached, “Paddys Run Tributary Conceptual Design,” and associated “Basis of Estimate” have been developed by the DOE to create a small (approximately 0.25 acre) vernal pool with adjacent forest establishment within a 7-acre project area at the Fernald Preserve, Ohio.

WHEREAS, the attached, “Fernald Preserve ‘Triangle Area’ Ecological Restoration Conceptual Design Narrative,” and associated “Basis of Estimate” have been developed by the DOE to establish a prairie within the 6.6-acre “Triangle Area” at the Fernald Preserve, Ohio.

NOW THEREFORE BE IT RESOLVED, that the Trustee Council agrees, by unanimous consent, to expend approximately \$283,000 (\$257,913 + ~10% contingency) from the Natural Resource Damages Fund, for the Fernald Preserve, for DOE to implement the “Paddys Run Tributary Conceptual Design” and the “Fernald Preserve ‘Triangle Area’ Ecological Restoration Conceptual Design Narrative.”

Resolution No. 13
Fernald Preserve Natural Resource Trustees

DATED this 25th day of July, 2011.

United States Department of the Interior
U. S. Fish and Wildlife Service


By: Jennifer Finfera, Columbus, Ohio Field Office

Resolution No. 13
Fernald Preserve Natural Resource Trustees

DATED this 25th day of July, 2011.

Ohio Environmental Protection Agency

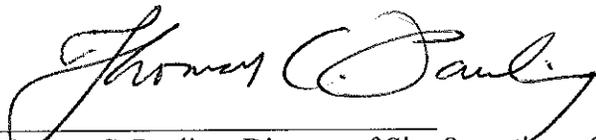
A handwritten signature in black ink, appearing to read "Thomas A. Schneider", is written over a solid horizontal line.

By: Thomas A Schneider, Fernald Project Manager

Resolution No. 13
Fernald Preserve Natural Resource Trustees

DATED this 25th day of July, 2011.

United States Department of Energy

A handwritten signature in black ink, appearing to read "Thomas C. Pauling", written in a cursive style. The signature is positioned above a horizontal line.

By: Thomas C. Pauling, Director of Site Operations, Office of Legacy Management

**Paddys Run Tributary
Conceptual Design
Fernald Preserve, Ohio**

April 2011



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

**Paddys Run Tributary Conceptual Design
Fernald Preserve, Ohio**

April 2011

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Abbreviations

B&B	balled and burlapped
cm	centimeters
DBH	diameter at breast height
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
ind/100 m ²	number of individuals per 100 meters squared
OBL	obligate wetland
qty	quantity
UPL	obligate upland

1.0 Overview

The Fernald Natural Resource Trustees plan to create a small (approximately 0.25 acre) vernal pool with adjacent forest establishment at the Fernald Preserve, Ohio. This project would take place within a 7-acre project area, located along Paddys Run Road. Current topography allows for potential vernal pool establishment. In addition to the vernal pool, three planting areas are proposed, as shown in Figure 1. The goal of this project is to create breeding habitat for ambystomid salamanders within a contiguous forest community. The proposed location is within the migration footprint for several ambystomid salamanders located in an adjacent off-property wet forest woodlot, according to analysis conducted by the Ohio Environmental Protection Agency (Gara 2010). This wet forest has been used as a reference for determining the size and location of the vernal pool, along with the proposed woody species diversity and density listed in the tables in this document.

2.0 Construction Plans

Activities associated with this approach include the following:

- [1] Kill existing herbaceous vegetation in Planting Areas B and C as topography allows.
- [2] Establish access locations, staging areas, and a construction benchmark for grade control.
- [3] Grade the vernal pool and place logs and leaf-litter substrate.
- [4] Expand several additional existing basins as topography allows.
- [5] Plant woody vegetation in Planting Area A, as well as herbaceous vegetation in the vernal pool.
- [6] Install deer fencing around Planting Area A.
- [7] Install bare-root seedlings in Planting Areas B and C.
- [8] Seed disturbed areas.

The vernal pool is to be graded to create a shallow basin (2.5-foot maximum depth) with a very-gradual-to-level slope in several areas. It is anticipated that the pool can be “field fit,” with final elevations determined on the spot using a laser level. Excess soil will be used to build a shallow berm for adjacent upland vegetation planting. Several additional existing basins could be expanded to create deeper pools as topography allows. Any agricultural drain tiles that are uncovered during excavation will be plugged on the downgradient side. On-site woody debris is to be used as substrate for the pool.

3.0 Planting Plans

Planting templates for the planting areas are provided in Table 1, Table 2, and Table 3. Vegetation installation, deer fence construction, and seeding is to take place pursuant to the Fernald Preserve Restored Area Maintenance Plan (DOE 2010).

Achieving the goals of this proposed project will take decades. As stated above, the species mix and quantities in the vegetation tables below were produced using the adjacent wet forest as a reference site (Table 4). The reference site species list was supplemented with woody vegetation that is characteristic of vernal pools in Ohio (Mack 2007). Over 1,000 stems per acre were surveyed within the reference site, including only 10 trees with a diameter at breast height (DBH) measurement exceeding 10 centimeters (cm). A two-tiered planting strategy is planned. For Planting Area A, a light density (20 trees/acre) of large tree plantings will be installed, along with a heavy density of other plantings (small container-grown and bare-root seedlings). Woody vegetation establishment will be concentrated around the constructed vernal pool, with the intent of creating canopy closure as quickly as possible. For Planting Areas B and C, planting activities will be limited to bare-root seedling installation. It is anticipated that eradication of existing cool-season grasses will result in increased establishment of volunteer woody vegetation.

Table 1. Template for Planting Area A

Species	Common Name	Wetland Indicator ^a	Form	Qty.	Size
Large Trees – 20/acre					
<i>Acer rubrum</i>	Red maple	FAC	tree	5	2- to 3-inch B&B
<i>Acer saccharum</i>	Sugar maple	FACU-	tree	14	2- to 3-inch B&B
<i>Carya laciniosa</i>	Shellbark hickory	FAC	tree	12	2- to 3-inch B&B
<i>Quercus bicolor</i>	Swamp white oak	FACW+	tree	7	2- to 3-inch B&B
<i>Quercus palustris</i>	Pin oak	FACW	tree	15	2- to 3-inch B&B
<i>Quercus rubra</i>	Red oak	FACU-	tree	20	2- to 3-inch B&B
<i>Ulmus americana</i>	American elm	FACW-	tree	7	2- to 3-inch B&B
Other Plantings – 1,000/acre					
<i>Acer saccharinum</i>	Silver maple	FACW	tree	750	bare root
<i>Aesculus glabra</i>	Ohio buckeye	FACU+	tree	75	1- to 3-gallon
<i>Asimina triloba</i>	Pawpaw	FACU+	small tree	150	1- to 3-gallon
<i>Carpinus caroliniana</i>	Blue-beech	FAC	small tree	50	1- to 3-gallon
<i>Carya cordiformis</i>	Bitternut hickory	FACU+	tree	50	1- to 3-gallon
<i>Celtis occidentalis</i>	Hackberry	FACU	tree	150	bare root
<i>Cephalanthus occidentalis</i>	Buttonbush	OBL	shrub	150	1- to 3-gallon
<i>Cornus amomum</i>	Silky dogwood	FACW	shrub	150	1- to 3-gallon
<i>Fagus grandifolia</i>	American beech	FACU	tree	75	1- to 3-gallon
<i>Lindera benzoin</i>	Spicebush	FACW-	shrub	150	1- to 3-gallon
<i>Liriodendron tulipifera</i>	Tulip tree	FACU	tree	600	bare root
<i>Quercus imbricaria</i>	Shingle oak	FAC	tree	75	1- to 3-gallon
<i>Quercus macrocarpa</i>	Bur oak	FAC-	tree	75	1- to 3-gallon
<i>Platanus occidentalis</i>	Sycamore	FACW-	tree	750	bare root
<i>Rosa palustris</i>	Swamp rose	OBL	shrub	150	1- to 3-gallon
<i>Rubus allegheniensis</i>	Common blackberry	FACU-	shrub	600	bare root

^a Positive or negative signs indicate a tendency toward higher (+) or lower (-) occurrence within a category.

Abbreviations

- B&B = balled and burlapped
- FAC = facultative
- FACU = facultative upland
- FACW = facultative wetland
- OBL = obligate wetland
- qty = quantity

Table 2. Template for Planting Area B

Species	Common Name	Wetland Indicator ^a	Form	Qty.
Bare-Root Seedlings – 1,000/acre				
<i>Acer saccharinum</i>	Silver maple	FACW	tree	100
<i>Aesculus glabra</i>	Ohio buckeye	FACU+	tree	100
<i>Cercis canadensis</i>	Redbud	FACU-	small tree	100
<i>Cornus amomum</i>	Silky dogwood	FACW	shrub	100
<i>Nyssa sylvatica</i>	Black-gum	FAC	tree	100
<i>Quercus bicolor</i>	Swamp white oak	FACW+	tree	100
<i>Quercus imbricaria</i>	Shingle oak	FAC	tree	100
<i>Quercus macrocarpa</i>	Bur oak	FAC-	tree	100
<i>Quercus palustris</i>	Pin oak	FACW	tree	100
<i>Platanus occidentalis</i>	Sycamore	FACW-	tree	100
<i>Rubus allegheniensis</i>	Common blackberry	FACU-	shrub	150
<i>Salix nigra</i>	Black willow	FACW+	tree	100
<i>Sambucus canadensis</i>	Common elderberry	FACW-	shrub	150
<i>Ulmus americana</i>	American elm	FACW-	tree	100

^a Positive or negative signs indicate a tendency toward higher (+) or lower (-) occurrence within a category.

Abbreviations

FAC = facultative

FACU = facultative upland

FACW = facultative wetland

qty = quantity

Table 3. Template for Planting Area C

Species	Common Name	Wetland Indicator ^a	Form	Qty.
Bare-Root Seedlings – 1,000/acre				
<i>Acer saccharum</i>	Sugar maple	FACU-	tree	100
<i>Aesculus glabra</i>	Ohio buckeye	FACU+	tree	100
<i>Celtis occidentalis</i>	Hackberry	FACU	tree	100
<i>Cercis canadensis</i>	Redbud	FACU-	small tree	100
<i>Corylus americana</i>	American hazel	FACU-	shrub	100
<i>Fagus grandifolia</i>	American beech	FACU	tree	100
<i>Liriodendron tulipifera</i>	Tulip tree	FACU	tree	100
<i>Quercus rubra</i>	Red oak	FACU-	tree	100
<i>Rubus allegheniensis</i>	Common blackberry	FACU-	shrub	250
<i>Rhus glabra</i>	Smooth sumac	[UPL]	shrub	250
<i>Tilia americana</i>	American basswood	FACU	tree	100
<i>Viburnum prunifolium</i>	Black-haw	FACU	shrub	100

^a Positive or negative signs indicate a tendency toward higher (+) or lower (-) occurrence within a category.

Abbreviations

FACU = facultative upland

UPL = obligate upland

qty = quantity

Table 4. Reference-Site Woody Vegetation Summary

Species	Common Name	Wetland Indicator ^a	Form	Avg. DBH (cm)	Qty.	Density (ind/100 m ²)
<i>Acer negundo</i>	Box elder	FAC+	tree	17.15	2	0.10
<i>Acer saccharum</i>	Sugar maple	FACU-	tree	6.93	223	11.15
<i>Aesculus glabra</i>	Ohio buckeye	FACU+	tree	3.30	30	1.50
<i>Asimina triloba</i>	Pawpaw	FACU+	small tree	1.04	191	9.55
<i>Celtis occidentalis</i>	Hackberry	FACU	tree	6.48	24	1.20
<i>Euonymus atropurpureus</i>	Burning-bush	FACU	shrub	0.64	1	0.05
<i>Fagus grandifolia</i>	American beech	FACU	tree	1.52	5	0.25
<i>Fraxinus americana</i>	White ash	FACU	tree	25.40	5	0.25
<i>Gleditsia triacanthos</i>	Honey locust	FAC-	tree	39.37	2	0.10
<i>Quercus bicolor</i>	Swamp white oak	FACW+	tree	88.90	1	0.05
<i>Ulmus americana</i>	American elm	FACW-	tree	7.01	21	1.05
<i>Viburnum prunifolium</i>	Black-haw	FACU	shrub	0.99	11	0.55
				Totals:	516	25.80

^a Positive or negative signs indicate a tendency toward higher (+) or lower (-) occurrence within a category.

Abbreviations

FAC = facultative

FACU = facultative upland

FACW = facultative wetland

ind/100 m² = number of individuals per 100 meters squared

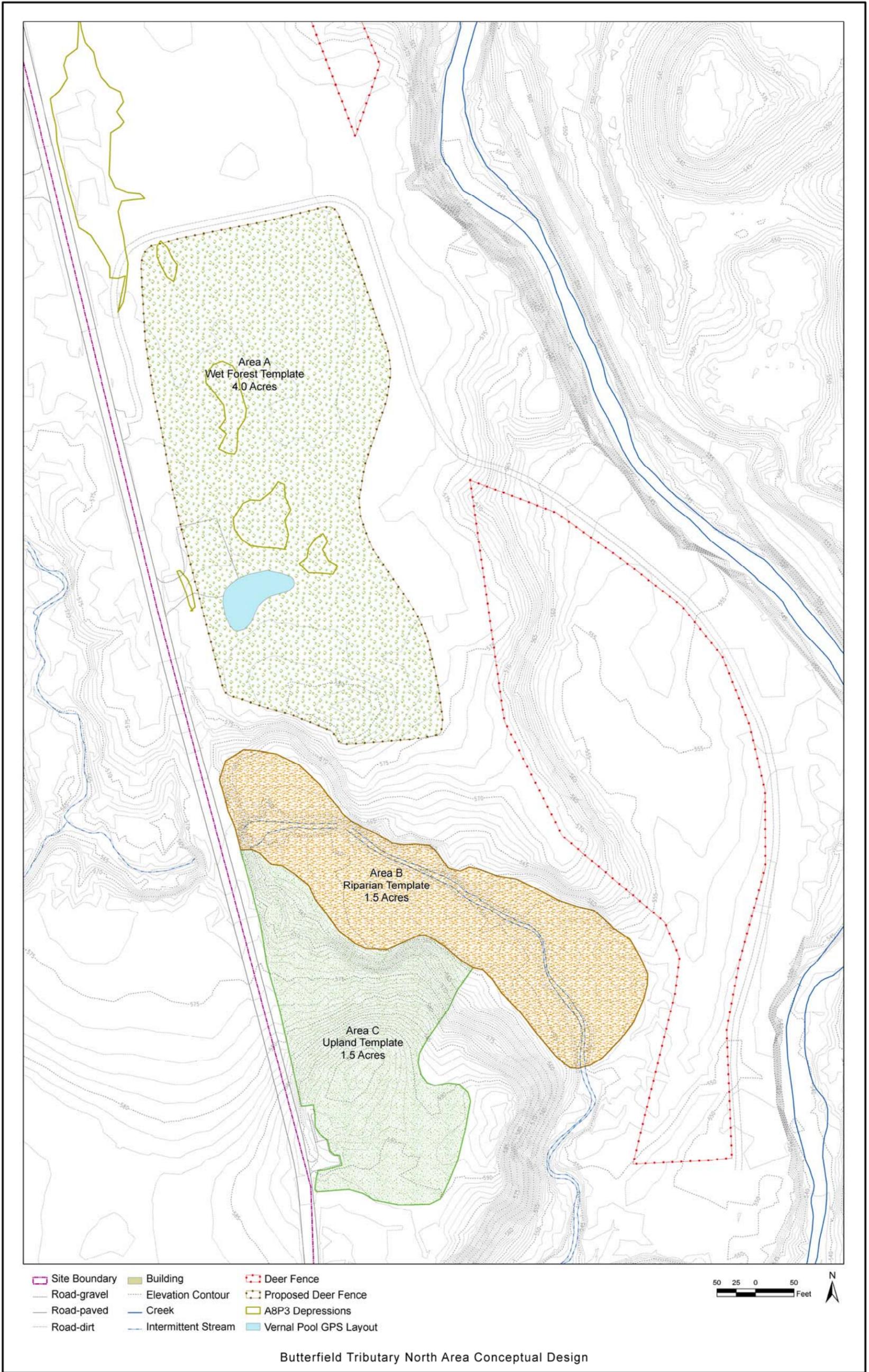
qty = quantity

4.0 References

DOE (U.S. Department of Energy), 2010. *Fernald Preserve Restored Area Maintenance Plan*, LMS/FER/S05080, Fernald Area Office, Cincinnati, Ohio, March.

Gara, Brian, 2010. Email regarding Geographic Information System analysis of existing vernal pools and the potential for restoration in nearby locations on the western portion of the Fernald Preserve, February 23.

Mack, John J., 2007. *Characteristic Ohio Plant Species for Wetland Restoration Projects v. 1.0*, Ohio EPA Technical Report WET/2007-1, Ohio Environmental Protection Agency, Wetland Ecology Group, Division of Surface Water, Columbus, Ohio.



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Figure 1. Proposed Planting Areas

Resource	FY 2008		FY 2009		FY 2010		FY 2011		FY 2012		Total	
	DPLH	Budget	DPLH	Budget	DPLH	Budget	DPLH	Budget	DPLH	Budget	DPLH	Budget
	1.502.1.06.506.8.02 Natural Resource Trustee - Paddy's Run Tributary Forest Restoration Project											
BBS4 Business Specialist 4	-	-	-	-	-	-	-	-	70	\$3,526	70	\$3,526
COM4 Communication Specialist 4	-	-	-	-	-	-	-	-	6	\$311	6	\$311
ENE5 Engineer 5	-	-	-	-	-	-	-	-	482	\$37,538	482	\$37,538
ESH1 Environ Safety & Health Spec 1	-	-	-	-	-	-	-	-	8	\$225	8	\$225
IFS4 Information Specialist 4	-	-	-	-	-	-	-	-	80	\$4,741	80	\$4,741
STE5 Scientist 5	-	-	-	-	-	-	-	-	86	\$6,827	86	\$6,827
Total Labor	-	-	-	-	-	-	-	-	732	\$53,168	732	\$53,168
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Materials/Services	-	-	-	-	-	-	-	-	-	\$4,535	-	\$4,535
Subcontracts	-	-	-	-	-	-	-	-	-	\$136,690	-	\$136,690
Travel	-	-	-	-	-	-	-	-	-	-	-	-
Training	-	-	-	-	-	-	-	-	-	-	-	-
Relocation	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-
Total ODCs	-	-	-	-	-	-	-	-	-	\$141,225	-	\$141,225
G and A	-	-	-	-	-	-	-	-	-	\$9,886	-	\$9,886
Fee	-	-	-	-	-	-	-	-	-	\$2,659	-	\$2,659
Program Support	-	-	-	-	-	-	-	-	-	\$31,041	-	\$31,040
WFO Fee	-	-	-	-	-	-	-	-	-	\$7,139	-	\$7,139
TASK TOTAL	-	-	-	-	-	-	-	-	732	\$245,117	732	\$245,117

Fernald Preserve “Triangle Area” Ecological Restoration Conceptual Design Narrative

The 6.6-acre “Triangle Area” is located on the northwest corner of the Fernald Preserve. The Fernald Natural Resource Trustees have targeted this area as a potential location for ecological restoration. A preliminary sketch and cost estimate has been submitted to the Trustees that calls for the conversion of existing cool season grasses to tallgrass prairie habitat. The narrative and cost estimate justification provided below adds detail on this proposed project, as requested by the Trustees.

Prairie establishment would require extensive preparation work to minimize competition from cool season grasses and weeds. The existing grass cover must be mowed, and then followed with at least one application of glyphosate herbicide. Optimally, several herbicide applications should be conducted. The area is large enough that application would be accomplished with a boom-sprayer pulled by a small tractor. Seeding would take place approximately two weeks following the last herbicide application, either in late spring or in the fall. Seeding would be accomplished with a tractor-pulled seed drill, with additional broadcast seeding of selected forbs.

The attached mesic prairie seed mix would be seeded. Approximately 3 acres are available for seeding. It is anticipated that the 1.5-acre former rail bed could be restored with mowing, spot herbicide application and additional seeding.



Fernald Preserve

Triangle Area

Mesic Prairie Grass Mix

Scientific Name	Common Name	lb/ac
<i>Andropogon gerardii</i>	BIG BLUESTEM	3
<i>Bouteloua curtipendula</i>	SIDE-OATS GRAMA GRASS	0.5
<i>Elymus canadensis</i>	CANADA WILD RYE	10
<i>Lolium multiflorum</i>	ANNUAL RYE	5
<i>Panicum virgatum</i>	SWITCH GRASS	0.5
<i>Schizachyrium scoparium</i>	LITTLE BLUESTEM	3
<i>Sorghastrum nutans</i>	INDIAN GRASS	3
	Total lb/ac	25

Mesic Prairie Forb Mix

Scientific Name	Common Name	oz/lacre
<i>Asclepias tuberosa</i>	BUTTERFLY-WEED	2.00
<i>Aster laevis</i>	SMOOTH ASTER	0.50
<i>Aster novae-angliae</i>	NEW ENGLAND ASTER	0.50
<i>Baptisia australis</i>	BLUE FALSE INDIGO	1.50
<i>Baptisia lactea</i>	WHITE FALSE INDIGO	1.50
<i>Chamaecrista fasciculata</i>	PARTRIDGE-PEA	1.50
<i>Oesmodium canadense</i>	CANADA TICK-TREFOIL	1.00
<i>Echinacea purpurea</i>	PURPLE CONEFLOWER	1.00
<i>Eryngium yuccifolium</i>	RATTLESNAKE-MASTER	1.00
<i>Eupatorium purpureum</i>	PURPLE JOE-PYE WEED	0.25
<i>Euthamia graminifolia</i>	FLAT-TOPPED GOLDENROD	0.10
<i>Heliopsis helianthoides</i>	SMOOTH OXEYE	1.00
<i>Lespedeza capitata</i>	ROUND-HEADED BUSH-CLOVER	1.00
<i>Monarda fistulosa</i>	WILD BERGAMOT	0.25
<i>Penstemon digitalis</i>	FOXGLOVE BEARD-TONGUE	0.25
<i>Ratibida pinnata</i>	GRAY-HEADED CONEFLOWER	1.00
<i>Rudbeckia hirta</i>	BLACK-EYED SUSAN	0.25
<i>Senna hebecarpa</i>	NORTHERN WILD SENNA	2.00
<i>Silphium laciniatum</i>	COMPASS PLANT	2.00
<i>Silphium perfoliatum</i>	CUP-PLANT	2.00
<i>Silphium terebinthinaceum</i>	PRAIRIE DOCK	2.00
<i>Solidago rigida</i>	STIFF GOLDENROD	0.25
<i>Tradescantia ohiensis</i>	OHIO SPIDERWORT	0.75
<i>Verbena stricta</i>	HOARY VERVAIN	0.50
	Total oz/lac	24.10

Resource	FY 2008		FY 2009		FY 2010		FY 2011		FY 2012		Total	
	DPLH	Budget	DPLH	Budget	DPLH	Budget	DPLH	Budget	DPLH	Budget	DPLH	Budget
	1.502.1.06.506.8.03 Natural Resource Trustee - Triangle Area											
STE5 Scientist 5	-	-	-	-	-	-	-	-	20	\$1,606	20	\$1,606
Total Labor	-	-	-	-	-	-	-	-	20	\$1,606	20	\$1,606
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Materials/Services	-	-	-	-	-	-	-	-	-	-	-	-
Subcontracts	-	-	-	-	-	-	-	-	-	\$8,520	-	\$8,520
Travel	-	-	-	-	-	-	-	-	-	-	-	-
Training	-	-	-	-	-	-	-	-	-	-	-	-
Relocation	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-
Total ODCs	-	-	-	-	-	-	-	-	-	\$8,520	-	\$8,520
G and A	-	-	-	-	-	-	-	-	-	\$596	-	\$596
Fee	-	-	-	-	-	-	-	-	-	\$80	-	\$80
Program Support	-	-	-	-	-	-	-	-	-	\$1,620	-	\$1,620
WFO Fee	-	-	-	-	-	-	-	-	-	\$373	-	\$373
TASK TOTAL	-	-	-	-	-	-	-	-	20	\$12,796	20	\$12,796